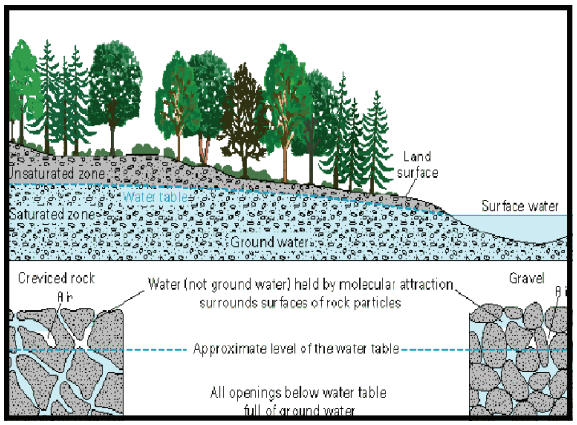


What is Groundwater?

Groundwater is the water that fills the small spaces between rock particles (sand, gravel, etc.) or cracks in solid rock. Rain, melting snow, or surface water becomes groundwater by seeping into the ground and filling these spaces. The top of the water-saturated zone is called the "***water table***."

When water seeps in from the surface and reaches the water table, it begins moving towards points where it can escape, such as wells, rivers, or lakes.

An ***aquifer*** is any type of geologic material, such as sand or sandstone, which can supply water wells or springs.

The groundwater, which supplies wells, often comes from within a short distance (a few miles) of the well. How fast groundwater moves depends on how much the well is pumped and what type of rock particles or bedrock it is moving through.

What were the steps the city took to develop a Wellhead Protection Plan?

1. Form a Community Planning team.
2. Identify the land area to be protected.
3. Identify land uses and possible sources of pollution in the sourcewater protection area and determine how vulnerable the sourcewater protection area is to pollution.
4. Implement ways to prevent groundwater pollution.
5. Develop an alternate way to supply water if the public well becomes polluted.

What Can You Do?

To help prepare a plan:

- Serve on work groups
- Attend source water protection meetings
- Help identify land uses and possible sources of contamination on your property

To protect local groundwater:

- Recognize and manage possible sources of contamination on your property
- Use hazardous products as directed and dispose of them properly
- Conserve water

Where Does Your ***DRINKING WATER*** Come From?

The

City of Cannon Falls

Has developed a
SOURCEWATER PROTECTION PLAN

In cooperation with
Minnesota Department of Health
&
Minnesota Rural Water Association

For Further Information Contact:

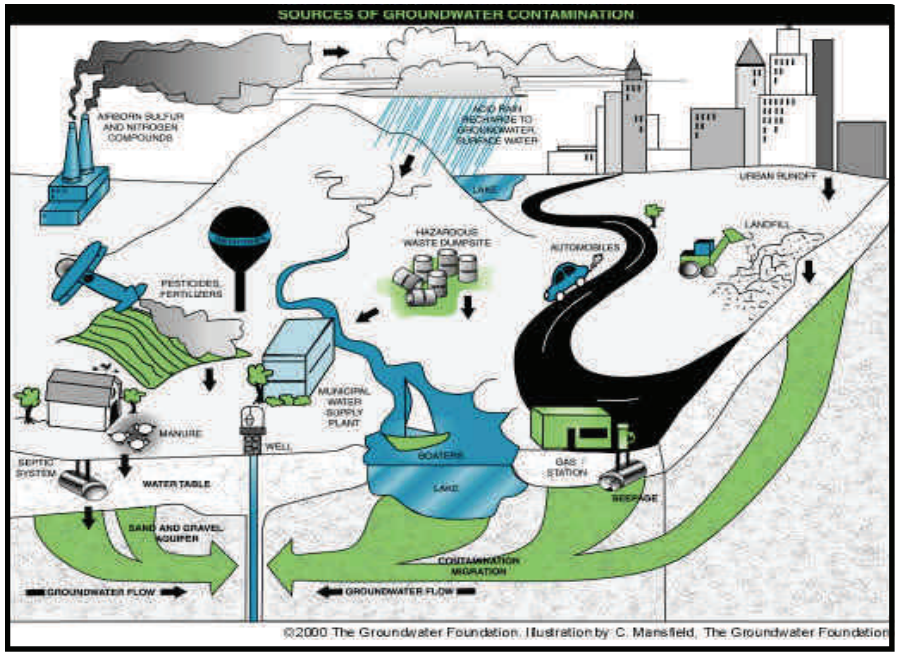
Jed Petersen
Public Works Director
City of Cannon Falls
(507) 263-9344
pwdirector@cannonfallsmn.gov

A community effort to protect public wells...

The City of Cannon Falls relies on groundwater for their drinking water supply The City owns and operates wells that draw water from groundwater aquifers located several hundred feet underground. Groundwater aquifers are vulnerable to contamination from human land surface activities.

The City of Cannon Falls is working with their citizens to protect drinking water supplies by carrying out a Sourcewater Protection plan This plan has been prepared in conjunction with several local, county and state agencies. The Minnesota Department of Health is the lead agency for the State's program and will assist communities with defining sourcewater protection areas and developing plans to protect wells. Minnesota Rural Water Association, in cooperation with the U.S. Environmental Protection Agency, provides technical assistance to public water suppliers to help meet the system's sourcewater protection goals.

For more sourcewater protection information, contact the MN Rural Water Association at (800) 367-6792.



Most Minnesotans get drinking water from wells

Sourcewater Protection is a way to prevent drinking water from becoming polluted by managing possible sources of contamination in the area which supplies water to a public well. Sourcewater Protection will be an ongoing need for communities. Everyone has an important part to play in protecting drinking water wells—today and for the future. Become involved the implementation of Monticello's SOURCEWATER PROTECTION PLAN. Contact one of the listed agencies for additional information, or call your community's water department.

How do wells become polluted?

Wells become polluted when substances that are harmful to human health get into the groundwater. Water from these wells can be dangerous to drink when the level of pollution rises above health standards. Many of our everyday activities can cause pollution. Much can be done to prevent pollution, such as wise use of land and chemicals. The expense of treating polluted water or drilling new wells can also be avoided. Help avoid drinking water contamination by being an environmentally aware citizen.

Wells and Water information

Online

For information on **wells or private drinking water**, visit our website: Minnesota Department of Health (MDH) Well Management Program, Wells and Borings (www.health.state.mn.us/wells).

For resources or questions specific to **well sealing**, visit: Sealing of Wells and Borings (www.health.state.mn.us/communities/environment/water/wells/sealing).

Email

Email the section directly at: health.wells@state.mn.us

Who to Call

For an **area well specialist**, contact the MDH office nearest you. A map of offices can be found at Contacting the Well Management Section (www.health.state.mn.us/communities/environment/water/wells/contactus).

MDH offices

MAIN OFFICE
651-201-4600
800-383-9808
625 North Robert Street
P. O. Box 64975
St. Paul, MN 55164-0975

BEMIDJI
218-308-2100
705 Fifth Street Northwest
Bemidji, MN 56601

DULUTH
218-302-6166
Duluth Technology Village
11 East Superior Street
Duluth, MN 55802

FERGUS FALLS
218-332-5150
1505 Pebble Lake Road
Fergus Falls, MN 56537

ST. CLOUD
320-223-7300
Midtown Square
3333 West Division Street
St. Cloud, MN 56301

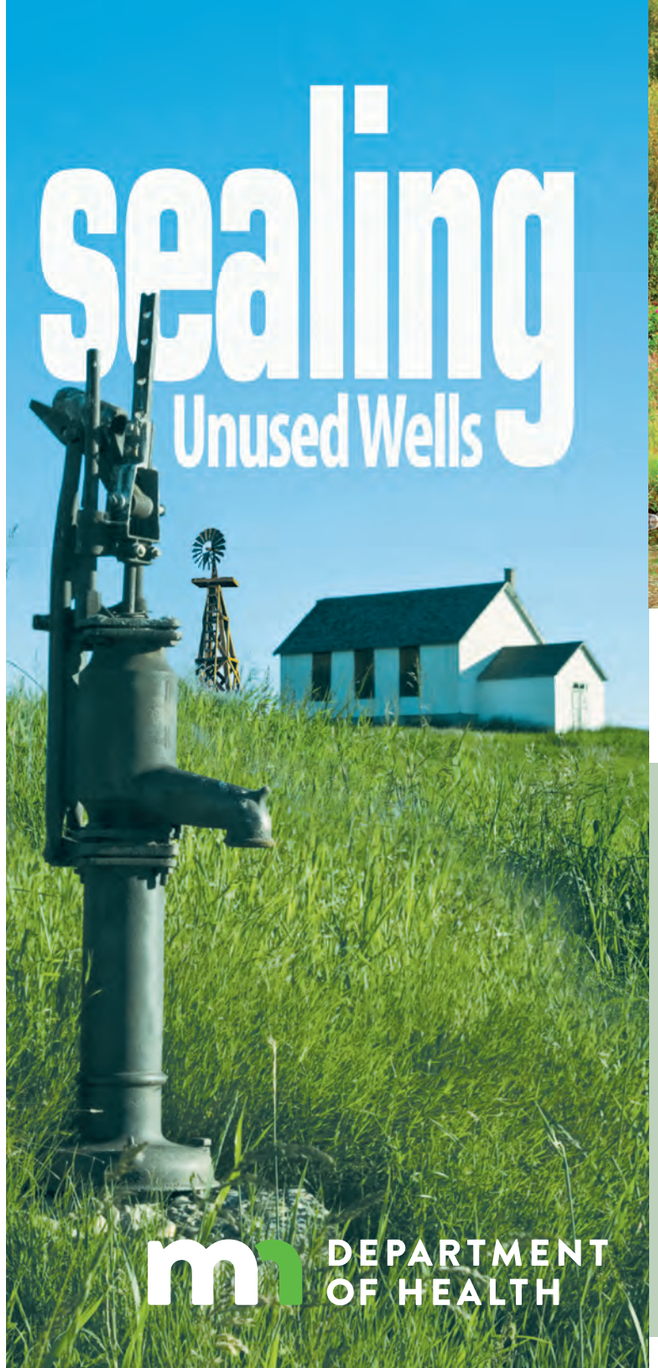
MARSHALL
507-476-4220
1400 East Lyon Street
Marshall, MN 56258

ROCHESTER
507-206-2700
18 Wood Lake Drive Southeast
Rochester, MN 55904

DEPARTMENT OF HEALTH

To request this document in another format, call 651-201-4600.
Publications\Sealing Unused Wells 01/26/2022R
Printed on recycled paper.

sealing Unused Wells



DEPARTMENT OF HEALTH

Wherever you live in Minnesota – northwoods, farm country, small town, or big city – you could have one or more wells on your property. A well may have been your home's main water source before city water became available, or it was installed to serve secondary buildings and barns, or used to water lawns or gardens.

The reality is . . . wells do not last forever.

Wells are no longer used for a variety of reasons:

- Not enough water.
- Needed repairs.
- Became contaminated.
- Simply "lost" or abandoned when property changed hands.
- Land use changed.
- Connected to a community water system.

Minnesota homeowners guide to sealing unused WELLS

Every unused well that is not properly sealed poses a safety, health, and environmental threat to your family and community as well as a potential legal risk to the homeowner.

Physical Safety

Children and small animals can easily fall into an unprotected, open well. Also, accidents can occur when equipment is unsuspectingly driven over a crumbling well or well pit.

Health & Environment

An unused well can act like a drain, allowing surface water runoff, contaminated water, or improperly disposed waste a direct pathway into drinking water sources. When this occurs, the quality of everyone's water is threatened – city water wells, neighbor's wells, even your current well. Therefore, it is recommended that homeowners test their water annually. For more information, visit: Owner's Guide to Wells (www.health.state.mn.us/communities/environment/water/wells/waterquality/test.html).

Legal Responsibilities

Consider the responsibility and liability issues if an old well on your property is proved to be a conduit for contaminants that reach a drinking water source for neighbors or your city. Selling your property? You are required to provide a well disclosure statement to the buyer before a purchase agreement is signed. The statement indicates the location, number of wells, and if the well is being used or not. For well disclosure information, visit: What You Should Know About Wells at Property Transfer (www.health.state.mn.us/communities/environment/water/wells/disclosures/wellsatpropertytransfer.html).

How to find a WELL

1 Inspect Your Property

If your house was built before public water was available, the property may have one or more wells. Wells can be located either inside or outside a building.

INDOORS look for:

Glass block or concrete patch in an exterior step

Wells are often housed in a small room in the basement, many times under exterior concrete steps

Pipe sticking up out of the floor in your basement, or a concrete patch in the floor where the well was located

OUTDOORS look for:

Low spot or sunken area in the ground

Metal, wood, or concrete cover or manhole

Areas that stay wet can be caused by an unsealed flowing well

Windmill, an old shed or well house, or an old pump

Dug wells typically appear as a ring anywhere from 1 foot or several feet in diameter, made of concrete, tile, bricks, or rocks

Pipes 1 to 8 inches wide above, at, or below the surface may indicate a well (sewer lines or septic systems may also have similar pipes, investigate further if unsure)

2 Resources Online

The **Minnesota Well Index (MWI)** contains various information for many wells in Minnesota. To see what information is available for your well, visit: Minnesota Well Index (www.health.state.mn.us/mwi).

A **Well Disclosure Certificate** contains information such as the location, number, and status of wells on the property. To see what information is available for your well, visit: Well Disclosure Certificate Search (www.health.state.mn.us/wdclookup).

3 Other Resources

Old photos, former owners, or **long-time area residents** may know about windmills, houses, or buildings no longer present

City, township, county, and state **property records**

Area **well drillers**

Old fire insurance drawings at your local **historical society**

After locating the well, determine the WELL use

Well in Use

Minnesota laws do not require a well that is in use to be sealed unless the well is contaminating the groundwater or has the potential to cause health problems.

Unused Well

If the well is not in use and does not have a Water Well Maintenance Permit (www.health.state.mn.us/communities/environment/water/wells/disclosures/welldisclosure.html#mp), or the well poses a threat to health or safety, Minnesota law requires that ***you must have the well sealed***.

If your well appears to be filled or capped, but you learn it was improperly sealed, the homeowner is responsible to have the well properly sealed by an MDH licensed well contractor.

What you need to know about sealing a WELL

Contracting

The most important thing to know about sealing a well is that you cannot do it yourself. Minnesota law mandates that a well only be sealed by an MDH licensed well contractor.

For a list of licensed contractors in your area, visit: Licensed Well and Boring Contractor Directory (www.health.state.mn.us/lwcsearch) or see the back page and call your nearest MDH office.

Costs

The cost to seal a well can vary considerably. Access to the well, special geological conditions, debris in the well, depth and diameter of the well are all factors that can affect the cost of well sealing. Therefore, it is important to get several estimates to compare costs.

If a contractor is already on the site drilling a new well, the cost of sealing an old well can often be less. The same is true if a group of homeowners or a community get together and contract to have a number of wells sealed at the same time.

Funding Assistance

Various grants and/or cost-share programs may be available through local or state government agencies. Low interest loans for well construction, repair, and sealing are also often offered through local lenders to homeowners that meet income and location requirements. Preapproval is often required to qualify for these grants or loans, so arrangements should be made before you contract to have the well sealed.
For more information, visit: Sealing of Wells and Borings (www.health.state.mn.us/communities/environment/water/wells/sealing).

Recordkeeping

Once fully sealed, the contractor is required to submit a **Well and Boring Sealing Record** to MDH. You receive a copy of this record as well. Keep this record with your other property records. It documents the well is properly sealed.

WANTED

Leaky Undergound Storage Tanks

Become Better Informed about Wellhead Protection

Nearly one out of every four underground storage tanks in the United States may be leaking, according to the U.S. Environmental Protection Agency. We are working cooperatively with storage tank owners to implement preventive measures to protect drinking water supplies. Mismanaged storage tanks pose a serious threat to drinking water.

Simple Steps YOU can take to protect your drinking water:

*Make sure all underground tanks are properly installed, backfilled, and compacted with good materials.

*Install and utilize a leak detection system on all storage tanks.

*Install and utilize a line leak detection system.

*Do NOT overfill or spill while filling underground storage tanks.

*Follow all Minnesota Pollution Control Agency requirements and recommended practices.

For more information contact:

Jed Petersen
Public Works Director
City of Cannon Falls
(507) 263-9344

Learn ways to protect your drinking water at: www.mrwa.com

MN RURAL WATER ASSOCIATION

Scan with your phone's QR code reader

Use of Ag Chemicals

Take Steps to Protect Your Drinking Water Resources

Become Better Informed about Wellhead Protection

Agricultural chemicals can have a significant impact on groundwater and drinking water resources when not properly managed. They can contaminate groundwater through how they are used.

Best Management Practices for USE and APPLICATION:

*Read and follow all label instructions, including "Environmental Restrictions." Different products have different setback and use restrictions from water bodies and sensitive areas (sinkholes, terraces, etc).

*Drinking water resources are vulnerable in sensitive areas with coarse textured (sandy) soils and high water table. Consult with a certified crop consultant and review fact sheets on Atrazine.

*To reduce run-off and leaching to groundwater, apply agricultural chemicals at the appropriate time of the year, crop, and weed growth stages described on the label.

*Do not apply agricultural chemicals less than 50' from a well. (See the State Well Code setback requirement for a hazardous substance.) A greater distance is preferred whenever possible.

*Adopt practices that help reduce the use of agricultural chemicals such as: crop rotations to minimize pests, spot spraying, and increasing crop population and density to reduce infestations, etc.

*Follow irrigation and chemigation permit requirements for proper check valves, backflow prevention devices, chemical tank construction, and setback requirements.

*Calibrate and maintain equipment to avoid over-application, leaks, and spills.

Report all spills to the State Duty Officer at: 800-422-0798

*Additional Best Management Practices for Agricultural Chemical Use and Application can be found at: **www.mda.state.mn.us**.*

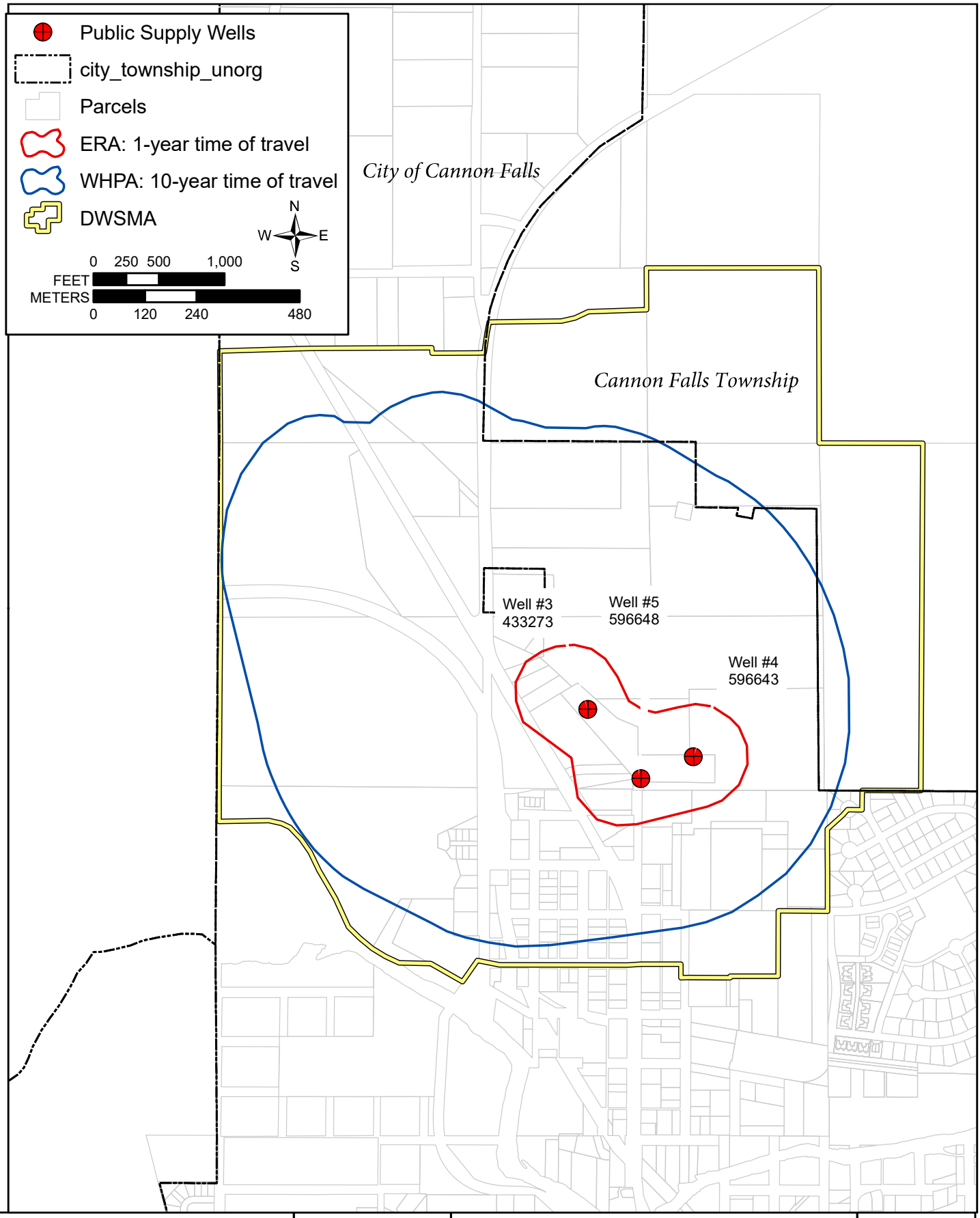
For more information contact:
Jed Petersen
Public Works Director
City of Cannon Falls
(507) 263-9344

Learn ways to protect your drinking water at: www.mrwa.com

MN RURAL WATER ASSOCIATION

Scan with your phone's QR code reader

EXPLANATION



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SEH

3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (888) 908-8166
TF: (800) 325-2055
www.sehinc.com

Project: CANNO 128201
Print Date: 08/13/2015

Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Goodhue County (2015); USDA NAIP (2015)

MAP OF THE WHPA AND DWSMA

WELLHEAD PROTECTION PLAN PART 1
Cannon Falls, Minnesota

Figure 1

Part II Wellhead Protection Plan Update

Potential Contaminant Inventory, Goals and Management Strategy

Cannon Falls, Minnesota

Public Water Supplier No. 1250001
SEH No. CANNO 128201 14.00

May 15, 2017

SEH

Building a Better World for All of Us®

Engineers | Architects | Planners | Scientists

Potential Contaminant Inventory, Goals and Management Strategy
Part II Wellhead Protection Plan Update
Cannon Falls, Minnesota

SEH No. CANNO 128201

May 15, 2017

Reviewed By: _____ Date: _____
Susan Wojtkiewicz

Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196
651.490.2000

Glossary of Terms

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

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

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

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

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

Surface Water Contribution Area (SWCA). In a conjunctive delineation, the geographic area that may provide recharge to the aquifer within the well capture zone, attributed to: 1) the presence of a surface hydraulic feature; and 2) the runoff of precipitation or meltwater.

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

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

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

Acronyms

CWI	County Well Index
DNR	Minnesota Department of Natural Resources
EPA	United States Environmental Protection Agency
IWMZ	Inner Wellhead Protection Management Zone
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MGS	Minnesota Geological Survey
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPARS	MNDNR Permitting and Reporting System (formerly known as SWUDS)
MPCA	Minnesota Pollution Control Agency
PLS	Public Land Survey
SWCA	Surface Water Contributing Area
SWCD	Soil and Water Conservation District
UMN	University of Minnesota
USGS	United States Geological Survey

Table of Contents

Table of Contents (Continued)

Part II Wellhead Protection Plan Update

Potential Contaminant Inventory, Goals and Management Strategy

Prepared for the City of Cannon Falls, Minnesota

1.0 Introduction

1.1 Background

The wellhead protection (WHP) plan for the City of Cannon Falls was prepared in cooperation with the Minnesota Department of Health (MDH) and the Minnesota Rural Water Association. It contains specific actions that the city will take to fulfill WHP requirements that are specified under Minnesota Rules, part 4720.5100 to 4720.5590. Also, the support that Minnesota state agencies, federal agencies, and Goodhue County will provide is presented to identify their roles in protecting the city's drinking water supply. The plan is effective for 10 years after the approval date specified by MDH and the city is responsible for implementing its WHP plan of action as described in Table 11 of this report. Furthermore, the city will evaluate the status of plan implementation at least every two and one half years to identify whether its WHP plan is being implemented on schedule.

1.2 Report Contents

This report is Part II of a Wellhead Protection Plan for the City of Cannon Falls, and includes the following:

- A review and assessment of the data elements.
- The results of the potential contaminant source inventory.
- A review of changes, issues, problems, and opportunities related to the public water supply and the identified potential contaminant sources.
- A detailed discussion of the potential contaminant source management strategies and corresponding goals, objectives, and action plans.
- A review of the wellhead/source water protection evaluation program
- An alternative water supply contingency strategy.

1.3 Content of Appendices

Much of the technical information that was used to prepare this plan is contained in the appendices but is summarized in the main body of this plan.

Appendix A contains the Scoping Decision Notice No. 2. Part I of the plan was completed in 2016 and is summarized in Section 2 and is included in Appendix B. In Part I of the plan, the Wellhead Protection Area (WHPA) and Drinking Water Supply Management Area (DWSMA) were delineated, and vulnerability assessments of the wells and corresponding DWSMA were amended based on updated data available on the source water aquifer used by the municipal wells.

Appendix C contains data and supporting documentation for the inventory of potential contamination sources that may present a risk to the city's drinking water. This part of the plan is discussed in Section 3 in terms of assigning risk to the city's water supply and is discussed as issues, problems or opportunities summarized in Section 6.

Appendix D contains the contingency strategy to provide for an alternate water supply if there is a disruption caused by contamination or mechanical failure.

1.4 General Information

The municipal water supply wells included in the WHP Plan are listed in Table 1.

Table 1
Water Supply Well Wells Included in WHP

Well No.	Unique Well No.	Well Status
3	433273	Primary
4	596643	Primary
5	596648	Primary

The WHP Plan Manager is Tom Bergerson, Director of Public Works, City of Cannon Falls.

WHP Team Members are Ron Johnson, Administrator, City of Cannon Falls and Robyn Hoerr, Minnesota Rural Water Association.

2.0 Delineation of the Wellhead Protection Area, Drinking Water Supply Management Area and Vulnerability Assessments

2.1 WHPA and DWSMA Delineation

The boundaries of the WHPA and DWSMA and the DWSMA vulnerability are shown in Figure 1 and well vulnerability is listed in the table below. A detailed description of the process used for 1) delineating the WHPA and the DWSMA, and 2) preparing the vulnerability assessments of the city water supply well(s) and DWSMA is presented in the Part I report found in Appendix B.

Table 2

Water Supply Well Data

Well No.	Unique Well No.	Date Constructed	Aquifer	Total Depth (ft)	Casing Depth (ft)	Casing Diameter (in)	Vulnerability
3	433273	1988	Jordan	393	297	24	Not Vulnerable
4	596643	1998	Jordan	400	288	24	Not Vulnerable
5	596648	1998	Jordan	400	281	23	Not Vulnerable

The WHPAs are defined by a 10-year time of travel; the WHPA and DWSMA are shown on Figure 1. Figure 1 shows the emergency response areas (ERAs), which are defined by a 1-year time of travel. The Inner Wellhead Protection Management Zone (IWMZ) is the area within a 200-foot radius around each well. Definitions of rule-specific terms that are used are provided in the "Glossary of Terms."

2.2 DWSMA Vulnerability Assessment

The significance of this assessment relative to the likelihood that a contaminant may move from a potential source to the source water aquifer is summarized below in terms of a travel time. Generally, the higher the vulnerability rating, the greater the risk that a released contaminant may result in contaminated drinking water.

The DWSMA vulnerability is moderate. Moderate vulnerability indicates that vertical recharge to the source water aquifer occurs over a time period of years to several decades. Isotropic data and water chemistry were also considered in the vulnerability assessment.

The vulnerability of the DWSMA is based upon the following information:

1. Water chemistry data from wells located within the DWSMA indicate that the aquifer contains water that has no detectable levels of tritium (<0.8 TU at Well #3 (433273) on 9/5/2008) or human-caused contamination; and
2. Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifer exhibits areas of low geologic sensitivity in the DWSMA that are isolated from the direct vertical recharge of surface water.

3.0 Data Elements and Assessment

3.1 Required Data Elements

The data elements that are included in this plan document the need for the WHP measures that will be implemented to help protect the city's water supply from potential sources of contamination. The city met with representatives from MDH on two occasions to discuss the data elements that are specified in Minnesota Rules, part 4720.5400, for preparing a WHP plan.

The first scoping meeting that was held on December 17, 2012 addressed the data elements that were needed to support the delineation of the WHPA, the DWSMA, and the well and DWSMA vulnerability assessments. The second scoping meeting that was held on July 29, 2015 discussed the data elements required to 1) identify potential risks to the public water supply and 2) develop effective management strategies to protect the public water supply in relation to the well and DWSMA vulnerability. The results of each meeting were communicated to the city by MDH through a formal scoping decision notice.

The Part 2 data elements are based on the determination that the DWSMA has is of moderate vulnerability.

Each data element is required to be assessed for its impact on 1) the use of the public water supply well, 2) delineation of the WHPA, 3) the quality and quantity of water supplying the public water supply wells, and 4) land and groundwater uses within the DWSMA. This information is found in Appendix B.

3.2 Physical Environment

3.2.1 Precipitation

This data element does not apply because there is no direct hydraulic connection between surface waters and the aquifer serving this water supply system.

3.2.2 Geology

Geology is a required data element and was described in Part I in detail and summarized below. Management of the DWSMA must reflect what is known about this data element.

The city of Cannon Falls draws groundwater from the Jordan Sandstone aquifer. A description of the regional hydrogeologic setting of the St. Peter-Prairie du Chien-Jordan aquifer system developed by MDH in support of wellhead protection area delineation is included in the Part I report (Appendix B).

Cannon Falls is in an area of groundwater discharge, evidenced by the aquifer test results, the strong artesian water elevations in the Jordan Sandstone relative to the surface of the Cannon River, and the historic springs in the area. This is corroborated by the non-detect tritium (<0.8 TU) and nitrate (<0.05 mg/L) in the well water, indicating a long residence time (greater than 50 years) for water in the aquifer before it reaches the well. These indicators would lead to a low vulnerability throughout; however, it is possible for human activities to alter the hydrologic system more readily than other situations. For example, high capacity wells installed nearby could shift the flow pattern and induce recharge of young water to the aquifer. Also of note, the overlying dolomite is documented to contain karst features (Appendix B); karst would enhance the potential for vertical movement of surficial

contamination. Therefore, a moderate vulnerability rating was assigned throughout the DWSMA.

In addition to managing the DWSMA based on moderate vulnerability, the presence of karst features makes it necessary to address deficiencies in understanding groundwater and surface water interactions in the DWSMA by mapping karst features. The Karst Features Data Base contains information on 371 sinkholes, nine stream sinks, and 160 springs in Goodhue County (Alexander and others, 2003), but many likely remain to be mapped. A careful karst inventory including sinkholes, springs, and seeps should be conducted by qualified personnel trained in karst hydrogeology during year 3 with particular emphasis in the vicinity of Cannon Falls. Contact the MDH Source Water Hydrologist to develop a mapping strategy during year 2. This recommendation is in Section 9.0 of Part I (Appendix B).

There are no known borehole geophysical studies or records from wells, borings and exploration test holes. There are no known surface geophysical studies pertaining to the Cannon Falls area.

3.2.3 Soils

This data element does not apply for Cannon Falls because there is no direct hydraulic connection between surface waters and the aquifer serving this water supply system.

3.2.4 Water Resources

This data element does not apply because there is no direct hydraulic connection between surface waters and the aquifer serving this water supply system.

3.3 Land Use

3.3.1 Parcels & Boundaries

Figure 1 shows the boundaries of parcels within the DWSMA and the municipal boundaries for the City of Cannon Falls. Part of the DWSMA is located outside of the City's municipal boundaries, falling within the Township of Cannon Falls. Parcels in the Township of Cannon Falls are subject to Goodhue County zoning regulations. Management of the DWSMA must reflect what is known about this data element. Cannon Falls will work with other municipalities, the Township of Cannon Falls and Goodhue County, in managing the DWSMA.

3.3.2 Potential Contaminant Sources

Mapping and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources have been completed and are shown on Figure 2.

The wellhead protection team reviewed data from relevant databases and made corrections and additions. The team also considered information provided by MDH via the Old Municipal Well Report. All potential wells identified in the Old Municipal Well Report are located outside of the DWSMA. However, as they still pose a threat to the Cannon Falls water supply, a measure is provided in this plan, to address these wells.

The inventory, mapping and management of land uses and potential sources of contamination for the DWSMA must reflect what is known about these data elements, as described in the table below. The table indicates specific categories of potential contaminant sources that must be inventoried for the moderately vulnerable DWSMA.

Table 3

Potential Contaminant Sources to Inventory

Potential Contaminant Sources	Moderately Vulnerable DWSMA
Above-ground Storage Tanks (greater than 1,100 gallons)	x
Leaking Underground Storage Tanks	x
Class V wells[1]	x
Pipeline Facility	x
Potential Contamination Site[2]	x
Solid Waste Management Site	x
Spills	x
Storage or Preparation Area	x
Suspected Contaminant of Concern	x
Underground Storage Tank	x
Wells	x
Land Use/Land Cover Map and Table	x
Inner Well Management Zone Inventory	x

Notes

[1]Potential Class V wells include: Agricultural Drainage Well, Disposal Well, Industrial Drainage Well, Large Capacity Cesspool, Large Capacity Waste Water Disposal Site, Leaking Underground Storage Tank, Misc. Injection Well, Motor Vehicle Waste Disposal Well, Recharge Well, Reinjection Well, Special Drainage Well, Storm water Injection Well

[2]Potential Contamination Sites (PCS) include the following: *Brownfields (BMS) Delisted State Superfund Sites (DPLP), Federal Superfund Sites (NPL)*

Hazardous Waste Investigative/cleanup (HWIC), No Further Remedial Action Planned (NFRAP), State Superfund Sites (PLP), Suspected Hazardous Waste Site (CERCL), Voluntary Investigative Cleanup (VIC)

Table 4 shows the inventory of potential point contaminant sources by type, status and assigned risk relative to their potential to impact the DWSMA and water supply wells. Some private wells are located within the DWSMA but there are no Potential Class V wells.

There are three active leaking underground storage tank remediation sites within the DWSMA along with a potential contaminant site and suspected contaminant of concern. Several active aboveground and underground storage tanks were identified within the DWSMA. Note that only aboveground storage tanks larger than 1,100 gallons are inventoried.

Table 5 summarizes potential contaminant sources that were identified in the Inner Well Management Zone (IWMZ), a 200-foot radius of each of Cannon Falls' wells. Two of the wells have a gravel pocket or French drain that should be labeled as being for clear water drainage only. The potential for a pollutant or contaminant to drain into the soil and presence of a construction or demolition debris disposal site were also noted.

Table 4

Potential Point Contamination Source Type and Assigned Risk

Potential Contaminant Source Type	Status	Number of Sites Within DWSMA	Assigned Risk
Private Wells	Active	5	High
Private Well	Inactive/Unused	1	High
Municipal Wells	Active	3	High
Aboveground Storage Tanks (> 1,100 gallons)	Active	3	Low
Underground Storage Tanks	Active	1	Moderate
Leaking Underground Storage Tank	Active	3	Moderate
Leaking Underground Storage Tank	Closed/Inactive	1	Low
Potential Contamination Site	Active	1	Low
Suspected Contaminant of Concern	Active	1	Moderate
No sites of the following type were identified within the DWSMA: Class V wells, Pipeline Facility, Solid Waste Management Site, Spills, Storage or Preparation Area			

Table 5

Potential Contamination Sources and Assigned Risk for the IWMZ

Source Type	Total	Level of Risk
Pollutant or contaminant that may drain into the soil (PC1)	1	Moderate
Construction or demolition debris disposal site (CD1)	1	Moderate
Gravel pocket or French drain for clear water drainage only (GP1)	2	Moderate

Additional data for potential contaminant sources, the Old Municipal Well Inventory and the Inner Well Management Zone inventory forms are found in Appendix C.

3.3.3 Land Cover, Zoning and Land Use

Management of the DWSMA must reflect what is known about land use and zoning data elements. Figure 3 shows land cover and the table below provides the proportion of area of the DWSMA of each land use type. Figure 4 shows zoning within the DWSMA for parcels in the City of Cannon Falls and Goodhue County zoning for parcels in Cannon Falls Township. The 2016 Goodhue County Comprehensive Plan is available online at http://www.co.goodhue.mn.us/documentcenter/view/11368 and serves as a guide for land use within the county. The plan does not include a countywide land use map but refers to data available from the county's GIS website. The City of Cannon Falls does not have a current comprehensive plan.

Land use within the DWSMA is tabulated by area and percentage in Table 4. The majority of the DWSMA is fairly evenly distributed among four classifications: Cultivated Land, Deciduous Forest, Urban and Industrial and Grassland. Comparing the land use and zoning maps, no areas of conflict between land use and zoning (or intended land use) were

identified. Current land uses are consistent with the zoning. There are no anticipated land use changes or changes in land use controls within the DWSMA.

Table 6

Land Use within DWSMA

Land Use Type	Area (acres)	Percentage of DWSMA
Cultivated Land	154	28.2%
Deciduous Forest	149	27.4%
Urban and Industrial	119	21.9%
Grassland	106	19.4%
Farmsteads and Rural	9	1.6%
Water	5	0.9%
Grassland-Shrub-Tree	2	0.4%
Other Rural Developments	1	0.1%

3.3.4 Public Utility Services

Management of the DWSMA shall consider the following data elements:

- Transportation routes or corridors
- Storm sewers, sanitary sewers and public water supply systems
- Construction, maintenance and use of public water supply and other wells
- Gas and oil pipelines
- Public drainage systems

Figure 5 shows storm sewer and sanitary sewers along with transportation routes and corridors. Due to security concerns, a map of the public water supply system is not provided.

Several county roads and numerous local streets lie within the DWSMA. State Highway 29 and County Road 29 are located within the DWSMA. Interstate 35 is on the western border of the DWSMA. There are two rail spurs and a rail corridor at the south end of the DWSMA. These transportation corridors may carry hazardous materials through the DWSMA. Therefore, the presence of these transportation facilities will be managed by proactively working with local emergency management entities to make them aware of the DWSMA and consider DWSMA protection should any spills occur.

Storm sewers, sanitary sewers and the public water supply system within the DWSMA are generally in good condition and are maintained by the City of Cannon Falls. The public water supply system is designed to allow isolation of parts of the system if necessary. There are several storm water ponds within the DWSMA that are part of the City's storm sewer system. Based on the DWSMA's moderate vulnerability, these ponds are not of concern as potential contaminant sources. There are no gas or oil pipelines or public drainage systems in the DWSMA.

3.4 Water Quantity

3.4.1 Surface Water Quantity

This data element does not apply because there is no direct hydraulic connection between surface waters and the aquifer serving this water supply system.

3.4.2 Groundwater Quantity

Management of the DWSMA shall consider the following data elements:

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

Currently there are no other high capacity wells within the DWSMA for which well interference complaints have been identified. There are no water appropriation permits or state environmental borehole data.

3.5 Water Quality

3.5.1 Surface Water Quality

This data element does not apply because there is no direct hydraulic connection between surface waters and the aquifer serving this water supply system.

3.5.2 Groundwater Quality

This data element must be considered in the management of the DWSMA, and shall include:

- Summary of water quality data, including: bacteriological contamination indicators; inorganic chemicals and organic chemicals.
- List of water chemistry and isotopic data from wells, springs, or other groundwater sampling points
- Groundwater tracer studies
- Site study and well water analysis of known areas of groundwater contamination

Generally, the quality of the source water aquifers utilized for the Cannon Falls public water supply is good; the water supply is free of harmful contaminants and pollutants. The public water supply system has always remained in full compliance with all state and federal drinking water regulations.

Water samples were collected from the wells and were analyzed for nitrate and a tritium analysis was conducted from Well 3 (433273) in 2008. No tritium or nitrate was detected in the samples, confirming the non-vulnerable nature of the wells (Alexander and Alexander, 1989).

There are no groundwater tracer studies or studies of known areas of groundwater contamination applicable to the DWSMA.

4.0 Impact of Land and Water Use Changes on the Public Water Supply Wells

The city estimates that the following changes to the physical environment, land use, surface water, and groundwater may occur over the ten-year period that the WHP plan is in effect. This is needed to determine whether new potential sources of contamination may be introduced in the future and to identify future actions for addressing these anticipated sources. Land and water use changes may introduce new contamination sources or result in changes to groundwater use and quality. The anticipated changes may occur within the jurisdictional authority of the City, although some may not due to part of the DWSMA being outside of the City boundaries.

The following table describes the anticipated changes to the physical environment, land use, and surface water or groundwater in relationship to 1) the influence that existing governmental land and water programs and regulations may have on the anticipated change, and 2) the administrative, technical, and financial considerations of the City of Cannon Falls and property owners within the DWSMA.

Table 7

Expected Land and Water Use Changes

Expected Change (Physical Environment, Land Use, Surface Water, Ground Water)	Impact of the Expected Change On the Source Water Aquifer	Influence of Existing Government Programs and Regulations on the Expected Change	Administrative, Technical, and Financial, Considerations due to the Expected Change
No changes to the physical makeup of the aquifer are expected.	No changes, therefore, no impact.	No changes, therefore, existing programs or regulations are adequate.	Because there are no expected changes to the physical makeup of the aquifer no additional administrative, technical or financial considerations required.
No changes are expected in the surface water sources	No changes, therefore, no impact.	No changes, therefore, existing programs or regulations are adequate.	Because there are no expected changes no additional administrative, technical or financial considerations required.
Land use changes within the DWSMA are not anticipated.	No changes, therefore, no impact.	No changes, therefore, existing programs or regulations are adequate.	Because there are no expected changes no additional administrative, technical or financial considerations required.
Construction of private wells within those areas outside of the city limits within the DWSMA is a possible change in groundwater source.	Private wells have the potential to impact existing public wells and can become a source of contamination.	Current City of Cannon Falls regulations address this issue for wells within municipal boundaries. Outside of municipal boundaries, the City does not have jurisdiction.	City will need to monitor data for private wells constructed with the DWSMA, but outside of city municipal boundaries.

5.0 Issues, Problems and Opportunities

5.1 Identification of Issues, Problems and Opportunities

The City of Cannon Falls has identified water and land use issues, problems and opportunities related to 1) the aquifer used by the city water supply wells, 2) the quality of the well water, or 3) land or water use within the DWSMA.

The City assessed 1) input from public meetings and written comments that it received, 2) the data elements identified by MDH during the scoping meetings, and 3) and the status and adequacy of the city's official controls and plans on land use and water uses, as well as those of local, state, and federal government programs. The results of this effort are presented in the following table which defines the nature and magnitude of contaminant source management issues in the city's DWSMA. Identifying the issues, problems and opportunities as well as resource needs enables the city to: 1) take advantage of opportunities that may be available to make effective use of existing resources, 2) set meaningful priorities for source management and 3) solicit support for implementing specific source management strategies.

5.2 Comments Received

There have been several occasions for local governments, state agencies and the general public to identify issues and comment on the city's WHP plan. At the beginning of the planning process, local units of government were notified that the city was going to develop its WHP plan and were given the opportunity to identify issues, as well as to comment. A public information meeting was held to review the results of the delineation of the WHP area, DWSMA, and the vulnerability assessments. Also, a public hearing was held before the completed WHP plan was sent to MDH for state agency review and approval. The following issues were identified during comment periods:

Table 8

Issues, Problems and Opportunities

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
Potential contaminant sources were identified within the IWMZ	Aquifer	Potential for contaminants to enter the water supply aquifer	Provide signage or mitigation as appropriate	Not applicable
Potential contaminant sources identified within the DWSMA include ASTs, USTs and potential contaminants of concern	DWSMA	Potential for contaminants to enter the water supply aquifer	Share potential concerns associated with contamination that could impact the water supply aquifer with property owners.	Existing controls are likely adequate; MPCA has jurisdiction
The amended DWSMA extends beyond city boundaries	Aquifer, Well Water Quality, DWSMA	Water is recharging the city's aquifer from lands outside the city limits. The city has no land use controls or authority over these areas.	The city will need to work cooperatively with Goodhue County and Township of Cannon Falls to ensure smart land use decisions are made within the City's DWSMA.	Goodhue County has zoning authority over this area and can provide valuable assistance in land use issues. Cooperation with Township of Cannon Falls is needed.
The Minnesota Department of Health has compiled historical information, the Old Municipal Well Report, for use in the planning process. Old municipal wells and two unused wells at Minnesota Malting are suspected.	Aquifer, Well Water Quality	Wells which have not been sealed according to MDH standards may provide a pathway for pollutants to enter into the aquifer.	With the assistance of MDH the city can locate, assess and seal the wells if they pose a threat to the city's drinking water supply.	MDH Well Management has the ability to require the city to properly address unused improperly sealed wells. The city can utilize the MDH WHP grant program to seal the wells.
The City of Cannon Falls has limited resources and funds to implement the wellhead protection plan.	Aquifer, Well Water Quality, DWSMA	With limited resources implementing the WHP plan will be a challenge for the City of Cannon Falls.	Form partnerships with the Township, County and State agencies who have controls in the DWSMA so they can help with implementation.	Not applicable

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
It is always difficult to foresee or plan for every threat or potential contaminant source which may affect Cannon Falls in the future	Aquifer, Well Water Quality, DWSMA	The City may not be prepared technically or financially to address potential threats unknown to them at this time.	If a critical issue or potential contaminant threat becomes an issue in the future for the City, the city can ask for assistance from the various state agencies and MRWA to promptly take action to prevent this contaminant source from contaminating their drinking water supply. Grants dollars may also be available to help cover various cost and equipment.	Not applicable
Cannon Falls is in an area of groundwater discharge but changes in water use and pumping could shift the water flow pattern and induce recharge of younger water to the aquifer.	Aquifer	Younger water may impact potential for contamination of the aquifer.	Work with MDH to assess aquifer condition with monitoring in year 5 for chloride, bromide and tritium.	Not applicable
Karst features are present and there may be unmapped springs and sinkholes in the area that would provide additional information for understanding groundwater-surface water interaction.	Aquifer	Karst features may impact potential for contamination of the aquifer.	Work with MDH to perform Karst Feature Mapping in the vicinity of the DWSMA	Not applicable

6.0 Existing Authority and Support Provided by Local, State and Federal Governments

In addition to its own controls, the City of Cannon Falls will have to rely upon partnerships formed with local units of government, state agencies, and federal agencies with regulatory controls or resource management programs in place to help implement its WHP plan. The level of support that a local, state, and federal agency can provide to help offset the risk that is presented by a potential contamination source will depend up on its legal authority as well as the resources that are available to local governments.

6.1 Existing Controls and Programs of the City of Cannon Falls

The city has identified the following legal controls and/or programs that it has in-place that can be used to support the management of potential contamination sources within the DWSMA.

Table 9

Controls and Programs of the City of Cannon Falls

Type of Control	Program Description
Zoning Ordinance and Conditional Use Permits	Sets standards and orderly growth of various land uses within the City limits and allows the City to apply permit conditions to land uses they deem necessary.
Connection to City Services (Water and Sewer)	City requires residents to connect to city water and sewer where available.
Cross Connection Ordinance	Prevents the cross connection between the City's distribution system and private water sources.

6.2 Local Government Controls and Programs

The following departments or programs within Goodhue County may be able to assist the city with issues relating to potential contamination sources that 1) have been inventoried or 2) may result from changes in land and water use within the DWSMA.

Table 10

Local Agency Controls and Programs

Government Unit or Organization	Name of Control/Program	Program Description
Goodhue County Environmental Services Department	Zoning and Conditional Use Permits	Sets standards and orderly growth of various land uses within the County and allows the County to apply permit conditions to land uses they deem necessary.
	Household Hazardous Waste Collection.	Provides education to landowners and a collection program for disposing of household hazardous waste.
	Water Planning	Establishes countywide goals and priorities towards protecting water resources including setting watershed priorities to protect surface waters and groundwater.
	Delegated County Well Program	Well construction, maintenance permitting and well abandonment
Goodhue County Emergency Management Dept.	Transportation accidents causing contaminant spills	Directs the response and the extent of initial clean-up of fuel, chemical, or other hazardous substances that are released due to transportation accidents.
Goodhue County Soil and Water Conservation District	1) Agricultural BMPs 2) Storm water management 3) Wetland management 4) Feedlots 5) Residential BMPs	The Goodhue SWCD promotes the protection of water and soil resources in the county through educational programs, cost-sharing and collaboration with other local, state and federal agencies.
Cannon River Watershed Partnership	1) Agriculture 2) Engagement 3) Small Community Wastewater	Nonprofit organization that aims to engage people to protect and improve the water quality and natural systems of the Cannon River watershed.
North Cannon River Watershed Organization	Water Planning	The North Cannon River Watershed Management Organization (NCRWMO) is a governmental unit created in 1983 through a joint powers agreement between the eight townships and 3 small cities in Dakota County that are located within in the Cannon River Watershed

6.3 State Agency and Federal Agency Support

MDH will serve as the contact for enlisting the support of other state agencies on a case-by-case basis regarding technical or regulatory support that may be applied to the management of potential contamination sources. Participation by other state agencies and the federal government is based on legal authority granted to them and resource availability.

Furthermore, MDH 1) administers state regulations that affect specific potential sources of contamination and 2) can provide technical assistance for property owners to comply with these regulations.

The following table identifies specific regulatory programs or technical assistance that state and federal agencies may provide to the City of Cannon Falls to support implementation of its WHP plan. It is likely that other opportunities for assistance may be available over the ten-year period that the plan is in effect due to changes in legal authority or increases in funding granted to state and federal agencies. Therefore, the table references opportunities available when the city's WHP plan was first approved by MDH.

Table 11

State and Federal Agency Controls and Programs

Government Unit	Type of Program	Program Description
MN Dept. of Health	State Well Code (MR Section 4725)	MDH has authority over the construction of new wells and sealing of wells. MDH staff in the Well Management Program offers technical assistance for enforcing well construction, maintaining setback distances for certain contamination sources, and well sealing.
MN. Dept. of Health	Wellhead Protection	MDH can provide technical and financial assistance to the city for WHP activities and can help identify technical and financial support that other governmental agencies can provide to assist with managing potential contamination sources.
MN Dept. of Natural Resources	Water Appropriation Permitting (MR Section 6115)	DNR can require that anyone requesting an increase in existing permitted appropriations or to pump groundwater must address concerns of the impacts to drinking water if these concerns are include in a WHP plan.
MN Pollution Control Agency (MPCA)	Registered Storage Tank Program Storm water Program	MPCA administers the programs dealing with storage tank regulations and storm water management.
Environment Protection Agency (EPA)	Shallow Disposal Well Program	EPA has the regulatory authority over Class V Injections Well or also known as Shallow Disposal Wells.

6.4 Support Provided by Nonprofit Organizations

The Minnesota Rural Water Association will assist the City of Cannon Falls with implementing its WHP plan by providing 1) reference education and outreach materials for landowners, 2) technical support for implementing individual WHP action items listed in the plan, and 3) assisting the City with assessing the results of plan implementation.

7.0 Goals

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, over time, have presented to drinking water quality and 2) future changes have that may need to be addressed to protect the community's drinking water:

The overall goal of the City of Cannon Falls is to promote public health, economic development and community infrastructure by maintaining a potable drinking water supply for all residents of the community, both now and into the future.

8.0 Objectives and Plan of Action

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 related to administrative, financial, and technical considerations.

8.1 Objectives

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

A. Create awareness and general knowledge about the importance of WHP in the Cannon Falls Community and the City of Cannon Falls DWSMA.

B. Properly inventory and manage potential contaminant sources to protect the drinking water supply for the City of Cannon Falls.

C. Gather additional information within the DWSMA in order to better understand the size and vulnerability of the DWSMA.

D. Effectively track and report the implementation efforts and wellhead protection plan progress to all governing authorities.

E. Manage the Inner Wellhead Management Zone to prevent contamination of the aquifer near the public supply wells.

F. Effectively prepare the City of Cannon Falls for disruptions to the water distribution system.

G. Develop local land use controls and partner with local units of government to better protect the aquifer used by the City of Cannon Falls.

8.2 WHP Measures and Action Plan

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.

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 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 required to get cooperation from other agencies and cooperators
- The resources needed: staff, money, time, legal, and technical

Based upon the factors listed above, the WHP team has prioritized WHP measures that will be implemented by the city over the 10-year period that this plan is in effect and assigned an appropriate priority ranking.

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 table lists each measure that it will implement over the ten-year period that the city's WHP plan is in effect, as well as the priority that it has assigned to each measure.

Measure	Priority	Measure	Objective Addressed	City Measure Unless Cooperator is Noted	Cost	Implementation time frame									
						2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
1	High	The City of Cannon Falls will notify the residents and businesses in Cannon Falls that the City has an approved wellhead protection plan and share with them the general themes included in the plan. The City will share this information through their city newsletter or on the website.	A	MDH, MRWA	Staff Time	•									
2	Medium	The City of Cannon Falls will provide WHP educational materials and a copy of the WHP on the City's website and update the page annually. Materials will address general WHP principles and practice and provide best management practices for tanks, private wells and other potential contaminant sources.	A	MRWA	Staff Time	•	•	•	•	•	•	•	•	•	•
3	High	Update potential contaminant source database periodically as tanks are removed and sites are closed or land owners or land use changes. This is also help with the next plan amendment.	B	MPCA MDH	Staff Time				•				•		
4	High	On an annual basis, check the County Well Index for records of new wells constructed within the DWSMA.	B		Staff time	•	•	•	•	•	•	•	•	•	•
5	High	Locate and assess unused wells (private wells, monitoring wells, dug wells identified by MDH) and continue to investigate wells identified by Old Municipal Well Report and those located at Minnesota Malting	B	MDH	Staff Time	•	•	•	•	•	•	•	•	•	•
6	High	If unused well(s) are located, work with property owner to properly seal well(s). This may include seeking grant funding	B	MDH Landowners	$1,500 per well	•	•	•	•	•	•	•	•	•	•

Table 11 – Wellhead Protection Measures

Measure	Priority	Measure	Objective Addressed	City Measure Unless Cooperator is Noted	Cost	Implementation time frame									
						2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
7	High	Work with MDH to develop a sampling program to collect water samples from at least one well for chloride, bromide and tritium	C	MDH	Staff Time					•					
8	Medium	Maintain a "WHP folder" that contains documentation of WHP activities you have completed.	D	MDH, MRWA	Staff Time	•	•	•	•	•	•	•	•	•	•
9	High	Complete an Evaluation Report every 2.5 years that evaluates the "progress of plan of action and the impact of a (any) contaminant release on the aquifer supplying the public water supply well" MN WHP Rule 4720.5270. City may contact MDH Planner to set up a meeting and this evaluation will be provided to the MDH Planner. This evaluation form is available on the MRWA website.	D	MDH, MRWA	Staff Time			•		•		•		•	
10	Medium	Continue to develop and maintain a line of communication between the City and Goodhue County in order to remain abreast of any land use changes which are pending within the City's DWSMA. Send a letter to Goodhue Co. requesting the formal opportunity to provide comments on pending land use changes within the DWSMA	B, G	Township of Cannon Falls, Goodhue County	Staff Time	•	•	•	•	•	•	•	•	•	•

Measure	Priority	Measure	Objective Addressed	City Measure Unless Cooperator is Noted	Cost	Implementation time frame									
						2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
11	High	Work with MDH to perform Karst Feature Mapping in the vicinity of the DWSMA	C	MDH	$5,000						•				
12	High	Assist MDH staff in completing future Inner Wellhead Management Zone Inventories for the public water supply wells.	E	MDH	Staff Time		•					•			
13	High	Contact property owner of agricultural production field within the city's IWMZ to explain wellhead protection and encourage adherence to recommended fertilizer application rates	A, B,E	Property Owner	Staff Time	•		•							
14	Medium	Solid waste dumpsters located within the IWMZ should be located remotely from wells	E		Staff Time		•								
15	High	Post “No Dumping” signs at pumphouses with floor drains that discharge to a gravel pocket or seepage pit	E		$100		•								
17	Low	Notify Goodhue County Emergency Manager and local fire department of WHP and provide map of DWSMA.	C	Goodhue County	Staff Time	•									
18	Medium	Facilitate a meeting with Cannon River Watershed Partnership, North Cannon River Water Management Organization, Goodhue and Dakota County representatives to address drawdown of aquifer and changing groundwater flow.	A, G	Goodhue & Dakota Counties, CRWMO, CRWP			•								

9.0 Evaluation Program

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

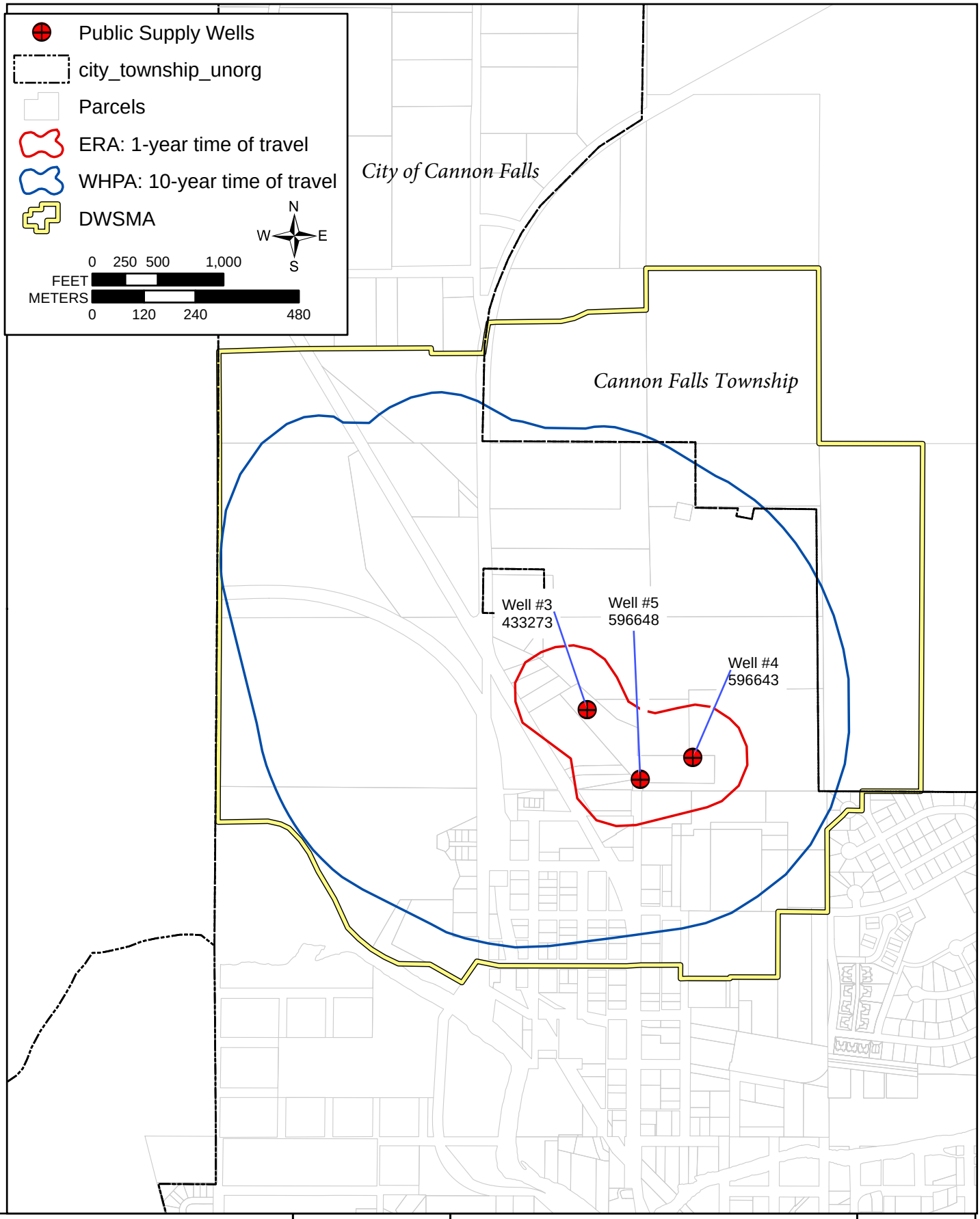
- An annual update on WHP will be provided to the City Council.
- The WHP team will meet at a minimum every two and one half years to assess the status of plan implementation and to identify issues that impact implementation of action steps throughout the DWSMA.
- The city will assess the results of each action item that has been taken to determine whether the action item has been accomplished to its purpose or whether modification is needed.
- The city will prepare a written report that documents how it has assessed plan implementation and the action items that were carried out. The report will be presented to MDH at the first scoping meeting that it will hold with the city to begin amending the WHP plan.

10.0 Contingency Strategy

The WHP plan must include a contingency strategy that addresses disruption of the water supply that is caused either by contamination or mechanical failure. The Water Supply Contingency Plan is found in Appendix D.

Figures

EXPLANATION



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SEH

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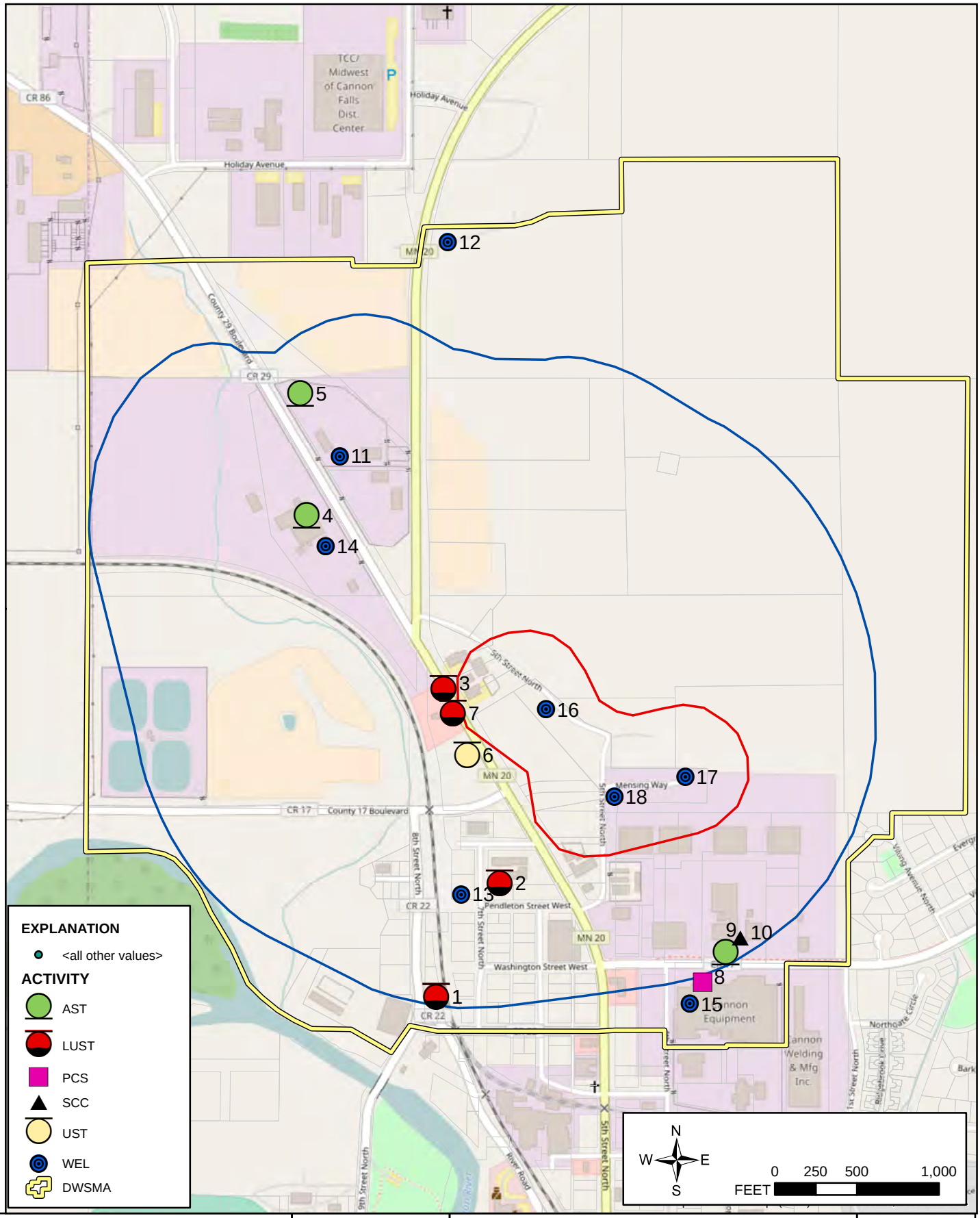
Project: CANNO 128201
Print Date: 08/13/2015

Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Goodhue County (2015); USDA NAIP (2015)

MAP OF THE WHPA AND DWSMA

WELLHEAD PROTECTION PLAN PART 1
Cannon Falls, Minnesota

Figure 1



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Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Goodhue County (2015); USDA NAIP (2015)

POTENTIAL CONTAMINANT SOURCES

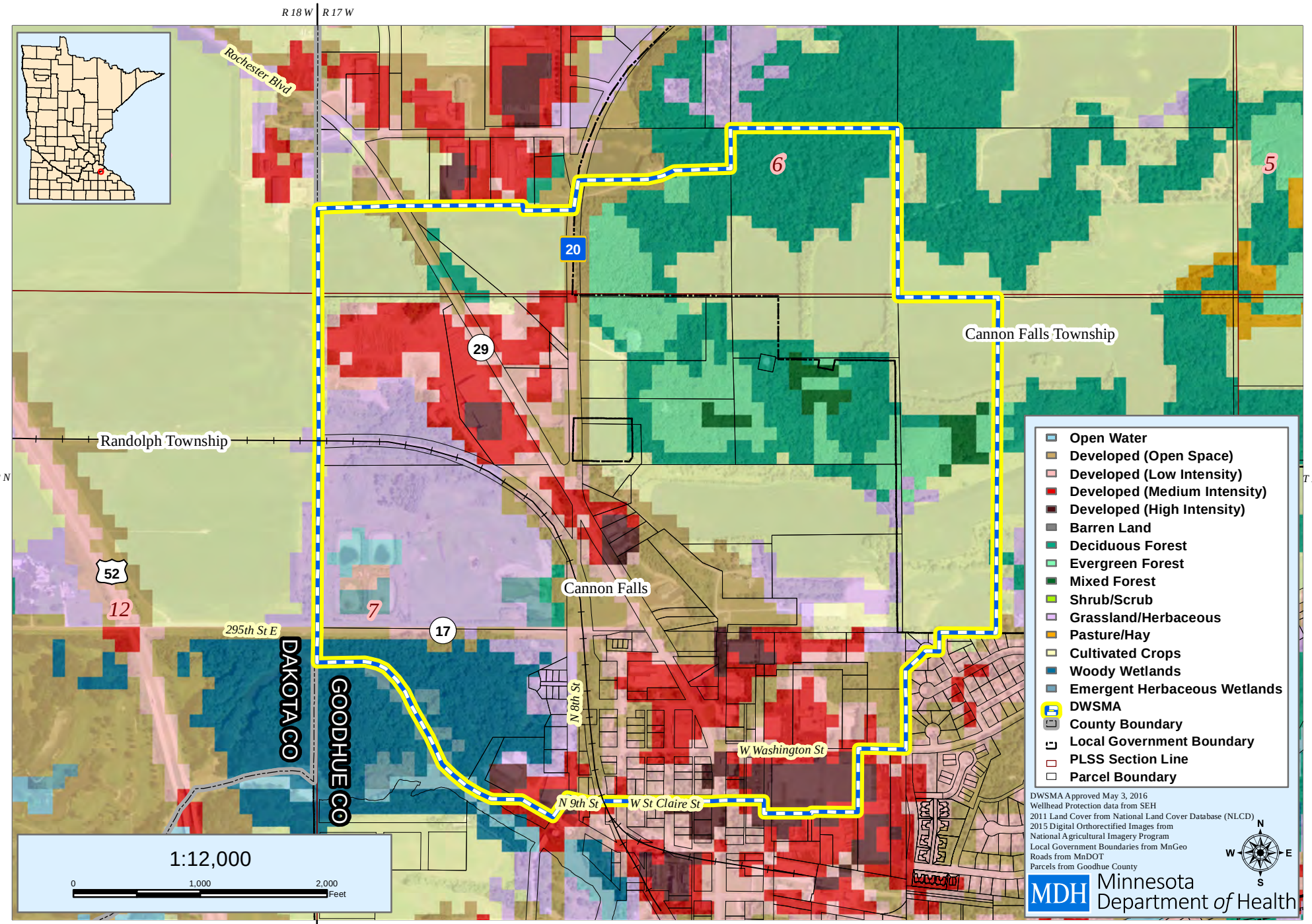
WELLHEAD PROTECTION PLAN PART 2
Cannon Falls, Minnesota

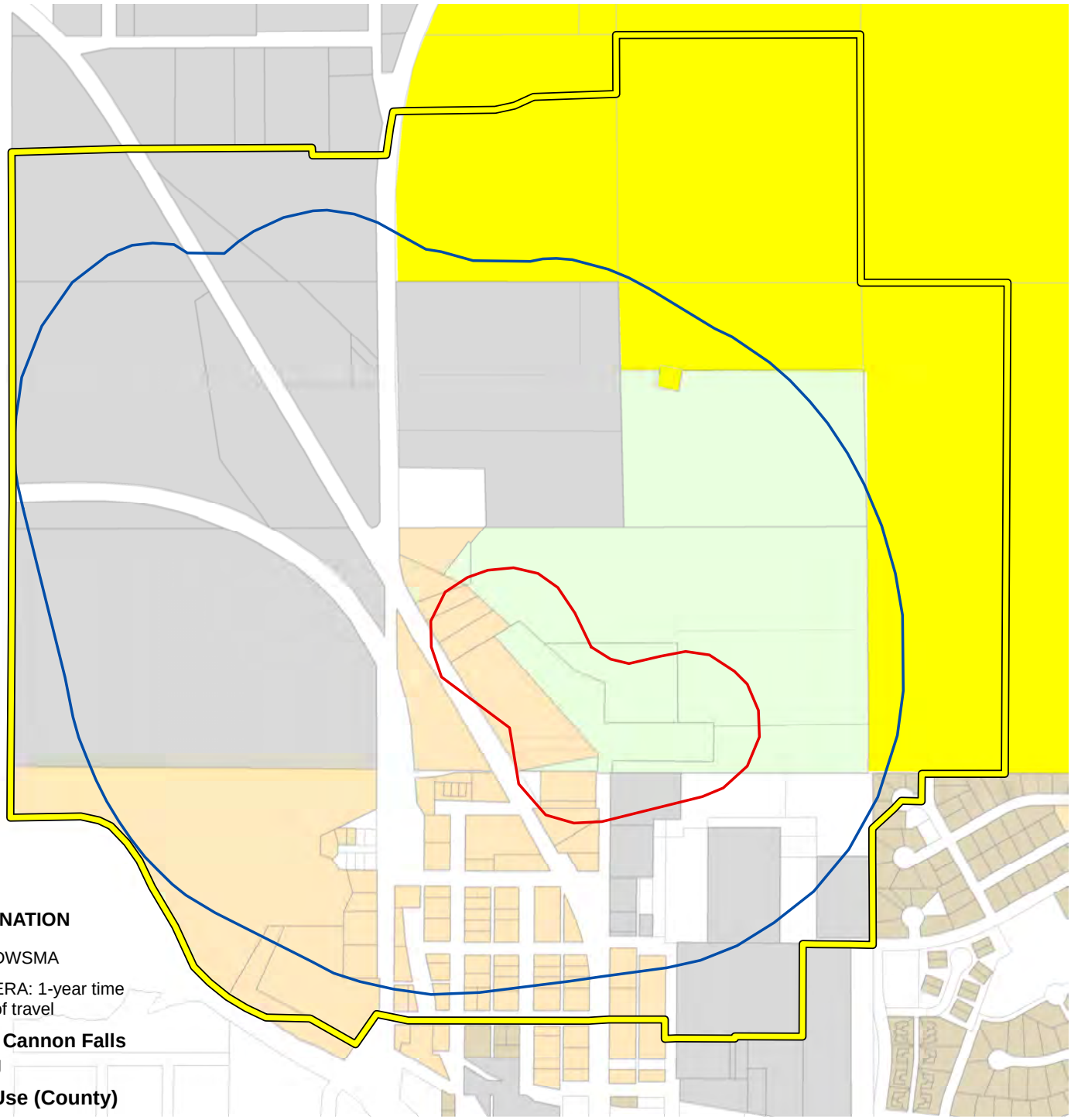
Figure 2

Cannon Falls
Goodhue County
Minnesota

Cannon Falls Drinking Water Supply Management Area (DWSMA) MN-00887 - Land Cover 2011

Minnesota Department of Health
Environmental Health
Source Water Protection Unit





EXPLANATION

- DWSMA
- ERA: 1-year time of travel

City of Cannon Falls Zoning

Land Use (County)

- Single Family Residential
- Urban Reserve
- Residential Business
- Industrial Land and Buildings
- Urban Fringe (Goodhue County Zoning)

N
W E
S

0 250 500 1,000
FEET

Map Document: P:\AE\C\Canno\128201\GIS\Part2\Fig 3 - Land Use.mxd

SEH
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (888) 908-8166
TF: (800) 325-2055
www.sehinc.com

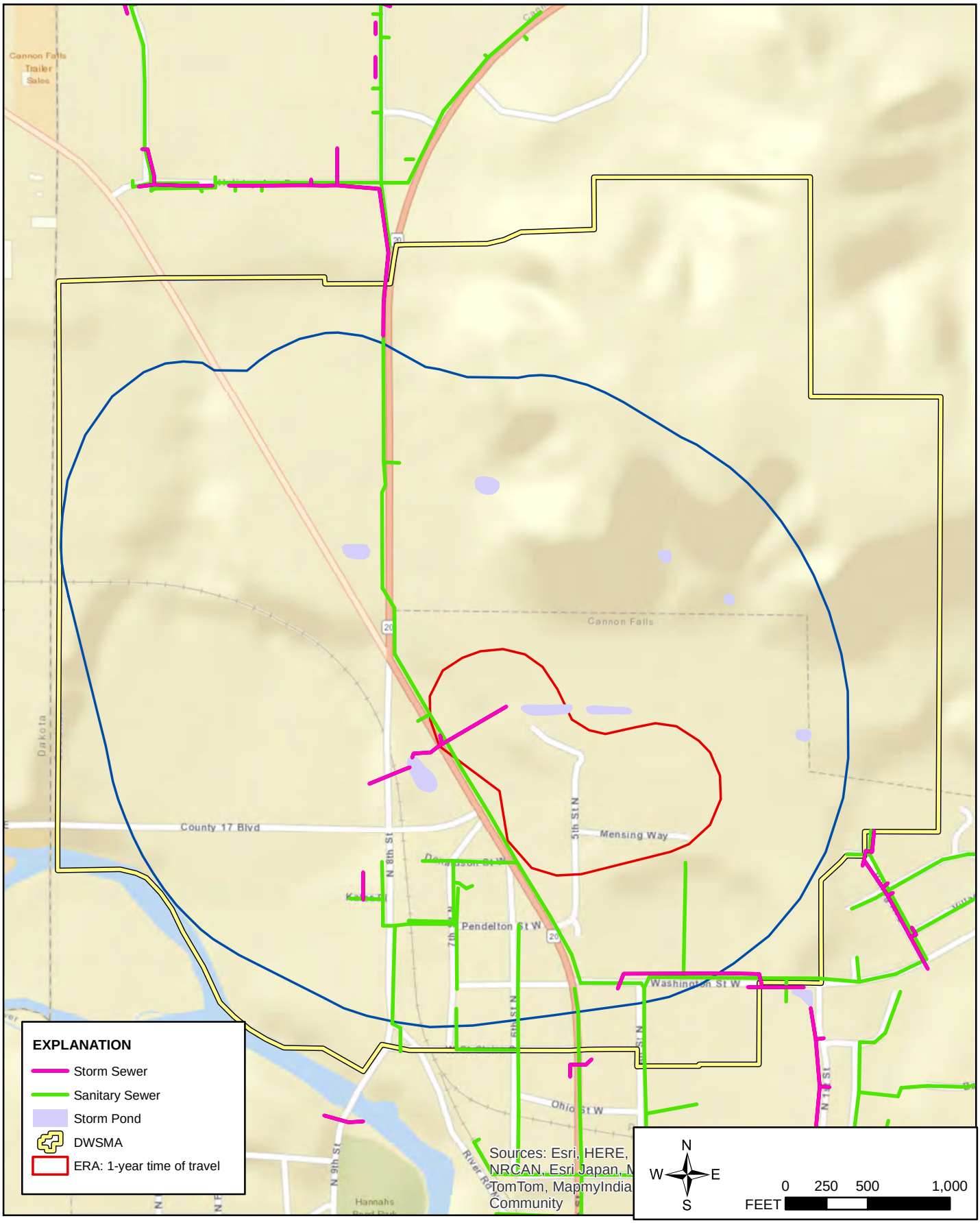
Project: CANNO 128201
Print Date: 0/02/2017

Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Goodhue County (2015); USDA NAIP (2015)

ZONING

WELLHEAD PROTECTION PLAN PART 2
Cannon Falls, Minnesota

Figure 4



Map Document: P:\AE\C\Canno\128201\GIS\Part2\Fig 4 - Utilities.mxd

SEH
3535 VADNAIS CENTER DR.
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Source: Goodhue County (2015); USDA NAIP (2015)

PUBLIC UTILITY SERVICES & TRANSPORTATION CORRIDORS

WELLHEAD PROTECTION PLAN PART 2
Cannon Falls, Minnesota

Figure 5

Appendix A

Scoping Decision Notice and Assessment of Data Elements

July 15, 2016

MINNESOTA MDH DEPARTMENT OF HEALTH

Protecting, maintaining and improving the health of all Minnesotans

Mr. Tom Bergeson, Public Works Director
City of Cannon Falls
918 River Road
Cannon Falls, Minnesota 55009

Dear Mr. Bergeson:

Subject: Scoping 2 Decision Notice and Meeting Summary – City of Canon Falls – PWSID 1250001

This letter provides notice of the results of the second scoping meeting held with you and Ron Johnson (city of Cannon Falls), Robyn Hoerr and Scott Hansen (Minnesota Rural Water Association), Susan Wojtkiewicz (Short Elliott Hendrickson, Inc.), and Pat Bailey (Minnesota Department of Health) on July 6, 2016, at Cannon Falls City Hall regarding Part II of your wellhead protection (WHP) plan. During the meeting, we discussed data elements that must be compiled and assessed to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements that were discussed at the meeting. The data elements must be compiled and assessed in terms of their present and future implications on the 1) use of the well(s), 2) quality and quantity of water supplying the public water supply well(s), and 3) land and groundwater uses in the drinking water supply management area. We also discussed a summary of planning issues that were identified during the Part I WHP Plan development process which should be considered for inclusion in your Part II WHP Plan.

The city of Cannon Falls has met the requirements to distribute copies of the first part of the WHP plan to local units of government and hold an informational meeting for the public. The city of Cannon Falls will have until June 2, 2017, to complete its WHP plan.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. MDH understands Susan Wojtkiewicz of SEH will be working with you to develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, contact me by email at pat.bailey@state.mn.us or by phone at (507) 206-2741.

Sincerely,

Pat Bailey, Planner
Source Water Protection
Environmental Health Division
18 Wood Lake Drive Southeast
Rochester, Minnesota 55904-5506

PB:ds-b
Enclosures
cc: Ron Johnson, City Administrator, City of Cannon Falls
Bassam Banet, MDH Engineer, -- Metro District Office
Robyn Hoerr, Minnesota Rural Water Association
Susan Wotjkiewicz, Short Elliott Hendrickson, Inc.
Ron Struss, Minnesota Department of Agriculture

SCOPING 2 DECISION NOTICE
Moderately Vulnerable DWSMA

Remainder of the Wellhead Protection Plan

Name of Public Water Supply: **City of Cannon Falls** **PWSID 1250001**		**Date:** July 15, 2016
Name of the Wellhead Protection Manager: Mr. Tom Bergeson, Public Works Director		
Address: 918 River Road	**City:** Cannon Falls	**Zip:** 55009
Unique Well Numbers: 433273 (Well 3), 596643 (Well 4), 596648 (Well 5)		**Phone:** (507) 263-4626

Instructions for Completing the Scoping 2 Form

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

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

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

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION

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

Technical Assistance Comments:

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

Technical Assistance Comments:

GEOLOGY

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

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

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

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

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

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect the geology of the area(s).

N	R	S	
	X		Existing surface geophysical studies.

Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect the geology of the area(s).

SOILS

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

Technical Assistance Comments:

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

Technical Assistance Comments:

WATER RESOURCES			
N	R	S	An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
X			
Technical Assistance Comments:			
N	R	S	An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
X			
Technical Assistance Comments:			
N	R	S	The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X			
Technical Assistance Comments:			
N	R	S	An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X			
Technical Assistance Comments:			
N	R	S	An existing map showing those areas delineated as floodplain by existing local ordinances.
X			
Technical Assistance Comments:			

DATA ELEMENTS ABOUT THE LAND USE

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

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

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

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

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

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

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

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

N	R	S	
	X	X	Existing zoning map.

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

PUBLIC UTILITY SERVICES

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

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

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

Technical Assistance Comments: It is not necessary to include a map of your public water supply system in your plan if you feel it would pose a threat to the security of your system. An existing map of the storm sewers and sanitary sewers in the Drinking Water Supply Management Area(s) must be included in the wellhead protection plan and must also be submitted to MDH as part of the approval.

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

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

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

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

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

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

DATA ELEMENTS ABOUT WATER QUANTITY

SURFACE WATER QUANTITY

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

Technical Assistance Comments:

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

Technical Assistance Comments:

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

Technical Assistance Comments:

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

Technical Assistance Comments:

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

Technical Assistance Comments:

GROUNDWATER QUANTITY

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

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

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

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

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

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

DATA ELEMENTS ABOUT WATER QUALITY

SURFACE WATER QUALITY

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

Technical Assistance Comments:

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

Technical Assistance Comments:

GROUNDWATER QUALITY

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

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

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

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

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

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

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

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

N	R	S	
	X		An existing property audit identifying contamination.

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

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

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

City of Cannon Falls Scoping 2 Meeting
Wellhead Protection (WHP) Planning Issues Summary

Drinking Water Protection Issues Identified to Date:

- Cannon Falls is in an area of groundwater discharge but changes in water use and pumping could shift the water flow pattern and induce recharge of younger water to the aquifer. Because of this setting and the presence of karst, the setting is considered to be moderately vulnerable.
- There may be additional unmapped springs and sinkholes in the areas that would provide additional information for understanding groundwater-surface water interactions.
- Minnesota Malting –
  - Before it was closed was a public water supply and was known to have two wells that were used for drinking water. When the company went out of business, it appears that a well disclosure was not filed for the two wells on the site. The status of these wells is not known.
  - It is also unclear if the present owner of the site is transferring any hazardous materials.
  - Also the conditions of the old MN Malting wastewater ponds needs to be determined.

Water Quality Detections and Implications:

- There have been no detection of tritium. There have also been no contaminants such as nitrate detected. The water chemistry implies low vulnerability but because of the geology the DWSMA was assessed to be moderately vulnerable.

Old Municipal Well Information:

- The Minnesota Department of Health has compiled historical information for use in the planning process. This information in an updated format will be provided to the city at the Pre-PCSI Meeting by Robyn Hoerr, MRWA.

Sanborn Maps:

☒ Sanborn Maps are available for this area
☐ Sanborn Maps are not available for this area.

Recommended WHP Measures:

- Karst Feature Mapping should be done in the vicinity of the DWSMA.
- Changes in aquifer condition can be assessed through monitoring at the half way point of the plan amendment for parameters including chloride, bromide, and tritium.

Other:

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

Appendix B

Part I Wellhead Protection Plan

Part 1 Wellhead Protection Plan Update

WHPA Delineation, DWSMA Delineation, Well and DWSMA Vulnerability Assessments

Cannon Falls, Minnesota

Public Water Supplier No. 1250001
SEH No. CANNO 128201 4.00

March 31, 2016

WHPA Delineation, DWSMA Delineation, Well and DWSMA Vulnerability Assessments
Part 1 Wellhead Protection Plan Update
Cannon Falls, Minnesota

SEH No. CANNO 128201

March 31, 2016

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

Melanie Niday

Date: March 30, 2016 Lic. No.: 30346

Reviewed By: Susan Wojtkiewicz Date: March 31, 2016
Susan Wojtkiewicz

Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196
651.490.2000

SEH

Glossary of Terms

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

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

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

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

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

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

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

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

Acronyms

CWI	County Well Index
DNR	Minnesota Department of Natural Resources
EPA	United States Environmental Protection Agency
IWMZ	Inner Wellhead Protection Management Zone
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MGS	Minnesota Geological Survey
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPARS	MNDNR Permitting and Reporting System (formerly known as SWUDS)
MPCA	Minnesota Pollution Control Agency
PLS	Public Land Survey
SWCA	Surface Water Contributing Area
SWCD	Soil and Water Conservation District
UMN	University of Minnesota
USGS	United States Geological Survey

Executive Summary

This summary documents the delineation of the protection areas for the public water supply wells used by city of Cannon Falls and includes an assessment of their vulnerability to contamination. The recharge area for the wells is known as the wellhead protection area, or WHPA, and represents the area that contributes a 10 year pumping volume to the city's wells. The area represented by a one-year volume is known as the emergency response area, or ERA. Practical reasons require the designation of a management area that fully envelops the wellhead protection area, called the drinking water supply management area, or DWSMA. Each of these areas is shown in Figure 1.

The wells used by the city of Cannon Falls are sufficiently deep and well-constructed to be considered to have a low vulnerability to contamination. One of the principal considerations for this determination is that there is significant natural geologic protection between the ground surface and the depth from which the water is pumped. Available data suggest that the low vulnerability observed at the city wells is not consistent throughout the DWSMA. At present, none of the contaminants of concern for which the Safe Drinking Water Act has established standards are present in the city's water supply.

The low to high vulnerability of the DWSMA means that the chief contamination threats to the city of Cannon Falls' aquifer are other wells that reach or penetrate it and any karst features (such as sinkholes) located within the capture zone and upgradient of the wells. Old and unused wells and karst features may provide a conduit for contaminants to short circuit the natural geologic protection and are considered a principal threat to the city's drinking water source.

The following report outlines the steps taken to delineate the City of Cannon Falls WHPA, DWSMA and ERA.

Table of Contents

List of Tables

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List of Figures

List of Appendices

Part 1 Wellhead Protection Plan Update

WHPA Delineation, DWSMA Delineation, Well and DWSMA Vulnerability Assessments

Prepared for City of Cannon Falls

1.0 Introduction

Short Elliott Hendrickson, Inc. (SEH) developed Part I of the wellhead protection (WHP) plan at the request of the city of Cannon Falls (PWSID 1250001). The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

This document contains the amendment of the Wellhead Protection Plan that was first developed for the city of Cannon Falls in 2003. The Minnesota Department of Health (MDH) requires that wellhead protection plans be reviewed and amended to reflect current conditions every ten years.

This report presents delineations of the wellhead protection area (WHPA) and drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply wells and DWSMA. Figure 1 shows the boundaries for the WHPA and the DWSMA. The WHPA is defined by a 10-year time of travel. Figure 1 also shows the emergency response area (ERA), which is defined by a one-year time of travel. Definitions of rule-specific terms used are provided in the "Glossary of Terms."

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

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

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status[1]	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer[2]	Well Vulnerability
3	433273	P	24	297	393	1988	Jordan	Not Vulnerable
4	596643	P	24	288	400	1998	Jordan	Not Vulnerable
5	596648	P	23	281	400	1998	Jordan	Not Vulnerable

Note: 1. Primary (P), Emergency Backup (E), Seasonal Use (S)

1.1 Summary of Changed Conditions from Previous Plan

Few changes have occurred in the City's public water supply infrastructure in the time since the Plan was prepared in 2003. The total volume of water pumped by the PWS wells has decreased from the 2002 delineation by about half and the allocation of pumping between wells has become more balanced. In 2008, Well 3 was sampled for tritium which was found to be non-detect. This finding significantly changes the vulnerability assessment of the wells; from vulnerable to non-vulnerable. In addition, a significant change in policy has been in place from 2005 with respect to delineation of wellhead protection areas in fractured and solution weathered bedrock (MDH, 2011). These hydrogeologic conditions apply to the area of Cannon Falls. Because of these differences in pumping volume, additional water quality information, and delineation methodology, it is prudent to re-delineate the wellhead protection areas.

2.0 Assessment of the Data Elements

MDH staff met with representatives of the city of Cannon Falls on December 17, 2012, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. **Table 2** presents the assessment of these data elements relative to the present and future implications of planning items specified in Minnesota Rules, part 4720.5210. The Scoping Decision Notice can be found in Appendix A of this report.

Table 2- Assessment of Data Elements

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation					
Geology					
Maps and geologic descriptions	M	H	H	H	MGS, DNR, USGS, Consultant Reports
Subsurface data	M	H	H	H	MGS, MDH, MPCA, DNR, MDA
Borehole geophysics	M	H	H	H	MGS, Consultant Reports
Surface geophysics	L	L	L	L	DNR, MPCA, Consultant Reports
Maps and soil descriptions					
Eroding lands					
Water Resources					
Watershed units					
List of public waters					
Shoreland classifications					
Wetlands map					
Floodplain map					
Land Use					
Parcel boundaries map	L	H	L	L	County
Political boundaries map	L	H	L	L	MnGEO, City
Public Land Survey map	L	H	L	L	MnGEO
Land use map and inventory					
Comprehensive land use map					
Zoning map					
Public Utility Services					
Transportation routes and corridors	L	L	L	L	MnDOT, MnGEO
Storm/sanitary sewers and PWS system map					
Oil and gas pipelines map					
Public drainage systems map or list					
Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH
Surface Water Quantity					
Stream flow data					

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Ordinary high water mark data					
Permitted withdrawals					
Protected levels/flows					
Water use conflicts	M	M	M	M	City, MDH, DNR
Groundwater Quantity					
Permitted withdrawals	H	H	H	H	DNR
Groundwater use conflicts	H	H	H	H	DNR
Water levels	H	H	H	H	DNR, MPCA, MDA, MDH, City
Surface Water Quality					
Stream and lake water quality management classification					
Monitoring data summary					
Groundwater Quality					
Monitoring data	H	H	H	H	MPCA, MDH, MDA, USGS
Isotopic data	H	H	H	H	MPCA, MDH, MDA, USGS, County, UMN
Tracer studies	L	L	L	L	DNR, MPCA (None Available)
Contamination site data	M	M	M	M	MPCA, MDA
Property audit data from contamination sites					
MPCA and MDA spills/release reports	M	M	M	M	MPCA

Definitions Used for Assessing Data Elements:

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

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

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

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

Acronyms used in this report are listed on page ii, after the "Glossary of Terms."

3.0 General Descriptions

3.1 Description of the Water Supply System

The city of Cannon Falls obtains its drinking water supply from 3 primary wells. **Table 1** summarizes information regarding them.

3.2 Description of the Hydrogeologic Setting

The city of Cannon Falls draws groundwater from the Jordan aquifer. Figures 3, 4, and 5 show the distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials. The figures were prepared by the MDH using well record data that is contained in the CWI database. The geological maps and studies that were used to further define local hydrogeologic conditions are provided in the "Selected References" section of this report.

A description of the regional hydrogeologic setting of the St. Peter-Prairie du Chien-Jordan aquifer system developed by MDH in support of wellhead protection area delineation is included as Appendix B. A description of the local aquifer properties and hydrogeologic setting for the aquifer used to supply drinking water is presented in **Table 3**.

Table 3- Description of the Local Hydrogeologic Setting

Aquifer	Attribute	Descriptor	Data Source
Prairie du Chien (OPDC)	Aquifer Material	Dolostone	CWI Well Logs, MGS
	Porosity (type and value)	0.05	Fractured rock – solution enhanced. MDH 2012 analysis of Hydrogeologic setting
	Aquifer Thickness	272 ft.	City Well Logs
	Stratigraphic Top Elevation	830 feet AMSL	City Well Logs
	Stratigraphic Bottom Elevation	558 feet AMSL	City Well Logs
	Hydraulic Confinement	Confined	City Well Logs
	Transmissivity (T)	Reference Value: 11,270 ft^2/day	The reference value for the transmissivity of the OPDC Aquifer was determined by a 2012 MDH analysis of the hydrogeologic setting of Southeastern Minnesota and is listed in the "Selected References" of this report.
	Hydraulic Conductivity (K)	Reference Value: 104.4 ft/day	See above.
	Groundwater Flow Field	See Figure 2 – Ambient Groundwater Flow Field	Defined by using static water level elevations from well records in the CWI database and documents listed in the "Selected References" section of this report
Jordan Sandstone (CJDN)	Aquifer Material	Sandstone	City Well Logs
	Primary Porosity	0.25	MDH 2012 analysis of Hydrogeologic setting
	Aquifer Thickness	110 ft	City Well Logs
	Stratigraphic Top Elevation	560 feet AMSL	City Well Logs
	Stratigraphic Bottom Elevation	450 feet AMSL	City Well Logs
	Hydraulic Confinement	Confined	City Well Logs

	Transmissivity (T)	Reference Value/Range	The reference value for the transmissivity of the Jordan Sandstone Aquifer was determined from pumping tests on Cannon Falls 5. The pump test data was re-assessed in July 2012 by the MDH (see Appendix F).
		4270 ft^2/day	
		4030 – 4510 ft^2/day (± 6%)	
	Hydraulic Conductivity (K)	Reference Value :	See above.
		38.8 ft/day	
	Groundwater Flow Field	See Figure 2 – Ambient Groundwater Flow Field	Defined by using static water level elevations from well records in the CWI database and documents listed in the "Selected References" section of this report

4.0 Delineation of the Wellhead Protection Area

4.1 Delineation Criteria

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

Table 4- Description of WHPA Delineation Criteria

Criterion	Descriptor	How the Criterion was Addressed
Flow Boundary	Local Lakes and Rivers: Cannon River	The rivers and lakes provided boundary conditions to the model that extended to and included these natural boundaries. They were included in the model and helped set the regional groundwater flow and water balance.
Flow Boundary	Other High-Capacity Wells Table 6	The pumping amounts were determined using the same approach used for the public water supply wells. The pumping amounts of these other wells were included in the methods used for the delineation.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the DNR, Appropriations Permit 1985-5058, and was converted to a daily volume pumped by a well.
Groundwater Flow Field	See Figure 2	The model calibration process addressed the relationship between the calculated versus observed groundwater flow field.
Aquifer Transmissivity (T)	Reference Value: OPDC: 7640 ft^2/day CJDN: 4270 ft^2/day	The reference value for the transmissivity of the Jordan and Prairie du Chien Aquifers were determined from pumping tests and other data collected for the City of Cannon Falls WHP Plan. Appendix F contains the MDH pumping test analysis for Well 5 (596648). Uncertainty regarding aquifer transmissivity was addressed as described in Section 5.4.
Time of Travel	10 years	The public water supplier selected a 10 year time of travel.

Pumping data was obtained from the DNR Permit and Reporting System (MPARS) for the public water supply's Appropriation Permit No. 1985-5058. These values, confirmed by the public water supplier, were used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in **Table 5**. Also, an estimate of the pumping for the next five years is shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.

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

Well Name	Unique Well No.	2010 (MGY)	2011 (MGY)	2012 (MGY)	2013 (MGY)	2014 (MGY)	2017 Projected* (MGY)	Daily Volume (cubic meters)
3	433273	53.947	63.09	58.22	**68.886**	63.399	63.502	714
4	596643	56.689	59.269	62.281	**64.987**	61.67	62.979	674
5	596648	**57.229**	54.217	53.662	37.441	39.326	43.476	594

Annual volumes expressed as million gallons per year (MGY).
Bold indicated greatest annual pumping volume
* Projections assume water production will maintain average pumping from 2012 - 2014

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

Table 6- Other Permitted High-Capacity Wells

Unique Well No.	Well Name	Aquifer	2011 volume (MGY)	Daily Volume (cubic meters)
247196	MINNESOTA MALTING			0
218619	MINNESOTA MALTING			0
248081	SUNRISE VILLA MOBILE HOME	OPCJ	0.0	15
248082	SUNRISE VILLA MOBILE HOME	OPCJ	0.0	15
121808	CALLISTER, COLIN	OPCJ	12.4	200
120151	GERGEN JR, EDWARD	OPDCCSTL	3.2	200
120152	GERGEN JR, WILLIAM	OPCJ	0.0	220
	MULVIHILL, GLENN M			240
	CANNON GOLF CLUB	OPCJ	25.8	350
216375	GUSTAFSON PINE CREEK FARMS	OPCJ	26.0	390
	FRANDRUP, ARTHUR H	OPCJ		400
	FELTON, DOUGLAS A			400
179106	FELTON, DOUGLAS A	OPCJ	0.0	420
162662	NELSON, CARL A	OPCJ	10.7	500
232243	GUSTAFSON PINE CREEK FARMS	OPCJ		500
216374	GUSTAFSON PINE CREEK FARMS	CJDN	21.9	570
207894	GRISIM, JON	OPCJ		600
	AHLERS, DAVID H	OPCJ	10.8	730
120158	CONZEMIUS, JOHN	OPCJ	47.5	1180

4.2 Method Used to Delineate the Wellhead Protection Area

The WHPA was determined using a combination of two different models; a porous-media flow model and a calculated fixed radius (CFR) procedure. MLAEM, a multi-layer groundwater flow model code (Strack, 1989), was used to delineate the capture zones in the Jordan Sandstone. In addition, the wells are also hydraulically connected to the Prairie du Chien Group, composed of fractured and solution weathered bedrock. These conditions require a different approach that accounts for flow through rocks with secondary porosity (MDH, 2011). The resulting WHPA boundaries are a composite of the capture zones calculated using these two approaches.

The MLAEM Code was originally selected and developed by the MDH as part of a regional model that includes Cannon Falls. MLAEM is a quantitative method capable of simulating both simple and complex groundwater flow processes, including the influence of vertical infiltration and the pumping influence of multiple high-capacity wells. The model used for the delineation is based on a two-layer MLAEM model developed by the MDH in 2013 which is described in Appendix C. The model code is included in Appendix D.

The fracture-flow delineation procedure was developed to address the increased variability in flow velocities and directions in geologic settings with secondary porosity (MDH, 2011). This Guidance describes a modified volumetric analysis and does not use a model based on flow equations. The area that is calculated by this procedure is called a calculated-fixed-radius (CFR) capture zone. Because the wells are constructed to be hydraulically connected to the Prairie du Chien Group, a CFR capture zone must be considered as a part of the delineation.

Appendix F of this report documents the steps and results of the fracture flow analysis and the CFR zone is shown on Figure 6. From this analysis, the proportion of water contributed to the wells from the overlying Prairie du Chien aquifer was determined to be less than 10% of the total produced; therefore, a regular porous media delineation was completed to delineate the WHPA.

4.2.1 Conceptual Model

The model is comprised of two layers: the first layer is the Prairie du Chien dolomite and the second layer is the Jordan sandstone. Recharge through layers of sandstone and glacial till and outwash overlaying the Prairie du Chien is represented as a resistive layer on top. The interconnection between the Prairie du Chien and the Jordan is represented as a uniform resistance over the modeled area of 4000 days, obtained from an aquifer test. The rivers in the vicinity are modeled as lines of head (elevation) specified discharge.

4.2.2 Boundary Conditions

The Jordan is modeled as confined and the Prairie du Chien is modeled regionally as confined and locally unconfined in river valleys. A porosity of 0.05 was used for the Prairie du Chien (OPDC) and 0.25 for the Jordan (CJDN) aquifers. Where the Prairie du Chien is the uppermost bedrock, infiltration is specified at 2.0e-4 m/day (2.9 inches/year). Where the Prairie du Chien is a deep confined aquifer, infiltration was modeled as a resistive element with 40,000 days resistance and a water elevation of 300 meters. Regional discharges are modeled as head (elevation) specified linesinks where the rivers have cut down into the Prairie du Chien-Jordan and lower aquifers.

In the vicinity of the City, a resistance value of 1,000 days is used where the Prairie du Chien is the first bedrock, where the St. Peter and Platteville or younger rocks are present, 30,000 and 40,000 days were used, respectively. The water elevation values used for the resistance elements were obtained from drillers records in state data sets.

The nearby large capacity wells at the malting plant are no longer used and other wells farther away are not close enough to influence the City wells except for travel times longer than twenty years and in a down-gradient direction. All other boundary types—geological and hydrological—are far enough away as to not significantly affect the flow direction or quantity of groundwater flow to the City wells.

4.3 Results of Model Calibration and Sensitivity Analysis

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

A regional calibration was performed on the total discharge from the model. In this model, the given or known values were hydraulic conductivity and water elevation. Infiltration is only roughly estimated and discharge to the rivers is the unknown to be solved. Therefore, comparison of the discharge calculated versus that observed was the critical measure for the quality of the model, both regionally and locally.

Calculated river discharges were compared to the observed discharges from USGS stream gauging stations. Daily and monthly statistical data were obtained for all years of record from the USGS web site. Additional baseflow measurements were obtained from published USGS Hydrologic Atlas reports. Detailed calibration to flux of the regional flow model is described in Blum (2013).

Model sensitivity is the amount of change in model results caused by the variation of a particular input parameter. Input parameters include:

- The pumping rate directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer within the capture zone, proportional to the porosity of the aquifer materials. However, the pumping rate is based on the results presented in Table 5 and, therefore, the sensitivity of this parameter is minimized for the WHPA delineation.

- The direction of groundwater flow determines the orientation of the capture area. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are the source of water to the well. The ambient groundwater flow field defined in Figure 2 provides the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for a well.

- A hydraulic gradient of zero produces a circular capture zone, centered on the well. As the hydraulic gradient increases, the capture zone changes into an elliptical shape, with the well centered on the down-gradient focal point. The hydraulic gradient was determined by using water level elevations that were taken from wells that have verified locations (Figure 2). Generally, the accuracy of the hydraulic gradient determination is directly proportional to the amount of available data that describes the distribution of hydraulic head in the aquifer.

- The aquifer thickness, hydraulic conductivity, and porosity influence the size and shape of the capture zone. A decrease in porosity causes a linear, proportional increase in the areal extent of the capture zone; whereas thickness and hydraulic conductivity each factor into the transmissivity, which defines the relative proportions of the capture zone width to length. A decrease in thickness or hydraulic conductivity decreases the length of the capture zone and increases the distance to the stagnation point, making the capture zone more circular in shape and centered on the well.

4.4 Addressing Model Uncertainty

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

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

1. Pumping Rate - For each well, a maximum historical (five-year) pumping rate or an engineering estimate of future pumping, whichever is greater (Minnesota Rules, part 4720.5510, subpart 4). The maximum historical rate was greater than projected rates and therefore used for all wells.
2. Porosity - A range of porosity values was used to address variability in aquifer composition that may affect the dimensions of the capture zone.

Capture areas were developed by compositing flow paths for a range of aquifer permeabilities (reference value, reference value doubled, and reference value halved) and times of travel of one and ten years (Figure 6). As the model code uses constant input values for each run, several runs were required to include all variations in input parameters.

5.0 Delineation of the Drinking Water Supply Management Area

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

- Center-lines of highways, streets, roads, utility or railroad rights-of-ways;
- Public Land Survey coordinates and divisions;
- Property lines (Goodhue County parcel data);
- Political boundaries.

A GIS shapefile of the DWSMA is provided in Appendix D.

6.0 Vulnerability Assessments

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

6.1 Assessment of Well Vulnerability

The vulnerability assessments for each well used by the city of Cannon Falls are listed in **Table 1** and are based upon the following conditions:

1. Well construction meets current State Well Code specifications (Minnesota Rules, part 4725), meaning that the well itself should not provide a pathway for contaminants to enter the aquifer used by the public water supplier;
2. None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that the well itself serves to draw contaminants into the aquifer as a result of pumping;
3. Water samples were collected from the wells and were analyzed for nitrate and a tritium analysis was conducted from Well 3 (433273) in 2008. No tritium or nitrate was detected in the samples, confirming the non-vulnerable nature of the wells (Alexander and Alexander, 1989).

Well vulnerability for each public supply well is identified in Table 1 above. The MDH vulnerability scoring sheets are included as Appendix E of this report.

6.2 Assessment of Drinking Water Supply Management Area Vulnerability

The vulnerability of the DWSMA is shown in Figure 7 and is based upon the following information:

1. Water chemistry data from wells located within the DWSMA indicate that the aquifer contains water that has no detectable levels of tritium (<0.8 TU at Well #3 (433273) on 9/5/2008) or human-caused contamination; and
2. Review of the geologic logs contained in the CWI database and geological maps and reports indicate that the aquifer exhibits areas of low geologic sensitivity in the DWSMA that are isolated from the direct vertical recharge of surface water.

Based on the modeled time of travel, the aquifer vulnerability was determined to be moderate in the DWSMA (Figure 7). Cannon Falls is in an area of groundwater discharge, evidenced by the aquifer test results, the strong artesian water elevations in the Jordan Sandstone relative to the surface of the Cannon River, and the historic springs in the area. This is corroborated by the non-detect tritium (<0.8 TU) and nitrate (<0.05 mg/L) in the well water, indicating a long residence time (greater than 50 years) for water in the aquifer before it reaches the well. These indicators would lead to a low vulnerability throughout; however, it is possible for human activities to alter the hydrologic system more readily than other situations. For example, high capacity wells installed nearby could shift the flow pattern and induce recharge of young water to the aquifer. Also of note, the overlying dolomite is documented to contain karst features (Appendix B); karst would enhance the potential for vertical movement of surficial contamination. Therefore, it is prudent to assign a moderate vulnerability throughout the DWSMA (Figure 7).

7.0 Recommendations

The following recommendations have been generated to inform the next amendment of the city of Cannon Falls Wellhead Protection Plan.

1. Water Quality Monitoring: The standard assessment monitoring package should be analyzed during year 5, including the primary wells and river. MDH can provide sample bottles and cover analytical costs. The city may need to collect the samples and ship them to MDH.
2. Karst Feature Mapping: Address deficiencies in understanding groundwater and surface water interactions in the DWSMA by mapping karst features. The Karst Features Data Base contains information on 371 sinkholes, nine stream sinks, and 160 springs in Goodhue County (Alexander and others, 2003), but many likely remain to be mapped. A careful karst inventory including sinkholes, springs, and seeps should be conducted by qualified personnel trained in karst hydrogeology during year 3 with particular emphasis in the vicinity of Cannon Falls. Contact the MDH Source Water Hydrologist to develop a mapping strategy during year 2.

8.0 Standard of Care

The interpretations presented in this report are based on local data collected during this study and previous studies, such as current and historical pumping tests and regional data collected from governmental agencies. Data collected and analyzed by others and used in this report may not be precise or accurate. This Plan does not account for any variations that may occur between points of exploration; geologic and hydrogeologic conditions likely differ across the study area. Also, it must be noted that seasonal and cyclical fluctuations in the hydrogeologic characteristics and properties of the aquifers will occur.

The scope of this report and the corresponding groundwater flow model and calculations is limited to the delineation of capture zones for the Cannon Falls municipal wells. Use of the groundwater flow model by other parties or for other purposes is not advised. Use or modification of the model for purposes other than the delineation of capture zones must be done with caution and a full understanding of the inherent assumptions and limitations of the data.

This Plan represents our understanding of the significant aspects of the local geologic and hydrogeologic conditions; the conclusions are based on our hydrogeologic and engineering judgment, understanding and perspective, and represent our professional opinions. These opinions were arrived at in accordance with the currently accepted standard of care for geologic and engineering practices at this time and location. No warranty is implied or intended.

9.0 Selected References

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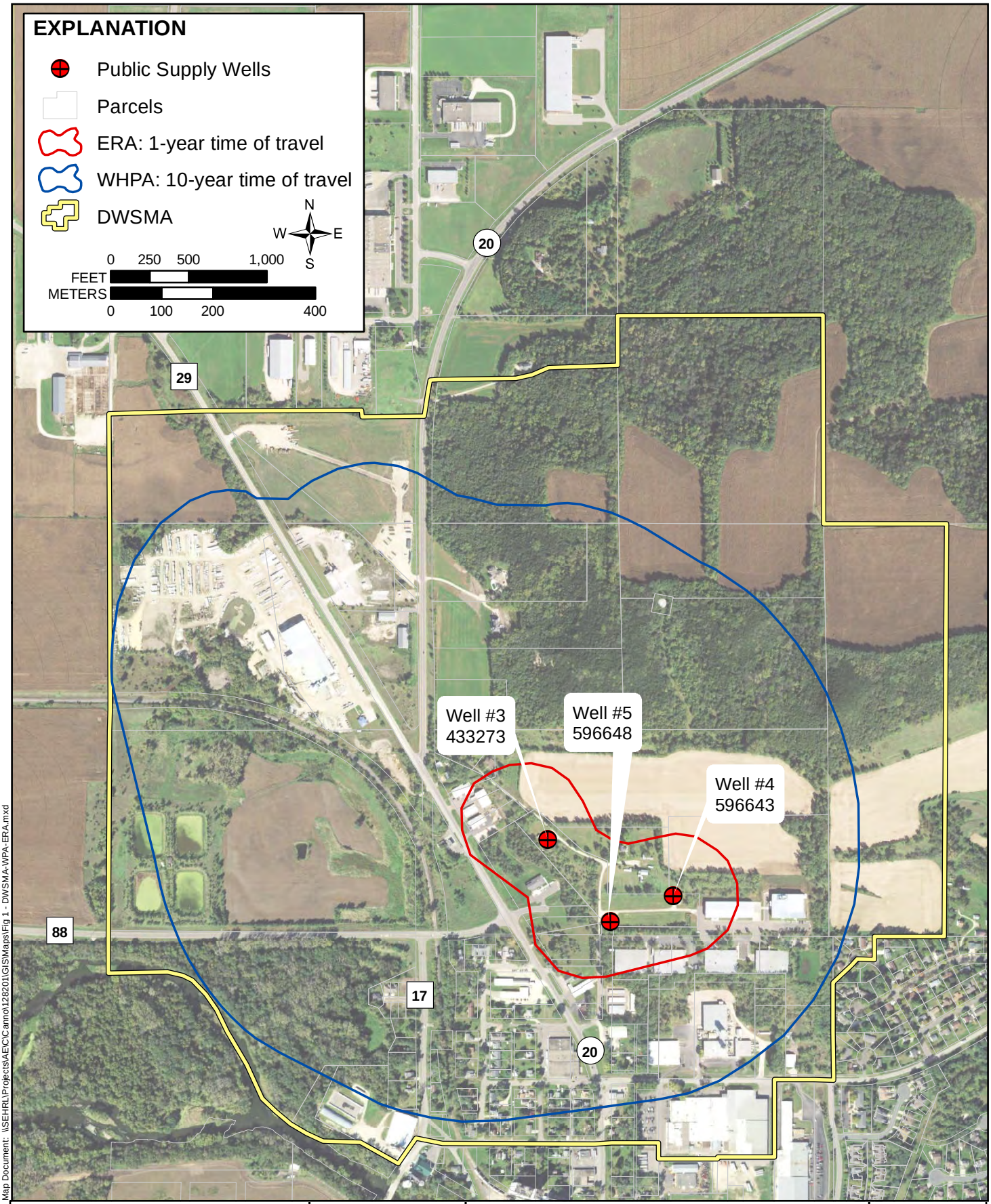
List of Figures



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Project: CANNO 128201
Print Date: 08/13/2015

Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Goodhue County (2015); USDA NAIP (2015)

MAP OF THE WHPA AND DWSMA

WELLHEAD PROTECTION PLAN PART 1
Cannon Falls, Minnesota

Figure 1

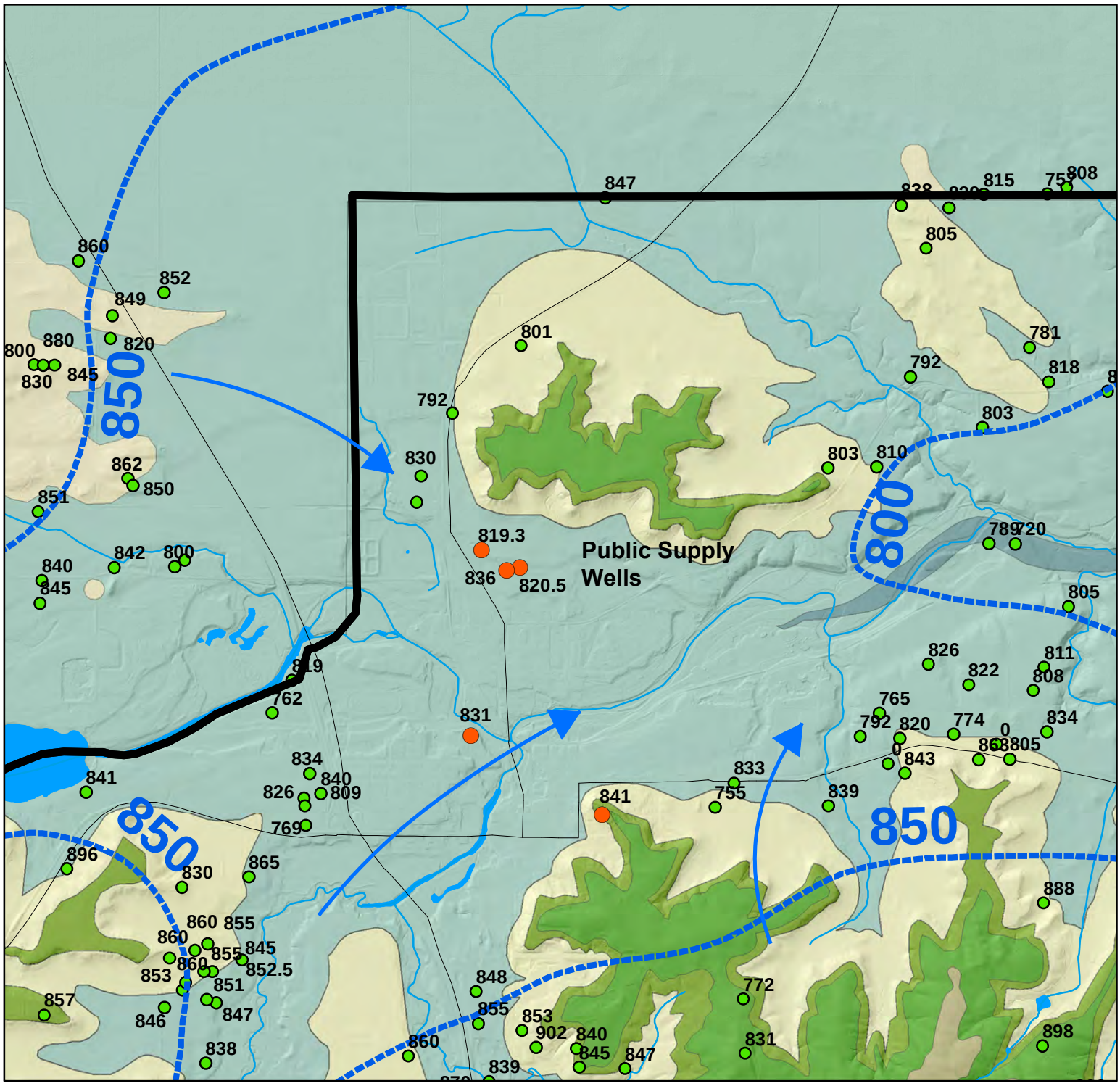


Figure 2: Ambient Ground Water Flow Field

Created by: Minnesota Department of Health

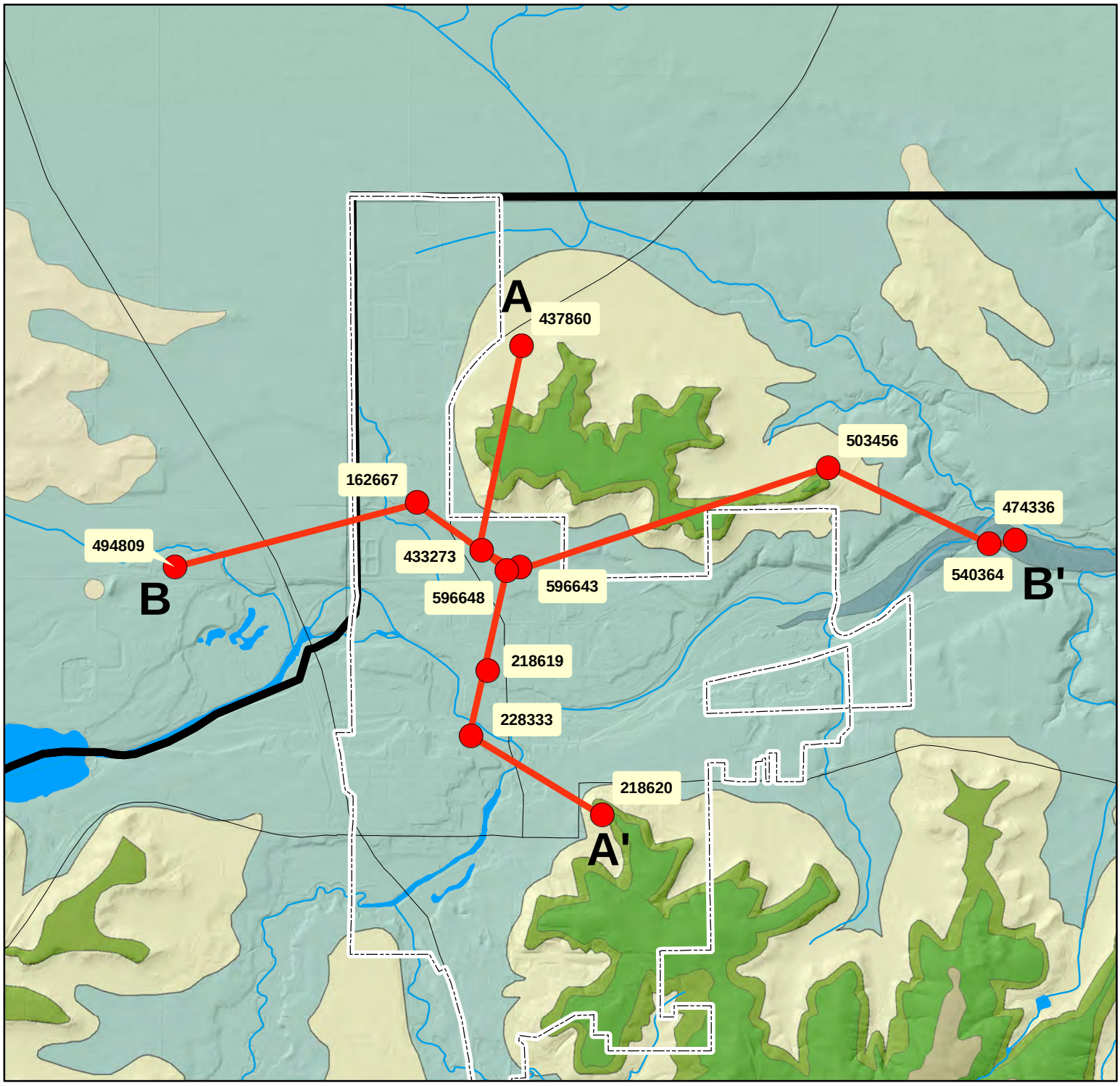


Figure 3: Bedrock Geology and Trends of Cross-Sections

Created by: Minnesota Department of Health

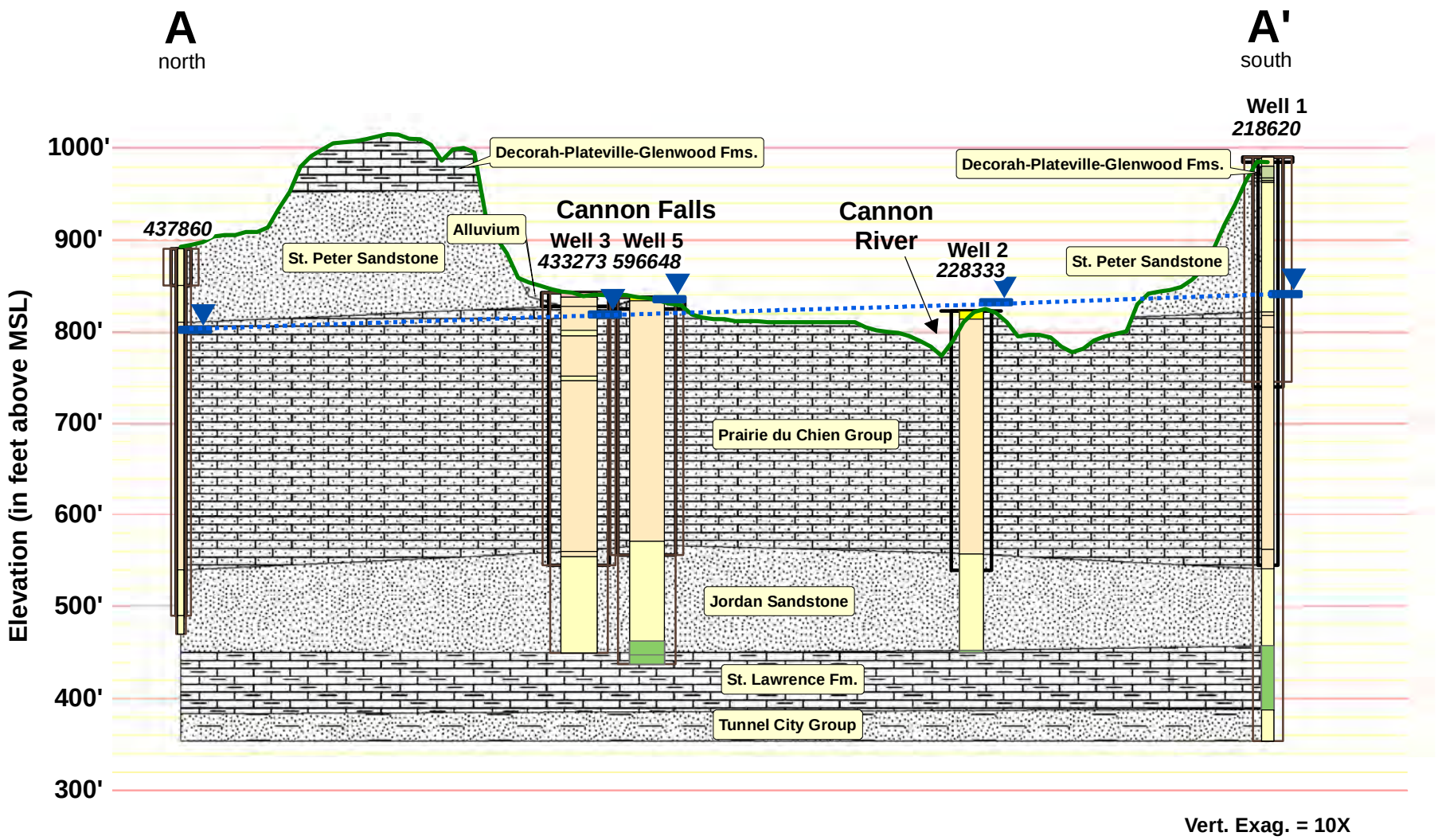
Section Well
Section Line
Hyghway
Stream
Water
Cannon Falls
County

Geoloic Units

- Galena-Cummingsville Fm.
- Decorah Shale
- Platteville-Glenwood Fms.
- St. Peter Sandstone
- Prairie du Chien-Shakopee Fm.
- Prairie du Chien-Oneota Fm.

N

0 0.25 0.5 1 Miles



Cross Section Lithology

- Dolomite and Sandstone
- Dolomite and Shale
- Fine Sandstone
- Sand and Gravel
- Sandstone
- Shaly Dolomite

Driller's Description Lithology

- carbonate rock
- sand
- shale
- shaley limestone
- sandstone
- soil

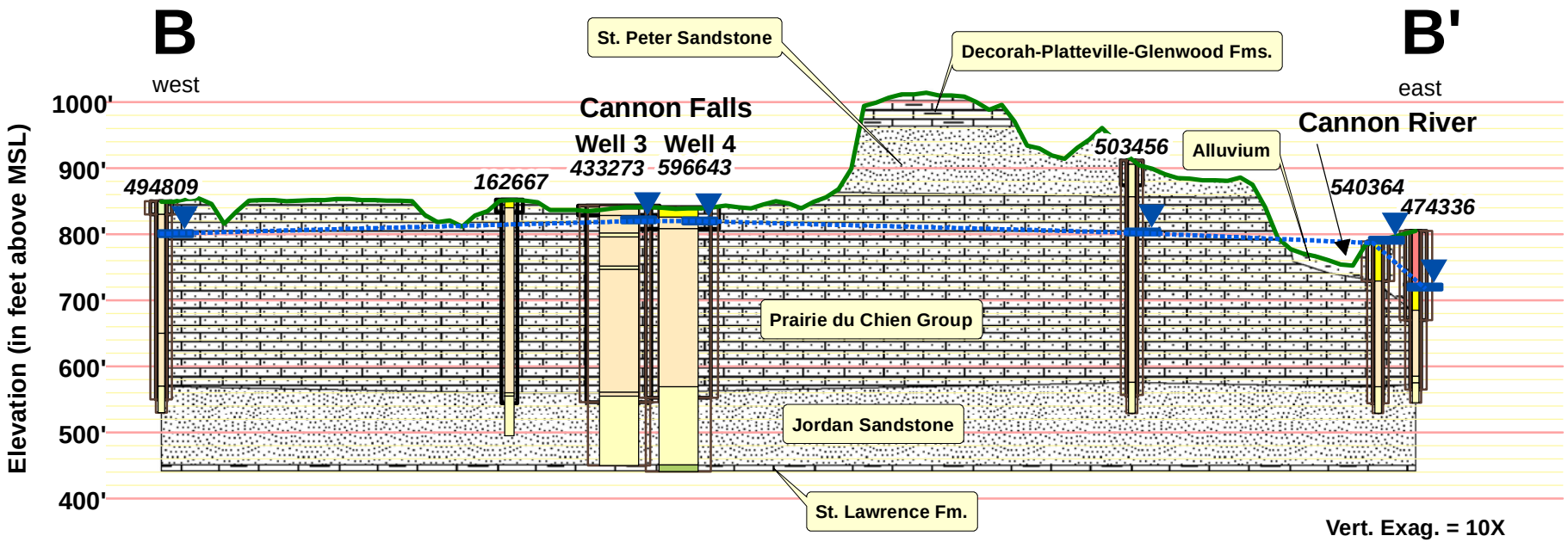
- Static Water Level
- Ground Surface Elevation
- Minor Elevation Division
- Major Elevation Division

Well Construction

- Casing
- Grout
- Hole

Figure 6
Geologic Cross Section A - A'

Created by: Minnesota Department of Health



Cross Section Lithology

- Dolomite and Sandstone
- Dolomite and Shale
- Fine Sandstone
- Sand and Gravel
- Sandstone
- Shaley Dolomite

Driller's Description Lithology

- clay
- dolomite
- gravel
- sand
- dolomite and shale
- sandstone
- soil

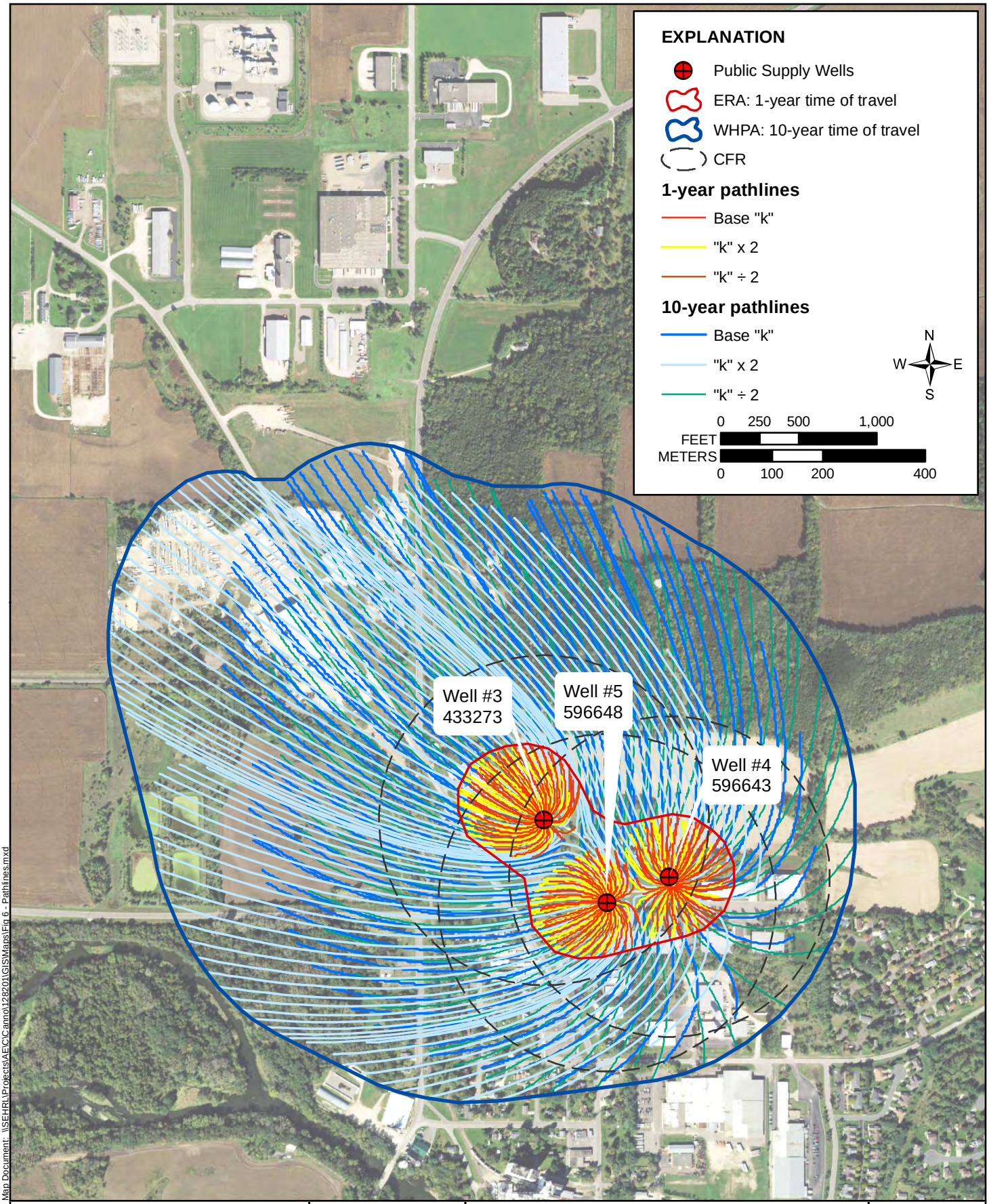
- Static Water Level
- Ground Surface Elevatiion
- Major Elevation Division
- Minor Elevation Division

Well Construction

- Casing
- Grout
- Hole

Figure 5
Geologic Cross Section B - B'

Created by: Minnesota Department of Health



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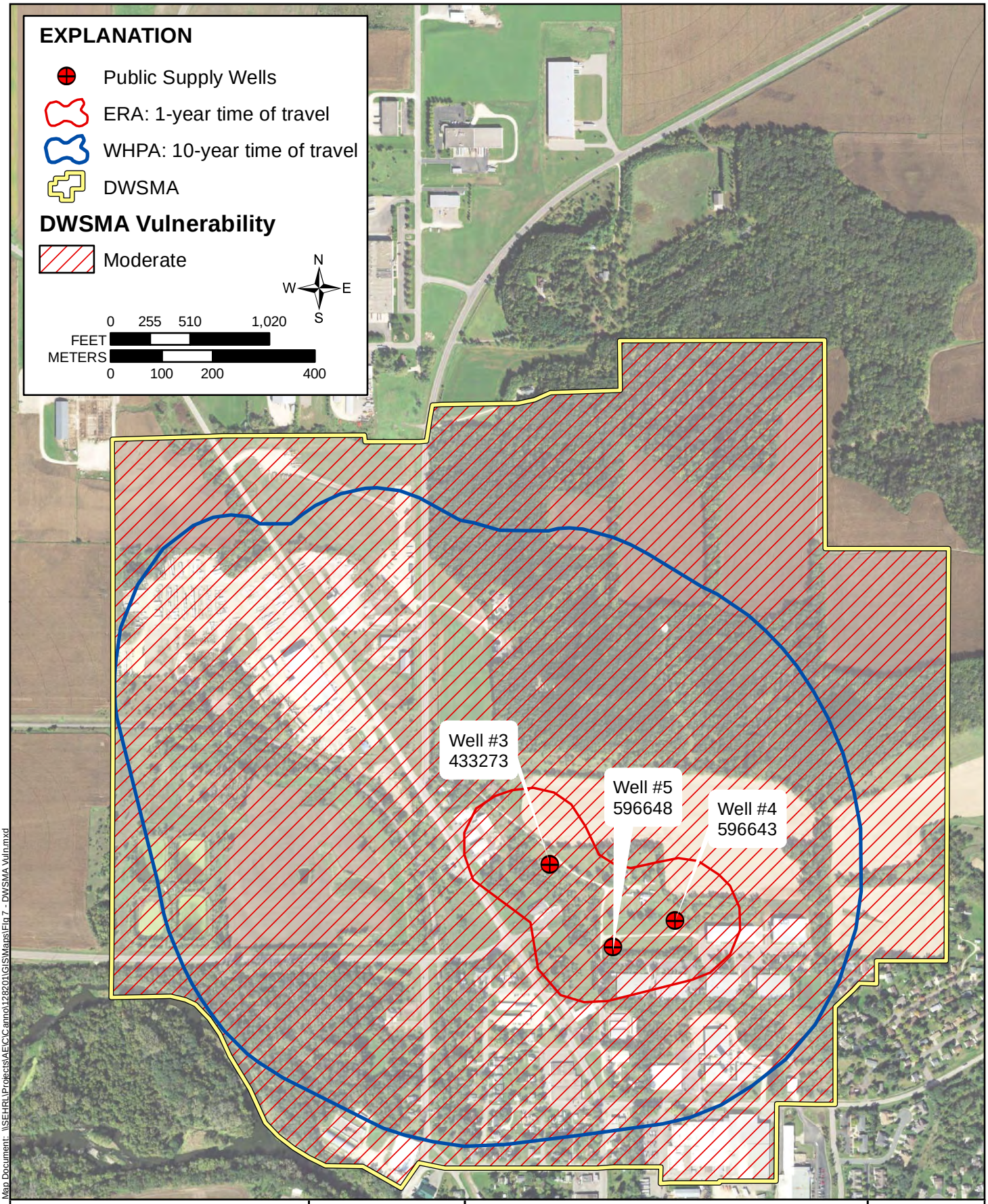
Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: NAIP

PATHLINES FOR MLAEM MODEL RUNS

WELLHEAD PROTECTION PLAN PART 1
Cannon Falls, Minnesota

Figure 6



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Print Date: 08/13/2015

Map by: jmacholl
Projection: NAD 83 UTM Zone 15N
Source: Bing

DWSMA VULNERABILITY

WELLHEAD PROTECTION PLAN PART 1
Cannon Falls, Minnesota

Figure 7

Appendix C

Potential Contaminant Source Inventory Data

PCSI SUBMITTAL AND NARRATIVE

The following information is provided for the PCSI

Description	File Name or Location
A single list/table of all potential contaminant sources (PCS) in the DWSMA	Attached to this document (Table C-1)
Attribute data for each PCS identified	Table C-1, PCSI_COMPILE.LPK
A map showing the locations of all PCS identified in the DWSMA	Figure 2
A land use/land cover map and table	Figure 3, Figure 4, Table 6
An inventory of the Inner Wellhead Management Zone(s)	Table 5

The inventory of potential contaminant sources was completed with a number of steps. Databases were consulted and information for potential sources within the DWSMA or immediately adjacent to it were identified from the Minnesota County Well Index, Property Transfer Well Index, Minnesota PCA What's in My Neighborhood dataset, Class V Wells data provided by MDH/MRWA/EPA, and Old Municipal Well Report. Some potential contaminant sources were discussed at the scoping meeting and were included in the Scoping 2 notice information by MDH. MDH also provided additional information regarding these potential contaminant sources that led to them not being included in the PCSI.

PCSI data sets were compiled by the consultant and provided to the WHP Team for review. The raw PCSI data sets were verified and enhanced by ground-truthing, cross referencing the environmental data with property use and ownership data. The Public Works Director also reviewed the data and provided input on validity and site locations. Based on information gathered by the Public Works Team, and the group's review of the data, the consultant updated the inventory and rechecked data with property ownership and address information to compile the PCSI.

One challenge found in preparing the PCSI is that there are several properties with multiple database listings. It appears that investigations or remediation have been conducted by parties and that some of these properties have undergone several ownership changes. In addition, there are a number of wells outside of the DWSMA that need to be investigated based on information in the Old Municipal Well Report.

Table C-1

PCSI_ID	PIN	FAC_NAME	ADDRESS	CITY	ZIP5_CODE	PCS_C	STATUS_C	MAT_C	PROGRAM_ID	TOTAL	COMMENT
1	524800360	Ag Partners Cooperative	1226 8th St	Cannon Falls	55009	LUST	Y	F001	LS0011919		
2	524800110	School Bus Garage	1420 N 6th St	Cannon Falls	55009	LUST	N	F001	LS0004234		
3	525100180	M & B Service - Apco	N Highway 20	Cannon Falls	55009	LUST	Y	F001	LS0001561		
4	525100240	Hancock Concrete Products	2020 County Road 29	Cannon Falls	55009	AST	Y	F001	TS0124788		
5	525100230	Cemstone Products - Cannon Falls	2133 County Road 29	Cannon Falls	55009	AST	Y	F001	TS0054563		
6	525100180	Conoco Food Mart	1720 N Highway 20	Cannon Falls	55009	UST	Y	F001	TS0012162		
7	525100180	Former Cannon Stop	1720 N Highway 20	Cannon Falls	55009	LUST	Y	F001	LS0017536		
8	525000070	Cannon Equipment Midwest	324 Washington St W	Cannon Falls	55009	PCS	Y		VP27840		
9	525000042	Bergquist Co - Cannon Falls	301 Washington St W	Cannon Falls	55009	AST	Y	C001	50711	2	2 - 2000 gal xylene or other chemical tanks
10	525000042	Bergquist Co - Cannon Falls	301 Washington St W	Cannon Falls	55009	SCC	Y		VP14510		
11	525100230	CEMSTONE READY MIX PLANT	2133 County Road 29	Cannon Falls	55009	WEL	A		00418670		
12	280060701	KOURI, RICHARD		Cannon Falls	55009	WEL	A		00497460		
13	524800080	CROWE, RYNE		Cannon Falls	55009	WEL	A		00426186		
14	525100240	HANCOCK CONCRETE PRODUCT	2020 County 29 Blvd	Cannon Falls	55009	WEL	A		00162667		
15	525000070	CANNON EQUIPMENT	324 Washington St W	Cannon Falls	55009	WEL	U		00272736		
16	525100131	CANNON FALLS 3		Cannon Falls	55009	WEL	A		00433273		
17	525100131	CANNON FALLS 4		Cannon Falls	55009	WEL	A		00596643		
18	525100131	CANNON FALLS 5		Cannon Falls	55009	WEL	A		00596648		

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

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250001	**COMMUNITY**
NAME	Cannon Falls	
ADDRESS	Cannon Falls Water Superintendent, City Hall, 918 River Road, Cannon Falls, MN 55009	

FACILITY (WELL) INFORMATION

NAME	Well #3
FACILITY ID	S03
UNIQUE WELL NO.	433273
COUNTY	Goodhue

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1250001 S03	**UNIQUE WELL NO.**	433273

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1250001 S03	UNIQUE WELL NO.	433273

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1250001 S03	UNIQUE WELL NO.	433273

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	Y	120	Y
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

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

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

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

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

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

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

PWS ID / FACILITY ID	1250001 S03	UNIQUE WELL NO.	433273

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

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

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

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

INSPECTOR	Hoerr, Robyn	DATE	2 - 4 - 2013

PWS ID / FACILITY ID	1250001 S03	UNIQUE WELL NO.	433273

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Advise property owner that the agricultural production field is within the city well's inner wellhead management zone, and encourage adherence to recommended fertilizer application rates.		02/04/2013

COMMENTS

Floor drain in well house drains to surface to SW of building.

Corn is grown in an agricultural field to the north of the well house. Potential for nitrogen application to this field.

For further information, please contact:

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

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

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

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250001	**COMMUNITY**
NAME	Cannon Falls	
ADDRESS	Cannon Falls Water Superintendent, City Hall, 918 River Road, Cannon Falls, MN 55009	

FACILITY (WELL) INFORMATION

NAME	Well #4
FACILITY ID	S04
UNIQUE WELL NO.	596643
COUNTY	Goodhue

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1250001 S04	**UNIQUE WELL NO.**	596643

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1250001 S04	UNIQUE WELL NO.	596643

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	Y	120	Y
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	30	Y
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1250001 S04	UNIQUE WELL NO.	596643

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	none found within 200' of this well.						

* New potential contaminant source.

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

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

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

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

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

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

PWS ID / FACILITY ID	1250001 S04	UNIQUE WELL NO.	596643

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

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

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

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

INSPECTOR	Hoerr, Robyn	DATE	2 - 4 - 2013

PWS ID / FACILITY ID	1250001 S04	UNIQUE WELL NO.	596643

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Solid waste dumpsters should be located remotely from wells.		
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

Commercial construction waste disposal dumpster.

For further information, please contact:

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

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

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

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1250001	**COMMUNITY**
NAME	Cannon Falls	
ADDRESS	Cannon Falls Water Superintendent, City Hall, 918 River Road, Cannon Falls, MN 55009	

FACILITY (WELL) INFORMATION

NAME	Well #5
FACILITY ID	S05
UNIQUE WELL NO.	596648
COUNTY	Goodhue

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1250001 S05	**UNIQUE WELL NO.**	596648

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
Agricultural Related							
*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well[2] (Class V well - illegal[3])	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		
SSTS Related							
AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well)[2]	50/300/150[4]	50/300/150[4]	100/600/300[4]	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		

PWS ID / FACILITY ID	1250001 S05	UNIQUE WELL NO.	596648

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well[2] (Class V well - illegal[3])	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	30	Y
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		

PWS ID / FACILITY ID	1250001 S05	UNIQUE WELL NO.	596648

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
FFH	Fire or flushing hydrant	10	N/A		Y	30	N
PLE	Property line or easement	50	N/A		Y	100	N

* New potential contaminant source.

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

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

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

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

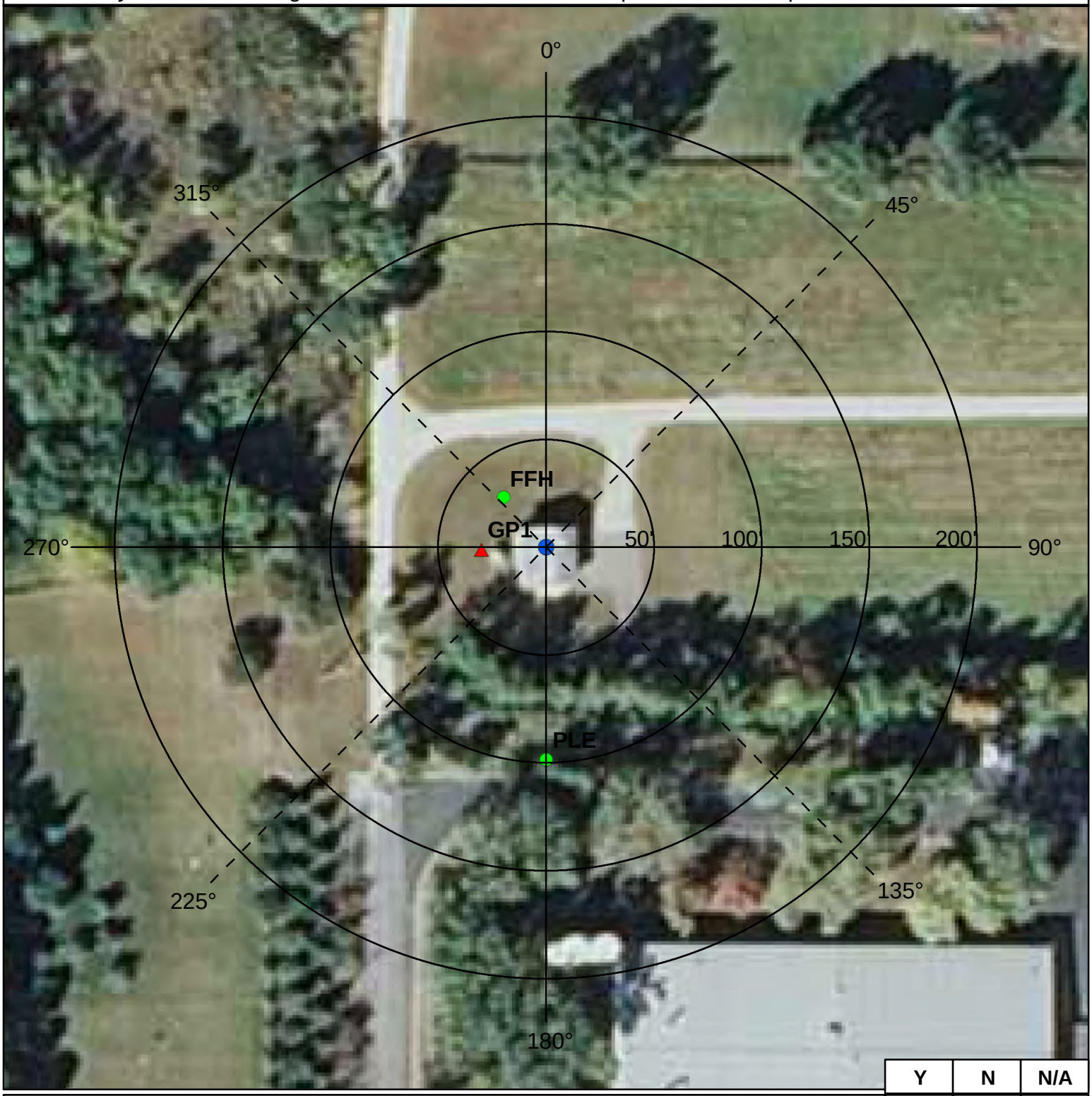
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls;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

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

PWS ID / FACILITY ID	1250001 S05	UNIQUE WELL NO.	596648

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

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



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

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

INSPECTOR	Hoerr, Robyn	DATE	2 - 4 - 2013

PWS ID / FACILITY ID	1250001 S05	UNIQUE WELL NO.	596648

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

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

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

Appendix D

Water Supply Contingency Plan

WATER SUPPLY CONTINGENCY PLAN

CANNON FALLS, MINNESOTA

INDEX

Annual Plan Review

Date Reviewed	*Reviewer*	*Comments*

Plan Distribution

Person	*Organization*	*Plan Location*

Date Approved: _____

MINNESOTA DUTY OFFICER

BCA Operations Center

651-649-5451 **1-800-422-0798**

TDD: 1-800-627-3529 **Satellite Phone: 1-254-543-6490**

About the Duty Officer

The Minnesota Duty Officer Program provides a single answering point for local and state agencies to request state-level assistance for emergencies, serious accidents or incidents, or for reporting hazardous materials and petroleum spills. The duty officer is available 24 hours per day, seven days per week.

If there is an immediate threat to life or property, call 911 first.

When to Call the Duty Officer

Examples of incidents the duty officer can assist with include (but are not limited to):

- Natural disasters (tornado, fire, flood etc)
- Requests for National Guard
- Hazardous materials incidents
- Search and rescue assistance
- AMBER Alerts
- Requests for Civil Air Patrol
- Radiological incidents
- Aircraft accidents/incidents
- Pipeline leaks or breaks
- Substances released into the air

Agency Resources Available

State Agencies

- Department of Agriculture
- Department of Commerce
- Department of Education
- Department of Health
- Department of Human Services
- Department of Military Affairs
- Department of Natural Resources
- Department of Transportation
- Minnesota Office of Enterprise Technology
- Minnesota Pollution Control Agency
- Department of Public Safety
  - Bureau of Criminal Apprehension
  - Homeland Security and Emergency Management
  - Minnesota Joint Analysis Center
  - Minnesota State Patrol
  - Office of Pipeline Safety
  - State Fire Marshal
- Other state agencies not listed

Other Resources

- Minnesota Arson Hotline
- Local bomb squads
- Chemical assessment teams
- Emergency response teams
- Fire and rescue mutual aid
- Amateur radio (ARES/RACES)
- Minnesota voluntary organizations
- Fire chiefs assistance teams
- Search-and-rescue dogs
- Interagency Fire Center
- U.S. Air Force Search and Rescue Center

A. PURPOSE

The purpose of this Contingency Plan is to establish, provide and keep updated, certain emergency response procedures and information for the City of Cannon Falls, Minnesota, which may become vital in the event of a partial or total loss of public water supply services.

B. PUBLIC WATER SUPPLY CHARACTERISTICS

1. Current Supply Source: The City of Cannon Falls provides drinking water to its residents from a groundwater source: three wells ranging from 393 to 400 feet deep that draw water from the Jordan and Jordan-St. Lawrence aquifers.

Table B-1 Water Supply Well Data

Well No.	Unique Well No.	Date Constructed	Aquifer	Total Depth (ft)	Casing Depth (ft)	Casing Diameter (in)	Vulnerability
3	433273	1988	Jordan	393	297	24	Not Vulnerable
4	596643	1998	Jordan	400	288	24	Not Vulnerable
5	596648	1998	Jordan	400	281	23	Not Vulnerable

2. Treatment: Drinking water is disinfected by chlorination.

3. Storage and Distribution: The system includes water main, two ground reservoirs and an elevated storage tank located on the southeast corner of the city. There are four water main crossings of the Cannon River. These crossings will serve as isolation points for the distribution system.

4. Maps/Plans: Water system plans and maps are on file at the Public Works Department. Office hours are generally 7:00 am to 3:30 pm and the phone is (507) 263-4626.

C. PRIORITY OF WATER USERS DURING WATER SUPPLY EMERGENCY

1. Institutional/public use for vulnerable populations such as hospitals, clinics and daycares receiving highest priority followed by schools and other transient facilities.
2. Residential
3. Commercial and Industrial

D. ALTERNATIVE WATER SUPPLY OPTIONS

1. There are no other public water suppliers close enough to Cannon Falls to allow for an interconnection.
2. Water can be trucked from Randolph
3. Bottled water can be obtained from
   Culligan Water, Red Wing, phone 651.388.8808

E. INVENTORY OF AVAILABLE EMERGENCY EQUIPMENT AND MATERIALS

Table E-1 contains a list of services, equipment and supplies that are available to the City of Cannon Falls to respond to a disruption in the water system. It is believed that the items contained in Table E-1 would be adequate to respond to most (if not all) water system emergencies.

Table E-1

Description	Owner	Telephone	Location	Acquisition Time
Well & Pump Repair	Kimmes Bauer	507-263-3522	Cannon Falls	1 hour
Electrician	Wheeling Electric	507-649-1546	Nerstrand	2 hours
Plumber	Paul's Plumbing	507-263-2057	Dennison	1 hour
Backhoe	Doug's Backhoe	507-291-0178	Cannon Falls	1 hour
Chemical Feed	Hawkins-Feedrite	651-730-1115	St. Paul	3 hours
Meter Repair	Mid American Meter	763-478-8041	Medina	2 hours
Generator	MN Warn	800-367-6792	Various	3 hours
Valves, pipe & other supplies	Minnesota Pipe	651-463-6090	Farmington	3 hours

F. EMERGENCY IDENTIFICATION PROCEDURES

Table F-1 Procedural Operations

Incident	Response Procedure and Comments
Identify Disruption (Mechanical Failure or Contamination)	Identifies the nature of the water supply disruption and communicates this information to the city government, the alternate response coordinator, and members of the emergency oversight committee.
Notify Response Personnel	Notifies city staff and others who will be responding to the water supply emergency about the disruption and coordinates their efforts to correct it.
Incident Direction and Control	Identifies the actions that are needed to correct the water supply emergency and directs responders to implement corrective actions.
Internal Communication	Communicates the status of response efforts to the primary spokesperson and the emergency oversight committee as needed to keep these parties informed of progress.
Assess Incident Response on Continual Basis	Assesses the efforts to correct the water supply disruption on a continual basis so that the emergency oversight committee can take additional corrective actions and the city government and public are updated on issues and progress.
Define the Extent of a Contamination Disruption	Coordinates efforts to define the extent and level of the contamination with local, state, and federal agencies. This may continue after initial corrective actions have been implemented.
Assess the Extent of a Mechanical Disruption	Coordinates efforts to define the cause(s) of the mechanical failure and the equipment, data, and expertise that are needed to correct it. Identifies measures for reducing the likelihood that a similar mechanical failure will not occur in the future.
Identify Need for an Alternate Water Supply	Evaluates the need to obtain an alternate water supply, the time period it is needed before the water supply emergency is corrected, and the actions that are needed to achieve it.

G. NOTIFICATION PROCEDURES

1. Agency Notification

Table G-1 contains the names and telephone numbers for contacts at various local and state agencies that may be notified in the event of a public water supply system emergency. Based on the nature of the emergency and the information available, various representatives from this listing will be selected by the response coordinator to be part of *the **emergency oversight committee*** which will then meet throughout the duration of the emergency to aid in decision-making and positive outcomes.

Table G-1. Agency Emergency Contact Listing

Personnel	Name	Telephone	Email
Mayor	Robby Robinson	651.270.2294	mrobinson@cannonfallsmn.gov
Council Member	Cedar Abadie	651.206.9588	cabadie@cannonfallsmn.gov
Council Member	Ken Carpenter	651.270.1942	kcarpenter@cannon fallsmn.gov
Council Member	Morris Mattson	651.210.2572	mmattson@cannfallsmn.gov
Council Member	Mike Dalton	507.263.5107	mdalton@cannonfallsmn.gov
Council Member	LeRoy McCusker	507.263,4864	lmccusker@cannonfallsmn.gov
State Incident Duty Officer	------	800-422-0798 or 651-649-5451	-----
Goodhue County Emergency Director	Diane Richter-Biwer	651-267-2640	
Goodhue County Emergency Preparedness Coordinator	Heather Arndt	651.385.6157	
Fire Chief	Todd Anderson	507.263.7027	
Police Chief	Jeff Mc Cormick	507.263.2278	
Ambulance	Tim Malchow	507.263.7027	

2. Critical Response Personnel

Table G-2 – Critical Response Personnel

Role	Name	Phone	Responsibilities
Response Coordinator	Tom Bergeson, Public Works Director	507.298.7091	Coordinate actions to address emergency
Water Operator	Wes Anway Utility Superintendent	507.291.0717	Direct or contact individuals and businesses to resolve issue(s)
Alt. Water Operator	Ted Hartgers	507.291.0565	Direct or contact individuals and businesses to resolve issue(s)
Public Relations	Ron Johnson, City Administrator	507.263.9300	Contact media to inform citizens/ businesses of emergency

3. Public Information Plan

a. Public Information Center Location during Emergency: City Hall

b. Information checklist to be conveyed to the public and media

Name of water system: Cannon Falls
Contaminant of concern and date: _____

Source of contamination: _____

Public health hazard: _____

Steps the public can take: _____

Steps the water system is taking: _____

Other information_____

c. Media Contacts

Media	Name	Telephone
Newspaper	Cannon Falls Beacon	Local Phone: 507.263.3991 Toll Free: 800.263.3991
Radio	Q Media Group	615.388.7151
Other		

G. MITIGATION AND CONSERVATION PLAN

1. MITIGATION

The City of Cannon Falls is a participant in the Goodhue County 2016 All-Hazards Mitigation Plan that addresses possible drinking water hazards.

a. Infrastructure maintenance/upgrades/maps will be planned to address the most critical areas of the water distribution system.
b. Regular inspection of tower, well, pump house will be performed
c. Staff emergency training will be planned

2. CONSERVATION

a. Water Meters: All services are metered.
b. Rate structure: Unit charges (per 1,000 cubic feet) for water increase for the highest quantity tier and irrigation rates are increased.