Appendix

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Hydrogeologic Assessment of the Drinking Water Source and Wells for the City of Eden Valley

DELINEATIONS – WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA

VULNERABILITY ASSESSMENTS – WELLS AND DRINKING WATER SUPPLY MANAGEMENT AREA

December 17, 2019

Hydrogeologic Assessment of the Drinking Water Source and Wells for the City of Eden Valley

Public Water Supply ID: 1470012

City of Eden Valley
P.O. Box 25
Eden Valley, Minnesota 55329
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I hereby certify that this plan, document or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the State of Minnesota.

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Glossary of Terms

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

Drinking Water Supply Management Area (DWSMA). The area delineated using identifiable 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. Assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

Acronyms

CWI - County Well Index

DNR - Minnesota Department of Natural Resources

EPA - United States Environmental Protection Agency

FSA - Farm Security Administration

MDA - Minnesota Department of Agriculture

MDH - Minnesota Department of Health

MGS - Minnesota Geological Survey

MLAEM - Multi Layer Analytic Element Model

MnDOT - Minnesota Department of Transportation

MnGEO - Minnesota Geospatial Information Office

MPCA - Minnesota Pollution Control Agency

NRCS - Natural Resource Conservation Service

SWCD - Soil and Water Conservation District

UMN - University of Minnesota

USDA - United States Department of Agriculture

USGS - United States Geological Survey

Summary

Protection Areas - The recharge area for the wells is known as the wellhead protection area, or WHPA, and represents the area that contributes water to the city's wells within a 10-year time period. The area that contributes water within a one-year time period is known as the emergency response area, 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.

Geology and Groundwater Flow – The city of Eden Valley has three primary wells screened in a sand and gravel aquifer that is buried beneath approximately 45 feet of glacial materials. Such aquifers are known generically as Quaternary Buried Artesian Aquifers (QBAA). The city's aquifer is between approximately 50 to 80 feet below the ground surface (Table 1). Regionally, groundwater flow is towards the well field, from the east and the west.

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer[1]	Well Vulnerability
Well #2	211666	Primary	12	52	72	8/17/1959	MTPL	Vulnerable
Well #3	211662	Primary	12	57	78	9/8/1970	QBAA	Vulnerable
Well #4	649153	Primary	12	48	73	9/14/2001	QBAA	Vulnerable

Note 1: MTPL = multiple. Well #2 is primarily supplied by the QBAA aquifer but is drilled a few feet into shale-rich Cretaceous sediments that probably provide little water to the well.

Well Vulnerability - The vulnerability of each well has been assessed based on 1) well construction details, especially conformance with standards required by the state well code, 2) the geologic sensitivity of the aquifer, and 3) past monitoring results. Neither Well #2 nor Well #3 meet construction standards as grouting information is unknown. If the wells were not grouted, they have the potential for acting as a conduit for flow of surface water and contaminants into the buried aquifer. All wells are considered vulnerable to contamination due to tritium being detected in the well water (Table 2). Detectable tritium indicates the presence of young (post-1953) water.

Table 2 - Isotope and Water Quality Results

Unique Number (Well Name)	Tritium (TU)	Nitrate (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Chloride/ Bromide Ratio
211666 Well #2	4.92 (08/14/2018)	<0.05 (05/05/2014)	NA	NA	NA
211662 Well #3	8.58 (08/14/2018)	<0.05 (05/05/2014)	10.90 (09/10/2012)	0.07 (09/10/2012)	156
649153 Well #4	6.85 (08/14/2018)	<0.05 (05/05/2014)	11.20 (09/10/2012)	0.05 (09/10/2012)	224

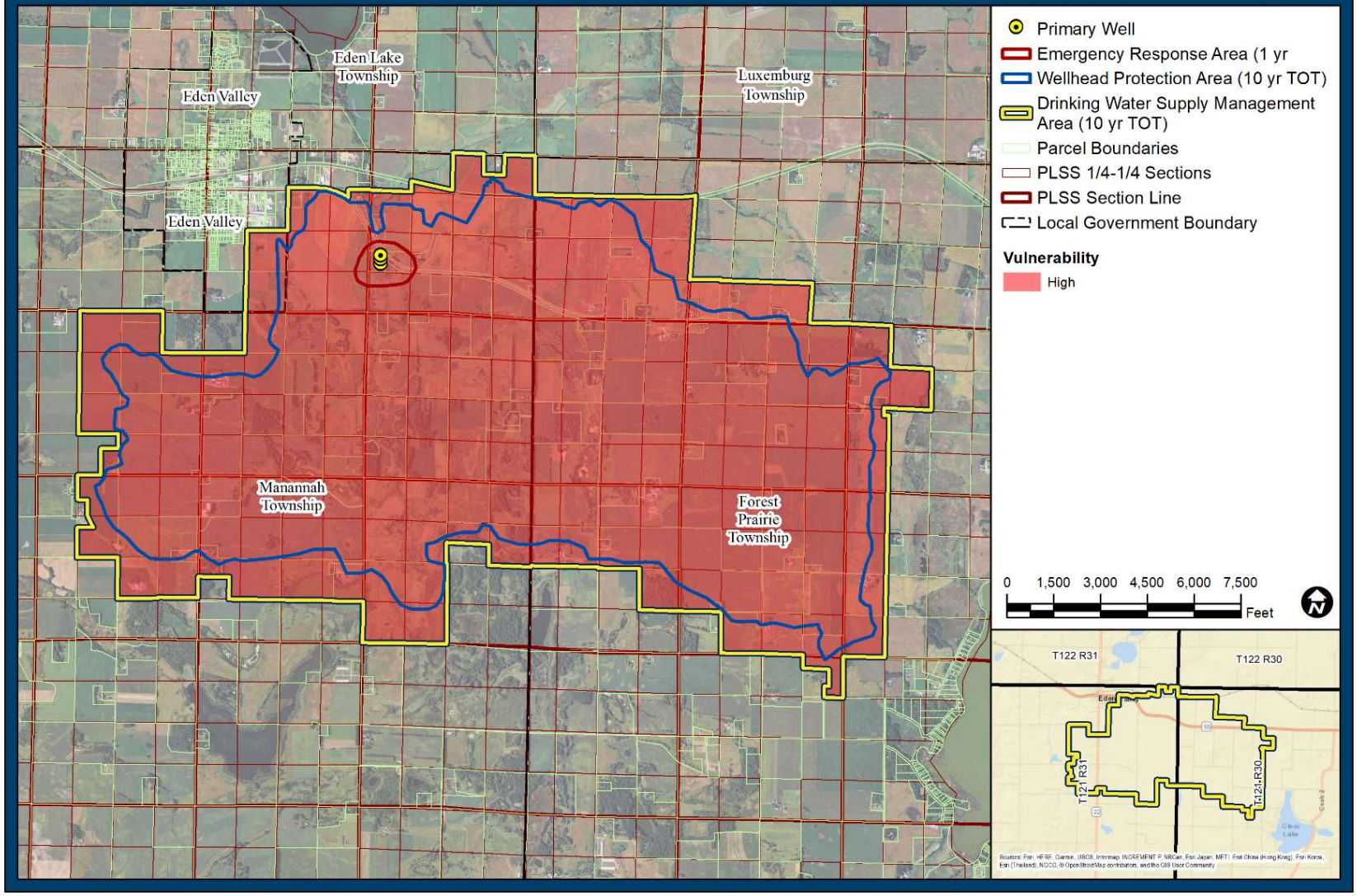
DWSMA Vulnerability - The vulnerability of the city's aquifer throughout the DWSMA is based on the geologic sensitivity ratings of wells and their monitoring data (Table 2). Based on this information, MDH has assigned a high vulnerability to the DWSMA. This suggests that water and contaminants may travel from the land surface to the city's aquifer within a time span of weeks to a few years. Highly vulnerable aquifers are prone to a wide variety of contaminant threats.

Water Quality Concerns - At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the city's water supply. In water samples collected pre-treatment, arsenic has been detected at concentrations greater than one-half of the maximum levels (5 µg/L). Post-treatment water concentrations are less than one-half of the maximum level (1.5 µg/L, 04/20/2017).

Recommendations - Recommendations have been generated to improve future delineations and vulnerability assessments and should be considered for inclusion as management strategies in the city's wellhead protection plan (WHPP). These activities include: well locating, water quality monitoring and further evaluation of the connection between nearby ditches and the city wells. Further details can be found in the Recommendations section of this report.

Meeker County
Minnesota

Figure 1
Drinking Water Supply Management Area and Vulnerability
City of Eden Valley



Technical Report

Discussion

This document describes the amendments to Part 1 of the wellhead protection (WHP) plan for the city of Eden Valley (PWSID 1470012). The purpose for amending the plan is to address the changes that have occurred since the plan was last approved, in order to update the WHP measures that are needed to protect public drinking water. In addition, the locations of the city's wells were adjusted for greater accuracy. The amended areas are signficantly larger (Figure 8) because of the addition of a surface water contribution area. The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

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

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

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

Assessment of the Data Elements

MDH staff met with representatives of the city of Eden Valley on May 14, 2018, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Appendix A presents the assessment of these data elements relative to the present and future implications of planning items specified in Minnesota Rules, part 4720.5210.

General Descriptions

Description of the Water Supply System

The city of Eden Valley obtains its drinking water supply from three primary wells. Table 1 summarizes information regarding them.

Description of the Hydrogeologic Setting

The city of Eden Valley draws groundwater from a glacial sand aquifer. The city wells are completed between 72 and 78 feet below grade, and are screened in a north-south trending outwash sand unit that has an estimated average thickness of 28 feet. To the east and west of the well field, gently sloping hills are comprised of a thicker sequence of unsorted glacial till materials interbedded with relatively thin lenses of sand. Groundwater flow is converging towards the well field from the east and west. A thorough discussion on the hydrogeologic setting is available in Part 1 of the Wellhead Protection Plan (WHPP), section 2.2 (Haglund, 2008).

A description of the hydrogeologic setting for the aquifer used to supply drinking water is presented in Table 3.

Table 3 - Description of the Local Hydrogeologic Setting

Attribute	Descriptor	Data Source
Aquifer Material	Sand	CWI
Porosity Type and Value	Primary, 20 percent	Fetter, 1988
Aquifer Thickness	28-33	CWI
Stratigraphic Top Elevation	1,060 ft AMSL	CWI
Stratigraphic Bottom Elevation	1,032 ft AMSL	CWI
Hydraulic Confinement	Confined	Well #3 (211662) aquifer pumping test
Transmissivity	6,500 ft^2/day	Representative value derived from long-term pumping test at Eden Valley. See Table 4 for the reference value.

Attribute	Descriptor	Data Source
Hydraulic Conductivity	Range of Values: 81 ft/day (*global*) 123 ft/day (*Outwash inhomogeneity*) 197 ft/day (*Wellfield Inhomogeneity*),	Global value estimated from specific capacity data of drift wells; wellfield inhomogeneity estimated from aquifer test at city wells; valley outwash estimated using specific capacity information.
Groundwater Flow Field	Groundwater flow is converging toward the wellfield from the east and west, with a gradient ranging from 0.001 to 0.0022 (Figure 2).	Defined by using static water level elevations from well records in the CWI database.

The distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials are shown in Figures 3, 4, and 5. They were prepared using well record data contained in the CWI database. The geological maps and studies used to further define local hydrogeologic conditions are provided in the "Selected References" section of this report.

Delineation of the Wellhead Protection Area

Delineation Criteria

The boundaries of the WHPA for the city of Eden Valley 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	Aquifer Inhomogeneity	The aquifer is bounded by less permeable materials (till) to the east and west.

Criterion	Descriptor	How the Criterion was Addressed
Flow Boundary	Other High Capacity Wells	One high-capacity well is actively used within three miles of the city of Eden Valley's wells and its pumping was simulated in the flow model.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the DNR, Appropriations Permit Number 1959-0555, and was converted to a daily volume pumped by a well.
Groundwater Flow Field	Groundwater flow is converging toward the wellfield from the east and west, with a gradient ranging from 0.001 to 0.0022 (Figure 2).	The groundwater flow field was simulated by the model elements and closely matched that observed from well data.
Aquifer Transmissivity	Reference Value: 6,500 ft^2/day	The aquifer test plan was approved on January 7, 2019, and T was determined from a long-term pumping test. Uncertainty regarding aquifer transmissivity was addressed as described in the "Addressing Model Uncertainty" section.
Time of Travel	10 years	The public water supplier selected a 10-year time of travel.

Pumping data was obtained from the DNR Permit and Reporting System (MPARS) for the public water supply's Appropriations Permit Number 1959-0555. These values, confirmed by the public water supplier, were used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. An estimate of the pumping for the next five years is also shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.

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

Well Name	Unique Number	2013	2014	2015	2016	2017	2022 Pumping	Daily Volume (gallons)	Daily Volume (cubic meters)
Well #2	211666	21.939	22.854	**24.061**	16.327	16.519	24.061	65,921	250
Well #3	211662	0	6.939	4.155	7.491	**15.814**	15.814	43,326	164
Well #4	649153	**28.414**	24.055	19.237	24.674	17.169	28.414	77,847	295

(Expressed as millions of gallons, unless noted. **Bolding** indicates greatest annual pumping volume.)

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

Table 6 - Other Permitted High-Capacity Wells

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	Annual Volume of Water Pumped (gallons)	Daily Volume (gallons)
796275	Becker Farms	2013-1503	QBAA	Agricultural Crop Irrigation	8,856,000	24,263

Method Used to Delineate the Wellhead Protection Area

The WHPA for the city of Eden Valley's wells was determined using the software code MLAEM (Strack, 1989). An additional capture zone calculation was conducted using the stochastic analytical groundwater flow method Oneka (Barnes and Soule, 2002). The resulting WHPA

boundaries are a composite of the capture zones calculated from several different model scenarios (Figure 1).

The MLAEM Code was selected because it is capable of simulating the influence of 1) surface water features, 2) spatial variability or geologic materials, 3) vertical infiltration, and 4) the pumping influence of multiple high-capacity wells. All of these conditions were considered for this delineation. In general, the input parameters for the model were determined from information 1) provided by the public water supplier, 2) interpreted from local well logs and pumping test data, and 3) obtained from existing published reports and maps (see References).

The MLAEM used in the initial WHPP was updated to include current representative flow volumes and a high capacity well. A thorough discussion of the groundwater flow model is presented in the initial WHPP for Eden Valley (Haglund, 2008). The Minnesota Geological Survey published a Geologic Atlas for Meeker County in 2015. The data aligns with the conceptual model created for the initial WHPP.

Oneka was used to assess the probability of impacts that local variations in hydrogeologic conditions may have on a well capture zone. This model treats the aquifer properties and the available water level measurements as variable input parameters. The locations of wells, water levels, and the aquifer geometry were evaluated using information from the CWI database. For the solution, Oneka finds the flow field that best fits the network of water level elevations by varying the values of the aquifer thickness and transmissivity. Oneka then evaluates the probability of the capture of a given point based on the number of times it is included in the capture areas generated by the total number of solutions. The output from the model is a capture zone probability map for the specified time of travel (10 years).

Representative aquifer parameters were used in the base case model scenario. Additional modeling scenarios using MLAEM and Oneka were then simulated using reasonable estimations of parameters to demonstrate model sensitivity and to reflect uncertainty conditions, which are addressed in the next section. The model parameters for all model runs are listed in Table 7.

The combined output of all model results were composited to create the final WHPA (Figure 1).

Results of Model Calibration and Sensitivity Analysis

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

analyses are used to document that the delineation is optimal, conservative, and protective of public health based on existing information.

Model Calibration

A qualitative evaluation of the calibration can be made by comparing the simulated potentiometric surface (Figure 2) with observed water level targets obtained from the CWI database. Upon review, the calibrated flow model generally captures the major features of the groundwater flow system along with the elevation, shape, magnitude, and gradient of the CWI database observed flow field.

A quantitative measure by which to evaluate the success obtained during calibration is to compare the root mean square of the residuals (RMSE) and the maximum observed head difference of the calibration dataset. The calibration dataset included water level information from wells in an approximate three mile radius of the city's wells. The residual root mean square (RMS) error of the calibration well set was approximately 2.2 meters with a normalized RMSE of 13 percent. It is noted that this error is less than the calibration target of 15 percent (Anderson et al., 2015). The calibration targets (wells) with the greatest residual difference between measured and simulated heads were generally at locations beyond the contribution area to the city's wells.

Sensitivity Analysis

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

- The **pumping rate** directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer and an expanded capture zone, proportional to the porosity of the aquifer materials.

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

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

  How Addressed and Results – General flow direction was determined based upon static water levels of similarly screened wells in the area of the model. Overall, the sensitivity of the WHPA to the direction of groundwater flow should not be significant, given the current knowledge of the hydraulic head distribution in the aquifer.

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

  How Addressed and Results – The flow field shown 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 each well. The regional model has been calibrated to hydraulic heads. The sensitivity of the WHPA to the hydraulic gradient should not be significant given the current knowledge of the hydraulic head distribution in the aquifer.

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

  How Addressed and Results – Hydraulic conductivity was varied during the calibration process to reduce error between observed and modeled water levels. After calibrated values had been identified, two additional model runs were performed wherein the hydraulic conductivity was decreased/increased by 50 percent to account for the reduced values generally observed for this parameter away from the city's well field and the uncertainty in the specific capacity calculations. This resulted in capture zones that were approximately 50 percent smaller and 25 percent larger than the initial calibrated case, respectively.

  With the ONEKA model, the hydraulic conductivity is treated as an uncertain input parameter by providing a pre-determined statistical distribution. The solution identifies the best fit and ultimately outputs a capture zone probability map (Barnes and Soule, 2003).

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

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

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

  How Addressed and Results – The aquifer thickness within the MLAEM was estimated from well records, and weighted toward thickness estimated from stratigraphic information from the public well records. The thickness was not varied in these simulations.

With the ONEKA model, the thickness is treated as an uncertain input parameter by providing a pre-determined statistical distribution. The solution identifies the best fit and ultimately outputs a capture zone probability map (Barnes and Soule, 2003).

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 areas 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).
2. Aquifer Hydraulic Conductivity – Hydraulic conductivity was adjusted plus and minus 50 percent.
3. Probability Analysis – The Oneka Model was used to estimate capture zone probability.

Capture areas were developed for a range of hydraulic conductivities and times of travel of one and of 10 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. Table 6 documents the variables used to address MLAEM uncertainty.

Table 7 - Model Parameters Used in MLAEM Base Case and Uncertainty Runs

File Name	Total PWS Well Discharge (cubic meters per day)	Hydraulic Conductivity (meters per day)	Porosity (%)	Aquifer Thickness (meters)
2019_EV_model_n20.dat	709	60	20	8.5
Kminus_50percent_n20.dat	709	30	20	8.5
Kplus_50percent_n20.dat	709	90	20	8.5

The Oneka Model helps to address uncertainties related to aquifer parameters as variations of the flow field. A 10-year capture zone probability map (Figure 6) was generated for the public water supply wells; the values used for the Oneka Model are shown in Table 8. The probability map for the public water supply wells shows that uncertainty of the capture zone increases as the distances from the public water supply wells increase.

Table 8 - Ranges of Values Used for the Oneka Model

File Name	**Hydraulic Conductivity (meters/day)** ***(distribution, value)***	**Thickness** ***(distribution, value)***	**Porosity (%)**
EV_10yr.one	Lognormal 3.1-4.3	Normal 8.5	20

Conjunctive Delineation

The vulnerability of the DWSMA is high; therefore, according to current MDH guidance, the need for a conjunctive delineation must be assessed.

When surface water bodies, such as the ditches near the city wells, are determined to be within the highly vulnerable ERA of a PWS well and adequate data exists to confirm a hydraulic connection between the well(s) and the water bodies, the surface water feature(s) and their watershed(s) are to be included in the WHPA. In these instances, the surface water features and their watersheds are known as the surface water contribution area (SWCA), and the groundwater capture area is known as the GWCA (Figure 7). As part of this delineation, the need to incorporate the SWCA of the unnamed ditch to the west of Eden Valley's well field and another unnamed ditch to the east and north of Highway 55 in the WHPA was assessed using water chemistry results and the calibrated groundwater flow model.

Well #2 (211666), Well #3 (211662), Well #4 (649153) and the ditch immediately west of the wellfield were sampled on a quarterly basis over one year for stable isotopes of oxygen and hydrogen. The results indicate the city's wells are likely receiving a significant amount of their recharge from surface water sources (Appendix B). Additionally, the groundwater flow model results suggest that the city's wells likely capture water from the surface within a time of one year. These results support the inclusion of the nearby ditches and its watershed in the city's WHPA. The SWCA was delineated using DNR Level 09 catchments that contributed to the two aforementioned ditches.

Water samples collected in 1997 from Wells 2 and 3 (21166 and 211662, respectively) were analyzed for, and found no detection of, tritium. Subsequent samples were collected in 2006 at

Wells 2 and 3 which did detect tritium. Between those two sampling events, Well #4 (649153) was installed (2001), and average total discharge from PWS wells nearly doubled. Records indicate from 1988-2001, total average water usage reported by Eden Valley was approximately 27 million gallons per year, compared to 2002-2017, where total average water usage is over 53 million gallons per year. This evidence suggests that this increase in pumping has induced

greater leakage from overlying materials, or increased the amount of water being pulled vertically through the aquifer, exposing the city's wells to younger water, as evidenced by the presence of tritium and surface water.

Delineation of the Drinking Water Supply Management Area

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

- Center-lines of highways, streets, roads, or railroad rights-of-ways.
- Public Land Survey coordinates.
- Property or fence lines.

Vulnerability Assessments

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

Assessment of Well Vulnerability

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

1. It is unknown if well construction at Wells 2 and 3 (211666, 211662, respectively) meets current State Well Code specifications (Minnesota Rules, part 4725) as no grouting information exists in their respective records. If the wells were not grouted, they could provide a pathway for contaminants to enter the aquifer used by Eden Valley. Well construction at Well #4 (649153) 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. The geologic conditions at the well site do not include a cover of clay-rich geologic materials over the aquifer, which could retard or prevent the vertical movement of contaminants.
3. None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at regulatory level.
4. Water samples were collected from Well #2 (211666), Well #3 (211662), and Well #4 (649153) between 2012 and 2018 and were analyzed for tritium, nitrate, chloride and bromide (Table 2). Tritium was detected in the most recent samples, confirming the vulnerable nature of the wells (Alexander and Alexander, 1989). However, the absence of elevated chloride to bromide ratios in these samples suggest that the aquifer water quality has not been strongly influenced by human-caused sources of salt contamination.

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. Isotopic and water chemistry data from wells located within the DWSMA indicate the aquifer contains water that has detectable levels of tritium and is receiving a significant amount of recharge from nearby ditches.
2. Review of the geologic logs contained in the CWI database, geological maps, and reports indicate the aquifer exhibits a predominantly high geologic sensitivity throughout the groundwater contribution area and is not isolated from the direct vertical recharge of surface water. Throughout the SWCA, geologic sensitivity varies from high to very low. The north-south trending outwash channel consists mostly of moderate geologic sensitivity, while the gently sloping hills comprised of unsorted glacial till materials to the east and west of the outwash channel is primarily composed of low geologic sensitivity. While the geologic sensitivity is low in these areas, the DWSMA vulnerability, as it relates to the surface water contribution area, is high due to the potential for runoff into the highly vulnerable groundwater contribution area.
3. Arsenic, which is a naturally-occurring contaminant, has been detected in the water from public water supply Well #3 (211662) at a concentration of 6.60 µg/L) and Well #4 (649153) at a concentration of 5.52 µg/L. However, the presence of a naturally occurring contaminant does not necessarily indicate that there is a direct pathway between the aquifer and potential contamination sources that occur at or near the land surface.

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

Recommendations

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

1. Well Locating: If wells are constructed within two miles of the city or one mile of the DWSMA, their locations should be verified. This information may allow a better understanding of the extent and thickness of the city's aquifers, and could result in a more refined WHPA in the future.
2. Water Quality Monitoring: Sample Wells 2, 3 and 4 (or whatever primary wells exist at that time) for vulnerability parameters in year six of plan development, determined in consultation with MDH (likely tritium, chloride, bromide, nitrate and ammonia) and dependent on available funding. The city may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

3. Future monitoring of surface water from the nearby ditches (east and west), and Wells 2, 3, and 4 (211666, 211662, 649153, respectively) should be conducted to help to confirm initial results. The details of the monitoring program should be worked out in consultation with MDH hydrologist, but may incorporate temperature logging to further assess the connection between the wells and nearby surface water features and/or evaluations of gain or loss of ditch flow in proximity to the city wells.

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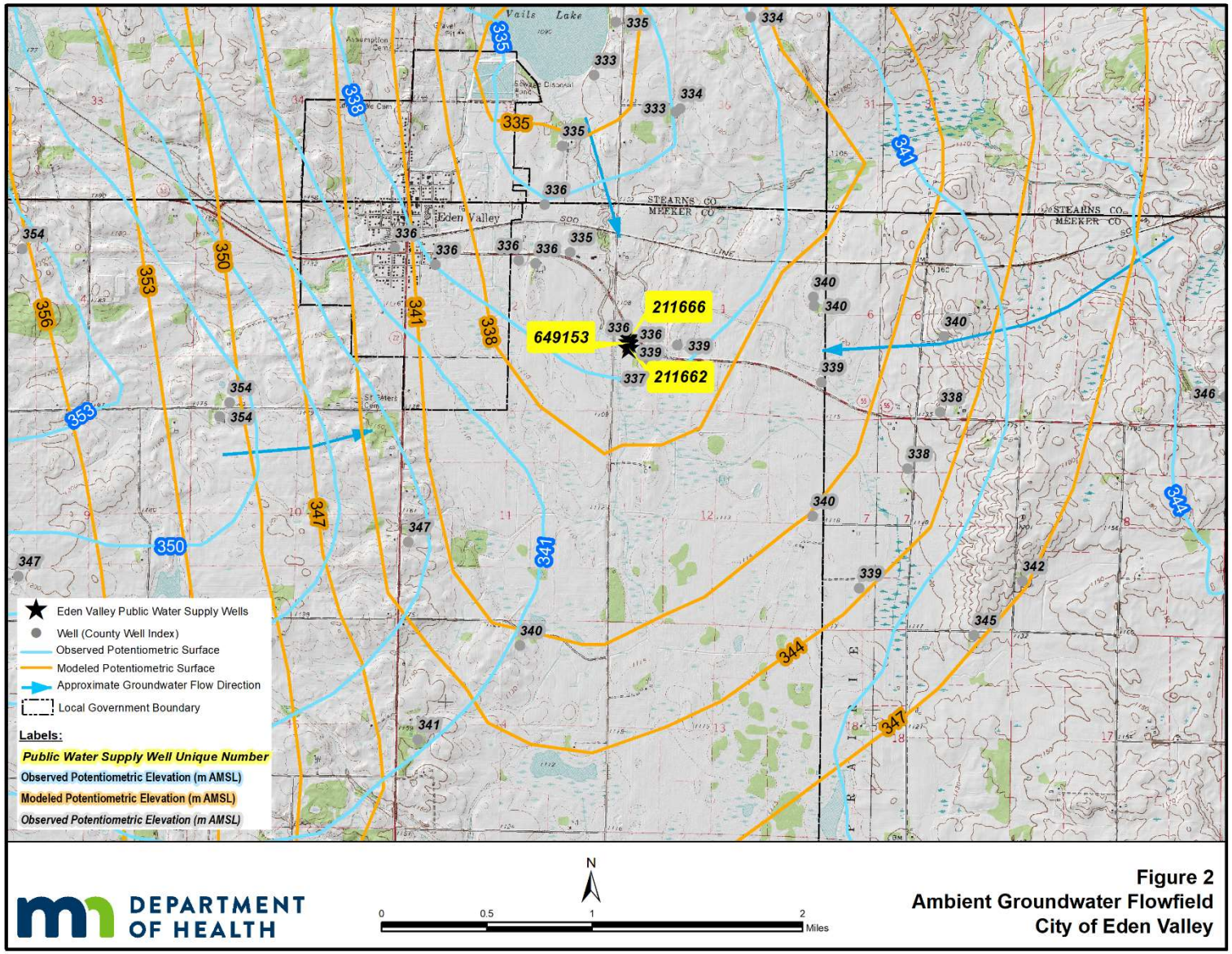
Figures



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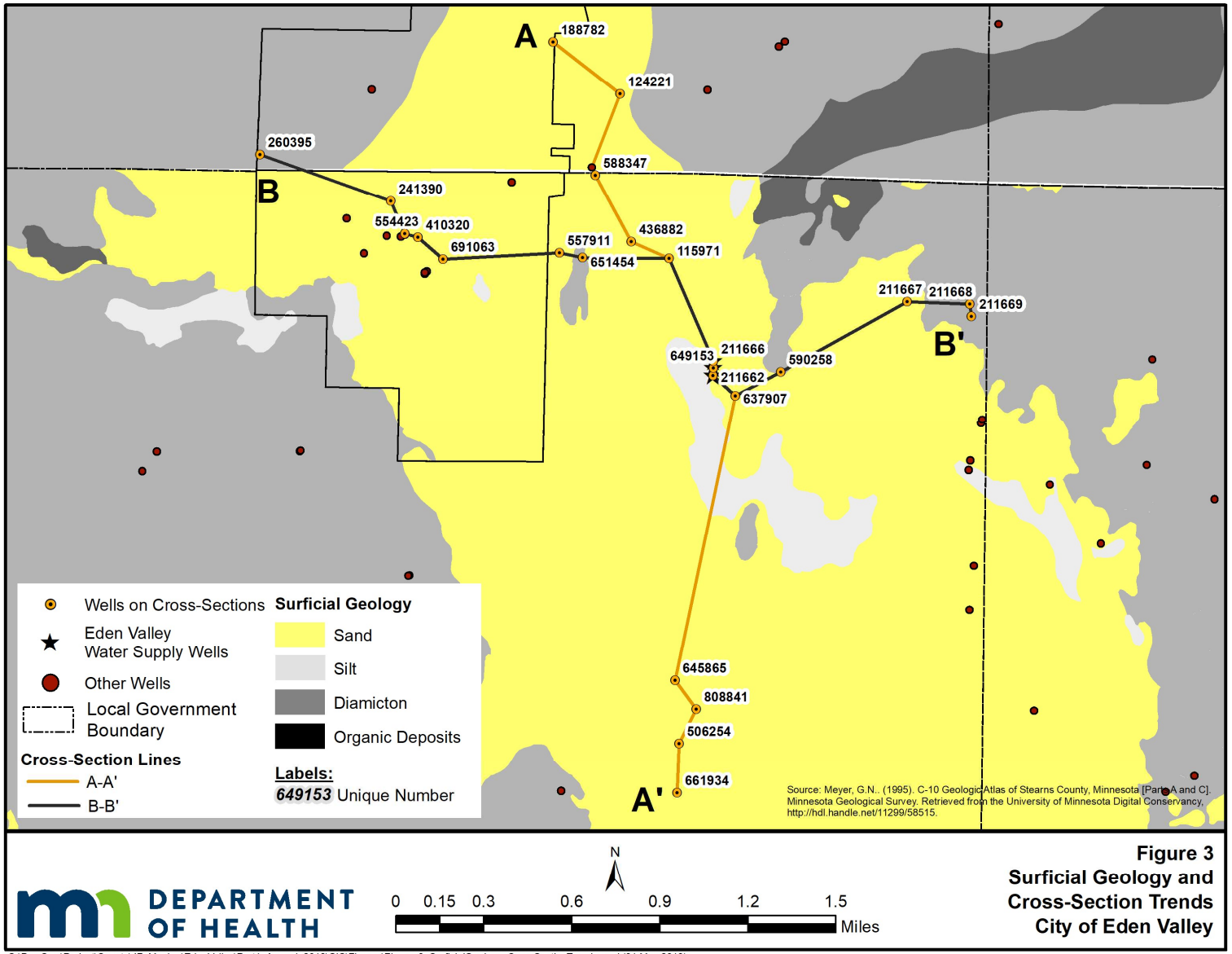
A
188782
124221
260395
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B
241390
554423
410320
691063
557911
436882
651454
115971
211667
211668
211669
B'
649153
211666
590258
211662
637907
645865
808841
506254
661934
A'
Wells on Cross-Sections
Eden Valley Water Supply Wells
Other Wells
Local Government Boundary
Cross-Section Lines
A-A'
B-B'
Surficial Geology
Sand
Silt
Diamicton
Organic Deposits
Labels:
649153 Unique Number
Source: Meyer, G.N., (1995). C-10 Geologic Atlas of Stearns County, Minnesota [Part A and C]. Minnesota Geological Survey. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/58515.
DEPARTMENT OF HEALTH
N
0 0.15 0.3 0.6 0.9 1.2 1.5
Miles
Figure 3
Surficial Geology and
Cross-Section Trends
City of Eden Valley
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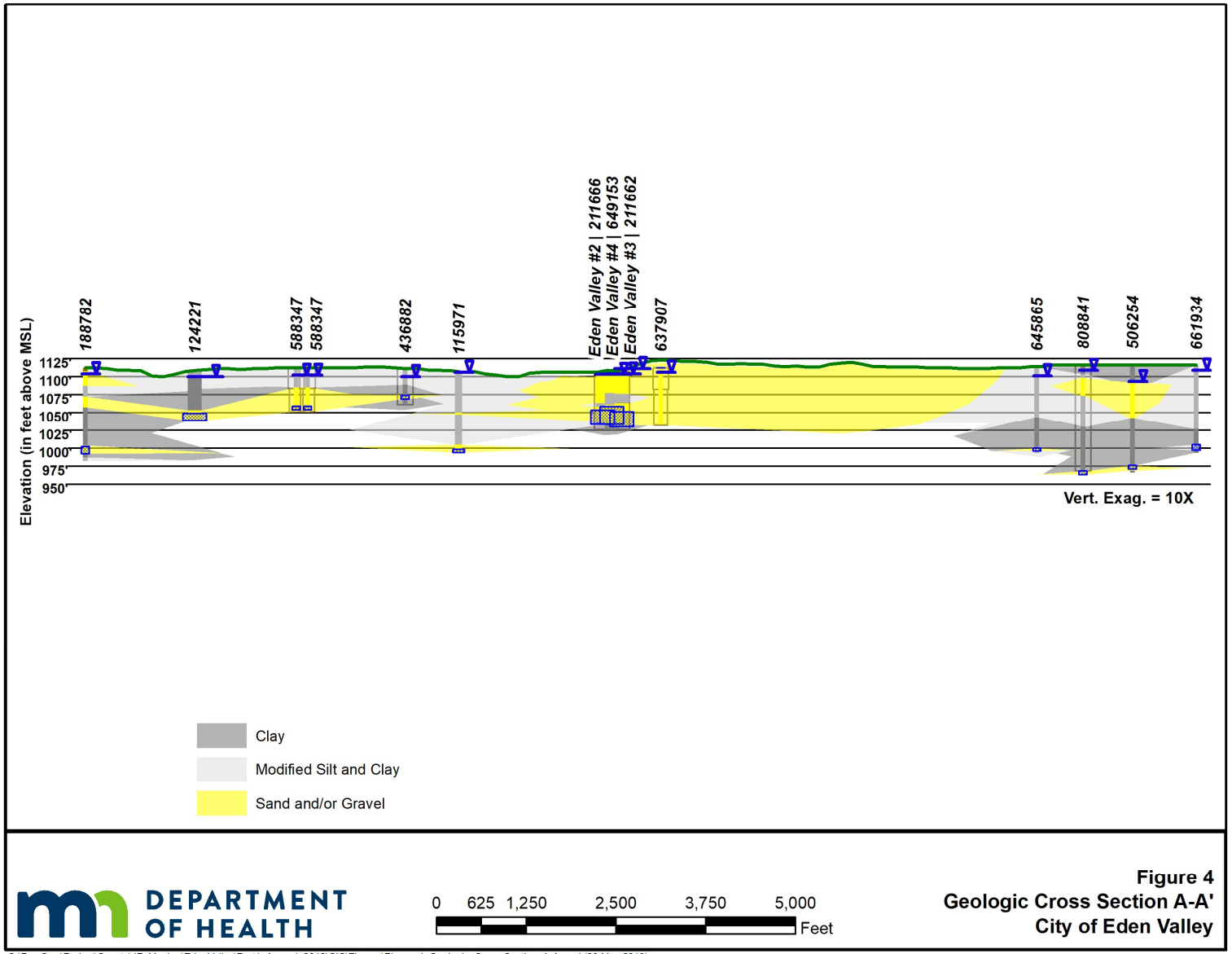
188782
124221
588347
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436882
115971
Eden Valley #2 | 211666
Eden Valley #4 | 649153
Eden Valley #3 | 211662
637907
645865
808841
506254
661934
Elevation (in feet above MSL)
1125'
1100'
1075'
1050'
1025'
1000'
975'
950'
Vert. Exag. = 10X
Clay
Modified Silt and Clay
Sand and/or Gravel
DEPARTMENT OF HEALTH
0 625 1,250 2,500 3,750 5,000
Feet
Figure 4
Geologic Cross Section A-A'
City of Eden Valley
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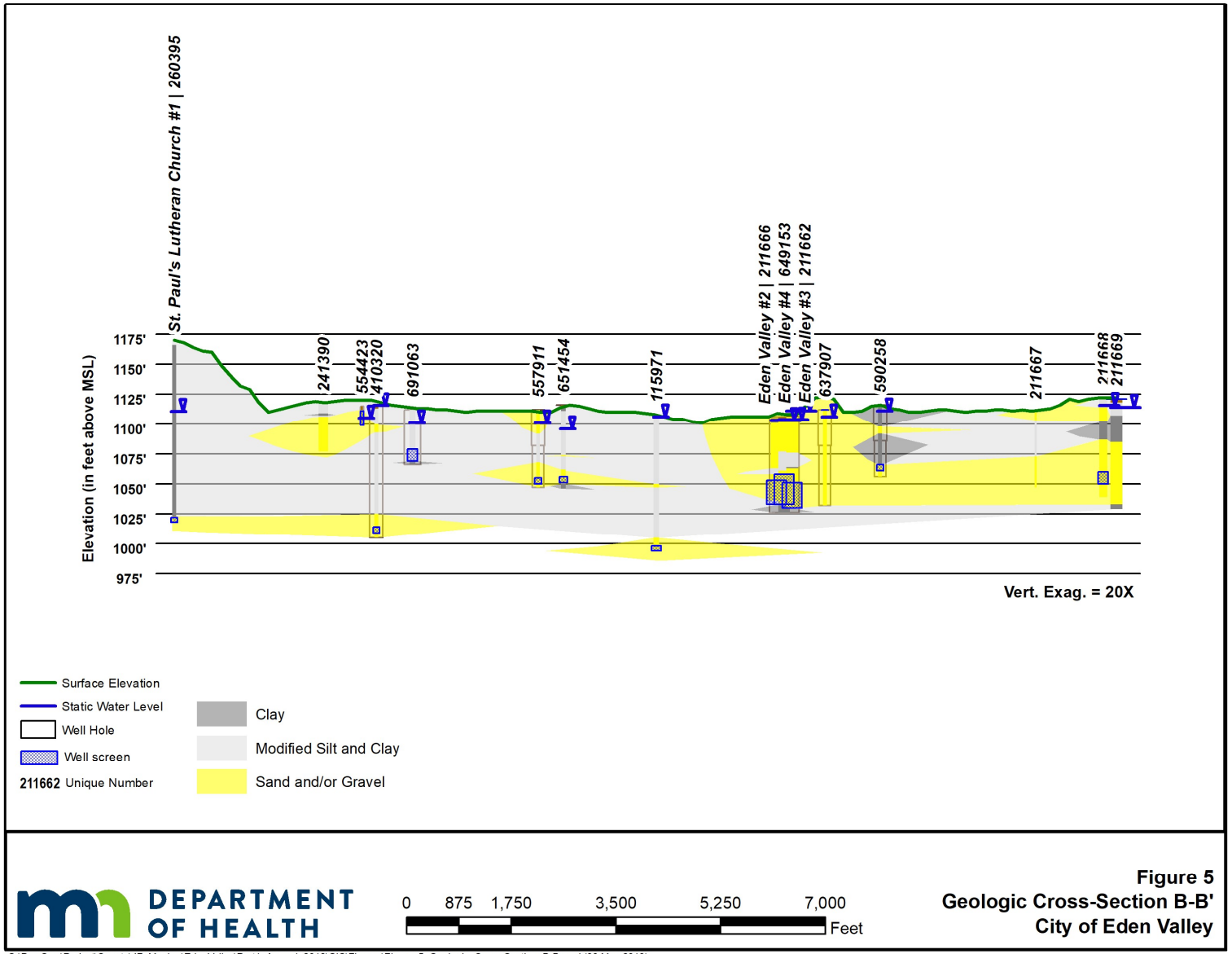
St. Paul's Lutheran Church #1 | 260395
241390
554423
410320
691063
557911
651454
115971
Eden Valley #2 | 211666
Eden Valley #4 | 649153
Eden Valley #3 | 211662
637907
590258
211667
211668
211669
Elevation (in feet above MSL)
1175'
1150'
1125'
1100'
1075'
1050'
1025'
1000'
975'
Vert. Exag. = 20X
Surface Elevation
Static Water Level
Well Hole
Well screen
211662 Unique Number
Clay
Modified Silt and Clay
Sand and/or Gravel
DEPARTMENT OF HEALTH
0 875 1,750 3,500 5,250 7,000
Feet
Figure 5
Geologic Cross-Section B-B'
City of Eden Valley
O:\DwpSwp\Project\County\47_Meeker\EdenValley\Part1_Amend_2018\GIS\Figures\Figure_5_Geologic_Cross-Section_B-B.mxd (30 May 2019)

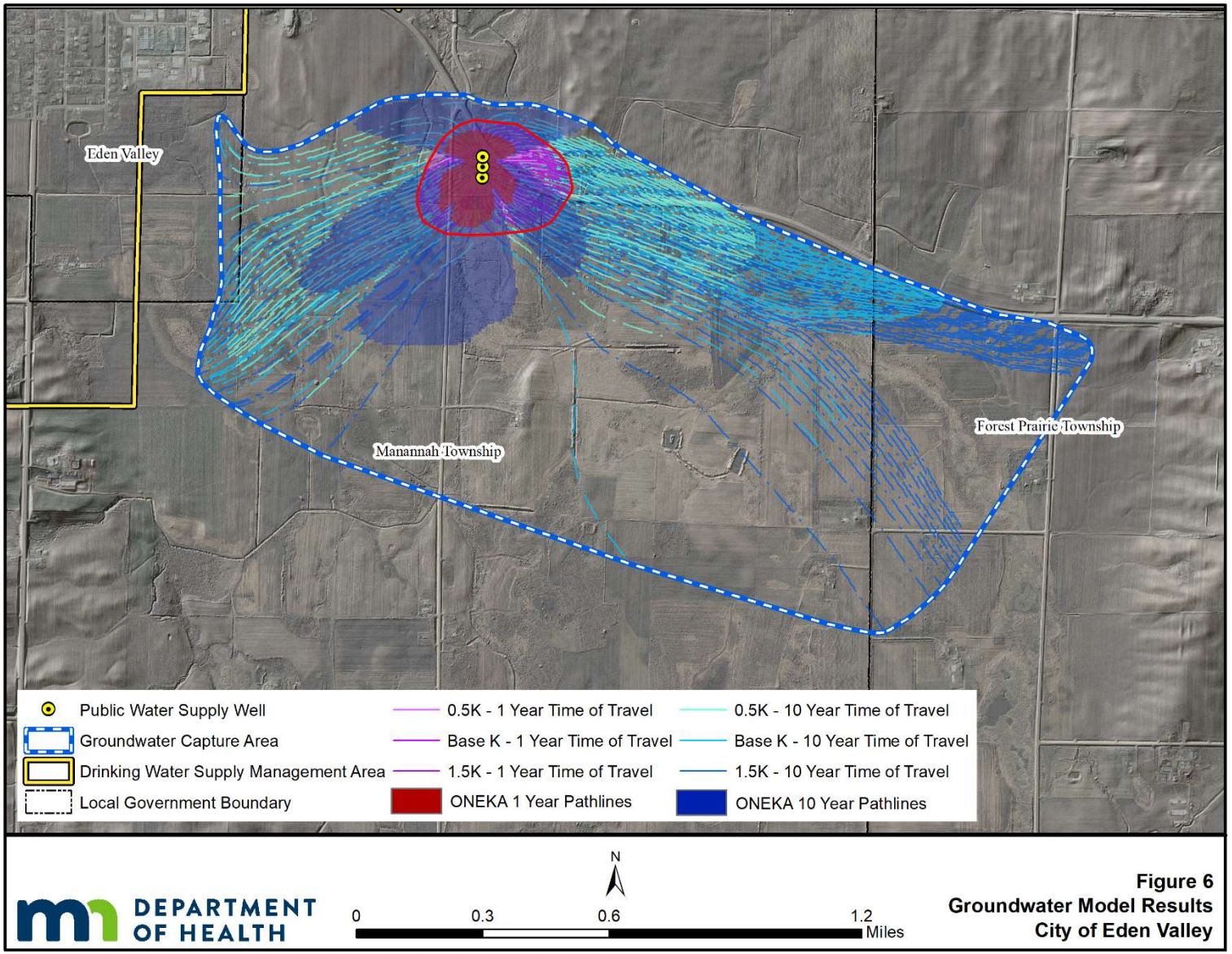

Figure 6
Groundwater Model Results
City of Eden Valley

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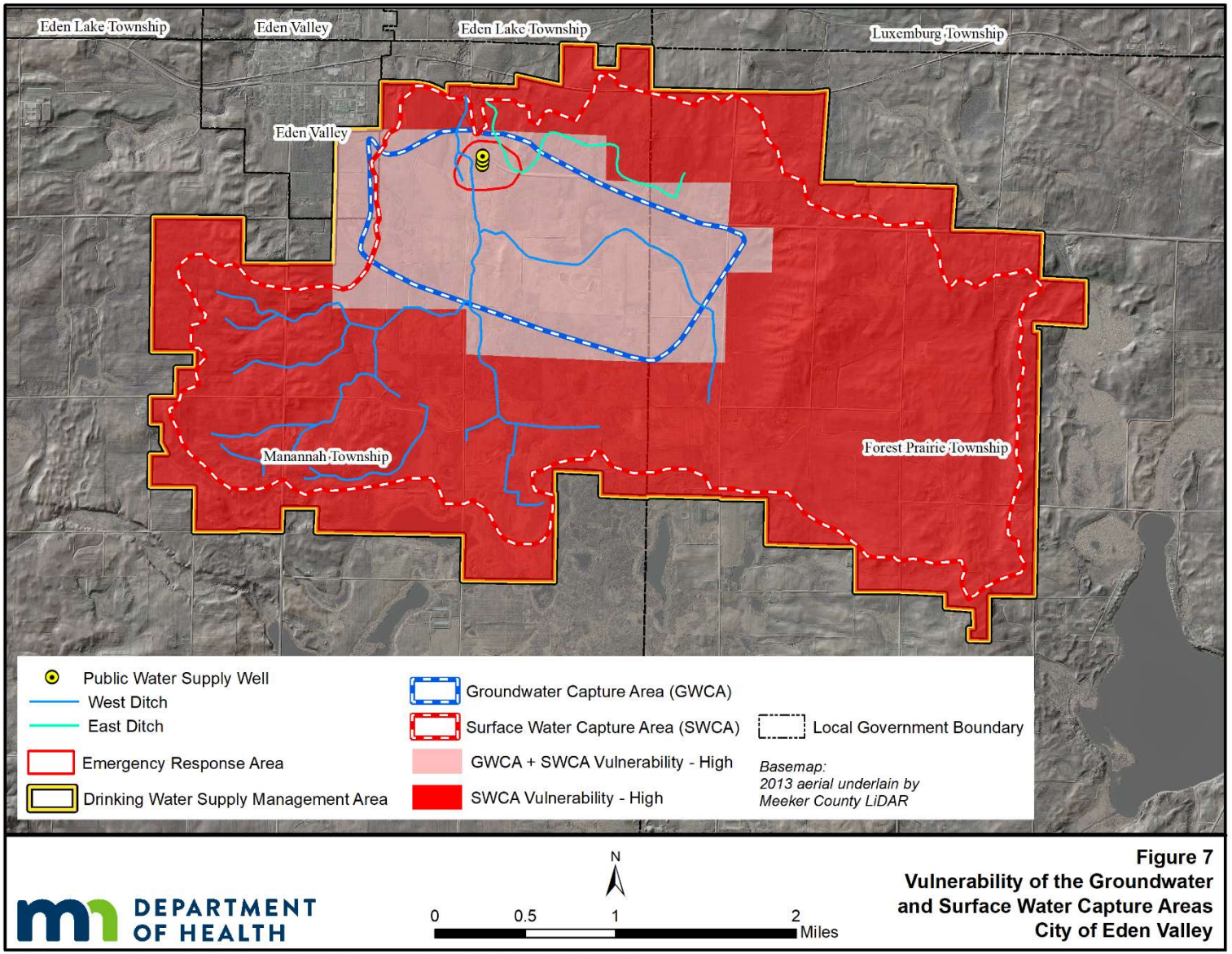

Figure 7
Vulnerability of the Groundwater and Surface Water Capture Areas
City of Eden Valley

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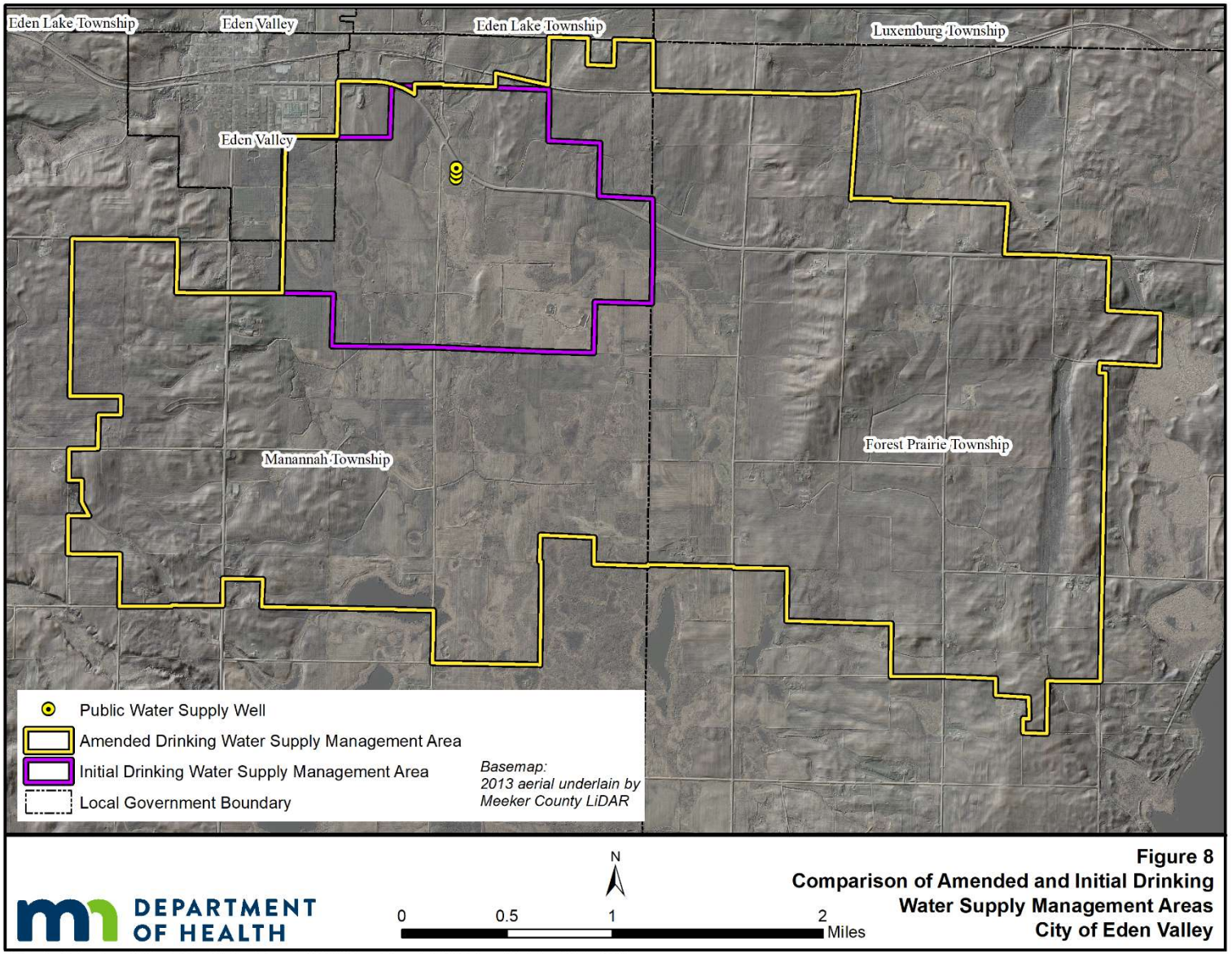

Eden Lake Township
Eden Valley
Eden Lake Township
Luxemburg Township
Eden Valley
Manannah Township
Forest Prairie Township
Public Water Supply Well
Amended Drinking Water Supply Management Area
Initial Drinking Water Supply Management Area
Local Government Boundary
Basemap:
2013 aerial underlain by
Meeker County LiDAR
DEPARTMENT OF HEALTH
N
0
0.5
1
2
Miles
Figure 8
Comparison of Amended and Initial Drinking Water Supply Management Areas
City of Eden Valley
O:\DwpSwp\Project\County\47_Meeker\EdenValley\Part1_Amend_2018\GIS\Figures\Figure_8_DWSMA_AmendVsInitial.mxd (18 Jun 2019)

Appendix A: Data Elements Assessment

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Climate	Precipitation	H	H	H	H	USGS
Geology	Maps and geologic descriptions	M	H	H	H	MGS, DNR
Geology	Subsurface data	M	H	H	H	MGS, MDH, DNR
Geology	Borehole geophysics	M	H	H	H	No relevant data
Geology	Surface geophysics	L	L	L	L	No relevant data
Soils	Maps and soil descriptions	L	H	M	L	NRCS
Soils	Eroding lands					
Water Resources	Watershed units	L	H	L	L	MnGEO, DNR
Water Resources	List of public waters	L	H	L	L	MnGEO, DNR
Water Resources	Shoreland classifications					
Water Resources	Wetlands map	L	H	L	L	USFWS
Water Resources	Floodplain map					
Land Use	Parcel boundaries map	L	H	L	L	Meeker County
Land Use	Political boundaries map	L	H	L	L	MnGEO
Land Use	Public Land Survey map	L	H	L	L	MnGEO
Land Use	Land use map and inventory					
Land Use	Comprehensive land use map					
Land Use	Zoning map					
Public Utility Services	Transportation routes and corridors	L	L	L	L	MnDOT, MnGEO
Public Utility Services	Storm/sanitary sewers and PWS system map	L	M	L	L	City (No relevant data)
Public Utility Services	Oil and gas pipelines map					
Public Utility Services	Public drainage systems map or list	L	H	L	L	MnGEO, DNR
Public Utility Services	Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH
Surface Water Quantity	Stream flow data	L	H	H	H	DNR, USGS (no relevant data found)
Surface Water Quantity	Ordinary high water mark data	L	H	L	L	DNR (no relevant data found)
Surface Water Quantity	Permitted withdrawals	L	H	L	L	DNR
Surface Water Quantity	Protected levels/flows	L	H	L	L	DNR (no relevant data found)

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Surface Water Quantity	Water use conflicts	L	H	L	L	DNR (no relevant data found)
Groundwater Quantity	Permitted withdrawals	H	H	H	H	DNR
Groundwater Quantity	Groundwater use conflicts	H	H	H	H	DNR (no relevant data found)
Groundwater Quantity	Water Levels	H	H	H	H	DNR, MPCA, MDA, MDH, City (no relevant data found)
Surface Water Quality	Stream and lake water quality management classifications					
Surface Water Quality	Monitoring data summary	L	H	L	L	MDH
Groundwater Quality	Monitoring data	H	H	H	H	MDH
Groundwater Quality	Isotopic data	H	H	H	H	MDH
Groundwater Quality	Tracer studies	H	H	H	H	None Available
Groundwater Quality	Contamination site data	M	M	M	M	MPCA (no relevant data found)
Groundwater Quality	Property audit data from contamination sites					
Groundwater Quality	MPCA and MDA spills/release reports	M	M	M	M	MPCA, MDA (no relevant data found)

Definitions Used for Assessing Data Elements

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

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

Appendix B: Vulnerability Suite Chemistry Results

The city of Eden Valley's primary wells show a near-atmospheric average tritium signature of 6.78 tritium units (Table B-1). Current atmospheric levels are ~8 tritium units (MN State Climatology dataset, 2015). This suggests that the water recharging the city's primary aquifer is quite young. As a result, sampling of the unnamed ditch to the west of the wellfield (referred to as "West Ditch") was also conducted for this Wellhead Delineation and results are reported in Table B-1.

Accounting for the contribution of surface water from the ditch to the city's aquifer was also conducted. This approach uses chemical concentrations to calculate approximate percentages of water from surface water and groundwater that make up the city's well chemistry. These calculations, which are summarized and averaged in Table B-2, suggest that a significant amount of recharge to the aquifer is likely coming from surface water. The average value of 40 percent is over the 20 percent cutoff that is considered by MDH to represent a significant surface water contribution. It should be noted, however, that the proportion of surface water in the well sample likely correlates to the discharge volume of the aquifer. During periods of high demand (e.g. spring/summer), more water is being removed from the aquifer, and the aquifer receives more recharge via vertical infiltration. As result, the pumped wells are pulling in a greater volume of water from near, or at, the surface. During periods of low demand (e.g. winter), less water is removed from the aquifer, thus limiting vertical recharge to the well and relying more on water pulled into the well laterally.

Figure A-1 shows how the oxygen-18 and deuterium isotopic values for the city's wells and the ditch compare with the meteoric water line (MWL) of Landon et al (2000). All data for the wells plots near and slightly below the MWL. The ditch samples plot off the MWL, with two samples plotting slightly below but near the wells samples and the MWL and two plotting well away from the MWL, which is likely due to evaporation. Using the Line-Conditioned Excess method of evaluating deviation from the MWL (Landwehr and Coplen, 2004), 60-80% of the water samples from the city wells were considered significantly different than the MWL.

Table B-1 – ^{18}O Summary Information

ID	Number of Samples	Minimum Value	Maximum Value	Mean Value	Coefficient of variation (CV)[1]	Do 1 or more samples show evidence for evaporated surface water? (#)	% of samples showing evidence for evaporated surface water	% evap SW times the mean LC Excess*	% rank of the % evap SW times the mean LC Excess* (includes Virus Study wells: 88 wells total)	Open water (sq.m.) in 1 year Capture Zone	Open water (sq.m.) in 10 year Capture Zone	Most conservative Geologic Sensitivity	Most recent Tritium result	Surface Water Impact Assessment
0000211662 (1470006S02)	5	-10.17	-8.86	-9.454	**5%**	Yes (4 of 5)	80%	-2.83086205951474	69%	Yes	Yes	L	8.58	possibly impacted by short-residence time surface water at short times of travel
0000211666 (1470006S01)	5	-10.17	-9.13	-9.724	**4%**	Yes (3 of 5)	60%	-1.25320429798976	33%	Yes	Yes	VH	4.92	possibly impacted by short-residence time surface water at short times of travel
0000649153 (1470012S03)	4	-9.78	-8.83	-9.285	**4%**	Yes (3 of 4)	75%	-2.52480025509445	64%	Yes	Yes	VH	6.85	possibly impacted by short-residence time surface water at short times of travel

(1) - A **bold** CV indicates it meets or exceeds the threshold value for high variability of 3% and may indicate rapid or seasonal recharge (https://dwpreports.web.health.state.mn.us/DWP_Reports/gw_categories_11.pdf).

Table B-2 – Stable Isotope Analysis

^{18}O	^{2}H	ID	Collection Date	LC Excess* (1)	Does the LC Excess* show that the sample is significantly different than the MWL?(2)	Evidence for evaporated surface water?(3)	Estimated Annual Precipitation (Bowen grid for North America for 18O values) (4)	Is the sample 18O value significantly different than the Estimated Annual Precipitation value (Bowen, 2003)?(5)	Precipitation month most closely matching ^{18}O	Precipitation for month most closely matching ^{18}O	Precipitation difference for month most closely matching ^{18}O	Percentage of Surface Water in Pumped Well Sample
-8.86	-70.27	0000211662 (1470006S02)	9/1/2010	-5.40904844	Yes	Yes	-10.1250	Yes	September	-9.1675	0.3075	40
-9.42	-69.3	0000211662 (1470006S02)	10/18/2010	-2.39371077	Yes	Yes	-10.1250	Yes	September	-9.1675	0.2525	37
-10.17	-69.13	0000211662 (1470006S02) (Replicate)	2/14/2011	1.01349781	Yes	No	-10.1250	No	April	-10.2600	0.0900	9
-9.38	-70.89	0000211662 (1470006S02)	5/4/2011	-3.45919716	Yes	Yes	-10.1250	Yes	September	-9.1675	0.2125	67
-9.13	-67.97	0000211666 (1470006S01) (Replicate)	9/1/2010	-2.93092610	Yes	Yes	-10.1250	Yes	September	-9.1675	0.0375	32
-9.7	-70.1	0000211666 (1470006S01)	10/18/2010	-1.60437877	Yes	Yes	-10.1250	Yes	September	-9.1675	0.5325	22
-10.17	-67.54	0000211666 (1470006S01) (Replicate)	2/14/2011	1.90233483	Yes	No	-10.1250	No	April	-10.2600	0.0900	9
-9.76	-70.8	0000211666 (1470006S01)	5/4/2011	-1.73071661	Yes	Yes	-10.1250	No	April	-10.2600	0.5000	33
-8.83	-70.07	0000649153 (1470012S03)	9/1/2010	-5.42973207	Yes	Yes	-10.1250	Yes	September	-9.1675	0.3375	41
-9.36	-68.12	0000649153 (1470012S03)	10/18/2010	-1.99904477	Yes	Yes	-10.1250	Yes	September	-9.1675	0.1925	40
-9.78	-67.25	0000649153 (1470012S03)	2/14/2011	0.34211840	No	No	-10.1250	No	April	-10.2600	0.4800	70
-9.17	-67.82	0000649153 (1470012S03)	5/4/2011	-2.67042418	Yes	Yes	-10.1250	Yes	September	-9.1675	0.0025	86

(1) - Bowen GJ, Revenaugh J (2003) Interpolating the isotopic composition of modern meteoric precipitation. Water Resources Research 39, 1299, doi:10.129/2003WR002086

(2) - Absolute values of LC Excess* that are greater than 1 are considered significant deviations from the Minnesota MWL.

(3) - Evidence of evaporated surface water is set to 'Yes' only for those samples where the LC Excess* was both negative and significant, and 18O is heavier than the Estimated Annual Precipitation.

(4) - Landwehr, J.M. and Coplen, T.B. (2004) Line-conditioned excess: A new method for characterizing stable hydrogen and oxygen isotope ratios in hydrologic systems. In Isotopes in Environmental Studies, Edition: 1, Chapter: IAEA-CN-118/56, Publisher: IAEA, pp.132-135. See pp. 99-100 in: http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/36/003/36003223.pdf

(5) - Differences between 18O and Estimated Annual Precipitaion that are greater than 0.4 are considered significantly different.

Table B-3 – Stable Isotope Results

Place/Sample Name	Date Taken	del 18Oxygen (per mil)	del Deuterium (per mil)		Place/Sample Name	Date Taken	del 18Oxygen (per mil)	del Deuterium (per mil)
Well 2 (211666)	9/1/2010	-8.86	-70.27		Well 3 (211662)	9/1/2010	-9.13	-67.97
Well 2 (211666)	10/18/2010	-9.42	-69.3		Well 3 (211662)	10/18/2010	-9.70	-70.1
Well 2 (211666)	2/14/2011	-10.17	-69.13		Well 3 (211662)	2/14/2011	-10.17	-67.54
Well 2 (211666)	5/4/2011	-9.38	-70.89		Well 3 (211662)	5/4/2011	-9.76	-70.8
Well 4 (649153)	9/1/2010	-8.83	-70.07		West Ditch (SWS264)	9/1/2010	-7.00	-57.01
Well 4 (649153)	10/18/2010	-9.36	-68.12		West Ditch (SWS264)	10/18/2010	-8.20	-63.17
Well 4 (649153)	2/14/2011	-9.78	-67.25		West Ditch (SWS264)	2/03/2011	-9.63	-67.36
Well 4 (649153)	5/4/2011	-9.17	-67.82		West Ditch (SWS264)	5/4/2011	-9.01	-68.08

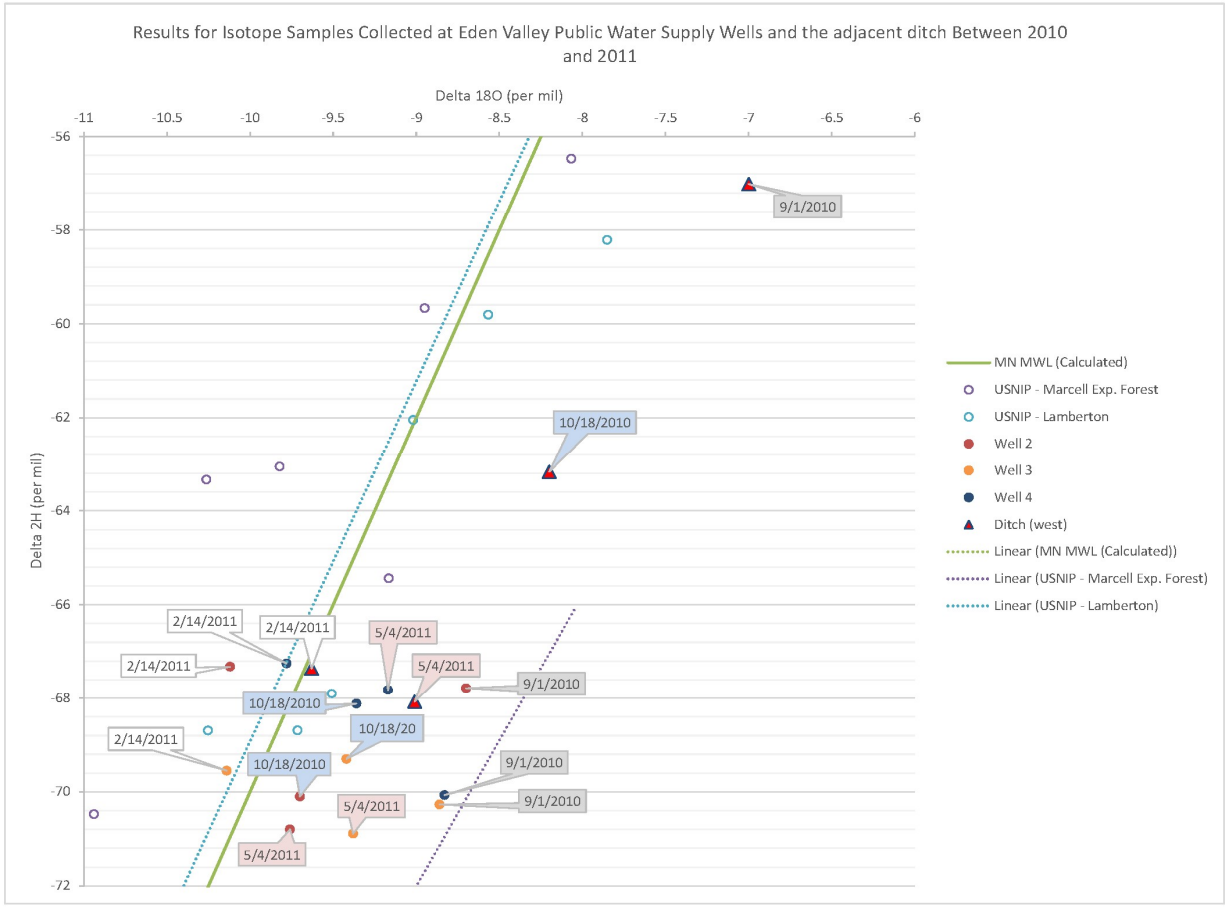


Figure B-1: Eden Valley Well and West Ditch Stable Isotope Results Plotted Against the Meteoric Water Line

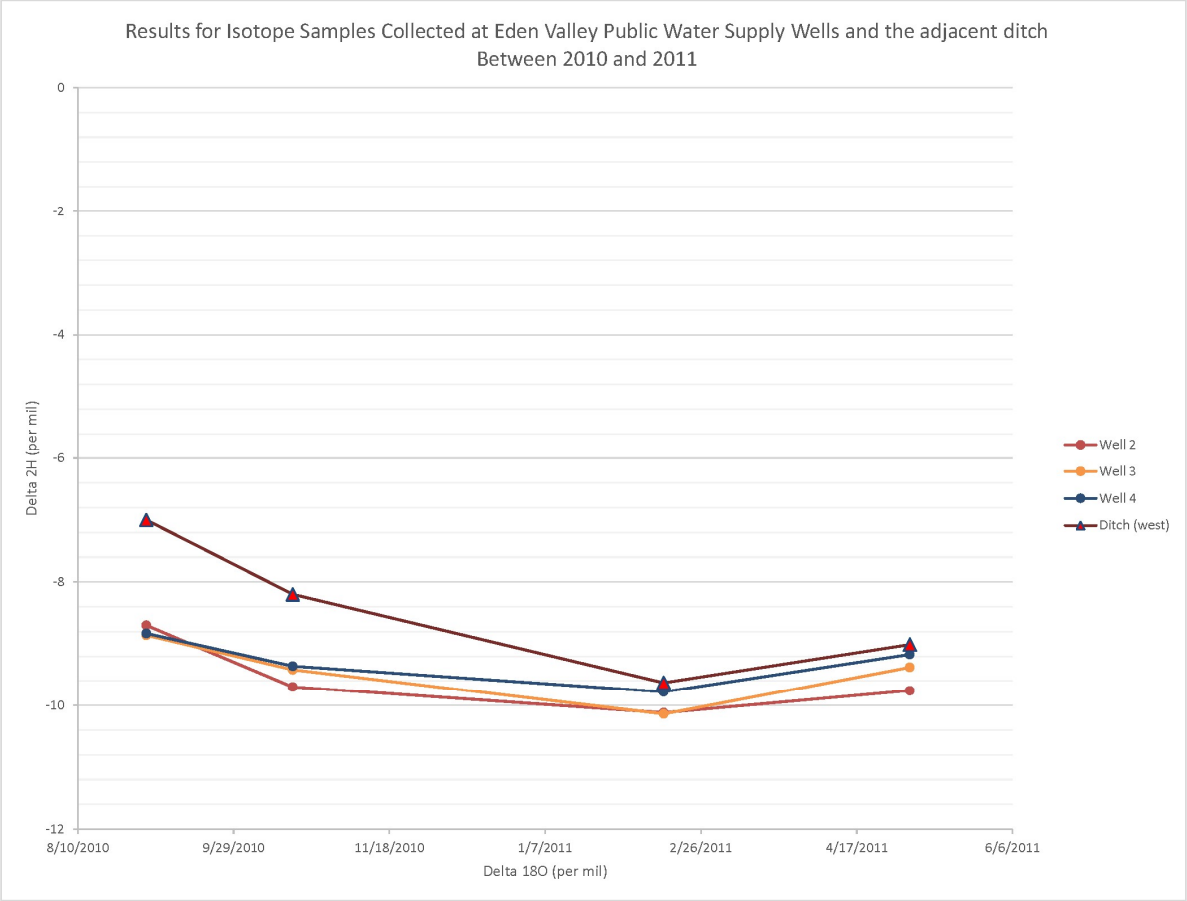


Figure B-2: Eden Valley Well and West Ditch Stable Isotope Results Over Time

June 5, 2018

Mr. Jim Rademacher, Public Works Director
City of Eden Valley
P.O. Box 25
Eden Valley, Minnesota 55329

Mr. Steven Geislinger, Water Operator
City of Watkins
P.O. Box 306
Watkins, Minnesota 55389

Dear Mr. Geislinger and Mr. Rademacher:

Subject: Scoping Decision Notice No. 1 for the City of Eden Valley, PWSID 1470012, for Amending the Wellhead Protection Plan

This letter provides notice of the results of the Scoping 1 meeting that Karen Voz and myself (Minnesota Department of Health), and Dave Neiman (Minnesota Rural Water Association) held with you and Deb Kramer (city of Watkins) on May 14, 2018, to amend your wellhead protection plan. During the meeting, we discussed the preparation of Part I of a Wellhead Protection (WHP) Plan that will document the 1) delineation of a wellhead protection area, 2) delineation of a drinking water supply management area, and 3) assessments of well and aquifer vulnerability related to these areas for the primary water supply wells that are used by Eden Valley. As you may remember, the wellhead protection area is the surface and subsurface area surrounding your public water supply wells through which contaminants are likely to move and affect your drinking water supply. The drinking water supply management area is the area delineated using identifiable landmarks that reflect the wellhead protection area boundaries as closely as possible.

The city will have until February 11, 2020, to complete the amendment of its entire Wellhead Protection Plan, Part I and Part II. The Minnesota Department of Health (MDH) highly recommends that half of the time allotted be dedicated to completing Part II of the plan.

It is our understanding that MDH will assist the city with amending its Part I report. There will be no cost to the city for any involvement by MDH staff with this work. It will be the responsibility of Eden Valley to assist with the data collection to aid in the delineation and vulnerability assessments, as you did with the original WHP Plan.

At our meeting, we discussed rule requirements and the types of information needed to amend the Part I report. The Wellhead Protection Plan must be prepared in accordance with Minnesota Rules, parts 4720.5100 to 4720.5590. General wellhead protection requirements and criteria for delineating the wellhead protection area and data reporting are presented in Minnesota Rules, parts 4720.5500 to 4720.5510.

The enclosed Scoping Decision Notice No. 1 formally identifies the information that the city must provide to MDH to meet rule requirements for amending and preparing Part I of the Wellhead Protection Plan. The wellhead rule refers to the existing information required for wellhead planning as data elements. Much of this information is available in the public domain, as described in the Scoping Decision Notice No. 1 form. You only need to provide the information that is not in the public domain and, therefore, not available to MDH. The

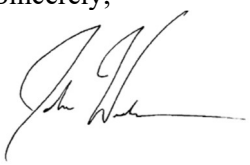
Scoping Decision Notice No. 1 form also 1) lists the Minnesota unique well number and well construction for each well that will be included in the Wellhead Protection Plan [Table 1], 2) lists the pumping volumes for each well [Table 2], and 3) includes a map of the well locations. A summary of the information that the PWS needs to provide is included at the end of the Scoping Decision Notice No. 1 form.

After the delineation has been completed, we would again like to meet with you to discuss the wellhead protection area delineation and the boundaries of the drinking water supply management area. The boundaries of the drinking water supply management area use streets, roads, section lines, or other features that the public can easily understand for referencing the areas that will be included in the city's WHP Plan.

Finally, it is our understanding that you will both serve officially as wellhead protection co-managers on behalf of the city. You are responsible for providing written notice to local units of government of the city's intent to amend the Wellhead Protection Plan, as required by the wellhead protection rule (part 4720.5300, subpart 3). A copy of this notice should be forwarded to MDH and must include a list of the city wells, their unique well numbers, and contact information for you as Wellhead Protection manager. If you do not have a copy of your original notice from your previous WHP Plan, your Minnesota Rural Water Association Planner can provide you with some examples of the notification of intent that other communities have used. Please contact him at 218-820-0595 or dave.neiman@mrwa.com.

In closing, we look forward to working with you on amending your Wellhead Protection Plan. If you have any questions regarding our comments, please contact me at 651-201-4658 or at john.woodside@state.mn.us.

Sincerely,



John Woodside, P.G., Hydrologist
Source Water Protection Unit
Environmental Health Division
P.O. Box 64975
St. Paul, Minnesota 55164-0975

JSW:ds-b
Enclosures: Scoping Decision Notice No. 1, Summary of Data Requested, Table 1 - Public Water Supply Well Information, Table 2 - Annual Volume of Water Pumped From PWS Wells, Table 3 - Permitted High-Capacity Wells, Map of Well Location(s)
cc: Deb Kramer, City of Watkins
Karen Voz, Planner, Source Water Protection Unit, St. Cloud District Office
Dave Neiman, Planner, Minnesota Rural Water Association
Ron Struss, Minnesota Department of Agriculture

SCOPING DECISION NOTICE No. 1
(Vulnerable Setting)

The purpose for the first Scoping Meeting, as required by Minnesota Rules, part 4720.5310, is to discuss the information necessary for preparing the Part I Report of a Wellhead Protection Plan. The Part I Report identifies the area that provides the source of drinking water for the public water supply (PWS) so that the PWS can develop land use or management practices to protect their groundwater resource from contamination. Specifically, the Part I Report documents the delineation of the wellhead protection area (WHPA), the delineation of the drinking water supply management area (DWSMA), and assesses the vulnerability of the PWS well(s) and DWSMA.

The wellhead rule (Minnesota Rules, part 4720.5310) refers to the information required for wellhead planning as data elements. This form lists the data elements that are stated in Minnesota Rules, part 4750.5400. The Minnesota Department of Health (MDH) uses this form to designate which data elements are needed to prepare the Part I Report, based on the hydrogeological setting, vulnerability of the well(s), and aquifer information known at the time of the Scoping 1 Meeting.

Name of Public Water Supply **City of Eden Valley (PWSID = 1470012)**		**Date** June 5, 2018
Name of the Wellhead Protection Co-Managers Mr. Jim Rademacher and Mr. Steven Geislinger		
Address P.O. Box 25	**City** Eden Valley	**Zip** 55329
Unique Well Numbers 211666 (Well 2); 211662 (Well 3); 649153 (Well 4)		**Phone** 320-248-2400 320-453-5252

Instructions for Completing the Scoping No. 1 Form

N	D	V	S	
X				**N** = If this box is checked with an "X," this data element is **NOT** necessary for the **Part I Report** of your Wellhead Protection Plan. This data element may be identified later at the Scoping 2 Meeting and used for the Part 2 Report. Please go to the next data element.

N	D	V	S	
	X			**D** = If this box is checked with an "X," the preparer of the Part I Report is **required** to use this information for the **DELINEATION** of the WHPA or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.

N	D	V	S	
		X		**V** = If this box is checked with an "X," the preparer of the Part I Report is **required** to use this information for the **VULNERABILITY** assessment of the PWS well(s) or the DWSMA. If there is no check in the "S" box, this information is available in the public domain or is on-file at MDH.

N	D	V	S	
			X	**S** = If this box is checked with an "X," the PWS **must SUBMIT** the information to the MDH.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

A. PRECIPITATION

N	D	V	S	
	X			A.1: An existing map or list of local precipitation gauging stations.

Technical Assistance Comments: Precipitation values can be used to determine the local recharge in the groundwater model. The map can be used to determine the closest gauging station. The locations of the gauging stations are available in the public domain.

N	D	V	S	
	X		X	A.2: An existing table showing the average monthly and annual precipitation, in inches, for the preceding five years.

Technical Assistance Comments: This information may be used for determining local recharge for the groundwater model. This information may be available in the public domain if there is a local gauging station, or may be obtained from the local wastewater treatment plant.

B. GEOLOGY

N	D	V	S	
	X	X	X	B.1: 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: Information of this type is required to characterize the geologic and hydrogeologic setting of the PWS well field(s). This information is used to define aquifer geometry, location and magnitude of the recharge and discharge areas, and groundwater flow information. Aquifer tests or alternatives listed in MN Rules, part 4720.5510, subpart 6, can be used to help characterize flow in the aquifer. Reference all information used to develop the conceptual model of the geologic setting and submit to MDH only the information that is not available in the public domain.

N	D	V	S	
	X	X	X	B.2: Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.

Technical Assistance Comments: Information of this type may be useful to refine the understanding of the geologic and hydrogeologic setting on a local basis. Submit only if the PWS or city has information of test drilling or site investigations conducted by the city that is not available in the public domain.

N	D	V	S	
	X	X	X	B.3: Existing borehole geophysical records from wells, borings, and exploration test holes.

Technical Assistance Comments: Information from geophysical records may provide additional information about aquifer thickness, well construction, and water level information at a local scale. Submit only if the information is not available in the public domain.

N	D	V	S	
	X	X	X	B.4: Existing surface geophysical studies.

Technical Assistance Comments: Information from geophysical studies may be useful to refine the understanding of the geology on a local basis. Submit only if the information is not available in the public domain.

C. SOILS

N	D	V	S	
	X	X		C.1: Existing maps of the soils and a description of soil infiltration characteristics.

Technical Assistance Comments: This information is in the public domain and can be used to delineate the WHPA and assess the vulnerability of the DWSMA because it indicates the underlying geology.

N	D	V	S	
X				C.2: A description or an existing map of known eroding lands that are causing sedimentation problems.

Technical Assistance Comments:

D. WATER RESOURCES				
N	D	V	S	D.1: An existing map of the boundaries and flow directions of major watershed units and minor watershed units.
	X			
Technical Assistance Comments: This information is in the public domain and may be used to delineate the surface water contribution area of the WHPA.				
N	D	V	S	D.2: An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.
	X	X		
Technical Assistance Comments: This information is in the public domain and may be used to delineate the surface water contribution area of the WHPA and determine the vulnerability of the DWSMA.				
N	D	V	S	D.3: The shoreland classifications of the public waters listed under sub-item (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.
X				
Technical Assistance Comments:				
N	D	V	S	D.4: An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.
X				
Technical Assistance Comments:				
N	D	V	S	D.5: An existing map showing those areas delineated as floodplain by existing local ordinances.
X				
Technical Assistance Comments:				

DATA ELEMENTS ABOUT THE LAND USE

E. LAND USE				
N	D	V	S	E.1: An existing map of parcel boundaries.
	X		X	
Technical Assistance Comments: This information may be helpful in delineating the DWSMA, if available. If this information is provided, identification numbers must be provided for each parcel. An electronic format for the map is preferable. Submit only if the information is not available in the public domain.				
N	D	V	S	E.2: An existing map of political boundaries.
	X		X	
Technical Assistance Comments: Please provide this information if the boundaries have been updated/changed. This information may be helpful in delineating the DWSMA. An electronic format for the map is preferable.				
N	D	V	S	E.3: An existing map of public land surveys, including township, range, and section.
	X			
Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.				
N	D	V	S	E.4: A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
X				
Technical Assistance Comments:				

N	D	V	S	E.5: An existing, comprehensive land-use map.
X				

Technical Assistance Comments:

N	D	V	S	E.6: Existing zoning map.
X				

Technical Assistance Comments:

F. PUBLIC UTILITY SERVICES

N	D	V	S	F.1: An existing map of transportation routes or corridors.
	X			

Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.

N	D	V	S	F.2: An existing map of storm sewers, sanitary sewers, and the public water supply systems.
	X		X	

Technical Assistance Comments: Do not submit a map of the storm sewers and sanitary sewers. Describe the difference in how much water is pumped and how much is sold. The difference is the leakage that may be used as recharge in the groundwater model.

N	D	V	S	F.3: An existing map of gas and oil pipelines used by gas and oil suppliers.
X				

Technical Assistance Comments:

N	D	V	S	F.4: An existing map or list of public drainage systems.
	X	X		

Technical Assistance Comments: This information is available in the public domain and may be helpful in delineating the DWSMA.

N	D	V	S	F.5: An existing record of construction, maintenance, and use of the public water supply well(s) and other wells within the DWSMA.
	X	X	X	

Technical Assistance Comments: If the information is different than that on-file with MDH, please provide 1) the pumping rates for the current and previous years, and the projected annual pumping rates for the next five years for each well in the PWS; and 2) well record(s) for the PWS welll(s). Information about the PWS well(s) may affect the vulnerability assessment due to rehabilitation/reconstruction of a well or changes in pumping rates.

DATA ELEMENTS ABOUT WATER QUANTITY

G. SURFACE WATER QUANTITY

N	D	V	S	
	X	X		G.1: An existing description of high, mean, and low flows on streams.

Technical Assistance Comments: This information is available in the public domain and may be used to determine hydraulic connections between surface water bodies and the aquifer(s) of concern.

N	D	V	S	
	X			G.2: An existing list of lakes where the state has established ordinary high water marks.

Technical Assistance Comments: This information is available in the public domain. The information may be used to determine the WHPA.

N	D	V	S	
	X	X	X	G.3: An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.

Technical Assistance Comments: Only required if different from the DNR database. Surface water bodies may be in direct hydraulic connection with the aquifer(s) of concern and withdrawals may affect water levels in both the surface water and adjacent groundwater systems.

N	D	V	S	
	X			G.4: An existing list of lakes and streams for which state protected levels or flows have been established.

Technical Assistance Comments: This information is available in the public domain and may be used to determine hydraulic connections between surface water bodies and the aquifer(s) of concern.

N	D	V	S	
	X	X	X	G.5: An existing description of known water-use conflicts, including those caused by groundwater pumping.

Technical Assistance Comments: Please notify MDH of surface water/well interference problems of which the PWS is aware. Conflicts between use of groundwater resources and surface water bodies would indicate a hydrologic boundary that would need to be considered in delineating the WHPA.

H. GROUNDWATER QUANTITY

N	D	V	S	
	X	X	X	H.1: An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.

Technical Assistance Comments: Please submit this information for wells that are not permitted by the DNR because this information may be useful in identifying the hydrologic boundary conditions that could affect the size and shape of the WHPA boundaries.

N	D	V	S	
	X	X	X	H.2: An existing description of known well interference problems and water-use conflicts.

Technical Assistance Comments: Please notify MDH of well interference problems of which the PWS is aware. Interference problems with other wells, if present, likely indicate a hydrologic boundary that would need to be considered in making the WHPA delineation.

N	D	V	S	
	X	X	X	H.3: An existing list of state environmental boreholes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: Only submit monthly water level measurements (with unique well numbers and dates) that are not in the public domain.

DATA ELEMENTS ABOUT WATER QUALITY

I. SURFACE WATER QUALITY

N	D	V	S	
X				I.1: An existing map or list of the state water quality management classification for each stream and lake.

Technical Assistance Comments:

N	D	V	S	
		X	X	I.2: 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: This information can be used to evaluate surface water/groundwater interactions and aquifer water quality. Submit if the PWS has information that is not available in the public domain.

J. GROUNDWATER QUALITY

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

Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
	X	X	X	J.2: An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.

Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
	X	X	X	J.3: An existing report of groundwater tracer studies.

Technical Assistance Comments: Submit if the PWS has information that is not available in the public domain because the information may help explain groundwater flow paths.

N	D	V	S	
		X	X	J.4: An existing site study and well water analysis of known areas of groundwater contamination.

Technical Assistance Comments: Submit if the PWS has information on contaminant sources not available in the public domain because these reports may contain additional geologic or hydrogeologic information.

N	D	V	S	
X				J.5: An existing property audit identifying contamination.

Technical Assistance Comments:

N	D	V	S	
	X	X		J.6: An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

Technical Assistance Comments: Notify MDH of reports on spills or contaminant releases that are on-file with the PWS or city but are not in the public domain. These reports do not need to be submitted but MDH staff would like to review reports.

City of Eden Valley
Summary of Data Request
Specific Data to be Provided to MDH by PWS

As discussed during the first Scoping Meeting on May 14, 2018, the public water supply (PWS) will provide the following information for Part I of their Wellhead Protection Plan to the Minnesota Department of Health. The number of the data element that refers to the information needed to prepare the Part I Report is listed in the parenthesis at the end of each request.

1) PWS well information: Use Tables 1 and 2, the well records for the PWS wells, and a map showing the locations of all the PWS wells, to review the accuracy of 1) all PWS well construction, 2) well locations, and 3) pumping information. (F.5)

   Table 1 lists well use and construction for each of the PWS wells. Have you reconstructed any wells? Are there well records for reconstructed wells?

   The enclosed map shows the locations of the primary public water supply wells. Please let us know if you feel the wells are not correctly located. These locations must be used to delineate your wellhead protection areas.

   Table 2 shows the available pumping information.

2) Provide a copy of any aquifer test or specific capacity information for the PWS well(s) that was obtained during well construction, maintenance, or repair. (B.1)

3) Is there an existing map of parcel and/or political boundaries that could be used for defining the Drinking Water Supply Management Area (DWSMA)? If you wish to use parcel lines, please provide the parcel identification number for each parcel boundary along with the map. Have the city boundaries changed? If the city boundaries have changed, please provide the new boundaries. The boundaries of the DWSMA may be larger if political boundaries are used instead of the parcel boundaries. (E.1 and E.2)

4) If there are private well records, soil boring reports, geophysical studies, or water level measurements in your files that MDH staff did not identify at the scoping meeting and that would be available for MDH staff to review and copy, please notify MDH. (B.2, B.3, B.4, and H.3)

5) Identify reports that you have on-file relating to leaks/contamination sites that may be a concern to your drinking water supply that MDH may review and copy. (J.4)

6) If your files contain water chemistry data, such as bacteria, virus, inorganic, organic, or isotopic results from wells or other groundwater sampling points, that are not currently available to MDH that MDH may review and copy, please notify MDH. (J.1 and J.2)

7) Identify reports that you have in your files relating to groundwater tracer studies that have been conducted. (J.3)

Summary of Data Request
Page 2

8) Provide information about other high-capacity wells in your area that may not be permitted and are not listed on the attached Table 3. (H.1)

9) Describe any conflicts over water use that the PWS has been involved with, such as 1) private wells that went dry (or well interference) or 2) springs or wetlands that were affected. Was the Department of Natural Resources involved in resolving the conflict? (G.5 and H.2)

10) Describe the annual amount of water that is lost due to leaks in the distribution system. Can you identify specific parts of the distribution system where this loss occurs? (F.2)

11) If local precipitation information is not available in the public domain within a couple of miles and in the same geomorphic setting, please provide average monthly precipitation values from the wastewater treatment facility during the preceding five years. (A.2)

12) Identify any other reports about surface water withdrawals or surface water monitoring data from lakes, streams, or wetlands that are not in the public domain that MDH staff could review and copy. (G.3 and I.2)

Table 1 - Public Water Supply Well Information
Eden Valley, Minnesota

Local Well Name	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Well Vulnerability	Aquifer
Well #2	211666	Primary	12	52	72	8/17/1959	Vulnerable	Multiple Aquifer (MTPL)
Well #3	211662	Primary	12	57	78	9/8/1970	Vulnerable	Quaternary Buried Artesian Aquifer (QBAA)
Well #4	649153	Primary	12	48	73	9/14/2001	Vulnerable	Quaternary Buried Artesian Aquifer (QBAA)

Table 2 - Annual Volume of Water Pumped from Eden Valley PWS Wells (gallons)

Well Name/ Number	2013	2014	2015	2016	2017	Projected 2022
Well #2 (211666)	21,939,000	22,854,000	24,061,000	16,327,000	16,519,000	No increase
Well #3 (211662)	0	6,939,000	4,155,000	7,491,000	15,814,000	No increase
Well #4 (649153)	28,414,000	24,055,000	19,237,000	24,674,000	17,169,000	No increase

Source: MN Dep't. of Natural Resources Division of Waters - MNDNR Permitting and Reporting System (MPARS)

Table 3 - Permitted High-Capacity Wells
DNR State Water Use Database System

Unique Number	Well Name	DNR Permit Number	Aquifer	Use	Annual Volume of Water Pumped (Gallons)
796275	Becker Farms	2013-1503	QBAA	Agricultural Crop Irrigation	5,256,000

Map of Well Locations


Well #2
Well #4
Well #3
Primary Well
USDA-FSA-APFO Aerial Photography Field Office, Copyright © 2013 National Geographic Society
DEPARTMENT OF HEALTH
N
0
50
100
200
Feet
Figure 1
Public Water Supply Well Locations
City of Eden Valley
O:\Dwp\Swp\Project\County\47_Meeker\Eden Valley\GIS\EdenValley.mxd (01 Jun 2018)

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

December 2, 2019

Mr. Jim Rademacher, Public Works Director
City of Eden Valley
P.O. Box 25
Eden Valley, Minnesota 55309-0025

Mr. Steve Geislinger, Public Works Director
City of Watkins
P.O. Box 306
Watkins, Minnesota 55389-0306

Subject: Scoping 2 Decision Notice and Meeting Summary – City of Eden Valley – PWSID 1470012

Dear Mr. Rademacher and Mr. Geislinger,

This letter provides notice of the results of a scoping meeting held with both of you, Cindy Anderson (city of Eden Valley), Deb Kramer (city of Watkins), and Wayne Cymbaluk (Stearns County SWCD) on November 6, 2019, at Eden Valley City Hall regarding wellhead protection (WHP) planning. During the meeting, we discussed the data elements that must be compiled and assessed to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements discussed at the meeting. We also discussed a summary of planning issues and recommendations that were identified during the Part 1 WHP Plan development process which should be considered for inclusion in your Part 2 WHP Plan.

The city of Eden Valley 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 Eden Valley will have until February 11, 2020, to complete its WHP plan.

MDH understands a consultant will be working with you to develop a draft of the remainder of the WHP plan. I will be contacting you to review the progress of the development of Part 2 of your plan. Upon request, the Technical Assistance Planner can provide a glossary of

terminology, identification of information sources for the required Data Elements, and other technical assistance documents. 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 karen.s.voz@state.mn.us or by phone at 320-223-7322.

Sincerely,

Karen S. Voz, Principal Planner
Source Water Protection Unit
Environmental Health Division
St. Cloud District Office
3333 West Division Street, Suite #212
St. Cloud, Minnesota 56301-4557

KSV:ds-b
Enclosures
cc: Jon Groethe, MDH Engineer, St. Cloud District Office
Wayne Cymbaluk, Stearns County Soil and Water Conservation District
Luke Stuewe, Minnesota Department of Agriculture

SCOPING 2 DECISION NOTICE

Variable Vulnerable DWSMA and SWCA

Remainder of the Wellhead Protection Plan

Name of Public Water Supply:	**Date:**
City of Eden Valley **PWSID:** 1470012	December 2, 2019
Name of the Wellhead Protection Co-Managers: Mr. Jim Rademacher, Public Works Director, City of Eden Valley Mr. Steve Geislinger, Public Works Director, City of Watkins	
Unique Well Numbers: 211666 (Well #2), 211662 (Well #3), 649153 (Well #4)	**Phone:** Jim Rademacher: 320-453-5252 Steve Geislinger: 320-764-6400

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

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

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT

PRECIPITATION

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

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

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

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

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 areas.

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 areas.

SOILS

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

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

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

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

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: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
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: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
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: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
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: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	**R**	**S**	An existing map showing those areas delineated as floodplain by existing local ordinances.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			

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.			

Land Use: Ground Water and Surface Water Contribution Vulnerability

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

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

Groundwater and Surface Water Contribution Vulnerability

1) All potential contaminant sources as listed below. Two DWSMA Vulnerability Figures for the city of Eden Valley are attached for reference to identify the different areas of vulnerability and the Surface Water Contribution Area.

2) A land use/land cover map and table.

3) An inventory of the Inner Wellhead Management Zone(s) (IWMZ).

☒ Areas with Combination High Vulnerability Groundwater and Highly Vulnerable SWCA

1) All potential contaminant sources as listed on the attachment: Potential Contaminant Source Inventory Requirements for Highly and Very Highly Vulnerable DWSMA.

☒ Highly Vulnerable SWCA Area Only

1) All potential contaminant sources as listed on the attachment: Potential Contaminant Source Inventory Requirements for Highly Vulnerable Surface Water Contribution DWSMA.

As a starting point, MDH will provide a land cover map and table from federal databases. 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	An 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**	An existing map of transportation routes or corridors.
	X		
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	**R**	**S**	An existing map of storm sewers, sanitary sewers, and public water supply systems.
	X	**X**	
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**	An existing map of the gas and oil pipeline used by gas and oil suppliers.
	X	**X**	
Technical Assistance Comments: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.			
N	**R**	**S**	An existing map or list of public drainage systems.
	X	**X**	
Technical Assistance Comments: The management of the vulnerable parts of 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 this data element.			

DATA ELEMENTS ABOUT WATER QUANTITY

SURFACE WATER QUANTITY

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

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

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

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

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

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

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

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

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

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

GROUNDWATER QUANTITY

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

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

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

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

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

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

DATA ELEMENTS ABOUT WATER QUALITY

SURFACE WATER QUALITY

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

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

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: The management of the vulnerable parts of the Drinking Water Supply Management Area(s) must reflect what is known about this data element.

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.

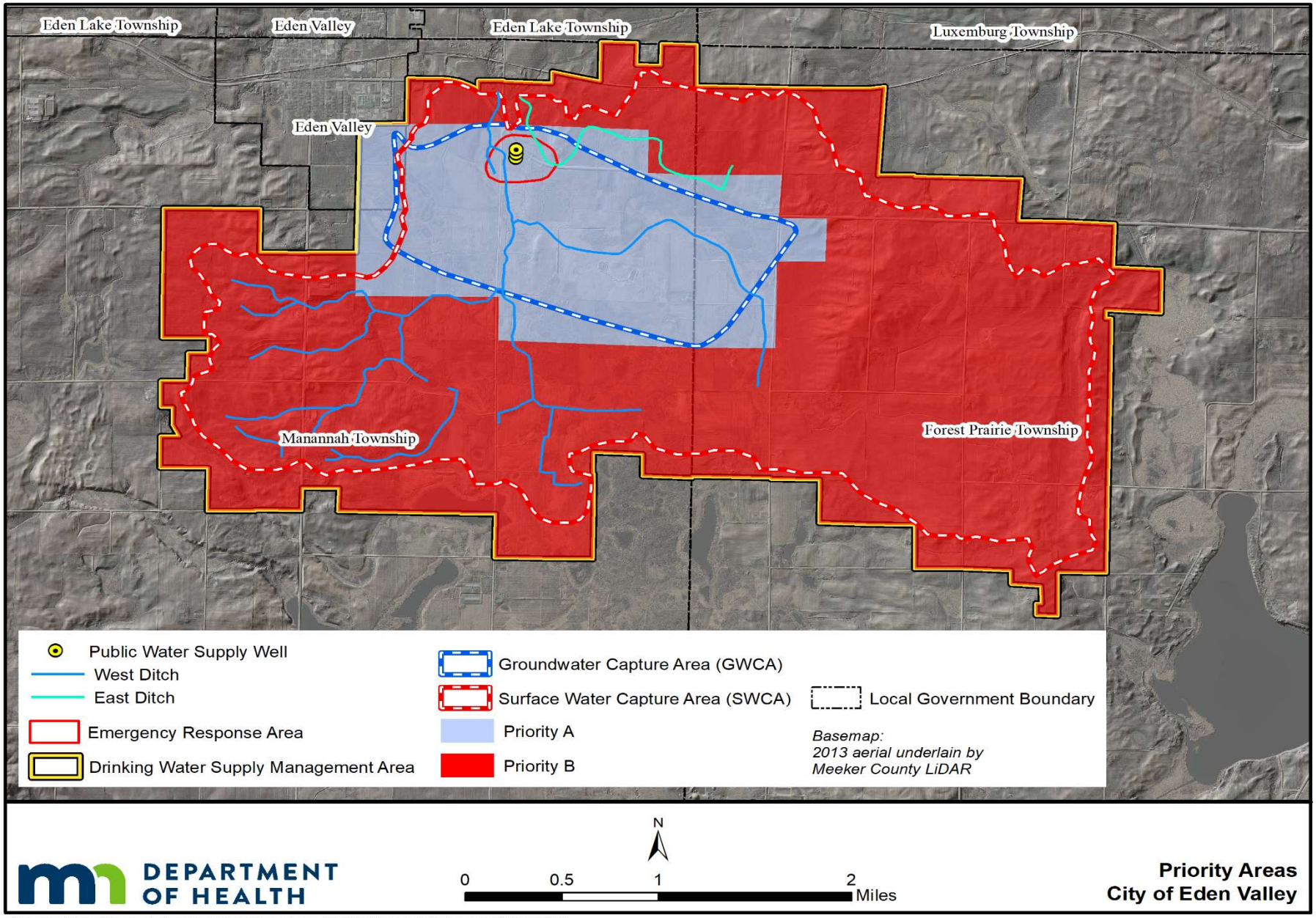
Technical Assistance Comments: The management of all the Drinking Water Supply Management Area(s) must reflect what is known about these data elements.

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.



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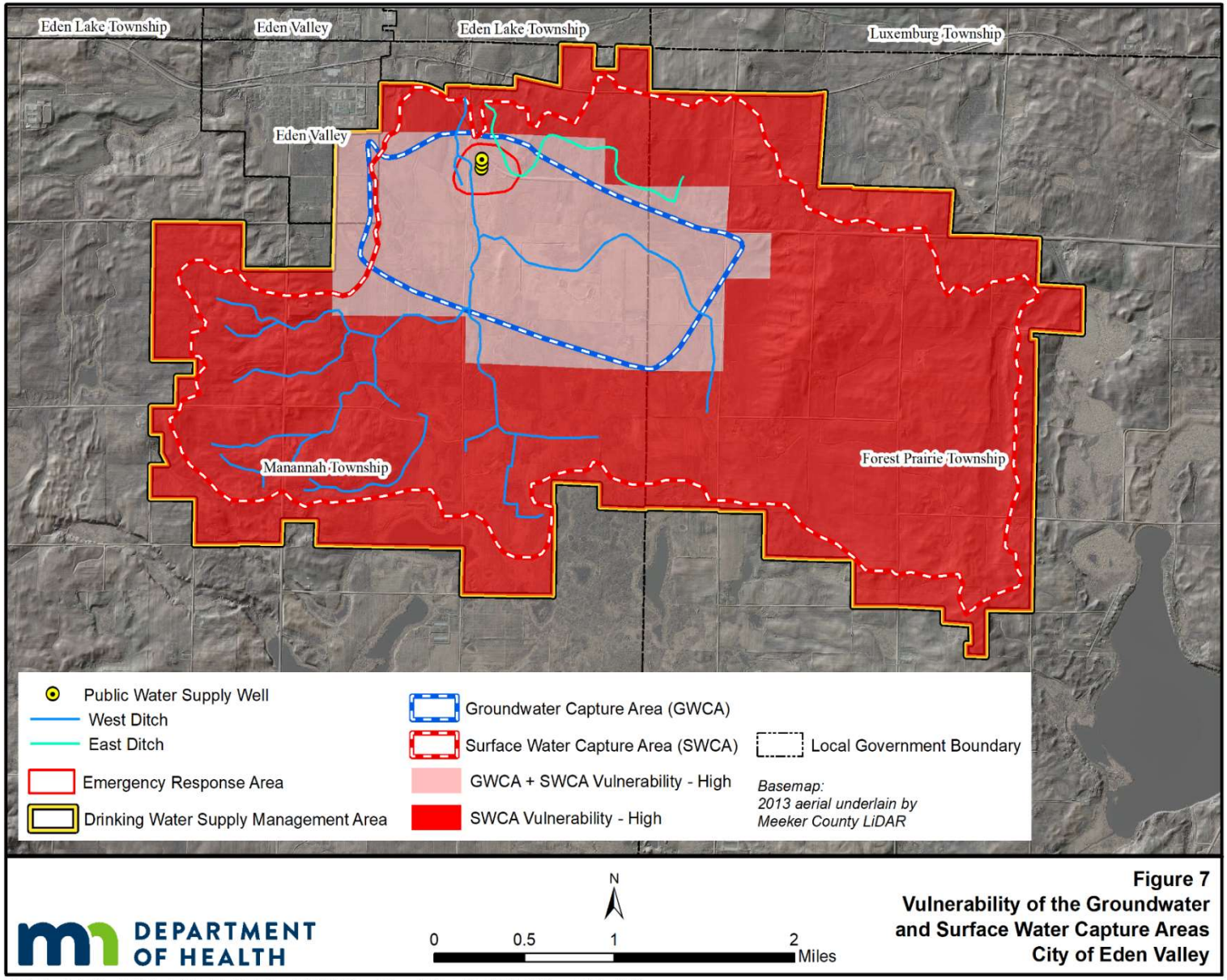

Figure 7
Vulnerability of the Groundwater and Surface Water Capture Areas
City of Eden Valley

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Eden Valley Scoping 2 Meeting
Wellhead Protection (WHP) Planning Issues Summary

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

Drinking Water Protection Issues Identified to Date:

- The DWSMA increased significantly in size and the vulnerability went from low to high with a highly vulnerable surface water contribution area.
- The majority of land within the DWSMA lies outside the city of Eden Valley and within two townships located in Meeker County.

Water Quality Detections and Implications:

- All wells are considered vulnerable to contamination due to tritium being detected in the well water. Detectable tritium indicates the presence of young (post-1953) water.
- Chloride is elevated (in Part I Plan). The chloride/bromide ratio suggests that the elevated chloride is likely due to road salt.
- Well #2 (211666), Well #3 (211662), Well #4 (649153) and the ditch immediately west of the wellfield were sampled on a quarterly basis over one year for stable isotopes of oxygen and hydrogen. The results indicate the city's wells are likely receiving a significant amount of their recharge from surface water sources. Additionally, the groundwater flow model results suggest that the city's wells likely capture water from the surface within a time of one year. These results support the inclusion of the nearby ditches and its watershed in the city's WHPA.
- Arsenic, which is a naturally occurring contaminant, has been detected in the water from public water supply Well #3 (211662) at a concentration of 6.60 µg/L and Well #4 (649153) at a concentration of 5.52 µg/L. However, the presence of a naturally occurring contaminant does not necessarily indicate that there is a direct pathway between the aquifer and potential contamination sources that occur at or near the land surface.

Old Municipal Well Information:

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

Sanborn Maps:

☒ Sanborn Maps are not available for this area.

Recommended WHP Measures:

1. Well Locating: If wells are constructed within two miles of the city or one mile of the DWSMA, their locations should be verified. This information may allow a better understanding of the extent and thickness of the city's aquifers, and could result in a more refined WHPA in the future.
2. Water Quality Monitoring: Sample Wells 2, 3 and 4 (or whatever primary wells exist at that time) for vulnerability parameters in year six of plan development, determined in consultation with MDH (likely tritium, chloride, bromide, nitrate and ammonia) and dependent on available funding. The city may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

3. Future monitoring of surface water from the nearby ditches (east and west), and Wells 2, 3, and 4 (211666, 211662, 649153, respectively) should be conducted to help to confirm initial results. The details of the monitoring program should be worked out in consultation with MDH hydrologist, but may incorporate temperature logging to further assess the connection between the wells and nearby surface water features and/or evaluations of gain or loss of ditch flow in proximity to the city wells.
4. Spill response planning is critical to protecting the public water supply wells from potential contamination due to the location of State Highway 55 to the well field.
5. The presence of chlorides in the groundwater indicates that the use of road salt is reaching the groundwater used for drinking water.
6. Land use practices in the surface water contribution area of the DWSMA should be managed to prevent contaminants from entering the ditches, groundwater and drinking water source.

Other: None

Scoping 2 Decision Notice Attachment

Potential Contaminant Source Inventory Requirements

Highly and Very Highly Vulnerable DWSMA

The following current and historical potential contaminant sources and related codes, materials and related codes, and activity status and related codes are required to be included in the potential contaminant source inventory. In cases where a materials identification is required, a materials designation and code must be assigned. All potential contaminant sources must be assigned an activity status and related code using state program descriptors or local knowledge.

Potential Contaminant Sources (PCS) **Material**	**PCS Codes** **Material Codes**
Above-Ground Storage Tank	AST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Agricultural Drainage Well (potential Class V)	ADW
Animal Burial Site	ABS
Animal Feedlot	AFL
Ash Disposal Site	ASHD
Disposal Well (potential Class V)	DISWLL
Drainage Ditch (non-public, non-roadway)	DITCH
Dump (unpermitted)	DMP
Grave(s)	GRV
Hazardous Waste Generator	HWG
Hazardous Waste Handler	HWH
Industrial Drainage Well (potential Class V)	INDW
Land Application	LAPP
Agricultural chemicals	C010
Chemicals (unspecified)	C000
Fertilizers	A050
Minerals and metals (unspecified)	M000
Waste (used unless one of the materials listed below apply)	W000
Solid waste	W100
Animal manure	W520
Biolsolids	W200
Septage	W720
Industrial	W740

PCS Inventory Requirements High and Highly Vulnerable DWSMA Page 2

Large Capacity Cesspool (potential Class V)	CVLCC
Large Capacity Waste Water Disposal Site (potential Class V)	C V W W D
Leaking Underground Storage Tank	LUST
Misc. Injection Well (potential Class V)	INJWLL
Motor Vehicle Waste Disposal Well (potential Class V)	CVMVW
Nuclear Reactor	NR
Pipeline Crossing Over Water	PIPEX
Pipeline Facility	PLFAC
Pit (aggregate)	PIT
Potential Contamination Site[1]	PCS
Rail Crossing Over Water	RAILX
Recharge Well (potential Class V)	RWLL
Reinjection Well (potential Class V)	RIWLL
Road Crossing Over Water	ROADX
Sinkhole	SINK
Sludge Disposal Site	SLDG
Solid Waste Management Site	SWMS
Special Drainage Well (potential Class V)	SPDW
Spills	S P L
Storage or Preparation Area	STOR
Agricultural chemicals	C010
Chemicals (include RMP facilities here)	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances (include TRIS facilities here)	C001
Road salt	C020
Solvents and coatings	S000
Pressure-treated wood	C220
Waste (used unless one of the materials listed below apply)	W000
Solid waste	W100
Animal manure	W520
Waste oils	W700
Motor vehicle waste	W710
Tires	W120
Stormwater Basin	SWB
Stormwater Injection Well (potential Class V)	SWI
Stormwater Outlet	SROUT
Subsurface Sewage Treatment System	SSTS

PCS Inventory Requirements High and Highly Vulnerable DWSMA Page 3

Suspected Contaminant of Concern	SCC
Chemical	C000
Food, agricultural, and consumer products	A000
Fuels, gases, and oils	F000
Materials and minerals	M000
Pathogens	P000
Solvents and coatings	S000
Waste	W000
Underground Storage Tank	UST
Chemicals	C000
Fertilizers	A050
Fuels, gases, and oils	F000
Hazardous substances	C001
Solvents and coatings	S000
Waste	W000
Waste - Metro Area	IWS
Wastewater Disposal Site[2]	WWDS
Wastewater Stabilization Pond	WSP
Wastewater Treatment Pond	WWTD
Wells	WEL

Footnotes:

[1]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)
- State Assessment Site (SAS)

[2]Wastewater Disposal Sites (WWDS) include the following:

- National Pollutant Discharge Elimination System (NDPES)
- State Disposal System Permit (SDS)

PCS Inventory Requirements High and Highly Vulnerable DWSMA Page 4

Activity Status; Codes; and Descriptions

Status	Code	Description
Active	A	PCS is operative or in use. Examples: Animal feedlot is active. Well is in use or has maintenance permit.
Closed	C	PCS is inactive and is not open from a regulatory viewpoint. Example: Leaking storage tank site or landfill is closed.
Inactive	I	PCS is present but not currently active. Examples: Gravel pit is inactive. Well is un-used.
Removed	R	PCS has been removed. Example: Underground storage tank has been removed.
Unknown	U	Activity status of the PCS is not known definitely or has not been evaluated. Examples: Class V site status unknown. Well is thought to be sealed, but no official sealing record has been identified.

Revised: December 1, 2015

Scoping 2 Decision Notice Attachment
Potential Contaminant Source Inventory Requirements

Highly Vulnerable Surface Water Contribution Area

The following current and historical potential contaminant sources and related codes, materials and related codes, and activity status and related codes are required to be included in the potential contaminant source inventory. In cases where a materials identification is required, a materials designation and code must be assigned. All potential contaminant sources must be assigned an activity status and related code using state program descriptors or local knowledge.

Potential Contaminant Sources (PCS) Material	PCS Codes	Material Codes	Comments / Caveats
Above-Ground Storage Tank	AST		Outdoor, spills and runoff; note presence or absence of containment
Chemicals		C000	
Fertilizers		A050	
Fuels, gases, and oils		F000	
Hazardous substances		C001	
Solvents and coatings		S000	
Waste		W000	
Animal Feedlot	AFL		Aboveground storage and runoff ; note if it is an open lot
Ash Disposal Site	ASHD		Runoff and flooding potential
Drainage Ditch (non-public, non-roadway)	DITCH		Runoff movement through any public or other drainage ditch system toward lake or streams
Hazardous Waste Generator with Outside Storage	HWG		For aboveground outside storage
Hazardous Waste Handler	HWH		Aboveground storage and runoff, spills

PCS Inventory Requirements Highly Vulnerable SWCA Page 2

Land Application	LAPP		Runoff and flooding potential
Agricultural chemicals		C010	
Chemicals (unspecified)		C000	
Fertilizers		A050	
Minerals and metals (unspecified)		M000	
Waste (used unless one of the materials listed below apply)		W000	
Solid waste		W100	
Animal manure		W520	
Biosolids		W200	
Septage		W720	
Industrial		W740	
Large Capacity Cesspool (potential Class V)	CVLCC		Runoff and flooding potential
Large Capacity Waste Water Disposal Site (potential Class V)	CVWWD		Runoff and flooding potential
Pipeline Crossing Over Water	PIPEX		
Pit (aggregate)	PIT		Runoff and flooding potential
Potential Contamination Site[1]	PCS		Likely to be highly plume- and site-dependent, driven by how much of a surface water issue the contaminant is
Rail Crossing Over Water	RAILX		
Road Crossing Over Water	ROADX		
Sludge Disposal Site	SLDG		
Solid Waste Management Site	SWMS		Aboveground storage runoff issues

PCS Inventory Requirements Highly Vulnerable SWCA Page 3

Spills	SPL		Aboveground, runoff and ponding at surface
Storage or Preparation Area	STOR		Aboveground, runoff potential; note if site is subject to an industrial stormwater permit
Agricultural chemicals		C010	
Chemicals (include Risk Management Plan facilities here)		C000	
Fertilizers		A050	
Fuels, gases, and oils		F000	
Hazardous substances (include Toxic Release Inventory Site facilities here)		C001	
Road salt		C020	
Solvents and coatings		S000	
Pressure-treated wood		C220	
Waste (used unless one of the materials listed below apply)		W000	
Solid waste		W100	
Animal manure		W520	
Waste oils		W700	
Motor vehicle waste		W710	
Tires		W120	
Stormwater Basin	SWB		Runoff out of basins during storm events could reach lakes. Also could be area of focused recharge to aquifer.
Stormwater Outlet	SROUT		
Subsurface Sewage Treatment Center	SSTS		

PCS Inventory Requirements Highly Vulnerable SWCA

Suspected Contaminant of Concern	SCC		These would be inventoried in a groundwater high or moderate vulnerability area, but should be inventoried anywhere there's a potential for travel via runoff events. To be used when no other potential contaminant source is appropriate.
	Chemical	C000	
	Food, agricultural, and consumer products	A000	
	Fuels, gases, and oils	F000	
	Materials and minerals	M000	
	Pathogens	P000	
	Solvents and coatings	S000	
	Waste	W000	
Wastewater Disposal Site[2]	WWDS		If site discharge would likely interact with stormwater runoff; one example could be industrial wastewater from a food processing facility. Include wastewater discharges to streams or lakes that contribute to the source aquifer.
Wastewater Stabilization Pond	WSP		Flooding risk
Wastewater Treatment Pond	WWTD		

PCS Inventory Requirements Highly Vulnerable SWCA

Footnotes:

[1]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)

State Assessment Site (SAS)

[2]Wastewater Disposal Sites (WWDS) include the following:

National Pollutant Discharge Elimination System (NDPES)

State Disposal System Permit (SDS)

PCS Inventory Requirements Highly Vulnerable SWCA Page 6

Activity Status; Codes; and Descriptions

Status	Code	Description
Active	A	PCS is operative or in use. Examples: Animal feedlot is active. Well is in use or has maintenance permit.
Closed	C	PCS is inactive and is not open from a regulatory viewpoint. Example: Leaking storage tank site or landfill is closed.
Inactive	I	PCS is present but not currently active. Examples: Gravel pit is inactive. Well is un-used.
Removed	R	PCS has been removed. Example: Underground storage tank has been removed.
Unknown	U	Activity status of the PCS is not known definitely or has not been evaluated. Examples: Class V site status unknown. Well is thought to be sealed, but no official sealing record has been identified.

CITY OF EDEN VALLEY POTENTIAL CONTAMINANT SOURCE INVENTORY

DV_TYPE_C	MAPID	PIN	FAC_NAME	ADDRESS	CITY	ZIP5_CODE	PCS_C	STATUS_C	PROGRAM_ID	TOTAL	COMMENTS
GW	120	10-0071000	LOCH/ANDREW & DONNAMAE	39043 632ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
GW	122	10-0074000	DEMORETT/TROY M	63047 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
GW	123	10-0075000	DEMORETT/EUGENE A & MARGARET	38775 CSAH 34	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
GW	124	10-0076000	NOHNER/RYAN & SHONDA	38623 CSAH 34	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
GW	125	10-0077000	NOHNER/GARY & JOYCE	38735 CSAH 34	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
GW	128	10-0083000	OCH/CHAD D & ANN E	62853 385TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
GW	153	15-0004000	STENGER/STEVEN & HEIDI	62010 MN HIGHWAY 55	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
GW	156	15-0010001	LEO/KENNETH & DIANE	39155 627TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
GW	157	15-0011000	MAGEDANZ/JOHN P & DEBRA	61911 MN HWY 55	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
GW	172	15-0141000	BRUEMMER/KEVIN G	38706 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
GW	173	15-0144000	HAAG/KYLE A	38499 627TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR TRENCH
GW	174	15-0146000	PRESS/COREY L & TIFFANY L	38413 627TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
GW	187	10-0071000	LOCH/ANDREW & DONNAMAE	39043 632ND AVE	WATKINS	55389	WEL	U	UNK	1	UNKNOWN
GW	188	10-0074000	DEMORETT, TROY	63047 MN HIGHWAY 55	WATKINS	55389	WEL	A	00829102	1	DOMESTIC
GW	189	10-0074020	USGS WATKINS TEST 8	NA	WATKINS	55389	WEL	U	00211663	1	TEST WELL
GW	190	10-0075000	DEMORETT, GENE	38775 CSAH 34	WATKINS	55389	WEL	A	00441029	1	DOMESTIC
GW	191	10-0076000	NOHNER/RYAN & SHONDA	38623 CSAH 34	WATKINS	55389	WEL	U	UNK	1	UNKNOWN
GW	192	10-0077000	NOHNER/GARY & JOYCE	38735 CSAH 34	WATKINS	55389	WEL	U	UNK	1	UNKNOWN
GW	193	10-0083000	OCH/CHAD D & ANN E	62853 385TH ST	WATKINS	55389	WEL	U	UNK	1	UNKNOWN
GW	194	15-0004000	STANGER, BECKY	62010 MN HIGHWAY 55	EDEN VALLEY	55329	WEL	A	00590258	1	DOMESTIC
GW	195	15-0010000	USGS WATKINS TEST 1	39726 617TH AVE	EDEN VALLEY	55329	WEL	U	00211671	1	TEST WELL
GW	196	15-0010000	USGS WATKINS TEST 7	39726 617TH AVE	EDEN VALLEY	55329	WEL	U	00211670	1	TEST WELL
GW	197	15-0010001	DOCKENDORF, RON	39155 627TH AVE	WATKINS	55389	WEL	A	00691136	1	DOMESTIC
GW	198	15-0011000	HANSEN, ANNA	61911 MN HWY 55	EDEN VALLEY	55329	WEL	A	00637907	1	DOMESTIC
GW	199	15-0012001	Eden Valley #2	61775 MN HWY 55	EDEN VALLEY	55329	WEL	A	00211666	1	PWS
GW	200	15-0012001	Eden Valley #3	61775 MN HWY 55	EDEN VALLEY	55329	WEL	A	00211662	1	PWS
GW	201	15-0012001	Eden Valley #4	61775 MN HWY 55	EDEN VALLEY	55329	WEL	A	00649153	1	PWS
GW	202	15-0129000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	55329	WEL	A	00796275	1	IRRIGATION
GW	203	15-0141000	BRUEMMER/KEVIN G	38706 617TH AVE	EDEN VALLEY	55329	WEL	U	UNK	1	UNKNOWN
GW	204	15-0144000	WILLNER, JEREMY	38499 627TH AVE	WATKINS	55389	WEL	A	00693562	1	DOMESTIC
GW	205	15-0144001	USGS WATKINS TEST 9	NA	EDEN VALLEY	55329	WEL	U	00211675	1	TEST WELL
GW	206	15-0146000	PRESS/COREY L & TIFFANY L	38413 627TH AVE	WATKINS	55389	WEL	U	UNK	1	UNKNOWN
SW	101	10-0069000	VALLEY VIEW DAIRY	63356 MN HIGHWAY 55	WATKINS	55389	AFL	A	093-103853	1	10.65 AU
SW	102	10-0079000	JEFF PAULY FARM	63551 MN HIGHWAY 55	WATKINS	55389	AFL	A	093-65141	1	375 AU
SW	103	10-0084000	NOHNER FARM	38248 627TH AVE	WATKINS	55389	AFL	A	093-65216	1	51.69 AU
SW	104	10-0089000	CHRISTOPHER DVORAK FARM	38731 642ND AVE	WATKINS	55389	AFL	A	093-65077	1	109.6 AU
SW	105	10-0129000	BECKER FARMS - SEC 11	67010 380 ST	WATKINS	55389	AFL	A	093-60105	1	530 AU
SW	106	10-0177000	JAMES M SCHREIFELS FARM	64893 375TH ST	WATKINS	55389	AFL	A	093-64102	1	11.7 AU
SW	107	10-0195000	SCHNEIDER BROS - SITE III	63511 380TH ST	WATKINS	55389	AFL	A	093-65135	1	350 AU
SW	108	10-0195000	SCHNEIDER BROS - SITE II	63511 380TH ST	WATKINS	55389	AFL	A	093-65134	1	0 AU
SW	109	15-0005000	JOHN MAGEDANZ FARM	39726 617TH AVE	EDEN VALLEY	55329	AFL	A	093-66192	1	700.35 AU
SW	110	15-0183000	MARK RUHLAND FARM	60314 373RD ST	EDEN VALLEY	55329	AFL	A	093-103840	1	210 AU
SW	1	15-0162000	BKR PROPERTIES LLC	37634 MN HIGHWAY 22 S	EDEN VALLEY	55329	LAPP	A	LA 309	1	ISO NOVA BIOSOLIDS
SW	2	15-0164020	ISONOVA TECHNOLOGIES LLC	NA	EDEN VALLEY	55329	LAPP	A	LA 305	1	ISO NOVA BIOSOLIDS
SW	3	15-0179000	BECKER R	NA	EDEN VALLEY	55329	LAPP	A	LA 307	1	ISO NOVA BIOSOLIDS

CITY OF EDEN VALLEY POTENTIAL CONTAMINANT SOURCE INVENTORY

DV_TYPE_C	MAPID	PIN	FAC_NAME	ADDRESS	CITY	ZIP5_CODE	PCS_C	STATUS_C	PROGRAM_ID	TOTAL	COMMENTS
SW	4	15-0178000	BECKER R	NA	EDEN VALLEY	55329	LAPP	A	LA 307	1	ISO NOVA BIOSOLIDS
SW	5	15-0119000	JR BECKER	NA	EDEN VALLEY	55329	LAPP	A	LA 311	1	ISO NOVA BIOSOLIDS
SW	6	15-0137000	RHULAND RMT	NA	EDEN VALLEY	55329	LAPP	A	LA 306	1	ISO NOVA BIOSOLIDS
SW	112	15-0164001	ISONOVA TECHNOLOGIES LLC	37780 MN HWY 22	EDEN VALLEY	55329	SROUT	A	MNRNE397C	1	STORMWATER
SW	111	15-0164001	ISONOVA TECHNOLOGIES LLC	37780 MN HWY 22	EDEN VALLEY	55329	SROUT	I	MNRNE37CQ	1	STORMWATER
SW	113	10-0056000	SOMMERFELD/PRESTON & KIMBERLY	64370 MN HWY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	114	10-0056003	DOCKENDORF/RONALD N & MARY K	63952 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	115	10-0058000	HESSE/AARON W & KAITLYN J	63722 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR TRENCH
SW	116	10-0068000	DOCKENDORF/JAMES M & SARAH R	39378 632ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	117	10-0069000	STENGER/RICHARD & ARLISS	63356 MN HIGHWAY 55	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	118	10-0069001	ANDERSON/CASEY A	63480 STATE HWY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	2BR PRESSURE BED
SW	119	10-0069003	KLATT/SCOTT	63648 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	121	10-0073000	DEMORETT/ROBERT H & CYNTHIA	39510 627TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	126	10-0079000	PAULY/JEFFREY D & JOAN	63551 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	127	10-0082000	SCHNEIDER/BRIAN J/ET AL	63512 380TH ST	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	129	10-0084000	NOHNER/MICHAEL J & DENISE E	38248 627TH AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	130	10-0085000	NISTLER/ROBERT D	63788 MN HIGHWAY 55	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
SW	131	10-0088000	HESSE/KEVIN J/ET AL	38548 637TH AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	132	10-0089000	DVORAK/CHRISTOPHER L	38731 642ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	133	10-0093000	NELSON/EDWIN	38272 642ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	134	10-0094000	HESSE/KEVIN J	38232 637TH AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	135	10-0095000	WEINMANN/EDWARD C & MARY K	38938 647TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
SW	136	10-0098001	BENGTSON/SHARLA J	38676 647TH AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	137	10-0098002	GEISLINGER/DANIEL J & CHRISTIN	64828 385TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	138	10-0099000	BENGTSON/SHARLA J	38676 647TH AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	139	10-0106000	MANUEL/JOHN C	64719 385TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	140	10-0177000	SCHREIFELS/JAMES M/TRUST MARGARET E SCHREIFELS TRUST	64893 375TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR TRENCH
SW	141	10-0180001	ERTL/MATTHEW R & KAYLA M	37253 642ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	5BR MOUND
SW	142	10-0183000	MEIERHOFER/RONALD O & DIANE A	37180 642ND AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	143	10-0184000	MEIERHOFER/RONALD O & DIANE A	37180 642ND AVE	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	144	10-0185000	SCHREIFELS/MICHAEL & DAYNA	64481 375TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	145	10-0186000	SCHWEGEL/ALVIN A & LEAH M	64500 375TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR MOUND
SW	146	10-0188001	HESSE/JEFFREY & CONNIE J	64358 375TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR TRENCH
SW	147	10-0189000	HESSE/RICHARD & MARY ANN	37952 642ND AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	148	10-0193000	TUMAN/NANCY L	37567 CSAH 34	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	149	10-0195000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	150	10-0195010	SCHNEIDER/BRIAN J	63453 380TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	151	10-0197000	SCHNEIDER/DONALD G & VICTORIA	37654 CSAH 34	WATKINS	55389	SSTS	U	UNK	1	UNKNOWN
SW	152	10-0198000	HESSE/SCOTT J	63415 380TH ST	WATKINS	55389	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
SW	154	15-0005000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	155	15-0006000	SCHUMACHER/THOMAS L & ANN M	39594 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	158	15-0013000	BEUMER/MICHAEL C	39515 627TH AVE	WATKINS	55389	SSTS	A	MEEKER CO	1	4BR MOUND
SW	159	15-0027000	HAAG/HAROLD & KARIN	61347 MN HIGHWAY 55	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR PRESSURE BED
SW	160	15-0027001	FODSTAD/WILLIAM & CAROL	61273 MN HIGHWAY 55	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	4BR MOUND
SW	161	15-0028000	MAGEDANZ/PAUL & CONNIE	61596 MN HWY 55	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN

CITY OF EDEN VALLEY POTENTIAL CONTAMINANT SOURCE INVENTORY

DV_TYPE_C	MAPID	PIN	FAC_NAME	ADDRESS	CITY	ZIP5_CODE	PCS_C	STATUS_C	PROGRAM_ID	TOTAL	COMMENTS
SW	162	15-0029000	CZECH/QUINTEN & BRITNEY	61620 MN HIGHWAY 55	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	163	15-0118000	KRAMER/LOUIS E	38387 MN HWY 22	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
SW	164	15-0120000	PIGEON LAKE ENTERPRISES INC C/O TOM LARSON	60696 380TH ST	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	165	15-0121000	REITER/DANIEL & WANDA/TRUST DANIEL & WANDA REITER TRUSTEES	60134 380TH ST	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	4BR MOUND
SW	166	15-0129000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
SW	167	15-0132000	KEMPEL/LENNIS & SANDRA	38251 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	168	15-0134000	WENDROTH/ARTHUR H	61222 380TH ST	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
SW	169	15-0135000	HEMMESCH/JUDY M	38039 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	4BR MOUND
SW	170	15-0138000	RUHLAND/GEORGE N/REV TRUST & MARY JO RUHLAND REV TRUST	38378 MN HWY 22	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	171	15-0139000	HESSE/RANDY J	38470 MN HWY 22	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR TRENCH
SW	175	15-0149000	MAGEDANZ/TRAVIS J & CHARLENE C	38126 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	176	15-0162000	BKR PROPERTIES LLC	37634 MN HIGHWAY 22 S	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	? HT
SW	177	15-0163000	FUCHS/GREG H/& LINDSEY PARR	37548 MN HIGHWAY 22 S	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	4BR TRENCH
SW	178	15-0164000	BKR PROPERTIES LLC	37958 MN HWY 22	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	179	15-0164001	ISONOVA TECHNOLOGIES LLC ATTN JIM BATTEN	37780 MN HWY 22	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	180	15-0165000	WENDROTH/ARTHUR H	61222 380TH ST	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
SW	181	15-0167000	BRANCH/FRANCIS M/ET AL C/O JEANNE M BRANCH	37863 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	182	15-0168000	RUHLAND/WILLIAM M & LAURA M	37427 617TH AVE	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	183	15-0172002	WEINMANN/HAROLD L	37442 MN HIGHWAY 22 S	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	3BR MOUND
SW	184	15-0181000	RUHLAND/JEFFREY/& MARIA T ROMERO RUHLAND	37545 MN HIGHWAY 22 S	EDEN VALLEY	55329	SSTS	A	MEEKER CO	1	4BR TRENCH
SW	185	15-0183000	RUHLAND/MARK & LINDA	60314 373RD ST	EDEN VALLEY	55329	SSTS	U	UNK	1	UNKNOWN
SW	186	15-0164001	ISONOVA TECHNOLOGIES LLC	37780 MN HWY 22	EDEN VALLEY	55329	SWMS	A	UT0118	1	SOLID WASTE
SW	207	15-0164001	ISONOVA TECHNOLOGIES LLC	37780 MN HWY 22	EDEN VALLEY	55329	WWTD	A	MNG960060	1	WASTEWATER SDS
SW		MULTIPLE	MINNESOTA PIPELINE 4	NA	NA	NA	PIPEX	A	4025	1	CRUDE OIL PIPELINE

PARCELS WITHIN DWSMA

PID	NAME	ADDRESS	CITY	STATE	ZIP
10-0056000	SOMMERFELD/PRESTON & KIMBERLY	64370 MN HWY 55	WATKINS	MN	55389
10-0056001	LINZ/ROBERT & LINDA	36846 650TH AVE	WATKINS	MN	55389
10-0056002	LANDWEHR DAIRY LLC	16591 COUNTY RD 2	WATKINS	MN	55389
10-0056003	DOCKENDORF/RONALD N & MARY K	PO BOX 499	WATKINS	MN	55389
10-0057000	LINN/JAMES P & SHIRLEE	PO BOX 249	EDEN VALLEY	MN	55329
10-0058000	HESSE/AARON W & KAITLYN J	63722 MN HIGHWAY 55	WATKINS	MN	55389
10-0059000	PIEPENBURG/LANCE & EVANGELEEN	29856 CSAH 31	LITCHFIELD	MN	55355
10-0064000	SICHENEDER/TIMOTHY A	5125 UPLAND AVE	NEW GERMANY	MN	55367
10-0066000	PAULY/JEFFREY D & JOAN	63551 MN HIGHWAY 55	WATKINS	MN	55389
10-0067000	SICHENEDER/TIMOTHY A	5125 UPLAND AVE	NEW GERMANY	MN	55367
10-0068000	DOCKENDORF/JAMES M & SARAH R	39378 632ND AVE	WATKINS	MN	55389
10-0069000	STENGER/RICHARD & ARLISS	63356 MN HIGHWAY 55	WATKINS	MN	55389
10-0069001	ANDERSON/CASEY A	63480 STATE HWY 55	WATKINS	MN	55389
10-0069002	STENGER/STEVEN & HEIDI	62010 MN HIGHWAY 55	EDEN VALLEY	MN	55329
10-0069003	KLATT/SCOTT	63648 MN HIGHWAY 55	WATKINS	MN	55389
10-0071000	LOCH/ANDREW & DONNAMAE	39043 632ND AVE	WATKINS	MN	55389
10-0073000	DEMORETT/ROBERT H & CYNTHIA	39510 627TH AVE	WATKINS	MN	55389
10-0074000	DEMORETT/TROY M	63047 MN HIGHWAY 55	WATKINS	MN	55389
10-0074001	RUHLAND/MISTY M	4502 W 2ND ST	PLAINVIEW	TX	79072
10-0074020					
10-0075000	DEMORETT/EUGENE A & MARGARET	38775 CSAH 34	WATKINS	MN	55389
10-0076000	NOHNER/RYAN & SHONDA	38623 CSAH 34	WATKINS	MN	55389
10-0076001	SICHENEDER/TIMOTHY A	5125 UPLAND AVE	NEW GERMANY	MN	55367
10-0077000	NOHNER/GARY & JOYCE	38735 CSAH 34	WATKINS	MN	55389
10-0078000	PENK/RICHARD W & ROXANNE/TRUST RICHARD& ROXANNE PENK TRUSTEES	19340 612TH AVE	LITCHFIELD	MN	55355
10-0079000	PAULY/JEFFREY D & JOAN	63551 MN HIGHWAY 55	WATKINS	MN	55389
10-0079001	CHURCH OF GOD CEMETERY				
10-0080000	HESSE/KEVIN J/ET AL	38548 637TH AVE	WATKINS	MN	55389
10-0081000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
10-0082000	SCHNEIDER/BRIAN J/ET AL	63453 380TH ST	WATKINS	MN	55389
10-0083000	OCH/CHAD D & ANN E	62853 385TH ST	WATKINS	MN	55389
10-0083001	FOREST PRAIRIE FARMS LLC	38248 627TH AVE	WATKINS	MN	55389
10-0084000	NOHNER/MICHAEL J & DENISE E	38248 627TH AVE	WATKINS	MN	55389
10-0085000	NISTLER/ROBERT D	63788 MN HIGHWAY 55	WATKINS	MN	55389
10-0086000	LINN/JAMES P & SHIRLEE	PO BOX 249	EDEN VALLEY	MN	55329
10-0087000	LINN/JAMES P & SHIRLEE	PO BOX 249	EDEN VALLEY	MN	55329
10-0088000	HESSE/KEVIN J/ET AL	38548 637TH AVE	WATKINS	MN	55389
10-0089000	DVORAK/CHRISTOPHER L	38731 642ND AVE	WATKINS	MN	55389
10-0089001	ARNOLD/JOHN A & JULIE M	PO BOX 238	EDEN VALLEY	MN	55329
10-0089002	BERG/MARK J & LINDA D	PO BOX 431	EDEN VALLEY	MN	55329-0431
10-0090000	RUHLAND/BARBARA R	65119 MN HIGHWAY 55	WATKINS	MN	55389
10-0091000	RUHLAND/BARBARA R	65119 MN HIGHWAY 55	WATKINS	MN	55389
10-0092000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
10-0093000	NELSON/EDWIN	16450 JASMINE CT	COLD SPRING	MN	56320
10-0094000	HESSE/KEVIN J	38232 637TH AVE	WATKINS	MN	55389
10-0094001	PAULY/JEFFREY D	63551 MN HIGHWAY 55	WATKINS	MN	55389
10-0095000	WEINMANN/EDWARD C & MARY K	38938 647TH AVE	WATKINS	MN	55389
10-0098000	TREANOR FARMS LLC C/O JOHN & JULIE ARNOLD	21802 MEEKER STEARNS ST	EDEN VALLEY	MN	55329
10-0098001	BENGTSON/SHARLA J	38676 647TH AVE	WATKINS	MN	55389
10-0098002	GEISLINGER/DANIEL J & CHRISTIN	64828 385TH ST	WATKINS	MN	55389
10-0099000	BENGTSON/SHARLA J	38676 647TH AVE	WATKINS	MN	55389
10-0105000	GEISLINGER/VICTOR F & MARY J	37026 654TH AVE	WATKINS	MN	55389
10-0106000	MANUEL/JOHN C	64719 385TH ST	WATKINS	MN	55389
10-0169000	LIBBESMEIER/BRADLEY R & ELLEN	14279 CSAH 2	WATKINS	MN	55389
10-0173000	LINZ/ROBERT & LINDA	36846 650TH AVE	WATKINS	MN	55389
10-0177000	SCHREIFELS/JAMES M/TRUST MARGARET E SCHREIFELS TRUST	64893 375TH ST	WATKINS	MN	55389
10-0179000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
10-0180000	SCHREIFELS/JAMES M/TRUST MARGARET E SCHREIFELS TRUST	64893 375TH ST	WATKINS	MN	55389
10-0180001	ERTL/MATTHEW R & KAYLA M	37253 642ND AVE	WATKINS	MN	55389
10-0182000	MEIERHOFER/RONALD O & DIANE A	37180 642ND AVE	WATKINS	MN	55389
10-0183000	MEIERHOFER/RONALD O & DIANE A	37180 642ND AVE	WATKINS	MN	55389
10-0184000	MEIERHOFER/RONALD O & DIANE A	37180 642ND AVE	WATKINS	MN	55389
10-0185000	SCHREIFELS/MICHAEL & DAYNA	64481 375TH ST	WATKINS	MN	55389
10-0185001	SCHREIFELS/JAMES M/TRUST MARGARET E SCHREIFELS TRUST	64893 375TH ST	WATKINS	MN	55389
10-0186000	SCHWEGEL/ALVIN A & LEAH M	64500 375TH ST	WATKINS	MN	55389
10-0187000	SCHREIFELS/JAMES M/TRUST MARGARET E SCHREIFELS TRUST	64893 375TH ST	WATKINS	MN	55389

PARCELS WITHIN DWSMA

PID	NAME	ADDRESS	CITY	STATE	ZIP
10-0188000	VAN NURDEN/DALE N	6900 SIOUX TRL	ROCKFORD	MN	55373
10-0188001	HESSE/JEFFREY & CONNIE J	64358 375TH ST	WATKINS	MN	55389
10-0189000	HESSE/RICHARD & MARY ANN	37952 642ND AVE	WATKINS	MN	55389
10-0190000	SCHNEIDER/DENNIS & KAREN	36722 642ND AVE	WATKINS	MN	55389
10-0191000	SCHNEIDER/DENNIS & KAREN	36722 642ND AVE	WATKINS	MN	55389
10-0192000	TUMAN/NANCY L	2920 97TH CT	PLATO	MN	55370-5627
10-0193000	TUMAN/NANCY L	2920 97TH CT	PLATO	MN	55370-5627
10-0195000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
10-0195010	SCHNEIDER/BRIAN J	63453 380TH ST	WATKINS	MN	55389
10-0196000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
10-0197000	SCHNEIDER/DONALD G & VICTORIA	37654 CSAH 34	WATKINS	MN	55389
10-0198000	HESSE/SCOTT J	63415 380TH ST	WATKINS	MN	55389
10-0199000	LOCH/JOSEPH	37068 CSAH 34	WATKINS	MN	55389
10-0219001	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
15-0002000	SCHNEIDER FARMS LLC	63511 380TH ST	WATKINS	MN	55389
15-0004000	STENGER/STEVEN & HEIDI	62010 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0004001	ERNST/STEVEN H & LAJEAN E	13634 UPPER ELKWOOD CT	APPLE VALLEY	MN	55124
15-0005000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0006000	SCHUMACHER/THOMAS L & ANN M	39594 617TH AVE	EDEN VALLEY	MN	55329
15-0007000	STENGER/STEVEN & HEIDI	62010 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0008000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0009000	STENGER/RICHARD & ARLISS	63356 MN HIGHWAY 55	WATKINS	MN	55389
15-0010000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0010001	LEO/KENNETH & DIANE	39155 627TH AVE	WATKINS	MN	55389
15-0011000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0012000	BLOMKER/WILLIS	PO BOX 293	EDEN VALLEY	MN	55329
15-0012000	BLOMKER/WILLIS	PO BOX 293	EDEN VALLEY	MN	55329
15-0012001	EDEN VALLEY & WATKINS	PO BOX 25	EDEN VALLEY	MN	55329
15-0012002	EDEN VALLEY & WATKINS	PO BOX 25	EDEN VALLEY	MN	55329
15-0013000	BEUMER/MICHAEL C	39515 627TH AVE	WATKINS	MN	55389-5851
15-0013001	DONNAY/BETTY ANN	13027 MN HIGHWAY 55	WATKINS	MN	55389
15-0027000	HAAG/HAROLD & KARIN	61347 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0027001	FODSTAD/WILLIAM & CAROL	61273 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0028000	MAGEDANZ/PAUL & CONNIE	18785 228TH AVE	RICHMOND	MN	56368
15-0029000	CZECH/QUINTEN & BRITNEY	61620 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0030000	SCHWEGEL/REGINA P & CHARLES	61510 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0031000	WILLNER/ARLINDA A	61488 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0032000	EUERLE/DELFRED & CINDY	39088 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0114000	WESTRUP/JEROME A	38805 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0115000	WESTRUP/JEROME A	38805 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0116000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0117000	WESTRUP/JEROME A	38805 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0118000	KRAMER/LOUIS E	37875 600TH AVE	EDEN VALLEY	MN	55329
15-0119000	RUHLAND/BARBARA R	65119 MN HIGHWAY 55	WATKINS	MN	55389
15-0120000	PIGEON LAKE ENTERPRISES INC C/O TOM LARSON	39084 560TH AVE	EDEN VALLEY	MN	55329
15-0121000	REITER/DANIEL & WANDA/TRUST DANIEL & WANDA REITER TRUSTEES	60134 380TH ST	EDEN VALLEY	MN	55329
15-0122000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0124010	A&E FAMILY FARMS LLP	PO BOX 238	EDEN VALLEY	MN	55329
15-0125000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0127000	WESTRUP/JEROME A	38805 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0129000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0131000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0132000	KEMPEL/LENNIS & SANDRA	38251 617TH AVE	EDEN VALLEY	MN	55329
15-0133000	ANDERSON/BRUCE	15791 COUNTY ROAD 180	PAYNESVILLE	MN	56362
15-0134000	WENDROTH/ARTHUR H	61222 380TH ST	EDEN VALLEY	MN	55329
15-0135000	HEMMESCH/JUDY M	38039 617TH AVE	EDEN VALLEY	MN	55329
15-0136000	BRADSHAW/JOHN H	PO BOX 551	EDEN VALLEY	MN	55329
15-0137000	RUHLAND/ROBERT R & MICHAEL E	2200 S FOOTHILL TRL	SHAKOPEE	MN	55379
15-0137001	RUHLAND/THOMAS G	18012 TURTLE CT	COLD SPRING	MN	56320
15-0138000	RUHLAND/GEORGE N/REV TRUST & MARY JO RUHLAND REV TRUST	942 STEARNS AVE E APT 3	EDEN VALLEY	MN	55329
15-0139000	HESSE/RANDY J	PO BOX 442	EDEN VALLEY	MN	55329-0442
15-0140000	ANDERSON/BRUCE	15791 COUNTY ROAD 180	PAYNESVILLE	MN	56362
15-0141000	BRUEMMER/KEVIN G	38706 617TH AVE	EDEN VALLEY	MN	55329
15-0142000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0143000	STENGER/STEVEN & HEIDI	62010 MN HIGHWAY 55	EDEN VALLEY	MN	55329
15-0144000	HAAG/KYLE A	38499 627TH AVE	WATKINS	MN	55389
15-0144001	PENK/RICHARD W & ROXANNE/TRUST RICHARD& ROXANNE PENK TRUSTEES	19340 612TH AVE	LITCHFIELD	MN	55355
15-0145000	NOHNER/MICHAEL J & DENISE E	38248 627TH AVE	WATKINS	MN	55389

PARCELS WITHIN DWSMA

PID	NAME	ADDRESS	CITY	STATE	ZIP
15-0145010	NOHNER/JERROD E	38248 627TH AVE	WATKINS	MN	55389
15-0145020	NOHNER/JERROD E & JODEE M	38248 627TH AVE	WATKINS	MN	55389
15-0146000	PRESS/COREY L & TIFFANY L	38413 627TH AVE	WATKINS	MN	55389
15-0147000	MAGEDANZ/TRAVIS	38126 617TH AVE	EDEN VALLEY	MN	55329
15-0148000	MAGEDANZ/JOHN P & DEBRA	39726 617TH AVE	EDEN VALLEY	MN	55329
15-0149000	MAGEDANZ/TRAVIS J & CHARLENE C	38126 617TH AVE	EDEN VALLEY	MN	55329
15-0149010	MAGEDANZ/TRAVIS J & JOHN P	38126 617TH AVE	EDEN VALLEY	MN	55329
15-0150000	US FISH & WILDLIFE	22274 615TH AVE	LITCHFIELD	MN	55355
15-0152000	UNITED STATES OF AMERICA C/O US FISH & WILDLIFE SERVICE	5600 W AMERICAN BLVD SUITE 990	BLOOMINGTON	MN	55437-1458
15-0153000	DEMORRETT/ADELINE/TRUST	150 E COLEMAN AVE APT 107	EDEN VALLEY	MN	55329-1029
15-0155000	NOHNER/MICHAEL J & DENISE E	38248 627TH AVE	WATKINS	MN	55389
15-0156000	NOHNER/MICHAEL J & DENISE E	38248 627TH AVE	WATKINS	MN	55389
15-0160000	US FISH & WILDLIFE	22274 615TH AVE	LITCHFIELD	MN	55355
15-0162000	BKR PROPERTIES LLC	PO BOX 379	EDEN VALLEY	MN	55329-0379
15-0162010	ISONOVA TECHNOLOGIES LLC ATTN JIM BATTEN	PO BOX 4086	SPRINGFIELD	MO	65800
15-0163000	FUCHS/GREG H/& LINDSEY PARR	37548 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0164000	BKR PROPERTIES LLC	PO BOX 379	EDEN VALLEY	MN	55329-0379
15-0164001	ISONOVA TECHNOLOGIES LLC ATTN JIM BATTEN	PO BOX 4086	SPRINGFIELD	MO	65800
15-0164020	BKR PROPERTIES LLC	PO BOX 379	EDEN VALLEY	MN	55329-0379
15-0165000	WENDROTH/ARTHUR H	61222 380TH ST	EDEN VALLEY	MN	55329
15-0166000	WENDROTH/ARTHUR H	61222 380TH ST	EDEN VALLEY	MN	55329
15-0167000	BRANCH/FRANCIS M/ET AL C/O JEANNE M BRANCH	37863 617TH AVE	EDEN VALLEY	MN	55329
15-0168000	RUHLAND/WILLIAM M & LAURA M	PO BOX 163	EDEN VALLEY	MN	55329
15-0168010	RUHLAND/DAVID J	PO BOX 8	EDEN VALLEY	MN	55329
15-0171000	US FISH & WILDLIFE	22274 615TH AVE	LITCHFIELD	MN	55355
15-0171010	RUHLAND/DAVID J	PO BOX 8	EDEN VALLEY	MN	55329
15-0172002	WEINMANN/HAROLD L	37442 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0174000	RUHLAND/JENNIFER G/ET AL	2302 N 7TH ST	NORTH ST PAU	MN	55109
15-0177010	NEXGEN DAIRY LLC	39679 592ND AVE	EDEN VALLEY	MN	55329
15-0178000	BECKER/JOSEPH J & KAREN L	38600 MN HWY 22 S	EDEN VALLEY	MN	55329
15-0179000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0180000	RUHLAND/JEFFREY/& MARIA T ROMERO RUHLAND	37545 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0181000	RUHLAND/JEFFREY/& MARIA T ROMERO RUHLAND	37545 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0182000	BECKER FARMS	38600 MN HIGHWAY 22 S	EDEN VALLEY	MN	55329
15-0183000	RUHLAND/MARK & LINDA	60314 373RD ST	EDEN VALLEY	MN	55329
24-0018000	GRUENES/ARNOLD B & KRIS L	17565 COUNTY ROAD 43	RICHMOND	MN	56368

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

DEPARTMENT OF HEALTH

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1470012 **COMMUNITY**
NAME	Eden Valley
ADDRESS	Eden Valley Water Superintendent, Eden Valley City Hall, 171 Cossairt Avenue West, PO Box 25, Eden Valley, MN 553290025

FACILITY (WELL) INFORMATION

NAME	Well #2
FACILITY ID	S01
UNIQUE WELL NO.	211666
COUNTY	Meeker

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1470012 S01	**UNIQUE WELL NO.**	211666

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

PWS ID / FACILITY ID	1470012 S01	UNIQUE WELL NO.	211666

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		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.		Y	128	
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		

PWS ID / FACILITY ID	1470012 S01	UNIQUE WELL NO.	211666

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				
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	Y	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	1470012 S01	UNIQUE WELL NO.	211666

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

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

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

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

INSPECTOR	Voz, Karen (SWP)	DATE	1 - 2 - 2020

PWS ID / FACILITY ID	1470012 S01	UNIQUE WELL NO.	211666

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
A spill resonse plan could be developed to provided emergency response in the event a spill or release would occur on State Highway 55.		

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

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

DEPARTMENT OF HEALTH

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1470012 **COMMUNITY**
NAME	Eden Valley
ADDRESS	Eden Valley Water Superintendent, Eden Valley City Hall, 171 Cossairt Avenue West, PO Box 25, Eden Valley, MN 553290025

FACILITY (WELL) INFORMATION

NAME	Well #3
FACILITY ID	S02
UNIQUE WELL NO.	211662
COUNTY	Meeker

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1470012 S02	**UNIQUE WELL NO.**	211662

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

PWS ID / FACILITY ID	1470012 S02	UNIQUE WELL NO.	211662

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		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.		Y	135	
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		

PWS ID / FACILITY ID	1470012 S02	UNIQUE WELL NO.	211662

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				
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	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	1470012 S02	UNIQUE WELL NO.	211662

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

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

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

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

INSPECTOR	Voz, Karen (SWP)	DATE	1 - 2 - 2020

PWS ID / FACILITY ID	1470012 S02	UNIQUE WELL NO.	211662

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

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

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

DEPARTMENT OF HEALTH

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

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1470012 **COMMUNITY**
NAME	Eden Valley
ADDRESS	Eden Valley Water Superintendent, Eden Valley City Hall, 171 Cossairt Avenue West, PO Box 25, Eden Valley, MN 553290025

FACILITY (WELL) INFORMATION

NAME	Well #4
FACILITY ID	S03
UNIQUE WELL NO.	649153
COUNTY	Meeker

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1470012 S03	**UNIQUE WELL NO.**	649153

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

PWS ID / FACILITY ID	1470012 S03	UNIQUE WELL NO.	649153

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal)[2]	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal)[2]	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		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.		Y	128	
WEL	Operating well	record dist.	record dist.		Y	135	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / FACILITY ID	1470012 S03	UNIQUE WELL NO.	649153

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well[1]	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)[2]	illegal[3]	illegal[3]		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50[5]	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		
Additional Sources (If there is more than one source listed above, please indicate here).							
Potential Contamination Sources and Codes Based on Previous Versions of this Form							
	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	1470012 S03	UNIQUE WELL NO.	649153

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

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

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

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

INSPECTOR	Voz, Karen (SWP)	DATE	1 - 2 - 2020

PWS ID / FACILITY ID	1470012 S03	UNIQUE WELL NO.	649153

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

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

DEPARTMENT OF NATURAL RESOURCES

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
SOUTHERN REGION
Ecological & Water Resources
164 Co. Rd. 8 NE, P.O. Box 457
Spicer, MN 56288
320-796-2161 x 232 • Ethan.Jenzen@state.mn.us

June 5, 2018

Jim Rademacher
P.O. Box 25
300 Smith Street South
Eden Valley, MN 55329

Re: Water Supply Plan Approval, City of Eden Valley, Meeker County

Dear Mr. Rademacher:

The Department of Natural Resources has reviewed the City of Eden Valley's 2017 Water Emergency and Conservation Plan and updated water usage, submitted on June 4, 2018, for compliance with Minnesota Statutes, Chap. 103G.291, Subd. 3. On behalf of the Commissioner of Natural Resources, your Plan is approved. This approval is effective upon the Department's receipt of a completed copy of the attached "Certificate of Adoption" Form. Please return the form to my office as soon as the City Council officially adopts the plan.

While your current plan is approved, DNR staff review of the plan did indicate one area of concern that **must be addressed** in the near future to remain compliant with MN Statutes Chap. 103G.291.

- Information regarding a critical water deficiency restriction/official control to restrict water use and enforce restrictions does not specifically mention a Governor's Critical Water Deficiency declaration (see Page 32 of draft Plan). This control is an essential portion of a Water Supply Plan to help limit non-essential water use during periods of extended and/or severe drought. In addition, acknowledgement and inclusion of this control is necessary for Plan approval. Please see the attached draft version of the ordinance, which was developed through assistance from MN Rural Waters and the League of MN Cities. In addition, we would like to work with the City to develop additional water level monitoring capacity in proximity to the municipal well field. Specifically, the installation of a well to monitor water levels within the source aquifer for the City will help greatly in the determination of long-term resource sustainability. Along these lines, please note that it is standard policy for the installation of an observation well to be required as a portion of the installation of a new municipal well.

Thank you for the opportunity to review your 2017 Water Emergency and Conservation Plan and the recently submitted data. Please contact me at 320-796-2161 ext. 232 if you have any questions, or would like assistance with developing an amended Plan.

Sincerely,

Ethan Jenzen
Area Hydrologist, Ecological and Water Resources

ec: Skip Wright, EWR R4 North District Manager
Carmelita Nelson, EWR Water Consv. Consultant
Kent Louwagie, Bolton and Menk
Amanda Strommer, MDH
Anne Nelson, EWR Apprs. Hydrologist

DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

Old Municipal Well Report for Eden Valley

PWSID: 1470012

MDH

March 2019

Minnesota Department of Health
Environmental Health in Minnesota

MDH Public Water Supply Sources Report

PWSID: **1470012**
PWS Name: **Eden Valley**
PWS Type: **Community**
PWS Status: **Active**

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

MNDWIS PWS SOURCES IN FLOW

Source Info							MNDWIS Data				CWI Data			
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log (s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	**Well #2**	GW	Primary	Active	211666 **O***	12/17/1998 (D. Neiman)	1959	72	52	12	08-17-1959	72	52	12
S02	**Well #3**	GW	Primary	Active	211662 **O***	12/17/1998 (D. Neiman)	1970	78	57	12	09-08-1970	78	57	12
S03	**Well #4**	GW	Primary	Active	649153	11/17/2004 (D. Neiman)	2001	73	48	12	09-14-2001	73	48	12

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

Old Municipal Wells

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

OLD MUNICIPAL Well Data

Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
Well A	Old Well		42				Before 1917	Rotary/Drilled				State Street in the northern part of the village. 12 ft from Well No. 1 Lot 15, Block 6	Abandoned 1924
Well B	Well No. 1	241390	40			10	1923	Rotary/Drilled				Pumpstation in the center of the village. Lot 15, Block 6	Abandoned 1977
Well C			22				1943	Dug	1959			15 ft SE of the Old Well on Lot 15, Block 6	Abandoned 1969
Well D	Well No. 2	211666 **S***	72		52	12	1959	Rotary/Drilled				Isolated rural area SE of the village.	Active

OLD MUNICIPAL Well Data													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
												Section 1, Township 121 N, Range 31 W	
Well E	Well No. 3	211662 S*	78		57	12	1970	Rotary/Drilled				205 ft south of Well No. 2	Active

Databases Searched	Remarks
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory (1Suite); Biennial Report of the MN State Dairy and Food Commissioner-1907; Minnesota Geological Survey City Well File Folders; MGS Bulletin (22, 27, 31, or 32); MDH DWP MNDWIS; MN Historical Soc.-Fire Underwriters Insp. Bureau (Fisher) historical map ; Sanborn Fire Insurance Maps; MDH WELLS	

Old Municipal Well Data Compiled By: **Mara Boulanger** Compiled Date: **3/20/2019 1:07:59 PM**

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
1	Old Well		42 feet				Pre-1917	Drilled	1924: Abandoned			*Located on State Street in the northern part of the village. *Situated 12 feet from Well No. 1. *Lot 15, Block 6	
2	Well No. 1	241390	40 feet			10 inch	1923	Drilled	1977: Abandoned			*Located in the pump station in the center of the village. *Lot 15, Block 6	
3	Dug Well		22 feet				1943	Dug	1959: Out of Service 1969: Abandoned			*15 feet southeast of the old well on Lot 15, Block 6	
4	Well No. 2 (STILL IN USE)	211666 S*	72 feet			12 inch	1959	Drilled				*Located in isolated rural area southeast of the village.	

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.

Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
												*Section 1, Township 121 North, Range 31 West	
5	Well No. 3 (STILL IN USE)	211662 S*	78 feet			12 inch	1970	Drilled				*Located 205 feet south of existing Well No. 2.	

Databases Searched	Remarks

Old Municipal Well Data Compiled By: **Gail Haglund** Compiled Date: **2/19/2009**

Source: MN Dep't. of Health - 3/20/2019

Use of MDH Public Water Supply Sources Report

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

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

Old Municipal Wells are unsealed, abandoned wells. These wells pose a risk of contamination to existing wells and aquifers. According to State Well Code and under the terms of your Wellhead Protection Plan, your PWS may need to identify, locate, and properly seal Old Municipal Wells within your Drinking Water Supply Management Area, to current MDH standards. While historical records may indicate that some of these wells were "capped", "abandoned", or "sealed" in the past, unless it can be shown that the sealing was performed to current standards, they may need to be located, cleaned out, and sealed properly with a well sealing record issued.

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

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

Restart

ELEVENTH BIENNIAL REPORT

OF THE

Minnesota State Dairy and Food Commissioner

TRANSMITTED TO THE LEGISLATURE

1907

1907
HARRISON & SMITH CO.
MINNEAPOLIS

MEEKER COUNTY.

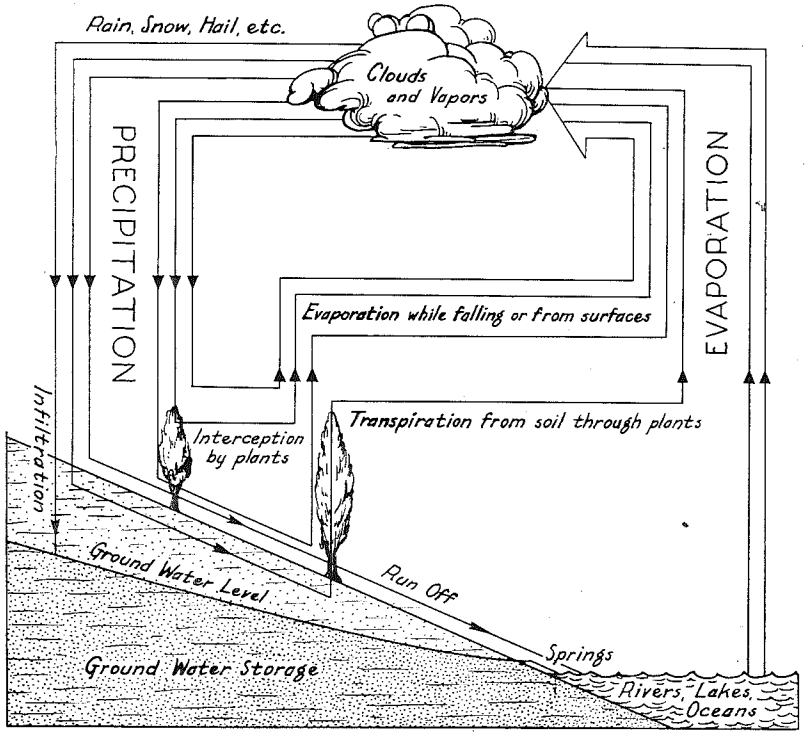
Lamson Creamery Co	Dassel	Ole Nyquist	Dassel, Route 1.	P. J. Oleson	Dassel, Route 1.
Corvuso Creamery Association	Litchfield	J. Carlson	Corvuso	A. Olson	Corvuso.
Grove City Creamery Association	Grove City	Nels Akeson	Grove City	E. L. Paulson	Grove City.
Lake Stella Creamery Association	Litchfield	R. Leverance	Litchfield	L. J. Levenick	Litchfield.
Darwin Creamery Association	Darwin	J. McLabe	Darwin	M. Mattson	Darwin.
Manannah Creamery Association	Litchfield	T. Hollehan	Manannah	H. Smith	Manannah.
Greenleaf Co-operative Creamery Ass	Litchfield	John Lawrance	Greenleaf	Ed. Kellgren.	Greenleaf.
Forest City Creamery Association	Litchfield	J. Harbinson	Forest City	W. Lund	Forest City.
Eden Valley Cry., H. Schoenecker, Prop.	Eden Valley	H. Schoenecker	Eden Valley	H. Schoenecker	Eden Valley.
Watkins Creamery Association	Watkins	N. Clinton	Watkins	J. F. Kielty	Watkins.
Golden Gate Creamery, E. W. Patzel, Prop.	Eden Valley	E. W. Patzel	Eden Valley	E. W. Patzel	Eden Valley.
Dassel Co-operative Dairy Association	Dassell	N. J. Johnson	Dassel	F. F. Foss	Dassel.
Kingston Co-operative Creamery Assn	Kingston	T. J. Murphy	Kingston	W. A. Kendall	Kingston.
Lake Jenny Co-operative Cry. Assn	Dassel	John Engquist	Dassel, R. 2.	A. Mogren	Dassel, R. 2.
Star Lake Co-operative Creamery Assn	Litchfield	Evan Evanson	Litchfield, R. 5.	Anton Nelson	Litchfield, R 5.
Hope Lake Creamery Association	Litchfield	H. O. Halvorson	Litchfield, R. 6.	John Edman	Litchfield, R. 6.
Danielson Creamery Association	Grove City	Peter Mortensen	Rosendale	H. Rasmussen	Rosendale.
Cosmos Creamery Association	Grove City	And. B. Nelson	Cosmos	Hans W. Peterson	Cosmos.
Litchfield Creamery	Litchfield	H. L. Halverson	Litchfield	Alf. Anderson	Litchfield.
Crow River	Grove City	J. B. Marshall	Crow River	H. Johnson	Crow River.

MILLE LACS COUNTY.

Bergholm Co-operative Creamery	Bock	Ed. Eckdall	Bock	M. M. Sorrenson	Bock
J. A. Michels	Milaca	J. A. Michels	Milaca	J. W. Michels	Milaca
Bock	Bock	C. G. Haltar	Bock		
West Branch	Long Siding	O. Erickson	Long Siding	G. E. Lindall	Long Siding
Malaca Creamery Co	Milaca	W. B. Fadden	Milaca		

MORRISON COUNTY.

Dixville	Royalton	J. H. Russell	Royalton	W. H. Gilmer	Royalton, R 5.
Philips Creamery, John Philips	Royalton	John Philips	Royalton	John Philips	Royalton
Elmdale Creamery, K. H. Gunderson	Royalton	K. H. Gunderson	Elmdale	C. E. Stallman	Elmdale.
Upsala Creamery, Mrs. J. Swedbeck	Royalton	Mrs. J. Swedbeck	Upsala	Peter Viehauser	Upsala.
Acme Creamery	Royalton	J. A. Russell	Royalton	W. H. Gilmer	Royalton.
Little Falls Creamery	Little Falls	O. A. Johnson	Little Falls	O. A. Johnson	Little Falls.
Acma	Royalton	J. H. Russell	Royalton	C. W. Parker	Royalton.
Buckman	Buckman	J. Schmolks	Royalton	W. Sloniker	Buckman.
Randall Creamery	Randall				
Farmers' Creamery	Freedham				
Flensburg Creamery Co	Flensburg				
Beaver Dam Creamery Co	Little Falls				
Freedhaven Creamery Co	Freedham				
North Prairie	Royalton	J. M. McNeal	Rice	J. C. Janish	Royalton.



The Hydrologic Cycle. It has been estimated that a drop of water evaporated from the ocean rains five times before it gets back to the sea. (After National Resources Board Report.)

UNIVERSITY OF MINNESOTA
MINNESOTA GEOLOGICAL SURVEY
WILLIAM H. EMMONS, DIRECTOR

BULLETIN 31

THE GEOLOGY AND UNDERGROUND WATERS OF SOUTHERN MINNESOTA

BY

GEORGE A. THIEL

MINNEAPOLIS · 1944
THE UNIVERSITY OF MINNESOTA PRESS

gravel saturated with water. The public water supply was formerly taken from this gravel by means of a system of about 30 wells, each 2 inches in diameter and 40 feet deep. The water stood about 20 feet below the surface. Most of the water for the public system is now taken from a well 40 inches in diameter and 55 feet deep, with a screen 24 inches in diameter. The well is pumped 200 gallons per minute, with a drawdown of about 10 feet. There are many private, driven and bored wells that obtain water for domestic purposes at a depth of about 35 feet. The creamery well is 54 feet deep. South of the city, beyond the margin of the lacustrine plain, the drift is nearly 200 feet thicker and consists of boulder clay. A well 5 1/2 miles south of the city entered granite at a depth of 410 feet. There is a graphic representation of the log of this well in Figure 58.

Dassel

The village of Dassel is located to the east of the Litchfield plain, in the midst of a morainic area that has an irregular surface and numerous small lakes. Shallow wells obtain water from a gravel bed that occurs 65 feet below the surface. Another sandy stratum is found at a depth of 120 feet, but the best water-producing horizon is about 170 feet below the surface.

The public water supply is taken from a well 8 inches in diameter and 172 feet deep, with a static level 55 feet below the surface. When pumped at the rate of 100 gallons per minute the well shows 15 feet of drawdown. The creamery well is 178 feet deep and draws its water from the same horizon. An exploratory well drilled 6 miles south of the village penetrated 220 feet of glacial drift and 400 feet of Cretaceous clays and sandstones before entering pre-Cambrian granite. Another well about 7 miles to the north of the village encountered white shale at a depth of 230 feet. (See Figure 58.)

Eden Valley

Alluvial sands and gravels are deposited to a depth of about 50 feet in the valley in which this village is located. These deposits are saturated with water, and most of the wells are driven to a depth of about 30 feet into the porous sediments. The village well is 40 feet deep and has its static level 10 feet below the surface. The railway company once had a well 360 feet deep, but that source of water has been abandoned in favor of shallow wells (see accompanying section).

Well at Eden Valley *

		DEPTH (feet)	THICKNESS (feet)
Drift	Unclassified	0–200	200
	Fine sandstone	200–270	70
	Black shale	270–300	30
	Granitic rock	300–360	60

* Data from McCarthy Well Company, St. Paul.

Grove City

Grove City is located west of Litchfield, in the western part of the county. The public water supply formerly came from a well about 700 feet deep. No reliable record was kept of the drill cuttings, but Meinzer reported that "the drill seems to have passed through several hundred feet of glacial drift, then through strata of shale and sandstone, and finally through a considerable thickness of partly decomposed granite. The well was at first finished in such a manner that water could enter only from the bottom, when it yielded but 16 gallons a minute. The casing was then cut at the sand and gravel zone found between the depths of 220 and 260 feet, and a 30-foot brass screen was inserted, after which the well was successfully tested at 75 gallons a minute. The water now rises to a level 57 feet below the surface, or 1,150 feet above the sea."

Cosmos

This village has no public water supply system. The creamery has a well 250 feet deep, terminating in the glacial drift.

Forest City

This village is at a low point in the topography, and the head of water in the drift lifts it nearly to the surface. A well at the edge of the village almost flows. It penetrated the following glacial deposits:

		DEPTH (feet)	THICKNESS (feet)
Drift	Yellow clay	0–40	40
	Dry sand	40–80	40
	Blue clay with sandy layers	80–150	70

Watkins

The village of Watkins is located near the northeastern corner of the county, in the terminal moraine of the Late Wisconsin (Mankato) ice sheet. The water for its public supply system is taken from a well 10 inches in diameter and 297 feet deep, terminating in the glacial drift. The static level is about 70 feet below the surface. When pumped the well has a drawdown of 28 feet.

FARM WATER SUPPLIES

In the outwash area and the adjoining lacustrine sand plain many satisfactory supplies of water are obtained from shallow driven wells. In the morainic belts bored wells are still common, but they are being replaced by drilled wells that penetrate to greater depths. Many wells 2 inches in diameter and finished with screens were formerly drilled, but owing to the rapid incrusting of the screens the drilling of wells of such small diameter is to be discouraged. In the northern part of the county the water from the drift has little permanent hardness, and this is true also of the water from the lower portion of the drift in the southern townships. The suggestion is made, therefore, that in the latter region there

would be an advantage in drilling deeper, both to get softer water and to diminish the difficulty of incrustations on the screens.

South of Litchfield, beyond the plain, wells about 250 to 275 feet deep have the softer water. In that area it is at least 300 feet to granite. A well on the farm of Carl J. Anderson, 5 1/2 miles south of Litchfield, entered granite at a depth of 402 feet. In the region of Corvoso several wells 350 feet deep failed to reach granite. South of Dassel the upper surface of the granite is at a depth of about 300 feet. Near Lake Jennie it was encountered at a depth of 315 feet.

A few farm wells in the northeastern part of the county penetrate Cretaceous shales. The following well section is typical.

Farm Well North of Dassel (Sec. 28, T. 120 N., R. 29 W.)

		DEPTH (feet)	THICKNESS (feet)
Drift	Loamy soil	0–4	4
	Yellow clay	4–24	20
	Blue clay, some sandy	24–224	200
Cretaceous	White shale	224–230	6
	Red shale	230–234	4
	White shale	234–240	6

TABLE 80. — ANALYSES OF WATERS OF MEEKER COUNTY *

	1	2	3	4	5
Depth (feet)	180	40	360	55	180
Hardness	289	310	310	400	165
Alkalinity	344	288	340	290	252
Iron	1.6	0.6	3.4	1.5	0.4
Manganese	...	...	0.05	0.1	...
Chlorine	1	6	0.55	9.3	31
Fluorine	...	...	...	0	...
SO_4 radical	...	...	9.8	52	...
Turbidity	20	5	9	8	10
Color	20	25	17	15	35
Odor	0	0	...	...	0
pH value	...	...	7.3	8.1	...

* Data from State Board of Health Laboratory. Hardness, alkalinity, iron, and chlorine in terms of parts per million (1 grain per gallon = 17.1 p.p.m.). For key to turbidity and items following, see standards in section III.

1. Village well at Dassel. September 29, 1925.
2. Village well at Eden Valley. September 12, 1924.
3. City well at Grove City. October 22, 1936.
4. City well at Litchfield. October 27, 1937.
5. Village well at Watkins. July 8, 1924.

TABLE 81. — MINERAL ANALYSES OF WATERS OF MOWER COUNTY
(Analyses in parts per million)

	Surface Deposits				Devonian, Galena, and Platteville				St. Peter Sandstone
	1	2	3	4	5	6	7	8	9
Depth (feet)	...	12	30	15	226	135	263	243	600

Calcium (Ca)	60	97	96	56	75	62	88	67	69
Magnesium (Mg)	21	32	9.2	58	24	21	27	15	24
Sodium and potassium (Na + K)	3	8.6	15	16	8.5	10	...	18	7.2
Bicarbonate radical (HCO_3)	276	306	280	190	302	296	272	316	314
Sulphate radical (SO_4)	9	133	55	56	47	10	127	10	17
Chlorine (Cl)	2	2.8	16	25	4.1	5.2	11	0.9	6.1
Total solids	235	430	342	311	315	253	413	245	279

1. Hall's spring at Austin. May 1901.
2. Chicago, Milwaukee and St. Paul Railway well at Ramsey. October 1892.
3. Chicago, Milwaukee and St. Paul Railway well at Le Roy. November 1892.
4. Chicago, Milwaukee and St. Paul Railway well at Adams. December 1892.
5. Chicago, Milwaukee and St. Paul Railway well at Dexter. October 1892.
6. Former city well at Austin. November 1891.
7. Old Chicago, Milwaukee and St. Paul Railway well at Austin. June 1901.
8. New Chicago, Milwaukee and St. Paul Railway well at Austin. August 1901.
9. City well at Austin. June 1901.

The above analyses were reported by G. N. Prentiss, chemist, Chicago, Milwaukee and St. Paul Railway Company.

MOWER COUNTY

SURFACE FEATURES

Most of Mower County is a flat, featureless plain, embracing the divide between the Root River drainage and that of the Cedar and Upper Iowa rivers. This divide area is the highest land in southeastern Minnesota, its altitude being from 1350 to 1420 feet above sea level in the vicinity of Dexter. From this region the surface declines gently to an altitude of 1300 feet near the eastern border and to about 1200 feet along the Cedar River near the western margin of the county. In the eastern townships, where the drift is thin, there are many limestone sinks, and a karst type of topography is being developed. Further westward the drift is so thick that direct underground drainage is blocked, even though the same limestone strata are present.

UNCONSOLIDATED SURFACE MANTLE

All of Mower County, except a few spots in the stream valleys, is covered by glacial drift. It is thickest along the high divide mentioned above and thinnest along the valley of the Cedar River and in the eastern part of the county. In the southern part of the county a peaty soil zone lies between two sheets of till, both of which are regarded as pre-Wisconsin in age. The Late Wisconsin (Mankato) ice sheet had its eastern margin along the western side of Mower County, where a weak moraine marks its limits. This youngest drift is pebbly, clayey till, whereas that of pre-Wisconsin age has been leached of limestone pebbles to a depth of 4 to 6 feet.

Outwash gravels 10 to 50 feet thick occur along the course of the Cedar River, and along the present streams recent alluvium is present in narrow belts of no great thickness.

Unique Well Number 241390

County Meeker
Quad Eden Valley
Quad Id 141D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1992/08/10
Update Date 2014/03/10
Received Date

Well Name EDEN VALLEY 1 Well B

Township	Range	Dir	Section	Subsection	Field Located Elevation	MGS	ft.
121	31	W	3	AAADBC		1117.00	

well and contact address EDEN VALLEY 1

EDEN VALLEY MN Changed

Description	Color	Hardness	From	To (ft.)
LOAM AND CLAY			0	8
CLAY	YELLOW		8	10
HARDPAN			10	11
SAND AND GRAVEL WATER BEA			11	40

Remarks
WELL DRILLED PRE-1924

First Bedrock
Last Strat QHUU

Aquifer Quat. Water Table Aquifer
Depth to Bedrock ft.

Well Depth 40.00 ft
Depth Completed 40.00 ft
Date Well Completed

Drillhole Angle

Drilling Method Cable Tool

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use municipal

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 10 Depth
10.00 in. from 0.00 to ft. lbs/ft

Hole Diameter (in.)

Screen
Make Type
Diamter Slot Length Set

Open Hole(ft.) From to

Static Water Level
0.00 ft. Date measured

Pumping Level (below land surface)
ft. after hrs. pumping g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO ☐ NOT SPECIFIED

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed
Manufacture's name
Model number HP 0.00 Volts
Length of drop pipe Material Capacity g.p.m
Type

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☐ NO

Well Contractor Cerfication
Minnesota Geological Survey MGS

License Business Name **Lic. or Reg No.**

Name of Driller **Date**

Unique Well Number 211666

County Meeker
Quad Eden Valley
Quad Id 141D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1993/01/20
Update Date 2014/03/10
Received Date

Well Name EDEN VALLEY 2 Well D

Township	Range	Dir	Section	Subsection	Field Located Elevation
121	31	W	1	CBBCBA	MDH 1105.00 ft.

well and contact address EDEN VALLEY 2

EDEN VALLEY MN Changed

Description	Color	Hardness	From	To (ft.)
TOPSOIL	BLACK		0	2
CLAY	BLUE		2	4
SAND	BLUE		4	33
DIRTY SAND	BLUE		33	39
SAND & GRAVEL	BROWN		39	42
SANDY CLAY	BLUE		42	47
SAND	BLUE		47	69
STICKY SANDY SHALE	BLUE		69	72

Remarks
60' S.W. OF RIGHT-A-WAY LINE OF TRUNK HWY 55

First Bedrock KRET
Last Strat KRET
Aquifer multiple
Depth to Bedrock 69.00 ft.

Well Depth 72.00 ft
Depth Completed 72.00 ft
Date Well Completed 1959/08/17

Drillhole Angle

Drilling Method Non-specified Rotary

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 12 Depth 52
12.00 in. from 0.00 to 52.00 ft. lbs/ft

Hole Diameter (in.)

Screen Yes
Make Type
Diamter Slot Length Set
12.00 20 52 ft. to 72 ft.

Open Hole(ft.) From to

Static Water Level
2.00 ft. land surface Date measured 1959/09/10

Pumping Level (below land surface)
10.00 ft. after 8.00 hrs. pumping 290.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO ☐ NOT SPECIFIED

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed
Manufacture's name
Model number HP 0.00 Volts
Length of drop pipe Material Capacity 200 g.p.m
Type

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☐ NO

Well Contractor Cerfication
Fredrickson's 08317
License Business Name Lic. or Reg No.

Name of Driller Date

Unique Well Number **211662**

County Meeker
Quad Eden Valley
Quad Id 141D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1993/01/20
Update Date 2014/03/10
Received Date

Well Name EDEN VALLEY 3 Well E

Township	Range	Dir	Section	Subsection	Field Located Elevation	
121	31	W	1	CBBCCA	MDH 1108.00	ft.

well and contact address EDEN VALLEY 3

EDEN VALLEY MN Changed

Description	Color	Hardness	From	To (ft.)
PEAT			0	2
FINE SAND			2	20
SAND & GRAVEL			20	32
CLAY & STONES			32	44
CLAY			44	45
GRAVEL			45	78

Remarks

First Bedrock
Last Strat QGUU
Aquifer Quat. buried artes. aquifer
Depth to Bedrock ft.

Well Depth	Depth Completed	Date Well Completed
78.00 ft	78.00 ft	1970/09/08

Drillhole Angle

Drilling Method

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 12 Depth 57
12.00 in. from 0.00 to 57.00 ft. lbs/ft

Hole Diameter (in.)

Screen Yes
Make Type
Diamter Slot Length Set
12.00 22 57 ft. to 78 ft.

Open Hole(ft.) From to

Static Water Level
-3.00 ft. land surface Date measured 1970/09/08

Pumping Level (below land surface)
10.00 ft. after hrs. pumping 450.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO ☐ NOT SPECIFIED

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed 1970/00/00
Manufacture's name
Model number HP 25.00 Volts
Length of drop pipe Material Capacity g.p.m
Type Turbine

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☐ NO

Well Contractor Cerfication
Bergerson-Caswell 27058
License Business Name Lic. or Reg No.

Name of Driller Date

Unique Well Number 649153

County Meeker
Quad Eden Valley
Quad Id 141D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 2002/01/22
Update Date 2014/03/10
Received Date

Well Name EDEN VALLEY 4

Township	Range	Dir	Section	Subsection	Field Located Elevation	MDH
121	31	W	1	CBCACB	1106.00	ft.

well address EDEN VALLEY
55 SH
EDEN VALLEY MN 55329 Changed

contact address CITY OF EDEN VALLEY
P.O. BOX 25
EDEN VALLEY MN 55329 Changed

Description	Color	Hardness	From	To (ft.)
TOPSOIL	BLACK		0	2
CLAY	GRAY		2	3
SAND (FINE)	GRAY		3	25
SAND & GRAVEL	VARIED		25	29
SANDY CLAY	GRAY		29	45
SAND & GRAVEL (SMALL)	GRAY		45	73
SHALE (STICKY)	BLUE	HARD	73	80

Remarks

First Bedrock KRET
Last Strat KRET
Aquifer Quat. buried artes. aquifer
Depth to Bedrock 73.00 ft.

Well Depth 80.00 ft
Depth Completed 73.00 ft
Date Well Completed 2001/09/14

Drillhole Angle

Drilling Method Non-specified Rotary

Drilling Fluid Bentonite

Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use community supply(municipal)

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 12 Depth 48
12.00 in. from 0.00 to 48.00 ft. 49.56 lbs/ft

Hole Diameter (in.) 18.0(To 80.0

Screen Yes
Make JOHNSON
Diamter 12.00 Slot 30 Length 25 Set 48 ft. to 73 ft.

Open Hole(ft.) From to
Type stainless steel

Static Water Level
2.40 ft. land surface Date measured 2000/07/27

Pumping Level (below land surface)
14.20 ft. after hrs. pumping 520.00 g.p.m.

Wellhead Completion
Pitless adapter manufacturer MONITOR Model 9PS121WBE0
☐ Casing Protection ☑ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☑ YES ☐ NO ☐ NOT SPECIFIED
Material neat cement From 0.0 To 48.0 ft. 1.75 Cubic yards

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☑ YES ☐ NO

Pump
☐ Not Installed Date Installed 2001/09/11
Manufacture's name GRUNDFOS
Model number 475S-200-2 HP 20.00 Volts 230
Length of drop pipe 32.0 Material Capacity 475 g.p.m
Type Submersible

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☑ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☑ NO

Well Contractor Cerfication
L.t.p. Enterprises, Inc. 91686
License Business Name **Lic. or Reg No.**
VERDECK, D.

Name of Driller **Date**

Stable Isotope Results (^{18}O and $\delta\ ^{2}H$) City of Eden Valley

John Woodside | Hydrologist

Water Sampling Locations

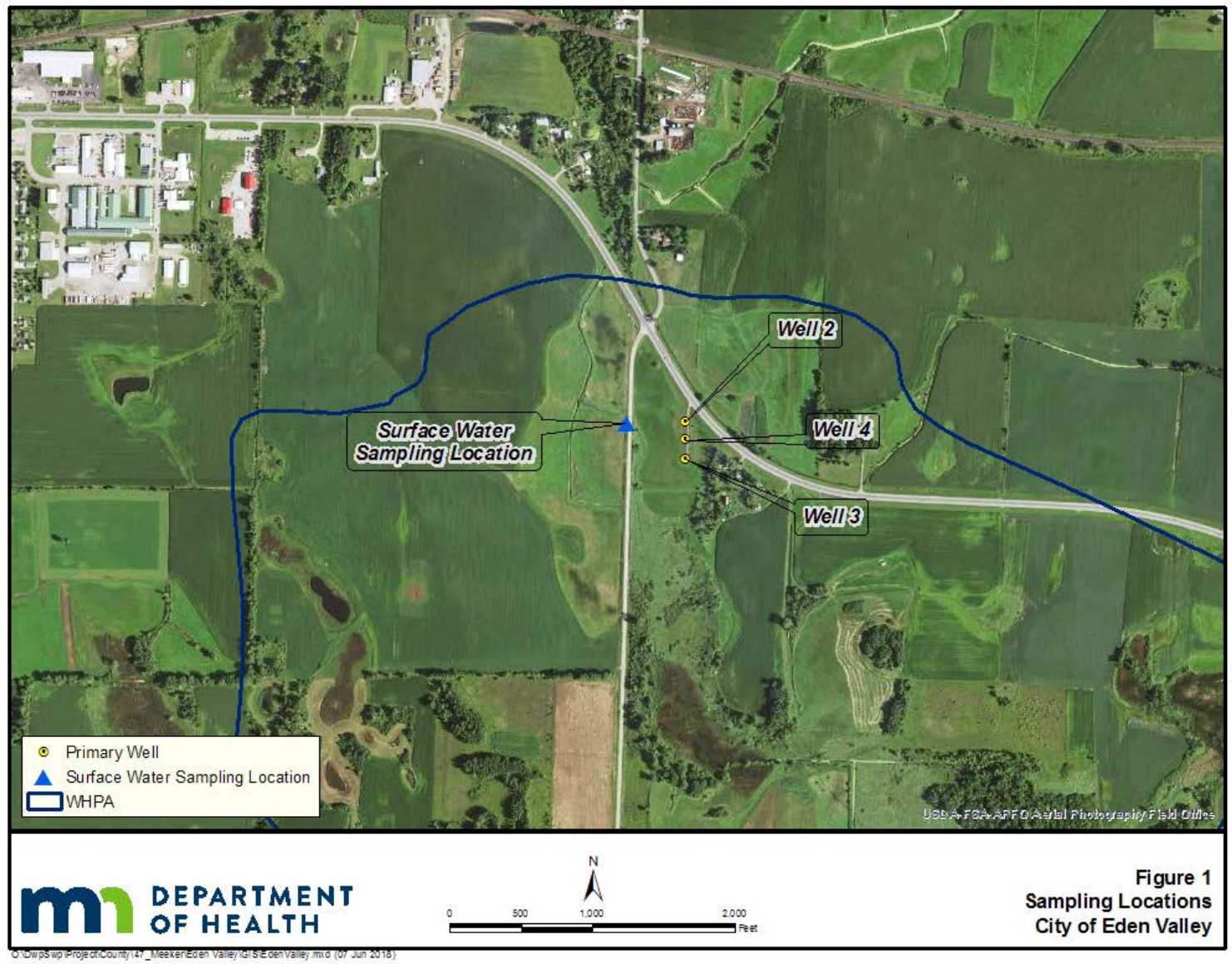
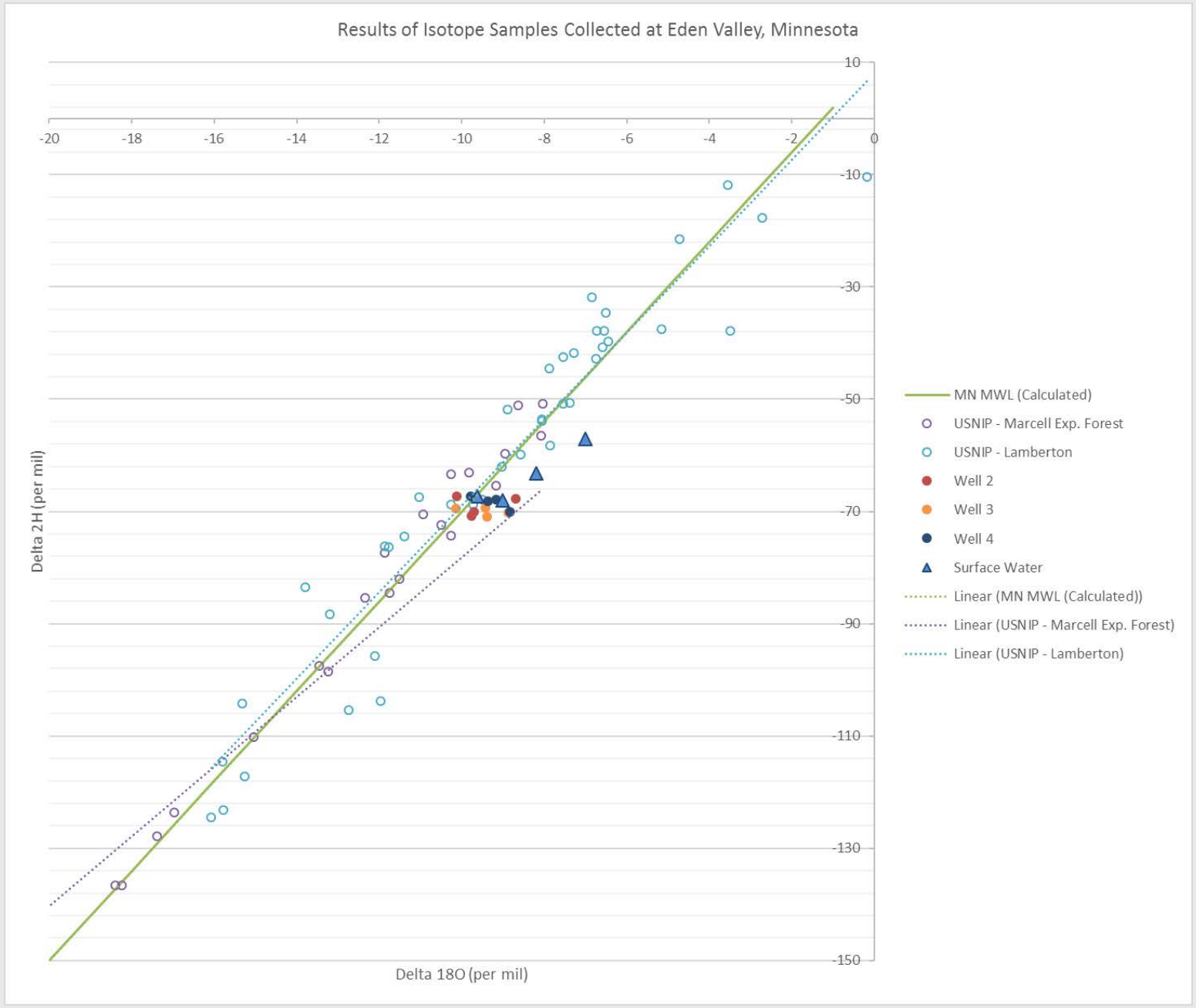
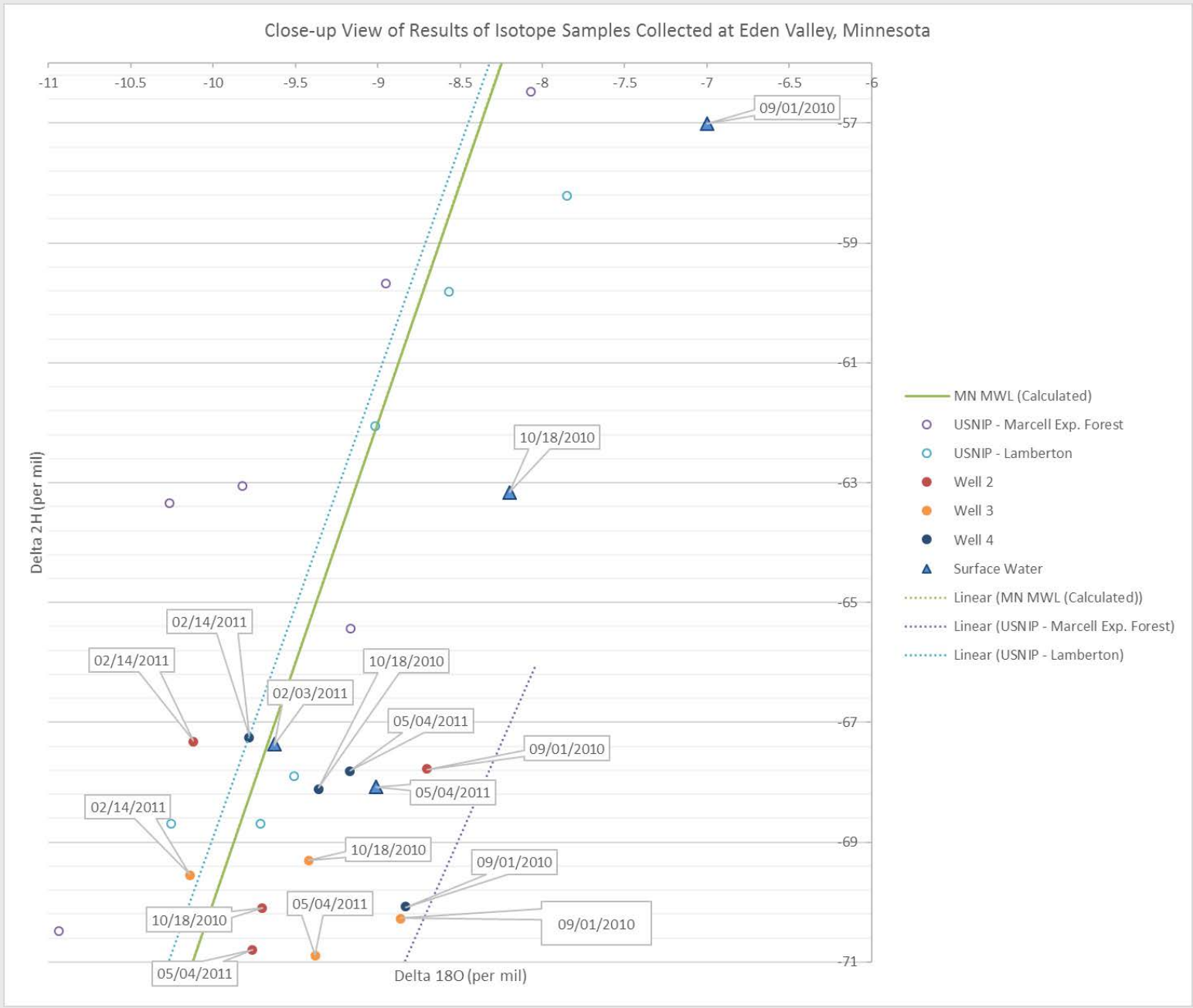


Figure 1
Sampling Locations
City of Eden Valley

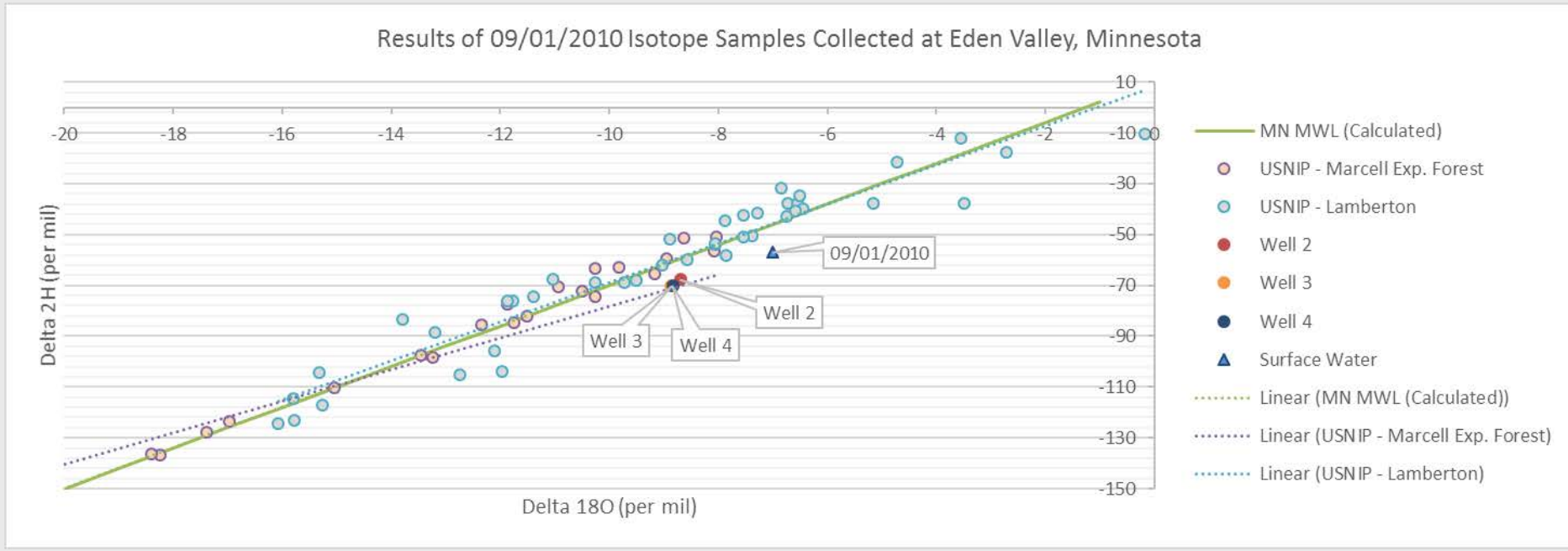
Isotope Results, All Samples
Eden Valley, MN

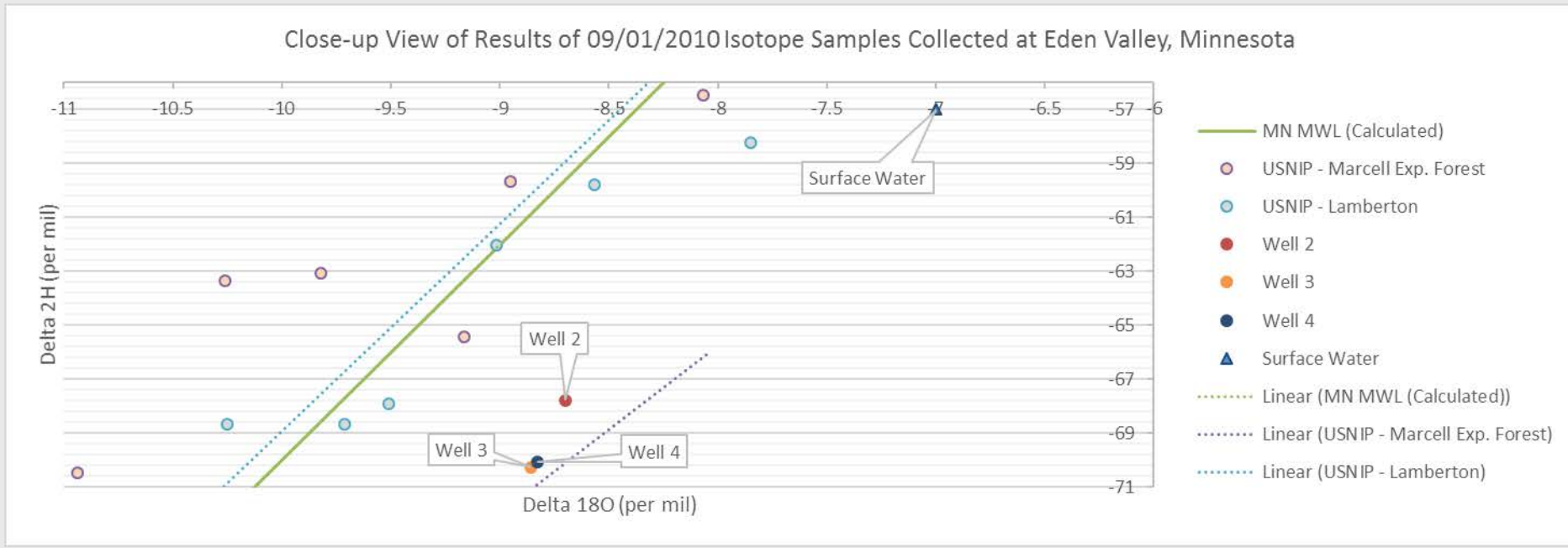


Isotope Results, Close-up View of all Samples
Eden Valley, MN

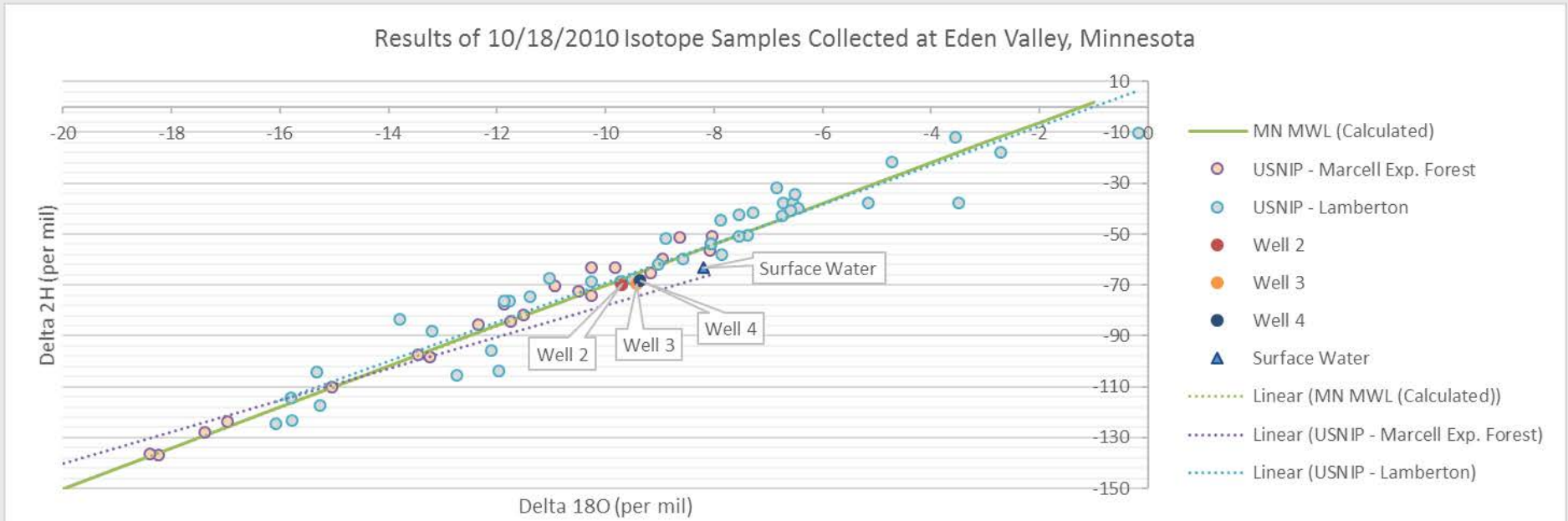


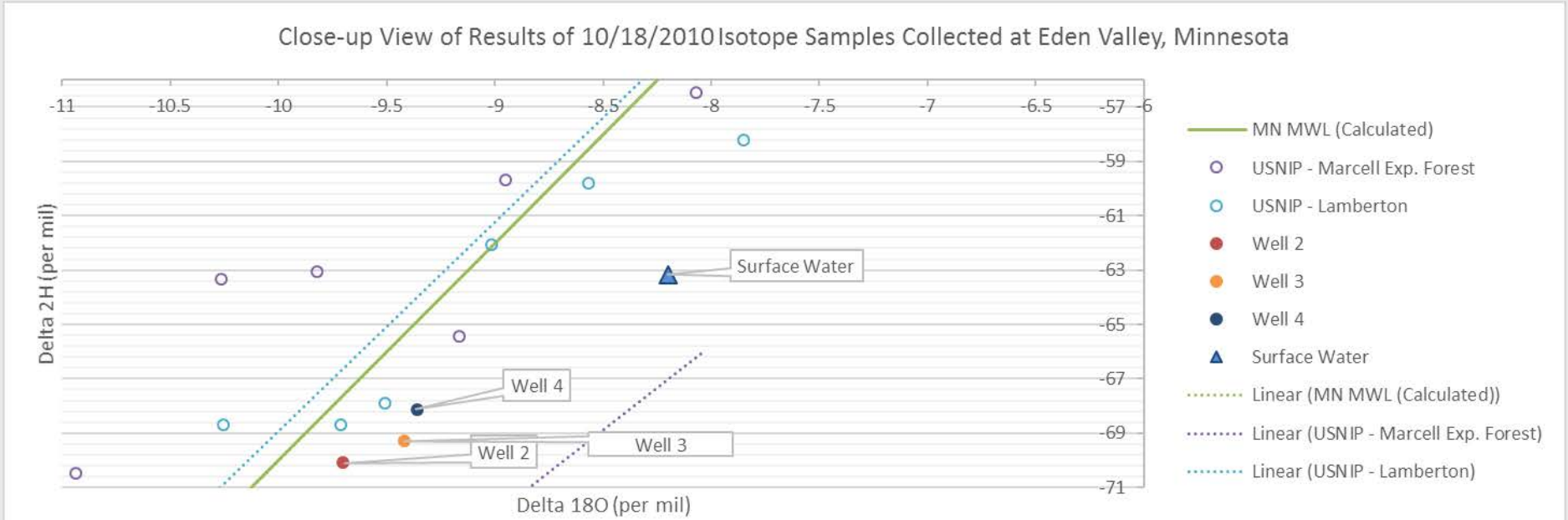
Isotope Results, September 1, 2010
Eden Valley, MN



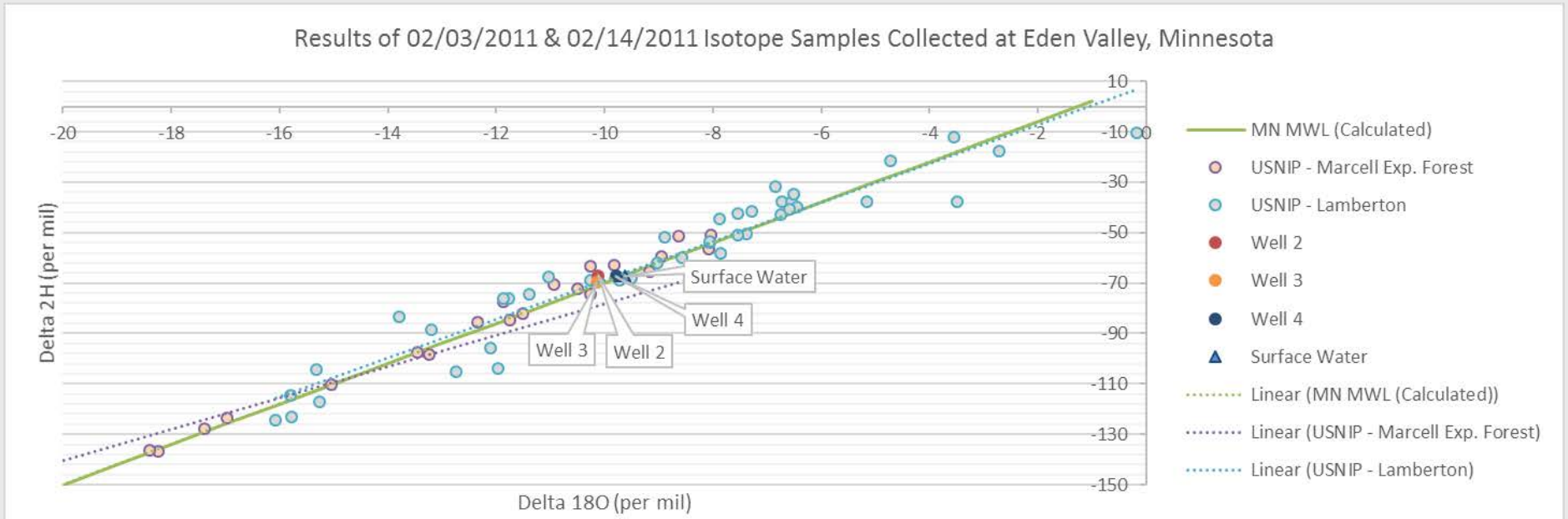


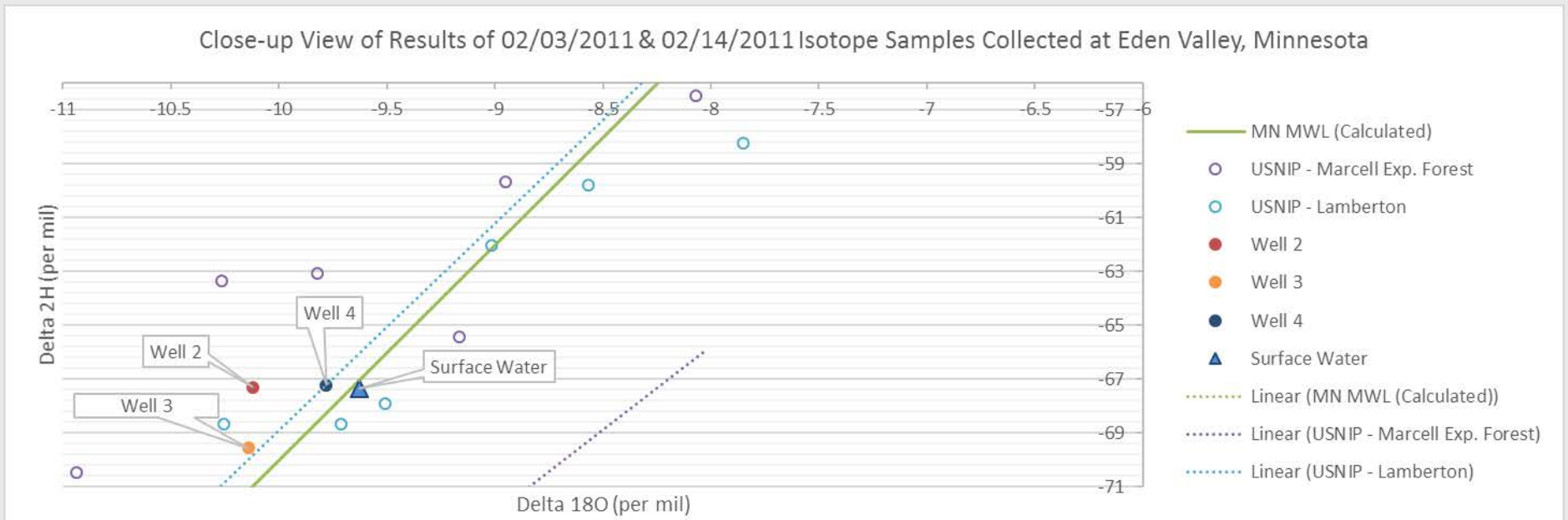
Isotope Results, October 18, 2010
Eden Valley, MN



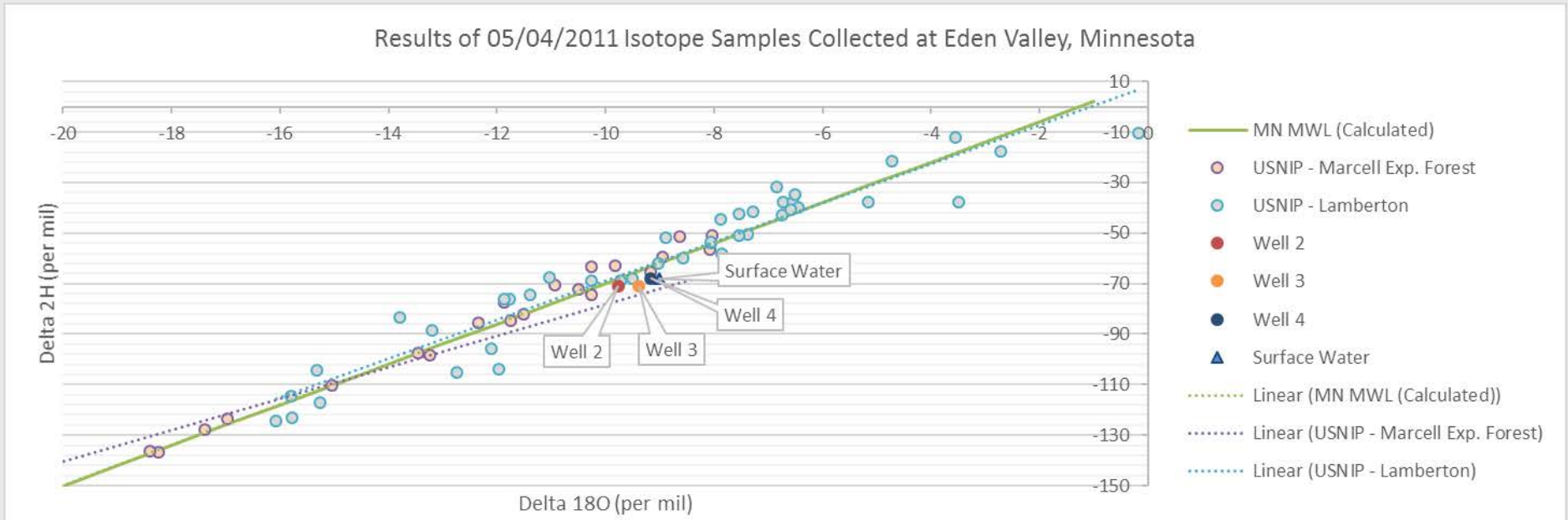


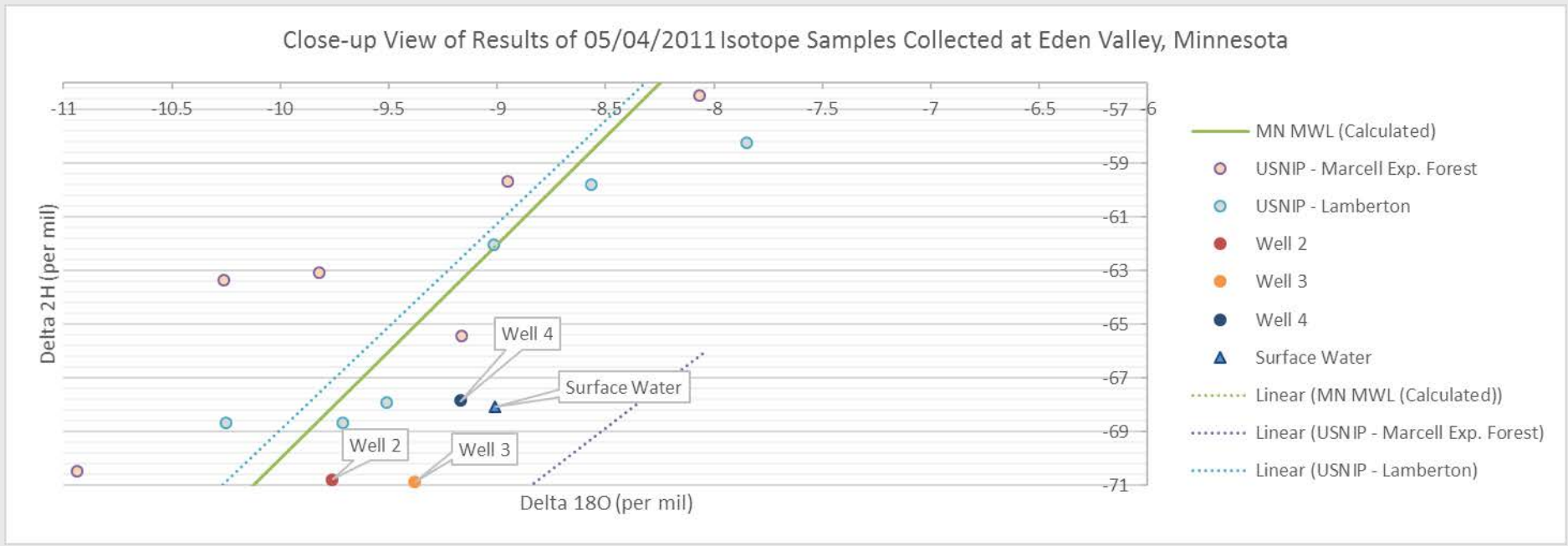
Isotope Results, February 3 & 14, 2011
Eden Valley, MN



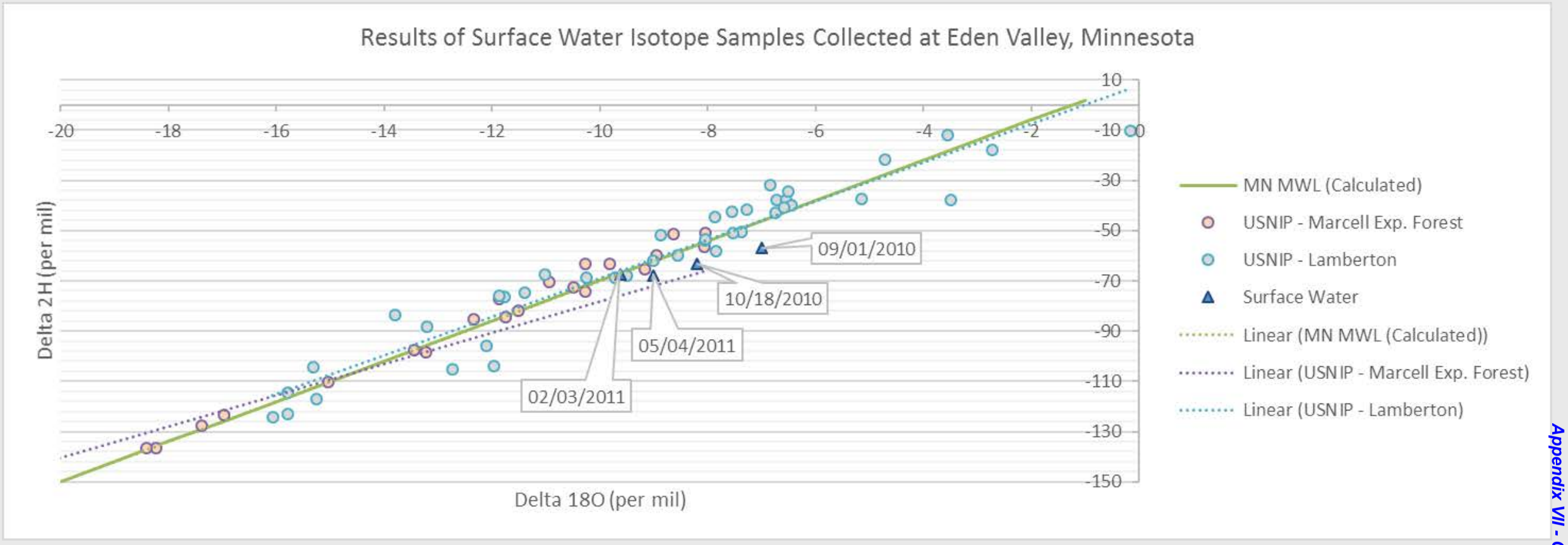


Isotope Results, May 4, 2011
Eden Valley, MN

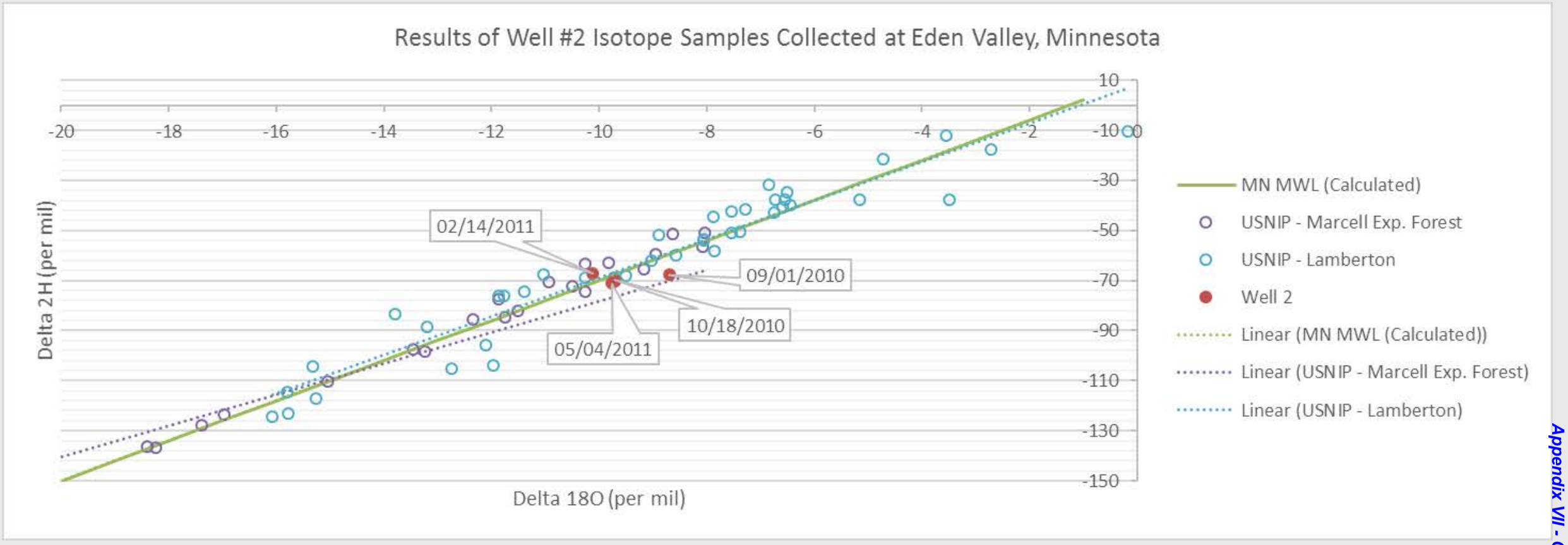




Isotope Results, Surface Water
Eden Valley, MN

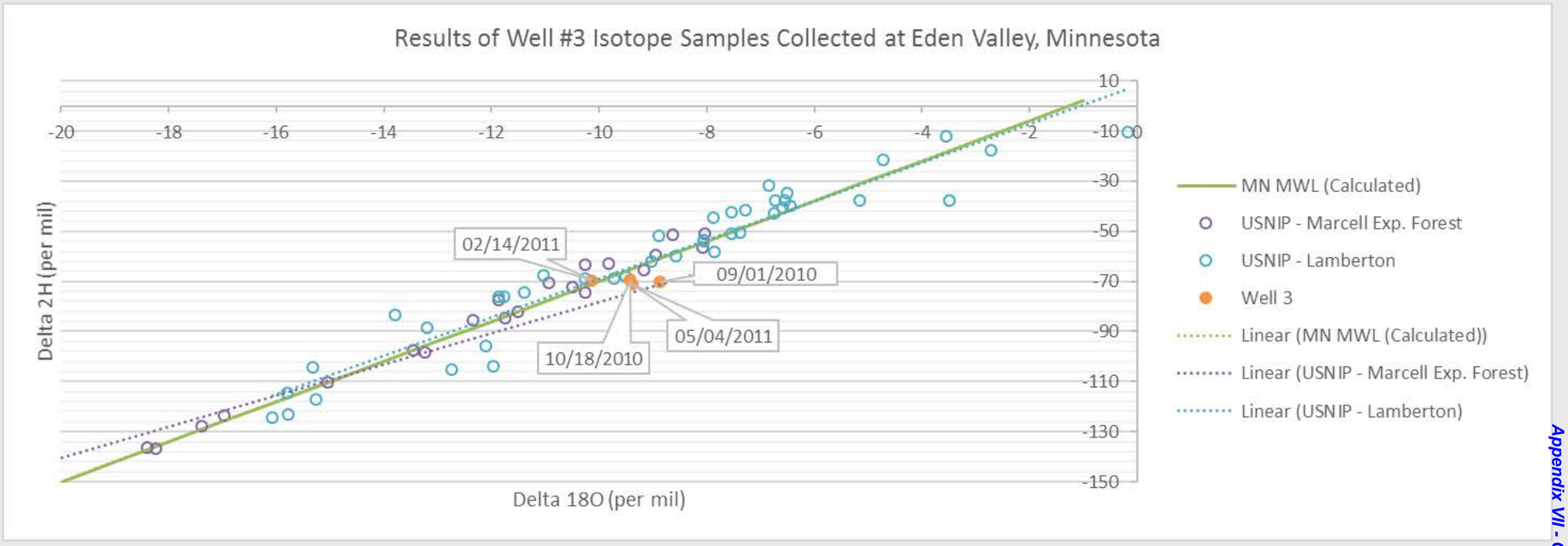


Isotope Results, Well #2
Eden Valley, MN



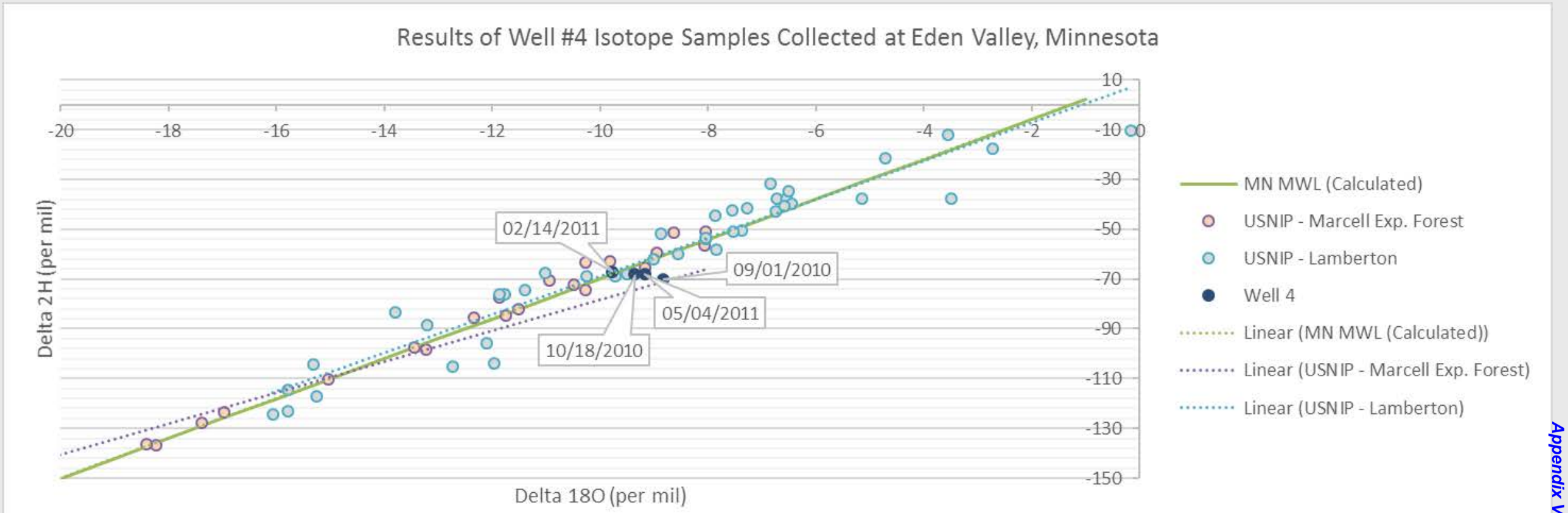
Appendix VII - City of Eden Valley

Isotope Results, Well #3
Eden Valley, MN



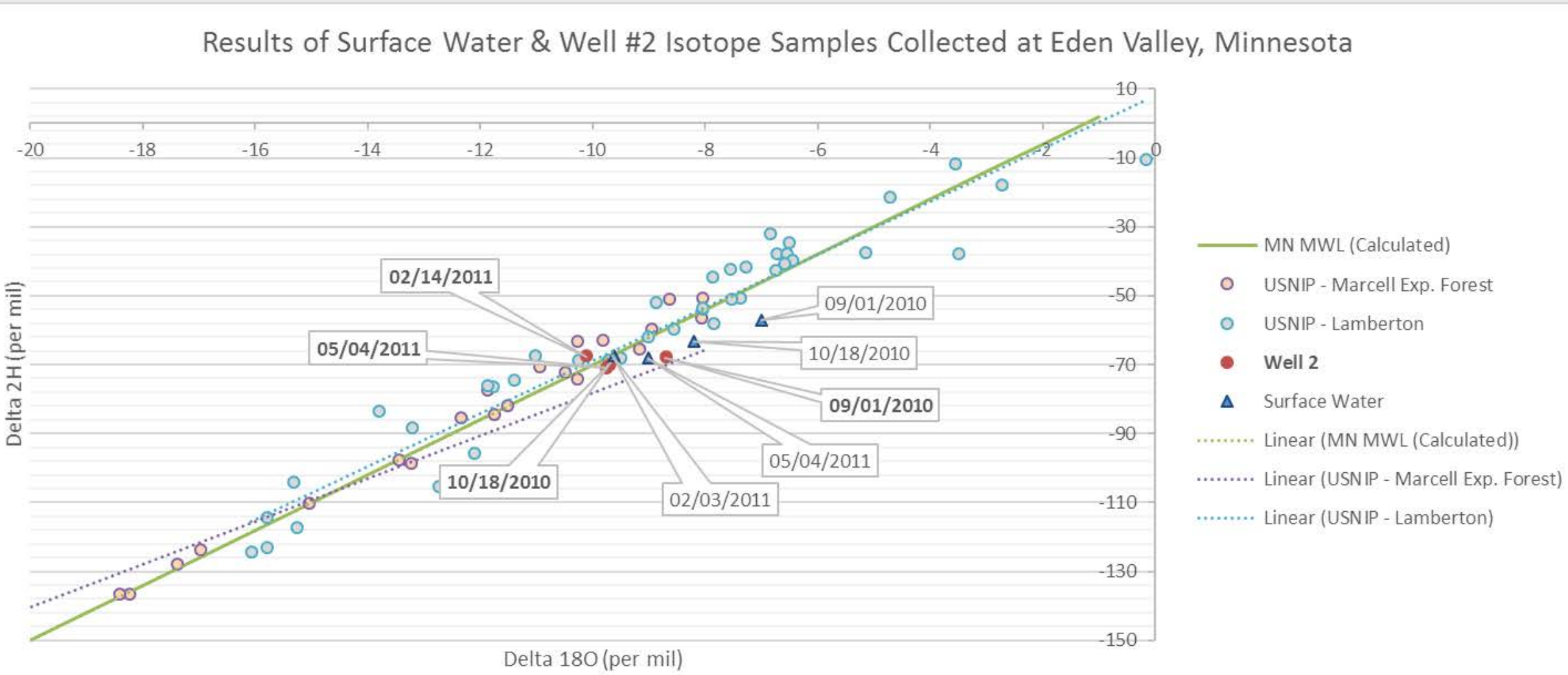
Appendix VII - City of Eden Valley

Isotope Results, Well #4
Eden Valley, MN



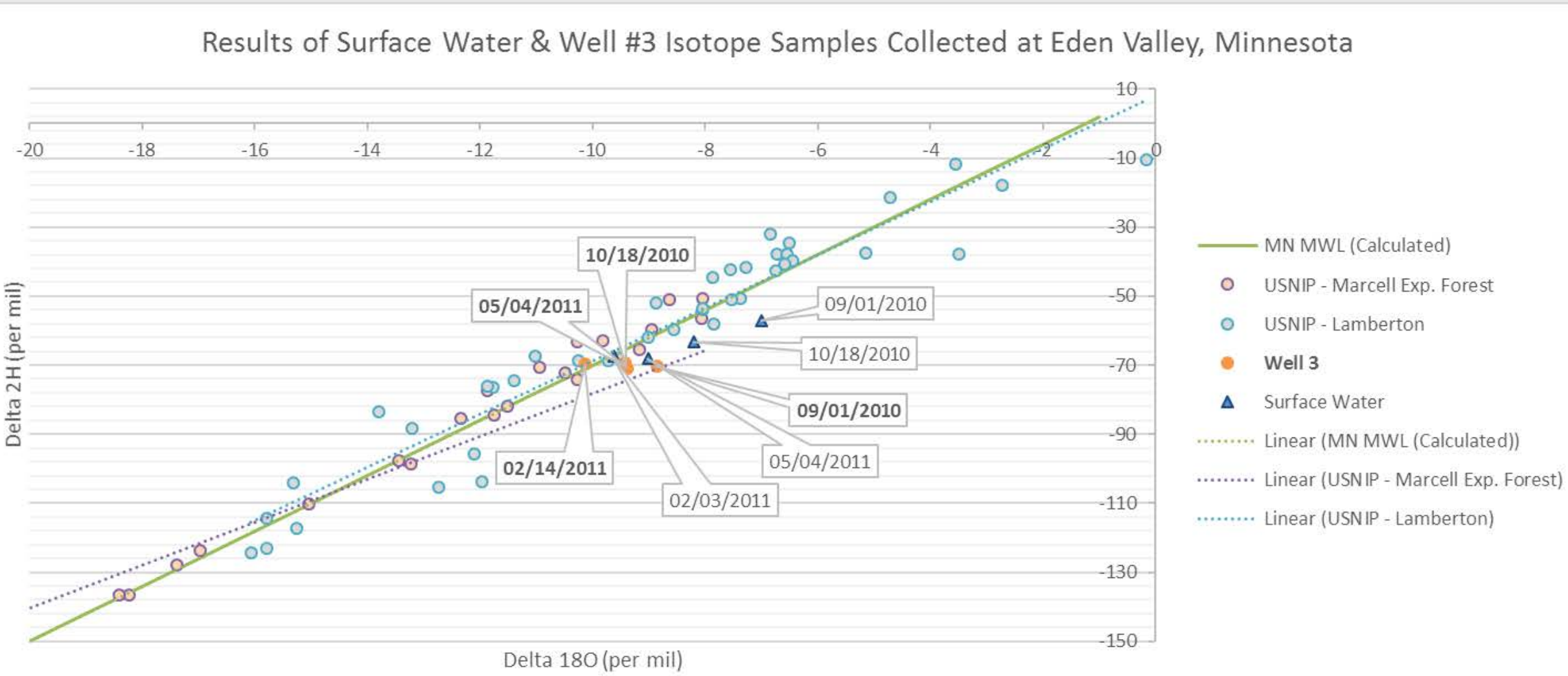
Appendix VII - City of Eden Valley

Isotope Results, Surface Water and Well #2
Eden Valley, MN



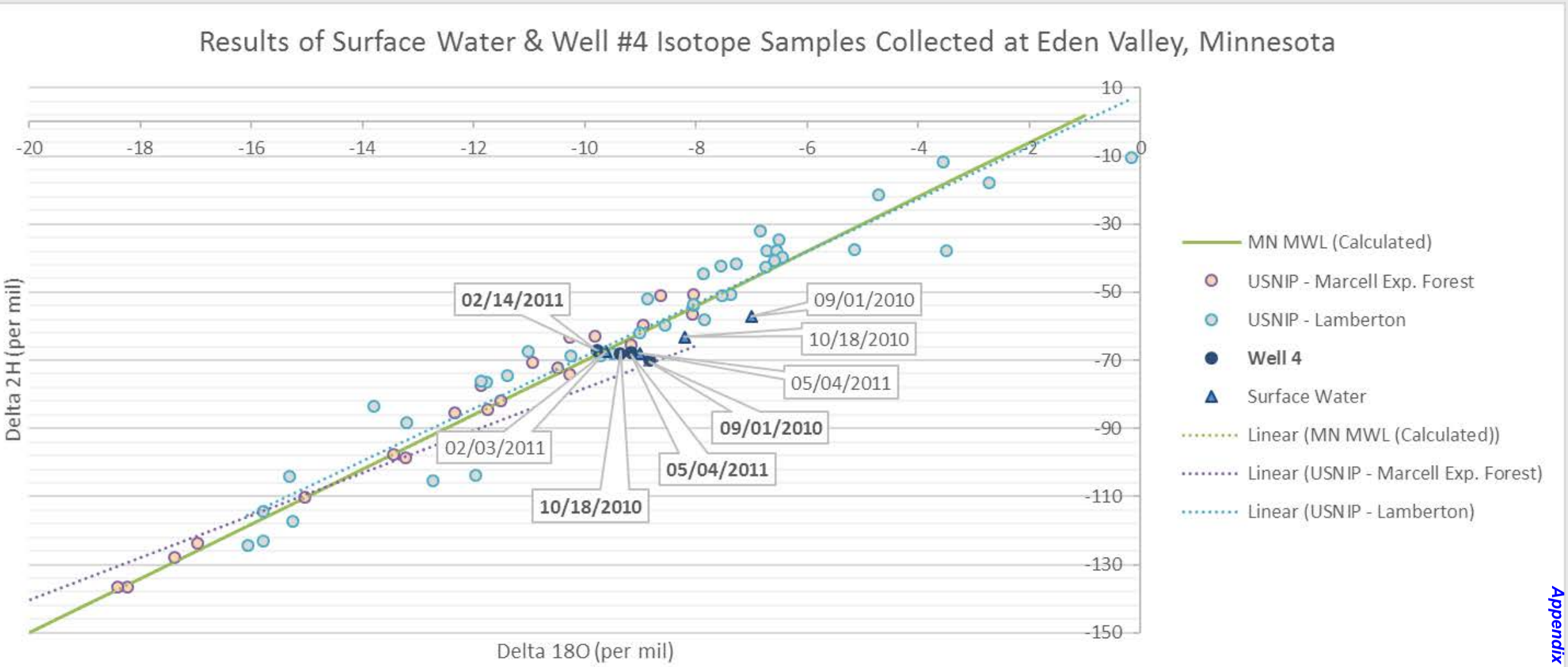
Appendix VII - City of Eden Valley

Isotope Results, Surface Water and Well #3
Eden Valley, MN



Appendix VII - City of Eden Valley

Isotope Results, Surface Water and Well #4 Eden Valley, MN



Appendix VII - City of Eden Valley

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 surface and subsurface areas surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in the wellhead protection plan. (Minnesota Rules, part 4720.5100, subpart 13). This area is delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection area boundaries as closely as possible.

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.

Emergency Standby Well. A well that is pumped by a public water supply system only during emergencies, such as when an adequate water supply cannot be achieved because one or more primary or seasonal water supply wells cannot be used.

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.

Nonpoint Source Contamination. Refers to contamination of the drinking water aquifer that is caused by polluted runoff or pollution sources that cannot be attributed to a specifically defined origin, e.g., runoff from agricultural fields, feedlots, or urban areas.

Point Source Contamination. Refers to contamination of the drinking water aquifer that is attributed to pollution arising from a specifically defined origin, such as discharge from a leaking fuel tank, a solid waste disposal site, or an improperly constructed or sealed well.

Primary Water Supply Well. A well that is regularly pumped by a public water supply system to provide drinking water.

Seasonal Water Supply Well. A well that is only used to provide drinking water during certain times of the year, either when pumping demand cannot be met by the primary water supply well(s) or for a facility, such as a resort, that is closed to the public on a seasonal basis.

Vulnerability. Refers to the likelihood that one or more contaminants of human origin may enter either 1) a water supply well that is used by the public water supplier or 2) an aquifer that is a source of public drinking water.

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

WHP Plan Goal. An overall outcome of implementing the WHP plan, e.g., providing for a safe and adequate drinking water supply.

WHP Measure. A method adopted and implemented by a public water supplier to prevent contamination of a public water supply, and approved by the Minnesota Department of Health under Minnesota Rules, parts 4720.5110 to 4720.5590.

WHP Plan Objective. A capability needed to achieve one or more WHP goals, e.g., implementing WHP measures to address high priority potential contamination sources within 5 years.

CITY OF EDEN VALLEY WHPP AMENDMENT - IMPLEMENTATION SCHEDULE

Appendix IX - City of Eden Valley

NOTE: 1) For a complete description of each strategy, refer to the WHP Plan, Chapter 5. **2) Year 1 starts 60 days after final plan approval is received from MDH.**

STRATEGIES	Potential Grant Funded	On-going or As needed	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	COMPLETION DATE
MONITORING, DATA COLLECTION, AND ASSESSMENT:													
1 - Contact MDH Hydro - set up PWS well sampling.	X							X					
2 -Contact MDH Hydro - set up well and ditch monitoring.	X							X	X				
3 - Apply for grant for rainfall collection equipment.	X		X										
4 - Update Potential Contaminant Source Inventory as needed.	X	X											
5 - Work with MDH to identify old municipal wells and sealing status.	X				X								
WELL AND CONTAMINANT SOURCE MANAGEMENT:													
6 - Review and update IWMZ survey form with MDH/MRWA.	X							X					
7 - Monitor setbacks for new IWMZ uses.		X											
8 - Develop spill response plan (write grant to fund).	X			X									
9 - Map/Letter to MNDOT, Fire Department, City Street Department, County Emergency Mgmt., etc.	X		X										
10 - Work with MDH to assess mitigation options for potential flooding of city wellfields.	X				X								
11 - Gather information on wells without existing log. (Priority A area) Report to MDH	X		X	X	X								
12 - Apply for MDH grant to seal any abandoned and unused/unsealed wells in Priority A area.	X	X											
13 - Notify MDH of any known new wells drilled within Eden Valley area.	X	X											
14 - Provide well maintenance and sealing infor to all well owners in Priority A area. Website, etc.	X		X	X				X					
15 - Request SSTS information update from Meeker County.	X		X	X	X	X	X	X	X	X	X	X	
16 - Apply for funding to mitigate failing septic systems in Priority A area.	X	X											
17 - Send DWSMA map and letter to Septic System pumpers in Meeker and Stearns Counties.	X			X									
18 - Work with Meeker/Stearns SWCD to promote BMPs in priority inlets/outfalls. (write grant to fund)	X			X			X						
19 - Stormwater Guidance document to SRWD and Meeker County.	X			X									
20 - Lettter to SRWD requesting monitoring of ditch.	X		X					X					
21 - Leter to IsoNova.	X			X									
22 - Request inventory of feedlots from Meeker County.	X		X										
23 - Nutrient management, BMPs - work with partners (apply for grant to fund).	X					X							
EDUCATION AND OUTREACH:													
24 - Wellhead information on city websites (Eden Valley and Watkins) - apply for grant.	X		X	X			X						
25 - Participate in 1W1P implementation when feasible.	X	X											
26 - Community Youth Water Festival.	X		X	X	X	X	X	X	X	X	X	X	
27 - Distribute leak detection tablets when needed.	X	X											
LAND USE AND PLANNING													
28 - Incorporate into local Comprehensive Plan.	X		X										
29 - Letter to Meeker and SRWD requesting notification of re-zoning and/or permits.	X		X										
WHP COORDINATION, REPORTING, AND EVALUATION:													
30 - Meeting to review wellhead measures and plan implementation.			X		X		X		X		X		
31 - Maintain WHP folder.			X	X	X	X	X	X	X	X	X	X	
32 - Develop Spreadsheet for implementation.			X										
33 - Evaluation report every 2.5 years - to MDH in year 8.					X			X			X		