DRAFT

2020

City of Cosmos, MN
WELLHEAD PROTECTION PLAN



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CLEAN WATER LAND & LEGACY AMENDMENT

MN RURAL WATER ASSOCIATION

MINNESOTA MDH DEPARTMENT OF HEALTH

Introduction—

This document presents the wellhead protection (WHP) plan for the City of Cosmos that will help provide for an adequate and safe drinking water supply for community residents. It contains the following components:

- Assessment of the data elements used to prepare the plan;
- Delineation of the wellhead protection area;
- Delineation of the drinking water supply management area;
- Assessments of well and drinking water supply management area vulnerability;
- Impact of land and water use changes on the public water supply well used by the water supplier;
- Issues, problems, and opportunities affecting the wells, well water, and the drinking water supply management area;
- Wellhead protection goals for this plan;
- Objectives and plan of action for achieving the wellhead protection goals;
- Evaluation program for assessing the effectiveness of this plan; and
- Contingency strategy to address an interruption of the water supply.

Water Supply Wells Included in This Plan

Unique Number	Well Name or Number	Use/Status
222103	Well 3	Primary
764301	Well 4	Primary

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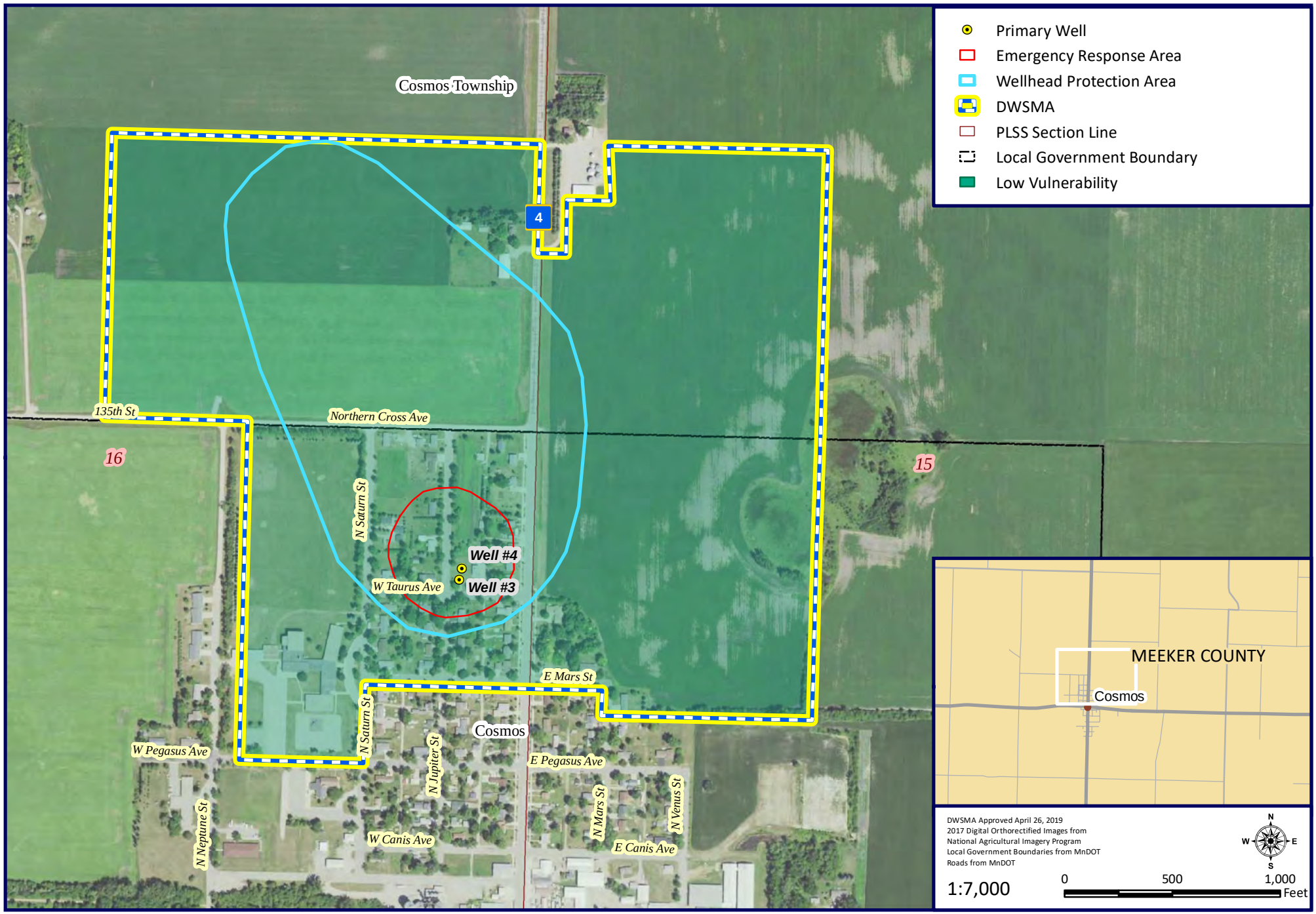
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Cosmos
Meeker County
Minnesota

Cosmos Drinking Water Supply Management Area (DWSMA) MN-01146 - Low Vulnerability

Figure 1

DEPARTMENT OF HEALTH



Chapter 1 - Introduction

1.1 Background

The wellhead protection (WHP) plan for the City of Cosmos was prepared in cooperation with the Minnesota Department of Health (MDH) and the Minnesota Rural Water Association. It contains specific actions that the city will take to fulfill WHP requirements that are specified under Minnesota Rules, part 4720.5100 to 4720.5590. Also, the support that Minnesota state agencies, federal agencies, Meeker County, and others will provide is presented to identify their roles in protecting the city's drinking water supply. The plan is effective for 10 years after the approval date specified by MDH and the city is responsible for implementing its WHP plan of action, as described in Chapter 9 (Table 8) of this report. Furthermore, the city will evaluate the status of plan implementation at least every two-and-one-half years to identify whether its WHP plan is being implemented on schedule.

1.2 Plan Appendices

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

- Appendix I contains information relating to the required data elements and the assessment of data elements. The data elements required to be assessed were indicated in the MDH scoping 2 document.
- Appendix II contains the delineation of the wellhead protection area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply wells and the DWSMA. This part of the plan is summarized in Chapter 3.
- Appendix III contains the inventory of potential contamination sources for the entire DWSMA and for the Inner Wellhead Management Zone. This inventory is discussed in Chapter 4 in terms of assigning risk to the city's water supply and is also discussed in Chapter 6, relating to issues, problems or opportunities.
- Appendix IV contains the contingency strategy to provide for an alternate water supply if there is a disruption caused by contamination or mechanical failure. This information is discussed in Chapter 11.

Chapter 2 - Identification and Assessment of the Data Elements Used to Prepare the Plan

The city met with representatives from MDH on two occasions to discuss required data elements that are specified in Minnesota Rules, part 4720.5400, for preparing a WHP plan. The first scoping meeting, held on November 20, 2017, addressed the data elements that were needed to support the delineation of the WHPA, the DWSMA, and the well and DWSMA vulnerability assessments. The second scoping meeting, held on May 20, 2019, discussed the data elements to be assessed for the purpose to 1) identify potential risks, and issues, problems and opportunities to the public water supply and 2) develop effective management strategies to protect the public water supply source. The results of each meeting were communicated to the city by MDH through a formal scoping decision notice.

Each data element identified in the Scoping 2 document is required to be assessed for its impact on 1) the use of the public water supply well, 2) delineation of the WHPA, 3) the quality and quantity of water supplying the public water supply wells, and 4) land and groundwater uses within the DWSMA. ***Presented in Appendix I is information about the availability of information regarding each required data element and the results of assessing each data element relative to the overall impact each data element may have on the four items listed above***.

The availability of the information relating to each data element that is used in this plan was assessed by the Minnesota Department of Health, MRWA technical staff, and the City of Cosmos. During the assessment process the City of Cosmos, Minnesota Department of Health and MRWA staff 1) reviewed the completeness of the information available relating to each data element that is used in this plan and 2) determined if a data element is considered an issue, concern or opportunity that the City of Cosmos can address in this plan.

The data elements specified by the MDH relating to the **physical environment** are considered sufficient to provide an adequate assessment. The Cosmos DWSMA is located in southwestern Meeker County, Minnesota. The city utilizes two primary wells (Well #3 and Well #4) that are constructed in a Quaternary Buried Artesian Aquifer (QBAA) and are protected from surface contaminants by a layer of clay-rich sediment. The city is not identified to be in a FEMA 100-year floodplain area, and no concerns or issues have been identified with these data elements.

The assessment of the data elements relating to **land use** identified the following:

- Most of the DWSMA is within the city of Cosmos jurisdiction, with a portion to the north being within Cosmos Township. Land use decisions in this area are regulated by Meeker County.
- The city of Cosmos has zoning designations and land use and utility ordinances which are adequate to protect the city's drinking water supply from contamination.
- The most prevalent land cover within the area of the DWSMA is urban residential or mixed and urban residential. The areas in the northern portion of the DWSMA and outside of the city's jurisdiction are designated as agricultural.
- The construction of homes within the DWSMA is anticipated to be very limited over the ten-year span for which this plan is in effect.

Finally, the data elements relating to **water quantity and quality** are considered sufficient to provide an adequate assessment. The city depends primarily on two wells (Well 3, Unique #222103), and Well 4, Unique #727301). The water quality has been excellent, and water quantity has been adequate for the city, to date. Consideration should be given, however, to potential impacts to the Cosmos water utility resulting from other high-capacity wells in the area.

Actions needed to address identified issues, concerns or opportunities as a result of the data element assessment process are included in the plan of action (Chapter 9). Not all of the data elements listed in the WHP rule were required to be addressed in the WHP plan because of the non-vulnerable nature of the city's source of drinking water.

Chapter 3 - Delineation of the Wellhead Protection Area, Drinking Water Supply Management Area and Vulnerability Assessments

A detailed description of the process used for 1) delineating the WHPA, Emergency Response Area (ERA) and the DWSMA, and 2) preparing the vulnerability assessments of the city water supply wells and DWSMA is presented in Appendix II. The City of Cosmos requested that MDH do this work and it was performed by John Woodside, P.G., Hydrologist, MDH who is a licensed geoscientist by the State of Minnesota.

3.1 WHPA and DWSMA Delineation

Figure 1 shows the boundaries of the WHPA, DWSMA, ERA and political boundaries. The WHPA was delineated using computer simulations of groundwater movement to generate the underground capture zones for city Wells 3 and 4. The ERA is considered to be the area capturing recharge depicting a 1 year time-of-travel of groundwater to the city's wells.

The DWSMA boundaries were designated using the following criteria:

- Center-lines of highways, streets, roads, or railroad right-of ways,
- Public Land Survey coordinates, and
- Property ownership (parcel) boundaries or fence lines.

3.2 Well Vulnerability Assessment

The construction and water quality obtained from the primary wells used by the city is included in the assessment of well vulnerability in the Part 1 report. The vulnerability of the city wells to contamination from human-caused activities is considered to be low, or non-vulnerable. While well #4 currently meets construction standards since documentation and past records indicate that it is adequately sealed into the borehole and does not pump water that contains human-caused contaminants there is no information for Well #3 related to grouting. There have been no indications, to date, that surface contaminants have entered the aquifer, based on water quality test results from both wells, which may indicate that Well #3 likely has adequate grouting.

3.3 DWSMA Vulnerability Assessment

The low vulnerability assigned to the DWSMA (Figure 1) was determined using geologic, soils, and groundwater chemistry information and indicates that at least 10 feet of clay-rich geological material covers the source water aquifer.

Chapter 4 - Establishing Priorities and Assigning Risk to Potential Contamination Sources

The low vulnerability determination for the DWSMA results in a focus for the potential contaminant source inventory of wells greater than 300 feet in depth of the open interval or screened section of the well and wells of undocumented or unknown depths, other types of boreholes or excavations that may reach the aquifer, and certain types of Environmental Protection Agency Class V Wells.

4.1 Contaminants of Concern

None of the human-caused contaminants regulated under the federal Safe Drinking Water Act have been detected at levels indicating that any well itself serves to draw contaminants into the aquifer as a result of pumping.

4.2 Inventory Results and Risk Assessment

A thorough search for wells of the above description was completed by referencing information from the Minnesota Well Index (MWI), MDH public well disclosure database, MDH Old Municipal Well (OMW) Inventory report, and city records/local knowledge. To the best of the WHP team's knowledge, only one other well in addition to the city's own municipal wells #3 and #4 is confirmed to be present in the DWSMA that meet the description required (greater than 198 feet in depth, or of unknown depth). A map and full inventory of potential contaminants is presented in Appendix III.

The WHP Team's review of the OMW report from MDH raised a number of issues that the group felt would be best further investigated after the WHP plan approval. Questions related to the Old Well #1 and #2 sealing, test well sealing, a creamery well that was at one time interconnected with the city's utility system, and the existence of a railroad depot well all require further data gathering. All information related to these wells is of concern because the wells have a higher likelihood of being deeper wells. If they are left abandoned, improperly sealed, unsealed altogether, there is potential for surface contaminants to enter the groundwater aquifer. A summary of the WHP Team's OMW investigation findings, to date, can be found with other Potential Contaminant Source Inventory (PCSI) information in Appendix III.

The WHP team was also required to determine locations of potential Class V wells within the protection area, at request of the USEPA Region 5. After consulting EPA records and local knowledge, no such wells are thought to be located in the protection area.

Table 1 - Potential Contamination Sources and Assigned Risk for DWSMA

Potential Source Type	Total Number	Number Within Emergency Response Area and Level of Risk		Number Within Remainder of the DWSMA and Level of Risk	
Municipal Well (active, in service)	2	2	H	--	--
Wells >300 feet deep, or of unknown depth	1	0	--	1	L
Class V Well	0	0	--	0	--

Land use within the DWSMA (Table 2) consists mostly of cultivated land, urban residential and industrial with a small amount of grassland, deciduous forest and farmsteads. A map depicting the land cover can be seen in Figure 2.

Table 2 – Land Use Within DWSMA

Land Use	Acres	Percent
Cultivated Land	123	69
Urban and Industrial	45	25
Grassland	6	3
Deciduous Forest	1	1
Farmsteads and Rural Residence	3	2
Total Acres	**178**	

The current land cover appears to coincide with the designated zoned use of the properties within the DWSMA (refer to Cosmos Zoning Map, Figure 3 and Meeker County Zoning Map, Figure 4). Furthermore, the Meeker County Comprehensive Land Use Plan to 2030 predicts very little population growth or changes within the City of Cosmos (refer to Meeker County Comprehensive Future Land Use Map, Figure 5).

The areas 200 feet around city wells 3 and 4, or the Inner Wellhead Management Zone (IWMZ) were also surveyed to determine whether there are potential sources of contamination that may cause acute health effects. The surveys are included in Appendix III, and document that there are municipal sanitary and storm water utility lines, and a water treatment backwash basin in these IWMZ areas. Wells #3 and #4 are also within each-others' IWMZ's. All utility infrastructure in the IWMZ's are located such that they meet set back distances from wells identified in the Minnesota Well Code regulations. Also, these utility infrastructure components would not generally be considered problematic relative to the city's drinking water quality due to the protected nature of the aquifer that the city utilized for drinking water provided that they and the city's wells remain in good repair. The highest priority for city action in the IWMZ areas will be to maintain the utility infrastructure in good condition to prevent leaking contaminants into the area in close proximity to the wells.

Chapter 5 - Impact of Land and Water Use Changes on the Public Water Supply Well(s)

Changes to the physical environment, land use, surface water, and groundwater that may occur over the 10-year period that the WHP plan is in effect are indicated in Table 3 as well as 1) the influence that existing governmental land and water programs and regulations may have on the anticipated change, and 2) administrative, technical, and financial considerations of the city of Cosmos and property owners within the DWSMA.

Table 3 - Expected Land and Water Use Changes

Expected Change (Physical Environment, Land Use, Surface Water, Groundwater)	Impact of the Expected Change On the Source Water Aquifer	Influence of Existing Government Programs and Regulations on the Expected Change	Administrative, Technical, and Financial Considerations Due to the Expected Change
Physical Environment: No changes anticipated.	Does Not Apply	Does Not Apply	Does Not Apply
Land Use: (1) Additional wells constructed in or near the city's DWSMA (though somewhat unlikely) may have the ability to impact the city's wells.	(1)The newly constructed wells may impact the static water level of the aquifer, or may influence the direction of ground water flow resulting in alterations of the city's WHPA and/or DWSMA.	(1) The MDH Well Management Unit and MNDNR Water Appropriations Unit commonly work cooperatively to determine the impacts of proposed high capacity wells on WHP areas and existing municipal wells.	(1) The city should remain in contact with the MDH and DNR to discuss impacts of high capacity wells proposed for construction in the DWSMA, or within 1 mile of the DWSMA boundary. There may be additional administrative, technical, or financial considerations resulting from impacts from other high-capacity wells.
(2) The DWSMA does not fall entirely within the jurisdiction of the city of Cosmos.	(2) The Cosmos city staff will need to work cooperatively with other entities who have land use authorities within the DWSMA.	(2) While the DWSMA is within a portion of Cosmos Township, Meeker County enforces land use controls within this area.	(2) The city will work to improve communication with Cosmos Township and Meeker County, specifically related to land use issues that may impact the city's groundwater quality.
(3) Land use within the DWSMA may change from its current use.	(3) The most probable land use changes to occur within the DWSMA would be going from current use to residential housing. This land use is a less intensive land use than many other possibilities from a groundwater protection perspective.	(3) Property within the DWSMA that changes land use would most likely be converted to residential use, if any changes at all occur during the life of this plan. The city has adequate ordinances to address issues that may arise during development, and municipal utilities have already been extended, to a degree, so that it may be possible for connection.	(3) The city feels that it currently has adequate land use controls through its zoning ordinance to direct land use changes in the DWSMA to reduce risk of contamination to the city's drinking water aquifer. No additional costs should be associated with this concern because the activities fall within the established policies and procedures currently observed by city staff. No additional administrative or technical considerations are necessary at this time.
Surface Water: No changes anticipated.	Does Not Apply	Does Not Apply	Does Not Apply
Groundwater: A small number of residential housing units may be constructed within the DWSMA in the future.	Additional residential housing units and drinking water system users will increase demand on the city's municipal drinking water supply.	The city's existing zoning ordinance and utility ordinance are adequate and increase the likelihood that these properties will be connected to the city's municipal utility system, if feasible.	The city's existing municipal utility infrastructure may support the connection of the additional residential properties. Current water treatment and water storage are adequate to support the limited growth expected over the next 10 years.

Chapter 6 - Issues, Problems, and Opportunities

6.1 Identification of Issues, Problems and Opportunities

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

6.2 Comments Received

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

(INCLUDE INFORMATION AND DISCUSSION FROM PUBLIC MEETINGS INPUT HERE

Table 4- Issues, Problems, and Opportunities

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
(1) The potential exists for wells to be constructed in the vicinity of the DWSMA that pump water from the same aquifer as the city's wells (wells greater than 198 feet in depth).	Aquifer DWSMA	The City has no authority over the construction and pumping rates for newly constructed high capacity wells. Also, these wells may alter the WHPA boundary and provide a pathway for pollutants to enter into the aquifer.	The City will need to work closely with the MDH SWP Unit and the DNR-Waters Unit in the identification of new high capacity wells which might be drilled within the DWSMA or 1 mile of the DWSMA boundaries and their potential impact on the WHPA boundaries.	Current local and state rules are considered adequate insofar as allowing private wells to be constructed according to construction codes and setbacks. But, state rules do not consider drinking water wells as a land use and therefore, well ownership and usage cannot be controlled by a LGU.
(2) There may be land use changes within the DWSMA.	Aquifer	Properties developed in the DWSMA will likely be connected to city utilities, which will increase the treated water demand.	The capacity of the water system is adequate to service the anticipated additional residences, however, water conservation measures are perceived to be helpful to reduce demand and treatment costs.	The conversion of land in the DWSMA to residential use is not likely to result in increased risk of contamination for the city's drinking water wells. The system is currently able to meet the projected increased demand, but the promotion of conservation measures is desirable.
(3) There may be unused/unsealed wells in the DWSMA. Other unused/unsealed wells may also be discovered within the DWSMA.	Aquifer Water Quality DWSMA	The city will focus on the search for unused and unsealed wells in the DWSMA. When these wells are found, an assessment of the risk to the municipal drinking water wells and aquifers should be completed based upon the depth, construction, and state of repair of the well.	The city can partner with Meeker County and/or the MN Department of Health grant programs to help fund the costs of properly sealing unused wells. The Meeker County Water Management Plan may include language that states the County's intention to work cooperatively with other entities that are pursuing the sealing of unused/unsealed wells, and may have funding available to assist with the sealing costs.	The city does not have authority to require that unused/unsealed wells be sealed. This authority resides solely with the MDH. Sealing and searching for unused/unsealed wells may become a demand on city staff time and financial resources. The city can promote well sealing by assisting property owners with securing grant funds to provide financial assistance with well sealing activities.
(4) There is little geologic or hydrological data available for the area surrounding the city of Cosmos.	Aquifer DWSMA	The delineation of the recharge area for the city's wells was based on existing regional data, and not specific to the city of Cosmos.	Opportunities specifically related to the verification of new well construction within 1 mile of the DWSMA, additional water quality testing, and collecting aquifer test data from one or both of the city's wells would be useful.	The city performs routine maintenance on the wells and water system, but lacks staff time and resources to perform an aquifer pump test, or spend considerable time verifying wells outside the DWSMA. A SWP grant may be utilized to facilitate the collection of hydrological data.

Table 4- Issues, Problems, and Opportunities--CONTINUED

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
(5) The construction information for municipal Well #3 is incomplete and further information is needed related to well grouting.	Aquifer Water Quality	There is no available information related to the grouting of Well #3 at the time of construction. Lack of adequate grout, or improper well construction can increase the risk of contamination of the water supplied to the well.	The city gather additional information and data related to the construction of municipal Well #3 at the next convenient opportunity and have the well evaluated by a licensed well contractor.	The city performs routine maintenance on the city's municipal wells and can explore the possibility of utilizing funds from a SWP grant for additional data collection efforts.
(6) The city would like to increase groundwater and water conservation public educational efforts.	Water Quality Water Quantity	A lack of information provided to property owners within the DWSMA and within the utility service area is missing an opportunity to change behaviors that can lead to less pumping pressure on the aquifer and awareness about the connection between land use and drinking water contamination.	The city can provide educational materials related to water conservation and groundwater protection via different avenues to property owners within the DWSMA and the city's utility service area. There are numerous sources for educational materials on a variety of topics that are available for the city's use.	The city can provide public educational materials to the public via its website, or other effective avenues. If necessary, the city can apply for a SWP grant to assist with funding educational efforts above what the city already provides.

Chapter 7 - Existing Authority and Support Provided by Local, State, and Federal Governments

In addition to its own controls, the city of Cosmos will rely upon partnerships formed with local units of government, state agencies, and federal agencies with regulatory controls or resource management programs to help implement its WHP plan.

7.1 Existing Controls and Programs of the City of Cosmos

Table 5 shows the legal controls for the management of potential contamination sources within the DWSMA.

Table 5 - Controls and Programs of the Public Water Supplier

Type of Control	Program Description
Land Use Zoning Ordinance	Provides an opportunity to require performance standards to offset potential risk posed by a land use.
Utility Ordinance	Provides the city authority to regulate the connection to- and use of- city's water and waste water utility.

7.2 Local Government Controls and Programs

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

Table 6 - Local Agency Controls and Programs

Government Unit	Name of Control/Program	Program Description
Meeker County	(1) Emergency Management	(1) Directs the response and the extent of initial clean-up of fuel, chemical, or other hazardous substances that are released due to transportation accidents.
	(2) Land Use, Comprehensive Planning	(2) A public process that defines goals and objectives to achieve the county's vision. Land use plans and zoning maps, when consistent with a comprehensive plan, can protect the health, welfare and safety of community residents. The Meeker County 2030 Comprehensive Plan is found at: http://www.co.meeker.mn.us/DocumentCenter/View/187/Comprehensive-Land-Use-Plan-Chapter-1-3-PDF
	(3) Local Water Planning	(3) Establishes countywide goals and priorities towards protecting water resources and administers a cost share program for implementation of water protection activities. The 2013 – 2023 Meeker County Comprehensive Local Water Plan is found at: http://www.co.meeker.mn.us/DocumentCenter/View/238/Meeker-County-Comprehensive-Water-Plan-PDF
	(4) Soil and Water Conservation District	(4) Comprehensive plan to direct the SWCD Board of Supervisors in effective planning and to prepare a program plan for the accomplishment of its duties in dealing with soil and water management.
Mid-Minnesota Development Commission (MMDC)	Assistance with local planning activities	Provides technical assistance to government, businesses and local organizations; administer state and federal programs, and coordinate multi-jurisdictional activities in order to facilitate cooperative efforts between local units of government in Meeker, Kandiyohi, Renville and McLeod Counties.

7.3 State Agency and Federal Agency Support

MDH will serve as the contact for enlisting the support of other state agencies on a case-by-case basis regarding technical or regulatory support that may be applied to the management of potential contamination sources. Participation by other state agencies and the federal government is based on legal authority granted to them and resource availability. Furthermore, MDH 1) administers state regulations that affect specific potential sources of contamination and 2) can provide technical assistance to property owners to comply with these regulations.
The following table (Table 7) identifies the specific regulatory programs or technical assistance that state and federal agencies may provide to the city of Cosmos to support implementation of the WHP plan. It is likely that other opportunities for assistance may be available over the 10-year period that the plan is in effect due to changes in legal authority or increases in funding granted to state and

federal agencies. Therefore, the table references opportunities available when the city's WHP plan was first approved by MDH.

Table 7 - State and Federal Agency Controls and Programs

Government Unit	Type of Program	Program Description
MDH	State Well Code (Minnesota Rules, Chapter 4725)	MDH has authority over the construction of new wells and the sealing of wells. MDH staff in the Well Management Program offer technical assistance for enforcing well construction codes, maintaining setback distances for certain contamination sources, and well sealing.
MDH	Wellhead Protection Program (Minnesota Rules, part 4720.5100 to 4720.5590)	MDH has staff that will help the city identify technical or financial support that other governmental agencies can provide to assist with managing potential contamination sources.
DNR	Water appropriation permitting (Minnesota Rules, Chapter 6115)	DNR can require that anyone requesting an increase in existing permitted appropriations, or to pump groundwater, must address concerns regarding the impacts to drinking water if these concerns are included in a WHP plan.
U.S. EPA Region 5	Class V Injection Well Program (40 Code of Federal Regulations 144, Subpart G)	Automatic closure of Class 5 automotive waste disposal wells in WHPA, inventory of all Class V wells, regulatory authority (permitting) of large-capacity septic systems serving 2 or more households, or 20 or more people per day.

7.4 Support Provided by Nonprofit Organizations

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

Chapter 8 - Goals

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

A. ***To promote public health and economic stability by ensuring a potable drinking water supply for all residents of the community.***

B. ***Maintain the current level of drinking water quality which meets or exceeds all state and federal drinking water standards.***

C. ***Provide ongoing collection of data to support future wellhead protection efforts.***

Chapter 9 - Objectives and Plan of Action

Objectives provide the focus for ensuring that the goals of the WHP plan are met and that priority is given to specific actions that support multiple outcomes of plan implementation.

Both the objectives and the wellhead protection measures (actions) that support them are based on assessing 1) the data elements (Chapter 2 and Appendix I), 2) the potential contaminant source inventory (Chapter 4, Appendix III), 3) the impacts that changes in land and water use present (Chapter 5) and 4) issues, problems, and opportunities referenced to administrative, financial, and technical considerations (Chapter 6).

9.1 Objectives

The following objectives have been identified to support the goals of the WHP plan for the city of Cosmos:

1. Create public awareness and general knowledge about the importance of WHP for ensuring an adequate and safe drinking water supply;
2. Collect additional information that is needed to support management of potential contamination sources, assessment of the adequacy of management measures, and future update of the wellhead protection plan;
3. Serve as an example to others by effectively managing the potential contamination sources that the city of Cosmos owns or operates;
4. Develop capabilities with other governmental units to manage priority contamination sources that present the greatest risk to the community's drinking water supply;
5. Assess the effectiveness of the measures that are contained in the City's wellhead protection plan.

9.2 WHP Measures and Action Plan

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

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

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

9.3 Establishing Priorities

WHP measures reflect the administrative, financial, and technical requirements needed to address the risk to water quality or quantity presented by each type of potential contamination source. Not all of these measures can be implemented at the same time, so the WHP team assigned a priority to each. A number of factors must be considered when WHP action items are selected and prioritized (part 4720.5250, subpart 3):

- Contamination of the public water supply wells by substances that exceed federal drinking water standards.
- Quantifiable levels of contamination resulting from human activity.
- The location of potential contaminant sources relative to the wells.
- The number of each potential contaminant source identified and the nature of the potential contaminant associated with each source.
- The capability of the geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time needed to acquire cooperation from other agencies and cooperators.
- The resources needed, i.e., staff, money, time, legal, and technical resources.

The city of Cosmos defines a priority for implementing a WHP measure as an action that will have a substantial impact, either direct or indirect, on the reduction of the risk of contamination of the city's drinking water supply by human-caused activity. The following table lists each measure that will be implemented over the 10-year period that the city's WHP plan is in effect, including the priority assigned to each measure.

Table 8 - WHP Plan of Action

DATA COLLECTION:

Description	Objective	Priority	Responsible Party & Cooperators (if not the City)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (1): The city will continue to search for the existence of wells in the DWSMA by (1) remaining aware of local conditions, (2) reviewing and verifying available historical and property information (such as the Old Municipal Well Report from MDH), and (3) performing a search on the Minnesota Well Index (MWI) Online database. The MWI online application can be found at : **http://www.health.state.mn.us/divs/eh/cwi/**	2	H		Staff Time	●	●	●	●	●	●	●	●	●	●
WHP Measure (2): The city will continue to cooperate with the MDH in completing the Federal Safe Drinking Water Act testing requirements and review test results for indications of water quality degradation.	2, 3, 4	H	MDH	Staff Time	●	●	●	●	●	●	●	●	●	●
WHP Measure (3): The city will verify the locations of new wells constructed within 1 mile of the DWSMA. Consult the MWI online database or rely on local knowledge for new well construction information.	3	L		Staff Time			A S N E E D E D							
WHP Measure (4): City staff will contact the MDH hydrologist to coordinate the collection of water samples from the city's municipal wells for Tritium and other isotopic analysis at the discretion of the MDH hydrologist. The sampling is contingent on funding assistance from MDH for sampling and analysis, however the city may be asked to collect the samples and ship them to MDH.	2, 4	H	MDH	Staff time						●				
WHP Measure (5): If the opportunity presents, the city should contract for the completion of an aquifer pumping test using the city's municipal wells. Contact the MDH hydrologist when planning scheduled maintenance on the municipal wells to determine the desired parameters for the study. Evaluation of the grouting presence/condition for Well #3 can also be done at this same time.	2, 4	L	MDH	Staff Time & Study Costs	BASED ON OPPORTUNITY									

Table 7 - WHP Plan of Action - Continued

IWMZ MANAGEMENT:

Description	Objective	Priority	Responsible Party & Cooperators (if not the City)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (6): The city will request guidance from MDH/MRWA staff when new potential contaminant sources are proposed within the IWMZ to ensure that setback distances in the MN Well Code for new potential contamination sources are met.	3, 4	H	MDH/MRWA Planner	Staff Time	A	S		N	E	E	D	E	D	
WHP Measure (7): The city will implement measures that are specified in both the MDH sanitary survey report, Element #1 "Water Source" section and the IWMZ surveys as the city becomes aware of the information.	3	H		Staff Time/ Costs Unknown	A	S		N	E	E	D	E	D	
WHP Measure (8): City staff will assist with updating IWMZ potential contamination source inventory every 5 to 6 years, or as directed by MDH staff. Cooperate with MDH staff or MRWA planner**.**	3, 4	L	MDH or MRWA Staff	Staff Time			●					●		

Table 7 - WHP Plan of Action - Continued

LAND USE MANAGEMENT:

Description	Objective	Priority	Responsible Party & Cooperators (if not the city)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (9): The city will incorporate Wellhead Protection considerations into the city's land use planning and zoning process by: *posting a map of the DWSMA in the Council chambers; *continuing to enforce existing city ordinances requiring the connection to city utility infrastructure if the property is within a reasonable distance.	3	H		Staff Time	●	●	●	●	●	●	●	●	●	●
WHP Measure (10): The city will send a map of the Cosmos DWSMA along with a cover letter to the Meeker County Planning Department to request that consideration be given to the priorities of the Cosmos WHP plan when changes are proposed to land use in Cosmos Township that includes the DWSMA.	2, 4	H		Staff Time	●				●				●	

Table 7 - WHP Plan of Action - Continued

PUBLIC EDUCATION AND OUTREACH:

Description	Objective	Priority	Responsible Party & Cooperators (if not the city)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (11): The city will provide a brochure to the public with information that describes the goals and objectives of the city's WHP program. The brochure will be placed on the city's website, and copies will be kept for distribution at city hall. The city staff will contact MRWA staff to request the development of the brochure.	1	L	MRWA staff	Staff Time & Copying Costs		●								
WHP Measure (12): The city will provide a copy of the MDH publication, *The Well Owner's Handbook*, to property owners within the DWSMA who operate a well. Copies will also be kept for distribution at city hall. The publication is currently found at the following address and downloaded for printing: http://www.health.state.mn.us/divs/eh/wells/construction/handbook.pdf	1	L	MRWA staff	Staff Time & Copying Costs		●								
WHP Measure (13): The city will provide water conservation educational materials to the public by placing information on the city's website and provide copies of information at city hall.	1	L		Staff Time & Copying Costs		●								

Table 7 - WHP Plan of Action - Continued

POTENTIAL CONTAMINANT SOURCE MANAGEMENT:

Description	Objective	Priority	Responsible Party & Cooperators (if not the city)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (14): The city will work with property owners to identify the existence of and seal abandoned wells within the DWSMA. The city will evaluate potential funding sources to assist with the costs of sealing the well, and work with the property owner to complete the project.	3	H		Staff Time & Sealing Costs			AS NEEDED							
WHP Measure (15): The city will periodically update the PCSI data to include new information gained related to potential contaminant sources within the DWSMA.	3	L		Staff Time			●			●			●	

Table 7 - WHP Plan of Action - Continued

EVALUATION AND REPORTING:

Description	Objective	Priority	Responsible Party & Cooperators (if not the city)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (16): City staff will prepare an assessment of WHP plan implementation efforts a minimum of every 2.5 years. Contact MRWA or MDH planner for assistance with completion of this action.	**5**	L	MRWA or MDH Planner	Staff Time				●			●			●
WHP Measure (17): City staff will summarize all WHP plan implementation efforts in a report to MDH in the 7th year. Contact MRWA or MDH planner for assistance with completion of this action.	**5**	H	MRWA or MDH Planner	Staff Time								●		

Table 7 - WHP Plan of Action - Continued

WATER USE AND CONTINGENCY STRATEGY:

Description	Objective	Priority	Responsible Party & Cooperators (if not the city)	Cost	Implementation Time Frame									
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
WHP Measure (18): City staff will review and update the entire WHP Water Supply Contingency Plan every 5 years. Request assistance from MRWA planner or MDH planner.	**5**	X	MRWA/MDH Planner	Staff Time					●					●
WHP Measure (19): City staff will review and update the city and local contact sections of the WHP Water Supply Contingency Plan annually to reflect changes in city staff and the results of local elections.	**5**	X	MRWA/MDH Planner	Staff Time	●	●	●	●	●	●	●	●	●	●

Chapter 10 - Evaluation Program

Evaluation is used to support plan implementation and is required under Minnesota Rules, part 4720.5270, prior to amending the city's WHP plan. Plan evaluation is specified under Objective 5 and provides the mechanism for determining whether WHP action items are achieving the intended result or whether they need to be modified to address changing administrative, technical, or financial resource conditions within the DWSMA. The city has identified the following procedures that it will use to evaluate the success with implementing its WHP plan:

1. The WHP team will meet, at a minimum, every two-and-one-half years to assess the status of plan implementation and the results of each action item that has been taken to determine whether the action item has accomplished its purpose, or whether modification is needed. The WHP team will also identify issues that impact the implementation of action steps throughout the DWSMA. A briefing of the assessment results will be provided to the city council, and a copy of the report will be sent to MDH as documentation of implementation.
2. The city will prepare a written report that documents how it has assessed plan implementation and the action items that were carried out. The report will be presented to MDH at the first scoping meeting held with the city to begin amending the WHP plan.

Chapter 11 – Water Supply Contingency Plan

The WHP plan includes a Water Supply Contingency Plan that addresses disruption of the water supply caused by either contamination or mechanical failure. The plan was developed using a template provided by MDH. The Water Supply Contingency Plan is presented in Appendix IV of this plan.

Chapter 12 - 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.

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

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. Strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific, measurable, and have a defined completion date. They are more specific and outline the "who, what, when, where, and how" of reaching the goals.

Chapter 13 – References

Meeker County Local Comprehensive Water Plan (2013 - 2023):

http://www.co.meeker.mn.us/DocumentCenter/View/238/Meeker-County-Comprehensive-Water-Plan-PDF?bidId=

Meeker County Comprehensive Plan (2008):

http://www.co.meeker.mn.us/DocumentCenter/View/187/Comprehensive-Land-Use-Plan-Chapter-1-3-PDF

http://www.co.meeker.mn.us/DocumentCenter/View/188/Comprehensive-Land-Use-Plan-Chapter-4-5-PDF

http://www.co.meeker.mn.us/DocumentCenter/View/189/Comprehensive-Land-Use-Plan-Chapter-6-9-PDF

Chapter 14 – FIGURES

Figure 1—Map of DWSMA and Political Boundaries

Figure 2—DWSMA Land Cover Map

Figure 3—City of Cosmos Zoning Map

Figure 4—Meeker County Zoning Map

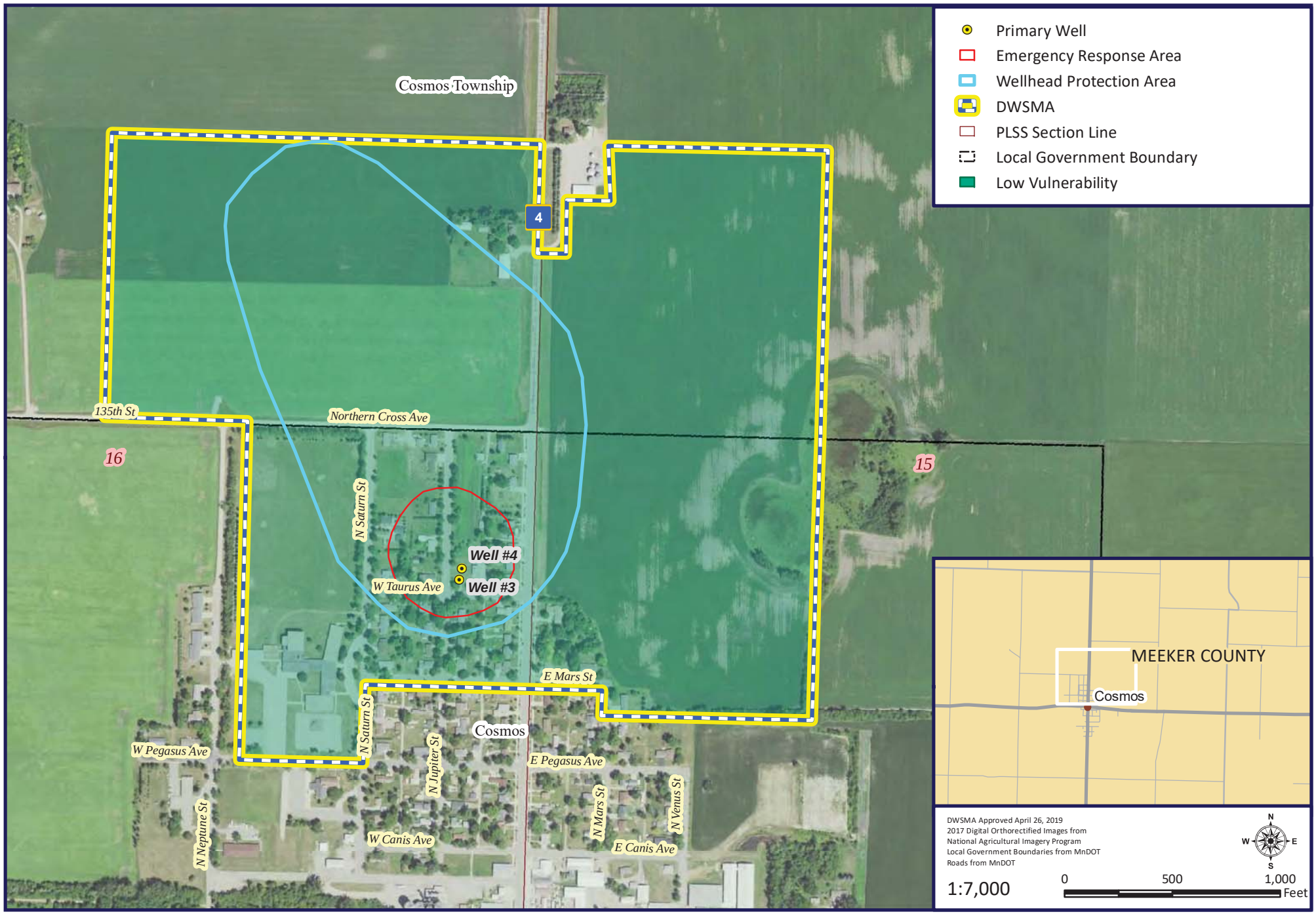
Figure 5—Meeker Comprehensive Future Land Use Map

Cosmos
Meeker County
Minnesota

Cosmos Drinking Water Supply Management Area (DWSMA) MN-01146 - Low Vulnerability

Figure 1

DEPARTMENT OF HEALTH

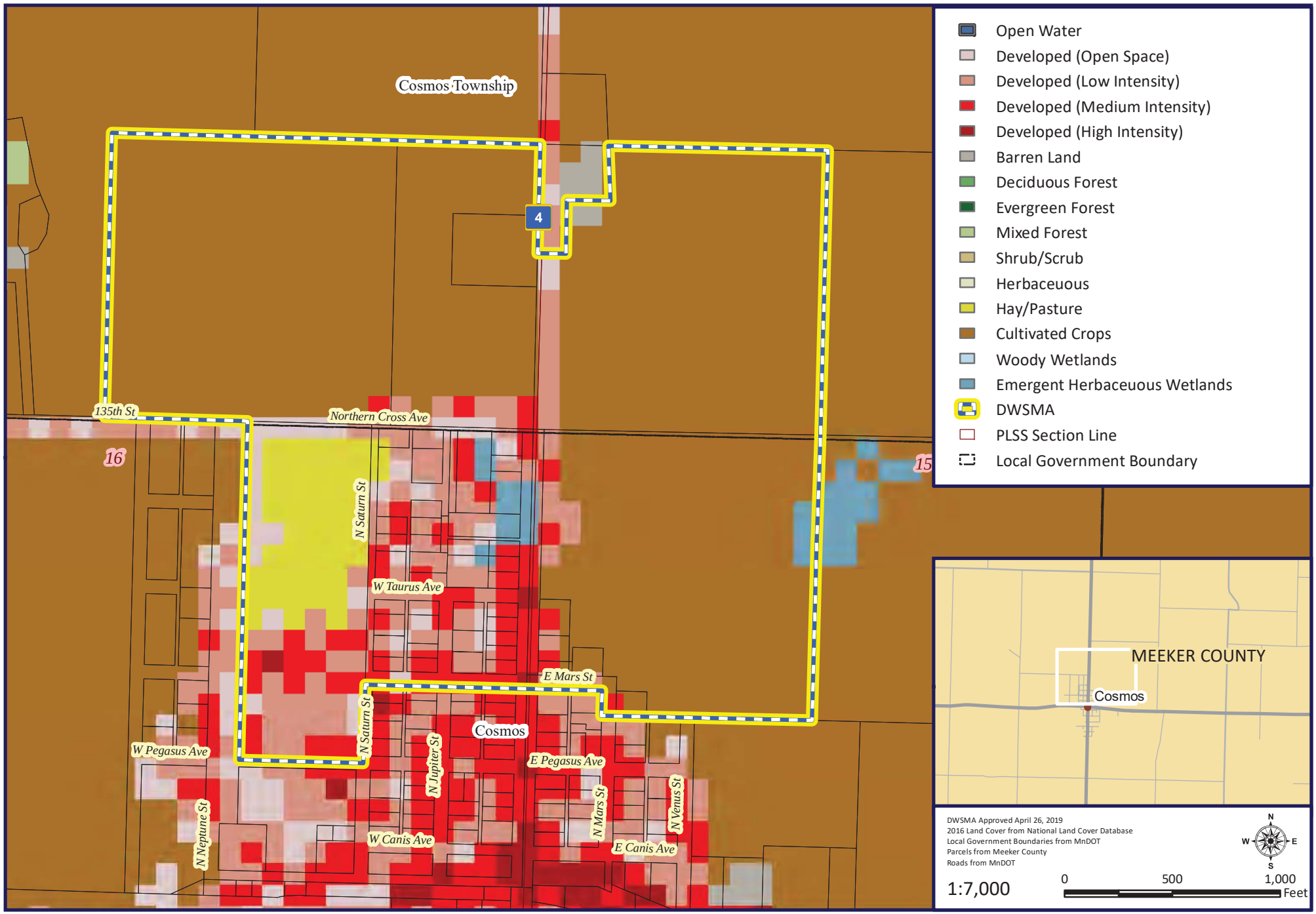


Cosmos
Meeker County
Minnesota

Cosmos Drinking Water Supply Management Area (DWSMA) MN-01146 - Land Cover 2016

Figure 2

DEPARTMENT OF HEALTH



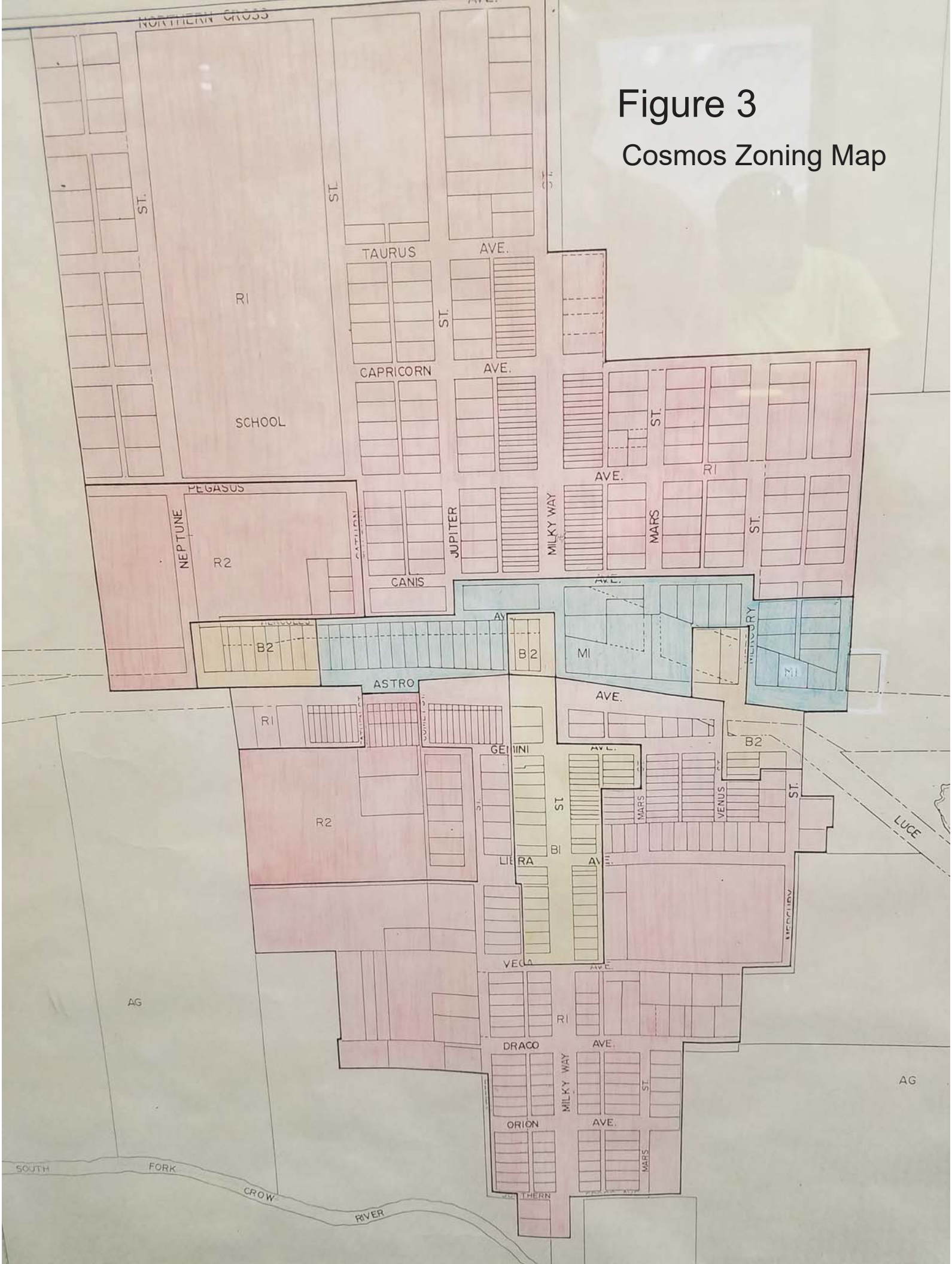


Figure 3

Cosmos Zoning Map

Beacon™ Meeker County, MN

Figure 4

Cosmos DWSMA

Created by: Robyn Hoerr

Meeker County Zoning Designations



Overview



Legend

Parcels
- <all other values>
- DITCH
- GAP
- LAKE
- OVERLAP
- RAILROAD
- ROAD
- **Lakes**

Combined Zoning
- A-1 General Agriculture
- C-1 Central Commerical
- C-2 Highway Commercial
- CITY
- I-1 Industrial Development
- R-1 Suburban Residential
- R-2 Rural Residential
- **Local Roads**

FID = 54 SECTION = 9 SHAPE_Leng = 21178.851560300001

Date created: 2/11/2020
Last Data Uploaded: 2/11/2020 2:25:26 AM

Developed by Schneider GEOSPATIAL

Comprehensive Future Land Use Map

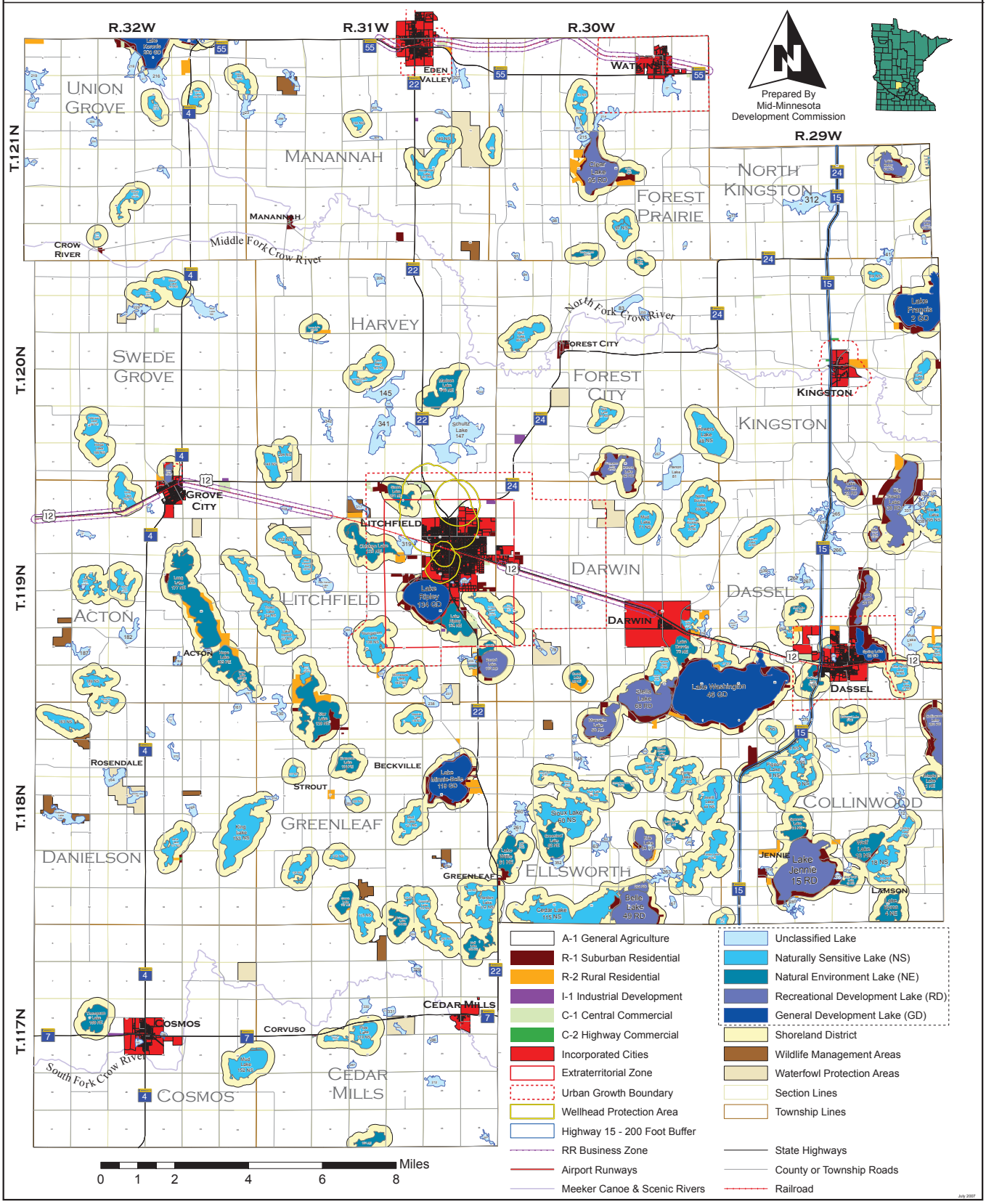


Figure 5

APPENDIX

Appendix I—

Assessment of Required Data Elements Used To Develop Plan

ASSESSMENT OF THE REQUIRED DATA ELEMENTS USED TO PREPARE THE PLAN

The data elements listed in the Minnesota Department of Health Scoping 1 and 2 Notice were identified by the MDH to be used in the WHP plan. The selection of data elements is based on 1) the hydrogeological setting and 2) vulnerability of the wells used by the Public Water Supplier, and 3) vulnerability of the DWSMA known at the time that each scoping meeting was held. Each data element is assessed for its impact on 1) the use of the public water supply wells, 2) delineation of the WHPA, 3) the quality and quantity of water supplying the public water supply wells, and 4) land and groundwater uses within the DWSMA.

Physical Environment

Precipitation information was not required because of the hydraulically confined aquifer used by the city of Cosmos.

Geologic information was obtained from 1) **existing maps, reports, and studies** that are listed in the References section of the Part 1 report, and 2) the **records of wells, test borings, and well sealing records** that are on file at the MDH and stored in the Minnesota Well Index (MWI) database. Soil data was not required because of the hydraulically confined aquifer used by the city of Cosmos.

Geologic information was used to determine 1) the extent and composition of the aquifer used by the city wells, 2) the vulnerability of the aquifer at the location of the wells used by the city, and 3) the vulnerability of the DWSMA. Geologic information affects the delineation of the WHPA because it is used to address the aquifer transmissivity and hydrologic boundaries delineation criteria. Second, geologic information provides insight into the pathways that recharging water takes to enter the aquifer which impact: 1) the use of the wells, and 2) the quality and quantity of water that is pumped. Finally, it is the principle information that is used to assess DWSMA vulnerability, which impacts land- and groundwater-uses within the DWSMA.

There is little geologic or hydrological data for the area surrounding the city of Cosmos. The delineation and vulnerability assessments were completed using regional data. Future delineations can be refined in coming amendments to the current delineation if additional data is obtained.

Most **water resources information** was not required because of the hydraulically confined aquifer used by the city of Cosmos. The DWSMA is not located within a major watershed district. The determination of whether the city's DWSMA is located within a 100-year flood plain was also required due to potential adverse impact on the ground water aquifer that flooding can have on the municipal and domestic wells. The FEMA floodplain information was reviewed at https://msc.fema.gov/portal/home. The Cosmos DWSMA is not located within a 100-year flood plain area.

Land Use

Land use information was obtained from the maps shown in Figures relating to existing **parcel boundaries**, **political boundaries**, **public land survey coordinates**, **land-use**, and **zoning**. Appendix III contains the map and inventory of current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contamination sources.

Parcel boundaries and public land survey coordinates were used in defining DWSMA boundaries. DWSMA boundaries impact land- and groundwater-uses because they define where the WHP plan will be implemented. They have no direct impact on 1) the use of the public water supply wells, 2) delineation of the WHP area, and 3) the quantity and quality of the well water used by the city of Cosmos.

The **land use and zoning maps** affect land- and water-use within the DWSMA because they provide a basis for limiting future land uses that may be incompatible with ordinances or planning goals. As such, they may be used for requiring increased scrutiny of new potential contamination sources, or imposing performance standards that affect the use of existing or new public water supply wells and the quantity and quality of the well water used by the city. The city currently enforces land use, zoning, and utility ordinances within their jurisdiction and feels that their existing authorities are adequate for the purposes of protecting the city's drinking water. There is a portion of the northern DWSMA that is outside of the city's jurisdiction in Cosmos Township. Meeker County has land use authority in this township, so the city will work cooperatively with them if land use changes in this area arise.

The information contained in Appendix III provides the basis for defining the types of potential contamination sources that may or do impact the quantity and quality of the well water used by the city of Cosmos. The priorities that are assigned to the WHP action steps that are specified in the plan are based on the information contained in Appendix III. As a result, these actions steps affect the future use of the municipal wells and land- and groundwater-uses within the DWSMA. Groundwater use was included to meet the hydrologic boundary and water use criteria for delineating the WHPA.

Information about public utility services includes maps of 1) **transportation routes and corridors**, 2) **storm sewers**, **sanitary sewers**, the **public water supply distribution system**, 3) **gas and oil pipelines**, and 4) **public drainage systems** was not required because of the hydraulically confined aquifer used by the city of Cosmos.

Record of the construction and maintenance of the public water supply wells is presented in the delineation and vulnerability assessment report (Part 1) found in Appendix II. Whether a well serves as a primary source of drinking water, or as emergency standby source, determines how often it is pumped. This affects the delineation of its WHPA because pumping amount is a delineation criterion. In addition, pumping may affect the movement of contamination toward a well and the one and ten-year capture areas are used to establish priorities for managing potential contamination sources within the DWSMA. The construction and maintenance of a public water supply well affects the well vulnerability assessment and the focus of the potential contamination source inventory. While City Well #4 meets current construction requirements, Well #3 lacks construction information related to well grouting. Water quality information for both wells indicate that human-caused contaminants have not entered the well, which leads to the assumption that Well #3 is most likely grouted. The city will likely look to update the well construction information for Well #3 at the earliest convenient opportunity.

Water Quantity Information

Water Quantity Information was obtained for groundwater resources. **Water Quantity Information** was not required for surface water resources because of the hydraulically confined aquifer used by the city of Cosmos.

The DNR is the principal source of water quantity information, although studies and reports that are available from other state and federal agencies or from the city of Cosmos are described in the References section of the delineation and vulnerability report. Water quantity information affects the 1) delineation of the WHPA because the pumping amounts are used to calculate the daily well discharge which is a WHPA delineation criterion, 2) use of the public water supply wells because a maximum annual amount for the public water supply system is specified under the DNR appropriations permit, and 3) land and water use within the DWSMA because pumping may impact whether other wells or existing land uses may cause contamination of the aquifer or contamination to move toward the public water supply well. It may indirectly affect the future quantity and quality of the water from the public water supply wells.

A list of wells covered by state appropriations permits, including the amounts of water appropriated, type of use, and aquifer source were assessed as follows. The city of Cosmos provided the information describing pumping for water supply over the previous 5 years and the projected pumping for the first five years of plan implementation. There are no known high capacity wells within a 3-mile distance of the city of Cosmos wells that were included as part of the Part 1 delineation analysis. Each component impacts the projected size and shape of the delineated wellhead protection area.

At the present time there are no known well interference problems and water use conflicts within the city of Cosmos DWSMA. Well interference and water use conflicts are used (if they exist) to delineate the WHPA because they document hydrologic boundaries that must be included. Also, they indicate areas where aquifer recharge is insufficient to meet pumping demands and this condition 1) limits groundwater use in the DWSMA and 2) may impact land uses such as agricultural irrigation or industry that rely on high capacity wells.
A search was conducted for **environmental bore holes, including the unique number, aquifer measured, years of record, and average monthly levels** from the observation well networks that are maintained by the DNR and the U.S. Geological Survey. This information is used to delineate the WHPA by providing information that helps to define aquifer recharge and the distribution of hydraulic head. It may have an indirect influence on water use within the DWSMA because the water level data can be used to document seasonal or long-term impacts that pumping has on the aquifer supplying the public water supply well. This information has no impact on the quality the water supplying the public water supply wells and land- and groundwater-uses within the DWSMA. There were no environmental bore holes listed.

Water Quality Information

Groundwater quality information was obtained from the Public Water Supply Program and Well Management Program at MDH, the city of Cosmos, and from reports and studies that are listed in the references section of this report. Surface water quality information was not required because of the hydraulically confined aquifer used by the city of Cosmos.

Information that summarizes **groundwater quality** is used to assess the pathways that recharge takes to the aquifer and this may impact the selection of methods that are used to delineate the WHPA and to assess well and DWSMA vulnerability. The presence of human-made contaminants is used to 1) calibrate a groundwater flow model by providing a means of checking travel time distance from the source of a contaminant to a public water supply well and 2) assess the vulnerability of the well and the DWSMA. The presence of naturally occurring contaminants is used to assess the extent that the source water aquifer is isolated from surface water recharge. The presence of either human-made or naturally occurring contaminants may influence pumping of the public water supply well because pumping may impact the rate at which contamination may be moving into the aquifer. Also, the level of contamination may require that the water be treated for potable use or that the contaminated water be blended with other water to reduce contaminant levels to drinking water standards.

The presence of human-made contaminants is used to identify potential sources of the contamination that should receive a high priority for inventory and for supporting the priority that is assigned to objectives and actions in the plan that manage these sources. This affects the focus of land and water use management practices within the DWSMA.

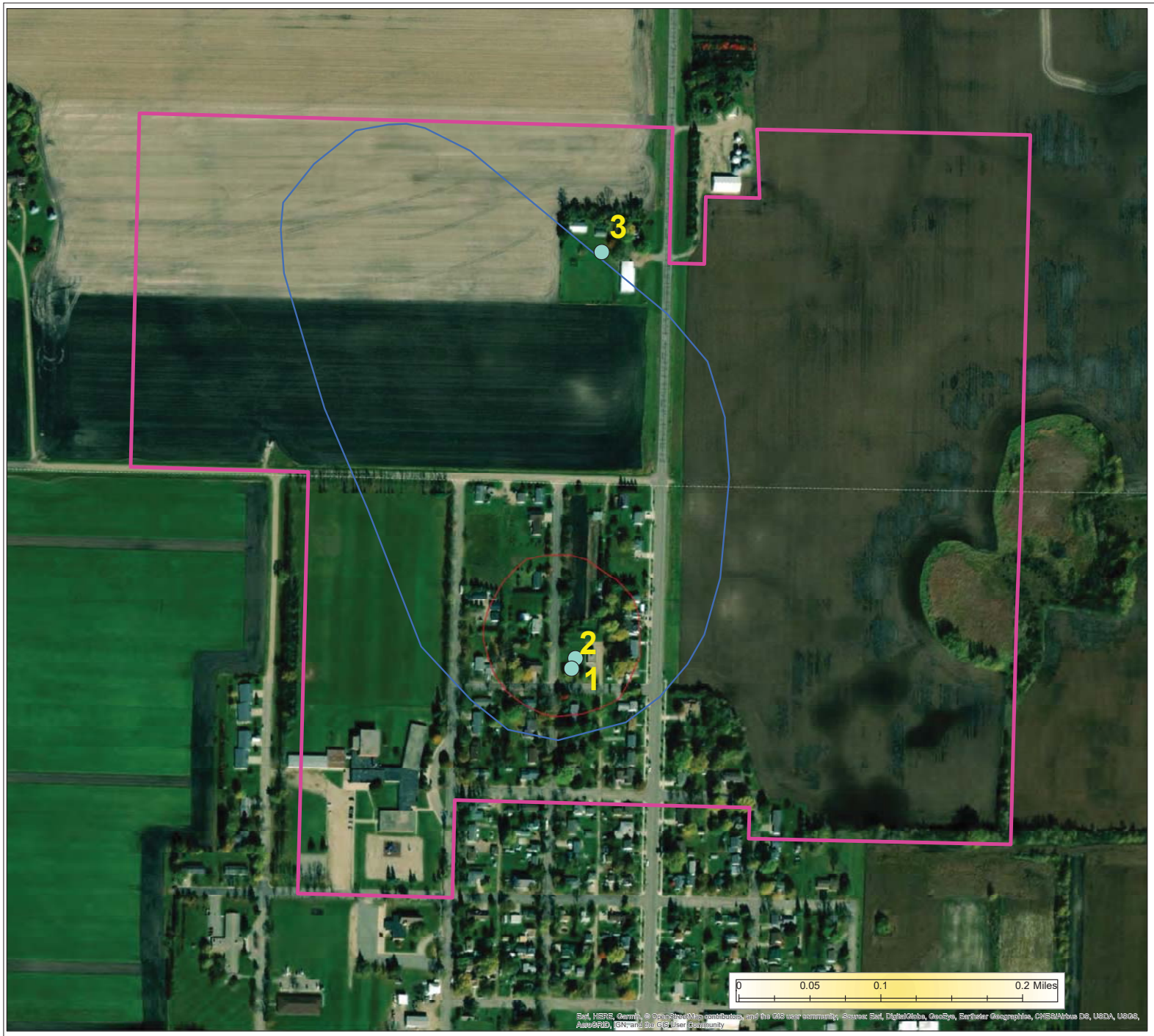
Water chemistry and isotopic data from wells, springs, or other groundwater sampling points and reports of groundwater tracer studies is used to determine the 1) time needed for surface water or precipitation to travel from the surface to the source water aquifer and 2) degree to which the source water aquifer if impacted by recharge from surface water features. This assessment affects the delineation of the WHPA because it helps define the degree of hydraulic confinement and whether a surface water feature comprises a hydraulic boundary that must be included. Also, this information is used to determine the sustainability of the aquifer and any surface water features that may be impacted by increased pumping within the DWSMA.

Site studies and water quality analyses of known areas of groundwater contamination, property audit results, reports of contamination spills and releases by the Minnesota Pollution Control Agency and Minnesota Department of Agriculture provide basic information that is used to determine the extent that groundwater quality may already be impaired by previous land- and groundwater-use practices. This information is used to assess the vulnerability of the well and the DWSMA, which affects 1) the scope, and direction of the inventory of potential contamination sources and 2) the resulting priorities that are assigned to objectives and actions for managing land- and groundwater-uses within the DWSMA. Also, the hydro-geologic information contained in the reports is used to refine the understanding of local groundwater conditions that

affects the delineation of the WHPA. There are no known areas of contamination within the aquifer used by the city of Cosmos.

APPENDIX II
Delineation of WHPA and DWSMA and Vulnerability Assessments

APPENDIX III
Potential Contaminant Source Inventory



Cosmos, MN

Potential Contaminant Source Inventory (PCSI)

N
W E
S

Legend

- Well
- DWSMA
- WHPA
- ERA

CLEAN WATER LAND & LEGACY AMENDMENT

DEPARTMENT OF HEALTH

MN RURAL WATER ASSOCIATION

Cosmos WHP Plan
Potential Contaminant Source Inventory

PCSI_ID	PIN	FAC_NAME	ADDRESS	CITY	ZIP5_CODE	PCS_C	STATUS_C	MAT_C	PROGRAM_ID	TOTAL	COMMENT
1	210142000	Cosmos Well #4	Taurus Avenue W	Cosmos	56228	WEL	A		727301	1	
2	210142000	Cosmos Well #3	Taurus Avenue W	Cosmos	56228	WEL	A		222102	1	
3	040091000	Fruetel, Leonard & Sonja	13671 MN Hwy 4	Cosmos	56228	WEL	A		743637	1	

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	1470011 **COMMUNITY**
NAME	Cosmos
ADDRESS	Cosmos Water Superintendent, c/o Mr. Michael Morris, 233 Milky Way Street South, P.O. Box 614, Cosmos, MN 56228

FACILITY (WELL) INFORMATION

NAME	Well #3
FACILITY ID	S03
UNIQUE WELL NO.	222103
COUNTY	Meeker

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1470011 S03	UNIQUE WELL NO.	222103

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	1470011 S03	UNIQUE WELL NO.	222103

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		Y	75	N
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	120	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		Y	70	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	53	
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	1470011 S03	UNIQUE WELL NO.	222103

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	1470011 S03	UNIQUE WELL NO.	222103

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

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



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

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

INSPECTOR	Larsen, Kim	DATE	4 - 11 - 2016

PWS ID / FACILITY ID	1470011 S03	UNIQUE WELL NO.	222103

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		

COMMENTS

9/7/2003 - Location for PCSI Type BLD (bearing = 0, distance = 0 , inventory date: 2/9/1999) could not be determined.
9/7/2003 - Location for PCSI Type ETL (bearing = 135, distance = 0 , inventory date: 2/9/1999) could not be determined.
9/7/2003 - Location for PCSI Type PSS (bearing = 0, distance = 0 , inventory date: 2/9/1999) could not be determined.
9/7/2003 - Location for PCSI Type SBM (bearing = 90, distance = 0 , inventory date: 2/9/1999) could not be determined.
9/7/2003 - Location for PCSI Type PLE (bearing = 0, distance = 0 , inventory date: 2/9/1999) could not be determined.

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	1470011 **COMMUNITY**
NAME	Cosmos
ADDRESS	Cosmos Water Superintendent, c/o Mr. Michael Morris, 233 Milky Way Street South, P.O. Box 614, Cosmos, MN 56228

FACILITY (WELL) INFORMATION

NAME	Well #4
FACILITY ID	S04
UNIQUE WELL NO.	727301
COUNTY	Meeker

IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?

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

PWS ID / FACILITY ID	1470011 S04	UNIQUE WELL NO.	727301

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	1470011 S04	UNIQUE WELL NO.	727301

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		Y	128	N**
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		Y	121	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		Y	78	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	53	
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	1470011 S04	UNIQUE WELL NO.	727301

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.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

[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.

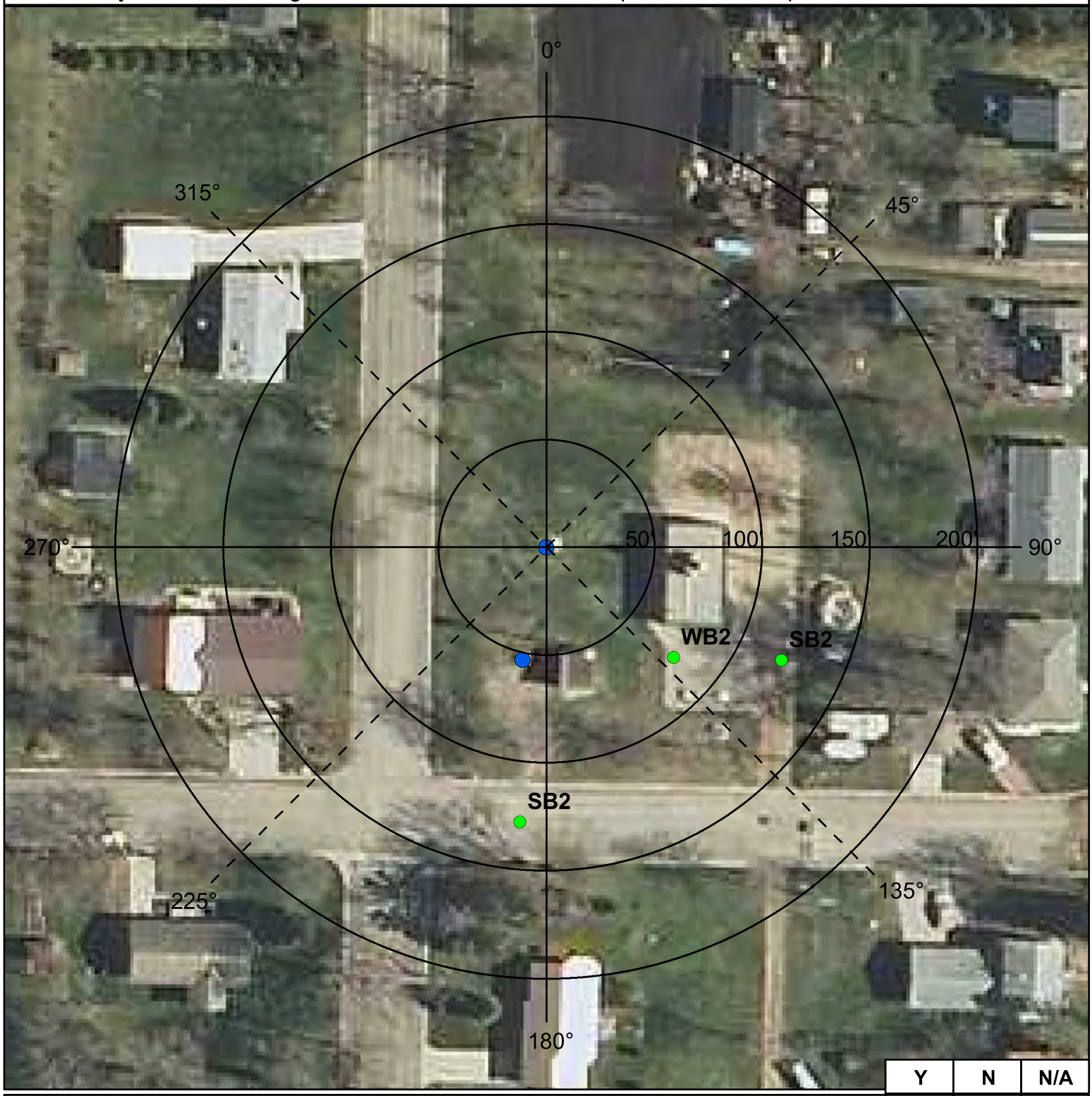
[5] A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; 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	1470011 S04	UNIQUE WELL NO.	727301

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

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



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

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

INSPECTOR	Larsen, Kim	DATE	4 - 11 - 2016

PWS ID / FACILITY ID	1470011 S04	UNIQUE WELL NO.	727301

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Any sewer lines that are observed to be leaking, cracked, or deteriorated, should be replaced.		

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

Summary of Old Municipal Well Report Issues

Well #1 has two construction logs. What may have happened is that MDH created one for Well #1 and Well #2 in 1992 since the original construction logs were not available. The wells were assigned unique numbers at this time.

The WHP team looked into the Well #1 (old 1930's well) question and managed to obtain some construction information and sealing information for this well. Unfortunately, it didn't completely clear up understanding of the current status of the well.

The original hope was that the information would show that there was a possibility that this well was deepened at some point from the initial 154 feet that was indicated in the old municipal well report. The well construction record showed that, when constructed by Keys Well Drilling Company in March of 1938, it was 154 ft deep. The well was inside the pump house. It was sealed in 2006, and the sealing record shows that the well was STILL 154 feet deep, and NOT the 256 feet indicated on the Well Log for Cosmos Well #1 that was created in 1992. There is the possibility that there was a incorrect entry made by the MDH inspector back in the 1950's when typing up the report. According to local knowledge, there was no other well at that location--which is supposedly the same, according to the well logs for both versions of Well #1 (Lot 4, Blk. 25, Larson's First Addn.).

In 1952 the MDH report mentions that old well #1 is being considered for use as a stand-by well since a municipal building may be built in the vicinity. Up until this point, the inspection records continued to recommend sealing of this old well, but didn't appear that this was ever done. The inspection reports after 1952 do not recommend sealing of the old well. In 1959, the report says that this well is 256 feet deep with an 8 inch casing and a 16 foot screen. The screen length does not match the 10 foot screen that is listed in the original construction log from 1938, but it is possible for a screen to be replaced or lengthened without completely redoing a well. A search through the city's records for well redevelopment/deepening information for this well might start with the years between 1952 and 1959 when the city may have had work done on it to improve its function and be able to bring it up to a useable condition. It's possible that additional work on the well didn't happen, though, and there was a mistake/misunderstanding about the well's depth. It should be noted that there is no indication in the MDH files that would lead the reader to believe that the well was ever reconstructed.

The second well used by the city (Well #2) is confirmed that the construction depth and sealing depth of 335 feet is the same. The first time this well was mentioned in the MDH inspection reports was in 1947. The report says that the old well has been 'abandoned' but not sealed.

The 250+ feet deep creamery well mentioned in the old municipal well report had been cross-connected to the city's water system up until 1951. The MDH report for that year said that it was disconnected and abandoned but not sealed. The city should determine any local knowledge of this well, or if there are city records that might provide additional information. The city can also inquire if the current property owner is open to helping to look for indications of an old well on site.

The city's well #3 was drilled in 1971. Around that same time there is information related to a Cosmos Test Well #2 (and it can be assumed there was a Test Well #1). Any information gained about the location and status of these wells would be helpful.

Finally, there is the question of whether or not there is an old railroad well in town. The existence of the rail road line and depot likely would have been before the city's water utility in 1938. The city should consult historical records and local knowledge to try to determine the existence of a well associated with the railroad.

APPENDIX IV
Water Supply Contingency Strategy

2020

Water Emergency Response Plan



CITY OF COSMOS

WATER EMERGENCY RESPONSE PLAN

Public Water System Name: City of Cosmos Water Department

Public Water System I.D. No.:

1	4	7	0	0	1	1

Address: 220 Milkyway S.
PO Box 7
Cosmos, MN 56228

Telephone No.: 320-877-7345

Municipality: Cosmos

County: Meeker

System Type: Community ☐ Nontransient Noncommunity

Population Served: 487

Section 1 – City Contacts/Information

One or more of the following persons will be in charge of the water system during any type of emergency:

City Contacts				
Name	**Position**	**Contact Number** (include area code)		
Gary Martin	Mayor	Cell: 320-583-3053		
Tom McCarthy	Council Member	320-444-772		
Jody Fruetel	Council Member	320-583-8384		
Emily Schmeling	Council Member	320-583-1570		
Angelica Hopp	Council Member	320-221-6211		
David Medina	Water Operator	320-221-4943		
John Douville	City Clerk	763-219-9636		

Public Water Supply Characteristics

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
Well #3	222103	Primary	8	308	342	11/8/1971	QBAA	Not Vulnerable
Well #4	727301	Primary	8	314	358	9/21/2005	QBAA	Not Vulnerable

In times of emergency, or when water supply is limited, the city will prioritize the delivery of water in the following way to the categories listed below:

Priority Group and Rank
Residential #1
Institutional #2
Commercial #3
Unaccounted

Treatment -- The City of Cosmos has a Class C Water Plant that treats the raw water

Storage and Distribution – 100,000 gallon elevated water tower

Maps/Plans – Maps and plans for the water and wastewater treatment facilities are kept at city hall. PDF files are also included in this plan.

Section 2 – Communication Procedures and Contact Information

Communication Procedure: Depending on the emergency, contact the groups listed below in the order provided. The contact information and specific procedures are located in the tables on the following pages.

Scenario Communication Procedures

Scenarios	Water Operator 320-221-4943	Customers	MDH District Engineer* 320-223-7339	Meeker County Emergency Mgmt. 320-693-5400	Fire Dept. Chief 911	MN Duty Officer 1-800-422-0798	County Sheriff 9-1-1	Mayor & Council	MPCA	MRWA	First Responders
Natural disaster that disrupts the supply of water	X	X	X	X		X	X	X		X	
Chemical spill	X	X	X	X	X		X	X	X		X
Unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination	X	X					X	X	X		
Situation that causes a loss of positive water pressure.	X		X			X		X		X	
Lack of resources that adversely affect operations due to lengthy power outages	X							X		X	
Chorine storage leak	X				X	X	X	X			X
Chemical overfeed	X	X	X			X		X			
Break in/terrorist acts	X		X			X	X	X	X		
Loss of One or More Sources of Supply	X		X		X			X	X	X	

Emergency Response Guidance for the Scenarios Listed Above

Intentional Events (Break in at facility which is connected to the distribution system or possible/actual contamination incident).

(1) Call County Sheriff (911) and report situation
(2) Call MDH Engineer (651-201-5386) and MDH District Engineer (320-223-7339).
(3) Call State Duty Officer (800-422-0798)

Unintentional Event (Possible/actual contamination incident, chemical spill, significant chemical overfeed etc…)

(1) Call State Duty Officer (800-422-0798)
(2) Call County Sheriff (911) and report situation
(3) Call MDH Engineer (651-201-5386) and MDH District Engineer (320-223-7339).

Chlorine Storage Leak

(1) Call local First Responders (911 - Hazmat Response Team)
(2) Call County Sheriff (911) and report situation
(3) Call State Duty Officer (800-422-0798)

Event that may affect, or is affecting the functionality of your water system (loss of pressure, loss of supply wells etc…)

(1) Call MDH Engineer (651-201-5386) and MDH District Engineer (320-223-7339).
(2) Call State Duty Officer (800-422-0798)
(3) Notify MNWARN and request assistance

Emergency Reference Table Contacts and Phone Numbers

Priority Sensitive Water Users		
Personnel	**Name**	**Work Telephone**
Manager	Cosmos Learning Center	320-877-7074

Agency Notification

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

Personnel	Name	Home Telephone	Work/Cell Telephone
Water Operator	David Medina	328-436-3462	320-221-4943
City Council	Tom McCarthy	320-444-7722	
City Council	Emily Schmeling	320-583-1570	
City Council	Angelica Hopp	320-221-6211	
City Council	Jody Fruetel	320-583-8384	
Mayor	Gary Martin	320-583-3053	
Response Coordinator	David Medina	328-436-3462	320-221-4943
Alt. Response Coordinator	John Douville	763-219-9636	320-877-7345
State Incident Duty Officer MNWARN Activation	N/A	N/A	800-422-0798
County Emergency Director	Brian Kruze	N/A	320-693-5420
Fire Chief	Jon Fruetel	911	320-583-1840
Sheriff	Brian Kruze	911	320-693-5420
System Operator	David Medina	328-436-3462	320-221-4943
Alt. System Operator	Michael Morris	320-522-1109	
School Superintendent			320-877-7074
Ambulance	Emily Schmeling	320-583-1570	
Clinic	Hutchinson Health		320-234-3290
Medical Facility or Doctor	Hutchinson Health		320-234-5000
Power Company	Xcel Energy	N/A	763-493-1631
Co. Highway Department	Meeker	N/A	320-693-5360
State Highway Department	Minnesota Highway Department	N/A	320-234-8475
Telephone Company	Mediacom	N/A	507-837-4878
Neighboring Water System	City of Lake Lillian	N/A	320-664-4440
MPCA	NA	N/A	(800) 657-3864
MRWA Technical Services	Jeff Dale	320-760-0552	(800) 367-6792
MDH District Engineer	Jon Grothe	N/A	320-233-7339
MDH Sourcewater Protection	Karen Voz	N/A	320-223-7322

Emergency Oversight Committee

The Emergency Oversight Committee was formed to assist and provide technical assistance to the Response Coordinator and the City of Cosmos to help them determine the appropriate action or response during emergency situations.

Emergency Oversight Committee			
Title	**Name**	**Telephone**	**Response Assignment**
Response Coordinator	David Medina	320-221-4943	Coordinate actions to address emergency
Alternate Response Coordinator	Gary Martin	320-583-3053	Coordinate actions to address emergency
Water Operator	Michael Morris	320-522-1109	Direct or contact individuals and businesses to resolve issue
Primary Spokesperson	Gary Martin	320-583-3053	Contact media to inform citizens/businesses of emergency
Alternate Public Relations	John Douville	763-219-9636	Contact media to inform citizens/businesses of emergency
Public Health/Medical	Emily Schmeiling	320-583-1570	Assist City as needed to address emergency
Alternate Public Health/Medical	Meeker County Public Health	320-693-5370	Assist City as needed to address emergency
MPCA Groundwater Division	NA	800-647-3864	Assist City as needed to address emergency
MRWA Technical Services	Jeff Dale	320-760-0552	Assist City as needed to address emergency
MDH District Engineer	Jon Grothe	320-223-7339	Assist City as needed to address emergency

INVENTORY OF AVAILABLE EMERGENCY EQUIPMENT AND MATERIALS

The Table below contains a list of services, equipment and supplies that are available to the public water supply system to respond to a disruption in the water system. It is believed that the items contained in the Table would be adequate to respond to most water system emergencies.

Description	Company	Phone Number	Location	Estimated Delivery Time
Well Repair	Thein Well	320-796-2111	Spicer	4 Hours
Pump Repair	Thein Well	320-796-2111	Spicer	4 Hours
Electrician	Dave's Electric	320-212-7009	Bird Island	2 Hours
Plumber	Plumbing by Craig	320-864-1991	Glencoe	2 Hours
Backhoe/ Excavator	Whitcomb Farm Drainage	320-664-4250	Lake Lillian	2 Hours
Chemical Feed	Hawkins	612-331-6910	Roseville	4 Hours
Meter Repair	Ferguson	319-631-3174	Blaine	4 Hours
Generator	City of Lake Lillian	320-664-4440	Lake Lillian	2 Hours
Valves	Ferguson	319-631-3174	Blaine	4 Hours
Pipe & fittings	Ferguson	319-631-3174	Blaine	4 Hours

Media Contacts

The list was formed to assist the Response Coordinator and the City of Cosmos to help them inform the public of appropriate action or response during emergency situations**.**

Media	Name	Telephone	Address
Newspaper	News Mirror	320-848-2248	201 Main St. S. Hector, MN
Website (City)	City	320-877-7345	
Digital Sign (City)	City	320-877-7345	

Section 3- City Public Emergency Relations

City Emergency Public Relations			
Title	**Name**	**Telephone**	**Response Assignment**
Primary Spokesperson	Gary Martin	320-583-3053	Contact media to inform citizens/businesses of emergency
Alternate Spokesperson	John Douville	763-219-9636	Contact media to inform citizens/businesses of emergency

The Responsibilities of the Primary Spokesperson are to:

1. Give public statements that have been prepared by the city regarding the water supply emergency;
2. Coordinate and compile information submitted by responders to the water supply emergency;
3. Schedule official meetings between the city and members of the media; and
4. Coordinate efforts to keep the public informed about the water supply emergency.

Public Information Center Location during Emergency:

Location: 220 Milkyway S., Cosmos, MN
Times Available: As Needed

Alternate Information Center Location Site: Cosmos Fire Station

Information Checklist to be conveyed to the Public and Media:

1. Name of the Water System;
2. Nature of the water supply emergency;
3. Steps being taken to replace the water supply;
4. *If applicable*- Contaminant(s) of concern & date first detected;
5. *If applicable* - Source(s) of contamination;
6. *If applicable* - Public health impacts of the contamination or water supply interruption;
7. Steps the public should be taking;
8. Other responders who are cooperating with the city; and
9. Steps being taken to eliminate the source of contamination mechanical failure.

Section 4 - Alternative Water Supply Options:

1. Catastrophic Event:

The Minnesota National Guard may be able to supply water trucks to bring water to Cosmos from surrounding communities. The following procedure is recommended:

- Contact the County Sheriff (320) 693-5400 or 911 to request assistance from the Minnesota National Guard.
- Sheriff contacts the Minnesota National Guard, Division of Emergency Management, State Duty Officer 800-422-0798; and Community Support Group at (651) 282-4013 to request assistance for the city.

- MN/WARN Response Network may offer assistance through the networking of other municipal utilities who are willing to offer assistance.

2. Bottled water supplies, delivery and distribution: Wal-Mart Litchfield (320) 693-1022
   Wal-Mart Hutchinson (320) 587-1020

3. New well (as a last resort)

4. Emergency treatment of water system as recommended by MDH District Engineer.

5. Source Management (blending water from both wells).