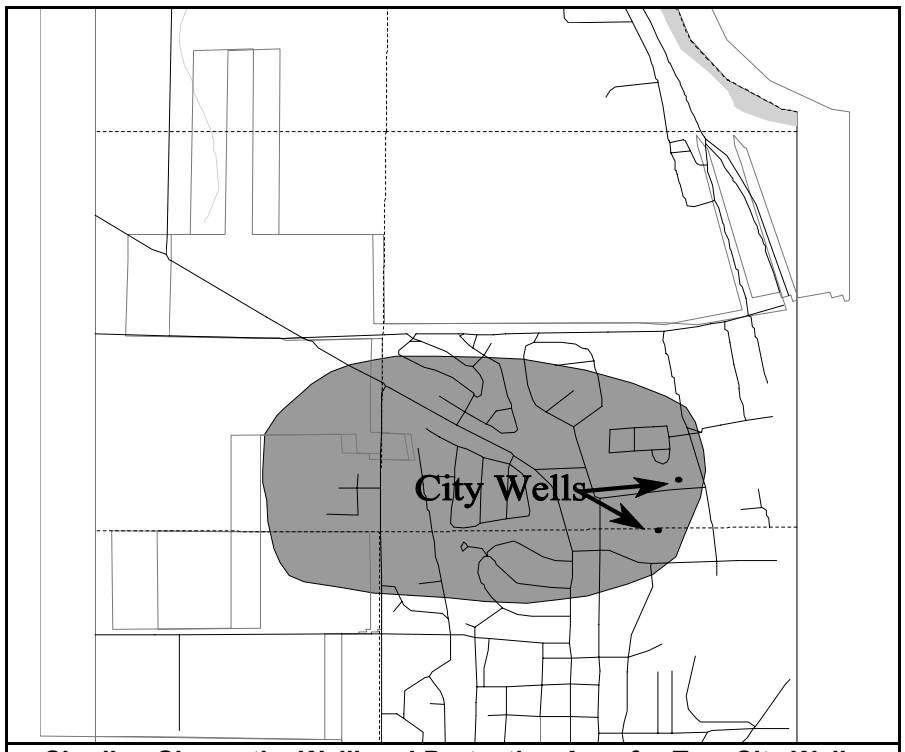
MINNESOTA RULES
PARTS 4720.5100 TO 4720.5590

GUIDANCE PERTAINING

TO WELLHEAD PROTECTION REQUIREMENTS

FOR PUBLIC WATER SUPPLY WELLS



Shading Shows the Wellhead Protection Area for Two City Wells

Prepared by the
Drinking Water Protection Section
Source Water Protection Unit
December 1997

Copies of this report are available from:

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

To request this document in another format, call:

Unit Receptionist - (651) 215-0800,
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GLOSSARY OF TERMS

The following definitions are included to assist the reader with understanding the terms used in this guidance document and in the Wellhead Protection Rule (Appendix I) found in **part 4720.5100**. Additional terms used in the Wellhead Protection Rule (Appendix I) are found in **part 4720.5100**.

AQUIFER is unconsolidated material or rock capable of producing water to supply a well.

CASING is a pipe or curbing placed in a well or boring to: A) prevent the walls from caving; B) seal off surface drainage; or C) prevent gas, water, or other fluids from entering the well.

COMMUNITY WATER SUPPLY SYSTEM is a public water system that pipes water for human consumption to at least 15 service connections used by year-round residents, or one that regularly serves at least 25 year-round residents. Examples include municipalities, housing subdivisions, apartment buildings, mobile home parks, hospitals, and correctional facilities.

CONFINED AQUIFER is an aquifer bounded above and below by impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself; an aquifer containing confined groundwater.

CONTAMINATION is the presence or addition of any substance to water which is or may become injurious to the health, safety, or welfare of the general public or private individuals using the well; and which is or may become injurious to domestic, commercial, industrial, agricultural, or other uses which are being made of such water.

DRINKING WATER SUPPLY MANAGEMENT AREA (DWSMA) is the area delineated using identifiable land marks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible. The boundaries of the DWSMA can be 1) the center lines of highways, streets, roads, or railroad right-of ways; 2) section, half-section quarter-section, quarter-quarter section, or other fractional section lines of the United State public land survey; or 3) property lines.

GROUNDWATER is water contained below the surface of the earth in the saturated zone including—without limitation—all water, whether under confined, unconfined, or perched conditions, in near-surface unconsolidated sediment or regolith, or in rock formations deeper underground.

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) is the area within 200 feet of a public water supply well.

LOCAL UNIT OF GOVERNMENT is a statutory or home rule charter city, town, county, soil and water conservation district, water shed district, organization formed for the joint exercise of powers under Minnesota Statutes, section 471.59, local health board, or other special purpose district or authority with local jurisdiction in water and related land resources management.

NONCOMMUNITY WATER SUPPLY SYSTEM is a public water system that pipes water for human consumption to at least 15 service connections used by individuals other than year-round residents for 60 days a year, or serves 25 or more people at least 60 days a year.

NONTRANSIENT NONCOMMUNITY WATER SUPPLY SYSTEM is a noncommunity water system that serves at least 25 of the same persons over six months per year. Examples include schools, universities, colleges, factories, office parks or buildings, large-sized resorts and hotels, child care centers, and businesses.

OFFICIAL CONTROLS are ordinances, plans and rules that control the physical development within the jurisdiction of a local unit of government, protect public health and safety, or implement the general objectives of the local unit of government.

PUBLIC WATER SYSTEM is a water system with 15 or more service connections or regularly serves at least 25 people 60 or more days a year. A system that serves water 60 or mores day a year is considered to "regularly serve" water. Public water systems can be publicly or privately owned. Public water systems are subdivided into two categories: community and noncommunity water systems. This division is based on the type of consumer served and the frequency the consumer uses the water.

PUBLIC WATER SUPPLIER OR SUPPLIER is any person who owns or operates a public water supply system.

RELATED LAND RESOURCES are lands affected by present or projected management practices that have significant effects on the quantity, quality, or use of groundwater or surface water.

TRANSIENT NONCOMMUNITY WATER SUPPLY SYSTEM is a noncommunity water system that does not meet the definition of a nontransient noncommunity water system. Generally, these systems serve a transient population such as parks, wayside rests, small-sized resorts and hotels, restaurants, bars, and campgrounds.

UNCONFINED AQUIFER is an aquifer where groundwater is under atmospheric pressure.

WATERSHED MANAGEMENT ORGANIZATION is a watershed district wholly within the metropolitan area or a joint powers entity established wholly or partly within the metropolitan areas by special law or by agreement that performs some or all of the functions of a watershed district for a watershed and that has the characteristics and the authority specified under section 103B.211. Lake improvement or conservation districts are not watershed management organizations.

WELLHEAD PROTECTION (WHP) is a method of preventing well contamination by effectively managing potential contaminant sources in all or a portion of a well's recharge area. This recharge area is known as the wellhead protection area.

WELLHEAD PROTECTION AREA (WHPA) is 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. This definition is the same for the federal Safe Drinking Water Act (40 Code of Federal Regulations, Section 1428) and the Minnesota Groundwater Protection Act (Minnesota Statute 103I).

WELLHEAD PROTECTION MEASURES are methods adopted and implemented by the public water supplier to prevent the contamination of the public water supply. Wellhead protection measures include public education, best management practices, household hazardous waste collection, groundwater monitoring, water conservation, design standards, operating standards, site plan review, subdivision regulations, zoning ordinances, and purchase of property or development rights.

WELLHEAD PROTECTION PLAN is a document that is submitted to the Minnesota Department of Health and addresses the items identified in the Wellhead Protection Rule (**parts 4720.5100 to 4720.5590**) and in the federal Safe Drinking Water Act, United States Code, title 42.

INTRODUCTION

The purpose for this document is to provide guidance regarding WHP requirements which are found in Minnesota Rules, parts 4720.5100 to 4720.5590, and administrated by the Minnesota Department of Health (MDH). The commissioner of health was granted authority by Minnesota Groundwater Protection Act (Minnesota Statute 103I, section 3, subdivision 5) to prepare a rule specifying WHP measures for public water supply wells. Rule parts and subparts of the rule are shown in bolded lettering where they are referenced in this document. The rule is presented in Appendix I.

WHP is a program intended to prevent human-caused contaminants from entering wells used by public water supply systems. Approximately ten percent of the state's 2400 community water supply wells show some presence of contamination related to human activities. However, most contaminant levels are below drinking water limits. Replacing contaminated wells is costly, as is constructing treatment facilities to take harmful contaminants out of drinking water. For example, MDH documented that over a ten-year period 26 communities spent over 44 million dollars on either replacing wells or treating contaminated drinking water (average per capita cost was $721). WHP supports not only public health protection but the protection of the financial resources invested in water supply systems.

This document is intended to provide clarification of the rule requirements but not to provide detailed information relating to the technical aspects of developing and implementing WHP measures. Other technical assistance documents prepared by MDH will address these topics. The glossary provides definitions of terms used in WHP and the proposed rule language. The first chapter presents general information about the WHP program and general concepts regarding WHP. The remaining chapters describe the rule requirements regarding 1) basic WHP measures all public water suppliers must implement and 2) the steps a public water supplier must follow when preparing a WHP plan.

CHAPTER 1

OVERVIEW OF WHP

Legal Basis For Implementing WHP - Over 98 percent of the 9,657 public water supply systems in Minnesota reply completely on groundwater. Because of this, the protection of wells and the aquifers which supply them is an important public health issue. Minnesota's WHP program must address both state and federal mandates. The MDH was designated as the lead agency for administering the state's WHP program in 1989 by Governor Perpich. Concerns over the impacts that unwise land and water use have on the quality and quantity of groundwater resources prompted the 1989 Minnesota Legislature to pass the Minnesota Groundwater Protection Act (Minnesota Statute 103I). The act provided broad-based support for state and local water resource programs and granted MDH authority to develop a WHP program to protect public water supply wells from contamination.

Similar concerns over contamination of public groundwater supplies prompted Congress in 1986 to amend the federal Safe Drinking Water Act to require that states develop WHP programs. Under the Safe Drinking Water Act provisions (40 Code of Federal Regulation, Section 1428) states must have their WHP programs approved by the U.S. Environmental Protection Agency (U.S. EPA) and address the following elements:

- the duties of state agencies, local government, and public water suppliers;
- the approach to delineating the WHPA for all public groundwater supplies;
- procedures for identifying potential sources of contamination within the WHPA;
- methods used to protect the water supply from contamination;
- means of providing an alternate drinking water supply in the event of well contamination;
- procedures for addressing new wells; and
- procedures for public participation.

Minnesota's WHP program was approved by U.S. EPA in March 1996. In August 1996, the Safe Drinking Water Act was amended again to strengthen the act's provisions by providing funding for "source water protection." Source water protection addresses public water supplies relying on either surface or groundwater. An approved WHP program fulfills the federal requirements of source water protection for public water supplies relying on groundwater.

WHP Program Development - Protecting public water supply wells from contamination involves the cooperation of public water suppliers, state and local agencies, property owners, and the general public. In order for Minnesota to have an effective and implementable WHP program, MDH has sought advise from many organization and groups. MDH established advisory groups to address technical and policy issues and prepare draft language for the proposed WHP rule. Recommendations from these groups were used to prepare the WHP program submittal to U.S. EPA. It is available through MDH and specifies the approach Minnesota will take to meet the Safe Drinking Water Act requirements.

The rule language presented in Appendix I was developed with the assistance and guidance from the following organizations:

American Institute of Professional Geologists

American Water Works Association

Association of Minnesota Counties

Consulting Engineers Council

League of Minnesota Cities

League of Women Voters

Manufactured Home Association

Metropolitan Council

Minnesota Association of County Planning and Zoning Administrators

Minnesota Association of Townships

Minnesota Association of Water Planning Coordinators

Minnesota Board of Soil and Water Resources

Minnesota Chamber of Commerce and Industry

Minnesota Department of Agriculture

Minnesota Department of Natural Resources

Minnesota Environmental Quality Board

Minnesota Farm Bureau Federation

Minnesota Plant Food Chemical Association

Minnesota Pollution Control Agency

Minnesota Rural Water Association

Minnesota's WHP rule became effective November 3, 1997. The promulgation of the rule and approval of the state's WHP program submittal by U.S. EPA provide the basis for implementing WHP in Minnesota.

Addressing Public Health Concerns Related to WHP - The amount of exposure to human-caused contaminants is used to determine the extent of WHP measures applied to public water supply wells. All users of public water wells must be protected from acute (short-term) health effects related to disease organisms and high levels of chemical contaminants. Basic WHP measures to address acute health concerns are presented in Chapter 2.

Chronic or long-term health effects related to ingesting low levels of chemical contaminants is a health concern for the regular users of public wells. Community and nontransient noncommunity public water suppliers regularly serve the same users and must develop and implement WHP plans to address chronic health concerns. The owners of transient wells are not required to do this under the WHP rule but would be encouraged by MDH to do so. WHP measures to address chronic health concerns involve preparing a WHP plan. The proposed requirements for developing and imple-menting a WHP plan are outlined in Chapter 2 and discussed in more detail in the remaining chapters.

CHAPTER 2

OVERVIEW OF THE APPLICATION AND IMPLEMENTATION OF THE WHP REQUIREMENTS

This chapter outlines the general requirements for WHP in Minnesota Rules, parts 4720.5100 to 4720.5590. This chapter outlines the responsibilities of public water suppliers relating to 1) their level of responsibility needed to meet these requirements and 2) specific actions which must be taken to implement WHP measures for their wells.

PART 1 - ADDRESSING ACUTE HEALTH CONCERNS THROUGH THE USE OF AN IWMZ

An IWMZ (**part 4720.5110, subpart 1**) must be delineated for all types of public water supply wells in which: 1) the isolation distances (Figure 1) from potential contamination sources specified in the state Well Code (Minnesota Rule 4725) must be main-tained; 2) nonconforming sources must be moni-tored for their impact on the public water supply well; and 3) WHP measures are implemented. Iso-lation distances are presented in Appendix II. The requirements for an IWMZ are based on the Minnesota Groundwater Protection Act (Minnesota Statute 103I) which mandates that state Well Code isolation distances be maintained for all types of water supply wells, not just public water supply wells. Public water suppliers must maintain these isolation distances for new sources which are installed on property under their jurisdictional control. They must work with adjacent property owners and local agencies to ensure that new sources meet these isolation distances on property not under their control.

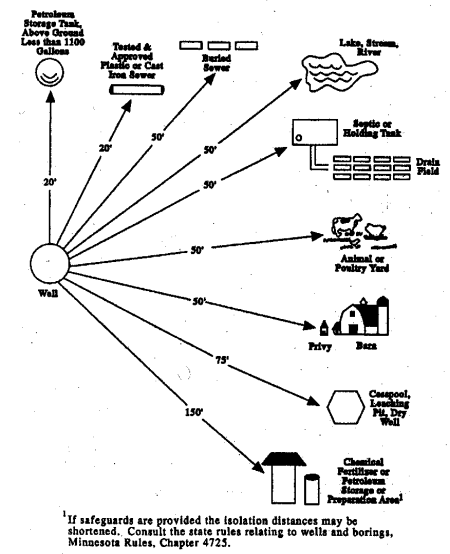

Figure 1. Examples of isolation distances.

Existing potential contaminant sources within the IWMZ which do not conform with state Well Code isolation distances must be evaluated and monitored to determine whether they present an acute health concern to the users of the public water supply well. For nonconforming potential contaminant sources within the IWMZ and not under the control of the public water supplier, assistance with monitoring sources must be solicited from other property owners or the appropriate local unit of government. Whenever practical, MDH will help public water suppliers with the task of informing other property owners and local agencies regarding state law requirements for maintaining contaminant source isolation distances from water supply wells.

For new and existing potential sources of contamination, the public water supplier is to implement appropriate WHP measures. This means that potential contaminant sources which present a risk to the health of people drinking the well water should be 1) managed to eliminate this risk or 2) moni-tored to determine whether contamination will enter the public water supply well. MDH staff will

assist the owners of public wells with developing and implementing management practices for potential contaminant sources in the IWMZ.

Phasing Schedule for the IWMZ - Due to their large numbers (9,657), public water suppliers will be phased into managing their IWMZ according to the following time schedule (**part 4720.5120**):

TYPE OF PUBLIC WATER SUPPLY	IMPLEMENTATION DATE
New public water supply.	Time of construction
Existing community.	June 1, 1999
Existing nontransient noncommunity serving a school or child center.	June 1, 1999
All other nontransient noncommunity.	June 1, 2000
Existing transient noncommunity serving an MDH licensed facility and not covered by a community health service delegation agreement.	June 1, 2001
Existing transient noncommunity serving an MDH licensed facility and covered by a community health service delegation agreement.	June 1, 2002
All other transient noncommunity.	June 1, 2003

PART 2 - ADDRESSING CHRONIC HEALTH CONCERNS THROUGH THE WHPA AND DWSMA

Owners of **community and nontransient noncommunity wells** must delineate a WHPA and a DWSMA and prepare and implement WHP measures for potential sources of contamination in the DWSMA (**part 4720.5110, subpart 2**):

Owners of **transient noncommunity wells** are not required to meet this rule requirement but may voluntarily delineate the WHPA, identify the DWSMA, and prepare and implement WHP measures for potential sources of contamination.

NOTE - From this point on, this document will be most helpful to: 1) owners of community wells, 2) owners of nontransient noncommunity wells, and 3) owners of transient noncommunity wells who are voluntarily preparing a WHP plan.

Phasing Schedule for Delineating a WHPA, DWSMA, and WHP Plan Submittal - The time and the resources available to MDH, other state agencies, local units of government and public water suppliers necessitate that community and nontransient wells be phased into the program. Under the rule (**part 4720.5130, subpart 3**), a community or nontransient noncommunity supplier that does not qualify for additional time specified in **part 4720.5130, subpart 4**, must submit a WHP plan to MDH which includes all wells in the public water supply system within:

- two years after notification by MDH or
- two years after an additional well is added to municipal public water supply system.

MDH will phase in existing community and noncommunity systems based on the vulnerability of their water supply wells. The criteria (**part 4720.5550**) MDH must use to designate a well as being vulnerable are:

- the well water contains 10 milligrams per liter nitrate plus nitrite nitrogen;
- the well water contains disease organisms or chemicals identified as groundwater contaminants;
- the well water contains one or more tritium units; or
- an enriched tritium analysis of the well water has not been performed within the past ten years and information on the well(s) construction is not available; or the geological material from the land surface to where the groundwater enters the public water supply well is: a) fractured bedrock, b) solution weathered bedrock, c) sandstone bedrock, d) fine sand or larger sized particles, or e) a combination of the materials specified in "a" to "d."

For new municipal public water supply wells, cities must prepare a preliminary WHPA delineation and an assessment of the impacts that existing land use may have on the aquifer serving the proposed municipal well based on best available information (**part 4720.5130, subpart 1**). The design specifications for the well, and existing information describing the time of travel and daily volume, must be used to determine what the preliminary WHPA may look like if the well were constructed as planned. The assessment of the land and water use is needed to help determine whether existing land uses or an existing WHPA for another public well may impact the quality of the water in the aquifer serving the public water supply. In some cases, an alternative location of the well may seem more appropriate once the preliminary WHPA delineation and land and water use assessment have been performed.

Additional Time May be Granted for WHP Plan Completion - Rule provisions **(part 4720.5130, subpart 4)** provide for additional time periods to prepare a WHP plan. The resources, time, and technical issues which impact the time in which a WHP plan is prepared will be unique for each public water supplier. There may be circumstances when additional time is needed to prepare the WHP plan. The rule grants additional six-month time periods for each of the following:

- each two existing or new wells up to six,
- privately owned systems,
- lack of state or local funding,
- the WHPA is within more than one governmental jurisdiction, and
- the WHPA is influenced by another public water supply well that is not in the public water supply system.

General Content of a WHP Plan - The following listing provides an overview of the WHP plan content. Subsequent chapters present more detailed descriptions of how elements of the plan are to be developed and the procedures and criteria MDH must use for review and approval. Every WHP plan must contain the following elements:

- Assessment of the date elements (**part 4720.5200**);
- Delineation of the WHPA and DWSMA (**part 4720.5205**);
- Assessment of well and DWSMA vulnerability (**part 4720.5210**);
- Impact of changes on public water supply well (**part 4720.5220**);
- WHP issues, problems, and opportunities (**part 4720.5230**);
- WHP goals (**part 4720.5240**);
- WHP objectives and a plan of action (**part 4720.5250**);
- Approach(es) used to evaluate the progress of the plan of action (**part 4720.5270**); and
- Contingency planning to address water supply interruption (**part 4720.5280**).

Data Reporting Requirements - The data and maps collected for a WHP plan must meet the reporting standards specified in **part 4720.5500**.

Data collected must (**part 4720.5500, subpart 1**):

- include one geographic indicator (map coordinate system) for point information;
- identify property parcels with an identification number assigned by the county auditor;
- include state identifiers, such as the unique number of a well or a number assigned by a state agency responsible for a potential source of contamination; and
- be recorded and reported on forms and software provided by MDH or other software when a data dictionary and an electronic cross-reference table are provided by the public water supplier. Newly created maps (**part 4720.5500, subpart 2**):
- must be presented at 1 to 24,000 scale (1 inch equals 2,000 feet) or greater detail. The seven and one half minute topographic maps prepared by the U.S. Geological Survey are at a scale of 1 to 24,000;
- must be presented in an electronic format (such as a coverage for a geographic information system) or drafted on a stable base material;
- must be presented at a consistent map scale; and
- may be combined on multiple maps or map overlays.

Laboratory methods used to analyze well water samples must be at least as precise as those used by MDH (**part 4720.5500, subpart 3**).

A geographic reference coordinate system used to define a geographic reference point must describe (**part 4720.5500, subpart 4**):

- the units of measurement used,
- the applicable zone,
- the applicable reference datum, and
- the map projection method used.

SUMMARY

Owners of transient noncommunity wells need only address the rule requirements regarding the IWMZ. However, the rule does not prevent the owner of a transient noncommunity well from voluntarily preparing a WHP plan. Community and nontransient noncommunity water suppliers using wells must address all provisions of the rule.

CHAPTER 3

GETTING STARTED AND INVOLVING THE PUBLIC

To ensure development of an effective WHP plan that meets the rule requirements, there are a number of initial steps which must be followed.

Identify a WHP Plan Manager - The first step that a public water supplier must take to ensure the success of the development and implementation of a WHP plan is to identify a person to coordinate plan development and implementation (**part 4720.5300, subpart 2**). This person will serve as the principal contact for MDH regarding the preparation and submittal of a WHP plan. The principal duties of this position may include:

- coordinating the technical, policy, and educational aspects of WHP plan development and implementation;
- serving as liaison with MDH and local units of government;
- writing the WHP plan;
- scheduling and conducting meetings;
- chairing workgroups; and
- overseeing data management and reporting.

Staff of local units of government, such as cities, townships, counties, and soil and water conservation districts, should also be looked to for assistance. An important benefit of WHP planning is the development of a cooperative effort between the public water supplier and local staff to ensure a broad examination of WHP-related issues.

State, and some federal agencies, can assist with data needs and interpretation. Public water suppliers could reduce the costs of WHP planning by drawing on staff resources from agencies and the public to provide valuable expertise. Often, their participation will be at minimal or no cost to the public water supplier.

Develop a Public Participation Process - Involving all interested parties in the WHP planning process is critical to its success. No group which could be significantly affected by WHP planning should be denied an opportunity to participate or at least comment. Public water suppliers are required to ensure there is a process for public participation during the development and implemen-

tation of a WHP plan (**part 4720.5300, subpart 6**). Also, the public water supplier is required to conduct a public information meeting about the approved WHPA and DWSMA delineations and vulnerability assessments (**part 4720.5330, subpart 7**). However, the scope and extent of public participation is left to the discretion of the public water supplier. It is a better strategy to actively involve members of the public at the beginning of the WHP planning process rather than waiting until the public hearing which is required once the plan is ready for submittal to MDH (**part 4720.5350, subpart 4**). Problems, conflicts, and opportunities of interest to the public should be identified early in the process so that they are addressed as much as possible. This helps ensure that decisions are based on shared information and perceptions, and helps educate the public about water-related issues and options available to protect their drinking water supply.

Include Local Units of Government - The public water supplier may use many methods to enlist the participation and involvement by local governments. However, informational meetings with local governments and opportunities for them to comment are required at several times during WHP plan development and review:

- notification of local governments within the DWSMA of intent to develop a WHP plan (**part 4720.5300, subpart 3**);
- meeting with local governments at least once during WHP plan development (**part 4720.5300, subpart 5**);
- submit copy of the WHPA, the DWSMA, and the vulnerability assessment approved by the MDH (**part 4720.5330, subpart 6**); and
- local government review of the second part of WHP plan before submittal to MDH (**part 4720.5350, subpart 1**).

SUMMARY

The WHP planning and implementation process must include measures to involve the general public and local units of government. Public involvement with developing and implementing WHP plans helps ensure that 1) land and water use issues are identified during WHP plan development and 2) a process for implementing priority contaminant source management controls within the DWSMA are implemented. Local governments may offer much support or advice regarding WHP plan develop-ment and implementation and may be able to integrate local WHP goals with those of county groundwater plans.

CHAPTER 4

DELINEATIONS AND VULNERABILITY ASSESSMENTS

This chapter presents the requirements for delineating the WHPA and DWSMA and conducting the vulnerability assessments of the public water supply well and the DWSMA. These elements of a WHP plan must be completed and approved by MDH before the remainder of the WHP plan is prepared (**part 4720.5330, subpart 1**).

Criteria for Delineating the WHPA - The WHPA provides the focus for implementing a strategy to protect a public water supply well from contamination. A number of factors must be considered when delineating the WHPA to ensure that it actually reflects groundwater movement to the well. The following criteria (**part 4720.5510**) must be used to delineate the WHPA:

- **Daily volume of water pumped** (**part 4720.5510, subpart 4**) is derived from the maximum annual amount of water pumped over a five-year period and is needed to reflect the pumping stress the well has on the aquifer. The annual amount is taken from either the previous five years or a projection of the next five years, whichever is the larger amount. This annual amount is divided by 365 to define the average maximum daily volume of water pumped by the well.
- **Aquifer transmissivity** (**part 4720.5510, subpart 6**) defines the ability of the aquifer to yield water to a pumping well and strongly affects the size and shape of the calculated WHPA.

To provide flexibility and contain the cost, the aquifer transmissivity is to be based on the first of the following methods applicable to the public water supply system:

- an existing pumping test conducted on the well,
- an existing pumping test conducted on another well in an equivalent hydrogeologic setting determined by the department,
- a pumping test for larger sized systems that meet the requirements of **part 4720.5520**,
- a pumping test for smaller sized systems that meet the requirements of **part 4720.5530**,
- an existing pumping test that meets the requirements of **part 4720.5520**,
- an existing specific capacity test, or
- an existing published transmissivity value.

Prior to determining the aquifer transmissivity, the public water supplier must submit an aquifer test plan to MDH for approval that specifies the method selected to determine the aquifer transmissivity and the reason this method was selected (**part 4720.5320, subpart 1**). The specific contents of an aquifer test plan are found in **part 4720.5540**. The MDH has 30 days to review and approve or disapprove the aquifer test plan (**part 4720.5320, subpart 2**). According to part **4720.5555**, MDH review of an aquifer test plan is for compliance with **part 4720.5320, part 4720.5510**, and the principles of review in **part 4720.5555, subpart 2**. If an aquifer test plan is disapproved, the MDH must identify in writing the parts of the plan that were disapproved and the reason for the disapproval. The public water supplier has 45 days to resubmit a revised aquifer test plan. The MDH has 30 days to review any resubmitted aquifer test plan.

- **Groundwater flow field** (**part 4720.5510, subpart 5**) defines the direction of groundwater flow and hydraulic gradient within the aquifer and is needed to "point" the WHPA in the proper direction and help determine the lateral extent of the WHPA. Groundwater moves preferentially toward a pumping well from the up gradient or "up stream" direction of groundwater flow. Most of the areal extent of a WHPA occurs up gradient of the well. Generally, the steeper the hydraulic gradient ("tilt" of the water table in the aquifer) the narrower and more elongate will be the resulting WHPA.

- **Flow boundaries** (**part 4720.5510, subpart 3**) consist of features such as rivers, streams, lakes, wetlands, changes in the geologic composition of the aquifer and surrounding formations, and nearby wells which may impact the rate at which groundwater moves toward the public water supply well. Their impact on the shape of the WHPA must be considered.

- **Time of travel or TOT** (**part 4720.5510, subpart 2**) defines the time period over which groundwater moves through the aquifer to supply the public water supply well. The minimum TOT required is ten years although the public water supplier can select a longer time period.

Any delineation method which incorporates all of these criteria may be used to delineate the WHPA.

Assessing the Vulnerability of the Public Water Supply Well and the DWSMA - These vulnerability assessments are needed to 1) determine the degree of risk that land uses may have on the quality of the groundwater entering the public water supply well, 2) guide the amount of effort needed to conduct an inventory of potential contaminant sources, and 3) help define measures for controlling potential contaminant sources so they do not present a threat to the public water supply well.

Once the DWSMA has been delineated, an assessment of well vulnerability and DWSMA vulnera-bility must be conducted by the public water supplier (**part 4720.5210**). The well vulnerability assessment conducted by MDH to phase the well into the WHP program (**part 4720.5550**) must be reviewed in light of other data collected for the WHPA delineation to determine whether it should be revised. Also, the geologic information collected for the WHPA delineation and groundwater chemistry data must be used to prepare an aquifer vulnerability assessment of the entire DWSMA. MDH will provide guidance to the public water supplier regarding how to conduct and document the results of this assessment.

Scoping Meeting Regarding WHPA Delineation and Vulnerability Assessments - The level of effort needed to meet WHPA criteria will vary from supplier to supplier because of the availa-bility

and quality of existing data. MDH will meet with the public water supplier (**part 4720.5310, subpart 1**) to determine the information needed to: 1) delineate the WHPA and 2) assess the vulnerability of the well and the DWSMA. Other topics to be discussed may include what delineation method(s) would be most appropriate given data availability, the hydrogeologic setting of the aquifer, and the construction of the public well. The types of existing information that MDH may require for the WHPA delineation and the well and DWSMA vulnerability assessment include such data as well records, geologic maps and reports, borehole geophysical records, groundwater chemistry data, parcel boundaries, and transportation systems (**part 4720.5400**). MDH will assist the public water supplier with collecting this data which are on file with state and federal agencies. MDH will formally notify the public water supplier of the requirements for WHPA delineation and vulnerability assessments within 30 days of the scoping meeting (**part 4720.5310, subpart 2**).

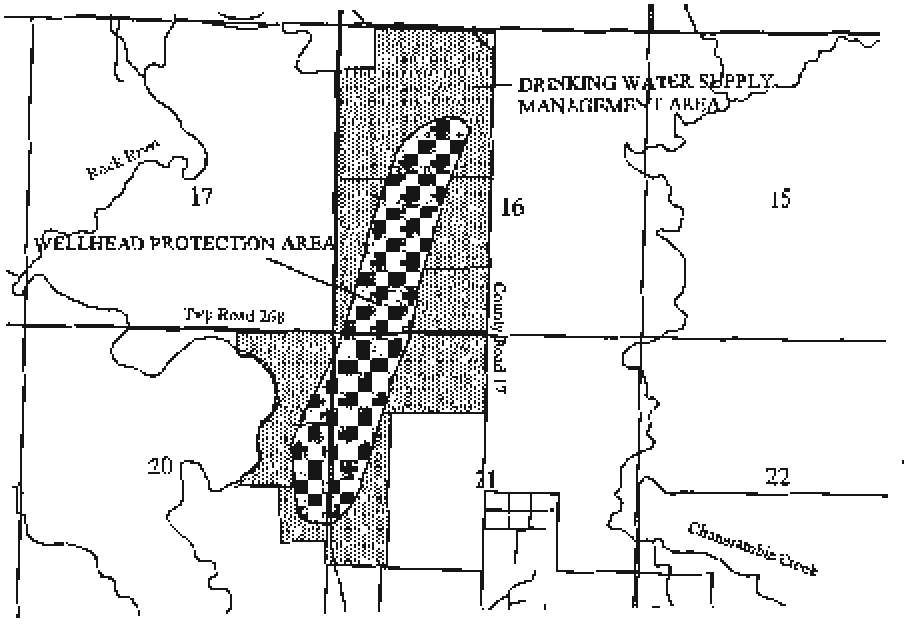

Figure 2. Example of a DWSMA versus a calculated

A map showing the delineated DWSMA must accompany the submittal of the delineated WHPA. The purpose for the DWSMA is to provide a more understandable geographic reference for where contaminant source controls are needed to protect the public well than can be achieved using only the calculated boundaries of the WHPA. It is much easier for the general public to see a road than where a mathematically calculated line crosses a property parcel. An example of a DWSMA versus a calculated WHPA is shown in Figure 2.

Submitting the WHPA and DWSMA Delineation and Vulnerability Assessments to

MDH - The following items must accompany this submittal:

Documentation of the delineated WHPA must accompany a map showing the WHPA boundaries (**part 4720.5205, subpart 1**). The following information (**part 4720.5205, subpart 2**) is needed for MDH review:

- the description of the hydrogeologic setting used to characterize the aquifer;
- the five delineation criteria described in **part 4720.5510, subparts 2 to 6**;
- the description of the delineation method used, including assumptions, and the supporting documentation for the assumptions;
- the description of all parameters, other than the delineation criteria described in **part 4720.5510**;
- the description of the delineation results, including:
  1) the results of model calibrations, when a groundwater flow model is used, and
  2) a narrative describing the uncertainties relating to the accuracy of the calculated WHPA boundaries;
- the data collected and used, including the source of the data (data provided to the public water supplier by MDH need not be submitted); and
- a copy of the calculations performed; when a computer model is used, the electronic data input and solution files.

The boundaries of the DWSMA must follow the WHPA as closely as possible. The maps of the delineated WHPA and DWSMA must be legible but do not have to be professionally drafted. However, the maps must conform to the statements in **part 4720.5500, subpart 2**, described in Chapter 2.

The vulnerability assessments must include: 1) a description of the public water supply well's vulnerability (**part 4720.5210, subpart 1**) and 2) a description of the DWSMA's vulnerability (**part 4720.5210, subpart 2**).

Documentation of the vulnerability of the DWSMA must (**part 4720.5210, subpart 3**):

- identify the method used;
- describe the geologic conditions throughout the DWSMA from the land surface to the aquifer;
- contain the data elements collected and used; and
- contain the maps, diagrams, reports, studies, and tables used to prepare the DWSMA vulnerability assessment.

Notification of MDH review results must be communicated to the public water supplier within 60 days after the filing of the submittal (**part 4720.5330, subpart 2**). Once the delineation of the WHPA, the DWSMA, and the vulnerability assessments have been approved, the public water supplier can complete the rest of the WHP plan. If the department does not approve a part of the submittal, the public water supplier will receive written notification that identifies the deficiency and the reasons for disapproval. The public water supplier must re-submit the corrected portion of the delineation or vulnerability assessment to MDH within 45 days (**part 4720.5330, subpart 4**).

Submitting the WHPA and DWSMA Delineations and Vulnerability Assessments to Local Units of Government - The public water supplier must submit a copy of the MDH approved WHPA boundary, DWSMA boundary, and the vulnerability assessments of the public water supply well and the DWSMA to local units of government within 30 days of MDH approval (**part 4720.5330, subpart 6**).

Public Meeting Regarding Delineation and Vulnerability Assessment Approval by MDH - Within 60 days of notification that MDH has approved 1) the delineated WHPA and DWSMA and 2) the vulnerability assessments of the public well and DWSMA, the public water supplier must hold at least one information meeting for the general public (**part 4720.5330, subpart 7**). The purposes for the meeting are to: 1) make affected land owners aware that their property is within the DWSMA, 2) provide the public with information regarding the level of protection needed for the public water supply well, 3) inform the general public about the intent to develop WHP management strategies, 4) solicit comments regarding potential contaminant sources or conflicting land uses which may impact the public water supply well, and 5) solicit participants who may assist the public water supplier with preparing and implementing the WHP plan.

SUMMARY

Delineation of the WHPA and the DWSMA and the vulnerability assessments of the public water supply well and its DWSMA must be approved by MDH before the remainder of the WHP plan is developed. MDH will meet with the public water supplier to scope out the information required to perform these tasks. Once approved, the public water supplier must send a copy of the approved WHPA and the DWSMA and the vulnerability assessments of the public water supply well and its DWSMA to the local units of government. Also, the public water supplier must hold a public information meeting to help ensure that the public understands where the DWSMA boundaries are and the degree of well and aquifer vulnerability within the DWSMA.

CHAPTER 5

PREPARING A PLAN OF ACTION TO MANAGE POTENTIAL CONTAMINANT SOURCES

This chapter presents the requirements and procedures for conducting an inventory and the managing of pertinent potential contaminant sources within the approved DWSMA. These elements of a WHP plan must be started after the delineations and the assessments discussed in Chapter 4 have been approved by MDH.

Second Scoping Meeting Between the Public Water Supplier and MDH to Determine the Relevant Data Elements Which Must Be Collected to Complete the WHP Plan - The public water supplier and MDH must hold a second scoping meeting (**part 4720.5340, subpart 1**) where the well and DWSMA vulnerability assessments will be used to determine the types and amounts of information that will be needed to complete the WHP plan. The existing information which MDH may require is categorized as describing: 1) the physical environment (**part 4720.5400, subpart 2**); 2) land use (**part 4720.5400, subpart 3**); 3) water quantity (**part 4720.5400, subpart 4**); and 4) water quality (**part 4720.5400, subpart 5**). MDH will assist the public water supplier with collecting the data on file at state and federal agencies. MDH will formally notify the public water supplier of the results of the second scoping meeting within 30 days (**part 4720.5340, subpart 2**) of the scoping meeting.

In addition to the delineation of the DWSMA and its vulnerability, there are a number of required elements in a WHP plan that guide the selection of WHP measures. These include the following.

Conducting a Contaminant Source Inventory - The identification of potential contaminant sources within the DWSMA is a fundamental element of WHP. It is needed to assign meaningful priorities to source management measures and to effectively monitor implementation of the WHP plan. A source inventory is an ongoing process. Initially, present and historical land uses must be inventoried. Once the WHP plan is approved by MDH, the source inventory must be updated as land use changes within the DWSMA.

A contaminant source inventory must address all land parcels within the DWSMA and land-use information must be reported using either 1) forms or software provided by MDH or 2) other software when a data dictionary and an electronic cross-reference table are provided (**part 4720.5500, subpart 1, item D**). This later requirement is needed to 1) provide consistency in reporting land use on a statewide basis, 2) use legal definitions of potential contaminant sources, and 3) reflect interagency standards for identification and reporting of potential contaminant sources.

The vulnerability assessments of the public water supply well and the DWSMA will be used to determine the extent of the source inventory. Source inventories for nonvulnerable wells and aquifer conditions within the DWSMA can be limited to identifying other wells which reach or penetrate the aquifer used by the public water supply well. Under these conditions, other wells are likely to be the only direct pathways for contaminants to reach a protected aquifer. Therefore, the source inventory only needs to focus on other wells.

Where either the public water supply well or the aquifer supplying it are determined to be vulnerable to contamination, source inventory efforts must address all land and water uses within the DWSMA. Here, the public well, due to its construction or local hydrogeological conditions, may readily permit contaminants to enter the well or the aquifer supplying it.

MDH will provide guidance and training regarding conducting source inventories within a DWSMA. A workshop for conducting source inventories will be held periodically and scheduled to accommo-date public water suppliers who have received notification of the second scoping decision regarding preparation of the WHP plan.

Identifying the Impact of Expected Changes to Land and Water Resources on the Public Water Supply - A WHP plan must list and describe expected changes to the physical environment, land use, surface water and groundwater that may impact the aquifer serving the public water supply well (**part 4720.5220**). This is needed to determine whether new potential sources of contamination may be introduced in the future and to identify future actions for addressing these anticipated sources. Examples of expected changes include: 1) rapid growth of a community, 2) construction of a large feedlot, 3) drilling a new well, 4) the establishment or the expansion a public water system, 5) the establishment or the expansion of a wastewater system. Strategies selected to manage potential sources of contamination must be explicit and logical in relationship to the identified changes.

Identifying the Issues, Problems, and Opportunities - A WHP plan must identify water use and land use issues, problems, and opportunities related to the aquifer serving the public water supply well, the well water, and the DWSMA (**part 4720.5230**). This is needed to define the nature and magnitude of contaminant source management issues in the DWSMA. Identifying the issues, problems, and opportunities will enable the public water supplier to: 1) take advantage of oppor-tunities 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. This will guide a public water supplier towards developing meaningful goals, objective priorities, and an effective plan of action.

The water quantity and quality data collected, under **part 4720.5400**, must be used in conjunction with the contaminant source inventory to assess the impacts that land use is having or may have on the aquifer used by the public water supply well. Potential impacts must be referenced to 1) existing or proposed land-use changes in the DWSMA and 2) the influence that existing land-use control programs have on water and related land resources. Also, the public water supplier must consider the administrative, technical, and financial aspects of any new WHP measures or for improving existing measures.

Establishing WHP Goals - A WHP plan must establish goals for present and future water and land use to provide a framework for determining plan objectives and a related plan of action (**part 4720.5240**). Examples of goals include the desired quality of the well water and the water in the aquifer serving the public water supply, the role that the public water supplier intends to assume in ensuring that problems and opportunities are addressed and the type of land use and management the public water supplier wishes to encourage in the DWSMA.

Objectives and Plan of Action - The core of a WHP plan is the identification and implementation of effective contaminant source management strategies that will protect a public water supply well from contamination (**part 4720.5250**). These management strategies, referred to in the rule as WHP measures, may range from nonregulatory activities, such as public education, to regulatory activities such as the adoption of a WHP ordinance. There are hundreds of activities that could be implemented as WHP measures, but a WHP plan should use management strategies which most effectively address local land and water uses as well as resource needs. Together, the Minnesota Department of Agriculture, the Minnesota Pollution Control Agency, and MDH have created guidance documents outlining WHP measures a public water supplier can select. MDH will hold a workshop on WHP measures periodically and schedule it to accommodate public water suppliers who are preparing this part of a WHP plan.

A number of factors must be considered when WHP measures are selected and prioritized (**part 4720.5250, subpart 3**). Such factors include:

- contamination of a public water supply well;
- quantities of the potential contamination sources;
- location of the source in relation to the well;
- capability of the geologic material to absorb a contaminant;
- existence and effectiveness of existing official controls;
- time required to obtain cooperation; and
- administrative, legal, technical, and financial resources needed.

It is likely that not all of the action steps proposed in the WHP plan can be implemented immediately following plan approval by MDH. Factors which may affect the rate at which action steps can be implemented include resource limitations, negotiations with property owners and state and local agencies, and needed changes to state and local legal authority to manage potential contaminant sources. Also, the priority assigned to a specific type of potential contaminant source must be referenced to the numbers of the source, the distance to the public water supply well, compliance to isolation distances specified in the state Well Code (Minnesota Rule 4725), and the ability of the aquifer to naturally assimilate specific types of contaminants related to the source. All of these factors must be considered when assigning priorities to proposed action steps.

The potential for the release of contaminants near the public water supply well must be addressed because little time may be available to react effectively. The plan of action must specify the response measures that will be used to address contaminant releases that are within a one-year TOT from the public water supply well.

The management of potential contaminant sources will likely involve participation by state agencies and other local agencies. When describing priorities, the WHP plan must identify the entity responsi-ble for implanting each action step. When local and state agencies are involved, the plan must docu-ment whether cooperation by these agencies has been arranged.

The plan of action in the WHP plan must (**part 4720.5250, subparts 2 and 4**):

- address the problems and opportunities identified in the plan;
- identify and prioritize the WHP measures that will be used;
- identify proposed changes in well construction, maintenance, and use; and
- identify who is responsible to implement each WHP measure selected.

Identifying a Strategy to Evaluate the Effectiveness of the WHP Measures - The public water supplier must identify in the WHP plan a strategy to evaluate the effectiveness of the selected WHP measures (**part 4720.5270, subpart 1**). This evaluation must be conducted every 2.5 years or when a plan is amended (**part 4720.5270, subpart 4**). The required components of an evaluation strategy are found in **part 4720.5270, subpart 2.** This evaluation will be used to focus the selection of WHP measures in the next WHP plan and must be submitted to MDH at the first scoping meeting held to amend an existing plan (**part 4720.5270, subpart 5**).

SUMMARY

The identification and implementation of WHP measures—management strategies—is the core part of any WHP and is the method for preventing the contamination of water serving a public water supply well. There are a number of factors that influence the selection of WHP measures, which means the identification and prioritization of the WHP measures must reflect these factors and is best achieved by the public water supplier. The selected WHP measures are to be evaluated.

CHAPTER 6

PREPARING THE CONTINGENCY STRATEGY FOR AN ALTERNATE WATER SUPPLY

The WHP plan must have a contingency strategy to address the disruption of the water supply due to mechanical failure or contamination (**part 4720.5280**). A contingency plan is needed to ensure a timely and effective response to any interruption of the public water supply. The public water supplier must prepare a description of the water supply system, its capacity, and the anticipated water use and demand of its users. Potential sources of water supply disruption must be identified, and alternative short- and long-term measures for restoring the water supply must be discussed. The contingency plan must present the logistical support that will be utilized to address water supply interruptions as well as specific emergency response procedures. Finally, mitigative measures that can be used to reduce the vulnerability of the present water supply system must be identified.

The strategy selected by the public water supplier will vary from supplier to supplier based on the situation. The requirements of a contingency strategy can be found in **part 4720.5280, subpart 2,** of the attached rule. The Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans which have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

SUMMARY

A contingency strategy identifying an alternate water supply in the event of a disruption caused by either mechanical failure or contamination must be included in a WHP plan. Emergency and conservation plans approved by DNR fulfill contingency planning requirements of the WHP rule.

CHAPTER 7

REVIEW AND APPROVAL OF THE REMAINING PART OF THE WHP PLAN

This chapter presents the requirements for the review and approval of the remaining part of the WHP plan. The WHP plan must be submitted to local units of government for review. Also, a public hearing is required before the WHP plan is submitted to MDH. The WHP plan must be reviewed and approved by MDH before the public water supplier can proceed with implementation.

Submitting the Remaining Part of the WHP Plan to Local Units of Government - Before the WHP plan is submitted to MDH, the public water supplier must submit a copy of the remaining part of the WHP plan to local units of government (**part 4720.5350, subpart 1**). The local units of government are allowed 60 days to review and comment on the part of the plan (**part 4720.5350, subpart 2**). The public water supplier must address any comments received from local units of government **(part 4720.5350, subpart 3**).

Holding a Public Hearing Regarding the WHP Plan - The public water supplier is to hold a public hearing on the WHP plan after the 60 day local government review and before the WHP plan is submitted to MDH. For communities, this hearing could be done at a regularly scheduled city council meeting. The purposes for the public hearing are to 1) make land owners aware of proposed management strategies that affect their property, 2) provide the public with information regarding the level of protection needed for the public water supply well, and 3) solicit comments regarding potential contaminant sources or conflicting land uses which may impact the public water supply well.

Submitting the WHP Plan to MDH - The public water supplier must submit to MDH the following items (**part 4720.5360, subpart 1**):

- the remaining WHP plan prepared after approval of the delineations and vulnerability assessments,
- all written comments received on the plan, and
- a summary of changes made to the plan as a result of the local review process.

MDH will forward copies of the plan submittal to the following agencies for comment (**part 4720.5360, subpart 2**):

- Minnesota Department of Agriculture,
- Minnesota Department of Natural Resources,
- Minnesota Pollution Control Agency,
- Minnesota Board of Water and Soil Resources, and
- other agencies MDH believes could assist with review.

These agencies will have 60 days in which to submit comments to MDH regarding whether any portion of the proposed WHP plan is contrary to state or federal law (**part 4720.5360, subpart 3**) or if it does not satisfy the review criteria specified in **part 4720.5555**.

MDH and the other identified agencies must use the following principles as the basis for plan review (**part 4720.5555**):

- **Compliance with the rule** - The WHP plan must be in compliance with **parts 4720.5100 to 4720.5590**.
- **Sound management of water resources** - includes evaluating whether significant up- or down-gradient effects on groundwater may result from management controls specified in the plan. Source management options should be based on sound data and technical analysis and the interactions between surface water and groundwater should be considered. Also, the effects of short- and long-term variations in precipitation must be evaluated for their impacts on source management.
- **Effective health and environmental protection** - includes preventing potential water and related land resource problems which may impact the public well, identifying anticipated and appropriate improvements in the quality of the environment within the DWSMA, and promoting public health and safety.
- **Efficient management of potential contaminant sources** - includes estimating the cost of implementing the WHP plan. Also the management approach must identify 1) mechanisms for funding plan implementation, 2) how coordination will be achieved with participating state and local agencies, 3) the approaches that were used to identify source management problems and opportunities to correct them, and 4) how water conservation practices will be used to support WHP goals.

Notification of MDH review results must be communicated to the public water supplier within 90 days after the filing of the submittal (**part 4720.5360, subpart 4**). Once the remaining part of the WHP plan has been approved, the public water supplier can proceed with implementing the WHP plan. If the department does not approve the plan, the public water supplier will receive written notification that identifies the deficiency and the reasons for disapproval. The public water supplier must resubmit the revised WHP plan to MDH within 120 days (**part 4720.5360, subpart 4, item B**). MDH must follow the same principles for plan review as when the WHP plan was first submitted.

SUMMARY

The remaining part of the WHP plan must be submitted to local units of government for comments on the plan before a public hearing is held on the plan by the public water supplier. After the public hearing, the plan is submitted for review by MDH and other agencies. MDH has 90 days to approve or disapprove the plan.

CHAPTER 8

IMPLEMENTING A WHP PLAN

Upon notification from MDH that the WHP plan has been approved, the public water supplier may proceed with implementation. This must begin within 60 days of approval notification and the public water supplier must notify local units of government within the DWSMA of the WHP plan adoption or future plan amendments (**part 4720.5560**). MDH will continue to work with the public water supplier on source control issues and coordinating involvement by state and local agencies with plan implementation. Issues and problems identified with implementing WHP plans will be forwarded to the Minnesota Environmental Quality Board and the Legislative Water Commission in a biennial plan for the WHP program.

SUMMARY

Upon approval of the remaining part of the plan, the public water supplier must begin implementing the WHP plan within 60 days.

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CHAPTER 9

UPDATING A WHP PLAN

WHP is an ongoing process and WHP plans need to be periodically reviewed and updated. Land and groundwater use within a DWSMA are likely to change over time and the WHP plan must be modified to reflect these changes. Otherwise, the delineated DWSMA may not reflect the area(s) which actually contribute water to the public water supply well and efforts to protect it from contamination will not reflect existing potential contaminant sources. Public water suppliers are required to review and update their WHP plans 1) every ten years to ensure that their plans reflect current conditions within a DWSMA (**part 4720.5570, subpart 1, item C**); 2) when another well is added to the public water supply system (**part 4720.5570, subpart 1, item A)**; or 3) when the boundaries of a WHPA being delineated overlap the boundaries of an MDH approved WHPA of another public water supply system (**part 4720.5570, subpart 1, item B**). The date the plan was originally approved by MDH will be used to reference ten-year periods. Notification of approval by MDH for an additional well will include notification to amend an existing approved WHP plan. The updated WHP plan must describe the method(s) used to update and amend it and MDH must review an amended plan following the same procedures used for the original plan.

Where there is a high density of public water supply wells, such as in some of the suburban communities in the Minneapolis-St. Paul area, the addition of another well may impact the delineated WHPA of an adjacent community. Here, both communities will have to cooperate on amending both of their WHP plans or develop a joint WHP plan for the WHPA formed by the combined pumping of each other's wells.

SUMMARY

A WHP plan must be amended every ten years or when another well is added to the system or the boundaries of an approved WHPA are impacted by the delineation of another WHPA.

APPENDIX I

MINNESOTA RULES
PARTS 4720.5100 TO 4720.5590

REGARDING WHP MEASURES FOR
PUBLIC WATER SUPPLY WELLS

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4720.5100 DEFINITIONS.

Subpart 1. **Scope.** The terms used in parts 4720.5100 to 4720.5590 have the meanings given them in Minnesota Statutes, section 103I.005 and in this part.

Subp. 2. **Angle of ambient groundwater flow**. "Angle of ambient groundwater flow" means the direction of groundwater flow through an aquifer undisturbed by pumping or human-caused activities. The angle of ambient groundwater flow is expressed in degrees, ranging from 0 to 360 degrees, and is measured in a clockwise direction from geographical north, not magnetic north.

Subp. 3. **Aquifer.** "Aquifer" has the meaning given in part 4725.0100, subpart 21.

Subp. 4. **Aquifer test plan**. "Aquifer test plan" means the document containing the plan by which the aquifer transmissivity value will be calculated for a public water supply well, as required under part 4720.5540.

Subp. 5. **Casing.** "Casing" has the meaning given in part 4725.0100, subpart 22.

Subp. 6. **Commissioner.** "Commissioner" means the commissioner of health.

Subp. 7. **Community water supply.** "Community water supply" has the meaning given to "community water system" in Code of Federal Regulations, title 40, section 141.2 (1992 and as subsequently amended).

Subp. 8. **Confined aquifer.** "Confined aquifer" has the meaning given in part 7045.0020, subpart 10.

Subp. 9. **Confining layer.** "Confining layer" has the meaning given in part 4725.0100, subpart 24a.

Subp. 10. **Contamination.** "Contamination" has the meaning given in part 4725.0100, subpart 34.

Subp. 11. **Contingency strategy.** "Contingency strategy" means the part of a wellhead protection plan that describes an organized, planned, and coordinated course of action that identifies the location and provision of an alternate drinking water supply if the public water supply is disrupted by mechanical failure or contamination.

Subp. 12. **Department.** "Department" means the Minnesota Department of Health.

Subp. 13. **Drinking water supply management area.** "Drinking water supply management area" means the surface and subsurface area surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in a wellhead protection plan. The boundaries of the drinking water supply management area are:

A. center lines of highways, streets, roads, or railroad rights-of-way;

B. section, half-section, quarter-section, quarter-quarter-section, or other fractional section lines of the United States public land survey;

C. property or fence lines;

D. the center of public drainage systems;

E. public utility service lines; or

F. political boundaries.

Subp. 14. **Drinking water supply management area vulnerability.** "Drinking water supply management area vulnerability" means an assessment of the likelihood for a potential contaminant source within the drinking water supply management area to contaminate a public water supply well based on:

A. the aquifer's inherent geologic sensitivity; and

B. the chemical and isotopic composition of the groundwater.

Subp. 15. **Flow boundaries.** "Flow boundaries" means hydrologic or geologic boundaries, including:

A. the physical limits of an aquifer;

B. lakes, rivers, streams, drainage ditches, or other surface hydrologic features;

C. areas of contrasting geologic materials; or

D. the pumping influence of other wells.

Subp. 16. **Geographic reference point.** "Geographic reference point" means a location on the earth's surface that is referenced in:

A. latitude and longitude;

B. a universal transverse mercator projection;

C. the public land survey system; or

D. the state plane coordinate system.

Subp. 17. **Groundwater.** "Groundwater" has the meaning given in Minnesota Statutes, section 115.01, subdivision 6.

Subp. 18. **Hydraulic gradient**. "Hydraulic gradient" means the slope of the water table or potentiometric surface.

Subp. 19. **Inner wellhead management zone.** "Inner wellhead management zone" means the land within a 200-foot radius of a public water supply well.

Subp. 20. **Isolation distance**. "Isolation distance" means the distance from a contamination source as described in parts 4725.4450 and 4725.5850.

Subp. 21. **Local unit of government**. "Local unit of government" has the meaning given in part 8405.0110, subpart 5.

Subp. 22. **Municipal public water supply well**. "Municipal public water supply well" means a public water supply well owned, managed, or operated by a municipality as defined in Minnesota Statutes, section 103B.305, subdivision 6.

Subp. 23. **Noncommunity water supply.** "Noncommunity water supply" has the meaning given to "noncommunity water system" in Code of Federal Regulations, title 40, section 141.2 (1992 and as subsequently amended).

Subp. 24. **Nontransient noncommunity water supply**. "Nontransient noncommunity water supply" has the meaning given to "nontransient noncommunity water system" in Code of Federal Regulations, title 40, section 141.2 (1992 and as subsequently amended).

Subp. 25. **Official controls**. "Official controls" has the meaning given in part 8405.0110, subpart 7.

Subp. 26. **Potential contaminant source**. "Potential contaminant source" means any human-related activity that presents a risk to groundwater quality.

Subp. 27. **Public water supplier or supplier**. "Public water supplier" or "supplier" has the meaning given to "supplier of water" in Code of Federal Regulations, title 40, section 141.2 (1992 and as subsequently amended).

Subp. 28. **Public water supply or supply.** "Public water supply" or "supply" has the meaning given to "public water system" in Code of Federal Regulations, title 40, section 141.2 (1992 and as subsequently amended).

Subp. 29. **Public water supply well.** "Public water supply well" means a well as defined in Minnesota Statutes, section 103I.005, subdivision 21, that serves a public water supply and is not a dewatering well or a monitoring well serving a public water supply.

Subp. 30. **Pumping discharge rate**. "Pumping discharge rate" means the volume of water discharged by a well per unit of time.

Subp. 31. **Pumping test**. "Pumping test" means a test, as described in parts 4720.5520 and 4720.5530, that is used to determine the aquifer transmissivity.

Subp. 32. **Related land resources**. "Related land resources" has the meaning given in Minnesota Statutes, section 103B.305, subdivision 8.

Subp. 33. **Remaining portion of the wellhead protection plan**. "Remaining portion of the wellhead protection plan" means that portion of the wellhead protection plan that remains to be completed after the public water supplier has fulfilled the requirements of parts 4720.5320 and 4720.5330.

Subp. 34. **Specific capacity test**. "Specific capacity test" means the productivity of a well obtained by dividing the gallons of water pumped per unit time by the number of feet the water level in the well is lowered due to its pumping.

Subp. 35. **State identifier**. "State identifier" means the unique number assigned by the department to a well or the number assigned by a state agency responsible for a potential source of contamination.

Subp. 36. **Time of travel**. "Time of travel" means the amount of time over which groundwater will move through a portion of an aquifer and the overlying geologic materials to recharge a well in use.

Subp. 37. **Transient noncommunity water supply.** "Transient noncommunity water supply" means a public water supply that is not a community water supply or a nontransient noncommunity water supply.

Subp. 38. **Transmissivity.** "Transmissivity" means the product of the average hydraulic conductivity and the saturated thickness of the aquifer. Hydraulic conductivity means the volume of water that will move through a porous medium in unit time under a unit hydraulic gradient through a unit area measured at right angles to groundwater flow.

Subp. 39. **Unconfined aquifer**. "Unconfined aquifer" has the meaning given in part 6115.0630, subpart 17.

Subp. 40. **Watershed district.** "Watershed district" means a district established under Minnesota Statutes, chapter 103D.

Subp. 41. **Watershed management organization**. "Watershed management organization" has the meaning given in Minnesota Statutes, section 103B.205, subdivision 13.

Subp. 42. **Well vulnerability.** "Well vulnerability" means an assessment of the likelihood of contamination entering a public water supply well based on the criteria specified in part 4720.5550, subpart 2.

Subp. 43. **Wellhead protection.** "Wellhead protection" means a method of preventing well contamination by effectively managing potential contaminant sources in all or a portion of the well's recharge area.

Subp. 44. **Wellhead protection measure.** "Wellhead protection measure" means a method adopted and implemented by a public water supplier to prevent contamination of a public water supply, and approved by the department under parts 4720.5110 to 4720.5590.

Subp. 45. **Wellhead protection plan or plan.** "Wellhead protection plan" or "plan" means a document that provides for the protection of a public water supply, is submitted to the department, is implemented by the public water supplier, and complies with:

A. the wellhead protection elements specified in the 1986 amendments to the federal Safe Drinking

Water Act, United States Code, title 42, chapter 6A, subchapter XII, part C, section 300h-7 (1986 and as subsequently amended); and

B. parts 4720.5200 to 4720.5290.

4720.5110 APPLICABILITY.

Subpart 1. **Inner wellhead management zone.** A public water supplier must:

A. maintain the isolation distances for new contaminant sources specified in parts 4725.4450 and 4725.5850 for potential contamination sources located around the public water supply well following the schedule specified in part 4720.5120;

B. monitor potential contaminant sources that were in existence, recorded, or authorized before May 10, 1993, and that are not in compliance with parts 4725.4450 and 4725.5850; and

C. implement wellhead protection measures for potential contaminant sources within the inner wellhead management zone.

Subp. 2. **Wellhead protection area.** For a community public water supply well and a nontransient noncommunity public water supply well, the public water supplier must:

A. delineate the wellhead protection area and the drinking water supply management area;

B. prepare a wellhead protection plan for the drinking water supply management area; and

C. implement a wellhead protection plan for the drinking water supply management area.

4720.5120 SCHEDULE; INNER WELLHEAD MANAGEMENT ZONE.

Wellhead protection measures for the inner wellhead management zone of a public water supply well must be initiated:

A. at the time a new public water supply well is constructed;

B. before June 1, 1999, for an existing community water supply well;

C. before June 1, 1999, for an existing nontransient noncommunity water supply well serving a child care center regulated under chapter 9503 or a school;

D. before June 1, 2000, for any other existing nontransient noncommunity water supply well;

E. before June 1, 2001, for an existing transient noncommunity water supply well serving a facility licensed by the department;

F. before June 1, 2002, for an existing transient noncommunity water supply well serving a facility licensed by the department that is covered by a community health service delegation agreement entered under Minnesota Statutes, section 145A.07; and

G. before June 1, 2003, for any other existing transient noncommunity water supply well.

4720.5130 WELLHEAD PROTECTION PLAN; PRELIMINARY REQUIREMENTS; SCHEDULE.

Subpart 1. **New municipal public water supply well**. In addition to the requirements of part 4720.0010, a well construction plan for a new municipal public water supply well must have:

A. a preliminary delineation of a wellhead protection area based on available information; and

B. an assessment of the impacts that existing land use and existing water use in the preliminary wellhead protection area, as described in subpart 2, may have on the movement of contaminants resulting from

human activity to the aquifer serving the proposed municipal public water supply well.

Subp. 2. **Criteria; preliminary wellhead protection area delineation.** A preliminary wellhead protection area must be delineated using the criteria in this subpart.

A. The criteria described in part 4720.5510, subparts 2 and 4, must be identified.

B. For a well to be constructed in an unconfined aquifer, the preliminary wellhead protection area must be extended one-half mile in an upgradient direction from the proposed well site, if the delineation method used does not incorporate the criteria specified in part 4720.5510, subpart 5.

Subp. 3. **Schedule.** An initial wellhead protection plan must be completed and submitted by the public water supplier for all the wells in a public water supply system within two years after:

A. an additional well is connected to a municipal public water supply system; or

B. the public water supplier receives notification from the department as specified in part 4720.5550 for:

(1) a community well not included under item A; or

(2) a nontransient noncommunity public water supply.

Subp. 4. **Additional time.** In addition to the two years allowed in subpart 3, the public water supplier has an additional six months to submit the plan:

A. for each two existing or new wells, up to six wells;

B. if the public water supply is not owned by a federal, state, or local unit of government;

C. if funds are not available to support plan development or implementation;

D. if the wellhead protection area lies in more than two governmental jurisdictions; or

E. if pumping of a well that is not a part of the water supply system influences the boundaries of the wellhead protection area being delineated.

CONTENT OF WELLHEAD PROTECTION PLAN

4720.5200 DATA ELEMENTS; ASSESSMENT.

Subpart 1. **Required data elements**. The data elements identified in the scoping decision notice under parts 4720.5310, subpart 2, and 4720.5340, subpart 2, must be assessed by the public water supplier.

Subp. 2. **Assessment of data elements**. A wellhead protection plan must assess the present and future implications of the data elements required in subpart 1 on:

A. the use of the well;

B. the wellhead protection area delineation criteria specified in part 4720.5510;

C. the quality and quantity of water supplying the public water supply well; and

D. the land and groundwater uses in the drinking water supply management area.

4720.5205 WELLHEAD PROTECTION AREA AND DRINKING WATER SUPPLY MANAGEMENT AREA DELINEATION.

Subpart 1. **Boundaries; wellhead protection area.** A wellhead protection plan must have a map showing the boundaries of the wellhead protection area that were determined using the criteria in part 4720.5510.

Subp. 2. **Documentation**. A wellhead protection plan must document the delineation of the wellhead protection area. The documentation must:

A. describe the hydrogeologic setting used to characterize the aquifer;

B. identify the five delineation criteria described in part 4720.5510, subparts 2 to 6;

C. describe the delineation method used, including assumptions, and the supporting documentation for the assumptions;

D. describe all parameters, other than the delineation criteria described in part 4720.5510, used for the delineation;

E. describe the delineation results, including:

(1) the results of model calibrations, when a groundwater flow model is used; and

(2) a narrative describing the uncertainties relating to the accuracy of the calculated wellhead protection area boundaries;

F. specify the data elements used, including data sources; and

G. contain a copy of the calculations performed or, when a computer model is used, the electronic data input and solution file.

Subp. 3. **Boundaries; drinking water supply management area.** A wellhead protection plan must have a map showing the boundaries of the drinking water supply management area. The boundary of the drinking water supply management area must follow the wellhead protection area as closely as possible.

4720.5210 VULNERABILITY ASSESSMENT.

Subpart 1. **Well vulnerability.** A wellhead protection plan must describe the results of the well vulnerability assessment conducted according to part 4720.5550.

Subp. 2. **Drinking water supply management area vulnerability**. A wellhead protection plan must have an assessment of the drinking water supply management area vulnerability.

Subp. 3. **Documentation; drinking water supply management area vulnerability assessment**. A wellhead protection plan must document the vulnerability assessment of the drinking water supply management area. The documentation must:

A. identify the method used to assess vulnerability;

B. describe the geologic conditions throughout the drinking water supply management area from the land surface to the aquifer used by the public water supply well;

C. contain copies of the data elements used, including data sources; and

D. contain maps, diagrams, reports, studies, and tables that were prepared to support the drinking water supply management area vulnerability assessment.

4720.5220 IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL.

Subpart 1. **Changes identified.** A wellhead protection plan must identify and describe expected changes that may occur during the next ten years to:

A. the physical environment;

B. land use;

C. surface water; and

D. groundwater.

Subp. 2. **Impact of changes**. A wellhead protection plan must list, describe, and assess the possible impact on the aquifer serving the public water supply well resulting from:

A. the expected changes identified in subpart 1;

B. the influence of existing water and land government programs and regulations; and

C. the administrative, technical, and financial considerations of the public water supplier and the property owners within the drinking water supply management area.

4720.5230 ISSUES, PROBLEMS, AND OPPORTUNITIES.

Subpart 1. **Requirement.** A wellhead protection plan must identify water use and land use issues, problems, and opportunities related to:

A. the aquifer serving the public water supply well;

B. the well water; and

C. the drinking water supply management area.

Subp. 2. **Identification.** To identify water use and land use issues, problems, and opportunities, the public water supplier must assess:

A. those problems and opportunities disclosed at public meetings and in written comment;

B. the data elements identified by the department in parts 4720.5310, subpart 2, and 4720.5340, subpart 2; and

C. the status and adequacy of official controls, plans, and other local, state, and federal programs on water use and land use.

4720.5240 WELLHEAD PROTECTION GOALS.

A wellhead protection plan must state goals for present and future water use and land use to provide a framework for determining plan objectives and related actions.

4720.5250 OBJECTIVES AND PLAN OF ACTION.

Subpart 1. **Objectives.** A wellhead protection plan must have measurable objectives for the well and drinking water supply management area.

Subp. 2. **Plan of action.** A wellhead protection plan must state a plan of action. A plan of action must:

A. address the problems and opportunities identified in the wellhead protection plan;

B. identify and prioritize the wellhead protection measures that will be used;

C. identify proposed changes in well construction, maintenance, and use; and

D. identify a time frame for the implementation of the action identified in the plan.

Subp. 3. **Establishing priorities**. A public water supplier must establish priorities in the plan of action that:

A. address:

(1) any substance that exceeds the maximum contaminant level specified in Code of Federal Regulations, title 40, part 141 (1995 and as subsequently amended); and

(2) a quantifiable level of a contaminant in the well water resulting from human activity; and

B. reflect:

(1) the number of each potential contaminant source identified and the nature of the potential contamination associated with each source;

(2) the location of each potential contaminant source in relation to:

(a) the public water supply well;

(b) the isolation distances; and

(c) a one-year time of travel emergency response time;

(3) the capability of the geologic material to absorb a contaminant;

(4) the effectiveness of existing controls;

(5) the time required to obtain cooperation from other public water suppliers, and local, state, and federal agencies and programs; and

(6) the administrative, legal, technical, and public and private financial resources needed.

Subp. 4. **Implementation responsibilities**. A plan of action must:

A. describe those actions that will be taken by the public water supplier alone;

B. describe those actions that will require the cooperation of a local unit of government or state and federal agencies; and

C. state whether the public water supplier has received commitments for the cooperation described in item B.

4720.5270 EVALUATION PROGRAM.

Subpart 1. **Program required** A wellhead protection plan must identify a strategy for evaluating the progress of the plan of action and the impact of a contaminant release on the aquifer supplying the public water supply well.

Subp. 2. **Strategy requirements.** The evaluation strategy must:

A. be conducted throughout the drinking water supply management area;

B. be based on the health risk the specific potential contaminant source presents to the public water supply well; and

C. specify the evaluation approach used for specific potential contaminant sources.

Subp. 3. **Evaluation approaches**. Evaluation approaches are:

A. sampling the quality of the groundwater throughout the drinking water supply management area;

B. documenting inventory control of potential contaminants;

C. documenting the implementation of wellhead protection measures; and

D. using monitoring data already required by existing laws and rules in effect at the time of plan adoption.

Subp. 4. **Evaluation frequency**. An evaluation must be conducted:

A. every 2.5 years or less; and

B. when a wellhead protection plan is amended as required in part 4720.5570, subpart 1.

Subp. 5. **Evaluation submittal.** An evaluation conducted in accordance with subpart 4, item B, must be submitted to the department at the first scoping meeting held to amend an existing plan.

4720.5280 ALTERNATE WATER SUPPLY; CONTINGENCY STRATEGY.

Subpart 1. **Contingency strategy required.** A wellhead protection plan must have a contingency strategy that addresses disruptions of the water supply caused by contamination or mechanical failures of the public water supply system.

Subp. 2. **Requirements.** The contingency strategy must:

A. identify the water supply replacement alternatives, including the location of the replacement supply that will be available during a disruption;

B. be based on:

(1) the location and capacity of individual wells and storage tanks;

(2) the location, type, and capacity of the water treatment facility;

(3) the location and capacity of major distribution lines; and

(4) the location of key points for isolating parts of the water supply system;

C. be based on water use and demand;

D. prioritize water uses and demands into low, medium, and high categories;

E. have:

(1) the response coordinator's name, telephone number, address, and response assignments;

(2) the names, addresses, telephone numbers, and response assignments of personnel for public health, water supply operations, and public relations;

(3) an alternate for each of the individuals identified in subitems (1) and (2);

(4) a list of services, equipment, and supplies available to respond to a disruption;

(5) a list of services, equipment, and supplies not available but needed to respond to a disruption; and

(6) a plan of action and time frame for obtaining the services, equipment, and supplies identified in subitem (5);

F. have a procedure to:

(1) identify the disruption;

(2) notify response personnel;

(3) identify incident direction and control;

(4) identify internal communication;

(5) inform the public;

(6) assess the incident on a continual basis;

(7) assess a contamination disruption;

(8) assess a mechanical disruption;

(9) provide an alternative water supply; and

(10) impose water use restrictions; and

G. identify ways to reduce the vulnerability of the water supply system to disruption and to improve the community's response capabilities.

4720.5290 DATA ELEMENTS; INCLUSION.

A wellhead protection plan must have a copy of the data elements identified in the scoping decision notices described in parts 4720.5310, subpart 2, and 4720.5340, subpart 2.

PROCEDURES FOR WELLHEAD PROTECTION PLAN DEVELOPMENT AND REVIEW

4720.5300 WELLHEAD PROTECTION PLAN DEVELOPMENT; PROCEDURES.

Subpart 1. **Applicability.** The procedures specified in parts 4720.5300 to 4720.5360 must be used by a public water supplier to develop and review a wellhead protection plan.

Subp. 2. **Plan manager.** A public water supplier must identify a person to manage and coordinate plan development and implementation.

Subp. 3. **Plan development; notice.** Before the development of a wellhead protection plan begins, a public water supplier must send notice of its decision to develop a plan to:

A. the governing bodies of counties, townships, municipalities, watershed districts, and watershed management organizations that may have jurisdiction wholly or partly within the estimated drinking water supply management area;

B. the regional development commission, if any; and

C. the department.

Subp. 4. **Notice content.** The notice must contain:

A. the name, address, and telephone number of the wellhead protection plan manager;

B. the state identifier of each well to be addressed in the wellhead protection plan;

C. the date the wellhead protection plan must be completed;

D. a workplan for plan development;

E. a list of the data elements identified by the department in the scoping decision notice that the public water supplier does not have but needs to:

(1) delineate the wellhead protection area and the drinking water supply management area; and

(2) assess the vulnerability of the well, the wellhead protection area, and the drinking water supply management area;

F. a request that the data elements identified in item E be shared, if available; and

G. a request for:

(1) existing water and related land resource plans and official controls; and

(2) a description of conflicts, problems, or opportunities that local units want examined and addressed in the wellhead protection plan.

Subp. 5. **Local units of government; meetings**. During the time the plan is being developed, a public water supplier must conduct at least one meeting with local units of government that may have jurisdiction in water and related land resources management within the drinking water supply management area.

Subp. 6. **Public participation**. A public water supplier developing a wellhead protection plan must ensure that there is a process for public participation during plan development and implementation.

Subp. 7. **Recordkeeping**. A public water supplier must maintain a record of each public meeting held.

4720.5310 FIRST SCOPING MEETING PROCEDURES.

Subpart 1. **Scoping meeting; delineation and vulnerability assessments**. A public water supplier and the department shall meet to discuss the data elements specified in part 4720.5400 that the department determines must be contained in the wellhead protection plan and be used to:

A. delineate the wellhead protection area and the drinking water supply management area; and

B. assess the vulnerability of the well and the drinking water supply management area.

Subp. 2. **Scoping decision; notice**. No later than 30 days after the scoping meeting specified in subpart 1, the department shall notify the public water supplier in writing of the data elements specified in part 4720.5400 that must be:

A. used to perform the delineation and vulnerability assessments;

B. contained in the wellhead protection plan; and

C. submitted to the department.

4720.5320 AQUIFER TEST PLAN; PROCEDURES.

Subpart 1. **Submittal.** An aquifer test plan as specified in part 4720.5540 must be submitted to the department by a public water supplier for department approval:

A. before the selection of the aquifer test method; and

B. before the delineation of the wellhead protection area.

Subp. 2. **Review; notice.** No later than 30 days after receipt of an aquifer test plan, the department shall:

A. approve or disapprove the aquifer test plan based on the criteria specified in part 4720.5555; and

B. provide the public water supplier notice of approval or disapproval of the aquifer test plan.

Subp. 3. **Disapproval notice**. If an aquifer test plan is disapproved, the department shall, as part of the notice of disapproval, provide the public water supplier with:

A. a written statement that identifies those portions of the disapproved aquifer test plan that require revision; and

B. the reasons for disapproval.

Subp. 4. **Resubmittal.** A disapproved aquifer test plan must be revised by the public water supplier and resubmitted to the department within 45 days after receiving notice of disapproval.

Subp. 5. **Revised aquifer test plan; review.** On receipt of a revised aquifer test plan, the department shall follow the same review process as for an original submittal.

4720.5330 DELINEATION AND VULNERABILITY ASSESSMENT REVIEW; PROCEDURES.

Subpart 1. **Delineation and vulnerability assessment; submittal**. Before the remaining portion of the wellhead protection plan is prepared, a public water supplier must submit to the department:

A. the maps and documentation required in part 4720.5205;

B. the vulnerability assessment required in part 4720.5210; and

C. the data elements required under part 4720.5310, subpart 2.

Subp. 2. **Review; notice.** No later than 60 days after the filing of the information specified in subpart 1, the department shall:

A. approve or disapprove, based on the criteria in part 4720.5555, the following:

(1) the wellhead protection area delineation;

(2) the drinking water supply management area boundary; and

(3) the well and drinking water supply management area vulnerability assessment; and

B. provide the public water supplier notice of approval or disapproval of the delineation.

Subp. 3. **Disapproval notice**. If a wellhead protection area delineation, a drinking water supply

management area boundary, or a vulnerability assessment is disapproved, the department shall, as part of its notice of disapproval, provide the public water supplier with:

A. a written statement that identifies those portions of the disapproved document that require revision; and

B. reasons for disapproval.

Subp. 4. **Resubmittal.** A public water supplier must revise a disapproved wellhead protection area delineation, drinking water supply management area boundary, or vulnerability assessment and submit the revision to the department within 45 days after receiving notice of disapproval.

Subp. 5. **Revised information; review**. On receipt of a revised wellhead protection area delineation, drinking water supply management area boundary, or vulnerability assessment, the department shall follow the same review process as for an original submittal.

Subp. 6. **Submittal to local units of government**. Within 30 days of department approval, the public water supplier must submit a copy of the wellhead protection area delineation, the drinking water supply management area boundary, and the vulnerability assessments approved by the department to:

A. local units of government wholly or partly within the drinking water supply management area;

B. the regional development commission, if any; and

C. watershed districts and watershed management organizations wholly or partly within the drinking water supply management area.

Subp. 7. **Public information meeting**. Within 60 days of the receipt of the notice of approval from the department, a public water supplier must hold one public information meeting for the general public about the approved:

A. wellhead protection area delineation;

B. drinking water supply management area boundary; and

C. vulnerability assessments.

4720.5340 SECOND SCOPING MEETING PROCEDURES.

Subpart 1. **Scoping meeting; remaining portion of wellhead protection plan**. A public water supplier and the department shall meet to discuss the data elements specified in part 4720.5400 that the department determines must be contained in the wellhead protection plan and used to prepare the remaining portion of the wellhead protection plan.

Subp. 2. **Scoping decision; notice**. No later than 30 days after the scoping meeting specified in subpart 1, the department shall notify the public water supplier in writing of the data elements specified in part 4720.5400 that must be:

A. used to prepare the remaining portion of the wellhead protection plan;

B. contained in the wellhead protection plan; and

C. submitted to the department.

4720.5350 LOCAL REVIEW; PUBLIC HEARING.

Subpart 1. **Submittal to local units of government.** The public water supplier must submit a copy of the remaining portion of the wellhead protection plan to:

A. local units of government wholly or partly within the wellhead protection area;

B. the regional development commission, if any; and

C. watershed districts and watershed management organizations wholly or partly within the wellhead protection area.

Subp. 2. **Local review.** A public water supplier must allow 60 days for the governmental units identified in subpart 1 to comment in writing on the remaining portion of the wellhead protection plan.

Subp. 3. **Comments; consideration.** A public water supplier must consider comments of a local unit of government, regional development commission, watershed district, or water management organization, if any, that:

A. identify and describe any conflict the commenting party has with the plan, when the conflict is not already identified in the remaining portion of the wellhead protection plan; and

B. state the commenting party's position on a conflict identified by the public water supplier for consideration by the department during the department's review of the plan.

Subp. 4. **Public hearing**. A public water supplier must conduct a public hearing on the wellhead protection plan after the 60-day period for local review and comment is completed and before submitting the plan to the department.

4720.5360 DEPARTMENTAL REVIEW; REMAINING PORTION OF PLAN.

Subpart 1. **Submittal to department**. After conducting a public hearing, a public water supplier must submit to the department six copies of:

A. the remaining portion of the wellhead protection plan, including the data elements to be submitted to the department as specified in part 4720.5340, subpart 2;

B. written comments received on the entire plan; and

C. a summary of changes made to the entire plan as a result of the local review process.

Subp. 2. **Department consultation**. On receipt of the items specified in subpart 1, the department shall transmit a copy of the items, along with a map of the wellhead protection area, a map of the drinking water supply management area, and the vulnerability assessment of the drinking water supply management area to:

A. the Minnesota Department of Agriculture;

B. the Minnesota Department of Natural Resources;

C. the Minnesota Pollution Control Agency;

D. the Board of Water and Soil Resources; and

E. any other state or federal agency the department determines could assist the department with the review of the plan.

Subp. 3. **Comment review.** The department shall:

A. evaluate a wellhead protection plan based on written comments from an entity specified in subpart 2 received no later than 60 days after the plan is transmitted to the entity; and

B. consider comments from an entity specified in subpart 2 that identifies any part of the remaining portion of a wellhead protection plan that is:

(1) contrary to a state or federal law or rule administered by the entity; or

(2) contradictory to the review criteria specified in part 4720.5555.

Subp. 4. **Review; notice; resubmittal**. No later than 90 days after a public water supplier files the remaining portion of a wellhead protection plan, the department shall approve or disapprove the remaining

portion of the wellhead protection plan based on the criteria specified in part 4720.5555, and shall provide the public water supplier notice of approval or disapproval of the wellhead protection plan.

A. If the remaining portion of a wellhead protection plan is disapproved, the department shall, as part of its notice of disapproval, provide the public water supplier with:

(1) a written statement that identifies those portions of the disapproved wellhead protection plan that require revision; and

(2) the reasons for disapproval.

B. A public water supplier must revise a disapproved wellhead protection plan and submit the revision to the department within 120 days after receiving notice of disapproval.

C. On receipt of a revised plan, the department shall follow the same review process as for an originally submitted wellhead protection plan.

DATA ELEMENTS FOR A WELLHEAD PROTECTION PLAN

4720.5400 DATA ELEMENTS.

Subpart 1. **Selection**. The department shall select data elements to be used in a wellhead protection plan in accordance with parts 4720.5310 and 4720.5340 based on the hydrogeological setting and vulnerability of the well and the drinking water supply management area known at both the time the scoping meeting is held and the scoping decision notice is mailed.

Subp. 2. **Physical environment**. The department shall select data elements about the physical environment from the areas described in items A to D.

A. Information about precipitation must include:

(1) an existing map or list of local precipitation gaging stations; and

(2) an existing table showing the average monthly and annual precipitation in inches for the preceding five years.

B. Information about the geology of the area must include:

(1) an existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics;

(2) existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department;

(3) existing borehole geophysical records from wells, borings, and exploration test holes; and

(4) existing surface geophysical studies.

C. Information about the soil conditions must include:

(1) existing maps of the soils and a description of soil infiltration characteristics; and

(2) a description or an existing map of known eroding lands that are causing sedimentation problems.

D. Information about water resources must include:

(1) an existing map of the boundaries and flow directions of major watershed units and minor watershed units;

(2) an existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches;

(3) the shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221;

(4) an existing map of wetlands regulated under chapter 8420 and Minnesota Statutes, sections 103G.221 to 103G.2373; and

(5) an existing map showing those areas delineated as floodplain by existing local ordinances.

Subp. 3. **Land use.** The department shall select data elements about land use from the areas described in items A and B.

A. Information about land use must include:

(1) an existing map of parcel boundaries;

(2) an existing map of political boundaries;

(3) an existing map of public land surveys including township, range, and section;

(4) a map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources;

(5) an existing comprehensive land-use map; and

(6) an existing zoning map.

B. Information about public utility services must include an existing:

(1) map of transportation routes or corridors;

(2) map of storm sewers, sanitary sewers, and public water supply systems;

(3) map of the gas and oil pipelines used by gas and oil suppliers;

(4) map or list of public drainage systems; and

(5) record of the construction, maintenance, and use of the public water supply well and other wells within the drinking water supply management area.

Subp. 4. **Water quantity.** The department shall select data elements about water quantity from the areas described in items A and B.

A. Information about surface water quantity must include an existing:

(1) description of high, mean, and low flows on streams;

(2) list of lakes where the state has established ordinary high water marks;

(3) list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn;

(4) list of lakes and streams for which state protected levels or flows have been established; and

(5) description of known water-use conflicts, including those caused by groundwater pumping.

B. Information about groundwater quantity must include an existing:

(1) list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source;

(2) description of known well interference problems and water use conflicts; and

(3) list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.

Subp. 5. **Water quality**. The department shall select data elements about water quality from the areas described in items A and B.

A. Information about surface water quality must include an existing:

(1) map or list of the state water quality management classification for each stream and lake; and

(2) summary of lake and stream water quality monitoring data, including:

(a) bacteriological contamination indicators;

(b) inorganic chemicals;

(c) organic chemicals;

(d) sedimentation;

(e) dissolved oxygen; and

(f) excessive growth or deficiency of aquatic plants.

B. Information about groundwater quality must include an existing:

(1) summary of water quality data, including:

(a) bacteriological contamination indicators;

(b) inorganic chemicals; and

(c) organic chemicals;

(2) list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points;

(3) report of groundwater tracer studies;

(4) site study and well water analysis of known areas of groundwater contamination;

(5) property audit identifying contamination; and

(6) report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

GENERAL WELLHEAD PROTECTION REQUIREMENTS AND CRITERIA

4720.5500 DATA REPORTING REQUIREMENTS.

Subpart 1. **Data requirements**. Data collected for a wellhead protection plan must:

A. have one geographic reference point for point information;

B. in the case of parcels, be identified with a parcel identification number assigned by the county auditor pursuant to Minnesota Statutes, section 272.193;

C. be identified with a state identifier, if available; and

D. be recorded and reported to the department on:

(1) forms and software provided by the department; or

(2) other software when a data dictionary and an electronic cross-reference table are provided by the public water supplier for translating the data into department data management format.

Subp. 2. **Maps.** When information is presented in map form and the map is newly created for plan purposes, the map:

A. must be presented at a one to 24,000 scale or greater detail;

B. must be presented in an electronic format or on a stable base material;

C. must have four geographic reference points with x and y coordinates, located at the extremes of the map;

D. must be presented in a consistent map scale; and

E. may be combined on multiple maps or map overlays.

Subp. 3. **Laboratory methods**. The laboratory methods used to analyze a well water sample must be at least as precise as those used by the department in part 4720.0350.

Subp. 4. **Geographic reference point documentation.** The coordinate system used to define a geographic reference point must be documented, including a description of:

A. the units of measurement used;

B. the applicable zone;

C. the applicable reference datum; and

D. the map projection method used.

4720.5510 CRITERIA FOR WELLHEAD PROTECTION AREA DELINEATION.

Subpart 1. **Criteria.** A method selected to delineate a wellhead protection area must incorporate the criteria specified in subparts 2 to 6.

Subp. 2. **Time of travel.** The time of travel must be at least ten years.

Subp. 3. **Flow boundaries**. The location and influence of flow boundaries must be identified using existing information.

Subp. 4. **Daily volume**. The daily volume of water pumped must be calculated for each well in the public water supply system.

A. The daily volume calculation must be:

(1) determined by dividing the annual volume of water pumped by 365; and

(2) based on the greatest annual volume of water used during the previous five years or the greatest annual volume of water projected over the next five years, whichever is greater.

B. The daily volume of water pumped must be expressed in gallons per day.

Subp. 5. **Groundwater flow field**. The groundwater flow field must be identified for the aquifer used by the public water supply well.

A. The ambient hydraulic gradient must be measured in a location:

(1) upgradient of the public water supply well; and

(2) beyond the pumping influence of the public water supply well.

B. Except as provided in item C, when a wellhead protection area is delineated for a public water supply well, an analytical method:

(1) may use a single value for the ambient hydraulic gradient; and

(2) must delineate a composite wellhead protection area that uses the angles of ambient groundwater flow that are ten degrees less and ten degrees greater than the measured angle of ambient groundwater flow.

C. When the ambient groundwater flow field cannot be determined due to transient hydraulic conditions, seasonal differences in the hydraulic gradient and the angle of groundwater flow must be accounted for when delineating the wellhead protection area. The ambient groundwater flow field is the two dimensional representation of equipotentials and flowlines created by groundwater movement through an aquifer undisturbed by pumping or other human-caused activities.

D. The hydraulic gradient must be expressed as the ratio of vertical feet divided by the distance in horizontal feet.

Subp. 6. **Aquifer transmissivity**. The aquifer transmissivity must be calculated.

A. The aquifer transmissivity must be expressed in feet squared per day.

B. The aquifer transmissivity must be based on the first of the following methods that is applicable to the public water supply system:

(1) an existing pumping test that meets the requirements of part 4720.5520 and that was previously conducted on a well in the public water supply system;

(2) an existing pumping test that meets the requirements of part 4720.5520 and that was previously conducted on another well in a hydrogeologic setting determined by the department to be equivalent;

(3) a pumping test that meets the requirements of part 4720.5520 and that was conducted to determine the aquifer transmissivity for a new or existing public water supply well specified in part 4720.5520, subpart 1;

(4) a pumping test that meets the requirements of part 4720.5530 and that was conducted to determine the aquifer transmissivity for a new or an existing public water supply well specified in part 4720.5530, subpart 1;

(5) an existing pumping test that does not meet the requirements of part 4720.5520 and that was previously conducted on:

(a) the public water supply well; or

(b) another well in a hydrogeologic setting determined by the department to be equivalent;

(6) an existing specific capacity test or a specific capacity test for the public water supply well; or

(7) an existing published transmissivity value.

4720.5520 PUMPING TEST STANDARDS FOR LARGER SIZED WATER SUPPLY SYSTEMS.

Subpart 1. **Applicability.** A pumping test must be conducted as specified in this part if:

A. the public water supply system consists of two or more wells;

B. a well is accessible for measuring the water level in the aquifer used by the public water supply system;

C. the pump or the water distribution system can maintain a ten percent or less variation in the discharge rate;

D. the water storage facility of the public water supply system can hold enough water to meet the water needs for the length of the pumping test specified in subpart 5; or

E. the water storage facility of the public water supply system can hold the discharge water or the water disposal method is not a public safety hazard.

Subp. 2. **Pumping capacity**. When a pumping test is conducted, the public water supply well must be pumped at its maximum obtainable capacity.

Subp. 3. **Water level measurement**. The water level measurements must be recorded in units of one-hundredths of a foot.

Subp. 4. **Total volume of water measurement**. The total volume of water pumped during the pumping phase of the test must be recorded as the total gallons pumped.

Subp. 5. **Pumping test length**. The length of the pumping test for a public water supply well must be no less than:

A. 24-continuous hours pumping, followed by a 24-continuous hour recovery period, in a confined aquifer; or

B. 72-continuous hours pumping, followed by a 72-continuous hour recovery period, in an unconfined aquifer.

Subp. 6. **Recording; start and finish**. The date and time of the start and the finish of the pumping test must be recorded to the second.

Subp. 7. **Groundwater level monitoring.** For a public water supply well completed in geological materials specified in part 4720.5550, subpart 2, item D, subitem (2), at least one well or environmental bore hole must be used to monitor groundwater levels before, during, and after the pumping test.

A. The well or environmental bore hole used to monitor groundwater levels must be located where it is influenced by the pumping well.

B. The public water supplier is responsible for the construction of one well or environmental bore hole to monitor groundwater levels if an existing well or environmental bore hole cannot be used for the test requirements specified in this subpart.

Subp. 8. **Frequency of readings; confined aquifer**. During the pumping phase and recovery phase of the test for a confined aquifer, water levels in the pumping well and any well or environmental bore hole used to monitor groundwater levels must be measured with sufficient frequency to characterize the drawdown versus time response in each of the following time intervals:

A. prepumping condition;
B. 0 to 5 minutes;
C. 5 to 10 minutes;
D. 10 to 20 minutes;
E. 20 to 60 minutes;
F. 60 to 120 minutes;
G. 120 to 180 minutes;
H. 180 to 360 minutes;
I. 360 to 720 minutes; and
J. 720 to 1,440 minutes.

Subp. 9. **Frequency of readings; unconfined aquifer**. During the pumping phase and recovery phase of the test for an unconfined aquifer, water levels in the pumping well and any well or environmental bore hole used to monitor groundwater levels must be measured with sufficient frequency to characterize the drawdown versus time response in each of the following time intervals:

A. prepumping condition;
B. 0 to 5 minutes;
C. 5 to 10 minutes;
D. 10 to 20 minutes;
E. 20 to 60 minutes;
F. 60 to 120 minutes;
G. 120 to 180 minutes;
H. 180 to 360 minutes;
I. 360 to 720 minutes;
J. 720 to 1,440 minutes;
K. 1,440 to 2,880 minutes; and
L. 2,880 to 4,320 minutes.

Subp. 10. **Readings; discontinuation**. The readings during the recovery phase of the test may be discontinued when the water levels in the pumping well and the well or environmental bore hole used to monitor groundwater level reach 95 percent recovery of the prepumping condition.

Subp. 11. **Recording; pumping rate**. The pumping rate for a public water supply well must be recorded during the pumping phase of the test:

A. every five minutes during the first hour of the pumping phase of the test;

B. at hours 2, 3, 6, and 12 for a confined aquifer; and

C. at hours 2, 3, 6, 12, 24, and daily following the 24-hour reading for an unconfined aquifer.

Subp. 12. **Final recording**. The final recording of the pumping rate for a public water supply well must be recorded five minutes before shutting off the pump.

Subp. 13. **Pumping rate variation.** When the pumping rate of a public water supply well varies by ten percent or greater from the previous reading, except for the final recording specified in subpart 12, new readings must be recorded at five-minute intervals for either the next hour or until a variation of less than ten percent is observed, whichever is the greater length of time.

Subp. 14. **Failure to record pumping rate**. Failure to record the pumping rate for a public water supply well at the times specified in subparts 11 and 12 requires the pump test to be redone.

Subp. 15. **Pumping rate measurement.** The pumping rate must be expressed in gallons per minute.

Subp. 16. **Recording and submittal requirements.** Pumping test data must be recorded and submitted to the department on forms or electronic data file templates provided by the department.

4720.5530 PUMPING TEST STANDARDS FOR SMALLER SIZED WATER SUPPLY SYSTEMS.

Subpart 1. **Applicability.** A pumping test must be conducted as specified in this part for public water supply systems not included under part 4720.5520, subpart 1.

Subp. 2. **Pumping capacity.** When a pumping test is conducted, the public water supply well must be pumped at its maximum obtainable capacity.

Subp. 3. **Pumping discharge rate.** The pumping discharge rate must be held to within ten percent of the discharge rate selected for the test.

Subp. 4. **Water level measurement**. The water level measurements must be recorded in units of one-hundredths of a foot.

Subp. 5. **Total volume of water measurement.** The total volume of water pumped during the pumping phase of the test must be recorded as the total gallons pumped.

Subp. 6. **Pumping test length.** The length of the pumping test must be as long as allowed by the:

A. capability of the pump;

B. capacity of the water reservoirs;

C. capacity of the water distribution system; and

D. capability to dispose of excess discharge water.

Subp. 7. **Frequency of readings.** Water levels must be measured for the duration of the test, and with sufficient frequency to characterize the drawdown versus time response in each of the time intervals specified in part 4720.5520, subpart 8 for a confined aquifer setting, or subpart 9 for an unconfined aquifer setting.

Subp. 8. **Recording; start and finish**. The date and time of the start and the finish of the pumping

test must be recorded to the second.

Subp. 9. **Recording and submittal requirements**. Pumping test data must be recorded and submitted to the department on forms or electronic data file templates provided by the department.

4720.5540 AQUIFER TEST PLAN CONTENT.

An aquifer test plan must be prepared for the wells in a public water supply system and submitted to the department for approval. The aquifer test plan must contain:

A. the state identifier;

B. a map showing the location of the pumping well and the monitoring well or environmental bore hole;

C. the name and address of the public water supplier;

D. the name and address of the person preparing the aquifer test plan;

E. specification of the method used from part 4720.5510, subpart 6;

F. a description of why the method was selected;

G. the existing data and the calculated transmissivity value, if the method selected is one of those specified in part 4710.5510, subpart 6, item B, subitem (1), (2), (5), (6), or (7).

4720.5550 CRITERIA FOR ASSESSING WELL VULNERABILITY.

Subpart 1. **Department determination**. The department shall use the criteria specified in this part to assign priority and notify a public water supplier in writing that a wellhead protection plan must be prepared for an existing well.

Subp. 2. **Well vulnerability criteria.** A public water supply well is vulnerable if:

A. the well water contains ten milligrams per liter or more nitrate plus nitrite nitrogen;

B. the well water contains quantifiable levels of pathogens as defined in part 7040.0100, subpart 26, or chemical compounds that indicate groundwater degradation as defined in Minnesota Statutes, section 103H.005, subdivision 6;

C. the well water contains one tritium unit or more when measured with an enriched tritium detection method; or

D. an enriched tritium analysis of the well water has not been performed within the past ten years; and

(1) information on the well construction is not available; or

(2) the geological material from the land surface to where the groundwater enters the public water supply well is:

(a) fractured bedrock;

(b) solution weathered bedrock;

(c) sandstone bedrock;

(d) unconsolidated material 0.062 millimeters (fine sand) or larger; or

(e) a combination of the materials specified in subitems (a) to (d).

4720.5555 CRITERIA FOR PLAN REVIEW.

Subpart 1. **Compliance with rules**. The department shall review:

A. an aquifer test plan for compliance with parts 4720.5320 and 4720.5510 to 4720.5540; and

B. a wellhead protection plan for compliance with parts 4720.5100 to 4720.5590.

Subp. 2. Principles of review. In addition to verifying compliance with rules, the department shall determine if the plan is based on:

A. hydrologic management of water criteria, including:

(1) upgradient and downgradient effects on groundwater by actions impacting water and related land resources;

(2) data and complete documentation of technical analysis;

(3) the interrelationships between surface water and groundwater, land and water use, and quality and quantity of water; and

(4) the effects of potential variations in precipitation;

B. health and environmental protection criteria, including:

(1) prevention of potential water and related land resource problems;

(2) anticipated improvements in the overall quality of the environment;

(3) public health and safety; and

(4) potential cumulative effects of past, present, and future actions; and

C. management criteria, including:

(1) estimated cost of implementing the wellhead protection plan;

(2) methods used to fund the wellhead protection plan;

(3) ways that wellhead protection planning is coordinated with other related planning programs;

(4) approaches used to identify problems and opportunities; and

(5) use of water conservation practices.

4720.5560 IMPLEMENTATION OF APPROVED WELLHEAD PROTECTION PLAN.

Subpart 1. **Plan implementation**. A public water supplier must begin implementation of a plan no later than 60 days after the public water supplier has received department approval of the plan or amendments to the plan.

Subp. 2. **Notification after plan adoption.** A public water supplier must notify local units of government within the drinking water supply management area of the adoption of a plan or amendments to a plan no later than 60 days after the public water supplier has received department approval of the plan or amendments to the plan.

4720.5570 AMENDMENTS TO WELLHEAD PROTECTION PLAN.

Subpart 1. **Amendments required.** A public water supplier must review and amend a wellhead protection plan:

A. if a well is added to the public water supply system;

B. if the boundaries of a wellhead protection area being delineated overlaps the boundaries of a department approved wellhead protection area of another public water supply system; or

C. every ten years from the date of the last approval of a plan by the department.

Subp. 2. **Amendment procedure**. Amendments to a wellhead protection plan must be developed and reviewed in the same manner specified in parts 4720.5300 to 4720.5360 for an initial wellhead protection plan.

Subp. 3. **Amendment timing**. The process of amending a wellhead protection plan in compliance

with subpart 1, item C, must begin eight years after the date of the last approval of a plan by the department.

Subp. 4. **Amendment criteria.** Amendments to a wellhead protection plan must comply with parts 4720.5200 to 4720.5290 and 4720.5500 to 4720.5540.

4720.5580 VARIANCE PROCEDURES.

The commissioner shall grant a variance to parts 4720.5200 to 4720.5570 only according to the procedures and criteria in parts 4717.7000 to 4717.7050.

4720.5590 INFORMAL RESOLUTION OF DISPUTES.

Subpart 1. **Applicability**. A public water supplier may use the procedures in this part to resolve any conflict between the public water supplier and the department about the development and implementation of a wellhead protection plan.

Subp. 2. **Request for meeting**. A public water supplier must request a meeting with the department by submitting a written request to the department that specifically identifies the provision of the wellhead protection plan in question and the issue involved. No later than 60 days after the meeting, the department shall notify the public water supplier in writing of the results of the meeting.

APPENDIX II

ISOLATION DISTANCES FROM CONTAMINANT SOURCES WHICH ARE SPECIFIED IN

MINNESOTA RULE 4725

MINNESOTA DEPARTMENT OF HEALTH
WELL MANAGEMENT SECTION
121 EAST SEVENTH PLACE, SUITE 220
P.O. BOX 64975
ST. PAUL, MINNESOTA 55164-0975
(651) 215-0811 or 1-800-383-9808

ISOLATION DISTANCES FROM A WATER SUPPLY WELL

CHAPTER 4725
RULES RELATING TO WELLS AND BORINGS
MAY 10, 1993

THIS LIST OF ISOLATION DISTANCES IS SUMMARIZED FROM MINNESOTA RULES, CHAPTER 4725. FOR COMPLETE REGULATIONS, CONSULT THESE RULES AND MINNESOTA STATUTES, CHAPTER 103I. ADDITIONAL INFORMATION AND EXPLANATION CAN BE OBTAINED BY CONSULTING THE *RULES HANDBOOK A GUIDE TO THE RULES RELATING TO WELLS AND BORINGS*, OR BY CONTACTING THE WELL MANAGEMENT SECTION, MINNESOTA DEPARTMENT OF HEALTH.

AGRICULTURAL CHEMICAL STORAGE OR PREPARATION AREA, MORE THAN 25 GALLONS OR 100 POUNDS DRY WEIGHT	150 FEET
AGRICULTURAL CHEMICAL STORAGE OR PREPARATION AREA WITH SAFEGUARDS	100 FEET
AGRICULTURAL CHEMICAL STORAGE OR PREPARATION AREA WITH SAFEGUARDS AND ROOFED	50 FEET
AGRICULTURAL CHEMICAL SUPPLY TANK	20 FEET[1]
ANIMAL FEEDLOT	50 FEET[2]
ANIMAL OR POULTRY BUILDING	50 FEET[2]
BUILDING	3 FEET
BUILDING PROJECTION, OVERHANG, DECK	3 FEET
CESSPOOL	75 FEET[2]
DRY WELL (SEWAGE)	75 FEET[2]
DUMP	150 FEET
ELECTRIC TRANSMISSION LINE	5 FEET[3]
ELECTRIC TRANSMISSION LINE IN EXCESS OF 50 KV	25 FEET
FEEDING OR WATERING AREA WITHIN A PASTURE	50 FEET[2]
FROST-PROOF YARD HYDRANT	10 FEET
GAS PIPE	5 FEET[3] GRAVE 50 FEET
HAZARDOUS SUBSTANCE STORAGE OR PREPARATION AREA, MORE THAN 25 GALLONS OR 100 POUNDS DRY WEIGHT	150 FEET
HAZARDOUS SUBSTANCE STORAGE TANK WITH SAFEGUARDS	100 FEET
HOLDING TANK (SEWAGE)	50 FEET
INTERCEPTOR (WASTE)	50 FEET
LEACHING PIT	75 FEET[2]
LP TANK	5 FEET[3]
MANURE STORAGE AREA	100 FEET[2]
ORDINARY HIGH WATER LEVEL OF A STREAM, RIVER, POND OR LAKE	50 FEET

PETROLEUM STORAGE OR PREPARATION AREA, MORE THAN 25 GALLONS OR 100 POUNDS DRY WEIGHT	150 FEET
PETROLEUM STORAGE TANK WITH SAFEGUARDS	100 FEET
PETROLEUM STORAGE TANK, UNDERGROUND, LESS THAN 1100 GALLONS	50 FEET
PETROLEUM STORAGE TANK, ABOVE GROUND, LESS THAN 1100 GALLONS	20 FEET
PIT	20 FEET
POLLUTANT, CONTAMINANT OR HAZARDOUS SUBSTANCE	50 FEET
PRIVY	50 FEET[2]
SANITARY LANDFILL	150 FEET
SEEPAGE PIT	75 FEET[2]
SEPTIC TANK	50 FEET
SEWAGE LIFT STATION	50 FEET
SEWAGE SUMP, WATERTIGHT	20 FEET
SEWAGE SUMP, NONWATERTIGHT	50 FEET
SEWER, BURIED, GRAVITY, APPROVED, AIR-TESTED	20 FEET
SEWER, BURIED, PRESSURE, APPROVED, AIR-TESTED, SERVING A SINGLE-FAMILY RESIDENCE	20 FEET
SEWER, BURIED, COLLECTOR OR MUNICIPAL, PRESSURIZED, OPEN-JOINTED, OR UNAPPROVED MATERIALS	50 FEET
STORM WATER DRAIN PIPE, 12 INCHES OR GREATER IN DIAMETER	20 FEET
SUBSURFACE DISPOSAL FIELD (DRAINFIELD)	50 FEET[2]
SWIMMING POOL, IN-GROUND	20 FEET
UNFILLED SPACE	20 FEET
UNUSED, UNSEALED WELL OR BORING	50 FEET
WASTE STABILIZATION POND	150 FEET

ADDITIONAL ISOLATION DISTANCES FOR COMMUNITY PUBLIC WATER SUPPLY WELLS

FIRE OR FLUSHING HYDRANT	10 FEET
GRAVEL POCKET RECEIVING CLEAR WATER DRAINAGE	30 FEET
HIGHEST WATER OR FLOOD LEVEL	50 FEET
MINIMUM DISTANCE FROM ANY CONTAMINATION SOURCE	50 FEET[4]
PROPERTY LINE OR EASEMENT	50 FEET

[1] THE 20-FOOT DISTANCE APPLIES ONLY TO AN IRRIGATION WELL AND AN AGRICULTURAL CHEMICAL SUPPLY TANK (CHEMIGATION TANK) PROTECTED WITH SAFEGUARDS.

[2] A WATER SUPPLY WELL WITH LESS THAN 50 FEET OF WATERTIGHT CASING, OR WHICH IS NOT CASED BELOW A CONFINING LAYER OF AT LEAST 10 FEET IN THICKNESS, MUST BE LOCATED AT LEAST TWICE THE INDICATED DISTANCE.

[3] A WELL OR BORING BETWEEN 5 AND 10 FEET OF AN ELECTRIC TRANSMISSION LINE, GAS PIPE OR LP TANK MUST BE PLACARDED AND WORK MUST NOT BE PERFORMED ON THE WELL OR BORING UNLESS THE ELECTRIC LINE IS DEENERGIZED AND GROUNDED OR SHIELDED, AND THE GAS PIPE OR LP TANK DOES NOT CONTAIN FLAMMABLE GAS.

[4] A COMMUNITY PUBLIC WATER SUPPLY WELL MUST BE A MINIMUM OF 50 FEET FROM ANY CONTAMINATION SOURCE. THE 20-FOOT CONTAMINATION DISTANCES (SEWER, PIT, STORM WATER DRAIN PIPE, ETC.) ARE INCREASED TO 50 FEET FOR COMMUNITY PUBLIC WATER SUPPLY WELLS.

To request this document in another format, call (651) 215-0811, T.D. (651) 215-0707, or for greater Minnesota through the Minnesota Relay Service at 1-800-627-3529 and ask for (651) 215-0811.

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