Office of the Revisor of Statutes

Administrative Rules

TITLE: Adopted Permanent Rules Relating to Wells and Borings

AGENCY: Department of Health

MINNESOTA RULES: Chapter 4725

FILED
JUN 2008
(MN) SECRETARY OF STATE
Mark Ritchie

RULE APPROVED
OFFICE OF ADMINISTRATIVE HEARINGS
May 29, 2008
DATE
ADMINISTRATIVE LAW JUDGE.

The attached rules are approved for filing with the Secretary of State

Sandra Glass-Sirany

Sandra Glass-Sirany
Senior Assistant Revisor

0803197

Department of Health

Adopted Permanent Rules Relating to Wells and Borings

4725.0100 DEFINITIONS.

[For text of subpart 1, see M.R.]

Subp. 1a. **Absorption area.** "Absorption area" has the meaning in part 7080.1100, subpart 2, as proposed in State Register, Volume 31, Number 33, page 1025, published on February 12, 2007, and not yet adopted, and includes the area of soil designed to absorb sewage effluent.

Subp. 1b. **Agricultural chemical.** "Agricultural chemical" has the meaning in Minnesota Statutes, section 18D.01, subdivision 3.

Subp. 1c. **Animal unit.** "Animal unit" has the meaning in part 7020.0300, subpart 5, and is a unit of measure comparing the production of animal manure. One animal unit is equal to one slaughter steer, one horse, or for animals not listed in part 7020.0300, subpart 5, the average weight of the animal in pounds divided by 1,000.

[For text of subp 19, see M.R.]

Subp. 21. **Aquifer.** "Aquifer" means a stratum of saturated, permeable bedrock or unconsolidated material having a recognizable water table or potentiometric surface which is capable of producing water to supply a well.

[For text of subp 21a, see M.R.]

Subp. 21b. **Bedrock.** "Bedrock" means a consolidated or coherent, hard, naturally formed aggregation of rock in the earth. Bedrock includes geologic materials deposited prior to the Cretaceous geologic period, and includes igneous and metamorphic rock such as granite, basalt, and iron formation, and sedimentary rock including sandstone, limestone, and shale. Bedrock includes sandstone formations such as the St. Peter or Jordan that may be semiconsolidated. Bedrock does not include alluvium, glacial drift,

glacial outwash, glacial till, saprolite, or soil. For the purposes of this chapter, bedrock does not include mineral matter deposited during, or more recently than, the Cretaceous geologic period, or weathered portions of the formation surface where more than 50 percent of the parent bedrock is altered to an unconsolidated state.

Subp. 21c. **Bentonite.** "Bentonite" means an aluminum silicate clay that contains at least 85 percent of the mineral montmorillonite and meets API specification 13A-04.

Subp. 21d. **Bentonite grout.** "Bentonite grout" means water and a minimum of 15 percent by weight of powdered or granular bentonite, with no additives to promote temporary viscosity. An additional 15 percent by weight of either washed sand or cuttings taken from the bore hole may be mixed into the bentonite and water slurry. The bentonite must be designed by the manufacturer as a grout or well and boring sealant, and must be mixed according to the manufacturer's specifications.

Subp. 21e. **Boring.** "Boring" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 2, and includes environmental bore holes, vertical heat exchangers, and elevator borings, except that for the purposes of this chapter, "boring" does not include exploratory borings regulated under chapter 4727.

Subp. 22. **Casing.** "Casing" means a pipe or curbing placed in a well or boring to:

A. prevent the bore hole walls from caving;

B. seal off surface drainage; or

C. prevent gas, water, or other fluids from entering the well or boring except through the screen, open hole, or perforated casing.

Subp. 22a. **Casing vent.** "Casing vent" means an outlet at the upper terminal of a casing, cap, or cover to allow equalization of air pressure in the casing and escape of toxic or flammable gases when present.

Subp. 22b. **Cement-sand grout.** "Cement-sand grout" means a fluid mixture of Portland cement, sand, and water in the proportion of 94 pounds of Portland cement, not more than 1.0 cubic foot of dry sand, and not more than six gallons of water. Admixtures to reduce permeability or control setting time must meet ASTM Standard C494/C494M-04.

Subp. 22c. **Certified representative.** "Certified representative" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 2a, and means an individual who acts on behalf of a licensee or registrant.

[For text of subp 23, see M.R.]

Subp. 23a. **Community water system.** "Community water system" has the meaning given in Code of Federal Regulations, title 40, section 141.2, and means a public water system which serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.

Subp. 23b. **Completion of work.** "Completion of work" means the date on which the installation of the pump or pumping equipment is finished, the date on which construction of the well or boring is completed if a pump or pumping equipment is not installed by the person constructing the well or boring, the date that construction work regulated by this chapter is completed, the date the well or boring is put into service, or the date that the permit or notification expires, whichever occurs first.

Subp. 23c. **Concrete.** "Concrete" means a mixture of Portland cement, sand and gravel aggregate, and water so that one cubic yard of concrete contains a minimum of 470 pounds (five 94-pound bags) of Portland cement, a maximum of 30 gallons of water, and sand and gravel aggregate passing a one-inch sieve. Admixtures to reduce permeability or control setting time must meet ASTM Standard C494/C494M-04.

Subp. 24a. **Confining layer.** "Confining layer" means a stratum of a geologic material that restricts vertical water movement. A confining layer includes:

A. a stratum at least ten feet in vertical thickness of unconsolidated materials or bedrock, that has a vertical hydraulic conductivity of 10^{-6} centimeters per second or less;

B. a stratum at least ten feet in vertical thickness of clay, sandy clay, or silty clay as defined by the United States Department of Agriculture in Handbook 18; or

C. a stratum at least ten feet in vertical thickness of the St. Lawrence or Eau Claire sedimentary bedrock formation, or a stratum at least two feet in vertical thickness of the Decorah or Glenwood sedimentary bedrock formation, as described in "Geology of Minnesota: A Centennial Volume" by Sims, P.K., and Morey, G.B., pages 459-473, "Paleozoic Lithostratigraphy of Southeastern Minnesota" by George Austin, which is incorporated by reference. The publication is available at the Minnesota Geological Survey, Minnesota Department of Health, or through the Minitex interlibrary loan program.

Subp. 24b. **Confining materials.** "Confining materials" means geologic materials that restrict vertical water movement. Confining materials include:

A. unconsolidated material or bedrock that has a vertical hydraulic conductivity of 10^{-6} centimeters per second or less;

B. clay, sandy clay, or silty clay as defined by the United States Department of Agriculture in Handbook 18 which is incorporated by reference; or

C. the Decorah, Glenwood, St. Lawrence, or Eau Claire sedimentary bedrock formations, as described in "Geology of Minnesota: A Centennial Volume" by Sims, P.K., and Morey, G.B., pages 459-473, "Paleozoic Lithostratigraphy of Southeastern Minnesota" by George Austin, which is incorporated by reference.

Subp. 24c. **Contact hour.** "Contact hour" means a minimum of 50 minutes of lecture, demonstration, workshop, or training excluding coffee breaks, registration, meals, or social activities.

Subp. 24d. **Council.** "Council" means the Advisory Council on Wells and Borings created under Minnesota Statutes, chapter 103I.

Subp. 24e. **Cuttings.** "Cuttings" means a mixture of drilling fluid, ground up rock, and unconsolidated material removed from a well or boring.

Subp. 24f. **Dewatering well.** "Dewatering well" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 4a. Dewatering well includes a temporary well for construction dewatering greater than 25 feet deep, and permanent dewatering wells. Dewatering well does not include:

A. a well 25 feet or less in depth for temporary construction dewatering;

B. a well used to lower groundwater levels for control or removal of groundwater contamination regulated as a remedial well; or

C. a drain tile, perforated pipe, sump, or pit less than ten feet deep, or less than ten feet below the floor of a basement, used to lower groundwater levels for construction or use of underground space.

Subp. 24g. **Dewatering well contractor.** "Dewatering well contractor" means a person issued a limited well/boring contractor's license to construct, repair, and seal dewatering wells.

Subp. 26a. **Drilling machine.** "Drilling machine" means a motorized machine or mechanical device mounted on a truck, trailer, crawler, or skid used to excavate, drill, or bore a well or boring. A drilling machine includes a cable tool, hollow rod, auger, or rotary tool.

Subp. 26b. **Drive-point well.** "Drive-point well" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 5.

Subp. 26c. **Drive-point well or dug well contractor.** "Drive-point well or dug well contractor" means a person issued a limited well/boring contractor's license to construct, repair, or seal drive-point wells or dug wells.

Subp. 26d. **Driven casing.** "Driven casing" means steel casing forced into the ground as the well or boring is advanced, where the outside diameter of the drill bit or drilling tools is equal to or less than the outside diameter of the casing, casing coupling, or drive shoe.

Subp. 27. **Dug well.** "Dug well" means a well that is excavated or dug with unconventional drilling equipment in which the side walls may be supported by material other than standard weight steel casing, stainless steel casing, or plastic casing as specified in this chapter. Water enters a dug well through the side walls and bottom.

Subp. 27a. **Elevator boring.** "Elevator boring" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 6, and does not include cable elevators, hydraulic cylinders used to elevate automobiles, or holeless elevators where the depth of the excavation is less than ten feet below the lowest landing of the elevator.

Subp. 27b. **Elevator boring contractor.** "Elevator boring contractor" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 7.

Subp. 27c. **Environmental bore hole.** "Environmental bore hole" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 8. An environmental bore hole must enter or go through a water bearing layer, be deeper than 25 feet or penetrate a confining layer, and be used for testing or for remediation of soil or groundwater contamination without extracting water. An environmental bore hole includes excavations used to:

A. measure groundwater levels, including an excavation used as a piezometer;

B. determine groundwater flow direction or velocity;

C. measure earth properties such as hydraulic conductivity, bearing capacity, or resistance;

D. obtain samples of geologic materials for testing or classification; or

E. remove or remediate pollution or contamination from groundwater or soil through the use of a vent, vapor recovery system, or sparge point without extracting groundwater.

[For text of subp 28, see M.R.]

Subp. 28a. **Feedlot.** "Feedlot" has the meaning given in part 7020.0300, subpart 3.

Subp. 29a. **Groundwater.** "Groundwater" has the meaning given in Minnesota Statutes, section 115.01, subdivision 6, and does not include water in an artificially created basin, such as a tank excavation, that is not hydrologically connected to the earth outside the basin.

Subp. 29b. **Groundwater thermal exchange device.** "Groundwater thermal exchange device" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 11, and includes a water-supply well used to withdraw or inject groundwater for a heat pump.

Subp. 30. **Grout.** "Grout" means a low permeability material used to fill the annular space around a casing, or to seal a well or boring. Grout is either neat-cement grout, cement-sand grout, or bentonite grout.

Subp. 30a. [See repealer.]

Subp. 30c. **Hazardous substance.** "Hazardous substance" has the meaning given in Minnesota Statutes, section 115B.02, subdivision 8.

Subp. 30d. **Hoist.** "Hoist" means a motorized machine or mechanical device that is not a drilling machine, mounted on a truck, trailer, crawler, or skid, which is used to:

A. remove or install a pump or pumping equipment, casing, screen, pitless adapter, or pitless unit;

B. remove an obstruction from a well or boring;

C. install a tremie pipe when sealing a well or boring; or

D. conduct an activity which requires a license or registration issued under this chapter.

Hoist does not include hand-operated equipment such as a pipe wrench, chain, pulley, or tripod.

Subp. 30e. **Holding tank.** "Holding tank" has the meaning given in part 7080.1100, subpart 40, and means a watertight tank for storage of sewage until it can be transported to a point of approved treatment and ~~disposal~~ dispersal.

Subp. 30f. **Hydrofracturing.** "Hydrofracturing" means the process of placing one or more packers into a bedrock formation and injecting potable water under pressures high enough to open existing fractures or create new fractures in the bedrock for the purpose of increasing the water yield.

Subp. 30g. **Individual well contractor.** "Individual well contractor" means an individual licensed according to Minnesota Statutes, section 103I.525.

Subp. 30h. **Interceptor.** "Interceptor" has the meaning given in part 4715.0100, subpart 66.

Subp. 30i. **Licensee.** "Licensee" means a person who is licensed as a well contractor, limited well/boring contractor, or elevator boring contractor under this chapter and Minnesota Statutes, chapter 103I.

Subp. 30j. **Limited well/boring contractor.** "Limited well/boring contractor" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 12, and includes a person with a license to: construct, repair, or seal drive-point wells or dug wells; install

or repair screens or pitless units or adapters and casing from the pitless unit or adapter to the upper termination of the casing; install a well pump or pumping equipment; seal wells or borings; construct, repair, or seal a dewatering well; or construct, repair, or seal a vertical heat exchanger.

Subp. 30k. **Manure storage area.** "Manure storage area" has the meaning given in part 7020.0300, subpart 14, and does not include a manure storage basin.

Subp. 30l. **Manure storage basin.** "Manure storage basin" means a lagoon, pit, impoundment, or excavation in the ground used to store liquid and solid manure.

Subp. 30m. **Monitoring well.** "Monitoring well" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 14.

Subp. 30n. **Neat-cement grout.** "Neat-cement grout" means a fluid mixture in the proportion of 94 pounds of Portland cement and not more than six gallons of water. Bentonite up to five percent by weight of cement (4.7 pounds of bentonite per 94 pounds of Portland cement) may be used to reduce shrinkage. Not more than 0.6 additional gallons of water may be added for each one percent of bentonite. Admixtures to reduce permeability or control setting time must meet ASTM Standard C494/C494M-04. The minimum density of neat-cement grout using regular (Type 1) Portland cement without bentonite or entrained air is 15.0 pounds per gallon. The minimum density of regular neat-cement grout with bentonite and without entrained air is:

A. 14.7 pounds per gallon for neat-cement grout and two percent bentonite;

B. 14.4 pounds per gallon for neat-cement grout and three percent bentonite;

C. 14.1 pounds per gallon for neat-cement grout and four percent bentonite; and

D. 13.8 pounds per gallon for neat-cement grout and five percent bentonite.

Subp. 30o. **Noncommunity water system.** "Noncommunity water system" means a public water system that serves an average of at least 25 persons daily at least 60

days a year, at a place other than their home, and that is not a community public water system. ~~A noncommunity water system includes, but is not limited to, water systems serving churches, schools, resorts, parks, camps, rest areas, and businesses meeting the criteria listed above.~~ Any water system meeting the criteria identified in this subpart that serves churches, schools, resorts, parks, camps, rest areas, or businesses is deemed to be a noncommunity water system.

Subp. 30p. **Ordinary high water level.** "Ordinary high water level" has the meaning given in Minnesota Statutes, section 103G.005, subdivision 14.

Subp. 30q. **Pasture.** "Pasture" has the meaning given in part 7020.0300, subpart 18.

Subp. 30r. **Person.** "Person" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 16.

Subp. 30s. **Petroleum.** "Petroleum" has the meaning given in Minnesota Statutes, section 115C.02, subdivision 10.

[For text of subps 31a and 32, see M.R.]

Subp. 33. **Pitless unit.** "Pitless unit" means a watertight assembly with a cap that attaches to a casing below ground, allows subsurface discharge through one or more openings, and extends the upper termination of the casing above the established ground surface.

Subp. 34. **Pollution or contamination.** "Pollution" or "contamination" means the presence or addition of any substance to groundwater which is or may become injurious to the health, safety, or welfare of the general public or private individuals using a well, boring, or groundwater; or which is or may become injurious to domestic, commercial, industrial, agricultural, or other uses which are being made of such water.

Subp. 34a. **Portland cement.** "Portland cement" means a construction material that conforms to ASTM Standard C150-04a, "Standard Specification for Portland Cement."

[For text of subp 35, see M.R.]

Subp. 35a. **Potable water-supply well.** "Potable water-supply well" means a water-supply well used to provide water to humans for such purposes as drinking; cooking; bathing; manufacturing or processing of food, drink, or pharmaceuticals; or to supply water to plumbing fixtures accessible to humans.

[For text of subps 36 and 37, see M.R.]

Subp. 37a. **Public water-supply well.** "Public water-supply well" means a well supplying water to a public water system.

Subp. 37b. **Public water system.** "Public water system" means a community or noncommunity water system regulated under chapter 4720.

[For text of subp 40, see M.R.]

Subp. 40a. **Rapid setting cement.** "Rapid setting cement" means a Type III Portland cement as designated in ASTM Standard C150-04a, an API Class C cement, or any Portland cement containing calcium chloride or sodium chloride in an amount between two and four percent by weight of Portland cement, or gypsum in an amount between 20 and 100 percent by weight of Portland cement.

[For text of 40b and 41a, see M.R.]

Subp. 41b. **Remedial well.** "Remedial well" means a water-supply well used to lower a groundwater level to control or remove contamination in groundwater and excludes horizontal trenches, and sumps or pits less than ten feet deep.

Subp. 41c. [See repealer.]

Subp. 41d. **Rock.** "Rock" means a naturally formed aggregation of mineral matter including the rocks described in part 4725.1851, subpart 4, item B.

Subp. 41e. **Sand.** "Sand" means unconsolidated mineral material composed principally of quartz ranging in size from 0.0025 to 0.040 inches in diameter.

Subp. 41f. **Scrap yard.** "Scrap yard" means an establishment, place of business, or place of storage or deposit that is maintained, operated, or used for storing, keeping, buying, or selling scrap, junk, or waste metal~~, including, but not limited to,~~ obtained from automobiles, trucks, tractors, farm equipment, industrial equipment, containers, ~~and~~ appliances, or similar items where the total scrap metal stored is greater than nine tons or consists of more than five motor vehicles.

Subp. 41g. **Screen.** "Screen" means a wire-wrapped, gauze, shutter, slotted, or engineered perforated pipe at the bottom of a casing designed to allow water to enter a well or boring and to prevent sediment from entering the well or boring.

Subp. 41h. **Screen leader or riser.** "Screen leader" or "riser" means a pipe smaller in diameter than the casing that is attached to the top of a screen and telescoped into a casing.

Subp. 41i. **Screen sump.** "Screen sump" means a pipe attached to the bottom of a screen.

Subp. 41j. **Sealing.** "Sealing" means the process of preparing a well or boring to be filled with grout and the process of filling a well or boring with grout.

Subp. 42. [See repealer.]

Subp. 43. **Seepage pit, leaching pit, or dry well.** "Seepage pit," "leaching pit," or "dry well" means an underground pit, tank, or receptacle into which a septic tank discharges effluent or other liquid waste and from which the liquid seeps into the surrounding soil through the bottom or openings in the side of the pit, tank, or receptacle.

Subp. 43a. **Sensitive water-supply well.** "Sensitive water-supply well" means a water-supply well with less than 50 feet of watertight casing where the casing does not

penetrate a confining layer or multiple layers of confining materials with an aggregate thickness of ten feet or more.

[For text of subp 44, see M.R.]

Subp. 44a. **Sewage.** "Sewage" has the meaning given in Minnesota Statutes, section 115.01, subdivision 17, and includes ~~grey~~ gray water discharge from bathing and laundry.

Subp. 44b. **Sewage sump.** "Sewage sump" means a sump, dosing chamber, lift station, tank, pit, or receptacle which contains a pump to discharge sewage.

[For text of subp 45, see M.R.]

Subp. 45a. **Soil ~~treatment~~ dispersal system.** "Soil ~~treatment~~ dispersal system" has the meaning given in part 7080.1100, subpart 79, and means the piping and media such as gravel, where sewage effluent is treated and ~~disposed of~~ dispersed into the soil by percolation and filtration and includes trenches, seepage beds, drainfields, at-grade systems, and mound systems.

Subp. 46. [See repealer.]

Subp. 47. **Static water level.** "Static water level" means the distance measured from the established ground surface to the water surface in a well or boring neither being pumped, nor under the influence of pumping nor flowing under artesian pressure.

Subp. 47a. **Storm water drain pipe.** "Storm water drain pipe" means a pipe or conduit carrying storm water or surface water from a building roof, parking lot, street, or paved area. Storm water drain pipe does not include a pipe or conduit carrying:

A. domestic waste water, sewage, or industrial wastes;

B. clear water drainage from building perimeter drain tile; or

C. water from a floor drain, not connected to a sewer, to a point of surface discharge.

[For text of subp 48, see M.R.]

Subp. 49. **Suction line.** "Suction line" means a pipe or line connected to the inlet side of a pump or pumping equipment or any connection to a casing that may conduct nonsystem water into the well or boring because of negative pressures.

[For text of subps 49b and 49c, see M.R.]

Subp. 49d. **Unconsolidated materials.** "Unconsolidated materials" means geological materials that are not bedrock and includes alluvium, glacial drift, glacial outwash, glacial till, lacustrine deposits, loess, saprolite, soil, and those materials specified in part 4725.1851, subpart 4, item A.

[For text of subp 49e, see M.R.]

Subp. 49f. **Vertical heat exchanger contractor.** "Vertical heat exchanger contractor" means a person issued a limited well/boring contractor's license for constructing, repairing, and sealing vertical heat exchangers.

Subp. 49g. **Vertical heat exchanger piping.** "Vertical heat exchanger piping" means a sealed piping system containing a heat transfer fluid, installed vertically in the ground, used to transfer heat to or from the surrounding earth.

Subp. 49h. **Wastewater treatment unit.** "Wastewater treatment unit" has the meaning given in part 7045.0020, subpart 103.

Subp. 50a. **Water-supply well.** "Water-supply well" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 20a, and includes wells used:

A. for potable water;

B. for irrigation;

C. for agricultural, commercial, or industrial water supply;

D. for heating or cooling;

E. as a remedial well; or

F. for testing water yields for irrigation, commercial or industrial uses, residential supply, or a public water system.

[For text of subp 50b, see M.R.]

Subp. 51. **Well.** "Well" has the meaning given in Minnesota Statutes, section 103I.005, subdivision 21, and includes water-supply wells, monitoring wells, and dewatering wells.

[For text of subp 51a, see M.R.]

4725.0150 INCORPORATIONS BY REFERENCE AND ABBREVIATIONS.

This part indicates documents, specifications, and standards that are incorporated by reference in this chapter. This material is not subject to frequent change, and is available from the source listed, for loan or inspection from the Barr Library of the Minnesota Department of Health, or through the Minitex interlibrary loan system. The abbreviations listed in parenthesis after the source name are used in this chapter.

A. American Association of State Highway and Transportation Officials (AASHTO), 341 National Press Building, Washington, D.C. 20004.

(1) AASHTO Standard H20-44, "Standard Specifications for Highway Bridges," 17th Edition, 2002, part 3.7.2.

(2) AASHTO Standard M306-04, "Standard Specification for Drainage, Sewer, Utility, and Related Castings."

B. American Petroleum Institute (API), 1220 L Street Northwest, Washington, DC 20005-4070.

(1) Specification 13A-04, "API Specification for Drilling Fluid Materials," 16th Edition.

(2) API Standard 5L-04, "Specification for Line Pipe."

C. American National Standards Institute (ANSI), 1430 Broadway, New York, New York 10018.

(1) ANSI Schedule 5 and Schedule 40, "Dimensions of Welded and Stainless Steel Pipe" as contained in ASA Standard B36.19 - 1965, "Welded and Seamless Wrought Steel Pipe."

(2) ANSI Standard Z34.1-1993, "Third Party Certification Programs for Products, Processes, and Services."

D. American Society of Mechanical Engineers, ASME International, Three Park Avenue, New York, NY 10016-5990, USA, ASME B36.10M-2000, "Welded and Seamless Wrought Steel Pipe."

E. American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

(1) ASTM ~~A53M-04~~ A53/A53M-04a, "Standard Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless."

(2) ASTM A589-96 (2001), Types I, II, and III, "Standard Specification for Seamless and Welded Carbon Steel Water-Well Pipe."

(3) ASTM ~~Standard A312/A312M-04~~ A312/A312M-04b, "Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes."

(4) ASTM C150-04a, "Standard Specification for Portland Cement."

(5) ASTM C494/C494M-04, "Standard Specification for Chemical Admixtures for Concrete."

(6) ASTM D2466-02, "Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40."

(7) ASTM D2487-00, "Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)."

(8) ASTM D3035-03a, "Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter."

(9) ASTM F480-02, "Standard Specification for Thermoplastic Water Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40, and SCH 80."

F. American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235, ANSI/AWWA C219-01, "Bolted, Sleeve-Type Couplings for Plain-End Pipe."

G. NSF International, 789 Dixboro Road, P.O. Box 130140, Ann Arbor, Michigan 48113.

(1) ANSI/NSF 14-2003, "Plastics Piping System Components and Related Materials."

(2) ANSI/NSF 60-2003e, "Drinking Water Treatment Chemicals - Health Effects."

(3) ANSI/NSF 61-2003e, "Drinking Water System Components - Health Effects."

H. Sims, P.K. and Morey, G.B., "Geology of Minnesota: A Centennial Volume," pages 459-473, "Paleozoic Lithostratigraphy of Southeastern Minnesota" by George Austin, 1972.

I. United States Department of Agriculture, Agricultural Handbook Number 18, Soil Survey Manual pages 136 to 140, October 1993.

4725.0200 APPLICATION TO ALL WELLS AND BORINGS.

[For text of subps 1 and 2, see M.R.]

Subp. 3. **Licensee or registrant responsibility.** The licensee or registrant is responsible to:

A. verify information and investigate conditions to comply with the requirements of this chapter, including the location of contamination sources; and

B. provide accurate and truthful information to the commissioner.

Subp. 4. **Access to information and property.** ~~Under Minnesota Statutes, section 144.99, subdivision 2, the commissioner may examine records or data of any person subject to regulation under Minnesota Statutes, chapter 103I, and may enter property for the purpose of taking an action authorized under statute or rule, or other actions listed in Minnesota Statutes, section 144.99, subdivision 1.~~ Upon presentation of credentials, the commissioner or an employee or agent authorized by the commissioner, may examine records or data related to matters governed by Minnesota Statutes, chapter 103I and section 144.99, of any person subject to regulation under Minnesota Statutes, chapter 103I, and, for the purpose of taking an action authorized under statute, rule, or otherwise identified in Minnesota Statutes, section 144.99, subdivision 1, relating to the enforcement of this chapter, may:

A. enter property to examine the records and data;

B. inspect equipment and material used in performing wells and borings work;

C. obtain and analyze water, air, and waste drill cuttings; and

D. inspect drill holes and drilled, sealed, or repaired wells and borings.

This authority must be exercised during regular working hours of Department of Health inspectors with respect to inspections of vertical heat exchangers and groundwater thermal exchange devices, and at reasonable times in all other cases.

Subp. 5. **Applicability to delegated well programs.** This chapter applies within a political subdivision regulating construction, repair, or sealing of wells or elevator borings delegated by the commissioner under Minnesota Statutes, section 103I.111. This does not prohibit a local delegated authority from adopting an ordinance which is consistent with or more restrictive than this chapter.

4725.0250 ENFORCEMENT.

Subpart 1. **Enforcement actions.** The commissioner may take one or more enforcement actions for a violation of this chapter, Minnesota Statutes, chapter 103I, section 144.99 or 144.992, including:

A. issuing a correction order under Minnesota Statutes, section 144.99, subdivision 3;

B. issuing an administrative penalty order requiring a violation to be corrected, and assessing a monetary penalty under Minnesota Statutes, section 144.99, subdivision 4;

C. bringing an action for injunctive relief in district court under Minnesota Statutes, section 144.99, subdivision 5;

D. issuing a cease and desist order under Minnesota Statutes, section 144.99, subdivision 6;

E. denying or refusing to renew an application for a permit, license, registration, or certificate under Minnesota Statutes, section 144.99, subdivision 8;

F. suspending, revoking, or imposing limitations or conditions on a permit, certification, license, or registration under Minnesota Statutes, chapter 14, and section 144.99, subdivisions 8 and 9;

G. enforcing the requirements of a stipulation agreement, settlement, or compliance agreement provided by Minnesota Statutes, section 144.99, subdivision 1;

H. using the license or registration bond to compensate persons injured or suffering financial loss because of the failure of a licensee or registrant to perform work in compliance with duties under this chapter and Minnesota Statutes, chapter 103I;

I. requesting prosecution by the county attorney in the county where the violation occurred or is occurring;

J. impounding a drilling machine or hoist used by a person who is not licensed or registered according to this chapter and Minnesota Statutes, chapter 103I; and

K. using other remedies afforded by law and rule.

Subp. 2. **Responsibility for correction.** The person responsible for creating a violation of this chapter is responsible for correcting the violation. In the case of a violation created or constructed by a licensee or registrant, the licensee or registrant is responsible for correcting the violation. The licensee or registrant who files a notification or obtains a permit for a well or boring is responsible for the well or boring's compliance with this chapter, even if the well or boring construction is subcontracted to another person. A well or boring that cannot be corrected, must be sealed and a complying well or boring constructed, unless the well or boring owner, responsible party, and commissioner agree otherwise in a stipulated agreement.

Subp. 3. **Time of correction.** Correction of a violation of this chapter must be completed under the supervision of the commissioner during normal business hours, within 30 days of notice of the violation, or as specified in an approved variance, work plan, or stipulation.

4725.0350 FEES APPLICABLE TO THIS CHAPTER.

Subpart 1. **Applicability.** The fees specified in Minnesota Statutes, chapter 103I, apply to this chapter, except:

A. that a federal agency, state agency, or local unit of government is exempt from payment of the fees; and

B. for notification and permits regulated by a board of health delegated under Minnesota Statutes, section 103I.111.

Fees are not refundable, except as specified in part 4725.1836.

Subp. 2. **Qualification application fee.** A nonrefundable fee as specified in Minnesota Statutes, chapter 103I, must be submitted to apply for qualification and examination for licensure as an individual well contractor as specified in part 4725.0475, subpart 3, or certification as a representative for any of the following:

A. a well contractor as specified in part 4725.0475, subpart 3;

B. a limited well/boring contractor as specified in part 4725.0475, subpart 4;

C. an elevator boring contractor as specified in part 4725.0475, subpart 5; or

D. a monitoring well contractor as specified in part 4725.0475, subpart 6.

Subp. 3. **License or registration fees.** An application for an original or renewal license or registration must be accompanied by a nonrefundable license or registration fee as specified in Minnesota Statutes, chapter 103I.

Subp. 4. **License or registration late renewal fee.** If a licensee or registrant fails to submit all information required for the renewal of a license or registration or submits the application and information after the required renewal date as specified in part 4725.1300, a late fee as specified in Minnesota Statutes, chapter 103I, must be paid in addition to the fees specified in subpart 3.

Subp. 5. **Notification fees.** A notification fee as specified in Minnesota Statutes, chapter 103I, must be paid by a property owner or the owner's agent for:

A. each new water-supply well constructed;

B. each dewatering well constructed, or for a dewatering project comprising five or more dewatering wells; and

C. each well sealed, or for sealing multiple monitoring wells located on a single property with depths varying by no more than 25 feet that are sealed within 72 hours of the start of construction.

Subp. 6. **Permit fees.** A nonrefundable permit fee as specified in Minnesota Statutes, chapter 103I, must be paid by a property owner or owner's agent:

A. annually for a water-supply well that is not in use and under a maintenance permit;

B. for construction of a monitoring well;

C. annually per well for a monitoring well that is unsealed and under a maintenance permit;

D. per site for construction of all monitoring wells, regardless of number, used as leak detection devices at a single motor fuel retail outlet, a single petroleum bulk storage site excluding tank farms, or a single agricultural chemical facility site;

E. for construction and injection of water by a groundwater thermal exchange device in addition to the notification fee specified in subpart 5;

F. for construction of a vertical heat exchanger;

G. annually for a dewatering well that is unsealed and under a maintenance permit except that a dewatering project comprising more than five wells shall be issued a single permit for wells recorded on the permit; and

H. for construction of a boring to install an elevator hydraulic cylinder.

Subp. 7. **Drilling machine registration fee.** A person must not use a drilling machine unless a nonrefundable fee as specified in Minnesota Statutes, chapter 103I, is paid annually to register the drilling machine.

Subp. 8. **Hoist registration fee.** A person must not use a hoist unless a nonrefundable fee as specified in Minnesota Statutes, chapter 103I, is paid annually to register the hoist.

Subp. 9. **Well disclosure fee.** According to Minnesota Statutes, section 103I.235, a nonrefundable disclosure fee as specified in Minnesota Statutes, chapter 103I, shall be collected.

Subp. 10. **Variance fee.** A nonrefundable fee as specified in Minnesota Statutes, chapter 103I, shall be charged by the commissioner to request a variance from this chapter.

Subp. 11. **Electronic payment.** Notification and permit fees for construction and sealing may be paid electronically.

4725.0410 VARIANCE.

Subpart 1. **General.**

A. The commissioner shall grant a variance to any provision of this chapter according to the procedures and criteria specified in parts 4717.7000 to 4717.7050.

B. A person requesting a variance must submit a written request on a form prescribed by the commissioner, along with the nonrefundable fee as required in Minnesota Statutes, chapter 103I.

C. A variance application for a well or boring located in the jurisdiction of a delegated program must be submitted, along with the fee as specified in Minnesota Statutes, chapter 103I, to the commissioner. The delegated program may require a separate application and fee.

D. A variance must be applied for and granted prior to commencing the activity for which the variance is requested.

E. An application submitted without the information required by this part and parts 4717.7000 to 4717.7050 shall be denied 18 months after the date received by the commissioner.

F. Construction, and the conditions of a granted variance, must be completed within 18 months of variance approval or the variance is void, unless conditions of the variance specify otherwise.

Subp. 2. **Additional standards for construction, repair, or sealing variance requests.** In addition to the information required in part 4717.7000, subpart 2, the applicant must submit to the commissioner, in writing, the following information for a request to vary a construction, repair, or sealing provision related to wells or borings in parts 4725.2010 to 4725.7450:

A. the location of the well or boring in terms of the township number, range number, section number, three-quarter sections, and the street address if assigned;

[For text of items B to G, see M.R.]

H. a description of the anticipated geologic conditions;

I. the depth to water, pumping rate, number of persons served by the well, and a description of the use of the well; and

J. information on special construction methods, safety measures, or precautions proposed to protect public health, safety, and the environment.

[For text of subp 3, see M.R.]

Subp. 4. **Additional standards for variance to be placed on a deed.** In addition to the information in subparts 1 and 2, a variance to be placed on a real property deed must include:

A. the complete name(s) of the fee owner(s) as the name(s) appears on the deed;

B. the property identification number;

C. the Torrens certificate number if the property is Torrens property; and

D. the legal property description.

Subp. 5. **Emergency variances.** A variance may be verbally granted by the commissioner in an emergency where a delay in starting work poses an immediate and significant danger to health or safety. ~~Exceptional circumstances include, but are not limited to, cases where: (1) well failure will leave persons or livestock without drinking water; (2) inaction presents an imminent threat to contamination of the well, boring, or groundwater; (3) delay will result in collapse or damage to the well or boring; (4) delay will result in the endangerment of health or safety such as in an unstable excavation; or (5) such action is court ordered.~~

A. The person applying for the variance must submit a completed application and fee to the commissioner prior to receiving approval.

B. Verbal approval must be given by the commissioner prior to starting construction.

C. Construction must be according to conditions verbally reported.

D. The emergency variance shall be void if construction is not started within 72 hours of verbal approval.

E. All construction and location standards in this chapter, except those specifically modified under the variance, shall apply to wells and borings constructed under an emergency variance.

F. The commissioner shall not issue an emergency variance to persons who ~~violate~~ have violated the emergency variance requirements.

LICENSING AND REGISTRATION

4725.0475 ACTIVITIES REQUIRING LICENSURE OR REGISTRATION.

Subpart 1. **Activity requiring licensure or registration.** Except for those persons exempted under Minnesota Statutes, section 103I.205, subdivision 4, paragraph (e), a person must hold a license or registration to:

A. construct, repair, modify, or seal a well or boring;

B. construct or seal a vertical heat exchanger or groundwater thermal exchange device;

C. construct, repair, or seal an elevator boring;

D. install a well pump or pumping equipment;

E. install, modify, or remove a screen, pitless unit, or pitless adapter; or

F. modify or materially affect the yield, water quality, diameter, depth, or casing of a well or boring including:

(1) attachment of water conditioning or other devices to the casing of the well or boring;

(2) chemical treatment of the well or boring with acid or other chemicals;

(3) development or stimulation of a well or boring including the use of explosives or hydrofracturing; or

(4) termination of a monitoring well, environmental bore hole, remedial well, or dewatering well casing at-grade, including installation or modification of the protective manhole or vault as required in part 4725.6850.

Subp. 2. **Exceptions to licensure or registration.** Nothing in this part shall prohibit:

[For text of item A, see M.R.]

B. a plumber or plumbing contractor from installing and servicing a water service pipe according to chapter 4715, from the source of supply;

C. a water conditioning contractor from installing water conditioning equipment within a building according to chapter 4715;

D. a limited well/boring contractor from repairing, installing a pump or pumping equipment, or repairing or sealing a well that the limited well/boring contractor is licensed to construct; and

E. a water-supply system operator certified under chapter 9400 or the owner of a transient, noncommunity water system from disinfecting the public well they are directly responsible for, according to part 4725.5550.

[For text of subp 3, see M.R.]

Subp. 4. **Limited well/boring contractor licenses.** A person performing any of the activities in items A to F must have either a well contractor's license or have a separate limited well/boring contractor license for each of the limited licensure areas listed in items A to F:

A. limited licensure to construct, repair, modify as specified in subpart 1, item F, or seal a dug well or drive-point well;

B. limited licensure to install, modify, or repair screens, pitless units or adapters, and casings from the frost line or pitless unit or adapter to the upper termination of the casing;

C. limited licensure to install a well pump or pumping equipment, or any of the activities in subpart 1, item F, subitems (1) and (2);

D. limited licensure to seal wells or borings, remove obstructions from a well or boring before sealing, remove or perforate casing before sealing, or other activities to seal a well or boring, except that a drive-point well or dug well contractor may seal a dug well

or drive-point well, a dewatering well contractor may seal a dewatering well, an elevator boring contractor may seal an elevator boring, a vertical heat exchanger contractor may seal a vertical heat exchanger, and a monitoring well contractor may seal a monitoring well or environmental bore hole;

[For text of items E and F, see M.R.]

Subp. 5. **Elevator boring contractor license.** A person must have an elevator boring contractor's license or a well contractor's license to construct, repair, or seal an elevator boring.

[For text of subps 6 and 7, see M.R.]

4725.0550 CERTIFIED REPRESENTATIVE OR INDIVIDUAL WELL CONTRACTOR.

Subpart 1. **Qualification application for certification to represent a licensee, registrant, or to be an individual well contractor.** Anyone applying to be certified as a representative of a licensee or registrant or an individual well contractor must submit to the commissioner a properly completed qualification application. The applicant must submit written documentation of the experience required in part 4725.0650. Written documentation includes, but is not limited to, well or boring construction or sealing records, letters from employers verifying employment, and work reports.

Subp. 3. **Qualifications, responsibilities, requirements.** A certified representative and individual well contractor must have honesty and integrity.

A. The certified representatives, or the individual well contractor, must be named on the license or registration for the licensee or registrant.

B. A certified representative must not represent more than one licensee or registrant.

C. The certified representative must ~~be responsible for conducting all operations under the representative's supervision and as delegated by the licensee or registrant in accordance with Minnesota Statutes, chapter 103I, and this chapter including, but not limited to~~:

(1) ~~supervision of~~ supervise work to ensure compliance with this chapter; ~~and~~

(2) ~~completion and signing of~~ complete and sign permit applications, notifications, variance applications, construction records, and sealing records~~.~~; and

(3) be responsible for conducting all operations under the representative's supervision and as delegated by the licensee or registrant according to this chapter and Minnesota Statutes, chapter 103I.

D. The certified representative and individual well contractor must annually complete the continuing education requirements in part 4725.1650.

Subp. 4. **Loss of certified representative.** When a certified representative no longer works for the registrant or licensee, the registrant or licensee must inform the commissioner within five days of that fact. If a licensee or registrant has only one certified representative and the representative no longer works for the registrant or licensee, the registrant or licensee must name an acting representative until a representative who meets the requirements in parts 4725.0550 to 4725.1025 is certified by the commissioner. The licensee or registrant may operate with an acting representative for no more than 150 days. The acting representative must notify the commissioner during business hours, a minimum of 24 hours prior to commencing work, of the proposed starting time of each well or boring construction or sealing.

4725.0650 EXPERIENCE REQUIREMENTS; CERTIFIED REPRESENTATIVE AND INDIVIDUAL WELL CONTRACTOR.

Subpart 1. **Well contractor certified representative and individual well contractor.** Anyone applying to be certified as a representative of a well contractor or to be an individual well contractor must have four years of experience. A year of experience is a year in which the applicant personally, and under the supervision of a licensed well contractor:

A. worked for a minimum of 1,000 hours. The applicant's 1,000 hours of experience must include drilling water-supply wells, grouting, sealing wells, repairing wells, installing pumps, disinfecting wells, and completing well construction and sealing records; and

B. constructed a minimum of ten water-supply wells; or

C. constructed at least one or more multiple cased water-supply wells with an outer casing diameter of ten inches or more and a well depth or cumulative depth of 700 feet or more.

An applicant with experience prior to 2006 must have constructed a minimum of five water-supply wells per year.

An applicant shall be deemed to have one year of experience ~~will be granted to an applicant who~~ if the applicant has successfully completed one year of education in well construction practices at an accredited college, university, or postsecondary institution. An applicant shall be deemed to have up to a maximum of two years of experience ~~will be granted to an~~ if the applicant ~~who~~ has successfully completed an associate or technical degree in well construction practices at an accredited college, university, or postsecondary institution.

Supervision is not equivalent to personally doing the work.

Subp. 2. **Monitoring well contractor certified representative.** Anyone applying to be certified as a representative of a monitoring well contractor must meet the requirements in items A to C, or meet the requirements in item D.

A. The applicant must be:

(1) a professional engineer licensed by the Minnesota State Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design according to Minnesota Statutes, sections 326.02 to 326.15;

(2) a hydrologist or hydrogeologist certified by the American Institute of Hydrology; or

(3) a geologist certified by the American Institute of Professional Geologists, or a geoscientist licensed by the Minnesota State Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design under Minnesota Statutes, sections 326.02 to 326.15.

[For text of items B to D, see M.R.]

Subp. 3. **Limited well/boring contractor certified representative; drive-point wells or dug wells.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to construct, repair, and seal dug wells and drive-point wells must have three years of experience. A year of experience is a year in which the applicant personally constructed five dug wells or drive-point wells and worked for a minimum of 1,000 hours constructing, repairing, or sealing dug wells or drive-point wells, and installing pumps in dug wells or drive-point wells. An applicant must have gained the experience under a licensed well contractor or a licensed drive-point well or dug well contractor.

Subp. 4. **Limited well/boring contractor certified representative; well screens, pitless adapters, and pitless units.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to install or repair well screens or pitless adapters or units and well casing from the pitless device to the upper termination of the well must have two years of experience. A year of experience is a year in which the applicant worked a minimum of 1,000 hours and personally installed or repaired five

well screens or pitless units or adapters and well casings from the pitless unit or adapter to the upper termination of the well. The experience must have been gained under the supervision of a licensed well contractor or limited well/boring contractor licensed to install or repair well screens or pitless units or adapters and well casings from the pitless unit or adapter to the upper termination of the well.

Subp. 5. **Limited well/boring contractor certified representative; pumps and pumping equipment.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to install a pump or pumping equipment must have two years of experience in pump installation and repair. The applicant must have personally installed 20 pumps. The work must include a minimum of 1,000 hours installing well pumps or pumping equipment.

Subp. 6. **Limited well/boring contractor certified representative; well sealing.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to seal wells must have three years of experience. A year of experience is a year in which the applicant:

A. personally sealed a minimum of five wells; and

B. worked a minimum of 1,000 hours constructing wells, clearing obstructions, removing or perforating well casings, and grouting wells.

The applicant must have gained the experience under a licensed well contractor or limited well/boring sealing contractor.

Subp. 7. **Limited well/boring contractor certified representative; dewatering wells.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to construct, repair, or seal dewatering wells must have two years of experience. A year of experience is a year in which the applicant:

[For text of items A and B, see M.R.]

Subp. 7a. **Limited well/boring contractor certified representative; vertical heat exchanger.** Anyone applying to be certified as a representative for a limited well/boring contractor licensed to construct, repair, or seal vertical heat exchangers must meet the requirements in item A or meet the requirements in items B and C.

[For text of item A, see M.R.]

B. The applicant must have a minimum of two years experience in well drilling. A year of experience is a year in which the applicant personally and under the supervision of a licensed well contractor constructed a minimum of five water- supply wells and constructed, repaired, or sealed wells and environmental bore holes for 500 hours.

[For text of item C, see M.R.]

Subp. 8. **Elevator boring contractor certified representative.** Anyone applying to be certified as a representative for an elevator boring contractor licensed to construct, repair, or seal an elevator boring must have two years of experience related to the construction, repair, and sealing of elevator borings. A year of experience is a year in which the applicant designed, supervised, or actually constructed three elevator borings.

Subp. 9. **Experience outside state.** If all or part of the experience required in this part was gained by an applicant outside Minnesota, the applicant must provide the commissioner with information satisfactorily demonstrating that the experience was gained constructing, repairing, and sealing wells or borings in geological conditions substantially similar to conditions in Minnesota and in a jurisdiction with certification, licensing, or registration requirements comparable to those in Minnesota.

4725.0900 COUNCIL EVALUATION OF APPLICANTS.

Upon request by the commissioner, the council may conduct oral examinations using a standardized examination developed by the commissioner in consultation with the council. Upon request by the commissioner, the council may also provide recommendations as to

the appropriate disciplinary action for representatives, licensees, and registrants found to be in violation of Minnesota Statutes, chapter 103I and this chapter.

4725.1025 EXAMINATION.

Anyone applying to be a certified representative of a licensee or registrant or as an individual well contractor must pass an examination which may be a combination of written and oral questions as determined by the commissioner with the advice of the Advisory Council on Wells and Borings established by Minnesota Statutes, section 103I.105. The applicant must pass the examination within one year from the date notified by the commissioner that the applicant is qualified to take the examination. An applicant who fails an examination must not retake the examination within two weeks of the failed attempt. An applicant who fails to successfully complete the examination after three attempts must reapply for certification as a representative or licensure as an individual well contractor, according to parts 4725.0550 to 4725.1025, and must not reapply within one year of the third failure to pass the examination. If, upon passing the examination, the applicant is not licensed as an individual well contractor or listed as a certified representative of a licensee or registrant within one year, reapplication as a certified representative or individual well contractor must be made according to parts 4725.0550 to 4725.1025.

4725.1075 APPLICATION FOR LICENSURE OR REGISTRATION.

Subpart 1. **Application for licensure or registration.** A person must apply for licensure or registration on a form provided by the commissioner.

A. The application must include the name, address, and telephone number of the person applying for licensure or registration and list the name, business address, and telephone number, if different, of all certified representatives of the licensee or registrant who meet the qualifications in parts 4725.0550 to 4725.1025. The licensee or registrant must have at least one certified representative.

B. The application form must be signed by an officer or other legally authorized agent of the person making application for licensure or registration.

C. The application for licensure or registration must be accompanied by the nonrefundable licensure or registration fee specified in Minnesota Statutes, chapter 103I.

4725.1300 LICENSE OR REGISTRATION RENEWAL.

Subpart 1. **Renewal.** Licenses expire on January 31 of each year and registrations expire on December 31 of each year. Each licensee or registrant shall submit an application for license or registration renewal on forms provided by the commissioner no later than January 31 for licenses and December 31 for registrations. The renewal application must be accompanied by the license and registration fees. A penalty fee, as specified in Minnesota Statutes, chapter 103I, must also be paid if the renewal is submitted after the January 31 license or December 31 registration deadline. At the time of license or registration renewal, the approved continuing education courses completed by the individual well contractor as required by part 4725.1650, or the name(s) of the certified representative(s), must be listed, and the licensee or registrant must provide the bond required under part 4725.1250.

Subp. 2. **Failure to renew.** A licensee or registrant who fails to renew a license or registration before the expiration date, and later wishes to renew, must pay all license or registration fees and late fees.

4725.1310 CERTIFICATION RENEWAL.

Subpart 1. **Renewal.** Certification of licensee representatives expires on January 31 of each year and certification of registrant representatives expires on December 31 of each year. Each representative shall submit an application for certification renewal on forms provided by the commissioner no later than January 31 for licensee representatives and December 31 for registrant representatives. At the time of certification renewal,

the approved continuing education courses completed by the representative as required by part 4725.1650 must be listed.

Subp. 2. **Failure to renew.** A person who fails to renew a certification within two years of expiration may not renew the certification. Requalification for certification must be according to parts 4725.0550 to 4725.1250.

4725.1500 DISCIPLINARY ACTION AGAINST CERTIFIED REPRESENTATIVE, INDIVIDUAL WELL CONTRACTOR, LICENSEE, OR REGISTRANT; RETURN OF DOCUMENTS.

Subpart 1. **Commissioner action.** The commissioner may suspend, revoke, or impose limitations or conditions on a license, certification, or registration if the certified representative, individual well contractor, registrant, or licensee:

A. violates a provision of this chapter or Minnesota Statutes, chapter 103I;

B. obtains a certification, license, or registration through error, fraud, or cheating;

C. provides false or fraudulent information verbally, or on renewal forms, construction or sealing reports, water sample reports, or other required reports;

D. knowingly aids or allows an unlicensed or unregistered person to engage in activities requiring a license or registration under Minnesota Statutes, section 103I.205, subdivision 4;

E. engages in conduct, in the course of performing work requiring licensure or registration, that is likely to harm the public, or conduct that demonstrates a willful or careless disregard for the health or safety of a property owner or other person;

F. has been convicted during the previous five years of a felony or gross misdemeanor reasonably related to the business of well or boring construction, repair, or sealing;

G. fails to pay monetary penalties that are assessed according to an administrative penalty order issued under Minnesota Statutes, chapter 144; or

H. violates the conditions of a stipulated agreement, variance, order, settlement, compliance agreement, license, registration, certification, notification, or permit.

Subp. 4. **Revoked certification, license, or registration.** A suspended or revoked certification, license, or registration along with the current drilling machine and hoist registration decals must be returned to the commissioner when the certification, license, or registration is revoked or suspended.

4725.1600 REAPPLICATION AFTER CERTIFICATION, LICENSE, OR REGISTRATION REVOCATION.

Subpart 1. **Revoked license, certification, or registration.** A person whose certification as a representative, license, or registration has been revoked may not reapply for certification, licensure, or registration within one year of the date of revocation. A person whose certification, license, or registration has been revoked must reapply as required by parts 4725.0550 to 4725.1250.

4725.1650 CONTINUING EDUCATION REQUIREMENTS.

An individual well contractor or a certified representative of a well contractor or monitoring well contractor must successfully complete six contact hours of continuing education activities annually, of which at least two hours must be obtained from a continuing education program presented or sponsored by the commissioner. A certified representative of a limited well/boring contractor or elevator boring contractor must successfully complete two contact hours of continuing education annually presented or sponsored by the commissioner. A certified representative with multiple limited well/boring or elevator boring certifications need only successfully complete two contact hours of continuing education annually presented or sponsored by the commissioner.

An individual well contractor or certified representative is exempt from the continuing education requirements for one year following the completion of the examination in part 4725.1025.

An individual well contractor or certified representative who fails to complete the continuing education required by this part, must not conduct contracting, or represent a licensee or registrant, for activities regulated by this chapter.

4725.1675 CRITERIA FOR CONTINUING EDUCATION.

A continuing education activity must meet the criteria in items A to E for credit to be given.

A. The activity must be related to wells and borings, drilling technology, groundwater contamination, health aspects of water quality, groundwater monitoring, geology, hydrology, well or boring construction and sealing, water systems and water treatment, or other subjects approved by the commissioner.

[For text of items B and C, see M.R.]

D. The activity must be at least one contact hour as defined in part 4725.0100, subpart 24c.

[For text of item E, see M.R.]

4725.1700 PLACEMENT OF DECALS AND LICENSE OR REGISTRATION NUMBER.

A licensee or registrant shall place in a conspicuous location on both sides of each drilling machine or hoist the license or registration number in figures not less than three inches high and 1-1/2 inches wide. The figures must be in a contrasting color to the rest of the machine or hoist. Decals issued by the commissioner designating the year for which the license or registration was issued or renewed must be affixed directly adjacent to and below the license or registration number on each drilling machine or hoist. Contractors using small drilling machines or hoists shall attach their decals on a portable display to

be shown at the well or boring site. The decals shall be issued by the commissioner upon licensure or registration and renewal.

4725.1800 DRILLING MACHINE AND HOIST REGISTRATION.

Upon licensure or registration, the licensee or registrant must register all drilling machines and hoists and pay a fee for each machine or hoist. Each time the licensee or registrant renews licensure or registration under part 4725.1300, the licensee or registrant must renew each drilling machine and hoist registration and must pay a renewal fee for each drilling machine or hoist. Upon acquiring additional drilling machines or hoists after initial licensure or registration or after renewal of licensure or registration, the licensee or registrant must register the machine or hoist and pay the hoist or drilling machine registration fee. The drilling machine and hoist registrations are concurrent with the license or registration, are not prorated, and expire on January 31 of each year for licensees and December 31 of each year for registrants. Upon receipt of the required fee and information, a drilling machine or hoist registration card shall be issued for identification purposes for each drilling machine and hoist registered by the contractor. The card shall be carried on the drilling machine or hoist at all times where it may be inspected by the commissioner.

The registration card and decals furnished for a drilling machine or hoist are not transferable.

A person must not use a drilling machine or hoist to conduct activities requiring a license or registration under this chapter unless the drilling machine or hoist is registered, displays the licensee's or registrant's license or registration number, and displays current decals.

PERMITS AND NOTIFICATIONS

4725.1810 PERMITS AND NOTIFICATIONS, GENERAL.

Subpart 1. **Well on property of another.** A person must not construct, or have constructed, a well on another person's property unless a written agreement exists according to Minnesota Statutes, section 103I.205, subdivision 8. The well owner, or other person identified in the agreement as being responsible for the well, has the responsibilities, authorities, and obligations of the property owner specified in this chapter.

Subp. 2. **Delegated programs.** A person constructing or sealing a well or boring that is located within a political subdivision with a well and boring program delegated under Minnesota Statutes, chapter 103I, must file a notification with, or obtain a permit from, the delegated program prior to construction or sealing of a well or boring regulated by the delegated program, except that a notification for construction or sealing of a community public water-supply well must be filed with the commissioner.

Subp. 3. **Fees.** Notification and permit fees must be paid according to parts 4725.0350 and 4725.1836 and Minnesota Statutes, chapter 103I.

Subp. 4. **Reporting measurements.** Depths or heights reported on a permit or notification must be measured from the established ground surface.

Subp. 5. **Hours of receipt, valid notification and permit.** A notification is not valid until the notification is received by the commissioner between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday, excluding holidays, except for emergency notifications and permits according to part 4725.1838. A notification received by facsimile after 4:30 p.m. is not valid until the next business day. A permit is not valid until the commissioner has approved the permit. A notification or permit is not valid unless accompanied by the proper fee. Work regulated under a notification or permit must not be done without a valid notification or permit.

Subp. 6. **Transfer of notification or permit.** A permit or notification is not transferable. Only the licensee or registrant who submits the notification, or the licensee or registrant who was issued the permit, may construct or seal the well or boring.

Subp. 7. **Conversion.** A well or boring must not be converted to another type of well or boring unless:

A. a variance is granted according to part 4725.0410; or

B. the well or boring was constructed by a contractor licensed or registered to construct that type of well or boring, the well or boring complies with the requirements of this chapter for that type of well or boring, and a new notification or permit, and fee if required, is submitted to the commissioner.

4725.1820 NOTIFICATION FOR CONSTRUCTION OF WATER-SUPPLY WELLS.

The owner of the property where a water-supply well is to be located, the property owner's agent, a licensed well contractor, or for a drive-point water-supply well, a limited drive-point well or dug well/boring contractor must submit notification of construction of the proposed water-supply well to the commissioner according to this part. This part does not apply to the construction of monitoring wells regulated by part 4725.1830; dewatering wells regulated by part 4725.1825; or drive-point water-supply wells installed by the well owner on the owner's property for residential or agricultural use regulated by part 4725.1849. This part applies to water-supply wells, including wells constructed for the purpose of testing water yields for irrigation, commercial use, residential supply, or a public water system.

A. A well must not be constructed, deepened through a confining layer, or have casing installed or removed below the frost line until notification is made to the commissioner.

B. Notification must be made on a form provided by the commissioner, or in a format approved by the commissioner. The notification must be legible, accompanied by the required fee, and signed by the certified representative of the licensee or the owner of the property where the well is located, or the property owner's agent.

C. A notification must be completed for each well.

D. The notification must include the following information for each well:

(1) the name and license number of the licensed contractor;

(2) the name, address, and telephone number of the well owner, and property owner if different; and

(3) the township number, range number, section and one quartile, and the property street address if assigned, of the proposed well location.

E. A new notification must be filed with the commissioner if:

(1) a licensed contractor other than the one listed on the original notification constructs the well; or

(2) the well is completed on property other than that listed on the original notification.

A new fee is not required for a new notification filed under this item.

F. The notification is valid for 18 months from the date it is filed.

4725.1825 DEWATERING WELL CONSTRUCTION NOTIFICATION.

This part applies to all dewatering wells as defined in part 4725.0100, subpart 24f, including drive-point wells used for dewatering.

A. A dewatering well must not be constructed, deepened through a confining layer, have casing installed or removed below the frost line, or completed as an at-grade well until a notification has been made to the commissioner by a dewatering well contractor or well contractor.

B. The dewatering well contractor or well contractor must submit to the commissioner a dewatering well construction notification on a form provided by the

commissioner, or in a format approved by the commissioner. The notification must be legible and signed by the dewatering well contractor or well contractor.

C. A construction notification must be completed for each dewatering well or dewatering well project including any wells deepened through a confining layer, having casing installed or removed below the frost line, or converted to an at-grade well. The notification must indicate whether the dewatering well, or dewatering well project will affect wells used for potable purposes, and if so, what measures will be taken to provide potable water to persons adversely affected by the dewatering.

D. The construction notification must include the following information for each well:

(1) the name and license number of the dewatering well contractor or well contractor;

(2) the name and address of the dewatering well owner, and property owner if different; and

(3) the township number, range number, section and one quartile, and the property street address if assigned, of the proposed dewatering well location.

E. Construction notifications are not transferable. Only the licensee who submitted the notification is authorized to construct the dewatering well or wells.

F. The construction notification is valid for 18 months from the date issued.

4725.1830 MONITORING WELL CONSTRUCTION PERMIT.

This part applies to all monitoring wells, including drive-point wells used as monitoring wells.

A. A monitoring well must not be constructed, deepened through a confining layer, have casing installed or removed below the frost line, or be converted to an at-grade well until a permit has been issued by the commissioner to the monitoring well contractor,

well contractor, or to a limited well screen and pitless adapter and pitless unit contractor for modification to an at-grade well.

B. A well contractor or monitoring well contractor must submit to the commissioner a permit application on a form provided by the commissioner, or in a format approved by the commissioner. The application must be legible and signed by the monitoring well contractor or well contractor and the property owner or agent.

C. A permit application must be completed for each monitoring well.

(1) For monitoring wells used as leak detection devices at a single petroleum bulk storage site excluding tank farms, a single agricultural chemical facility site, or a single motor fuel retail outlet, a single permit application may be completed for all wells on a site drilled under a single contract. A site consists of a single continuous piece of property on which the petroleum bulk storage facility or motor fuel retail outlet is located. The site does not include other properties on which monitoring wells are constructed to evaluate a spill or leak associated with the petroleum facility. All proposed monitoring wells on a site must be listed on the permit.

(2) A construction permit is not required for a temporary monitoring well if the monitoring well is sealed within 72 hours of the time construction on the well begins. A sealing notification is required prior to sealing in accordance with part 4725.1832.

D. A permit application for a monitoring well owned by a person other than the property owner must include a copy of a written agreement meeting the requirements of Minnesota Statutes, section 103I.205, subdivision 8.

E. The permit application must include the following information for each well:

(1) the name and registration number of the monitoring well contractor or license number of the well contractor or limited well/boring contractor;

(2) the name and address of the monitoring well owner, and property owner, if different;

(3) the township number, range number, section and one quartile, and the property street address if assigned, of the proposed monitoring well location; and

(4) the anticipated well depth.

F. Permit applications for monitoring wells constructed through a confining layer or into bedrock must include the following information for each well in addition to that required in item E:

[For text of subitems (1) to (5), see M.R.]

[For text of item G, see M.R.]

H. The permit is valid for 18 months from the date issued.

4725.1831 GROUNDWATER THERMAL EXCHANGE DEVICE PERMITS.

This part applies to the construction of a groundwater thermal exchange device (heat pump) with reinjection to an aquifer.

[For text of item A, see M.R.]

B. The property owner or the property owner's agent must submit to the commissioner a permit application on a form provided by the commissioner, or in a format approved by the commissioner. The application must be legible and must contain:

(1) the name, license number, and signature of the well contractor constructing the wells;

(2) the name, address, and signature of the owner of the property on which the device will be installed;

(3) the township number, range number, section, and one quartile, and the property street address if assigned, of the proposed device location;

[For text of subitems (4) to (8), see M.R.]

[For text of items C and D, see M.R.]

E. The groundwater thermal exchange device must be constructed within 18 months of the date the permit is issued.

4725.1832 NOTIFICATION FOR WELL SEALING.

This part applies to the sealing of wells, including water supply, remedial, monitoring, temporary monitoring, and dewatering wells, as provided by Minnesota Statutes, sections 103I.231, 103I.301, and 103I.315. This part does not apply to the sealing of borings.

A. A well must not be sealed until the owner of the property where the well is located, the owner's agent, or a licensee or registrant submits notification of proposed sealing of the well to the commissioner. Notification must be on a form provided by the commissioner or in a format approved by the commissioner. The notification must be legible and must include the following information for each well:

(1) the name and licensee number or registrant number;

(2) the name, address, and telephone number of the well owner, and property owner if different;

(3) the township number, range number, section and one quartile, and the property street address if assigned; and

(4) identification of a multiple-cased well with an inside casing eight inches or larger in diameter.

[For text of items B and C, see M.R.]

4725.1833 VERTICAL HEAT EXCHANGER CONSTRUCTION PERMITS.

This part applies to the construction of vertical heat exchangers.

A. A vertical heat exchanger must not be constructed, or have piping installed or removed below the frost line, until a permit has been issued by the commissioner to the well contractor or limited well/boring contractor licensed to construct vertical heat exchangers.

B. The well contractor or vertical heat exchanger contractor must submit to the commissioner a vertical heat exchanger permit application on a form provided by the commissioner. The application must be legible and signed by the well contractor or vertical heat exchanger contractor and the property owner or property owner's agent.

C. A permit application must be completed for each vertical heat exchanger and must include:

(1) the name and license number of the well contractor or vertical heat exchanger contractor;

(2) the name and address of the owner of the property on which the vertical heat exchanger will be installed;

(3) the township number, range number, section and one quartile, and the property street address if assigned, of the proposed vertical heat exchanger;

(4) a plan diagram showing the location of the vertical heat exchanger borings, property lines, and structures on the property;

(5) the geological materials expected to be encountered by the borings;

(6) the number, diameter, and depth of all bore holes drilled to install the vertical heat exchanger piping;

(7) the grout materials and grouting method;

(8) the type of heat transfer fluid to be used; and

(9) the system operating pressure.

D. The vertical heat exchanger must be constructed within 18 months of the date the permit is issued.

4725.1835 ELEVATOR BORING CONSTRUCTION PERMITS.

This part applies to an excavation or hole for installation of an elevator boring.

A. An elevator boring must not be constructed until a permit has been issued by the commissioner to the elevator boring contractor or well contractor.

B. An elevator boring contractor or well contractor must submit to the commissioner an elevator boring permit application on a form provided by the commissioner, or in a format approved by the commissioner. The application must be legible and signed by the elevator boring contractor or well contractor.

C. The permit must include the following information for each elevator boring:

(1) the name and license number of the elevator boring contractor or well contractor;

(2) the name and address of the elevator boring owner, and property owner if different;

(3) the township number, range number, section and one quartile, and the property street address if assigned, of the proposed boring location; and

(4) the anticipated depth of the elevator boring.

D. Permit applications for elevator borings constructed through a confining layer must include the following information in addition to that required in item C:

(1) the diameter of the boring;

(2) the drilling method;

(3) the casing materials;

(4) the materials and methods used to grout the boring; and

(5) a cross-sectional diagram of the boring.

E. The permit is valid for 18 months from the date issued.

4725.1836 NOTIFICATION AND PERMIT FEES.

The fees specified in Minnesota Statutes, chapter 103I, must accompany all notifications and permit applications. Notification or permit fees may be paid electronically and the permit requests or notifications may be submitted by facsimile. A notification or permit is not valid if payment by check is returned for nonsufficient funds, or electronic payment is refused by the financial institution. Notification and permit application fees shall not be refunded, except that a water-supply well notification fee may be refunded to the person who paid the fee if drilling has not taken place, and a written request for refund is received by the commissioner within 18 months of receipt of the fee.

4725.1838 EMERGENCY NOTIFICATIONS AND PERMITS.

Notifications and applications for permits may be verbally reported under emergency conditions for construction of water-supply wells, elevator borings, monitoring wells, and dewatering wells, except for monitoring wells and dewatering wells constructed through a confining layer and for at-grade monitoring wells. Emergency conditions are exceptional circumstances where a delay in starting construction poses an immediate and significant danger to health or safety and there is no time for prior notification or obtaining the required permit.

Exceptional circumstances include, but are not limited to, cases where well failure will leave livestock or persons without drinking water, where inaction presents an imminent threat to contamination of the well, boring, or groundwater, where delay will result in collapse or damage to the well or boring, where delay will result in the endangerment of health or safety such as in an unstable excavation, or where such construction is court ordered.

A. If emergency conditions affecting construction of a water-supply well, or dewatering well occur during normal business hours, the property owner, the property owner's agent or a licensed contractor may verbally provide to an authorized representative of the commissioner the information required for notification under part 4725.1820 or 4725.1825. If emergency conditions affecting construction of a monitoring well or elevator boring occur during normal business hours, the contractor may verbally provide the information required for permits under part 4725.1830 or 4725.1835, whichever is applicable, to an authorized representative of the commissioner.

B. If emergency conditions occur after business hours or on a nonbusiness day, construction of a water-supply well, monitoring well, dewatering well, or elevator boring may begin if the property owner, property owner's agent, or contractor, as required in item A, telephones the Minnesota Department of Health and leaves a message on the answering service reporting the applicable information required in part 4725.1820, 4725.1825, 4725.1830, or 4725.1835.

C. A written notification or written permit application and the applicable fees must be received by the commissioner within five working days after emergency notification of the start of construction of a water-supply well or dewatering well, or within five working days after the start of construction under an emergency permit for a monitoring well or elevator boring. The property owner, the property owner's agent, or a licensed or registered contractor is responsible for submitting a written notification or permit and fee.

[For text of items D and E, see M.R.]

F. The commissioner shall not issue emergency permits to, or accept emergency notifications from, contractors who violate the emergency notification or permit requirements.

4725.1840 UNSUCCESSFUL COMPLETION OF A WELL OR BORING.

If a water-supply well, monitoring well, dewatering well, vertical heat exchanger, or elevator boring for which a notification or permit has been filed is unsuccessful, a new well or boring may be constructed for the same owner on the same property within 18 months of notification or permit approval, without submitting a new construction fee, notification, or permit application if:

A. the construction and depth of the new well or boring is not substantially different from the initial well or boring;

B. the person installing the well or boring submits an amended well and boring construction record; and

C. the unsuccessful well or boring is sealed according to this chapter and a sealing record is submitted.

4725.1845 DENIAL OF CONSTRUCTION PERMIT APPLICATION.

Subpart 1. **Grounds for denial of application.** The commissioner may deny a permit application or revoke a permit for construction of a monitoring well, groundwater thermal exchange device, vertical heat exchanger, or elevator boring if:

[For text of item A, see M.R.]

B. information submitted in the permit application is determined to be incomplete, incorrect, omitted, false, or misrepresented;

[For text of items C to G, see M.R.]

[For text of subp 2, see M.R.]

4725.1848 WELL MAINTENANCE PERMITS.

Subpart 1. **Permit required.**

A. Annual maintenance permits are required for monitoring wells and dewatering wells that were constructed after January 1, 1990, and are not permanently sealed within 14 months of construction.

B. Annual maintenance permits are required for wells, including monitoring wells, dewatering wells, and water-supply wells, that are not in use and not sealed.

[For text of subps 2 and 3, see M.R.]

Subp. 4. **Well maintenance permits.** An annual well maintenance permit is required for an unsealed dewatering well, monitoring well, or water-supply well that is not in use or that is inoperable. The owner of the property on which such a well is located must submit the annual permit fee along with the permit application, or have the well sealed.

Subp. 5. **Monitoring well maintenance permits.** The provisions in items A to C apply to monitoring wells constructed after January 1, 1990.

[For text of items A to C, see M.R.]

Subp. 6. **Dewatering well maintenance permits.** The conditions in items A to C apply to dewatering wells constructed after January 1, 1990.

[For text of items A to C, see M.R.]

4725.1849 PROPERTY OWNER OR LESSEE DRIVE-POINT WATER-SUPPLY WELL CONSTRUCTION NOTIFICATION.

Subpart 1. **Scope.** This part applies to drive-point water-supply wells constructed by an individual on property that is owned or leased by the individual and that is used for agricultural purposes or as the individual's place of residence. The construction, maintenance, and repair of the drive-point well must comply with parts 4725.2010 to 4725.5650. This part does not grant authority for the individual to seal the drive-point well. This part does not apply to drive-point water-supply wells constructed by a well

contractor, drive-point wells installed for purposes other than water supply, or to wells other than drive-point wells installed by the property owner or lessee.

Subp. 2. **Notification.** Written notification of construction of a drive-point well installed by a property owner must be filed with the commissioner within ten days after completion of the well. The owner of the drive-point well must provide the following information on a notification form provided by the commissioner:

(1) the name, address, and telephone number of the drive-point well owner and property owner, if different;

(2) the legal description of the well location; and

(3) the date the well was constructed.

Subp. 3. **Retail sale of drive-point well screens.** A person who sells drive-point well screens at retail must provide each buyer with a copy of the notification form and informational materials provided by the department.

The commissioner shall provide copies of the drive-point notification form and information about well regulations to retail sellers of drive-point well screens.

4725.1851 WELL AND BORING RECORDS.

Subpart 1. **General.** A licensee, registrant, or property owner or lessee for a well constructed according to Minnesota Statutes, section 103I.205, subdivision 4, paragraph (e), clause (1), must submit an accurate, verified, legible written record of well or boring construction or sealing on forms ~~providing~~ provided by the commissioner, or in a format approved by the commissioner, containing the information in subparts 2 to 4 within 30 days after completion of the work. A written construction record is not required for any well or boring sealed within 30 days of the time construction began and for which a sealing record is submitted.

A. A new or amended record is required if a notification or permit is required under parts 4725.1820 to 4725.1838.

B. The licensee or registrant must furnish the owner or owner's agent one copy, retain one copy, and submit the remaining copies to the commissioner, except that where a local board of health has been delegated authority under Minnesota Statutes, section 103I.111, the remaining copies must be submitted to the delegated program.

C. A single record may be used to report more than one temporary monitoring well, dewatering well, or environmental bore hole if all the wells or borings on the record are located on a continuous parcel of property, the well or boring depths do not vary by more than 25 feet, and the wells or borings terminate in the same geologic formation. All wells or borings must be of the same type. A map must be attached to the record containing multiple wells or borings, showing all well or boring unique numbers and locations with distances and directions in relation to recognizable landmarks.

D. All depth measurements must be reported from the established ground surface.

Subp. 2. **Construction records.** Construction records for wells and borings must contain the information in subpart 3, items A to F, and the following information:

A. intended use;

B. depth;

C. drilling method;

D. casing material, diameter, and depth;

E. bore hole diameters and depths;

F. gravel pack and screen type and depth interval, or open hole interval;

G. static water level;

H. type, amount, and intervals of grout or sealing materials;

I. wellhead description including pitless adapter manufacturer and model if installed, and type of casing protection if installed;

J. date of completion;

K. pump and pumping equipment description;

L. description of the geological materials penetrated by the well or boring using terms in subpart 4;

M. hydrofractured interval if hydrofractured; and

N. drilling fluid used.

Subp. 3. **Sealing record.** A sealing record must be submitted for all wells and borings sealed.

The sealing record must contain the following information:

A. name and address of the property owner, and the well owner if different;

B. name, license or registration number of the contractor doing the work, name of the driller performing the work, and the signature of the certified representative;

C. date work was completed;

D. the county, township, range, section and three quartiles, and the property street address, if assigned, of the well or boring;

E. a map showing the well or boring location with distances and directions in relation to recognizable landmarks;

[For text of item F, see M.R.]

G. a description of the geological materials penetrated by the well or boring or a description of material penetrated by the nearest well or boring for which records are available, using terms in subpart 4;

[For text of items H to L, see M.R.]

M. a description of any obstruction or pump, if present;

N. the method of sealing the annular space around the casing, if present; and

O. a description of the wellhead completion before sealing was performed.

Subp. 4. **Geological materials.** The geological materials penetrated in drilling a well or boring must be reported. The person completing the record must include the rock and unconsolidated material types, color, and relative hardness. The grain size must be reported for unconsolidated materials and may be based on field observation without technical size measurement. Geological materials must be described using the terms in items A and B, terms contained in the Dictionary of Geological Terms, Third Revision, by the American Geological Institute, or ASTM Standard D2487-00.

A. Unconsolidated materials:

Material	Diameter Millimeters	Diameter Inches	Screen Slot No. From	Screen Slot No. To
(1) Clay	Up to 0.005	Up to 0.0002	-	-
(2) Silt	0.005-0.062	0.0002-0.0025	-	-
(3) Fine Sand	0.062-0.250	0.0025-0.0100	2	10
(4) Medium Sand	0.250-0.500	0.0100-0.0200	10	20
(5) Coarse Sand	0.500-1.000	0.0200-0.0400	20	40
(6) Very Coarse Sand	1.000-2.000	0.0400-0.0800	40	80
(7) Fine Gravel	2.000-4.000	0.0800-0.1600	80	160
(8) Coarse Gravel	4.000-62.500	0.1600-2.5000	160 and larger	
(9) Cobbles	62.500-250.000	2.5000-10.0000	-	-

B. Rock:

(1) basalt, which is a very fine-grained, dark igneous rock, commonly black, dark gray, or dark red-brown in which the mineral grains cannot be distinguished with the unaided eye;

(2) carbonate rock, which is a sedimentary rock consisting of limestone and dolomite or dolostone;

(3) dolomite or dolostone, which is a sedimentary rock composed primarily of the mineral dolomite (calcium-magnesium carbonate), which effervesces weakly in dilute hydrochloric acid;

(4) gabbro, which is a dark-colored, basic intrusive igneous rock comprised principally of basic plagioclase (commonly labradorite or bytownite) and clinopyroxene (augite);

(5) gneiss, which is a foliated rock formed by regional metamorphism, in which bands or lenticles of granular minerals alternate with bands or lenticles in which minerals having flaky or elongate prismatic habits predominate;

(6) granite, which is a plutonic rock in which quartz constitutes ten to 50 percent of the felsic components and in which the alkali feldspar/total feldspar ratio is generally restricted to the range of 65 to 90 percent;

(7) iron formation, which is a chemical sedimentary rock, typically thin bedded and/or finely laminated, containing at least 15 percent iron of sedimentary origin, and commonly but not necessarily containing layers of chert;

(8) limestone, which is a sedimentary rock composed primarily of the mineral calcite (calcium carbonate), which effervesces freely in dilute hydrochloric acid;

(9) metavolcanic (rock), which is a volcanic rock that shows evidence of having been subjected to metamorphism;

(10) quartzite, which is a very hard sandstone, consisting chiefly of quartz grains that have been so completely and solidly cemented with secondary silica that the rock breaks across or through the grains rather than around them, or a granoblastic metamorphic rock consisting mainly of quartz, which is formed by recrystallization of sandstone or chert by metamorphism;

(11) sandstone, which is a sedimentary rock consisting of cemented or otherwise compacted sediment composed predominantly of sand-sized particles generally of quartz;

(12) schist, which is a strongly foliated crystalline rock, formed by dynamic metamorphism, that can be readily split into thin flakes or slabs due to the well-developed parallelism of more than 50 percent of the minerals;

(13) shale, which is a sedimentary rock consisting of compacted or cemented silt and clay;

(14) slate, which is a fine-grained, hard, dark-colored metamorphic rock derived from shale, which typically is gray and which splits readily into flat pieces; and

(15) volcanic (rock), which is a generally finely crystalline or glassy igneous rock resulting from volcanic action at or near the earth's surface.

4725.1855 CUTTING FORMATION SAMPLES.

A licensee or registrant must submit cutting samples as specified in this part when the commissioner determines that samples are needed to provide subsurface geological and hydrological information for the state water information system.

A. The commissioner shall notify licensees and registrants of the areas from which cutting samples are required and provide licensees and registrants operating within the areas with maps or lists indicating counties, townships, sections, or other designated areas where cutting samples are required.

B. Licensees and registrants so notified and supplied shall collect cutting samples during the course of drilling in the designated areas according to the requirements specified. Licensees or registrants not supplied with sample collecting materials but who drill in an area designated for sampling shall notify the commissioner. Licensees or registrants shall collect the cutting samples in a manner representative of the materials encountered. Samples must be taken at five-foot intervals and at every change in geological material type. The cuttings must be placed in the sample bags provided, which shall have an attached tag on which the unique number, owner's name, location, and sample depth must be written.

C. Licensees or registrants shall notify the commissioner within 30 days of completion of work, so that the cutting samples can be collected. Until collected, the licensee or registrant shall store the samples protected from weather and disturbance and segregated by unique number and depth interval.

WELL AND BORING GENERAL CONSTRUCTION AND USE REQUIREMENTS

4725.2010 APPLICABILITY.

The general construction and use requirements specified in parts 4725.2010 to 4725.3875 apply to all wells and borings except exploratory borings regulated under chapter 4727. The additional requirements or exemptions in parts 4725.4050 to 4725.6050 apply to water-supply wells. The additional requirements or exemptions in part 4725.6150 apply to dewatering wells. The additional requirements or exemptions in parts 4725.6450 to 4725.6850 apply to monitoring wells and cased environmental bore holes. The additional requirements or exemptions in part 4725.7050 apply to vertical heat exchangers. The additional requirements or exemptions in part 4725.7250 apply to elevator borings. The additional requirements or exemptions in part 4725.7450 apply to environmental bore holes.

4725.2020 INTERCONNECTION OF AQUIFERS PROHIBITED.

Subpart 1. **Aquifer interconnections.** A well or boring must not be constructed to interconnect aquifers separated by a confining layer or interconnect an unconsolidated aquifer and a bedrock aquifer.

Subp. 1a. **Open bore hole, gravel pack, or screen in a confining layer.** A well or boring must not have open bore hole, gravel pack, or screen ~~extend~~ extending through more than:

A. ten feet of a confining layer, except for the Decorah or Glenwood formations;

B. two feet of the Decorah or Glenwood formations; and

C. 50 percent of the confining layer.

~~The provisions of this subpart do not apply in an area designated on a map published by the commissioner.~~ The commissioner may establish less stringent standards than identified in this subpart where protective conditions exist or unique characteristics of the confining layer exist, including low permeability overlying materials, favorable groundwater gradients, the presence of fractures or permeable horizons in the confining layer, or reduced contaminant loading in recharge areas. The areas subject to less stringent standards under this provision will be designated on a map published by the commissioner, along with the standards that do apply to those areas.

Subp. 2. [See repealer.]

Subp. 3. [See repealer.]

4725.2050 USE OF WELLS OR BORINGS FOR DISPOSAL OR INJECTION PROHIBITED.

A well or boring must not be used for disposal or injection of surface water, groundwater, or any other liquid, gas, or chemical, except for groundwater thermal exchange devices, drilling fluids, vertical turbine prelubrication water, treatment chemicals, priming water, water used for hydrofracturing, and water used for disinfection according to parts 4725.1831, 4725.2950, 4725.3250, 4725.3725, 4725.5050, 4725.5475,

and 4725.5550. This does not prohibit the injection of air for drilling, development, or sparging.

[For text of items A and B, see M.R.]

4725.2150 REQUIRED DISTANCE FROM GAS PIPES, LIQUID PROPANE TANKS, AND ELECTRIC LINES.

Subpart 1. **General distance.** The minimum isolation distances in item A or B must be maintained during construction, repair, or sealing of a well or boring, and installation of a pipe with flammable or volatile gas, an overhead or underground electric transmission, distribution, service, supply, feeder, branch, or conductor line hereafter called "electric line" or "line," or a liquid propane tank. The distances are measured horizontally from the closest part of the well or boring to the closest part of the pipe, tank, or line; or closest part of the vertical projection on the earth of an overhead or buried pipe, tank, or line. The minimum isolation distance between a well or boring and a pipe with flammable or volatile gas, an electric line, or a liquid propane tank is:

A. ten feet; or

B. five feet if:

(1) the person constructing the well or boring, or the person installing the pipe, line, or tank, marks the well or boring with a permanent sign warning of the location of the electric line, liquid propane tank, or gas pipe; and

(2) during construction or sealing of the well or boring:

(a) the electric line has been de-energized and visibly grounded, or insulating barriers not a part of, or an attachment to, the equipment or machinery have been erected to prevent physical contact with the line during well or boring construction; and

(b) the propane tank does not contain flammable or volatile gas.

Subp. 2. [See repealer.]

Subp. 3. **Exceptions.** Subpart 1 does not apply to:

A. an electrical service line for the well or boring;

B. a television, fiber optic, or other low voltage electric line with a voltage less than 50 volts;

C. a temporary liquid propane tank used during the construction, repair, or sealing of a well or boring;

D. an overhead electric line when the repairing or sealing of a well or boring does not involve the use of a drilling machine or hoist; or

E. a buried electric line or buried gas pipe when the repairing or sealing of a well or boring does not involve excavation.

The requirements of this part are minimum standards, and do not exempt persons from more restrictive requirements of the Occupational Safety and Health Administration.

4725.2175 LOCATION OF WELL OR BORING WITHIN BUILDING.

Subpart 1. **Location in a building.** A well or boring must not be located within a building, and a building must not be constructed to enclose a well or boring, unless the building (well house) meets the requirements of this part. Environmental bore holes and monitoring wells are exempt from this subpart if sealed within 72 hours of the time construction begins on the well or boring.

Subp. 2. **Requirements for a building (well house) containing a well or boring.** A building (well house) containing a well or boring must:

A. have adequate access for a drilling machine and hoist to construct, maintain, repair, and seal the well or boring;

B. be constructed at or above the established ground surface. If a floor drain is installed, it must discharge to the established ground surface, a gravel pocket, or a sewer constructed to prevent backup of sewage within 50 feet of the well or boring;

C. not be used to store materials or chemicals that may cause contamination of the well, boring, or groundwater, including fertilizers, pesticides, petroleum products, paints, and cleaning solvents;

D. have a concrete floor sloped to divert water away from the casing;

E. have a watertight gasket or caulk between the casing and the floor;

F. have any door hinged to swing outward;

G. be constructed according to this part exclusively to contain and protect the well, boring, pump, and water treatment equipment and water treatment chemicals; no other uses of the building are permitted; and

H. not be contained in, or part of, another building, except that a well house may be constructed with not more than one wall in common with another building. The common wall must not allow access to, or be open to, the well house.

Subp. 3. **Requirements for a well or boring inside a building.** A well or boring located in a separate building (well house) must:

A. have casing extending at least 12 inches above the established ground surface, and at least 12 inches above the building floor; and

B. be located according to part 4725.2185, except that this does not apply to a removable well house.

4725.2185 DISTANCE FROM A BUILDING.

A minimum horizontal isolation distance of three feet must be maintained between a well or boring and the farthest exterior projection of a building, including the walls, roofs, decks, overhangs, and other permanent structures unless the well or boring is located in a building constructed according to part 4725.2175. A building, deck, or other permanent structure, except a well house, must not be built to enclose a well or boring. The well or boring must be accessible for repair and sealing. Environmental bore holes

and monitoring wells are exempt from this subpart if sealed within 72 hours of the time construction begins on the well or boring.

4725.2250 GENERAL CASING REQUIREMENTS.

Subpart 1. **Casing types.** Permanent casing installed in a well or boring must be:

A. steel casing as specified in part 4725.2350;

B. stainless steel casing as specified in part 4725.6650 when used for a monitoring well, environmental bore hole, or remedial well;

C. flush threaded polyvinyl chloride casing as specified in part 4725.6650 when used for a monitoring well or environmental bore hole; or

D. plastic casing as specified in part 4725.2550.

Subp. 2. **Watertight casing required.** All casing couplings and casing joints must be watertight throughout ~~its length~~ their lengths. Casing must not have holes, cracks, or separations.

Subp. 2a. **Casing joints.** All casing joints must be watertight, with threaded, welded, or solvent welded joints, and comply with the standards in part 4725.2350, 4725.2550, or 4725.6650.

A. Threaded joints must have recessed couplings, reamed and drifted couplings, or other couplings that match the design, taper, and thread type of the casing. Thread must not be exposed on the pipe when the casing is joined.

B. Welded casing, except where an approved welding coupling is used, must have beveled joints. The weld must extend the full circumference of the casing and must completely fill the bevel.

C. Welding couplings must be made of material equivalent to the casing. The upper and lower welds must extend the full circumference of the casing, and completely

fill the gap between the coupling and casing. Welding the casing to the inside of the coupling is prohibited.

Subp. 3. **New casing required.** Casing used in the permanent construction of a well or boring must be new casing produced to the specifications of this part. Casing salvaged from the same type of well or boring within 120 days of installation is acceptable for reuse if it meets the specifications for new casing. A potable water well must be constructed with new casing or casing salvaged from a potable water well.

Subp. 4. **Casing markings required.** Steel and plastic permanent casing except flush-threaded PVC and stainless steel casing must be marked by the manufacturer in accordance with casing specifications in parts 4725.2350 to 4725.2550. Markings must be rolled, stamped, or stenciled by the manufacturer.

[For text of subp 5, see M.R.]

Subp. 6. **Casing rejection.** The commissioner shall reject casing for use in a well or boring if:

[For text of item A, see M.R.]

B. the casing fails to meet the specifications in part 4725.2350, 4725.2550, or 4725.6650; or

C. the lot of casing contains defective lengths, including casing with girth-welded joints, or welded patches, or the lot has more than five percent of the casings with lengths less than five feet.

Subp. 7. **Temporary casing.** Casing installed temporarily during drilling is not required to meet the specifications for casing in part 4725.2350, 4725.2550, 4725.6650, or this part except subparts 2, 7, and 16, but must be of sufficient strength to withstand the structural load imposed by conditions both inside and outside the well or boring,

and free of oil or other contaminants. The casing must be removed on completion of the well or boring.

Subp. 8. **Inner and outer casing.** The inside diameter of an outer casing must be at least 3.0 inches larger than the outside diameter of the inner casing, couplings, or bell-end, whichever is larger, except that the inside diameter of an outer casing must be at least 3.5 inches larger than the outside diameter of the inner casing, couplings, or bell end, whichever is larger, for inner casings deeper than 100 feet and larger than 12 inches inside diameter. The annular space between an inner casing and an outer casing must be grouted for its entire length by pumping neat-cement grout or cement-sand grout through a tremie pipe or through the casing as specified in part 4725.3050. The inner casing must extend above the established ground surface at least 12 inches.

Subp. 9. **Outer casing in unconsolidated materials.** A permanent outer steel casing installed in unconsolidated materials is not required to meet the requirements of this part except subparts 2, 9, and 17, or the material specifications for casing in part 4725.2350 if the casing is of sufficient strength to withstand the structural load imposed by conditions both inside and outside the well or boring, the casing is free of oil or other contaminants, an inner casing meeting the requirements of this chapter is installed, and the annular space between the casings is filled with neat-cement grout, or cement-sand grout. The outer casing must be installed in accordance with part 4725.3050, subpart 3 or 5.

Subp. 10. **Casing inside diameter.** The inside diameter of a permanent casing must not be less than two inches for a well or boring greater than 50 feet in depth.

Subp. 11. **Casing height.** A casing or casing extension must extend vertically at least 12 inches above the established ground surface, the floor of a building (well house) as specified in part 4725.2175, or a concrete slab, except that the casing for a hand pump may terminate a minimum of six inches above a concrete slab in accordance with part 4725.3250, item A, if the concrete slab is at least six inches above the established

ground surface. The established ground surface, slab, or floor immediately adjacent to the casing must be graded to divert water away from the casing. Termination of the top of the casing below the established ground surface, such as in a well pit, is prohibited except that an outer casing may terminate immediately below a pitless adapter installed on an inner casing.

[For text of subp 12, see M.R.]

Subp. 13. **Multiple casings.** Except for inner and outer casings installed in accordance with subpart 8, multiple casings must not be installed in a single bore hole.

Subp. 14. **Casing reduction and enlargement.** A casing must maintain the same inside diameter throughout the length of the casing, except that a larger diameter pitless unit may be installed.

Subp. 15. **Casing drive shoes.** A drive shoe must be installed on driven casing except for a drive-point casing, temporary casing, or outer casing that has a neat-cement or cement-sand grouted inner casing. The drive shoe must:

A. be made of steel or iron, with a hardened, beveled cutting edge;

B. have a wall thickness equal to or larger than the casing thickness; and

C. be threaded or welded to the bottom of the casing.

Subp. 16. **Temporary cap or cover required.** Until a well or boring is completed and a permanent cap or cover installed, the installer must temporarily cap or cover the bore hole, casing, and annular space of a well or boring when not actively working on the well or boring, in accordance with subpart 17, or install a weatherproof, tamper-proof cover. An overlapping steel plate is permitted. Tape, pails, loose plastic, or similar covers are not permitted.

Subp. 17. **Permanent cap or cover required.** A permanent watertight and vermin-proof cap or cover must be installed on the inner casing of a well or boring. The cap

or cover must be constructed of metal or plastic materials having a thickness comparable to the casing requirements specified in subpart 1. The cap or cover must consist of:

A. an overlapping cover or cap;

B. a threaded plug, cover, or plate;

C. a welded or solvent welded overlapping plate or cover;

D. an extension of the casing at least one inch into the base of a power pump; or

E. a sanitary seal or plug with a one-piece top plate, compression gasket, and noncorrodible draw bolt(s). If the well or boring is in a building that meets the requirements in part 4725.2175, a two-piece top plate, compression gasket, and noncorrodible draw bolts may be used.

4725.2350 STEEL CASING REQUIREMENTS.

Subpart 1. **General.** Steel casing used in the permanent construction of a well or boring must be new casing produced to:

A. ASTM Standard ~~A53M-04~~ A53/A53M-04a;

B. ASTM Standard A589-96 (2001), Types I, II, and III; or

C. API Standard 5L-04.

Steel casing must have the minimum weights and thicknesses specified in the table in subpart 2 subject to the tolerances in the specifications in this subpart.

[For text of subp 2, see M.R.]

4725.2550 PLASTIC CASING AND COUPLING REQUIREMENTS.

Subpart 1. **General requirements.** Plastic casing and couplings used in the permanent construction of a well or boring must:

A. meet ASTM Standard F480-02, except that flush threaded polyvinyl chloride casing must not be used except for a monitoring well or environmental bore hole; and

B. withstand internal pressures of 200 pounds per square inch (psi).

Standard dimension ratios (SDR) and water pressure ratings (PR) at 23 degrees Celsius (73 degrees Fahrenheit) for nonthreaded polyvinyl chloride (PVC) and acrylonitrile-butadiene-styrene (ABS) plastic casing equal to or greater than 200 psi are as follows:

(1) pressure rating of PVC casing materials:

SDR	PVC 1120	PVC 1220	PVC 2112	PVC 2116	PVC 2120
13.5	315 psi	315 psi	200 psi	250 psi	315 psi
17	250 psi	250 psi	-	200 psi	250 psi
21	200 psi	200 psi	-	-	200 psi

(2) pressure rating of ABS casing materials:

SDR	ABS 1316	ABS 2112
13.5	250 psi	200 psi
17	200 psi	-

The sources of the pressure rating in item B are the American Society for Testing and Materials Standard D2241-04a "Standard Specifications for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)" Table XI.I Standard Thermoplastic Pipe Dimension Ratios (SDR) and Water Pressure Rating (PR) at 73 degrees Fahrenheit (23 degrees Celsius) for Nonthreaded Plastic Pipe; and Standard D2282-99e "Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR)," Table XI.I Standard Plastic Pipe Dimension Ratios (SDR) and Water Pressure Ratings (PR) at 73 degrees Fahrenheit (23 degrees Celsius) for Nonthreaded ABS Plastic Pipe.

Subp. 2. **Additional approved fittings and couplings.** In addition to the plastic couplings approved under subpart 1, the following fittings and couplings may be used to connect a steel pitless unit or screen to plastic casing:

A. fittings or couplings with socket dimensions meeting the requirements of ASTM Standard F480-02, Table 3 and having a water pressure rating of at least 200 psi;

B. Schedule 40, slip x internal thread fittings, four-inch and smaller meeting the requirements of ASTM D2466-02; or

C. Schedule 40, slip x internal thread fittings and slip x external thread fittings, five-inch diameter meeting the requirements of ASTM D2466-02.

Subp. 3. **Compliance with ANSI/NSF standard required.** All plastic casings, couplings, components, and related joining materials including solvents, cements, or primers used in the construction of a well or boring must conform with the requirements of ANSI/NSF Standard 61-2003e or the health effects portion of ANSI/NSF Standard 14-2003 and be tested as conforming by an agency certified by the ANSI. Conformance to the ANSI/NSF standard must be coded, stamped, or marked on the casings, couplings, components, and related joining materials including solvents, cements, or primers.

4725.2650 PLASTIC CASING INSTALLATION.

[For text of subps 1 to 7, see M.R.]

Subp. 8. **Drilling inside permanent plastic casing prohibited.** A person must not drill inside permanent plastic casing. Drilling tools such as drill bits must not be inserted in plastic casing. This prohibition does not include the installation or repair of screens or development of the well or boring.

Subp. 9. **Limestone, dolomite restriction.** Plastic casing must not be used as an outside casing in wells and borings cased more than five feet into limestone or dolomite

bedrock. In limestone and dolomite bedrock, plastic casing may be used as an inner casing if surrounded for the entire length by an outer steel casing.

Subp. 9a. **Plastic cased wells or borings completed in bedrock.** A plastic cased well or boring completed in bedrock, whether screened or open hole, must be cased into the bedrock a minimum of five feet and the annular space surrounding the casing in bedrock must be filled with neat-cement grout or cement-sand grout according to part 4725.3050, subpart 7.

[For text of subps 10 and 11, see M.R.]

4725.2750 SCREENS; SCREEN LEADERS, RISERS, AND SUMPS.

If a screen is attached or connected to the casing, the connection must be made by a threaded, solvent-welded, or welded joint, or by a nontoxic packer. Lead packers must not be used. A screen riser or leader must not extend more than 21 feet above the screen. A screen sump must not extend more than ten feet below the screen. The total combined length of screen riser or leader and screen sump must not exceed 21 feet. A screen riser, leader, or screen sump must comply with the confining layer requirements of part 4725.2020, subpart 1a. Multiple screens separated by a screen riser, leader, or sump are not permitted.

4725.2850 GRAVEL PACKS.

Gravel packs, filter sand, or stabilizer materials must be comprised of mineral material or inert, nontoxic artificial materials, contain less than five percent calcareous material, and must be graded, cleaned, and washed. Gravel packs, filter sand, or stabilizer materials must not extend:

A. more than ten feet above the static water level;

B. more than ten feet above the top or below the bottom of the screen when a screen riser, leader, or screen sump is not installed;

C. above a screen riser or leader, or below a screen sump;

D. through a confining layer in violation of part 4725.2020, subpart 1a; or

E. through more than ten feet of open hole.

4725.2950 DRILLING FLUIDS.

Subpart 1. **Water.** Water used for drilling, development, hydrofracturing, sealing, repair, or rehabilitation, other than water from the well or boring itself, must:

A. come from a potable water system or from a well or boring of similar use and construction;

B. contain a free chlorine residual at all times, except for monitoring wells and remedial wells where chlorine will interfere with water quality analysis or remediation; and

C. be conveyed and stored in clean, sanitary tanks and water lines.

Subp. 2. **Drilling additives.** Drilling additives, including bentonite, must meet the requirements of ANSI/NSF Standard 60-2003e as determined by a person accredited by the ANSI under ANSI Standard Z34.1-1993. A drilling additive is a substance added to the air or water used in the fluid system of drilling a well or boring.

4725.3050 GROUTING.

Subpart 1. **Grouting materials.** The following grout materials as listed in part 4725.0100 are approved for filling an annular space between unconsolidated material or bedrock and a casing:

A. neat-cement grout, except that rapid setting cement must not be used with plastic casing;

B. cement-sand grout; and

C. bentonite grout when used in unconsolidated materials.

Subp. 2. **Grouting requirements and methods.** The following general requirements apply to the grouting of wells and borings.

A. Grouting must start immediately on completion of drilling and be completed before placing a well or boring in service.

B. The annular space to be grouted must be protected from collapse and the introduction of materials other than grout.

C. A steel plate, or a nontoxic metal, rubber, or plastic grout basket may be attached to the casing within ten feet of the bottom. Wood, burlap, or other organic material must not be used.

D. Grout must be pumped under pressure into the annular space from the bottom up to the established ground surface or base of the pitless adapter or unit. Grout must be pumped through the casing or through a tremie pipe placed within ten feet of the bottom of the space to be grouted. The tremie pipe may be retracted as grouting proceeds; however, the bottom of the tremie pipe must remain submerged in grout while grouting.

E. Grout flowing out of the annular space at the surface must meet the minimum specifications and densities in this chapter before grouting may stop.

F. Dumping of grout is not allowed except when the depth of the space to be grouted is less than ten feet.

Subp. 2a. **Wait on cement.** Neat-cement grout or cement-sand grout must be allowed to set a minimum of 24 hours. Rapid setting cement must be allowed to set a minimum of 12 hours. Drilling, development, or pump operation is prohibited during the time the cement is setting.

Subp. 3. **Grouting depth requirement.** When constructing a well or boring with a method such as mud or air rotary, auger, or jetting that creates an open annular space or drills a bore hole larger than the casing or casing couplings outside diameter, a grouting

material specified in subpart 1 and the grouting methods specified in subpart 2 must be used to fill the annular space between the casing and the bore hole.

A. If the depth of the casing is 50 feet or less, the grout must extend from the bottom of the casing, top of the bentonite seal as specified in subpart 8, or top of the gravel pack, to the established ground surface, or the base of the pitless adapter or unit.

B. If the depth of the casing is more than 50 feet, the annular space below 50 feet must be filled with grout, except that the portion of the well or boring in an unconsolidated formation below 50 feet in depth may be filled with cuttings. The cuttings must be placed without bridging, and must be the unconsolidated materials taken from the bore hole. The annular space above 50 feet must be filled from:

(1) a depth of at least 50 feet to the established ground surface or the base of a pitless adapter or unit; or

(2) the top of the bentonite seal as specified in subpart 8 or the top of the gravel pack to the established ground surface or the base of a pitless adapter or unit.

Subp. 4. **Grouting between casings.** The annular space between an inner and outer casing must be filled with neat-cement grout or cement-sand grout according to subpart 2.

Subp. 5. **Driving casing.** When driving casing in an unconsolidated formation, a cone-shaped depression or temporary outer casing filled with bentonite grout, bentonite powder, or granular bentonite must be maintained around the outside of the casing. The bottom of driven casing, except for a drive-point, temporary casing, or outer casing that has a neat-cement or cement-sand grouted inner casing must be equipped with a drive shoe in accordance with part 4725.2250, subpart 15. Casing may only be driven through:

A. an unconsolidated formation;

B. sandstone bedrock including the St. Peter, Jordan, Franconia, Ironton-Galesville, Mt. Simon, Hinckley, or Fond du Lac formations;

C. ten feet or less of limestone or dolomite bedrock including the Cedar Valley through Galena groups, the Platteville formation, or the Prairie du Chien group;

D. ten feet or less of the St. Lawrence or Eau Claire confining layers; and

E. two feet or less of the Decorah or Glenwood confining layers.

Subp. 6. **Sealing bore hole below screen.** If a bore hole extends more than ten feet below the bottom of a screen, the bore hole must be filled with grout from the bottom of the bore hole to within ten feet or less of the screen.

Subp. 7. **Grouting in bedrock.** The additional requirements in items A to C apply to grouting a well or boring in bedrock.

A. When bedrock is encountered in the construction of a well or boring, the casing must be equipped with a drive shoe driven firmly into stable bedrock or the casing must be grouted with neat-cement grout, or cement-sand grout from the bottom of the casing to the top of the bedrock.

B. When the casing of a well or boring extends more than ten feet into bedrock, or extends through any portion of a bedrock confining layer, the casing must be installed in a bore hole 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outside diameter of the casing or couplings, whichever is larger, and the annular space in bedrock must be grouted with neat-cement grout or cement-sand grout, except that steel casing may be driven more than ten feet in a sandstone formation.

C. If a cavern more than twice the diameter of the bore hole exists or the grout level fails to rise after insertion of either more than one cubic yard of grout or the quantity of grout necessary to fill ten vertical feet of hole, then the following grouting materials and methods may also be used in the portions where the conditions exist:

(1) pouring of a mixture of gravel or stone aggregate not larger than one-half inch in diameter while simultaneously pumping neat-cement grout or cement-sand grout through a tremie pipe in a ratio not to exceed five parts aggregate to one part grout;

(2) pumping a mixture of gravel or stone aggregate not larger than one-half inch in diameter and cement-sand grout or neat-cement grout in a ratio not to exceed five parts gravel or aggregate to one part Portland cement; or

(3) pumping of alternate, equal thickness layers of cement-sand grout or neat-cement grout and pouring gravel or stone aggregate not larger than one-half inch in diameter. Individual layers of aggregate must not exceed ten feet in thickness. Aggregate must not be emplaced in a confining layer.

Neat-cement grout or cement-sand grout must be pumped through the casing or through a tremie pipe. The aggregate must be poured into the bore hole at a rate that prevents bridging.

Subp. 8. **Bentonite seal between gravel pack and grout.** A layer of bentonite pellets, bentonite chips, or granular bentonite not to exceed five feet in thickness is allowed between a gravel pack and grout. The bentonite pellets, bentonite chips, or granular bentonite must not extend into a confining layer or extend more than ten feet above the static water level, and must be poured without voids or bridging. A tremie pipe must be inserted to within ten feet of the top of the pellets, chips, or granular bentonite, and the annular space grouted to the established ground surface or base of the pitless unit or adapter.

4725.3150 CASING CONNECTIONS AND CAPS.

Subpart 1. **Casing connections and caps 12 inches above ground.** A connection or fitting 12 inches or more above the established ground surface into the top or side of a casing must be constructed to be weatherproof and insect proof. The connection, including

a cap, cover, electrical connection, water treatment connection, discharge piping, vent, access pipe, or other connection to the casing must consist of:

A. a threaded connection;

B. a welded or solvent welded connection;

C. a rubber expansion sealer;

D. a bolted flange with rubber gasket;

E. an overlapping cap or cover with compression gasket;

F. an extension of the casing at least one inch into the base of a pump; or

G. a sanitary well seal with a one-piece top plate, compression gasket, and noncorrodible draw bolts. The cap or seal must be equivalent to the casing in weight and strength. If the well or boring is in a building that meets the requirements in part 4725.2175, a two-piece top plate, compression gasket, and noncorrodible draw bolts may be used.

Subp. 2. **Casing connections less than 12 inches above ground.** A connection to, or a fitting on a casing made less than 12 inches above the established ground surface must be constructed to be watertight, vermin-proof, and provide complete clearance within the internal diameter of the casing. The connection must not be submerged in water at the time of installation. The connection must be made at or above the frost line. The connection or fitting must consist of a:

A. threaded connection equivalent to the material and threading standards of ASTM ~~A53M-04~~ A53/A53M-04a, ASTM A589-96 (2001), API Standard 5L-04, ASTM ~~A312/A312M-04a~~ A312/A312M-04b, or ASTM F480-02;

B. welded connection for steel or stainless steel casing where:

(1) the welded fitting must:

(a) be made of forged or machined metal; a cast-iron fitting is not allowed;

(b) be certified for use with pressure-rated vessels or piping;

(c) be marked with the design pressure rating and manufacturer;

(d) be made of metal compatible with the casing material;

(e) have a design pressure rating equal to or greater than the casing;

(f) fully integrate branch reinforcement and maintain full casing strength by providing casing reinforcement, with reinforcement tapering at the sides of the fitting;

(g) have a contour matching the curvature of the casing; and

(h) be self-aligning;

(2) the installer of a welded fitting must:

(a) complete the weld free of slag, inclusions, bubbles, voids, or other imperfections;

(b) use a guide or template for cutting the hole in the casing, or use a properly sized drilled hole;

(c) install the welded fitting in accordance with the manufacturers recommendations; and

(d) field-weld the fitting by holding the welding rod in a vertical or horizontal position, or bench-weld the fitting before field installation, with a welding rod as corrosion-resistant as the casing;

C. solvent welded connection for plastic casing equivalent to the standards of ASTM F480-02, or part 4725.2550;

D. bolted sleeve-type coupling meeting ANSI/AWWA Standard C219-01 where:

(1) the bolted sleeve-type coupling must:

(a) have a working pressure rating of at least 150 pounds per square inch;

(b) have an interior coating that complies with ANSI/NSF Standard 61-2003e if the coupling has an interior coating in contact with water; and

(c) provide for the casing or pipe to extend at least 2.5 inches into the coupling;

(2) the installer of a bolted sleeve-type coupling must:

(a) install the coupling in accordance with ANSI/AWWA Standard C219-01; and

(b) insert the casing or pipe ends at least 2.5 inches into the coupling; or

E. pitless adapter or pitless unit meeting the requirements of part 4725.4850, subpart 1. A welded, solvent welded, or threaded coupling, adapter, or swaged fitting meeting the material standards of part 4725.2350, 4725.2550, or 4725.6650 may be used to connect a casing to a pitless adapter or unit.

Subp. 3. **Electrical connections.** Electrical wire must enter a casing, cap, cover, or pump base a minimum of 12 inches above the established ground surface except for a well or boring completed at-grade in accordance with part 4725.6850. Electrical wires above the ground surface must be contained within a conduit or the casing. The electrical wire connection through the casing, cap, cover, or pump base must be made watertight and vermin-proof with a compression fitting, gasket, or electrical conduit installed according to Minnesota Statutes, section 326.243, or caulk meeting the standards of ANSI/NSF Standard 14-2003 or 61-2003e.

4725.3250 PUMPS AND PUMPING EQUIPMENT.

A pump or pump base installed on a well must be constructed so no unprotected openings exist into the interior of the pump or well casing.

[For text of item A, see M.R.]

B. A reciprocating pump rod must operate through a stuffing box, packing gland, or other watertight and vermin-proof fitting.

C. An oil lubricated vertical turbine pump must not be installed in a well.

D. A water lubricated vertical turbine pump must be lubricated with water from the well or a potable source.

4725.3350 INTERCONNECTIONS AND CROSS CONNECTIONS.

No connection between a well or boring and another well, boring, water supply system, or contamination source is allowed unless the connection is:

A. protected by an air gap as described in part 4715.2010;

B. protected with a backflow prevention device as specified in parts 4715.2020 to 4715.2170;

C. protected with a backflow prevention device as specified in parts 1505.2100 to 1505.2800 if the well is an irrigation well used for chemigation; or

D. between wells or borings that meet the construction standards of this chapter, are used for the same purpose, and have equivalent water quality.

This part does not apply to a water distribution system after the pressure tank; however, this part does not exempt water distribution systems otherwise regulated by chapter 4715.

4725.3450 FLOWING WELL OR BORING.

Subpart 1. **General construction; flowing well or boring.** A well or boring from which groundwater flows above the established ground surface without pumping must

be constructed to prevent erosion of the aquifer and the confining layer. Casing must be installed into the flowing aquifer to prevent water flowing up the outside of the casing. The requirements in this part are in addition to other requirements of this chapter.

Subp. 1a. **Low flow and low pressure.** A flowing well or boring that flows 70 gallons per minute or less, and that has an artesian pressure ten pounds per square inch or less, must be constructed by either:

A. drilling a bore hole larger than the casing into the flowing aquifer, installing casing into the flowing aquifer, and grouting the annular space surrounding the casing with neat-cement grout or cement-sand grout from the bottom of the casing to the base of the pitless adapter or unit, or to the established ground surface according to part 4725.3050; or

B. driving steel casing with welded or threaded and coupled joints into the flowing aquifer.

Subp. 2. **High flow, high pressure, or special construction area.**

A. A well or boring must be constructed according to the requirements in this subpart when:

(1) the artesian flow rate at the established ground surface is greater than 70 gallons per minute;

(2) the artesian pressure at the established ground surface exceeds ten pounds per square inch; or

(3) the commissioner designates an area where the use of standard construction techniques have resulted in uncontrolled flows, or where hydrogeologic conditions such as eroded or unstable confining layers require special construction to successfully complete a well or boring and confine the artesian pressure.

B. A well or boring meeting the criteria in item A must be constructed by:

(1) installing an outer steel casing into, but not through, the confining layer overlying the flowing aquifer, except that the outer casing may terminate in a competent bedrock above the confining layer. The outer steel casing is not required to meet the material specifications for casing in part 4725.2350 if the casing is of sufficient strength to withstand the structural load imposed by conditions both inside and outside the well or boring. The casing must be installed by drilling a bore hole a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outside diameter of the casing or couplings, whichever is larger, into the confining layer overlying the flowing aquifer. The bore hole must not penetrate the entire thickness of the confining layer. Steel casing must be installed into the confining layer and neat-cement grout or cement-sand grout must be pumped into the annular space surrounding the casing from the bottom of the casing to the established ground surface or base of the pitless adapter or unit;

(2) drilling a bore hole a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outside diameter of the inner casing or couplings through the confining layer into the flowing aquifer;

(3) installing an inner casing into the flowing aquifer in accordance with part 4725.2250, subpart 8; and

(4) grouting the annular space surrounding the inner casing with neat-cement grout or cement-sand grout from the bottom of the casing to the established ground surface or base of the pitless adapter or unit.

Grouting must comply with part 4725.3050.

Subp. 3. [See repealer.]

[For text of subp 4, see M.R.]

Subp. 5. **Overflow discharge.** A water discharge from a flowing well or boring that disposes of water to the surface, a surface water body, sewer, or subsurface must:

A. be protected with an air gap according to part 4715.2010;

B. have a valve or other mechanism as required in subpart 4 capable of stopping all flow; and

C. have the outlet screened with a noncorrosive mesh screen having openings of 1/16 inch or less.

Subp. 6. **Temporary wells and borings.** Temporary wells and borings that flow, and are sealed within 30 days of the time construction begins, are not required to be constructed according to this part, but must be constructed to prevent erosion of the aquifer, drill hole, or surrounding property, and must be sealed to stop all flow with neat-cement grout or cement-sand grout according to part 4725.3850.

4725.3550 WELL LABEL.

[For text of subpart 1, see M.R.]

Subp. 2. **Attachment.** The well identification label must be attached to the well casing in a visible location using a stainless steel clamp, band, or strap. Alternatively, the label may be attached to a concrete pump base or pedestal, or at-grade well vault using screws or fasteners.

[For text of subps 3 and 4, see M.R.]

4725.3650 REQUIREMENTS FOR DESIGNATED SPECIAL WELL AND BORING CONSTRUCTION AREAS.

Subpart 1. **Plan review.** When the commissioner designates an area where contamination is detected as a special well and boring construction area, a well or boring must not be constructed, repaired, or sealed until the commissioner has reviewed and approved a proposed plan submitted by the installer. Sealing, repair, construction, and

location must comply with the approved plans. In addition to the information on the permit or notification, the plan must include the:

A. depth;

B. location;

C. casing type, diameter, and depth;

D. method of construction, including grout materials and grout method;

E. pumping rate; and

F. use.

Subp. 2. **Water quality monitoring.** The commissioner may require water quality monitoring by the property owner, well or boring owner, or other person in a designated special construction area if the commissioner finds monitoring is needed to determine the degree of contamination.

Subp. 3. **Additional requirements.** The commissioner may specify well and boring location and construction requirements more stringent than those specified in this chapter if the commissioner determines, based on an assessment of hydrogeologic conditions and contaminant characteristics, that additional requirements are needed to protect the public health or prevent degradation of the groundwater.

Subp. 4. **Water treatment.** The commissioner ~~may~~ shall require the owner of a newly constructed contaminated well in a special well and boring construction area to install, use, and monitor ~~a~~ an effective water treatment device if the commissioner determines that the device is reasonably necessary to ensure a safe drinking water supply or monitor the degree of contamination.

4725.3725 CHEMICAL TREATMENT AND REHABILITATION.

Subpart 1. **Treatment chemicals.** Chemicals placed in a well or boring to increase the yield, remove or treat contaminants or objectionable tastes or odors, or rehabilitate the well or boring must meet the requirements of ANSI/NSF Standard 60-2003e as determined by a person accredited by the ANSI under ANSI Standard Z34.1-1993. Sodium or calcium hypochlorite may be used if registered by the United States Environmental Protection Agency according to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), section 3(c)(7)(A), as an antimicrobial pesticide for use in potable water. Treatment chemicals must be neutralized or removed from the well, boring, and any connected piping systems prior to use of the well or boring. This part does not apply to chlorine or other treatment chemicals added to a water distribution system, or to a drilling additive used according to part 4725.2950.

Subp. 2. **Treatment with an acid.**

A. Before treating a well or boring with an acid, all confined spaces enclosing the well or boring must be blown out with fresh air before entry and a supply of fresh air must be provided during occupancy. When there is a question of adequate fresh air supply, a self-contained breathing apparatus must be worn.

B. The pH (hydrogen ion concentration) of the water must be measured prior to treatment.

C. The well or boring must not be placed back into service until the pH is within one pH unit of the pretreatment value.

4725.3750 REPAIR, CORRECTION, OR SEALING OF WELLS AND BORINGS.

Subpart 1. **Repair, correction, or sealing required.** The property owner must:

A. have a defective part of a well or boring repaired, including a broken, punctured, or otherwise defective or unserviceable casing, screen, fixture, seal, connection, cover, or cap;

B. eliminate injection or disposal of wastes, surface drainage, or flood water, directly entering a well or boring; and

C. disconnect a cross-connection between a well or boring and a public water system unless approved by the public water supplier and protected with an air gap or backflow prevention device in accordance with parts 4715.2020 to 4715.2170.

A well or boring not repaired or corrected must be permanently sealed.

[For text of subp 2, see M.R.]

Subp. 3. **Casing removal.** When all casing is removed from a well or boring, the installation of new casing or the reinstallation of casing is considered new construction and must meet all the requirements of this chapter for new construction, including termination of the casing at least 12 inches above the established ground surface, and compliance with the applicable isolation distance requirements.

Subp. 4. [See repealer.]

Subp. 5. **Repair of noncomplying well or boring.** A noncomplying well or boring constructed prior to July 15, 1974, may be repaired as long as the repair meets the requirements of this chapter.

Subp. 6. **Casing extension on buried well or boring.** A well or environmental bore hole with the upper termination of the casing buried below the established ground surface must have the casing extended 12 inches above the ground surface when the well or boring is uncovered.

4725.3850 SEALING WELL OR BORING.

Subpart 1. **Sealing required.** A well or boring, including an unsuccessful well or boring, regardless of when constructed, that is not in use, and that has not been issued a maintenance permit, or that is required to be sealed according to Minnesota Statutes,

section 103I.301, must be sealed according to this part by a contractor licensed or registered according to this chapter.

Subp. 2. **Removal of obstruction; debris.** Materials, debris, and obstructions that may interfere with sealing must be removed from the well or boring. Sand, aggregate, or fill materials must be removed when sealing a well or boring, except that:

A. sand from a blasted and bailed sandstone formation may remain in a blasted and bailed sandstone formation; and

B. sediment may remain in a well or boring if:

(1) the sediment is from the well or boring itself;

(2) the sediment is ten feet or less in thickness and is within ten feet of the original bottom of the well or boring;

(3) the sediment does not contain hazardous materials or pollutants; and

(4) the sediment is not within a confining layer.

Subp. 3. **Casing grouting, removal, and perforation.** The open annular space surrounding a casing must be grouted by:

A. filling the annular space with grout according to this part;

B. removing the casing and filling the well or boring with grout. If casing is to be removed from a collapsing formation, grout must be inserted so that the bottom of the casing remains submerged in grout; or

C. perforating or ripping the casing and forcing grout through the perforations. Grouting must start within 24 hours of perforating. Perforations or rips must penetrate the full thickness of the casings to be perforated or ripped. Casing to be perforated or ripped must:

(1) be perforated with a minimum of one-half square inch of open area in each foot of casing for casings 16 inches in diameter and smaller, and one square inch of open area in each foot of casing for casings larger than 16 inches in diameter. No perforation shall have an open area of less than one-eighth square inch;

(2) be perforated with a single hole at least two square inches in open area in each five feet of casing; or

(3) be ripped a minimum of five feet for every 20 feet of casing.

Casing must be perforated or ripped through the entire length of a confining layer.

Casing is not required to be removed, perforated, or ripped if a single casing extends less than 20 feet into the first bedrock encountered, and the bedrock is sandstone or limestone, or the casing was driven through an unconsolidated formation, sandstone, or shale.

Subp. 3a. **Sealing with grout, general requirements.** A well or boring must be sealed by filling the well or boring, including an open annular space, with grout or approved sealing materials to within two feet of the established ground surface or floor. Grout must be pumped through a tremie pipe or the casing from the original bottom of the well or boring upward. The bottom of the tremie pipe must be inserted to within ten feet of the bottom of the well or boring, and remain submerged in grout while grouting.

Subp. 4. **Approved grout for sealing well or boring in unconsolidated materials.** The portion of a well or boring in unconsolidated material must be filled with bentonite grout, neat-cement grout, or cement-sand grout. The grout must be pumped through a tremie pipe or the casing from the bottom of the well or boring upward to within two feet of the established ground surface. Clean sand or cuttings equal to the volume of bentonite grout may be mixed with the bentonite grout, or poured into the well or boring while bentonite grout is pumped through a tremie pipe. The sand or cuttings must be poured at a rate which prevents bridging.

Subp. 4a. **Alternative materials for sealing specified large diameter wells in unconsolidated materials.** In addition to the grout materials approved in subpart 4, a well or boring 16 inches or greater in inside diameter, less than 200 feet in depth, completed in unconsolidated materials, and containing less than 20 feet of water may be sealed by pouring at a rate sufficient to completely fill the well or boring without bridging:

A. uniformly mixed dry bentonite powder or granular bentonite and sand in a ratio of one part bentonite by volume to five parts sand;

B. clean unconsolidated materials including clay, sandy clay, and silty clay with a permeability of 10^{-6} centimeters per second or less;

C. concrete; or

D. granular, pelletized, or chipped bentonite not to exceed three-fourths inch in diameter along with sufficient water to hydrate the bentonite.

Sealing materials must have bearing strength sufficient to prevent subsidence and support traffic or building loads.

Subp. 5. **Approved grout for sealing well or boring in bedrock.** The portion of a well or boring in bedrock must be sealed with neat-cement grout or cement-sand grout.

Subp. 5a. **Alternatives for grout loss in bedrock.**

A. The materials and methods described in item B are approved for sealing in those uncased bedrock portions of a well or boring where the following conditions exist:

(1) a cavern more than twice the diameter of the bore hole;

(2) sandstone that is blasted and bailed; or

(3) the grout level fails to rise after insertion of more than one cubic yard of grout or the quantity of grout necessary to fill ten vertical feet of hole.

B. The materials and methods in this item are approved in those portions of a well or boring where the conditions in item A exist:

(1) pouring a mixture of gravel or stone aggregate not larger than one-half inch in diameter while simultaneously pumping neat-cement grout or cement-sand grout in a ratio not to exceed five parts aggregate to one part grout;

(2) pumping a mixture of gravel or stone aggregate not larger than one-half inch in diameter and neat-cement grout or cement-sand grout in a ratio not to exceed five parts gravel to one part Portland cement; or

(3) placing alternate, equal thickness layers of cement-sand grout or neat-cement grout and gravel or stone aggregate not larger than one-half inch in diameter. Neat-cement grout or cement-sand grout must be pumped through the casing or a tremie pipe. The aggregate must be poured into the bore hole at a rate that prevents bridging. Individual layers of aggregate must not exceed ten feet in thickness except in blasted and bailed sandstone formations, where sand may be used to fill the entire portion of the blasted and bailed sandstone. Aggregate must not be emplaced in a confining layer or inside of casing.

Subp. 5b. **Alternative materials for sealing specified large diameter wells in bedrock.** In addition to the grout materials approved in subpart 5, a well or boring 16 inches or greater in inside diameter, less than 200 feet in depth, completed in bedrock, and containing less than 20 feet of water, may be sealed by pouring concrete at a rate sufficient to completely fill the well or boring without bridging.

Subp. 6. [See repealer.]

Subp. 7. **Sealing flowing well or boring.** The discharge from a flowing well or boring must be stopped and the well or boring sealed according to this part with neat-cement grout or cement-sand grout. It is approved to use rapid-setting cement, or to use hematite or barite as a weighting agent in a proportion not to exceed equal parts

weighting agent and Portland cement. When a well or boring cannot be sealed as described in this part, the licensee or registrant must notify the commissioner.

Subp. 8. **Sealing disturbed.** The casing and grout seal must not be disturbed after a well or boring is sealed, except that the casing may be cut off at the base of an excavation encountering a sealed well or boring.

4725.3875 RESPONSIBILITY FOR SEALING.

Subpart 1. **Responsibility for sealing, general.** A property owner is responsible for having a contractor licensed or registered in accordance with part 4725.0475 seal an unused well or boring except in accordance with subparts 2 and 5.

Subp. 2. **Corrective work.** When a person, including a licensee or registrant seals a well or boring in violation of these rules, the person is responsible for sealing the well or boring in accordance with this chapter.

[For text of subp 3, see M.R.]

Subp. 4. **Unsuccessful or "test" well or boring.** An unsuccessful or "test" well or boring must be sealed in accordance with part 4725.3850 by the licensee or registrant who constructed the well or boring, unless the property owner has the well or boring sealed by another licensed or registered contractor, or completes the well or boring and places it in use.

Subp. 5. **Burial or building over an unsealed well or boring.** A person who buries, or constructs a building over, an unsealed, unused well or boring is responsible for having the well or boring sealed by a licensed or registered contractor.

WATER-SUPPLY WELLS

4725.4050 APPLICABILITY.

Parts 4725.4050 to 4725.6050 are standards that apply to water-supply wells in addition to the requirements in parts 4725.2010 to 4725.3875.

4725.4150 BENTONITE DRILLING FLUIDS.

Bentonite drilling fluids used to construct or repair a water-supply well must have a measurable chlorine residual at all times during drilling or repair, except for a remedial well where chlorine will interfere with water quality analysis or remediation.

4725.4250 LIMESTONE OR DOLOMITE WATER-SUPPLY WELLS.

Subpart 1. **Applicability.** This part applies to water-supply wells, including private drinking water supply, public drinking water supply, irrigation, commercial, groundwater thermal exchange, and remedial wells completed in or below limestone or dolomite. This part does not apply to borings, monitoring wells, or dewatering wells.

Subp. 2. **Plastic casing.** Plastic casing must not be used as an outside casing in a water-supply well cased more than five feet into limestone or dolomite bedrock, except that an inner plastic casing may be installed entirely inside an outer steel casing in accordance with part 4725.2250, subpart 8.

Subp. 3. **Bore hole size.** A casing that extends more than ten feet into limestone or dolomite bedrock must be installed in a bore hole a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outer diameter of the casing or couplings, whichever is larger.

Subp. 4. **Use of limestone or dolomite for potable supply.**

A. A water-supply well used to provide potable water must not be completed in limestone or dolomite bedrock unless the limestone or dolomite bedrock is overlain by at least 50 feet of unconsolidated material, sandstone, or shale that extends in all directions around the well for a minimum one-mile radius. Limestone or dolomite bedrock includes

the Cedar Valley through Galena groups, Platteville formation, and the Prairie du Chien group.

B. ~~The conditions in item A do not apply in an area designated on a limestone and dolomite bedrock well construction map published by the commissioner. The commissioner may establish maps in areas of known or suspected contamination, or unique hydrologic or geologic conditions, or in areas where protective conditions exist, including low permeability overlying materials, favorable groundwater gradients, or reduced contaminant loading in recharge areas.~~ The commissioner may establish limestone and dolomite bedrock well construction maps identifying areas of known or suspected contamination, areas with unique hydrologic or geologic conditions, or areas where protective conditions exist, including low permeability overlying materials, favorable groundwater gradients, or reduced contaminant loading in recharge areas. The conditions in item A do not apply in areas designated as approved for drilling on the limestone and dolomite bedrock well construction maps published by the commissioner.

Subp. 5. **Water-supply well completed in limestone or dolomite.** Where a potable water-supply well meeting the conditions of subpart 4 or a nonpotable water-supply well is completed in limestone or dolomite bedrock, the following apply:

A. If the static water level in the well is more than ten feet above the limestone or dolomite:

(1) steel casing must be installed into the limestone or dolomite by driving the casing with a drive shoe through unconsolidated materials or sandstone into, but not more than ten feet into, the limestone or dolomite; or

(2) a bore hole must be drilled into the limestone or dolomite and steel casing installed to the bottom of the bore hole. If the bore hole extends more than ten feet into the limestone or dolomite, the bore hole must be a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter,

than the outside diameter of the casing or couplings, whichever is larger. The annular space surrounding the casing must be grouted from the bottom of the casing to the top of the bedrock with neat-cement grout or cement-sand grout. The unconsolidated materials portion of the annular space must be grouted according to part 4725.3050, subparts 1 to 3.

B. If the static water level in the well is less than ten feet above the limestone or dolomite, a bore hole must be drilled a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outside diameter of the casing or couplings, whichever is larger. The bore hole must extend a minimum of 20 feet below the static water level. Steel casing must be installed to the bottom of the bore hole. The annular space from the bottom of the casing to the top of bedrock must be filled with neat-cement grout or cement-sand grout. The unconsolidated materials portion of the annular space must be grouted according to part 4725.3050, subparts 1 to 3.

Subp. 6. **Water-supply well completed below limestone or dolomite.** A water-supply well completed below limestone or dolomite where the conditions of subpart 4 apply must be constructed by drilling a bore hole a minimum of 3.0 inches larger, or 3.5 inches larger for casings deeper than 100 feet and larger than 12 inches inside diameter, than the outside diameter of the casing or couplings a minimum of ten feet below the limestone or dolomite, and a minimum of ten feet below the static water level. Steel casing must be installed to the bottom of the bore hole, and the annular space from the bottom of the casing to the top of bedrock must be filled with neat-cement grout or cement-sand grout. The unconsolidated materials portion of the annular space must be grouted according to part 4725.3050, subparts 1 to 3.

Subp. 7. **Remedial well in limestone or dolomite.** A remedial well is exempt from the requirement in subpart 5 to extend the casing 20 feet below the static water level if the well screen or open hole intersects the water table, the casing terminates no more than

ten feet above the static water level, and all casing installed in limestone or dolomite is grouted with neat-cement grout or cement-sand grout.

4725.4350 WATER-SUPPLY WELL DISTANCE FROM WATER BODIES; PROTECTIONS IN FLOOD AREAS.

Subpart 1. **Distance from water bodies.** The minimum horizontal distance between a water-supply well and the ordinary high water level of a stream, river, pond, storm water retention pond, or lake is 35 feet. The isolation distance does not apply to:

A. an area protected by a flood control structure accepted by the United States Federal Emergency Management Agency (FEMA), as designated on a FEMA flood map;

B. a wetland, grassed waterway, depression, culvert, or ditch holding water less than six months of the year; or

C. an artificial pond holding less than 5,000 gallons of water.

Subp. 2. **Flood protection.** A water-supply well must be constructed to prevent the entry of flood water into the well by:

A. extending the casing at least five feet above the regional flood level;

B. installing a watertight seal and extending the casing ten feet above the established ground surface, if the regional flood level is more than five feet above the established ground surface;

C. installing an outer, neat-cement grouted protective casing in accordance with part 4725.6755, subpart 2, item B, extending the protective casing and well casing a minimum of two feet above the established ground surface, and installing a waterproof threaded cap or a waterproof compression seal with drawbolts and a one-piece top plate on both casings; or

D. extending the casing a minimum of two feet above the established ground surface, installing a sealed spool, or flowing well pitless unit, and installing a waterproof, nonvented compression seal.

The requirements in this subpart do not apply to a water-supply well located in an area protected by a flood control structure accepted by the United States Federal Emergency Management Agency (FEMA), as designated on a FEMA flood map.

4725.4450 WATER-SUPPLY WELL DISTANCES FROM CONTAMINATION SOURCE.

Subpart 1. **Isolation distances.** A water-supply well must be located where there is optimum surface drainage and at the highest practical elevation. Whenever possible, water-supply wells should not be located down slope or down gradient of a contamination source. A water-supply well must be constructed as far as practical from a contamination source, but no less than the distances in this part.

The isolation distances in this part are minimum distances measured horizontally from the closest part of the upper termination of the water-supply well casing to the closest part of the contamination source, or the vertical projection of the contamination source on the established ground surface, whichever is closer.

Where this chapter establishes a minimum regulatory volume of a liquid, the volume of multiple tanks, each below the minimum, are not additive, unless the tanks are interconnected without backflow protection.

The minimum isolation distances must be maintained between a new well and a source of contamination no longer in use, unless all contaminants have been removed from the source, and visibly contaminated soils have been removed.

A contamination source must not be placed, constructed, or installed any closer to a water-supply well than the distances in this part.

A water-supply well must be no less than:

A. 300 feet from:

(1) the absorption area of a soil ~~treatment~~ dispersal system with an average design flow greater than 10,000 gallons per day;

(2) a landfill or dump containing mixed municipal solid waste from multiple persons, except for a disposal area of household solid waste from a single residence regulated by item E, subitem (20);

(3) a permitted demolition debris landfill, except for a disposal area for construction debris or demolition debris regulated by item E, subitem (19);

(4) a municipal or industrial wastewater rapid infiltration basin;

(5) a municipal wastewater stabilization pond with 500 or more gallons/acre/day of leakage; and

(6) a liquid manure storage basin or lagoon that ~~does not have a concrete or composite liner~~ is unpermitted or noncertified according to chapter 7020;

except that the minimum distance to a sensitive water-supply well is increased for subitems (1) to (6) to 600 feet as provided in subpart 2;

B. 150 feet from:

(1) a tank or container holding:

(a) ~~56~~ 25 gallons or more, or 100 pounds or more dry weight, of an agricultural chemical, or an area used to fill or clean agricultural chemical application equipment with these quantities, not protected with safeguards;

(b) 56 gallons or more, or 100 pounds or more dry weight, of a hazardous substance not protected with safeguards; or

(c) 1,100 gallons or more of petroleum not protected with safeguards as specified in chapter 7150 or 7151;

(2) the absorption area of a soil ~~treatment~~ dispersal system serving a facility such as a hospital, nursing home, mortuary, veterinary clinic, health care clinic, or similar facility handling infectious or pathological wastes, except as provided in item A, subitem (1), and except that the minimum distance to a sensitive water-supply well is increased to 300 feet as provided in subpart 2;

(3) a municipal wastewater stabilization pond with less than 500 gallons/acre/day leakage, except that the minimum distance to a sensitive water-supply well is increased to 300 feet as provided in subpart 2;

(4) an industrial wastewater stabilization pond, except that the minimum distance to a sensitive water-supply well is increased to 300 feet as provided in subpart 2; ~~and~~

(5) a municipal or industrial wastewater spray irrigation area, except that the minimum distance to a sensitive water-supply well is increased to 300 feet as provided in subpart 2; and

(6) a liquid manure storage basin or lagoon that does not have a concrete or composite liner, but has an earthen liner that was constructed under a Minnesota Pollution Control Agency permit or is certified according to chapter 7020, except that the minimum distance to a sensitive water-supply well is increased to 300 feet as provided in subpart 2;

C. 100 feet from:

(1) a solid manure storage area not covered by a roof, except that the minimum distance to a sensitive water-supply well is increased to 200 feet as provided in subpart 2;

(2) a ~~container holding 56 or more gallons, or 100 pounds dry weight, of an agricultural chemical,~~ safeguarded area used to store agricultural chemicals, or clean or fill agricultural chemical application equipment that is protected with safeguards as defined

in parts 1505.3010 to 1505.3150 for bulk pesticides, or with safeguards as specified in standards of the Department of Agriculture for fertilizers under parts 1510.0370 to 1510.0408 and Minnesota Statutes, chapter 18C;

(3) an underground storage tank holding 56 or more gallons, or 100 pounds dry weight, of a hazardous substance, or with more than 1,100 gallons of petroleum, if protected with safeguards as defined in chapter 7150;

(4) an aboveground storage tank with 56 or more gallons, or 100 pounds dry weight, of a hazardous substance, or with more than 1,100 gallons of petroleum, if protected with safeguards as defined in chapter 7151;

(5) a liquid manure storage basin or lagoon with a concrete or composite liner in accordance with chapter 7020, except that the minimum distance to a sensitive water-supply well is increased to 200 feet as provided in subpart 2;

(6) an unroofed animal feedlot holding 300 or more animal units, except that the minimum distance to a sensitive water-supply well is increased to 200 feet as provided in subpart 2;

(7) tanks, vessels, or components of a wastewater treatment unit; and

(8) a pipeline used to transport petroleum or crude oil to a petroleum refinery or distribution center;

D. 75 feet from a cesspool, seepage pit, leaching pit, or dry well, except that the minimum distance to a sensitive water-supply well is increased to 150 feet as provided in subpart 2;

E. 50 feet from:

(1) a ~~tank or container holding 56 or more gallons, or 100 pounds or more dry weight, of agricultural chemicals~~ safeguarded area used to store agricultural chemicals, or fill or clean agricultural chemical application equipment that is covered

with a permanent watertight roof and protected with safeguards as defined in parts 1505.3010 to 1505.3150 for bulk pesticides, or with safeguards as specified in standards of the Department of Agriculture for fertilizers under parts 1510.0370 to 1510.0408 and Minnesota Statutes, chapter 18C;

(2) an animal feedlot holding more than one animal unit, except as provided in item C, subitem (6), and except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(3) a feeding or watering area within a pasture holding more than one animal unit, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(4) an animal or poultry building, including a horse riding arena, holding more than one animal unit, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(5) an interceptor, including a flammable waste or sediment interceptor;

(6) a human grave, mausoleum, or area used to bury more than one animal unit;

(7) the absorption area of a soil ~~treatment~~ dispersal system except as provided in items A, subitem (1), and B, subitem (2), or a privy, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(8) a septic tank, sewage sump except as provided in item G, subitem (1), watertight sewage treatment device except as provided in item C, subitem (7), or watertight sewage holding tank;

(9) a buried storage tank holding between 56 and 1,100 gallons of petroleum;

(10) an unused, unsealed well or boring;

(11) a source of pollution or contamination that may drain into the soil except as provided in this part;

(12) a buried sewer, except as provided in item G, subitem (5), that:

(a) serves as a collector or municipal sewer;

(b) is open-jointed; or

(c) is constructed of materials that do not meet the specifications, methods, and testing protocol in parts 4715.0530 and 4715.2820;

(13) a floor drain, grate, or trough connected to a buried sewer, except as provided in item G, subitem (5);

(14) a watertight sand filter, peat filter, or constructed wetland;

(15) a storage area for bulk road deicing chemicals, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(16) the buried piping of a horizontal ground source closed loop heat exchanger, except as provided in item H, subitem (2);

(17) a sewage, septage, or sludge, land-spreading area, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(18) buried piping from petroleum, agricultural chemical, or hazardous material storage tanks;

(19) a disposal area for construction debris or demolition debris, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(20) a disposal area for household solid waste from a single residence, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(21) a solid waste transfer station, commercial compost site, or scrap yard;

(22) a disposal area for water treatment backwash, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(23) an industrial cooling water pond, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(24) a ~~grey-water disposal~~ gray-water dispersal area, except that the minimum distance to a sensitive water-supply well is increased to 100 feet as provided in subpart 2;

(25) an anhydrous ammonia tank;

(26) an animal rendering plant;

(27) multiple tanks or containers of agricultural chemicals, hazardous materials, or hazardous wastes, for residential retail sale or use, each holding less than 56 gallons or 100 pounds dry weight, where the aggregate volume of the tanks and containers exceeds 56 gallons or 100 pounds dry weight;

(28) a water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection;

(29) a storage area for oil-filled electrical transformers; and

(30) an elevator boring, except as provided in item G, subitem (12);

F. 35 feet from:

(1) vertical heat exchanger piping as specified in parts 4725.0100, subpart 49g, and 4725.7050, subpart 1, item G; and

(2) the ordinary high water level of a stream, river, pond, storm water retention pond, or lake as specified in part 4725.4350, subpart 1;

G. 20 feet from:

(1) a sewage sump with a capacity of less than 100 gallons which has been successfully tested in accordance with part 4715.2820, subpart 2 or 3, and is constructed according to part 4715.2440, subparts 1 and 4;

(2) a pit or unfilled space below the established ground surface that is four feet or more in depth, except a basement or building crawl space;

(3) an in-ground swimming pool;

(4) a petroleum storage tank that is not buried, holding between 56 and 1,100 gallons;

(5) a buried sewer serving one building, or two or less single-family residences, constructed of cast iron or plastic pipe according to the material specifications, methods, and testing protocol described in parts 4715.0530 and 4715.2820, subpart 2 or 3, or a floor drain connected to the buried sewer, except for:

(a) a collector or municipal sewer; or

(b) a sewer serving a facility such as a hospital, nursing home, mortuary, veterinary clinic, health care clinic, or similar facility handling infectious or pathological wastes;

(6) a storm water drain pipe eight inches or greater in diameter;

(7) an animal building, feedlot, confinement area, or kennel holding 0.1 to 1.0 animal unit, except that the minimum distance to a sensitive water-supply well is increased to 40 feet as provided in subpart 2;

(8) a buried nonpressurized water supply cistern or reservoir;

(9) a gravel pocket or French drain for clear water drainage;

(10) a portable privy or toilet;

(11) a water treatment backwash holding basin, reclaim basin, or surge tank, and associated piping, with a backflow protected sewer connection; and

(12) an elevator boring conforming to part 4725.7250; and

H. ten feet from:

(1) a frost-proof yard hydrant or discharge of a frost-proof hydrant draining into the soil, a fire hydrant, or a flushing hydrant; and

(2) the horizontal piping of a vertical heat exchanger, or a horizontal ground source closed loop heat exchanger constructed of materials, and using a heat transfer fluid, according to part 4725.7050.

Subp. 2. **Increased isolation distances for sensitive water-supply wells.** The distances in items A to F are exceptions to the isolation distances in subpart 1. The isolation distances in subpart 1 are doubled between a sensitive water-supply well and a contamination source directly entering the soil. A sensitive water-supply well must be located at least:

A. 600 feet from the absorption area of a soil ~~treatment~~ dispersal system with an average design flow greater than 10,000 gallons per day, a landfill or dump containing mixed municipal solid waste from multiple persons, a permitted demolition debris landfill, a municipal or industrial wastewater rapid infiltration basin, a municipal wastewater stabilization pond with 500 or more gallons/acre/day leakage, or a liquid manure storage basin or lagoon that ~~does not have a concrete or composite liner~~ is unpermitted or noncertified according to chapter 7020;

B. 300 feet from the absorption area of a soil ~~treatment~~ dispersal system serving a facility such as a hospital, nursing home, mortuary, veterinary clinic, health care clinic,

or similar facility handling infectious or pathological wastes; a municipal wastewater stabilization pond with less than 500 gallons/acre/day leakage; an industrial wastewater stabilization pond; ~~or~~ a municipal or industrial wastewater spray irrigation area; or a liquid manure storage basin or lagoon that does not have a concrete or composite liner, but has an earthen liner that was constructed under a Minnesota Pollution Control Agency permit or is certified according to chapter 7020;

C. 200 feet from a manure storage area, a liquid manure storage basin or lagoon with a concrete or composite liner according to chapter 7020, or an unroofed animal feedlot holding 300 or more animal units;

D. 150 feet from a cesspool, seepage pit, leaching pit, or dry well;

E. 100 feet from an animal feedlot holding more than one animal unit except as provided in item C; an animal or poultry feeding or watering area within a pasture holding more than one animal unit; an animal or poultry building including a horse riding arena holding more than one animal unit; the absorption area of a soil ~~treatment~~ dispersal system; a privy; a storage area for road deicing chemicals; a sewage, septage, sludge, or waste landspreading area; a disposal area for construction or demolition debris; a disposal area for household solid waste from a single residence; a disposal area for water treatment backwash; an industrial cooling water pond; a ~~grey-water disposal~~ gray-water dispersal area; or similar contamination source; and

F. 40 feet from an animal building, feedlot, confinement area, or kennel holding 0.1 to 1.0 animal unit.

Subp. 3. **Exception for irrigation well and fertilizer chemigation tank.** An irrigation well used only for nonpotable purposes must be at least 20 feet from a fertilizer chemigation supply tank conforming to the applicable requirements, setbacks, safeguarding, antipollution devices, purging, and posting requirements of parts 1505.2100 to 1505.2800.

4725.4650 SEDIMENT IN POTABLE WATER-SUPPLY WELLS.

The following requirements apply to a new potable water-supply well.

A. A water-supply well must be developed to remove drilling fluid, native silts and clays deposited during drilling, and the predetermined finer fraction of the natural formation or the gravel pack.

B. A new water-supply well must not produce a sustained quantity of more than five milligrams per liter (mg/l) of sand, or more than 200 mg/l of silt and clay as defined in part 4725.1851, subpart 4, item A, for potable water at the design capacity of the well, except when geological conditions preclude meeting the standard, and the well owner, licensee, and commissioner agree to accept the sediment in a stipulated agreement.

4725.4750 LEAD PROHIBITION IN POTABLE WATER-SUPPLY WELLS.

Materials used in construction of a potable water-supply well that contact water must not exceed eight percent lead except that solders and flux must not contain more than 0.2 percent lead.

4725.4825 NONPOTABLE WATER-SUPPLY WELLS.

Subpart 1. **Construction.** A water-supply well used to provide water for nonpotable purposes such as irrigation, heating and cooling, or industrial processing, that is not used for purposes listed in part 4725.0100, subpart 35a, must be constructed according to parts 4725.2010 to 4725.5550, except parts 4725.4550, 4725.4650, and 4725.4750.

Subp. 2. **Interconnection prohibited.** A nonpotable well or water system must not be interconnected with a potable well or water system except as provided in part 4725.3350.

Subp. 3. **Identification required.** A nonpotable well water system providing water to a building with a potable water system, or accessible to the public, must be marked as nonpotable according to part 4715.1910.

4725.4850 WATER-SUPPLY WELL PITLESS ADAPTER OR PITLESS UNIT, AND WELDED OR THREADED FITTING.

Subpart 1. **Pitless adapter or pitless unit.** Except as provided in subpart 2, a connection to a casing of a water-supply well made less than 12 inches above the established ground surface must be made with a pitless adapter or pitless unit. The connection must not be submerged in water at the time of installation. Native materials must be packed tightly around the pitless adapter or pitless unit to the ground surface. The pitless adapter or pitless unit must:

A. be constructed to provide complete clearance within the internal diameter of the casing;

B. be designed to be field-welded by holding the welding rod in a vertical or horizontal position, or bench-welded before field installation with a material as corrosion-resistant as the parent material;

C. have all threaded joints watertight with no threads exposed;

D. impart no taste, odor, or toxic material to the water; and

E. connect to the casing by a threaded connection, welded connection, bolted flange with gasket, clamp and gasket, or compression gasket.

A welded, solvent welded, or threaded coupling, adapter, or swaged fitting meeting the material standards of part 4725.2350, 4725.2550, or 4725.6650 may be used to connect a casing to a pitless adapter or unit.

Additionally, a pitless unit using a compression seal must provide for the well casing to extend at least 2.5 inches into the throat of the pitless unit. The compression collar must be held in place with corrosion-resistant bolts, nuts, and washers. The installer of a clamp-on or weld-on pitless adapter must use a guide or template for cutting the hole in the casing to accommodate the pitless adapter.

Subp. 2. **Welded or threaded fitting.** A welded or threaded fitting meeting the requirements of part 4725.3150, subpart 2, may be connected to the side, cap, or cover of a water-supply well casing and be used for venting, remediation, measurement of water levels or testing, treatment, or for an electrical connection. A water discharge line must be connected with a pitless unit or pitless adapter.

4725.5250 WATER-SUPPLY WELL PUMP DISCHARGE LINES.

A buried discharge line between a water-supply well casing and the pressure tank in an installation, including a deep well turbine or a submersible pump, must not be under negative pressure at any time. If a check valve is installed in a buried water line between the well casing and the pressure tank, the water line between the well casing and the check valve must meet the requirements of part 4725.5150 unless equipped with a vacuum release or combination air release and vacuum release device located between the check valve and the well. Pump discharge lines must be constructed of materials approved in part 4725.5150, subpart 1.

4725.5350 PRESSURE TANKS FOR WATER-SUPPLY WELLS.

[For text of subpart 1, see M.R.]

Subp. 2. **Buried tanks.** A buried or partially buried pressure tank installed on a water-supply well must:

[For text of item A, see M.R.]

B. have an interior coating that complies with ANSI/NSF Standard 61-2003e if the tank has an interior coating in contact with water;

[For text of items C to E, see M.R.]

4725.5450 VENTING WATER-SUPPLY WELLS.

Subpart 1. **Venting exceptions.** A water-supply well must be vented unless the well:

A. is a flowing well;

B. casing is used as a suction pipe;

C. has a packer jet assembly;

D. is used as a remedial well; or

E. is constructed with a watertight seal in lieu of a casing extension as specified in part 4725.4350, subpart 2.

Subp. 2. **Vent construction.** A well vent must:

A. be constructed of materials complying with parts 4725.2250 to 4725.2650, or 4725.5150, subpart 1;

B. have watertight joints and terminate at least five feet above the regional flood level unless provided with a watertight seal as specified in part 4725.4350, subpart 2;

C. terminate a minimum of 12 inches above the established ground surface or the floor of a building as specified in part 4725.2175, except that a vent for a community public water-supply well must terminate a minimum of 18 inches above the established ground surface and the floor of a building as specified in part 4725.2175;

D. be screened with a noncorrosive mesh screen having openings of 1/16 inch or less and pointed downward; and

E. be connected to the casing according to part 4725.4850.

Subp. 3. **Screened vents.** A screened vent incorporated into the underside of a well cap or cover may be used.

[For text of subp 4, see M.R.]

4725.5475 HYDROFRACTURING WATER-SUPPLY WELLS.

Subpart 1. **Scope.** This part applies to hydrofracturing a water-supply well, as defined in part 4725.0100, subpart 30f. A remedial water-supply well, or other well or

boring regulated by this chapter, must not be hydrofractured. Hydrofracturing must be done by a well contractor licensed according to Minnesota Statutes, section 103I.525.

Subp. 2. **Injection materials, water, and proppants.**

A. Water used for hydrofracturing must be potable water containing a chlorine residual. The use of surface water, unless obtained from a public water system, is prohibited.

B. Additives must meet the requirements of ANSI/NSF Standard 60-2003e as determined by a person accredited by the ANSI under ANSI Standard Z34.1-1993.

C. Proppants may be used to hold the joints and fractures open, and must be inert, clean, and nontoxic materials, including chlorinated, noncalcareous, washed sand.

Subp. 3. **Restrictions.** The following restrictions apply when hydrofracturing.

A. The upper packer must be a minimum of 50 feet below the established ground surface.

B. Hydrofracturing must not occur inside a casing. The upper packer must be a minimum of ten feet below the lower termination of a casing.

C. Hydrofracturing must only be done in igneous or metamorphic bedrock.

D. A water-supply well must not be hydrofractured unless located according to the isolation distances in parts 4725.4350 and 4725.4450.

Subp. 4. **Requirements.** The following requirements apply when hydrofracturing. The person hydrofracturing must:

A. remove additives injected during hydrofracturing;

B. disinfect a hydrofractured water-supply well upon completion of hydrofracturing, according to part 4725.5550;

C. collect a water sample from a hydrofractured water-supply well used for drinking or other potable purposes, and test the sample according to part 4725.5650; and

D. complete and submit a well and boring construction record, or amended record, within 30 days of completion of hydrofracturing.

4725.5550 WATER-SUPPLY WELL DISINFECTION.

Subpart 1. **Disinfection procedure.** A water-supply well must be disinfected according to this part. A disinfection procedure is presumed adequate when one or more water samples collected as specified in part 4725.5650 indicate the absence of total coliform bacteria.

Subp. 2. **Disinfection of new well or pump.** A person installing a new well or pump must ensure that the well is pumped until three volumes of the water contained in the well are pumped or until the water is as clear as groundwater conditions allow. After pumping, the person installing a new well or new pumping equipment must disinfect the well and pumping equipment with chlorine at a concentration sufficient to produce at least 50 parts per million of free chlorine in all parts of the well. The chlorine solution must contact the well surfaces above the static water level. The chlorine solution must remain in the well at least two hours before pumping all the chlorinated water from the well and the solution from the distribution system.

Subp. 3. **Disinfection during repair or modification.** A person repairing or modifying a well or pump must disinfect the well as specified in subpart 2 or disinfect at the start of the repair or reconditioning by applying chlorine at a concentration sufficient to produce 200 parts per million free chlorine in all parts of the well for the period of the well repair or reconditioning operation. Before taking water samples or returning the well to use, all chlorinated water must be pumped from the well and distribution system.

Subp. 4. **Disinfection materials.** Chlorine materials must meet the requirements of ANSI/NSF Standard 60-2000e as determined by a person accredited by ANSI

under ANSI Standard 234.1-1993 or be registered by the United States Environmental Protection Agency according to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), section 3(c)(7)(A), as an antimicrobial pesticide for use in potable water. Chlorine compounds with additives such as perfumes or algaecides must not be used for disinfection. An alternate disinfection material may be used if the material is a biocide meeting the material and use standards of this part and provides biocidal activity equivalent to the chlorine concentrations and contact times required in this part.

Subp. 5. **Chlorine in solid form.** Chlorine compounds in solid form used to comply with subparts 2 and 3 must be dissolved in potable water prior to placement in a water-supply well or circulated in the well to contact all well surfaces above the static water level, except that:

A. additional solid chlorine in excess of that necessary to produce the free chlorine required in subpart 2 or 3 may be added; and

B. solid chlorine may be used to disinfect a flowing well by placing the solid in the bottom of the well.

Subp. 6. **Remedial well exemption.** The requirement to disinfect a water-supply well does not apply to a remedial well if the disinfection will interfere with water quality analysis or create dangerous reactions with contaminants.

4725.5650 WATER QUALITY SAMPLES FROM NEWLY CONSTRUCTED POTABLE WATER-SUPPLY WELL.

Within 30 days of completion and before the use of a newly constructed potable water-supply well, the person constructing the well must assure that a water sample is collected from the well. A water sample is not required from a new pump installation in an existing well, or a well repair, unless a notification must be submitted according to part 4725.1820, item A.

A. The person constructing the well must inform the well owner that until analysis of one or more water samples from the well indicates the absence of total coliform bacteria, and the nitrate-nitrogen and arsenic analysis have been completed and reported, the well must not be used for human consumption.

B. The person constructing the well must assure that water samples are properly collected and submitted to a laboratory certified under parts 4740.2010 to 4740.2120. The laboratory must be certified to analyze total coliform bacteria nitrate-nitrogen, and arsenic, under the safe drinking water program test category. The laboratory reporting limit must be no greater than 1.0 milligrams per liter for nitrate-nitrogen, and no greater than 2.0 micrograms per liter for arsenic.

C. The sample must be analyzed for total coliform bacteria, arsenic, and nitrate-nitrogen. The person constructing the well must assure that the property owner and the commissioner receive a legible, reproducible copy of the analysis results within 30 days of analysis. The copy of analysis results sent to the commissioner must include the unique well number, the property owner's name and address, and the dates of sample collection and analysis.

D. If a water sample collected according to this part, or a water sample collected by the commissioner from a newly constructed potable water-supply well indicates the presence of total coliform bacteria, the person constructing the well is responsible for actions needed to eliminate possible causes of total coliform bacteria, redisinfect the well, and resample for total coliform bacteria.

4725.5750 DUG WATER-SUPPLY WELLS.

Subpart 1. **Construction.** A dug well must be constructed to comply with all requirements of this chapter including the materials, grouting, and casing standards. Where geological conditions preclude the possibility of completing a water-supply well with conventional drilling methods, materials, or casing, a variance may be granted under

part 4725.0410 to install a dug well for a residential water supply using unconventional techniques or materials. A dug water-supply well may only be constructed in an unconsolidated formation.

Subp. 2. **Cover.** A dug water-supply well must be protected with a cap or cover meeting the requirements of part 4725.3150, subpart 1, or a precast, overlapping, steel-reinforced, concrete cover at least four inches in thickness, or a locked, overlapping, metal cover at least 3/16 inch in thickness. The junction of cover with the well casing must be made with a watertight gasket and must be provided with a well vent according to part 4725.5450.

Subp. 3. **Watertight openings.** A pump opening and a connection below the established ground surface for a dug water-supply well must be made watertight according to part 4725.4850, subpart 1, or with concrete or cement.

Subp. 4. **Location.** Unless a dug water-supply well is grouted from the surface to a depth of 50 feet or through a confining layer, the well must be located according to part 4725.4450, subpart 2.

4725.5825 PUBLIC WATER-SUPPLY WELLS.

Subpart 1. **Requirements.** In addition to the requirements of parts 4725.2010 to 4725.5650, a water-supply well used to provide water for a noncommunity or community water system must comply with the requirements in subparts 2 to 6.

Subp. 2. **Notification of drilling required.** The licensee must notify the commissioner of the proposed construction starting time of a community or noncommunity public water-supply well 24 hours in advance of beginning construction. The information may be placed on the notification form required in part 4725.1820 or may be reported by telephone, facsimile, or in person. The notification must be made between the hours of 8:00 a.m. and 4:30 p.m. Monday through Friday, excluding holidays.

Subp. 3. **Additional disinfection or development required.** A public water-supply well constructed in an unconsolidated formation using a rotary or other method that creates an annular space and uses a bentonite drilling fluid, in addition to the disinfection requirements of part 4725.5550, must be either:

A. disinfected upon completion of drilling and prior to grouting by placing a minimum 200 mg/l free chlorine solution in the bottom of the well and circulating the solution both inside the casing and in the annular space to the established ground surface for a minimum of 30 minutes; or

B. developed by agitating and forcing water out of the screen for a minimum of one hour.

Subp. 4. **Grouting required.** A public water-supply well constructed with a method that creates an open annular space must be grouted as specified in part 4725.3050 from within ten feet of the lower termination of the casing to the established ground surface or base of the pitless adapter or unit. Casing may be driven according to part 4725.3050, subpart 5.

Subp. 5. **Sampling faucet required.** A sampling faucet must be installed for each new public water-supply well. The faucet must be:

A. metal;

B. installed a minimum of 12 inches above the established ground surface or floor; and

C. installed before any treatment devices and between the well and water storage.

Subp. 6. **Conversion to a public water-supply well.** A well, previously not used as a public water-supply well, may be used as a noncommunity or community public water-supply well only if the well meets the standards of this chapter. Plans and

specifications must be submitted to, and approved by, the commissioner prior to use as a public water-supply well. This provision is not meant to be used for the construction of a "test" well or environmental bore hole converted to a public water-supply well in order to circumvent the notification, inspection, and plan approval requirements of this chapter.

4725.5850 COMMUNITY PUBLIC WATER-SUPPLY WELLS.

Subpart 1. **Requirements.** In addition to the requirements of parts 4725.2010 to 4725.5825, a public water-supply well used to provide water for a community water system must comply with the requirements in subparts 1a to 8.

Subp. 1a. **Approval of plans and specifications.** A licensee must not construct or materially alter a well, including adding or removing casing below the frost line for a well providing water to a community water system, until plans and specifications have been approved according to part 4720.0010.

Subp. 2. **Site approval.** A licensee must not construct a well for a community public water system until the site has been approved by the commissioner.

Subp. 3. **Contamination sources.** A well for a community public water system must be located according to the distances specified in parts 4725.2150, 4725.2185, 4725.4350, and 4725.4450, but in no case less than 50 feet from a source of contamination except:

A. the minimum isolation distance is 20 feet for contamination sources listed in part 4725.4450, subpart 1, item G, subitems (2), (3), (8), (9), (11), and (12);

B. the minimum isolation distance is 20 feet to an aboveground petroleum storage tank holding less than 1,100 gallons used for emergency pumping of a community public supply well if the petroleum storage tank is:

(1) located in a room or building separate from the community well; and

(2) is of double-wall construction with leak detection between the walls; or

(3) is protected with secondary containment according to part 7151.5400;

C. the minimum isolation distance is ten feet for contamination sources listed in part 4725.4450, subpart 1, item H, subitem (1); and

D. there is no minimum distance to a pipe or conduit carrying only clear water from a floor drain in a community well house to a gravel pocket or French drain.

Subp. 4. **Flood protection.**

A. The established ground surface at the well site must be at least two feet above the highest known water elevation of a lake, pond, river, stream, or other body of surface water, the waters of which at the highest level would approach to within 50 feet measured horizontally of the well.

B. The established ground surface must be sloped to drain away from the well and be graded to prevent the accumulation and retention of surface water within 50 feet of the well. Filling must be protected from erosion by riprap or other suitable means.

Subp. 5. **Casing height.** The casing or casing extension must extend vertically at least 12 inches above the established ground surface, floor, or slab according to part 4725.2250, subpart 11.

Subp. 6. **Casing vent.** Casing vents must be constructed in accordance with parts 4725.4850 and 4725.5450 and terminate a minimum of 18 inches above the established ground surface or floor of a building as specified in part 4725.2175.

Subp. 7. **Property ownership or easement required.** The owner of a community public water-supply well must own or legally control, through a permanent easement, the property within a 50-foot radius of the well.

Subp. 8. **Radial water collectors.** Projection of radial water collectors must be in areas and at depths approved by the commissioner.

A. The exact location of caisson construction joints and porthole assemblies must be indicated on the submitted plans.

B. The caisson wall must be reinforced.

C. Procedures must be used that assure minimum vertical rise of the collectors.

D. The top of the caisson must be covered with a watertight floor.

E. Pump or other openings through the floor must have a minimum four-inch high curbing.

F. Pump discharge piping must not be placed through the caisson walls.

G. There must be no construction joint within 15 feet of the established ground surface.

4725.6050 REMEDIAL WATER-SUPPLY WELLS.

Subpart 1. **Additional requirements.** In addition to the general standards in parts 4725.2010 to 4725.3875, and the standards for water-supply wells, in parts 4725.4050 to 4725.5550, a remedial well must:

A. have spark arresters installed if petroleum products or other flammable or explosive materials are present;

B. be equipped with a casing vent or collect and treat gases, if toxic or flammable gases are present; and

C. have connections protected with an air gap or back flow prevention device as specified in parts 4715.2010 to 4715.2170, if the well discharges to a sewer or surface water.

Subp. 2. **Exemptions.** A remedial well is exempt from:

A. the distance from contamination source requirements in parts 4725.4350, subpart 1, and 4725.4450;

B. the minimum protective depth requirements in part 4725.4550;

C. the requirement in part 4725.2250, subpart 11, to extend the casing 12 inches above the established ground surface if the remedial well is constructed according to part 4725.6850 for at-grade construction;

D. the requirement in part 4725.4250, subpart 5, to extend the casing 20 feet below the static water level if the well screen or open hole intersects the water table, the casing terminates no more than ten feet above the static water level, and all casing installed in limestone or dolomite is grouted with neat-cement grout or cement-sand grout;

E. the venting requirements in part 4725.5450, except as provided in subpart 1, item B; and

F. the disinfection requirements in part 4725.5550 where disinfection will interfere with water quality analysis or create dangerous reactions with contaminants.

Subp. 3. **Screen or open hole across an unconsolidated formation and bedrock contact.** A remedial well that is constructed to remove contaminants from the water surface by placing a screen or open hole across the contact of an unconsolidated formation and bedrock is exempt from the requirements of part 4725.2020, subpart 1, if the screen or open hole:

A. intersects the water surface of an unconfined aquifer;

B. does not penetrate a confining layer; and

C. does not extend more than 20 feet into bedrock.

Subp. 4. **Stainless steel casing.** A remedial well may be constructed with stainless steel casing meeting ASTM Standard ~~A312/312M-04~~ A312/312M-04b, having at least ANSI Schedule 5 for welded joints, and ANSI Schedule 40 for threaded joints.

4725.6150 DEWATERING WELL.

Subpart 1. **Scope.** This part applies to a dewatering well as defined in Minnesota Statutes, section 103I.005, subdivision 4a. A dewatering well must be constructed,

repaired, maintained, and sealed in accordance with the general standards in parts 4725.2010 to 4725.3875, and the requirements of this part. A dewatering well must not be used for a purpose other than dewatering. A dewatering well is exempt from the provisions in parts 4725.4050 to 4725.6050.

[For text of subps 2 to 5, see M.R.]

Subp. 6. **Exceptions.** A dewatering well in an unconsolidated formation installed for less than 18 months and less than 50 feet in depth may be constructed and sealed according to the conditions and exemptions in items A to E.

A. Casing is not required to meet the standards of parts 4725.2350 to 4725.2650, if the casing is water tight, free of oil or other contaminants, and withstands the forces exerted on it during installation and removal.

B. The upper termination of the casing must be covered with a tamper-resistant overlapping cover on the casing as specified in part 4725.2250, subpart 17. The casing is not required to terminate at least 12 inches above the established ground surface if the casing extends at least 12 inches above the working grade. The working grade is the temporary elevation of the ground surface during a construction project.

C. The gravel pack must not extend more than ten feet above the static water level.

D. The annular space is not required to be grouted to a depth of 50 feet according to part 4725.3050, subpart 3, if the annular space is filled with cuttings taken from the bore hole.

E. At 18 months after construction or sooner, the well must be sealed according to this chapter. A dewatering well installed for 18 months or less, not encountering a confining layer, less than 50 feet in depth, completed in an unconsolidated formation, and that is not flowing, may be sealed according to part 4725.7450, subpart 4.

Subp. 7. **Special construction areas.** The commissioner may require additional construction standards in special well and boring construction areas as described in part 4725.3650.

4725.6450 APPLICABILITY AND USE.

This part applies to monitoring wells as defined in Minnesota Statutes, section 103I.005, subdivision 14.

In addition to the general construction, repair, maintenance, and sealing requirements in parts 4725.2010 to 4725.3875, a monitoring well must be constructed, repaired, maintained, and sealed according to this part. A monitoring well is exempt from the requirements in parts 4725.4050 to 4725.6050.

A monitoring well that is not in use must be sealed.

4725.6650 CONSTRUCTION OF MONITORING WELLS.

Subpart 1. **Casing.** Casing for a monitoring well must be steel or plastic casing meeting the standards of parts 4725.2250 to 4725.2650, or stainless steel or flush threaded polyvinyl chloride meeting the standards of this subpart.

A. A monitoring well may be constructed with flush threaded polyvinyl chloride (PVC) casing if:

(1) the screen intersects the surface of the water table at the time of installation and the well is constructed so the joint between the two deepest casing sections is above the surface of the water;

(2) the total depth of the monitoring well is 50 feet or less;

(3) the monitoring well is completed in unconsolidated materials; and

(4) the flush threaded PVC casing used meets the standards of ASTM F480-02, and the standards in Schedule 40 as referenced in ASTM Standard D1785-04.

B. A monitoring well may be constructed with stainless steel casing meeting ASTM Standard ~~A312/A312M-04a~~ A312/A312M-04b, having at least ANSI Schedule 5 for welded joints and ANSI Schedule 40 for threaded joints.

Subp. 2. **Grouting of annular space.** The annular space of a monitoring well must be grouted from ten feet or less above the screen or open bore hole to the established ground surface according to part 4725.3050, except that no cuttings from the bore hole must be added to the grout. Neat-cement or cement-sand grout may terminate at the base of the manhole or vault for an at-grade installation.

[For text of subp 3, see M.R.]

Subp. 4. **Screen or open hole across an unconsolidated formation and bedrock contact.** A monitoring well, that is constructed to monitor contaminants at the water surface, by placing a screen or open hole across the contact of an unconsolidated formation and bedrock according to part 4725.6050, subpart 3, is exempt from part 4725.2020, subpart 1.

4725.6755 PROTECTION OF MONITORING WELLS.

Subpart 1. **Casing, protective casing, and capping.** The inner casing of a monitoring well, and when installed, the protective outer casing as specified in subpart 2, item B, with bentonite grout in the annular space, must be covered with a cap or cover according to part 4725.2250, subpart 17. The protective outer casing may be covered with an overlapping cap or cover without a compression gasket.

A. Either the inner casing or the protective outer casing must be closed with a watertight, locked cap or a wrench-tightened, threaded metal cap.

B. The top of the well must be constructed to prevent entry of flood waters according to part 4725.4350, subpart 2.

C. A monitoring well cased with plastic must be protected with an outer steel protective casing as specified in subpart 2, item B.

Subp. 2. **Protection.** A monitoring well must be protected by:

A. surrounding the casing with a concrete pyramid or cone that has horizontal dimensions of at least 24 inches by 24 inches at the established ground surface, that rises 12 inches above the established ground surface at the casing, and has a base with a mass of at least three cubic feet below the established ground surface;

B. installing a steel outer casing meeting the material standards of part 4725.2350 that is at least 3.0 inches in diameter greater than the inner casing, that extends at least two feet above and four feet below the established ground surface, and that has bentonite grout, neat-cement grout, or cement-sand grout in the annular space between the casings from the bottom of the outer casing to the established ground surface; or

C. placing three posts at least four inches square or four inches in diameter around the well at equal distances from each other and two feet from the casing. The posts must extend two feet above and four feet below the established ground surface or to a depth of two feet if each post is set in concrete to a depth of two feet. The posts must be made of reinforced concrete, decay-resistant wood, or ASTM Schedule 40 steel pipe capped with an overlapping, threaded, welded steel or iron cap, or be filled with cement.

4725.6850 AT-GRADE MONITORING WELL.

[For text of subpart 1, see M.R.]

Subp. 2. **Termination location; map.** A monitoring well casing may terminate at-grade only on a roadway, sidewalk, driveway, or a parking area. The location of the well identified by unique well number must be marked on a scaled map with angles and directions from surveyed property corners, a permanent benchmark, or the corners of a permanent structure. The map must be submitted to the commissioner with the well record.

Subp. 3. **Construction.** An at-grade monitoring well must be constructed as specified in this subpart.

[For text of items A to G, see M.R.]

H. The manhole cover or vault must meet AASHTO Standards H20-44 and M306-04.

I. The well casing must be secured with a locking cap or cover according to part 4725.2250, subpart 17. The manhole cover or vault must be secured with a lock or tamper-resistant bolts.

[For text of item J, see M.R.]

VERTICAL HEAT EXCHANGERS

4725.7050 VERTICAL HEAT EXCHANGERS.

Subpart 1. **Construction.** A vertical heat exchanger must be constructed according to the general construction standards in parts 4725.2010 to 4725.3875 and the provisions in this part.

A. Vertical heat exchanger piping must be a minimum 160 psi pressure-rated, SDR 11 high density polyethylene, meeting ASTM Standard D3035-03a.

B. Connections to vertical heat exchanger piping must use socket fusion or butt fusion joining methods.

C. Vertical heat exchanger piping must be pressure tested with air or potable water for 15 minutes at a pressure of 1.5 times the system operating pressure or 75 pounds per square inch, whichever is greater, after installation in the bore hole.

D. The annular space between the vertical heat exchanger piping and the bore hole must be grouted with neat-cement grout or cement-sand grout in bedrock, and neat-cement grout, cement-sand grout, thermally enhanced bentonite grout, or bentonite

grout in unconsolidated materials according to the procedures in part 4725.3050, subpart 2. Thermally enhanced bentonite grout must consist of a fluid mixture of not more than 17.5 gallons of water, not more than 200 pounds of sand with 80 percent or more of the sand smaller than 0.0117 inch (passing U.S. Sieve #50), and a minimum of 50 pounds of bentonite.

E. Only food-grade or USP-grade propylene glycol must be used as heat transfer fluid. No other materials or additives must be used except for potable water. A permanent sign must be attached to the heat pump specifying that only approved heat transfer fluids must be used.

F. Water make-up lines to the vertical heat exchanger must be protected with backflow prevention according to parts 4715.2010 to 4715.2170.

G. A vertical heat exchanger constructed according to this part must be no less than 35 feet from a water-supply well. The horizontal piping must be no less than ten feet from a water-supply well.

[For text of subp 2, see M.R.]

ELEVATOR BORINGS

4725.7250 ELEVATOR BORINGS.

Subpart 1. **General.** An elevator boring must be constructed according to the general construction standards in parts 4725.2010 to 4725.3875 and cased, sealed, and maintained according to this chapter to prevent the vertical movement of water.

Subp. 2. **Casing.** The boring must be cased to the bottom of the excavation.

Subp. 3. **Exception.** The boring is exempt from the requirements in parts 4725.2150; 4725.2175; 4725.2185; 4725.2250, subpart 8, concerning extension of the casing 12 inches above the established ground surface; and 4725.2250, subpart 11.

Subp. 4. **Hydraulic fluid leakage protection.** Hydraulic fluid must be protected from leakage by:

A. attaching a watertight cap or plate to the bottom of the casing and surrounding the casing with neat-cement or cement-sand grout. The grout must extend at least three inches above and three inches below the bottom of the casing. The grout must be inserted according to part 4725.3050, subpart 2;

B. grouting the inside of the casing with cement-sand grout or neat-cement grout. The grout must extend at least two feet above the bottom of the casing and be inserted according to part 4725.3050, subpart 2; or

C. encasing the hydraulic cylinder in a Schedule 30 plastic outer pipe or sleeve with the bottom of the pipe or sleeve capped and the top extending above the pit floor.

Subp. 5. **Repair.** In addition to the requirements of part 4725.3750, when a hydraulic cylinder is removed from an elevator boring for repair or replacement, the boring must be protected from hydraulic fluid leakage according to subpart 4.

Subp. 6. **Sealing.** An elevator boring which is unsuccessful or no longer in use must be sealed according to part 4725.3850. The hydraulic cylinder, debris or obstructions, and sand placed around the hydraulic cylinder must be removed prior to sealing.

ENVIRONMENTAL BORE HOLES

4725.7450 ENVIRONMENTAL BORE HOLES.

Subpart 1. **Construction.** An environmental bore hole must be constructed, repaired, maintained, and sealed according to the general standards in parts 4725.2010 to 4725.3875. In addition, an environmental bore hole that is cased must be constructed to conform to the monitoring well requirements in parts 4725.6650 to 4725.6850.

[For text of subps 2 and 3, see M.R.]

Subp. 4. **Exception to sealing requirements.** An environmental bore hole less than 50 feet in depth, in an unconsolidated formation, and not encountering a confining layer may be sealed by removing the casing and screen and allowing the bore hole to collapse, except for a flowing boring which must meet the requirements of part 4725.3850.

A. The bore hole must not encounter pollution or contamination or have been installed to detect pollution or contaminants.

B. The collapse must not be induced other than by removal of the screen or casing.

C. The portion of the bore hole that does not collapse must be sealed immediately upon removal of the casing as specified in part 4725.3850 with bentonite grout, neat-cement grout, or cement-sand grout.

Subp. 5. **Screen or open hole across an unconsolidated formation and bedrock contact.** An environmental bore hole may be constructed to test contaminants without extracting water, or to vent, recover vapor, or sparge contaminants from the water surface, by placing a screen or open hole across the contact of an unconsolidated formation and bedrock according to part 4725.6050, subpart 3.

TERM CHANGES. The term "notification" shall be substituted for the term "notice" in the headnote of part 4725.1837. The term "water-supply" shall be substituted for the term "water supply" wherever it appears in parts 4725.4550, 4725.5050, and 4725.5150.

REPEALER. Minnesota Rules, parts 4725.0100, subparts 30a, 41c, 42, and 46; 4725.2020, subparts 2 and 3; 4725.2150, subpart 2; 4725.2450; 4725.3450, subpart 3; 4725.3750, subpart 4; 4725.3850, subpart 6; 4725.4950; and 4725.5675, are repealed.