

Rules Relating to Wells and Borings

A well provides a reliable, safe supply of drinking water when the well is properly constructed and maintained. The standards for the proper location, construction, repair, and sealing of wells in the state of Minnesota are contained in Minnesota Rules, Chapter 4725, Rules Relating to Wells and Borings. Minnesota Rules, Chapter 4725 regulates wells, including water supply, wells monitoring, wells elevator shafts, dewatering wells, environmental bore holes, and vertical heat exchangers. Drilling done to explore for minerals or petroleum is regulated under a different set of rules, Minnesota Rules, Chapter 4727. Minnesota Statutes, Chapter 103I contains the statutory authority for well contractor licensing, well permits, the duties and responsibilities of the Commission of Health, well disclosure, and additional requirements for wells and borings.

This chapter summarizes some of the well and boring rule requirements. A complete copy of the rules is available by consulting an official copy of Minnesota Rules, or by contacting the Minnesota Department of Health, Well Management Unit at 651-215-0811. Internet address: <http://www.revisor.leg.state.mn.us/arule/4725>.

DEFINITIONS

ANNULAR SPACE: The space between a bore hole and a casing pipe or between a casing pipe and liner pipe.

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

BORING (CHAPTER 103I): A hole or excavation that is not used to extract water and includes exploratory borings, environmental bore holes, vertical heat exchangers, and elevator shafts.

DEWATERING WELL (CHAPTER 103I): A non-potable well used to lower groundwater levels to allow for construction or use of underground space. A dewatering well does not include:

- (1) a well or dewatering well 25 feet or less in depth for temporary dewatering during construction; or
- (2) a well used to lower groundwater levels for control or removal of groundwater contamination.

DRIVE POINT WELL: A well constructed by forcing a pointed well screen, attached to sections of pipe or casing, into the ground with a hammer, maul, or weight.

DUG WELL (CHAPTER 4725): A well 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 the rules. Water enters a dug well through the side walls and bottom.

ELEVATOR SHAFT (CHAPTER 103I): A bore hole, jack hole, drilled hole, or excavation constructed to install an elevator shaft or hydraulic cylinder.

ENVIRONMENTAL BORE HOLE (CHAPTER 103I): A hole or excavation in the ground that penetrates a confining layer or is greater than 25 feet in depth; and enters or goes through a water bearing layer; and is used to monitor or measure physical, chemical, radiological, or biological parameters without extracting water. An environmental bore hole also includes a bore hole constructed for a vapor recovery or venting system. An environmental bore hole does not include a well, elevator shaft, exploratory boring, or monitoring well.

ENVIRONMENTAL BORE HOLE (CHAPTER 4725): A boring having meaning given in Minnesota Statutes, section 103I.005, subdivision 8, and includes excavations used to:

- A. measure groundwater levels;
- 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 gaseous pollution or contamination from groundwater or soil through the use of a vent, vapor recovery system, or sparge point.

EXPLORATORY BORING (CHAPTER 103I): A surface drilling done to explore or prospect for oil, natural gas, kaolin clay, and metallic minerals, including iron, copper, zinc, lead, gold, silver, titanium, vanadium, nickel, cadmium, molybdenum, chromium, manganese, cobalt, zirconium, beryllium, thorium, uranium, aluminum, platinum, palladium, radium, tantalum, tin, and niobium, and a drilling or boring for petroleum.

GROUNDWATER THERMAL EXCHANGE DEVICE (CHAPTER 103I): A heating or cooling device that depends on extraction and reinjection of groundwater from an independent aquifer to operate.

GROUT: Material used to fill the annular space around a casing, or to seal a well or boring. Grout is either neat cement, bentonite, or high solids bentonite.

MONITORING WELL (CHAPTER 103I): An excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed to extract groundwater for physical, chemical, or biological testing. "Monitoring well" includes a groundwater quality sampling well.

ROCK: A consolidated, coherent geological formation, including limestone, sandstone, shale, granite, basalt, slate, and quartzite.

SEALING: The process of filling a well or boring with grout.

UNCONSOLIDATED MATERIAL: Loose geological material, not cemented together, such as sand, gravel, and glacial drift.

VERTICAL HEAT EXCHANGER (CHAPTER 103I): An earth-coupled heating or cooling device consisting of a sealed piping system installed vertically in the ground to transfer heat to or from the surrounding earth.

WATER SUPPLY WELL (CHAPTER 4725): A well as defined in Minnesota Statutes, section 103I.005, subdivision 21, that is not a dewatering well or a monitoring well. A water supply well includes wells used:

- A. for potable water;
- B. for irrigation;
- C. for agricultural, commercial, or industrial water supply;
- D. for heating or cooling; or
- E. as a remedial well.

WELL (CHAPTER 103I): An excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed if the excavation is intended for the location, diversion, artificial recharge, or acquisition of groundwater. Well includes monitoring wells, drive point wells, and dewatering wells. "Well" does not include:

- (1) an excavation by backhoe or otherwise for temporary dewatering of groundwater for non-potable use during construction, if the depth of the excavation is 25 feet or less;
- (2) an excavation made to obtain or prospect for oil, natural gas, minerals, or products of mining or quarrying;
- (3) an excavation to insert media to repressure oil or natural gas bearing formations or to store petroleum, natural gas, or other products;
- (4) an excavation for non-potable use for wildfire suppression activities; or
- (5) borings.

WELL PUMP OR PUMPING EQUIPMENT (CHAPTER 4725): A device, machine or material used to withdraw or otherwise obtain water from a well, and all necessary seals, fittings, and pump controls. Well pump or pumping equipment does not include:

- A. water tanks except for buried pressure tanks;
- B. sampling devices placed in a monitoring well to obtain a water sample and are then removed after the sample is collected; or
- C. devices used in the construction or rehabilitation of a well.

LICENSING AND REGISTRATION

A license or registration is required to construct, repair or seal (abandon) a well or boring. In addition, a license or registration is required to modify or affect the yield, water quality, diameter, depth, or casing of a well or boring, including the attachment of water conditioning or other devices to the casing, chemical treatment of a well or boring, or development including hydro-fracturing.

License types include: well contractor and individual well contractor; elevator contractor; and five categories of limited well contractor license including drive point/dug well, screen and pitless, pump, well sealing, and dewatering. Monitoring well contractors are registered. The rules list specific experience and testing requirements for each type of license and registration.

WELL CONTRACTOR. A licensed well contractor may construct, repair, install pumps in, attach water conditioning or other devices to, chemically treat, develop, and seal wells including water supply wells, dewatering wells, drive point wells, dug wells, groundwater thermal exchange devices, and monitoring wells, and borings including environmental bore holes, elevator shaft excavations, and vertical heat exchangers. The license fee is \$250. A \$10,000 bond is required.

INDIVIDUAL WELL CONTRACTOR. The licensed individual does not represent a company and does not register drilling machines. Typically, persons obtain this license to have a “back-up” license in case the licensed well contractor representing the company leaves the company. The individual is exempt from the bond requirement. The license fee is \$50.

MONITORING WELL CONTRACTOR. A registered monitoring well contractor may construct, repair, install pumps in, attach water conditioning or other devices to, chemically treat, develop, and seal monitoring wells, and environmental bore holes. The registration fee is \$50. A \$10,000 bond is required.

LIMITED DUG WELL AND DRIVE POINT WELL CONTRACTOR. A licensed drive point and dug well contractor may construct, repair, install pumps in, attach water conditioning or other devices to, chemically treat, develop, and seal dug wells and drive point wells. The license fee is \$50. A \$10,000 bond is required.

LIMITED WELL SCREEN AND PITLESS CONTRACTOR. A licensed well screen or pitless contractor may install or repair well screens, pitless units or adapters, and casings above the pitless; and attach water conditioning or other devices to, chemically treat, or develop wells. The license fee is \$50. A \$2,000 bond is required.

LIMITED PUMP CONTRACTOR. A licensed pump contractor may install or repair well pumps or pumping equipment, and attach water conditioning or other devices to, chemically treat, or develop wells. The license fee is \$50. A \$2,000 bond is required.

LIMITED WELL SEALING CONTRACTOR. A licensed well sealing contractor may remove obstructions in wells prior to sealing, remove or perforate casings and seal wells. The license fee is \$50. A \$10,000 bond is required.

LIMITED DEWATERING WELL CONTRACTOR. A licensed dewatering well contractor may construct, repair, install pumps in, attach water conditioning or other devices to, chemically treat, develop, and seal dewatering wells. The license fee is \$50. A \$10,000 bond is required.

ELEVATOR SHAFT CONTRACTOR. A licensed elevator shaft contractor may construct, repair, or seal an excavation or boring for an elevator shaft hydraulic cylinder. The license fee is \$50. A \$10,000 bond is required.

PERMITS AND NOTIFICATIONS

A notification and fee must be submitted to the MDH prior to construction of a water supply well or dewatering well. A permit application and fee must be submitted to, and approved by, the MDH prior to construction of a monitoring well, elevator, vertical heat exchanger, or groundwater thermal exchange device.

A notification and fee must be submitted to the MDH prior to sealing a well.

The rules require a notification or a permit to deepen a well through a confining layer, install or remove casing below the frost line, or convert a well to at-grade. A permit or notification is not normally required to install a screen, well pump or pumping equipment, or pitless.

A permit or notification is valid for 18 months.

Maintenance permits and fees are required for monitoring wells and dewatering wells not sealed 14 months after construction.

Permit and notification requirements will be different in counties and cities where authority to regulate wells has been delegated. The cities of Bloomington and Minneapolis, and Blue Earth, Dakota, Goodhue, LeSueur, Mower, Olmsted, Wabasha, Waseca, and Winona Counties have local well programs. NOTE: Authority for regulation of community water supply wells cannot be delegated; these wells are regulated exclusively by the MDH.

WELL OR BORING RECORDS

A construction or sealing report must be filed within 30 days of completion of construction or sealing of a well or boring. A construction report is not required if a well or boring is sealed within 30 days of the start of construction and if a sealing report is submitted.

WELL AND BORING GENERAL CONSTRUCTION REQUIREMENTS

Interconnection of aquifers separated by a confining layer is prohibited. An open hole or screen must not extend more than 10 feet through a confining unit.

A well or boring may not be used for disposal of water, liquids, gas or chemicals.

A well or boring must be located a minimum of five feet from a gas pipe, LP tank, or electric line (25 feet if over 50kV) except for the service line to the well. If the electric line, gas pipe or LP tank is located between five and ten feet, a permanent sign warning of the location of these utilities must be installed on the well. Construction, repair or sealing within 10 feet is prohibited unless an electric line is de-energized and grounded, or shielded, and unless pipes and tanks do not contain flammable gas.

A well or boring may not be located inside a building except for a building (well house) exclusively housing the well or boring, pump and treatment equipment. A monitoring well or an environmental bore hole may be inside a building if the well or boring is sealed within 48 hours of the start of construction.

The storage of hazardous materials such as petroleum products or pesticides is prohibited in a building housing a well or boring.

A well or boring must be at least 3 feet horizontally from a building or building projection. A monitoring well or an environmental bore hole may be closer than 3 feet from a building if the well or boring is sealed within 48 hours of the start of construction.

Lead packers are prohibited.

A leader or blank screen may extend no more than 10 feet above or below the screen.

Gravel packs may extend a maximum of 10 feet above the static water level and no more than 10 feet above or below a screen.

Drilling water must contain a free chlorine residual, and come from the well or boring itself, a potable water system, or a well or boring of similar use and construction.

Drilling additives must meet NSF standard 60.

Chlorine compounds must not have additives.

Casing connections above grade must be weatherproof and insect proof, and below grade must be watertight.

The installation of oil lubricated turbine pumps is prohibited.

Connections between a well or boring and another well, boring, water supply system or contamination source are prohibited unless: 1) protected by an air gap or backflow preventer in accordance with the Plumbing Code; 2) protected with backflow prevention as specified in Department of Agriculture Rules for irrigation wells; or 3) the interconnection is between wells or borings meeting the standards of the rule, and the wells or borings are used for the same purpose and have equivalent water quality.

Flowing wells or borings must have flow control capable of stopping all flow.

Defective casing, seals, and screens must be repaired.

When all casing is removed from a well or boring, new casing cannot be installed or the old casing reinstalled unless the well or boring meets the requirements of the rules.

CASING FOR WELLS AND BORINGS

New casing is required but casing salvaged within 120 days may be used if the casing meets the specification for new casing.

Casing must be marked by the manufacturer.

The commissioner may reject casing which is not submitted for independent evaluation, fails to meet the specifications, or is defective.

Temporary casing, removed upon completion of the well or boring, does not have to meet the permanent casing standards.

An inner casing 12 inches in diameter and smaller must be 3.25 inches smaller than the outer casing. 6 X 10 and 8 X 12, plain end steel casing combinations, and other combinations with 1 and 5/8 inches of annular space are allowed. 3.5 inches (1 and 3/4 inch annulus) difference is required for casings larger than 12 inch.

Permanent outer casing is exempt from the casing standards if installed in unconsolidated formations with an inner casing which meets the standards and which is neat cement grouted.

A minimum 2 inch inside casing diameter is required for wells and borings greater than 50 feet deep.

The casing for wells and borings must terminate at least 12 inches above the established ground surface or the floor of a well house.

CASING MATERIAL STANDARDS

- **STEEL** - Steel casing must be certified by the manufacturer to meet ASTM A53, ASTM A589 or API 5L specifications. Remarketed or reject casing is prohibited. Ten inch and smaller casing must be at least schedule 40, larger casing must be at least standard weight.
- **STAINLESS STEEL** - Schedule 5 (welded) and schedule 40 (threaded) stainless steel casing must meet ASTM A312.
- **PLASTIC** - Plastic casing must meet ASTM F480 and be a minimum of 200 psi rated. Plastic casing couplings, solvents and components must be approved by a certified testing laboratory to meet NSF Standard 61 or the health effects portion of NSF Standard 14.

- **FLUSH THREADED PLASTIC (MONITORING WELLS)** - Flush threaded PVC well casing may only be used under certain conditions of depth and geology for monitoring wells and environmental bore holes. The casing must be at least schedule 40.
- **CONCRETE CURBING (DUG WATER SUPPLY WELLS)** - Concrete curbing is allowed only for dug water supply wells completed in unconsolidated formations. The curbing must be a minimum of 2.5 inches thick.

GROUTING WELLS AND BORINGS

Grouting must be completed before a well or boring is placed in service.

The top 30 feet of all wells and borings that are constructed with a method such as rotary, auger, or jetting which creates an annular space, must be grouted. The annular space in unconsolidated formations below 30 feet may be filled with cuttings.

Acceptable grout in unconsolidated formations include: concrete grout (above the water level); neat cement; bentonite grout or high solids bentonite grout.

Acceptable grout in rock includes neat cement, or concrete grout above the water level.

Bentonite grout, granular bentonite, or high-solids bentonite grout must be maintained in a depression around a casing or in a temporary outer casing while driving casing.

GROUT MATERIALS

***BENTONITE GROUT.** “Bentonite grout” means:

- A. water and a minimum of ten percent by weight of bentonite, with no additives to promote temporary viscosity; and
- B. ten percent by weight of either washed sand, cuttings taken from the bore hole, or granular bentonite.

The ten percent of washed sand, cuttings or granular bentonite may be either mixed with the bentonite and pumped together, or may be poured while the 10 percent bentonite slurry is pumped through a tremie pipe or the casing.

***HIGH SOLIDS BENTONITE GROUT.** “High solids bentonite grout” means a fluid mixture of water and a minimum of 15 percent by weight of bentonite, with no additives to promote temporary viscosity.

NEAT CEMENT GROUT. "Neat cement grout" means a 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. Admixtures to reduce permeability or control setting time must meet ASTM Standard C494-86.

CONCRETE GROUT. "Concrete grout" means a mixture of Portland cement, sand, and water in the proportion of 94 pounds of Portland cement and not more than an equal volume of dry sand and not more than six gallons of water. Admixtures to reduce permeability or control setting time must meet ASTM Standard C 494-86.

Conditions Where Grouting is Required, Wells and Borings

- **THE ANNULAR SPACE BETWEEN CASINGS.** The annular space between casings must be completely grouted with neat cement.
- **THE TOP 30 FEET OF WELLS OR BORINGS CONSTRUCTED WITH A METHOD WHICH CREATES AN ANNULAR SPACE.** Bentonite grout or high solids bentonite grout may be used only in unconsolidated formations. Neat cement may be used in any formation. Concrete may be used in any formation above the water level. No minimum bore hole size is required in unconsolidated formations.
- **THE ANNULAR SPACE BELOW 30 FEET IF NOT FILLED WITH CUTTINGS.** The annular space in unconsolidated formations may be filled with cuttings taken from the bore hole. Cement grout must be used in rock.
- **A BORE HOLE DRILLED MORE THAN 10 FEET BELOW A SCREEN.** If a hole is drilled, and the bottom of the screen is to be installed more than 10 feet above the bottom of the hole, the hole cannot be left open or caved in. It must be grouted from the bottom to within 10 feet of the screen.
- **CASING INSTALLED MORE THAN 10 FEET INTO ROCK.** If casing is installed more than 10 feet into rock, the casing must be installed in a bore hole 3.25 inches larger in diameter than the outside diameter of the casing, coupling, or bell end, whichever is larger. The annular space must be grouted with neat cement. Concrete grout may be used above the water level. Steel casing may be driven in a sandstone formation without grouting if the sandstone is the first bedrock unit.

Alternate grout methods and materials are allowed in rock where caverns more than twice the diameter of the bore hole exist, where loss of more than 1 yard of grout occurs, or where grout levels fail to rise after insertion of the quantity of grout calculated to fill 10 vertical feet of hole. Alternate methods include: pouring of up to 5 parts of 1/2 inch or smaller diameter aggregate while pumping one part neat cement grout; addition of up to 5 parts aggregate to concrete or neat cement grout; or placement of alternating maximum 10 feet thick, layers of aggregate and neat cement grout. Aggregate is prohibited in confining layers.

- **FLOWING WELLS OR BORINGS.** The casing of all flowing wells or borings must be neat cement grouted unless plain end casing is driven. No minimum bore hole size is required. Wells or borings located in a flowing well advisory area, which flow more than 70 gpm, or which have pressures of more than 10 psi must be installed with an outer and an inner casing. The outer casing must be installed into the confining layer in a bore hole 3.25 inches larger than the casing outside diameter. The inner casing must be installed into the flowing aquifer. The annular space around the outer casing, and between the casings, must be neat cement grouted.

ADDITIONAL GROUTING REQUIREMENTS, WATER SUPPLY WELLS

- **WATER SUPPLY WELLS IN OR BELOW LIMESTONE OR DOLOMITE.**

- If the top of the limestone or dolomite is less than 50 feet from the land surface at the well site or within a one mile radius around the well site, the formation may not be used for a potable water supply and the well must be cased and cement grouted below the limestone.
- For a water supply well constructed in or below dolomite or limestone rock, if the static water level is less than 10 feet above the top of the limestone or dolomite, the bore hole must be 3.25 inches larger than the outside diameter of the casing or couplings. The casing must extend 20 feet below the static water level, and the annular space in the rock must be cement grouted.
- If a water supply well is completed in a formation below a limestone or dolomite, the casing must extend at least 10 feet below the static water level and 10 feet into the formation. The bore hole in rock must be 3.25 inches larger than the casing outside diameter. The rock portion must be cement grouted.

- **DUG OR BORED WATER SUPPLY WELLS.** Dug or bored water supply wells must be cement grouted from the surface to a depth of 15 feet or to the static water level, whichever is greater. No minimum bore hole size is required

ADDITIONAL WATER SUPPLY WELL REQUIREMENTS

A potable water supply well must be cased to a minimum depth of 15 feet. A gravel pack must not be within 15 feet of the ground surface.

A potable water supply well must provide less than 5 mg/l of sand.

Materials used to construct a water supply well must not exceed 8% lead.

Weather-proof and insect-proof water supply well covers are required.

Discharge lines must be constructed of materials approved in the plumbing code.

A water supply well must be vented unless the well is a flowing well; casing is used as a suction pipe, has a with packer jet; is used as a remedial well; or has a watertight seal in a flood area. A screened, down-turned vent is required. The vent must terminate 5 feet above the regional flood level.

For a water-supply well, the casing must extend 5 feet above the regional flood level (100 year flood). Flood protection devices may be installed in lieu of casing extension if the regional flood level is more than 5 feet above the ground surface.

The person constructing a water supply well must inform the well owner that the well should not be used for drinking until water samples indicate the absence of total coliform bacteria.

Water samples from a new well must be analyzed for nitrate and coliform by a laboratory certified by the Minnesota Department of Health.

The person constructing a well is responsible for disinfection, resampling, and correction of the causes of bacterial contamination.

When repairing a water supply well with the upper terminus of the casing buried below the ground surface, the casing must be extended above grade.

The cover for a dug well must be gasketed.

COMMUNITY PUBLIC WATER SUPPLY WELLS

Community public wells must not be constructed until plans and the well site have been inspected and approved.

Surface water must not reach within 50 feet of a community well.

Casing vents on community public water supply wells must extend 18 inches above grade.

The owner of a community well must own, or have a permanent easement to, all property within 50 feet of the well.

Isolation Distances From A Water Supply Well

Alphabetical List

Agricultural Chemical Storage or Preparation Area, More Than 25 Gallons or 100 Pounds Dry Weight	150 Feet
Agricultural Chemical Storage or Preparation Area With Safeguards.....	100 Feet
Agricultural Chemical Storage or Preparation Area With Safeguards and Roofed..	50 Feet
*Agricultural Chemical Supply Tank	20 Feet
**Animal Feedlot	50 Feet
**Animal or Poultry Building.....	50 Feet
Building.....	3 Feet
Building Projection, Overhang.....	3 Feet
**Cesspool.....	75 Feet
**Dry Well (Sewage).....	75 Feet
Dump.....	150 Feet
***Electric Transmission Line.....	5 Feet
Electric Transmission Line in Excess of 50 KV.....	25 Feet
**Feeding or Watering Area Within a Pasture.....	50 Feet
Frost Proof Yard Hydrant.....	10 Feet
***Gas Pipe.....	5 Feet
Grave.....	50 Feet
Hazardous Substances Storage or Preparation Area, More than 25 Gallons or 100 Pounds Dry Weight.....	150 Feet
Hazardous Substance Storage Tank With Safeguards.....	100 Feet
Holding Tank.....	50 Feet
Interceptor (Waste).....	50 Feet
**Leaching Pit.....	75 Feet
***LP Tank.....	5 Feet
**Manure Storage Area	100 Feet

Ordinary High Water Level of a Stream, River, Pond or Lake	50 Feet
Petroleum Distribution Pipeline.....	150 Feet
Petroleum Pipe (Buried) To/From Petroleum Storage Tank.....	50 Feet
Petroleum Storage or Preparation Area, More Than 25 Gallons or 100 Pounds Dry Weight.....	150 Feet
Petroleum Storage Tank With Safeguards.....	100 Feet
Petroleum Storage Tank, Underground, Less Than 1100 Gallons	50 Feet
Petroleum Storage Tank, Above Ground, Less Than 1100 Gallons.....	20 Feet
Pit.....	20 Feet
Pollutant, Contaminant or Hazardous Substance.....	50 Feet
**Privy.....	50 Feet
Sanitary Landfill.....	150 Feet
**Seepage Pit.....	75 Feet
Septic Tank.....	50 Feet
Sewage Lift Station.....	50 Feet
Sewage Sump, Watertight.....	20 Feet
Sewage Sump, Non-Watertight.....	50 Feet
Sewer, Buried, Approved Air-Tested.....	20 Feet
Sewer, Buried, Pressure, Approved, and Air-Tested Serving a Single Family Residence.....	20 Feet
Sewer, Buried Collector, Municipal, Pressurized, Open Jointed, Or Unapproved Materials.....	50 Feet
Storm Water Drain Pipe 12 Inches or Greater In Diameter.....	20 Feet
**Subsurface Disposal Field (Drainfield).....	50 Feet
Swimming Pool, In-Ground.....	20 Feet
Unfilled Space Below Ground, Except a Basement or Crawl Space.....	20 Feet
Unused, Unsealed Well or Boring.....	50 Feet
Waste Stabilization Pond.....	150 Feet

**Additional Isolation Distances For
Community Public Water Supply Wells**

Fire or Flushing Hydrant.....	10 Feet
Gravel Pocket Receiving Clear Water Drainage.....	30 Feet
Highest Water or Flood Level.....	50 Feet
Minimum Distance From Any Contamination Source.....	50 Feet
Property Line or Easement.....	50 Feet

* The 20 foot distance applies only to an irrigation well and an agricultural chemical supply tank (Chemigation) protected with safeguards.

** A water supply well with less than 50 foot of casing, or which is not cased below a confining layer of at least 10 feet in thickness, must be located at least 200 feet from a manure storage area, 150 feet from a cesspool, seepage pit, leaching pit, or dry well, and 100 feet from a subsurface disposal field, animal feedlot, animal or poultry feeding or watering area, animal or poultry building, privy, or similar contamination source.

***A well between five and ten feet of an electric transmission line, gas pipe or LP tank must be placarded and work must not be performed on the well unless the line is de-energized and grounded or shielded, and the gas pipe or LP tank does not contain flammable gas.