

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. [Repealed, 33 SR 211]

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.

Statutory Authority: *MS s 103I.101; 103I.111; 103I.205; 103I.221; 103I.301; 103I.401; 103I.451; 103I.501; 103I.525; 103I.531; 103I.535; 103I.541; 103I.621; 144.05; 144.12; 144.383; 157.04; 157.08; 157.09; 157.13*

History: *17 SR 2773; 33 SR 211*

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