

3701-28-071

Special sealing requirements based on well type and geologic conditions.

- (A) The following types of wells and dry holes and shall be sealed in accordance with the requirements of this rule, in addition to the requirements of rule 3701-28-07 of the Administrative Code, unless otherwise indicated in this rule:
- (1) Dug or bucket drilled wells or dry holes. For purposes of this rule, “dug or bucket drilled well or dry hole” means a well consisting of a large diameter hole, deeper than it is wide, constructed into the ground, usually by hand, but if by mechanical means, by methods other than drilling, jetting, auguring or boring, and within which the side walls are supported by stone, brick, tiles or other similar materials;
 - (2) Wells and dry holes drilled through single unconsolidated aquifers, single consolidated aquifers, unconfined, unconsolidated aquifers or confined, unconsolidated aquifers that are not flowing at the surface;
 - (3) Wells and dry holes drilled through multiple unconsolidated and consolidated aquifers;
 - (4) Wells that are flowing; and
 - (5) Wells and dry holes drilled through fractured or cavernous formations or mine shafts.
- (B) All dug or bucket drilled wells and dry holes shall be sealed in accordance with the following requirements:
- (1) Notwithstanding paragraph (J)(2) of rule 3701-28-07 of the Administrative Code, the upper three to five feet of liner or casing material shall be removed.
 - (2) The static water level shall be measured and the well pumped dry if possible.
 - (3) The sides of the dug or bucket drilled well shall be rinsed, with the chlorine solution described in paragraph (J)(4) of rule 3701-28-07 of the Administrative Code.

- (4) If the dug or bucket drilled well is greater than twenty-four inches in diameter, twenty-five feet or less in depth, and the static water level is less than five feet below the ground surface then the following additional requirements shall be met:
- (a) The well shall be filled with clean clay or cement grout to the elevation of the static water level.
 - (b) A one foot layer of bentonite or cement grout shall be placed in the well at the elevation of the static water level. If the well is dry and bentonite is used, it shall be hydrated with five gallons of water per fifty pounds of bentonite.
 - (c) Notwithstanding paragraphs (J)(2) and (J)(7) of rule 3701-28-07 of the Administrative Code the liner shall be removed to the depth of the static measured water level, as measured pursuant to paragraph (B)(2) of this rule, and excavated six inches beyond the original outside diameter of the well.
 - (d) The remaining hole shall be filled with clean soil as required under paragraph (J)(8) of rule 3701-28-07 of the Administrative Code.
- (5) If the dug or bucket drilled well is greater than twenty-four inches in diameter, and twenty-five feet or less in depth, and the static water level is greater than five feet below the ground surface the well shall be sealed in accordance with the following additional requirements:
- (a) The well shall be filled with clean clay or cement grout to the elevation of the static water level.
 - (b) A one foot thick layer of bentonite grout or cement grout shall be placed in the well at the elevation of the measured static water level. If the well is dry and bentonite is used, it shall be hydrated with five gallons of water per fifty pounds of bentonite.
 - (c) A layer of clean clay or cement grout shall be added until the level in the well is three feet below the ground surface.

- (d) Notwithstanding paragraph (J)(2) of rule 3701-28-07 of the Administrative Code the top three feet of casing, wall or liner material shall be removed and the area shall be excavated six inches beyond the original borehole.
 - (e) A one foot thick layer of bentonite or cement grout shall be added at the level at which the casing, wall, or liner material was removed and the bentonite shall be hydrated with five gallons of water per fifty pounds of bentonite if the well is dry.
 - (f) The remainder of the well shall be filled with clean soil as required under paragraph (J)(8) of rule 3701-28-07 of the Administrative Code.
- (C) Wells drilled through single unconsolidated aquifers, single consolidated aquifers, unconfined, unconsolidated aquifers or confined, unconsolidated aquifers that are not flowing at the surface shall be sealed in accordance with the following requirements:
 - (1) Clean sand or gravel may be placed from the bottom of the well to the top of the aquifer or to twenty-five feet below ground surface, whichever is encountered first.
 - (2) The well shall then be pressure grouted with cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code or coarse grade bentonite shall be poured in accordance with paragraph (J)(5)(d) of rule 3701-28-07 of the Administrative Code to the surface while the casing is being removed or perforated where possible.
- (D) Wells drilled through multiple unconsolidated and consolidated aquifers that are not flowing at the surface shall be sealed in accordance with one of the following requirements, as applicable:
 - (1) The well shall be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code.

- (2) If the well is less than two-hundred feet deep and greater than four inches in diameter, coarse grade bentonite products may be poured into the well in accordance with paragraph (J)(5)(d) of rule 3701-28-07 of the Administrative Code;
 - (3) If the well is less than one-hundred feet deep and greater than four inches in diameter pelletized bentonite or coarse grade bentonite may be poured into the well in accordance with paragraph (J)(5)(d) of rule 3701-28-07 of the Administrative Code;
 - (4) If detailed construction and geologic data is available, then clean sand or gravel may be placed adjacent to the aquifer zones with grout placed adjacent to the confining units. The well shall then be sealed from the top of the uppermost aquifer to the surface with cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code.
- (E) Wells that are flowing shall be sealed in accordance with the following requirements, as applicable:
- (1) If possible, the casing shall be extended until the flow of water over the top of the casing stops.
 - (a) The well shall be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code; or
 - (b) If the well is less than two hundred feet deep, coarse grade or pelletized bentonite may be poured into the well in accordance with paragraph (J)(5)(d) of rule 3701-28-07 of the Administrative Code.
 - (2) If the hydrostatic head is too high to permit casing extension, one of the following requirements shall be met:

- (a) An inflatable packer shall be installed at the top of the producing formation to stop or restrict the flow of water. The well shall then be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code through the packer from the bottom of the hole to the bottom of the packer. The packer shall then be deflated and pressure grouting shall continue to the surface;
 - (b) A shut-in device shall be installed at the top of the well to prevent flow. A conductor pipe shall be inserted through the shut-in device and the well shall be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code from the bottom of the well to the ground surface;
 - (c) Disinfected gravel shall be poured into the well to reduce the flow of water and the well shall then be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code from the top of the gravel to the ground surface; or
 - (d) Cement grout slurries with additives to increase the density of the cement shall be used to control the flow of water. Cement grout shall be placed in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code and appropriate placement techniques shall be used to ensure that separation of the cement does not occur during the grouting process.
- (F) Wells drilled through fractured or cavernous formations, or mine shafts shall be sealed in compliance with the following requirements:
- (1) The depth and thickness of the fractured, cavernous zone or mine shaft shall be determined, if possible, and the fractures, cavernous zone or mine shaft shall be sealed in accordance with the following requirements:

- (a) Where the fractured, cavernous zone or mine shaft is greater than twenty-five feet from the ground surface, the intersection of the borehole and the fractured or cavernous zone shall be filled with clean disinfected gravel, or a plug consisting of a packer, shale basket, or other similar device shall be installed above the fractured or cavernous formation.
 - (b) Where the fractured, cavernous zone or mine shaft is less than twenty-five feet from the ground surface, then the well shall be filled with cement grout with additives that promote bridging across the fractured, cavernous zone or mine shaft.
- (2) The remainder of the well shall then be pressure grouted using cement grout in accordance with paragraph (J)(5)(b) of rule 3701-28-07 of the Administrative Code or bentonite grout in accordance with paragraph (J)(5)(c) of rule 3701-28-07 of the Administrative Code.

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Certified:

 /S/
Jodi Govern, Secretary
Public Health Council

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