

567—39.8(455B) Abandoned well plugging procedures.

39.8(1) *Freedom from obstructions.* Abandoned wells must be checked before they are plugged in order to ensure there are no obstructions that may interfere with plugging operations. Drop pipes, check valves, pumps, and other obstructions shall be removed if practical.

39.8(2) *Class 1 wells.* These wells may be plugged by pouring filling and sealing materials from the top of the well or by using tremie pipes, except for sand cement grout or concrete placed below the static water level, which must be placed by tremie pipe or dump bailer.

Filling materials of sand, gravel, crushed stone, rock, pea gravel or agricultural lime shall be placed up to 1 foot below the static water level; soils are not permitted below the static water level due to naturally occurring bacteriological, organic and inorganic contaminants. A minimum of 1 foot of bentonite pellets, graded bentonite or neat cement shall be placed on top of the filling material up to the static water level as a seal. Sand cement grout or concrete applied with a tremie pipe or dump bailer also may be used on top of the filling material up to the static water level and in standing water above the static water level to act as a seal. Filling material may then be added up to 4 feet below the ground surface.

It is preferable that the filling materials be omitted and that sealing materials be used to fill the entire well up to 4 feet below the ground surface. Sand cement grout or concrete shall be placed with a tremie pipe or dump bailer when used below the static water level.

The casing pipe and any curbing, frost pipe or pump house structure shall be removed to a depth of 4 feet below the ground surface and shall be capped by a minimum of 1 foot of bentonite pellets, graded bentonite, neat cement, sand cement grout or concrete. The cap shall extend 6 or more inches beyond the outside diameter of the top of the remaining well casing and shall terminate 3 feet below the ground surface. The remaining 3 feet (below the ground surface) shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

39.8(3) *Class 2 wells other than bedrock wells.* If the details of well construction are unknown or obstructions that may interfere with well plugging cannot be removed, the well shall be tremied full of neat cement or bentonite grout up to 4 feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating 4 feet below the ground surface.

Filling material consisting of sand, gravel, crushed stone, pea gravel or agricultural lime shall be placed in the bottom of the well up to 4 feet below the static water level. A minimum of 4 feet of sealing materials consisting of any bentonite products or neat cement shall be added above the filling material up to the original static water level. If bentonite grout or neat cement is used, it shall be placed by tremie pipe. If graded bentonite or bentonite pellets are used, they may be added by pouring in place and agitating to avoid bridging. Sealing materials shall be added above the static water level up to 4 feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating 4 feet below the ground surface.

It is preferable that the filling materials be omitted and that sealing materials be used to fill the entire well up to 4 feet below the ground surface.

Casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

39.8(4) *Class 2 bedrock wells.* If the details of well construction are unknown or obstructions that may interfere with well plugging cannot be removed, the well shall be tremied full of neat cement or bentonite grout up to 4 feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating 4 feet below the ground surface.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and the surface shall then be graded to divert water away from the abandoned well location.

a. Bedrock wells completed in a single confined aquifer. Before proceeding to plug the well, a bridge plug or packer shall be placed at or below the bottom of the casing to stop the flow of water where the

pressure in the confined aquifer causes the water to flow from the well to the surface. In such cases, filling materials shall be placed in the lower portion of the well before the bridge plug or packer is set.

Filling material consisting of pea gravel, crushed stone, gravel or agricultural lime shall be placed from the bottom of the well up to 10 feet below the bottom of the casing or confining layer, whichever is lower. Sealing materials consisting of any bentonite products, sand cement grout or neat cement shall be placed from the top of the filling material to at least 10 feet above the bottom of the casing or confining layer or to the static water level, whichever is higher. If bentonite grout, neat cement or sand cement grout is used, it shall be placed by tremie pipe. If graded bentonite or bentonite pellets are used, they shall be added by pouring in place and agitating to avoid bridging. The casing shall then be filled up to 4 feet below the ground surface with sealing materials. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout or concrete terminating 4 feet below the ground surface.

It is preferable that the filling materials be omitted and that approved sealing materials be used to fill the entire well up to 4 feet below the ground surface.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

b. Bedrock wells completed in a single unconfined aquifer. The plugging procedure for these wells is the same as for bedrock wells completed in a single confined aquifer except that a bridge plug or packer is not required to stop the flow of water since this problem will not exist in this type of well.

c. Bedrock wells completed in multiple aquifers. For the lowest aquifer, filling material consisting of pea gravel, crushed stone, gravel or agricultural lime shall be placed from the bottom of the well up to 10 feet below the bottom of the casing or confining layer, whichever is lower. Neat cement tremied in place shall then be placed as a sealing material on top of the fill and extend upward at least 20 feet. Sealing materials shall then be placed in at least the top 10 feet of each subsequent aquifer and extend at least 10 feet into the confining layer or casing above. The same type of filling materials and sealing procedures shall apply for each subsequent aquifer. Filling material may be placed from the top of the uppermost aquifer seal up to the static water level of the well. The casing shall then be filled with approved sealing or filling materials to 4 feet below the ground surface. If bentonite grout is used from the static water level to the top of the well, it should be capped by neat cement, sand cement grout, or concrete terminating 4 feet below the ground surface.

It is preferable that the filling materials be omitted and approved sealing materials be used to fill the entire well up to 4 feet below the ground surface. Sand cement grout or concrete shall be applied with a tremie pipe or dump bailer when applied below the static water level.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.

39.8(5) *Class 3 wells.* The preferred method of plugging a sandpoint well is to pull the casing and sandpoint out of the ground, allowing the hole to collapse and fill. If the sandpoint and casing cannot be extracted, they shall be tremied full of neat cement or completely sealed with bentonite products.

The casing pipe and any curbing, frost pit or pump house structure shall be removed to a depth of 4 feet below the ground surface. The remaining 4 feet shall then be backfilled with soil and graded so that surface water is directed away from the abandoned well location.