

# FACTS

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## PLUGGING ABANDONED WELLS

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The existence of abandoned wells is a problem that has been ignored for years. With increasing concern for the protection of our groundwater supplies (one of Canada's most valuable natural resources) this is a problem that we can no longer afford to ignore.

Groundwater is normally protected by a natural filter of varying soil. Abandoned wells are holes in that filter that can allow contaminants such as sediment, bacteria, and chemicals to flow directly into our groundwater supply. Runoff that might enter an abandoned well may contain pesticides, fertilizers, livestock waste and other contaminants. When these contaminants enter the groundwater supply they can move with the natural groundwater flow and may show up in public or private wells used to provide drinking water. It is critical that the quality of our groundwater be protected for our current uses and for future generations. Abandoned wells are also a safety hazard to humans and animals. Abandoned dug and bored wells that may have deteriorated gradually over the years are of particular concern because they may be large in diameter. A child can easily fall into large diameter dug wells and irrigation wells. Some abandoned wells are an accident waiting to happen.

*Ontario Regulation 903* places the legal responsibility for plugging abandoned wells onto the well owner. Section 21 states: "When a well is to be abandoned, it shall be plugged with concrete or other suitable material so as to preclude the vertical movement of water or gas in the well between aquifers or between an aquifer and the ground surface." The conditions under which a well owner must abandon and plug a well are when:

1. A new well is dry.
2. A well is not being used or maintained for future use.
3. A well is producing salty, sulphurous or mineralized water or water that is undrinkable.
4. The removal of any necessary operating equipment (i.e. Submersible pump).
5. A well that is in such a state of disrepair that continual use for the purpose for which it was constructed is impractical.

The regulations also authorize the Ministry of the Environment to order a well to be plugged if natural gas is encountered, or if the well was constructed in contravention of any of the provisions of the regulations including improper spacing from potential sources of pollution (i.e. Septic systems).

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Whether you plug your own well or hire a licensed well contractor, you should be aware that the plugging of some wells may be different because of the depth of the well, the static water level or the complex nature of the geological conditions. In these circumstances it is advisable to hire a well contractor who would have the proper equipment and the necessary knowledge of construction techniques and geological conditions. Improper techniques could result in failure to plug the well.

Before you begin to plug your well there is some essential information that must be gathered. The first step is to find out how the well was originally constructed:

1. Total well depth.
2. Depth of casing.
3. Casing diameter and changes in diameter with depth.
4. Static water level.
5. Type of aquifer.
6. Annular space seals, if present.

Water Well Records may contain this information, but may not be available for some dug wells, especially those constructed before 1950. If the well is shallow, much of this information can be observed directly or measured.

No two wells are the same and there are many variations in well construction, therefore it is impossible to provide detailed summaries for plugging a well for every situation. The following is a general method suitable for shallow wells in a water table aquifer.

**STEP 1** - Remove all pumping equipment, debris, and piping from the well.

**STEP 2** - Pump all water out of the well. If water can't be removed, disinfect with Chlorine.

**STEP 3** - Fill the bottom 0.3 metres (1 ft.) with granular bentonite (a commercially available colloidal clay in powder or granular form), add water and wait 30 minutes.

**STEP 4** - Pour 0.3 metres (1 ft.) of granular bentonite 3.0 to 2.5 metres (10 ft.) from the soil surface. Clean clay fill is best.

**STEP 5** - Remove the top two or three tiles 2.5 metres (8 ft.), plugging any holes or cavities found on the outside of the well tiles.

**STEP 6** - Pour 0.3 metres (1 ft.) of granular bentonite 3.0 to 2.5 metres (10 to 8 ft. depth) both inside and outside the remaining tile to form a blanket.

**STEP 7** - Backfill with impervious subsoil and topsoil materials.

Recent demonstration projects have shown that this work can generally be done in less than a day at a cost of between \$400 and \$1000. If you have a unique situation or you do not have clear answers to all the necessary questions, contact a local well contractor experienced in well plugging.

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## SOURCES

Ministry of the Environment:

[http://www.e-laws.gov.on.ca/dblaws/regs/english/900903\\_e.htm](http://www.e-laws.gov.on.ca/dblaws/regs/english/900903_e.htm)

<http://www.ene.gov.on.ca/envision/water/wells.htm>

<http://www.ene.gov.on.ca/cons/3788e01.pdf>

Ministry of Agriculture, Food and Rural Affairs:

<http://www.gov.on.ca/OMAFRA/english/environment/water/publications.htm>