

# Green Facts

## Important facts about water well construction

If you are planning to have a water well constructed on your property, there are some important facts you should know. In July 2007, Ontario amended Wells Regulation 903 to improve clarity and functionality and to ensure wells are properly constructed to better safeguard public health and our groundwater resources. These amendments became effective on December 31, 2007.

Ontario's Wells Regulation (Reg. 903, under the *Ontario Water Resources Act*) requires well contractors and well technicians who construct wells to be licensed by the Ministry of the Environment, and sets minimum construction standards to which all well contractors and well technicians, including private homeowners, must adhere. Although well construction and upgrading work can be done by a private well owner working on their own property, employing a licensed well contractor is strongly advised to ensure that proper minimum well construction standards are met and protection of the water supply is achieved.

### Construction requirements – water supply wells

There are a number of detailed requirements and minimum well construction standards in Regulation 903. They cover such things as casing, grouting, sealing, and pump testing of the well.

The well contractor is responsible for all work and costs to prevent any uncontrolled flow of water from a well. A written contract with the owner can release the well contractor from responsibility for cost, but completion of the work by the well contractor is mandatory. Other construction requirements include:

- A new well must be at least 15 metres from any source of contaminants if the well casing is watertight and is at least 6 metres in length below ground level.
- Any other new well that does not have casing to at least 6 metres below ground level must be at least 30 metres away from a source of contaminants.

- A well must be constructed so that surface drainage will not pond in the vicinity of the well.
- During construction, steps must be taken to protect the well against the entry of surface water and foreign materials.
- A new well must be chlorinated at least once to a residual concentration of 50 milligrams and not more than 200 milligrams of chlorine per litre of water for a minimum of 12 hours and left undisturbed. After 12 to 24 hours, the well must be tested for free chlorine residual. If the test results are not in the proper range, then the disinfection process must be repeated until the correct levels are obtained.
- A well must be constructed in such a way that there is no break-out of flowing water from around the well bore. A device is required on the well casing to permit stoppage of flow from the well both inside and outside of the well casing.
- All casing materials must be new and the top of the casing must be a minimum of 40 cm above the highest point on the ground surface. Well pits are not permitted on new wells. Casing in a drilled well must be a minimum of 6 metres in length unless the only useful aquifer of water-bearing zone is shallower, in which case the well must be at least 3 metres deep. The hole in the ground for the well must be made at least 7.6 cm wider than the well casing to a minimum depth of 6 m. This space

must be completely filled with a suitable sealant, such as bentonite.

• **Following construction, the well contractor must:**

- provide the well owner with a one-litre sample of well water for visual examination,
- measure the well depth in the presence of the well owner, and
- notify the well owner if there is sand in the well, if mineralized water or natural gas is encountered, and provide the well owner with an information package.

The well contractor is required to continuously pump water from the well for at least one hour. The well contractor must record the rate at which water is pumped from the well, measure the water levels in the well during pumping and then measure the water levels for at least one hour after the pumping has stopped. The information must be recorded on the Well Record. The well contractor will then recommend a pump setting, depth and pumping rate.

Within two weeks of completion of the well, the well contractor must deliver a copy of the Well Record to the owner. This is the official document filed with the Ministry of the Environment that gives the well's location and the details about its original construction and test pumping rate.

The well contractor is also required to place a stainless steel well tag obtained from the Ministry of the Environment on the well.

### **Construction requirements (test holes, dewatering wells)**

Regulation 903 applies to test holes and dewatering wells. There are, however, a number of regulatory exemptions and additional provisions that also apply to some of these non-water supply wells. Please refer to the complete regulation for specific requirements.

### **Well contamination**

One of the common causes of well contamination is failure to properly seal the annular space (the space between the well casing and the hole in the ground). One of the most common materials used for sealing this space is a bentonite slurry.

The connection where the waterline passes through the side of the well casing must be watertight if it is made below the ground surface. The method of use varies from a commercially manufactured pitless adaptor or sanitary well seal to durable sealing materials or a T-joint for sand points. Where a pump connection is made through the top of a casing in a drilled well, a commercially manufactured vermin-proof well cap is required.

Any outside excavation when making a below ground connection to the well casing must be filled with suitable sealant extending from the casing a minimum distance outward of 20 cm and extending from the bottom of the excavation to within 20 cm of the ground surface.

Most properly constructed wells require ventilation to allow air into the well casing for proper operation of the well and pump.

It is important to ensure that wells that emit natural gas are vented to the outside atmosphere to avoid the risk of explosion, fire or other safety risks.

### **Maintenance**

Once the well is constructed, it is the well owner's responsibility to maintain it in a manner that will prevent the entry of surface water and other foreign materials that are likely to contaminate the well and the aquifer.

### **Abandoning a well**

The Wells Regulation contains new provisions for abandoning a well. Please refer to the complete regulation for specific requirements. Wells must be properly abandoned if they are dry, mineralized, not being used, or not being properly maintained. Wells that produce unpotable water must be abandoned unless the well owner has sought and followed the direction of the Medical Officer of Health.

Wells may also have to be abandoned if it is determined that natural gas poses a potential hazard or if well construction standards have not been followed.

Abandoned wells are required to be plugged with a continuous column of an abandonment barrier that is compatible with the quality of the water found in the well from the bottom of the well to approximately 2 metres below the ground surface. The well must be sealed at the ground surface by placing 50 cm to 150 cm in vertical thickness of bentonite chips, pellets, granules or powder and the remainder of the well opening to ground

surface must be filled with soil cover. Wells greater than 65 cm in diameter must be plugged with an abandonment barrier strong enough to support the weight of person or vehicles that may move over the area.

The well contractor is also required to remove and return the stainless steel well tag, if one is present, to the Ministry of the Environment within 30 days after removal.

A well record must be completed and submitted to the Ministry of the Environment for well construction, abandonment and alteration including a well tag replacement.

### **Additional information sources**

You can obtain a copy of Regulation 903 from the e-Laws Web site at [www.e-laws.gov.on.ca](http://www.e-laws.gov.on.ca) or by calling Publications Ontario at **1-800-668-9938**. The following information sheets are available from the Ministry of the Environment's Web site or by calling its Public Information Centre:

- The protection of water quality in drilled wells
- The protection of water quality in jetted or driven point wells
- The protection of water quality in bored and dug wells
- Managing your water well in times of water shortage

For further information about wells contact the Water Well Help Desk at **1-888-396-9355** (Toll Free in Ontario) or your nearest Ministry of the Environment office listed in the blue pages of your telephone directory.

You can also call the ministry's Public Information Centre at **1-800-565-4923** or **416-325-4000** or visit the ministry's Web site at [www.ontario.ca/environment](http://www.ontario.ca/environment).