

Green Facts

The protection of water quality in jetted or driven point wells.

The purpose of the Green Facts sheet is to assist people who rely on jetted or driven point wells for their water to achieve good water quality. Improper well construction or failure to carry out routine preventive maintenance on a well site may result in contaminated water. In 2003, Ontario updated its regulatory requirements for water well siting, construction, maintenance and abandonment to better protect well users and groundwater resources.

Ontario's Well Regulation (Reg. 903 under the Ontario Water Resources Act) requires well contractors and well technicians who install sand points and the associated pumping equipment to be licensed by the Ministry of the Environment. The regulation also prescribes the minimum construction standards that all well contractors and well technicians, including private homeowners, must meet.

The regulation also states that "the well owner shall maintain the well at all times after the completion date in a manner sufficient to prevent the entry into the well of surface water or other foreign materials."

Driven and jetted wells are sometimes called sand point wells, because they are usually constructed in sandy soils. Although new sand point installation or upgrading work can be done by a private well owner working on their own property, employing a licenced well contractor is strongly advised to ensure that proper minimum well construction standards are met and protection of the water supply is achieved.

Factors contributing to the deterioration of well water quality

Jetted or driven point wells are particularly vulnerable to contamination for two reasons. First, they are often used to reach shallow aquifers, in the past sometimes as little as three metres beneath the surface (although a driven point or jetted well could extend much deeper into the aquifer),

increasing the likelihood of contaminants reaching the screened portion of the sand point. (Note that three-metre jetted or driven point wells are no longer allowed; the minimum is now six metres.) Second, there is seldom a good seal between the sides of the narrow bore hole around the top of the well casing.

In Ontario, driven point wells are constructed by forcing a pointed well screen, attached to sections of pipe, into the ground using a hammer, maul or percussion equipment. A jetted well is constructed using a high pressure water jet directed through the end of the point to cut or erode away the ground material. Fine particles are washed up and out of the bore hole.

Both driven and jetted wells are typically narrow; the piping that serves as the well casing is usually less than seven centimetres in diameter for water supply wells. These construction methods are not generally suitable for constructing a well through hard rock, heavy clays or rocky soil where boulders could damage the screen.

Because jetted and driven point wells have such a narrow diameter, there is little room for conventional pumping equipment to be installed inside the well casing. Instead, the casing acts as the pump riser (and therefore has to be a watertight line) and a suction pump is usually located in the building that is being supplied with water. As a result, the casing does not normally extend to the surface of the ground.

A poorly maintained or constructed well can result in the bacterial and/or chemical contamination of its water. Two of the most common causes of contamination are foreign materials and surface water travelling down the well (or the space between the well casing and the bore hole) to the aquifer, and improper activities directly over top of the buried well.

This type of well must be located at least 30 metres from a source of pollution because it does not have a minimum of six metres of watertight casing from the ground surface. Indicators that surface contamination may be gaining access to the well include:

- presence of coliform bacteria in counts exceeding recommended limits set by health authorities;
- changes in the quality of the water, such as turbidity, colour, taste or odour, especially after a rainstorm or snow melt;
- settlement of soils over the top of the well casing;
- the presence of biological material, such as animals, insects or roots; or
- changes in the chemical quality of the well water detected through laboratory analysis.

Preventive maintenance measures

Well owners should be aware of the measures that should be taken for the care and maintenance of a well to ensure it provides good quality water. The following is key.

Protect against contamination

To safeguard a well supply, do not do anything near the well that might result in contamination. Do not store, use or dispose of refuse, manure, petroleum products, salt, pesticides, paint or any other potential contaminant in the vicinity of the well. When mixing pesticides or paints, the water supply line from the pressure system should be equipped with a backflow device to prevent water from flowing back down the well.

Watch for signs of damage

A permanent marker should indicate the location of the well.

Any space outside the casing must be filled with a suitable sealant, such as a bentonite slurry for jetted point wells. This will prevent surface water runoff from seeping directly into the well around the casing. Where settlement of the sealant has occurred, call a well contractor licensed to work on your type of well.

If the general land surface around the well is depressed or susceptible to flooding, it must be raised and regraded so that it slopes away from the well. The extension above the well casing should then be raised to the level of the regraded ground surface.

The connection of the water line to the casing should be made by a buried T or elbow joint.

All wells that have been repaired must be chlorinated. It is strongly recommended that the well water be tested for

potability immediately after the work has been completed and confirmed safe to drink before the water is consumed.

Anyone hired to connect pumping equipment to a well must be the holder of a Ministry of the Environment-issued Well Technician Licence, Class 4 Pump Installation.

Anyone installing sand points is required to complete and submit a Well Record.

All abandoned wells must be plugged and sealed in accordance with the Wells Regulation.

Additional information sources

You can obtain a copy of Regulation 903 from the e-Laws web site at 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 (see below):

- The protection of water quality in drilled wells
- The protection of water quality in bored and dug wells
- Important facts about water well construction

For further information about wells contact 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. The ministry's web site is at www.ene.gov.on.ca.