

## Well Construction, Water Quality and Use

A sustainable water supply is critical for any farm operation. Groundwater is an important source of water on many farms in Nova Scotia, but the pumping rate, mineral quality and the expense of construction can make surface water supplies a preferred option in various areas of the province. A Nova Scotia Environment (NSE) publication, *Before You Construct a Water Well*, provides valuable information on planning a water supply and the components for both types of water systems.

In Nova Scotia, under the *Well Construction Regulations*, anyone constructing or repairing a water well must have a certificate of qualification from NSE. A searchable list of currently certified well drillers and diggers is available on the NSE website at: <http://www.novascotia.ca/nse/cms/Search.asp>.

For existing wells, individual well logs are available from any NSE office or the *NS Well Logs Database* is available on-line: <http://novascotia.ca/nse/groundwater/welldatabase.asp>. The database provides information on more than 100,000 water wells in the province, including information on well locations, geology and well construction, well depth and yield.

### Pitless well construction

In the past, it was common to cap a drilled well below ground. Many wells had a well pit to gain access to well pipe connections below the frost line. However, well pits are generally unsanitary and could allow surface water and possible contaminants into the well through a worn or damaged cap seal.

Pitless well construction greatly reduces the possibility for contaminated water to enter the well. A pitless adaptor (Figure 1) is also less expensive to install than a well pit. It is attached to the well casing to provide a sanitary and frost-proof seal between the casing and the water line running to the barn or house. Water from the well is diverted horizontally at the adaptor to prevent it from freezing. This device permits convenient access to the well and well components without having to dig around the well.

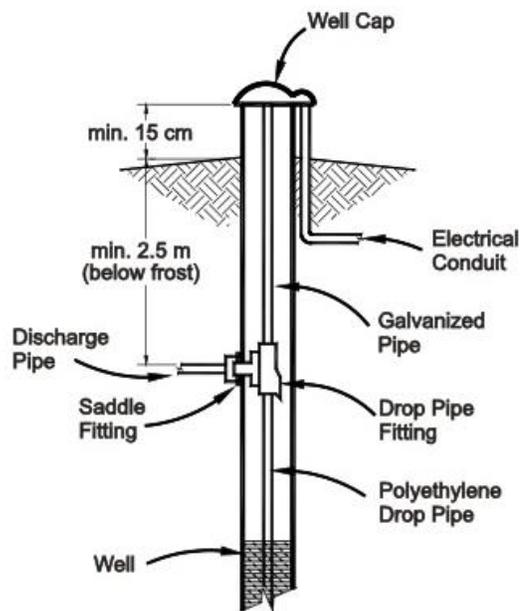


Figure 1: Pitless adaptor for a drilled well

Repairs and maintenance to a drilled well can result in bacterial contamination. Disinfection should be performed following any such work since bacteria can persist for long periods in a drilled well. A *Disinfection of Water Wells by Chlorination* factsheet is available from NSE or on the EFP website.

### Importance of Water Testing

Bacterial contamination of a water supply has the potential to seriously impact the health of livestock and humans who consume the water. Bacteria can also be an indicator that the water supply may be susceptible to contamination from other sources such as pesticides or fertilizers. Therefore, it is important to test water quality for bacteria on an annual basis to ensure that the water supply for the farm is safe to drink. For farms participating in an on-farm food safety program (i.e. CanadaGAP), testing may be required more often. Typically, on-farm food safety programs only require bacteria testing to be completed. Mineral quality, including nitrate, should also be tested every two years. Water results should be within the Canadian Drinking Water Guidelines for nitrate, total coliform and *E. coli* bacteria (Table 1).

**Table 1: Canadian Drinking Water Guidelines for human consumption**

Total coliform	.....	Absent
<i>E. coli</i>	.....	Absent
Nitrate	.....	Less than 10 mg/L

Water sample bottles are available at the regional Agricultural Resource Coordinator offices. Check with NSDA staff in your region for sample drop off times and delivery options.

### Water Quality

Nova Scotia Environment has produced *The Drop on Water* factsheet series. These factsheets provide information on different water quality parameters, such as bacteria and chemicals, that may be present in well water, as well as general information to protect drinking water supplies. The series is available at: <https://novascotia.ca/nse/water/thedroponwater.asp>.

Also available is a new Drinking Water Interpretation Tool on the NSE website. The tool allows you to compare your drinking water sample results to Health Canada drinking water quality guidelines and also provides links to additional sources of information: <https://novascotia.ca/nse/dwit/>.

### Water Withdrawal Approvals

Under the *Environment Act*, a water withdrawal approval is required if a water withdrawal exceeds 23,000 L (5060 gal) per day from any one water source for a period of more than two weeks. As an example, an inch of water applied to an acre of land amounts to 102,789 L (22,610 gal) of water; over 4 times the daily withdrawal limit. To obtain a water withdrawal approval, farmers are required to submit a completed application form and supporting documentation. Contact your local NSE office to discuss the water withdrawal approval process. NSE also has additional information and applications available on-line: <http://www.novascotia.ca/nse/water/withdrawalApproval.asp>.