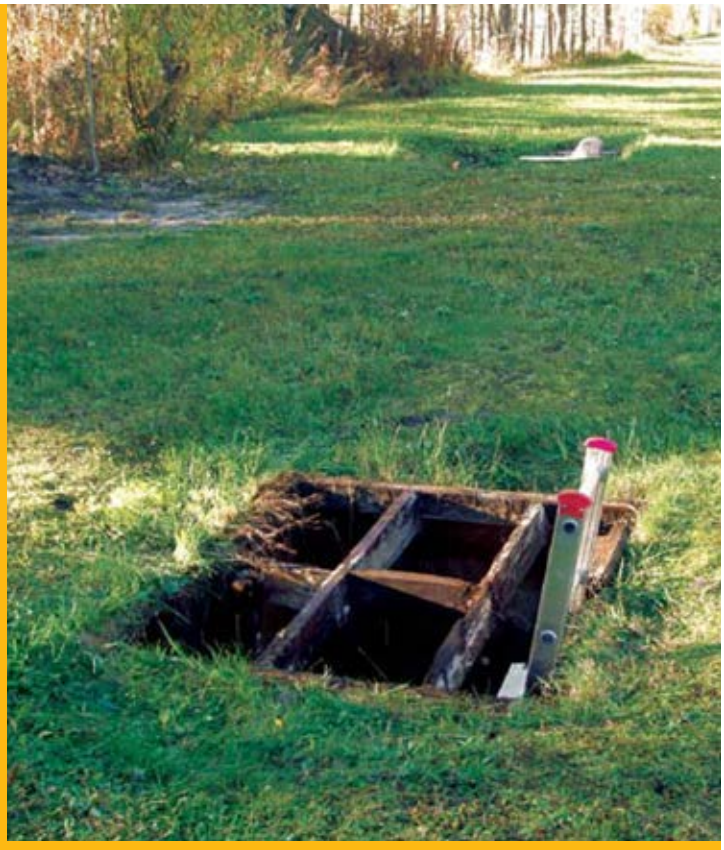
Upgrading Wells In Pits

Water Stewardship Information Series

BRITISH COLUMBIA

Ministry of Environment and Climate Change Strategy



The purpose of this brochure is to provide information to individuals who own a well(s) located inside a pit on why wells in pits should be upgraded, who can upgrade wells in pits and how upgrading can be done.

Why are wells located in pits?

Historically, well pits were commonly used to protect water line connections from freezing. A well pit is basically a large cribbing placed over the top 6-8 feet (1.8 to 2.4 meters) of the well. The well casing is cut off just above the base. Cribbing can be a square wooden structure (see Figure 1) or a circular metal structure (see Figure 2). It was common practice in the past to construct a large pit around the well to provide access to the underground water line connections below the frost line.

Figure 1. Well pit with wooden cribbing

Figure 2. Well pit with metal cribbing

Why should wells in pits be upgraded?

Wells inside pits are often flooded which can cause surface water to carry debris, bacteria, pesticides, fertilizers or oil products into your drinking water supply (see Figure 3). Mice, rodents, frogs and bugs can also enter the well pit and fall into the well.

In addition to the water contamination hazard, anyone entering the pit without proper safety gear may risk asphyxiation due to the lack of oxygen and/or the presence of other gases such as carbon dioxide. Methane, an inflammable gas, can also accumulate in the bottom of the pit and cause an explosion.

Figure 3. Water and debris in well pit

Who can upgrade a well in a pit?

Under the *Water Act*, any alteration to a well, including upgrading a well in a pit must be done by a qualified well driller. Installation or repair work on the well pump must be done by a qualified well pump installer. The registry of qualified well drillers and qualified well pump installers in British Columbia can be found at: https://apps.nrs.gov.bc.ca/gwells/registries

Any worker in a well pit must follow WorkSafeBC rules for confined space entry and have the appropriate training, experience and equipment.

How can a well in a pit be upgraded?

A qualified well driller or qualified well pump installer with confined space entry training must be hired to do this work. Each well pit situation may be different and should be assessed. In some instances it may be best to replace the well due to its location, age and condition. Typically, the general procedure for upgrading is as follows:

1. Turn off the power to the pump before any work begins. Disconnect electrical wiring and associated piping and remove the pump from the well.
2. Remove the well pit cribbing using a backhoe or other appropriate equipment (see Figure 4). Any work involving an open excavation must comply with WorkSafeBC regulations related to excavation and construction safety.

Figure 4. Well pit cribbing being removed by a backhoe

Figure 5. Well casing extended above ground level

3. First, check the type and condition of the well casing. If the casing is metal remove any corroded sections and extend the well casing to at least 12 inches (0.30 meters) above the finished ground level (see Figure 5) by threading or welding a metal casing extension to the existing well casing. If the existing casing is PVC, solvent weld the PVC casing extension to the existing casing. In areas where snow accumulates, a stick-up height of 24 to 36 inches (0.6 to 0.9 meters) is considered a more appropriate height. Alternatively, use a pitless connector or rigid coupler to join the existing well casing to the casing extension. Ensure all new casing joints are water tight. Protect PVC casings from damage caused by impact and sunlight.
4. Install a pitless adapter (see Figure 6) onto the new extended casing to provide a sealed waterline entry at a depth that will protect water lines from freezing. The pitless adaptor should be constructed of corrosion resistant materials such as brass (see Figure 7). Reinstall the pump and any associated piping, including a conduit for electrical works.

Figure 6. Pitless adapter works. installed below frost line

Figure 7. Pitless adapter

5. Fill the excavation hole with materials that have a lower permeability than the surrounding soil. i.e., do not fill the excavation with drain rock or pea gravel. Compact the fill. The well casing and extension must be kept vertical and inline at all times to ensure the pitless unit is not damaged or dislodged. Install a surface seal to prevent contaminants from the surface or the shallow subsurface zone from entering the well by either compacting bentonite around the extension joint and pitless adapter or placing a sono-tube around the upper casing and filling the sono-tube with a bentonite mixture. Grade the area around the top of the well in a manner that ensures adequate surface drainage away from the well and the wellhead is protected from damage (see Figure 8).

Figure 8. Grading around well head to protect well

6. Securely attach a vermin-proof and tamper-resistant well cap or lid to the casing to prevent the direct and/or unintended entry of persons and animals into the well (see Figure 9). Ensure the well cap or lid is sized to fit securely onto the well casing and should be vented to the atmosphere. Screen the open end of the air vent to prevent the entry of any insects or debris into the well. Use a check valve type of air vent to prevent flood water from entering the well in flood prone areas. Seal openings for electrical conduits entering the well.

Figure 9. Secure well cap

7. Disinfect the well and plumbing system before using the water. A procedure for simple chlorination can be found at https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/water-wells/bc_gov_5402_water_well_disinfection_webbrochure.pdf. Collect a water sample and have it tested for bacteria to ensure the well water is safe to drink. Look in the yellow pages of your telephone book under "Laboratories, Analytical" to find a laboratory to test your well water.

For further information

For further information on whether the well water is safe to drink, contact your local Health Authority (see listings in your local phone directory).

A registry of qualified well drillers and qualified pump installers can be found at: https://apps.nrs.gov.bc.ca/gwells/registries

For further information on WorkSafeBC requirements for confined spaces go to https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-09-confined-spaces

For further information on the Ground Water Protection Regulation go to https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/laws-rules

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The BRITISH COLUMBIA GROUND WATER ASSOCIATION
GROUND WATER DEVELOPMENT

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