



Best Practices for Dug Wells

A DUG WELL IS NOT TYPICALLY RECOMMENDED; however, in some instances a dug well can provide water where it is limited and a shallow aquifer is the only source. The purpose of this brochure is to provide home owners and contractors with best practices for dug water supply wells.

WHAT IS A DUG WELL?

Dug (or excavated) wells are shallow, typically less than 15 m (50 ft) deep and 1 m (3 ft) wide (see Figure 1). They are relatively inexpensive to construct as they are commonly dug using excavators, backhoes or power shovels. Unfortunately, the shallow depth of a dug well makes them vulnerable to contamination and susceptible to lowered water levels from drought, neighbouring well interference, and local changes in drainage.



FIGURE 1 A typical Dug Well

HOW DO I CHOOSE A LOCATION FOR MY DUG WELL?

To minimize water quality and quantity impacts, dug wells should be at least 3 m (10 ft) deep and sited away from surface water sources. Surface water can carry contaminants from the land surface into your well and the aquifer. Check with your local government about setbacks for construction of wells near streams, lakes and wetlands.

A new water supply well needs to be at least 15 m (50 ft) from an existing water supply well, unless the same person owns both wells and only one new well will be constructed, or if the existing well is not in use/intended for use in the future. The Health Hazards Regulation requires wells to be sited away from possible sources of contamination; at least 6 m (20 ft) from the nearest building, 30 m (100 ft) from any probable source of

contamination (e.g., septic tank or drain field, storage of chemicals including paints and pesticides, animal manure, parked cars, etc.), and 120 m (400 ft) from a cemetery or dumping ground (see Figure 2).

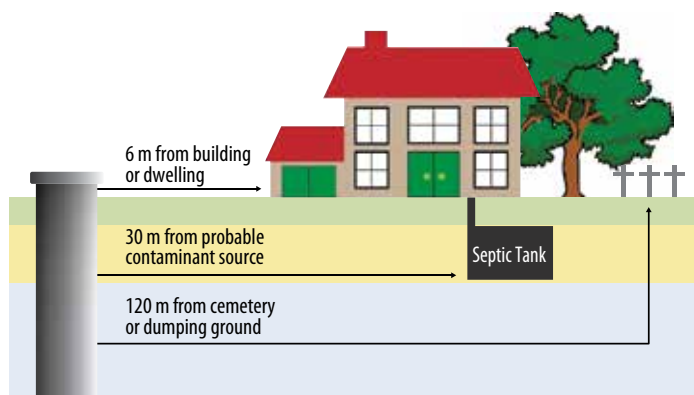


FIGURE 2 Regulated setbacks from potential contamination sources

HOW DO I PROPERLY CONSTRUCT A DUG WELL?

Anyone can construct a dug well less than 15 m (50 ft) deep; any deeper requires a registered well driller. However, the person constructing the well must be familiar with and follow the construction standards in the Groundwater Protection Regulation (see Figure 3):

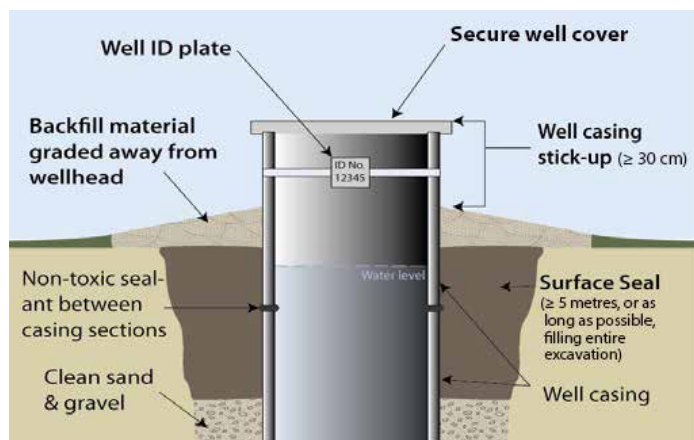


FIGURE 3 Properly constructed dug well

- ▶ **WELL CASING STICK-UP:** prevents flooding of the well. The stick-up must be at least 30cm (1 ft) above the ground (see Figure 4). It is recommended that all openings in the casing (e.g., seams) be sealed with a non-toxic sealant suitable for potable water.
- ▶ **SURFACE SEAL:** prevents contaminants from moving along the outside of the casing into the aquifer. The surface seal must fill the entire excavation around the well and be made of low-permeable materials, like bentonite clay, available from many building suppliers. The seal must be at least 2.5 cm (1 in) thick and, for water supply wells, 5 m (15 ft) long or the greatest possible length in wells less than 5 m deep.
- ▶ **SECURE WELL CAP AND COVER:** prevents the direct and unintended entry of contaminants, persons or animals into the well.
- ▶ **GRADED WELLHEAD AREA:** reduces the potential for contamination by directing water away and preventing it from ponding around the wellhead.
- ▶ **SUBMIT WELL CONSTRUCTION REPORT:** the person who constructs or decommissions a well must complete a well construction report or a well decommission report (see the “How do I submit a well report” section of this brochure for details).
- ▶ **WELL IDENTIFICATION PLATE:** allows the well to be easily identified. This metal ID plate must be visible and securely attached to the well or nearby post, pump house or building (ID plates are issued after the submission of well registration or well construction reports).



FIGURE 4
A 60 cm stick-up

- ▶ **WELL PUMP:** must be installed by a registered well pump installer.

HOW DO I SUBMIT A WELL REPORT?

Well construction reports provide valuable information about groundwater and how it is used in your area. The Groundwater Protection Regulation requires a well construction report to be completed by the person responsible for constructing the well and a copy must be submitted to the Comptroller and to the well owner.

You can view well records in the GWELLS application at: <https://apps.nrs.gov.bc.ca/gwells/>.

WHAT IS A SECURE CAP AND COVER FOR A DUG WELL?

An improperly capped well is more vulnerable to contamination and presents a safety hazard (see Figure 5). The Groundwater Protection Regulation requires all wells be fitted with secure, vermin-proof well caps or covers to prevent the direct and unintended entry of contaminants, persons or animals into the well. Caps for dug wells are usually concrete or metal sheeting and can either be purchased at a local building supply store or custom made (see Figure 6).



FIGURE 5 Improperly capped wells



FIGURE 6 Secure well caps

HOW CAN I MAINTAIN OR IMPROVE AN EXISTING DUG WELL?

Dug well owners are responsible for maintaining their wells and assessing whether they are susceptible to contamination due to their location or condition. A dug well should be properly decommissioned and replaced if it is located near a probable source of contamination (e.g., a septic tank or drain field), if the yield or water quality is poor, or if the casing is in poor condition or made of wood or stone cribbing. Otherwise, there are several ways to maintain or improve an existing dug well (see Figure 7 for some common dug well problems):



FIGURE 7 Common dug well issues

- ▶ **REPAIR OR REPLACE WELL CASING.** If cracks are visible in the well casing or if water is seeping into the well through the casing (see Figure 8), excavate around the well to repair or replace the casing. Extend the casing 30 cm (1 ft) or more above the ground surface. Seal all openings in the casing with a non-toxic sealant suitable for potable water.
- ▶ **REPAIR OR INSTALL SURFACE SEAL.** Holes or depressions around the wellhead may indicate an improper or non-existent surface seal. The owner of a well with a surface seal is required to maintain the integrity of the seal and repair it, if it is damaged. The owner of a well without a surface seal may want to consider installing one. To repair or install a surface seal, excavate at least 30 cm (1 ft) out around the casing and to the required minimum depth of 1 m (3 ft), or as deep as possible. Fill the entire hole using a low-permeable sealant, like bentonite or properly compacted clay, and then grade the wellhead area to direct surface run-off away from the wellhead.
- ▶ **INSTALL OR REPLACE WELL COVER.** A dug well must have a secure well cover that prevents entry of water and foreign matter, such as insects and debris.
- ▶ **RE-GRADE WELLHEAD AREA.** If water is ponding around the wellhead, grade the ground area around the well to direct surface run-off away from the wellhead.
- ▶ **CLEAR WELLHEAD AREA.** Ensure an area of at least 3 m (10 ft) around the well is clear of all debris and hazardous materials (e.g., gas cans, fertilizers).



FIGURE 8 Water able to seep into well through the casing

WHAT CAN I DO TO MAKE SURE MY WATER IS SAFE?

Well location is a major factor in well water safety (see Figure 2). Wells must not be too close to potential sources of contamination (see Figure 9). Do not use your well for dumping, storing or mixing materials; it may impact the quality of water in your well, nearby wells and the aquifer.

Regular testing of well water by an analytical laboratory is important for dug wells since they are susceptible to contamination. The Ministry of Health recommends that drinking water from dug wells be treated by disinfection, especially after any work is done on the well, such as casing or surface seal repair. For increased safety, a filtration system could be added. For information on the health and safety requirements of your well contact your local Health Authority or refer to the "Care for and Maintain Your Water Supply Well" link at the end of this brochure and open the "Disinfect a Well" link.



FIGURE 9 Dug well (in well house) near culvert & busy road

WHAT CAN I DO IF I HAVE A DUG WELL THAT IS NO LONGER IN USE?

Unused wells that are not properly deactivated or decommissioned pose a threat to an aquifer's water quality. A well not in use for 5 years must be deactivated, or decommissioned. If a well is deactivated for 5 years, at the end of that period it must be decommissioned. It is illegal to fill a well with garbage or junk. To deactivate a well, a secure cover must be installed, the well pump must be taken out of operation, the well must be readily accessible for inspection purposes, and it must be maintained in a safe and sanitary condition to prevent damage to the well and to protect the aquifer.

To properly decommission a water supply well, the movement of water along the inside or outside of the well must be stopped. Any known water-bearing zones must be sealed off and the top of the well must be plugged with at least 5 m (15 ft)¹ of sealant material, or along its full length if the well is less than 5 m (15 ft) deep. If the well does not have a casing, fill the entire depth with alternating layers of sealant and backfill materials (see Figure 10). Sealant layers must be a minimum of 1 m (3 ft) thick and at maximum intervals of 6 m (20 ft) apart. It is recommended that this decommissioning method also be used for a cased well, as casings may be left in place.

Mound backfill on top of the filled well to direct water away. Anyone is authorized to decommission a dug well that is less than 15 m (50 ft) deep; any deeper requires a registered well driller or a registered well pump installer. Refer to the "Care for and Maintain Your Water Supply Well" link at the end of this brochure and open the "Decommission a Well" link.

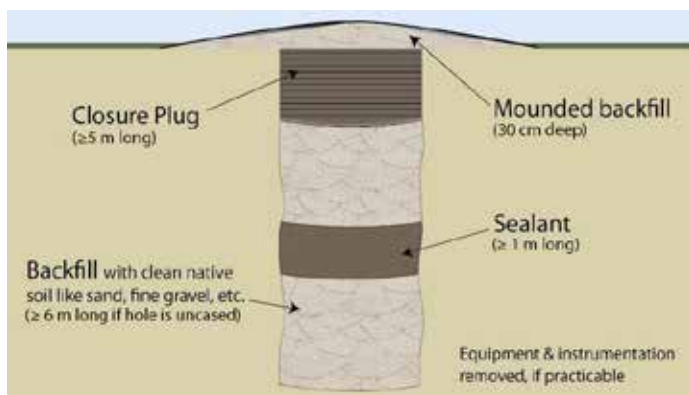


FIGURE 10 Decommissioned dug water supply well

¹ The 5 m surface seal length applies to water supply wells only.

The person responsible for closing the well must remove the ID plate (if one is attached) and complete/submit a well decommission report (see the "For Further Information" section at the end of this brochure for details).

Anyone working inside a dug well must follow WorkSafeBC rules for confined space entry.

FOR FURTHER INFORMATION

Registers of well drillers and pump installers, well registration forms, and well construction and maintenance tips: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells-aquifers/groundwater-wells/information-for-property-owners>

Well Construction Standards: *Groundwater Protection Regulation and Water Sustainability Act*: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/laws-rules>

WorkSafeBC requirements for confined spaces: <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-09-confined-spaces>

Health safety standards: contact your local Health Authority (look in your local phone directory).

Public Health Act: http://www.bclaws.ca/civix/document/id/complete/statreg/08028_01

Health Hazard Regulation: http://www.bclaws.ca/civix/document/id/complete/statreg/216_2011

Well construction/decommission reports can be downloaded at: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells-aquifers/groundwater-wells/information-for-well-drillers-well-pump-installers>, and submitted to the Ministry of Environment, GroundWater@gov.bc.ca, or PO Box 9362, Stn Prov Gov, Victoria BC, V8T 9M2.

Care for and Maintain Your Water Supply Well: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/groundwater-wells-aquifers/groundwater-wells/information-for-property-owners/care-for-and-maintain-your-water-supply-well>



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