



# Water Well Design and Construction

Your water well is one of your most important investments. Make sure it is designed and constructed properly!

## Well location

A properly located well is accessible for cleaning, testing, monitoring, maintenance and repair. The ground surrounding your well should be sloped away to prevent surface water from ponding around the casing. The well should be upslope and as far as possible from potential contamination sources. Also, it should not be located in a pit or housed in any building other than a pumphouse.

In Alberta, minimum distances are required between water wells and sources of contamination such as septic systems, manure piles and chemical or fuel storage.

### MINIMUM WELL SETBACK DISTANCES\*

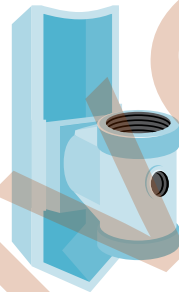
500 m (1,641 ft)	Landfill
100 m (329 ft)	Manure storage Sewage lagoon
50 m (165 ft)	Above-ground fuel tanks Sewage surface discharge
30 m (100 ft)	Manure application
15 m (50 ft)	Weeping tile septic field or evaporation mound
10 m (33 ft)	Watertight septic tank

\*Greater setback distances or other protection may be required if you have a shallow well or if there are shallow sand and/or gravel deposits on your property.

## Pitless adaptors

Well pits for new wells were banned in Alberta in 1993. Well pits can allow surface water, mice or debris to contaminate your water. If you have a well pit, have a licensed water well contractor replace it with a pitless adaptor (Figure 1).

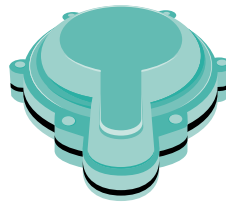
Figure 1:  
Pitless adaptor



## Vermin-proof well cap

Ask your licensed water well contractor for a vermin-proof well cap to keep animals, insects, contaminants and vandals from accessing your well (Figure 2).

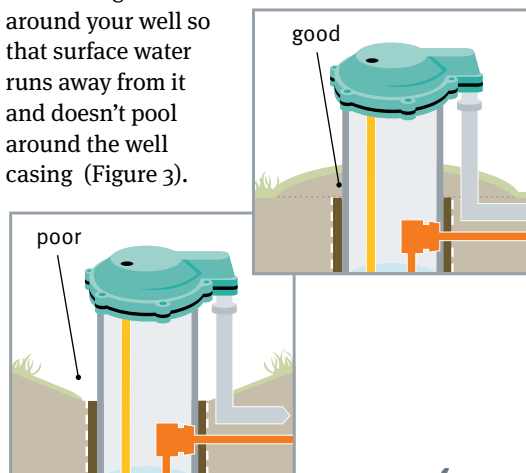
Figure 2:  
Vermin-proof well cap



## Landscaping

Grade the ground around your well so that surface water runs away from it and doesn't pool around the well casing (Figure 3).

Figure 3:  
Proper grading



## Watertight annular seal

Any space between the well casing and the borehole will allow surface contaminants to drain directly into the aquifer. This space should be tightly sealed with bentonite from the top of the aquifer all the way up to ground surface.

## Single aquifer source

A single aquifer completion eliminates intermixing of water bearing formations with different water qualities and prevents the depletion of aquifers.

## Water level monitoring

Your licensed water well contractor can provide options for routine water level monitoring such as permanent monitoring equipment or an access tube (Figure 4) for use with a hand-held measuring device (water level sounders).

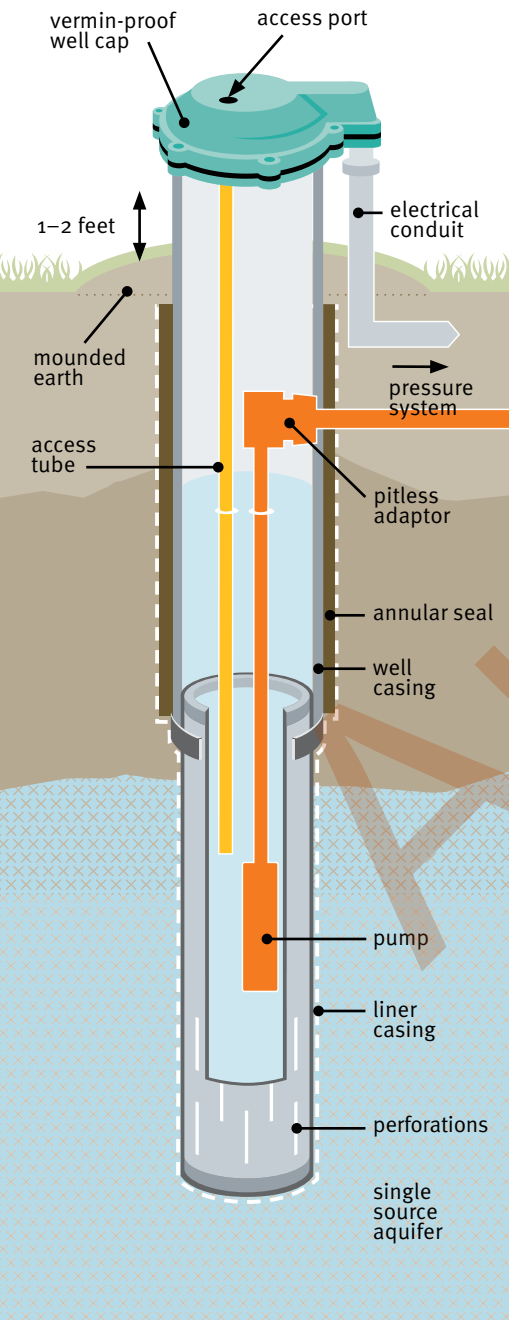
## Backflow prevention

Never install a hydrant directly on top of a wellhead; this allows potentially contaminated water to flow backwards into the well. Frost-free hydrants should be offset from a well, placed in a gravel bed to allow for proper drainage. Backflow can also occur if your water system has cross-connection(s) between several water sources. (Continued on page 2)

**WORKING  
WELL**  
Clean water.  
Well protected.



Figure 4:  
Key features of a good well



### Backflow prevention (continued)

If one source becomes contaminated, and a backflow prevention device such as a check valve was not installed, your entire water supply is at risk. You should also leave an air gap between the end of any hose connected to your water system (through a hose bib, faucet or tap) and a tank or container with pesticides, fertilizers or other chemicals. Installing a backflow prevention device such as a vacuum breaker will provide additional protection (Figure 5).

Figure 5:  
Vacuum breaker



### Pump installation

It's important to properly size the pump to your well. You must consider factors such as well yield, casing diameter, well depth, the distance from the pumping water level in the well to the final tap outlet, and your household water needs. Your licensed water well contractor can help with this.

Proper placement of the pump will extend the life of your well. The pump should be placed just above the intake portion or perforations to avoid damage to the pumping equipment, reduce the chances of pumping sediment, and to avoid drawing the water level in the well below the top of the aquifer.



When getting a new well installed, be sure to discuss proper design and construction details with your licensed water well contractor.

### FOR MORE INFORMATION:

#### Working Well

[www.workingwell.alberta.ca](http://www.workingwell.alberta.ca)

#### Water Wells That Last

<https://open.alberta.ca/dataset/716-a10>

A comprehensive water well management guide.

#### Alberta Water Well Drilling Association

<http://www.awwda.ca/>

For a list of licensed water well drillers in your area, visit the Association's website.

### CONTACT US:

#### General Questions?

Alberta Environment and Parks  
Information Centre  
Phone: 310-3773 toll free

#### Technical Questions?

Alberta Agriculture and Forestry  
Ag-Info Centre  
Phone: 310-FARM (3276) toll free