

Upgrading Your Well in a Pit

Eliminating your well pit is key to keeping groundwater supplies safe.

Well pits

In the past, it was common practice to locate water wells in pits (Figure 1) as they provided a frost free location for the pressure system and easy access to the underground water distribution lines. The well casing was cut off below ground level and the well was enclosed in a pit. Pits were generally made of wood, concrete or steel cribbing.

Provincial regulations now prohibit the construction of well pits as they increase the risk of contamination to groundwater and can be a deadly safety hazard. Although it takes time and money to properly upgrade an existing well and remove the well pit, doing so will eliminate these concerns.

Why are well pits a problem?

Well pits increase the risk of contamination to groundwater because they provide a place for water and contaminants to collect. When flooding occurs, if the water table rises, or if there is a break in the water system distribution line, water may collect inside the pit. This contaminated water could run directly into the well if it is not properly capped or if the casing has deteriorated. Water may also travel down the outside of the well if the casing is not properly sealed or if the sealing material has settled with time.

Another potential contamination risk comes from small animals and insects that find their way into well pits in search of water, warmth and food. From inside the well pit they can make their way directly into an improperly capped well and into the water you drink.

Well pits are “confined spaces” that can be a safety hazard to anyone who enters to service or repair the well. The air in a well pit can become oxygen deficient or may contain dangerous gasses that can come from the groundwater through the well. In Alberta, well pits have exploded due to the build-up of methane gas and people have died from asphyxiation after entering oxygen depleted well pits.

What is the alternative to a well pit?

The construction of well pits is no longer permitted in Alberta, but many old wells still exist in well pits. Considered sub-standard according to current regulations, landowners are encouraged to fill in existing well pits to help protect themselves and our valuable groundwater resources.

Well pits can be eliminated by relocating the pressure system, extending the existing well casing above ground level, installing

Figure 1:

A typical well pit



a pitless unit on the well casing and backfilling the pit. The pitless unit consists of a casing fitting and pitless adapter and provides a sanitary, water tight connection to the well casing where it connects the pump to the water distribution line (Figure 2). It is installed approximately 2 – 3 meters (6 – 10 feet) below ground level, for frost protection. Once this connection is made, the pit can be backfilled with clean clay and mounded at the ground surface.

Can I upgrade my well and remove the pit?

Only an experienced, qualified person with confined space entry training should be hired to do this. It is always best to hire a licenced water well contractor as they have the expertise and equipment to do a safe and proper job.

Figure 2:

Pitless adapter



**WORKING
WELL**

Clean water.
Well protected.



What is involved in upgrading a well in a pit?

Proper steps include:

1. Removing any equipment from inside the well and pit.
2. Repairing the well casing if damaged then extending it at least 60 centimetres (24 inches) above the ground surface.
3. Installing a pitless adapter onto the extended well casing. A non-obstructive type pitless adapter won't protrude inside the well casing and will allow easier access to the well for future maintenance or repair.
4. Relocating the pressure tank and switch inside a heated building.
5. Redesigning the water distribution system so the line from the pump goes directly to the pressure tank, and individual water lines go from the pressure tank to the different service points in the distribution system.
6. Sealing the outside of the original well casing with bentonite chips if there is any visible space.
7. Lining the bottom of the well pit with a layer of bentonite chips to create a seal. Removing the well pit structure and backfilling the excavation with clean, compacted clay ensuring the existing well casing and the new casing extension are kept straight. Adding a layer of bentonite chips around the pitless adapter and the water distribution line for additional protection.
8. Mounding around the well casing at ground surface with enough topsoil to ensure proper drainage away from the well and account for possible settlement over time.

9. Re-installing pumping equipment in the well and installing a secure well cap. A vermin-proof cap is recommended.
10. Disinfecting the well and water distribution system and sampling well water to be tested for bacteria.

If it is not possible to eliminate an existing pit, the well should be equipped with a water tight sanitary well seal (Figure 3), installed on the top of the casing. A sump pump should also be installed in the pit to ensure that any water entering the pit is promptly removed.

Figure 3:
Sanitary well seal



Pitless adapters provide convenient access to the submersible pump for maintenance or repair. However, to avoid injury when pulling up the pump, be sure to review the manufacturer's instructions for the specific type of pitless adapter you've had installed. Generally, a metal cable on spring-type adapters can be pulled to release the spring locking mechanism and the pump can be pulled out using the galvanized extension pipe. To avoid injury, the extension pipe must be fully supported before disengaging the pitless adaptor.



Well pits are dangerous! No one should enter a well pit without proper training in confined space entry and the appropriate safety equipment.



Always disinfect your well after any pump repairs. See the *Shock Chlorinating Your Well* fact sheet for more information.

FOR MORE INFORMATION:

Working Well
workingwell.alberta.ca

Water Wells That Last
<https://open.alberta.ca/publications/9781460143414>

A comprehensive water well management guide.

Alberta Water Well Drilling Association
<https://www.awwda.ca/>

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

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