

Protecting Your Well From Disasters

Being prepared for disaster can reduce negative impacts on your water well and help keep your drinking water safe.

Extreme weather, fire, physical damage and pollution can all have negative impacts on water wells. Do you know what to do when disaster strikes? Will your water well be affected? Being prepared and knowing what to do will help ensure your drinking water is protected.

How do I protect my well and what do I do if disaster strikes?

Flooding

Some regions of Alberta can experience significant flooding. Water wells and pumping systems that have been completely submerged by floodwater can become contaminated with harmful bacteria or hazardous materials like sewage, manure, fuel, chemicals, pesticides and fertilizers.

Preparedness: Water well casing should extend a minimum of 60 centimetres (24 inches) above the highest flood record. So, if your well is located in a pit or basement it is at higher risk. If it is located in a flood prone area, it should be equipped with a flood-proof well cap or a sanitary well seal that is vented above the highest flood record. Vermin-proof well caps (also known as sanitary well caps) have an O-ring seal that fits tightly around the well casing and a screened vent that allows the well to breathe; however, they will not keep floodwater out. In contrast, a flood-proof cap has a screened vent to allow for breathing under normal conditions but it also has an automatic vent shut-off feature that is triggered by rising floodwater. Another preventative measure is to install a backflow valve in the main water distribution line to prevent any floodwater from entering into your well.

Corrective Measures: If your well does get flooded, do not turn on the pump. Call a licenced water well contractor to assess the damage, and repair, clean and shock chlorinate the well. Before consuming the water, have it tested for bacterial and chemical contamination and get

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confirmation from your local Public Health Inspector that it is safe to drink.

Drought

Both seasonal dry spells and long-term drought can have an impact on shallow aquifers. If you have a shallow well you might experience water shortages during dry periods.

Preparedness: If you live in an area that is prone to drought or if you have a shallow well you should install a storage tank and reduce your pumping rate or haul extra water in from an alternative source to lower the demand on your well and aquifer. Avoid over-pumping your well because that can lead to numerous problems like sediment plugging, biofouling, mineral incrustation and premature well failure. See the fact sheet *Over-pumping Your Well* for more information.

Corrective Measures: If the measures you have taken do not resolve your water shortage issues, you may have to find an alternative water supply. This could include drilling an additional well into a deeper aquifer, hauling water from a municipal source or using treated surface water.

Freezing

During winter months extreme low temperatures may cause components of your water system, such as the pitless adapter or water distribution lines, to freeze. When this happens you may be left with no water.

Preparedness: Ensure all water lines are buried below the local frost level, insulated and heated, or located within a heated space like a pump house. In rare cases, some wells can “breathe” which means they blow or suck air in reaction to atmospheric conditions. If air going down the well is cold enough it could cause the water line in the pitless adapter to freeze. Breathing wells can also pose potential danger when located in enclosed spaces like well pits, basements or pump houses because they can deplete the

oxygen level in the air. For more information on breathing wells, refer to the Canadian Ground Water Association document *Water Wells that Breathe* at http://www.10704.com/pdf/hclsite/Water_Wells_That_Breathe.pdf.

Corrective Measures: Steam can be used to thaw frozen water pipes. Consult with a licenced water well contractor.

Fire

When fire occurs in close proximity to your water well, you may have issues with fire-damaged electrical wiring, pumping equipment, well casing and well cap. Toxic chemicals from melting well components, as well as fire-suppressant materials, can contaminate your water. Emergency vehicles can also inadvertently cause physical damage to the structural integrity of the well casing. Damage to the wellhead can create a pathway for surface water and sediment contamination. The loss of vegetation and soil layers around your well increases the potential for soil erosion and the likelihood of sediment and surface water entering into your well.

Preparedness: Be pro-active. Protect your well by developing a FireSmart plan for your property. For more information visit <https://wildfire.alberta.ca/firesmart/default.aspx>.

Corrective Measures: If your well is damaged by fire, contact a licenced water well contractor to assess the damage and repair the well. Before consuming the water, have it tested for bacterial and chemical

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contamination and get confirmation from your local Public Health Inspector that it is safe to drink.

Power Outages

Usually caused by extreme weather events, such as tornado, lightning, high winds or ice storms, power outages can be a nuisance and disrupt your water supply. Depending on the cause, power outages can last hours, days or even weeks.

Preparedness: Having an Emergency Preparedness Kit and a backup power supply, such as a generator, are key to being prepared for this kind of event.

Corrective Measures: Use a backup generator to supply power to your well and water distribution system, including any heating or freeze-protection components.

Physical Damage

Damage to your well can often be caused by accidental collision from vehicles, farm or construction equipment. Loss of structural integrity of your well, such as a cracked casing or broken well cap, can create a pathway for surface water and sediment to contaminate your well.

Preparedness: When drilling a new well, locate it in an area where there is minimal traffic, ensure it is well marked and clearly visible, and protect it from collision. PVC casing must be protected at surface by steel casing that is firmly anchored into the ground. Regularly inspect your well for signs of damage.

Corrective Measures: If you suspect physical damage has occurred, contact a licenced water well contractor to assess and repair the well.

Spills

Hazardous materials spilled on the ground surface may lead to contamination of your water well. This may occur due to a compromise in the well's casing or annular seal creating a direct pathway for contamination or spilled materials could slowly seep down through the layers of soil and rock materials that sit above your aquifer and contaminate your water

supply. Fuel and chemical storage sites, plus storage and application of pesticides, fertilizers and livestock manure are all examples of potential contamination sources.

Preparedness: Follow all regulations and best management practices regarding proper storage of hazardous materials and have an emergency spill kit on hand. Your well site should always be kept in a sanitary condition and regular inspections should be done on both your well and hazardous material storage sites.

Corrective measures: If a spill or leak has occurred, immediately contain the hazardous material to prevent further contamination. The contaminated material and soil must be collected and disposed of in accordance with Alberta Environment and Parks guidelines. For more information and to report a spill, contact 1-800-222-6514.

An emergency spill kit can be purchased from emergency and safety supply companies or you can build one yourself. It should include personal protective equipment (PPE), appropriate chemical absorbent, disposal bag and tie, emergency procedures and a shovel.

How will I know my water is safe to drink after a disastrous event?

Before using your well, contact a Public Health Inspector at your local Community Health Centre for advice on water quality testing of your well water. For a list of local health units, visit: <https://myhealth.alberta.ca>. Depending on the type of disaster there may be different water quality concerns – coliforms, E. coli, hazardous materials or toxic chemicals.

The Health Inspector will assist you in interpreting test results and advise you on corrective measures to take, if needed, such as shock chlorination, well repair or replacement. Do not drink your water until you are told it is okay to do so.



No matter what disaster occurs, an emergency preparedness kit is vital. The kit should include items like a three-day supply of food and potable water, prescription medicines, radio, flashlight and batteries, first aid kit and personal hygiene supplies.

FOR MORE INFORMATION:

Working Well
workingwell.alberta.ca

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

Beneficial Management Practices: Environmental Manual for Alberta Farmsteads
<https://open.alberta.ca/publications/beneficial-management-practices-environmental-manual-for-alberta-farmsteads-2018-edition>

Testing Your Water After Your Well has Flooded
<https://myhealth.alberta.ca/Alberta/Pages/Testing-your-water-after-your-well-has-flooded.aspx>

Emergency Preparedness Guide
<http://www.getprepared.gc.ca/cnt/rsrscs/pblctns/yprprdnssgd/yprprdnssgd-eng.pdf>

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