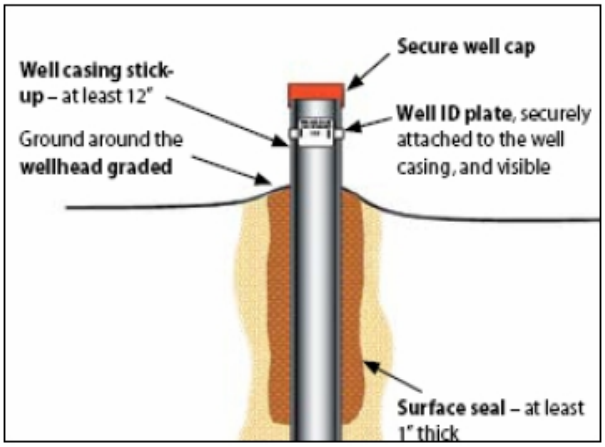
Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada | British Columbia The Best Place on Earth | Ministry of Environment | The British Columbia Ground Water Association

Water Stewardship Information Series

Water Wells – What to Do Before the Flood

Water wells and groundwater can be contaminated during flooding events due to the inflow of flood waters into the water well or aquifer. Flood water is often contaminated by livestock wastes, herbicide/pesticide residues, sewage (from the overflow of domestic septic systems) or other contaminants. While there are techniques which can be used to rehabilitate a well affected by surface flood water, there are steps which a well owner should follow before flooding to minimize any potential impacts. Here is a quick checklist for reducing the risk of flood water contamination of your water well:

1. Ensure that the land surrounding the well is sloped away so that surface water flows away rather than towards the well. This may involve extending the well casing above ground level. It is generally recommended that well casings extend at least 30 cm above ground



2. If possible, extend the well casing to above the anticipated flood level. A registered water well driller should be contacted to assist with this work.

3. You may also need to consider protecting the area over the water line between the well and the house with sand bags as a recent or improperly backfilled trench may provide a flow path for the flood water to the well casing.

4. You should ensure that the integrity of the surface seal outside the casing is maintained and in good shape. Check that there has been no settling of the soil or a cavity developed around the outside of the well casing where surface water is able to flow down. A local water well driller can provide information on commercial sources for fine bentonite chips which can be used to make an impervious seal around the well casing (some digging may be required to ensure the seal is installed to as deep as possible).

Photo Credit: Ontario Ministry of Environment

5. Well pits <u>significantly</u> increase the risk of well contamination as they provide a place for water and accompanying contaminants to collect. During flooding, well pits require special protective measures (e.g. cover with plywood and tarp, and secure with sandbags), but <u>even</u> <u>then they would still pose a very high risk of water well contamination</u>. To permit continued and safe use of an existing well located in a well pit, the well casing can be extended above ground level and a pitless adaptor added to allow distribution of the water. The pit can then be backfilled with low permeability backfill material (e.g. clay) that is mounded above the ground surface and around the extended well casing. A registered water well driller should be contacted to assist with this work. If insufficient time is available to carry out this work before the flood, it should be a priority after the flood.

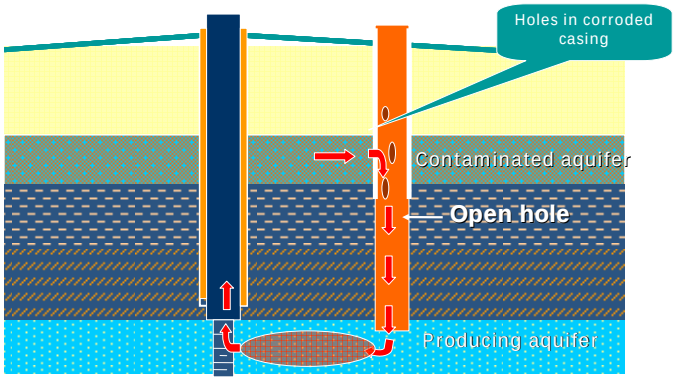
6. Ensure the well has a tight fitting water proof cap. Most wells have caps with vent holes which are required for proper operation. If the well is not used for the duration of the flood event then these vent holes should be plugged. To further reduce risk (again, no guarantees), you can carefully wrap the cap

and well casing with durable sheet plastic and duct tape to form as tight a seal as possible. Sand bags can be placed around the well to protect the well and plastic from debris. When sealing the well cap and protecting the well, remember that any sealing material will need to be removable in order to allow future servicing of the well.

7. To reduce the risk of contamination, ensure that livestock wastes, fertilizers and pesticides are removed from the flood prone area and that household septic systems are pumped empty prior to the onset of flooding. Caution is required when emptying fibreglass or plastic septic tanks that are not anchored. They should be refilled with clean water to prevent floating under high water table conditions. You should also consult other flood preparedness tip sheets for other measures you should take on your farm "before the flood".

8. Raise or remove any non-submersible mechanical or electrical equipment that is installed in a pit as it may be at risk from surface flooding or a rising water table. Turn the electricity off to your well pump just prior to the flood.

9. Ensure that any stand-by or abandoned (unused) wells in the area are also protected. Any abandoned well is an environmental liability and should be permanently sealed to ensure it will not act as a point source of groundwater pollution now or in the future. Flood waters entering an abandoned well can contaminate your active well and the aquifer that you and your neighbours draw water from. Again, if not enough time to do this now, it should be a priority "after the flood". Plugging of abandoned wells must be done by a registered well driller.



10. Ensure that backflow prevention valves are in place on all hydrants or outside taps. If the well is community well, the well should be assessed for risk of contamination or damage from flooding and upgraded before the flooding event if possible.

There is no guarantee that, even if you follow this checklist, you will not have problems with your well water quality after the flood. It is important that you disinfect your water well after the flood, and then pump your well, and sample and test the well water (at least for total coliform bacteria) before using it for domestic water supply. Boil your drinking water until you are sure it is safe for consumption.

For complete details on how sample and test to ensure your water supply is safe and how to disinfect your well, please contact your local Health Authority and/or refer to their FACTSHEETS on: Private Drinking Water Supplies, What to do After a Flood and Disinfection of a Well After Flooding. **If you continue to have problems with unsatisfactory coliform results after disinfecting your well, contact your local Health Authority. You may also consult the fact sheet "When Standard Water Well Chlorination Procedures are Ineffective" – a fact sheet for drillers, health authority staff and others involved in well recovery after a flood.**