

Risk of illness from well water

What is the problem?

- Safe drinking water is essential to good health.
- Private well water supplies can pose a risk to health unless they are properly **protected, maintained** and, if necessary, **treated**.
- They may become contaminated with microbes (germs/bugs) or chemicals. Some microbes cause serious illness, especially in people who are particularly vulnerable to infectious disease such as the elderly, the very young, pregnant women and sick people.
- It is important to remember that visitors and guests may be at greater risk of infection as they may have less immunity to the various microbes that can be found in water.
- You may not be able to tell without assessing your supply and having the water tested whether your water supply is safe - contamination will not always change the taste, smell or colour of your water.
- Drinking water which has been contaminated with microbes can lead to acute infectious gastroenteritis.
- Gastroenteritis is a general term describing infectious diarrhoea when the particular organism has not been identified. Its other symptoms may include vomiting, cramps and fever.
- Illness can be caused by viruses (e.g. Rotavirus), bacteria (e.g. E. coli, VTEC or Salmonella) or micro parasites (e.g. Cryptosporidium).
- There has been a marked rise in the number of cases of Verotoxigenic Escherichia coli (VTEC) in Ireland since 2005.
- There is compelling evidence that consuming water from private water sources such as wells can increase the risk of acquiring VTEC infection.
- Frequently in VTEC outbreaks, the exact type of VTEC causing the outbreak is found in the well water consumed by the people who have tested positive for VTEC.

How could my well become contaminated?

- Springs, wells and boreholes may become contaminated where:
 - ▶ the water emerges from the ground or
 - ▶ underground where the water collects in the borehole or well
- Springs and shallow wells that draw water from close to the surface are more likely to be contaminated than wells and boreholes that draw water from deep underground.
- On farmland, underground water can become contaminated with microbes or germs from the manure of grazing animals, from the spreading of manure or slurry or from wastewater treatment systems. The water can also pick up nitrates and pesticides applied to cropland.
- All wellheads must be protected from surface water contamination.
- Remember - wells and boreholes located in inherently vulnerable locations (e.g. karst limestone area with little soil cover) could become contaminated even if constructed to the highest standard.
- If well water changes in smell, taste or colour, for example after heavy rain, it may be a sign that the well has been contaminated.

What are the sources and types of microbial contamination in water?

▶ *Microbes (bacteria/germs/bugs):*

- *Animal faeces (manure/slurry)* - water supplies drawn from farmland where animals graze or where manure or slurry is spread are most at risk, particularly where rainwater can run directly off farmland into the water source.
- *Human faeces* - runoff from badly sited or defective waste water treatment systems (e.g. Septic tanks) and percolation areas can contaminate well water sources.
- Owners should ensure that septic tanks are properly maintained and serviced.

▶ *Coliforms/E. coli:*

- Drinking water is commonly tested for coliforms and *E. coli* (faecal coliforms).
- If *E. coli* are found in your water it is an indication that there has been contamination of the supply from animal or human faeces.

▶ *Verocytotoxigenic E. coli (VTEC):*

- VTEC is a particular type of *E. coli* that produces a toxin/poison (called verotoxin).
- In humans this toxin can cause a common and potentially very serious form of gastrointestinal infection which often results in bloody diarrhoea.
- While most cases recover without treatment, small children and the elderly are at greater risk of its most serious complication - Haemolytic Uraemic Syndrome (HUS). HUS can result in kidney failure and can be fatal.
- VTEC bacteria live in the intestines of cattle and other animals without causing them harm and are excreted in animal faeces. Therefore the bacteria may be present around animals or farm environments and in soil etc.
- VTEC can survive and be infective for up to a year in manure and soil.
- Contact with farm animals (including animals at pet farms and open farms) or their faeces are ways of becoming infected with VTEC.
- **Handwashing** after contact with animals and before eating or drinking is extremely important.
- VTEC from animal faeces may enter drinking water supplies especially after heavy rain and untreated water from private wells is at particular risk for VTEC.
- Run off from poorly sited or malfunctioning on-site domestic waste water treatment systems (septic tanks etc.) and percolation areas also pose a risk of VTEC to private wells.

▶ *Cryptosporidium:*

- *Cryptosporidium* is a parasite which can be found in human and animal faeces. Therefore it is important to protect well water supplies from sources of human and animal faeces.
- While most healthy people recover within a few weeks, infection with *Cryptosporidiosis* is a particular threat to people who are immunocompromised (i.e. where the immune system is weakened by other illnesses, such as cancer, or by certain medications).
- Occasionally this infection can be fatal.
- As testing for *Cryptosporidium* is not common in a private well setting, general well maintenance and actively preventing contamination of your well is extremely important in preventing this infection.
- Treatment (e.g. ultra violet) may be necessary to protect vulnerable supplies.

What are the sources of and types of chemical contamination in water?

- *Farming and forestry* - use of fertilizers, pesticides and sheep-dips. Artificial fertilizers and slurry contain nitrogen. Water with high levels of nitrates is not suitable for bottle fed infants. Herbicides should not be used around well water sources.
- *Industrial* premises and workshops, mining and quarrying (both operating and abandoned) and road or driveway run-off.

- *Lead* may be picked up from lead pipe work. Lead is a neurotoxin. Pregnant women, infants and young children are particularly sensitive to lead. Lead should not usually be a problem in houses built after the early 1970s.
- *Arsenic* contamination of groundwater usually occurs naturally. It is best to have no arsenic in your well water.
- *Radon and uranium* may be present in the water source because of the nature of the rocks in the catchment area, particularly in the granite areas. High levels may be harmful. The Radiological Protection Institute of Ireland (Tel: 01-2697766) can advise you on radon.

What should I do?

▶ *Find out about your spring, well, borehole:*

- Where is the spring, well, borehole located?
- Is the catchment area of your supply adequately protected?
- What route does it take to get to your property?
- Is it treated in any way – and if so is the treatment equipment in good order and serviced regularly?

▶ *Check your Spring, Well or Borehole:*

- Check that the wellhead is adequately protected to stop surface water getting into your supply, particularly during heavy rain. There should be no ponding of water near your well.
- Ensure that the well head is clean and that animals cannot get close.
- Ensure that nearby slurry and silage is stored safely
- Ensure that on-site domestic waste water treatment systems (e.g. septic tanks) and percolation areas are functioning properly.
- Oil, fertilizer, pesticides or other chemicals should not be stored or left in the pump-house or close to the well.
- Abandoned boreholes near your well may be contaminating the groundwater. They should be filled and covered correctly.

▶ *Consider getting your supply tested.*

- Get your well tested if you are concerned that it may be contaminated or vulnerable.
- It is advisable to have your well tested at least *once a year for microbial contamination*, and at least *once every three years for chemical contamination*.
- The best time to test your well is following a period of heavy rain or flooding since this is when the well may be overwhelmed and become contaminated.
- If you wish to get your well checked, contact your local County Council, City Council or HSE Environmental Health Officer in the first instance. Alternatively, you can arrange to have a sample tested using a private laboratory.

A test can only tell you about the quality of the water at the time of the test – the quality may change at different times.

▶ *Consider treating your supply*

- If you know or suspect that your well supply is contaminated you should consider getting it treated to remove the contamination.
- Even if the supply is satisfactory it might be worthwhile to have the water treated as a precautionary measure.
- It is also worth considering treatment if your supply serves other properties. Rather than installing treatment at each property, it may be better and cheaper to install treatment for the whole supply.
- Be aware that if you supply water to other people you have a responsibility to provide potable (safe) water.

- The choice of treatment must suit your supply and the contamination present.

A once-off disinfection procedure cannot replace a proper treatment system if your supply is frequently or continuously contaminated.

What else can I do?

- If you no longer want to use your well because of the cost of treating or improving it, you may be able to connect to a regulated public supply.
- You should contact your Local Authority to check if this is possible - it may not be feasible if the nearest public supply is some distance away.

The HSE cautions against switching from public water supplies to existing private wells

Important Health Advice for Contaminated wells

- Where a well is contaminated or suspected of being contaminated with microbes, the *water should be boiled* before it is used for:
 - drinking
 - washing teeth
 - preparing foodstuffs
 - making ice
- Expert advice should be sought to determine appropriate remedial measures and treatment e.g. chlorination or Ultra Violet light (UV) treatment.
- In cases of severe contamination an alternative water source may need to be considered.
- Expert advice should be sought in the case of chemical contamination.

Resources

- ▶ The HSE-Health Protection Surveillance Centre has produced general information on VTEC: <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/VTEC/Factsheet/>.
- ▶ Information on VTEC and private water supplies: <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/VTEC/VTECandwater/>.
- ▶ The Environmental Health Service of the HSE provides advice on maintaining well water and source protection. Contact details are available at: <http://www.hse.ie/eng/services/list/1/environ/Contact.html>
- ▶ Further information can be found on the Citizens Information website: http://www.citizensinformation.ie/en/environment/water_services/water_supply.html
- ▶ The Institute of Geologists of Ireland have good information on explaining groundwater and water wells: <http://www.igi.ie/assets/files/Water%20Well%20Guidelines/Explaining.pdf>
- ▶ Guidelines for drilling wells for private water supplies: <http://www.igi.ie/assets/files/Water%20Well%20Guidelines/Summary.pdf>
- ▶ Water well construction: <http://www.igi.ie/assets/files/Water%20Well%20Guidelines/Guidelines.pdf>
- ▶ E Coli – How to reduce the risks from your farm <http://www.fsai.ie/Ecolihowtoreducetheriskfromyourfarm.html>
- ▶ Health risks associated with switching from a public to a private water supply: http://www.lenus.ie/hse/bitstream/10147/281381/1/Switching%20from%20Public%20to%20Private%20Drinking%20Water%20Supplies_HSE%20Water%20Group%20Nov%202010.pdf

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