Manure Contamination of Rural Residential Wells

Answers to questions about residential well contamination from manure and agricultural runoff.

What causes contamination to get into my well?

Manure-related problems are usually caused when liquid manure is spread during the late winter and early spring months. During these times, manure cannot be tilled in or adequately absorbed by the soil.

Some common factors that can lead to contamination of residential wells include*:

- Thin or sandy soils above fractured bedrock,
- Groundwater near the surface,
- Depressions where runoff water stands (or drains into the ground),
- Sink holes,
- Winter or early spring spreading of manure nearby (especially liquid manure),
- Winter and early spring rains or snow melt causing runoff from nearby fields,
- Nearby unused or improperly abandoned wells, and
- Residential wells with shallow casings.

*** The Department of Health and Family Services recommends that all wells be sampled for bacteria at least once a year, or whenever changes are noticed, even if none of these factors are present. Things that put well water at risk cannot always be seen by well owners. Contact your local DNR office to get more information on your area (http://dnr.wi.gov/).**

What are the potential health concerns?

When people drink water that is contaminated with manure they can become very sick. Bacteria and other organisms found in manure can cause many diseases. Some of the more familiar organisms include *Cryptosporidium*, *E. coli O157-H7*, and *Salmonella*. Common symptoms include diarrhea, nausea, vomiting, cramps, or fever. When people bathe or shower in this contaminated water, it is less likely that they become ill. However, they can still get sick with ear and respiratory infections, skin rashes, or infections in open wounds.

If you or a family member have the symptoms above, see a doctor right away and let them know about your well water problem. This can be very important information for diagnosing and treating your symptoms. Your doctor may ask you for a stool sample. With a water test and a stool specimen, it may be possible to connect your illness to contamination in your well.

Young children, the elderly, and people with depressed immune systems can be particularly susceptible to developing illness and acquiring infections. These individuals should try to avoid exposure to contaminated water, and their water should be tested more often.

How do I know if my water is safe?

When runoff from fields or other potential sources of contaminants enter the groundwater supplying your well, you may notice that the taste, odor, color or clarity of the water changes. However, your well can be contaminated even if you don't notice changes. Regular testing is key to ensuring that your water supply is safe. If you live in an area with any of the other risk factors listed above, or your well has had a history of problems, you should test your well more than once per year. In particular, you may need to test your well after snow melt and rain in the spring.

What should I do if I notice changes in my water or a test result is "unsafe"?

If your well water changes color and smells like manure, immediately stop using it for all household uses other than flushing toilets. Contact your local Department of Natural Resources (DNR) Drinking Water program representative or your local health department. If changes are less obvious, stop using your water for drinking and food preparation and reduce unnecessary contact with the water until you receive results from water tests. If neighboring wells are contaminated but your water appears unchanged, have your well tested right away, and consider using bottled water until you get your results back from the lab. If your results come back "unsafe", and you suspect manure spreading is the source, contact your local DNR office. Based on your well results and other observations, you may be referred to the state or local health department for more advice. The presence of bacteria in a well does not always mean that manure has contaminated your well.

What do I test for and how do I test my well?

Well owners should test for Total Coliform, *E. coli* bacteria, and nitrate. Total Coliform and *E. coli* results are often provided from the same test at no additional charge. Contact a water-testing laboratory for assistance. See the DNR lab list at: http://dnr.wi.gov/org/water/dwg/WELLTEST.HTM.

Follow instructions provided by the lab for collecting the sample. When possible, ask the laboratory to provide "counts" for the bacteria results. This information can be helpful for problem-solving later. If your well results come back "unsafe" (bacteria are present) it is a good idea to collect another sample to confirm the result. The coliform bacteria test is used as an indicator of contamination, but it can come from many sources other than animal manure.

What do I do if the well test results come back "unsafe"?

1) Continue to use bottled water for drinking and food preparation until the problem is corrected and samples from your well show the water to be "safe" (free of bacteria).
2) If you have been given a "flush only" advisory, the DNR will give you options for an alternate water supply. This might be a temporary bulk storage tank supplied with water from a safe source. The full plumbing system should be disinfected prior to resuming use. If your well water does not test "safe", you may need to consider replacing the well, or connecting to another nearby source of safe water.
3) If your contaminated well is in poor condition (insufficient casing, etc.), it may be more susceptible to future contamination. You should have it replaced by a licensed well driller, or you should connect to another nearby source of safe water. The replacement well should be carefully constructed with additional casing to reduce the possibility of future problems.

4) If you drill a new well, be sure to properly abandon your old well to prevent future contamination of the new well.
5) If you must use your water before you can get bottled water for drinking, heat it to a rolling boil for at least five minutes prior to use. If your nitrate level is above 10 mg/L you should not boil the water to kill the bacteria as that also concentrates the nitrate.

Once you know your well is at risk of contamination from surface runoff and manure you should test it more frequently than once per year.

Can these problems be prevented?

YES. If the source of the contamination can be identified, steps can be taken to prevent future contamination. However, it is often difficult to clearly identify the source(s) of contamination. By evaluating land application practices on nearby fields and addressing improper practices, many of these incidents can be prevented.

Contamination events make us aware of areas where groundwater quality is particularly at risk. Once we know about sensitive areas, local soil and water conservation and/or DNR staff can ensure that farmers applying manure follow safer landspreading practices, avoid manure applications in areas prone to groundwater contamination, and tightly control or prohibit other activities that can affect groundwater.

For more information

- For health related questions, contact your local public health department, or the Department of Health and Family Services at (608) 266-1120. Health department listings can be found at http://dhfs.wisconsin.gov/localhealth/.

- For questions about your well or to report a manure spill, contact your local Department of Natural Resources office (http://dnr.wi.gov/) or the DNR Spills Hotline at 1-800-943-0003.

- For questions about manure management, contact the Department of Agriculture, Trade, and Consumer Protection (DATCP), (608) 224-4501 or visit: www.datcp.state.wi.us

Prepared by the Wisconsin Department of Health and Family Services, Division of Public Health with funds from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, and with the help of Wisconsin's local public health departments, the Department of Natural Resources, and Department of Agriculture Trade and Consumer Protection.
PPH 45088 revised 02/2006