What a Homeowner Should Know About Onsite Water Supply Systems

YOUR WATER WELL AND PUMP SYSTEM

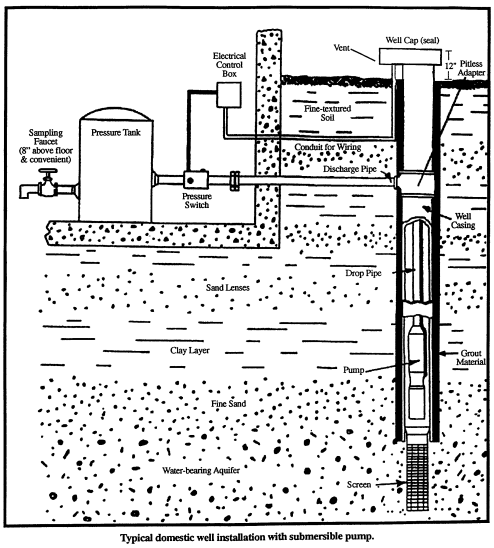
A water well can be a source of clean, potable water if it is properly located, adequately installed and carefully maintained. As a homeowner with a private water supply, it is your responsibility to properly maintain your well so as to protect Michigan's groundwater resources. A water supply system is an investment; to replace or find another groundwater supply can be very costly.

WHAT IS GROUNDWATER?

Most groundwater is fresh water. Many think of groundwater as part of a system of underground lakes and streams. This is true in only a few cases, however. Groundwater is usually found in cracks and spaces between rocks and between the soil particles that are under the earth's surface. These spaces act a bit like a giant underground sponge.

The area found just below the earth's surface with pore spaces filled partly with water and partly with air is called the unsaturated zone. This groundwater is generally not a reliable source of drinking water. The water in deeper spaces completely filled or saturated with water is called groundwater. The top of this saturated zone is the water table. Water for drinking and other uses is drawn from a saturated zone called an aquifer. About 95% of the U.S. total water supply of fresh water is groundwater. The remaining fresh water is surface water, found in lakes and streams.

WELL CONSTRUCTION



Typical domestic well installation with submersible pump.

WELL TERMS

Aquifer – An underground layer of rock, sand or gravel which contains enough groundwater to supply a well.

Screen - A filtering device at the bottom of the well casing used to keep sand from entering the well.

Pump - Used to move water from the aquifer to its intended use.

Casing - Steel or plastic pipe installed to prevent collapse of the well borehole and entrance of any contaminants. It's also used for placement of a pump.

Pitless Adapter - A device which provides access to the well and to parts inside the well, eliminating the need for a pit.

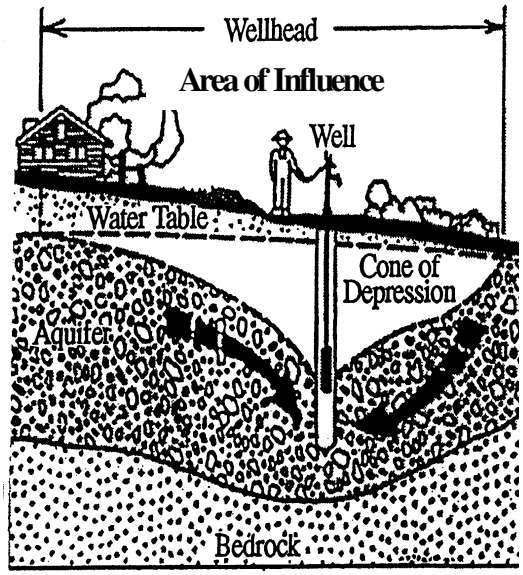
Well Cap - A cover on the top of the well casing to prevent the entrance of contaminants.

Pressure Tank - A closed water and air storage container that controls the water supply's system pressure.

Grout - Material used to seal the space between the outside of the well casing and the borehole or to seal an abandoned well.

HOW YOUR WELL WORKS

When your pump in your well is in operation, the water level in the aquifer around the well is lowered. The area affected by this pumping is greatest next to the well and gradually decreases as the distance away from the well increases. This area is known as the **wellhead area of influence**. Ground water flow in the area of influence is generally toward the well. Therefore, any contaminants present in this area may move toward the well. It is for this reason that proper handling, application and storage of chemicals or fertilizers is important to protecting your source of drinking water.



MAINTAINING YOUR WELL

If a well has been properly installed, maintained and all possible sources of contamination are properly isolated, a well should be able to be maintained contaminant-free.

TYPES OF CONTAMINATION

Bacteriological – Bacteria in a water supply is often the most frequently encountered form of contamination. When a sample is analyzed for bacteriological quality, it is tested for coliform bacteria. Coliform bacteria is considered to be an indicator organism because they are generally found to be associated with wastewater. Most coliform are generally considered harmless. However, their presence indicates that contamination has occurred and other more harmful organisms may be present. If your sample is found to contain coliform bacteria, steps to chlorinate the system should be taken. Contact a registered well driller or this department for specific information on the chlorination process.

Other forms of well water contamination include **inorganic materials** (i.e. nitrates, copper, lead) and **organic chemicals** (i.e. pesticides, herbicides). While these types of contamination do not occur as frequently as bacteriological contamination, correcting the problem is often difficult and costly.

The Macomb County Health Department collects samples for bacteriological analysis and partial chemistry analysis. Other testing is also available in certain cases. Contact this department for more information. There are fees for all samples collected.

HOUSEHOLD HAZARDOUS WASTE

Many household products pose a significant risk to human health and the environment. When improperly used or disposed of these products can directly effect groundwater. Improper disposal methods of household hazardous waste such as pouring down the drain, dumping on the ground, burning or disposing with the other household trash provides pathways for contaminating groundwater.

The Macomb County Health Department sponsors monthly collections of household hazardous waste. Contact the Department at (586) 469-5467 for additional information.

WHAT YOU CAN DO

- Understand that some household products pose a threat to groundwater.
- Read and follow label directions.
- Use non-hazardous alternatives.

PRODUCT	ALTERNATIVE
Furniture Polish	Lemon oil; Beeswax; Oil soap
Drain Cleaner	Mix 1 cup each of vinegar, baking soda, salt. Pour into drain & let stand 15 minutes. Flush with boiling water.
Oven Cleaner	Baking soda & salt can remove spots.
Air Fresheners	Baking soda & natural fragrance, spice and herbs.
All Purpose Cleaner	Mix vinegar & water.

WELL MAINTENANCE

DO & DON'T CHECKLIST

✔ **DO** make sure your well is properly installed and located and is not in need of any repairs. Contamination can enter poorly maintained wells more easily.

✔ **DO** make sure your well is protected from physical damage (i.e. being hit by a car or lawnmower).

✔ **DO** have your well water sampled periodically. Annual or biannual sampling is recommended.

✔ **DON'T** ignore your well. Periodically check it for maintenance items.

✔ **DON'T** do large amounts of landscaping or construction over or around your well. It makes the well inaccessible.

✔ **DON'T** spray or spread weed killers and fertilizers near the well casing.

✔ **DON'T** attempt complicated repairs on your well and/or pump system on your own. Contact a qualified professional.

SOURCES FOR HELP WITH WATER WELL PROBLEMS

Macomb County Health Department
Environmental Health Services Division
43525 Elizabeth Road
Mt. Clemens, Michigan 48043
(586) 469-5236

Michigan Department of Environmental Quality
Well Construction Unit
525 West Allegan
P.O. Box 30630
Lansing, Michigan 48909-8130
(517) 241-1377
www.deq.state.mi.us/dwr/gws/wcu/wcu.html

Michigan Ground Water Association
10475 Noggles Road
Manchester, Michigan 48158-9658
(313) 428-0020