Protect Your Drinking Water Simple Tips for Well Maintenance

Owning acreage often involves a few more chores than living in the city or suburbs. Many small acreage owners draw drinking water from a private well. Without some basic precautions, wells may allow pollutants into your water source. As the landowner, it is your responsibility to ensure your drinking water is safe. In order to ensure safe drinking water, landowners should regularly inspect and maintain their wells.

Locate Your Well

Wells may not be located near your pump or pressure tank. Start by looking for a four to eight inch wide metal casing, which may not reach the surface in older wells. Many well casings are enclosed in a concrete ring with a concrete lid. Unable to find the well? Try looking at well records posted online by the Washington Department of Ecology (see Resources at the end of this fact sheet). Be sure to locate all wells on a property since inactive wells, when improperly sealed, can lead to contamination of the groundwater supplying other nearby wells.

After you have located your well, check the distance between it and your septic tank and drainfield. If the distance is less than 100 feet, your septic system could contaminate the well water. Maintaining your septic system and having your tank pumped as needed extends the life of your

What is that hole in the ground?

An unused or abandoned well provides a direct connection between contaminated surface water and groundwater. Landowners may be liable if an improperly abandoned well leads to groundwater contamination. For more information on abandoned wells, see the WSU Extension fact sheet "Abandoned Wells: Forgotten Holes to Groundwater" available online (see Resources).

drainfield and prevents septic effluent from tainting groundwater and other nearby water bodies.

Divert runoff, such as from gutters on homes, driveays, barns or other buildings away from your well since runoff may carry pollutants. Pesticides, fertilizers, gasoline and other chemicals should not be stored in your well or pump house. Locate manure piles, compost piles, and animal confinement areas at least 100 feet from your well; a greater distance may be required if you have sandy soils. Manure contains bacteria and nitrates which can contaminate drinking water on your property as well



as your neighbor's and even nearby streams and water bodies.

Regularly Inspect Your Well

Annually inspect key points on your well to prevent potential well contamination: vent pipe, the cap, the casing and the base (Figure 1). Ensure he vent pipe is screened to keep insects and rodents and replace worn screen that may have deteriorated over time. The well cap should be intact, with no large cracks or chips, and securely attached to the casing. The casing should be at least 6" above the ground, and also be free of cracks and holes. There should be no standing water around the base of the well. If needed, slope the ground away from the base to improve drainage.



Figure 1: Four Key Areas To Inspect On Well Head

Water Testing

It is too epensive for well owners to test all potential contaminants on a regular basis. Tests of a new well or a new home purchase should include a panel of all possible contaminants to establish an initial level for the well. Test your drinking water if you suspect a problem. Table 1 provides the most common pollutants in drinking water. Before sampling, contact the lab first to get sample procedures and containers. It is important to use the appropriate container for the type of sample you are collecting. Follow the laboratory's instructions for collection and storage to avoid a contaminanted sample. A list of certified labs is available online from Clark County Public Health, see the Resources section.

Results – What Do They Mean?

Once you receive the results back from the lab, check them against the drinking water standards set by the US Environmental Protection Agency (EPA). Table 2 shows the standards for some common contaminants. Always keep copies of all results to track changes in your well water over time. Three contaminants are described below:

Coliform Bacteria

While commonly found in the environment, these bacteria do not naturally occur in groundwater. Sources include surface water contaminated by human or animal waste leaking down into your well, a nearby shallow water source such as a stream or a pond, or objects such as deceased rodents entering an open well. A positive test result for coliform bacteria indicates the presence of bacteria in the water. It should not be consumed unless it has been boiled for at least three minutes to kill the bacteria.



<u>Nitrate</u>

Transported easily through the soil by water, nitrate can come from fertilizers, as well as human and animal wastes. If nitrate is found in your well water, look for potential sources in the vicinity, such as leaking septic systems, heavily fertilized lawns, or animal manures. Higher nitrate levels reduce the ability of red blood cells to carry oxygen throughout the body. Most adults and children red blood cells rapidly return to normal once the source is removed. However infants are more severely affected and may develop blue baby syndrome, a serious health condition caused by lack of oxygen. Boiling water will only *increase* the concentration of nitrate in the water. Nitrate canot be removed through the use of filtration devices. More information on nitrate in drinking water is available from Washington Sate Department of Health; see Resources at the end of this fact sheet.

What to Test For	Standard	Signs	When to Test	Cause of Problems	Health Concerns
Arsenic	0.01 mg/L	Tasteless, odorless, colorless.	New well, new homesite, if never tested before	Leaches from surrounding soils or rocks.	Cardiovascular, kidney, skin, nervous system diseases, may lead to cancer
Coliform Bacteria	None allowed	Musty, septic or earthy odor	Each year.	Poor well seal, manure, leaky septic systems.	If bacteria reach well, other disease organisms may follow the same pathway. Do not drink the water until purified.
Nitrate	10 mg/L	Not always evident	Each year if in an area with known high nitrate. If not, every 3 years.	Fertilizers, manure, and leaky septic systems.	If it reaches the well, other pollutants can follow. Nitrate can harm infants and livestock.
Lead	0.015 mg/L in first draw sample	Metallic taste, corroded pipes, lead pipes, copper pipes with lead solder.	Only if suspected or when lead or copper pipes are present.	Lead pipes and copper pipes with lead solder.	Brain and blood disorders in children.
Iron	Unregulated: 0.3 mg/L	Rust stains on laundry and fixtures.	Only if suspected.	Leaches from surrounding soils or rocks.	Nuisance.
Hardness	Unregulated: 100 ppm	Scaly deposits and scum.	Only if suspected.	Dissolved miner- als in surrounding soils.	Nuisance.
Hydrogen Sulfide	Unregulated: 250 mg/L sulfate	Rotten egg odor	Only if suspected.	Dissolved sulfate in surrounding soils.	Nuisance.

 Table 1: Common Drinking Water Contaminants

Adapted from: After You Buy: Wells, Septic Systems, and a Healthy Homesite, Washington County Soil and Water Conservation District and Arsenic in Drinking Water, Washington State Department of Health

Arsenic

Arsenic naturally occurs in rock formations in some areas of Clark County. Water flowing through these rock formations dissolves the rock and arsenic and carries it to groundwater used as a source for drinking water. Even at high concentrations, arsenic has no taste, smell or color. Low levels of arsenic pose a slight health risk which increases with continued exposure over time. People respond differently to arsenic, even at the same level, so there is no sure way to know what may happen with any specific case. More information on arsenic in drinking water is available from Washington Sate Department of Health; see Resources at the end of this fact sheet.



Water Treatment

The type of water treatment needed is determined by the contaminant. Some water quality problems can be handled at the point where the water is taken from the well, while other problems should be treated when the water enters the home or where it is used. Contaminants such as bacteria or nitrate are a result of human or animal activity and can be treated by employing some simple strategies.

Look around your well head for ponding surface water, and divert all surface water from around your well head. Animal confinement areas and manure piles away should be located away from and down hill from your well. After removing potential sources, shock chlorinate your well to kill all bacteria (directions are available via a link in the Resources) and re-test after all traces of chlorine are gone. Continued

Contaminant	Maximum Contaminant Level			
Arsenic (As)	0.010 ppm1			
Barium (Ba)	2 ppm			
Fluoride (F)	4 ppm			
Mercury (Hg)	0.002 ppm			
Lead	0.015 ppm			
Iron (Fe)	0.3 ppm			
Nitrate (NO3 as N)	10 ppm			
Turbidity	1 turbidity unit			
Coliform Bacteria, Fecal Coliform, E. coli	None can be present			
From: http://www.epa.gov/safewater/contaminants/index.html#mcls				

bacteria problems may require treatment. Nitrate naturally flushes though the system over time and levels will decrease after removing potential sources. Most people are not susceptible to nitrate, however if you have a pregnant family member or young child, you may consider treating your water for nitrate to reduce levels.

If you opt to have a water treatment system installed, it is important to ensure the system is installed and maintained properly. is

Regular water testing should be conducted to determine the system working, if parts need replacing, or if system adjustments need to be made.

When choosing a particular treatment method, select a certified water treatment system. Third party organizations, such as the National Sanitation Foundation International (NSF) and the American National Standard Institute (ANSI), have strict testing protocols. Products meeting NSF/ANSI standards have had the manufacturer's performance claims verified. Materials used in the products are also certified by toxicologists for use with potable water. NSF reviews product literature to ensure it is correct and not misleading. NSF maintains an online searchable database of water treatments units available in the resources at the end of this fact sheet.

Good Taste ≠ Good Water

Taste is not an indicator that your well water is safe. All water contains some impurities which you cannot always see, smell or taste. Clear, good tasting water may still carry toxic chemicals or harmful organisms, while cloudy or bad tasting water may be safe to drink. To ensure your drinking water is safe consult with a certified lab or Clark County Public Health and follow their recommendations for appropriate tests.

By regularly inspecting your well head and keeping it clean and well protected, you can keep your drinking water clean. Maintaining your well also protects the water quality for your neighbors and our streams and wetlands.

Resources

Clark County Public Health Local Water Testing Lab list sile Small Acreage Arogram http://www.clark.wa.gov/public-health/water/documents/SERVICEPROVIDERS-WATER.pdf

Department of Ecology well log website <u>http://apps.ecy.wa.gov/welllog/</u>

Abandoned Wells Fact sheet link http://cru.cahe.wsu.edu/CEPublications/eb1714/eb1714.html Washington Sate Department of Health Nitrate Fact sheet http://www.doh.wa.gov/ehp/dw/Publications/331-214_2-21-07.pdf.

Washington Sate Department of Health Arsenic Fact sheet http://www.doh.wa.gov/ehp/dw/Publications/331-167_06-13-06.pdf

Adapted by Erin Harwood, WSU Clark County Extension (2008).



If you would like additional information on well maintenance or drinking water contact:

WSU Clark County Extension 11104 NE 149th Street C 100 Brush Prairie WA 98606 360-397-6060 extension 7720 http://clark.wsu.edu/

Clark County Clean Water Program 1300 Franklin Street Vancouver, WA 98660 360-397-6118 extension 4345 http://www.clark.wa.gov/water-resources/ Clark County Public Health (Enivr. Health) 1601 E Fourth Plain Vancouver, WA 98666 360-397-8428 http://www.clark.wa.gov/public-health/water/individual.html

Additional Resources

Clark County Public Health Drinking Water http://www.clark.wa.gov/health/environmental/drinking/index.html

How Fertilizers and Plant Nutrients Affect Groundwater Quality http://cru.cahe.wsu.edu/CEPublications/eb1722/eb1722.html

Protect Your Groundwater: Managing Livestock on Small Acreage http://cru.cahe.wsu.edu/CEPublications/eb1713/eb1713.html

Protecting Groundwater from Pesticide Contamination http://cru.cahe.wsu.edu/CEPublications/eb1644/eb1644.html

NSF Certified Product and Service Listings http://www.nsf.org/certified/dwtu/

The Oregon Well Water Program http://wellwater.oregonstate.edu/

WSU Extension Washington's Water http://wawater.wsu.edu/

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