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Inspecting and Maintaining Your Private Water Supply

Georgette Plaugher, WVU Extension Program Coordinator: Oil and Gas-Ag and Natural Resources and Greg Hamons, WVU Extension Agent: Pocahontas County-Ag and Natural Resources.

To protect your private water supply and maintain its water quality, it is your responsibility to monitor potential negative impacts and prevent problems before they happen. Sometimes this is difficult to do when situations on or near your property occur that are beyond your control. However, there are things you can do to ensure your activities are not impacting your water supply.

What needs inspected and maintained? How often?

- **Wells**
  - Keep the area around the wellhead clear of debris and make sure you have easy access.
  - Designate a 100-foot protection area (Figure 1) around the well where polluting activities are removed (animals, vehicles, chemicals, etc.).
  - Limit the use of fertilizers, pesticides, and other chemicals around the well.
  - Check the wellhead annually for damages (casing, well cap, and wiring).
  - Have the well professionally inspected every 10 years by a water well driller or hydrogeologist.
  - Repair or replace damaged parts. Replace the standard well cap with a sanitary cap.
  - Keep maintenance/repair records.
  - Obtain and keep on file a copy of your well completion report from your well driller.

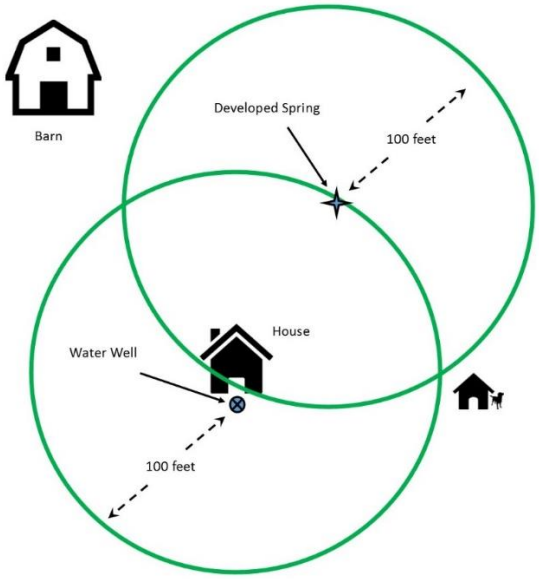

Figure 1. Recommended 100' zone of protection for private water supplies.

* **Springs**
  - Keep the area around the spring clear of debris and make sure you have easy access.
  - Designate a 100-foot protection area (Figure 1) around the spring where polluting activities are removed (animals, vehicles, chemicals, etc.).
  - Inspect the spring box annually to insure it is sealed to prevent insects, animals, and surface water from entering.
  - Fence livestock and wildlife out of the spring catchment area.
  - Disinfect the spring following initial construction and in the spring box if the spring box becomes unsealed and the spring is contaminated.

* **Cisterns**
  - Make sure the cistern is properly constructed and large enough to meet your household demands. Minimum storage capacity of 5,000 gallons is recommended.
  - Inspect the cistern annually for damage and to ensure that filters and water treatment equipment are working properly (Figure 2).
  - Rainwater can be highly corrosive to plumbing systems. Make sure the water is treated to prevent corrosion before it enters your plumbing system (Figure 2).

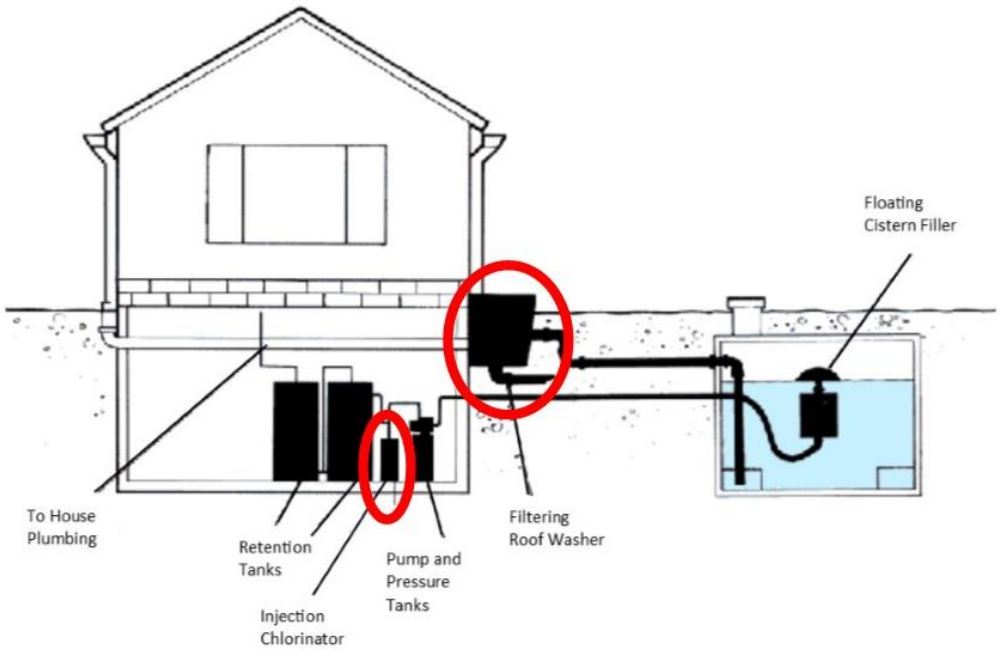

Figure 2. Proper filtration and treatment of water through a cistern are indicated within the red circles. Used with permission from the Water Filtration Company, Marietta, OH.

* **Water Supply** (Wells, Springs, and Cisterns)
    - Treat properly before it enters your drinking water supply (cisterns)
    - Test drinking water annually for coliform bacteria
    - Test drinking water every three years for pH, Total Dissolved Solids (TDS), and other contaminants based on land use activities within sight of your home
    - Water should be tested through your county health department, the WV state health department, or an independent, state certified laboratory
    - Compare your test results with the US EPA Primary and Secondary drinking water standards at: https://www.epa.gov/sites/production/files/2016-06/documents/npwdr_complete_table.pdf

What impacts my private water supply?

Improperly constructed and poorly protected wells, springs, and cisterns provide routes for contaminants to enter a private water supply. Poor wastewater management and unmaintained septic systems are common in rural areas and can be a source of high bacterial contamination. Antiquated plumbing systems (lead pipes) and inefficient water treatment systems can cause other health problems. There are numerous additional factors both on and off your property that can cause problems with your private water supply. They are listed in Table 1 below along with the water pollutants they produce.

Table 1. Factors affecting water quality in private water supplies

Land Use Impact	*Element*
Houses	Bacteria, nitrate, sediment, yard chemicals
Agriculture	Bacteria, nitrate, pesticides
Landfills	Fecal coliform, total suspended solids, Cyanide, Metals, Organics
Roads	Chloride, sodium
Industry	Volatile organics, petroleum
Mining	Metals (especially iron, manganese and aluminum), pH
Oil and Gas Drilling	Barium, chloride, total dissolved solids, methane

How far away can activities affect my water supply? How close is too close?

It depends on the geology underground, but in general, if you can see activities from your home they may be of concern. In the case of oil and natural gas drilling, exploration companies are required by WV law to test all private water supplies within 1000’ of the well pad.

What are the common water quality problems with private water supplies in West Virginia?

- Improper well, spring, or cistern construction
- Poor wellhead or spring protection and maintenance
- Naturally occurring problems common in West Virginia
  - Corrosive water-low pH and soft water (causes blue stains, metallic taste)
  - Hard water (caused by calcium and magnesium which can cause white residue, dingy laundry)
  - Iron (reddish stains, metallic taste)
  - Manganese (black stains, metallic taste)
  - Hydrogen sulfide gas (rotten egg odor)
  - Methane (odorless, colorless, and flammable, may cause spurting faucets or effervescent water)
- Bacterial-coliforms and E. coli from surface water, insects, animals or septic systems
- Manmade organic materials from dumps, industrial sites, or landfills
- Sediment
- Lead from older copper and lead pipe plumbing systems, most common in plumbing installed prior to 1991.

How do I know if I have a problem?

You may experience changes in your water such as color, taste, or smell. However, not all contaminants can be detected through our senses. If you are concerned you may have a problem, have your water tested at a certified laboratory. It is recommended you have your water tested annually for bacteria and once every three years for pH, TDS, and other possible contaminants relative to your area.

What do I do if I find out I have a problem?

This will depend on the severity of the problem. If the problem is minor, it may be corrected through maintenance and inspection, pollution control, or treatment. If the problem is major, a new water source might need to be developed. Explore all your options before taking action. Your county health department can help you with this. Once you determine the best solution to the problem, take action as soon possible. Unsafe water should not be consumed.

Resources

Individual Water Supplies, Wells, Cisterns, and Springs: WV Department of Health and Human Resources, Public Health Sanitation Division
http://www.wvdhhr.org/phs/water/index.asp

Penn State Institutes of Energy and Environment and Penn State Extension Drinking Water Interpretation Tool
http://dwit.psiee.psu.edu/

Penn State University Cooperative Extension Spring Development and Protection, http://extension.psu.edu/natural-resources/water/drinking-water/cisterns-and-springs/spring-development-and-protection

West Virginia Source Water Assessment (SWAP) and Wellhead Protection Programs (WHP)
http://www.wvdhhr.org/oehs/eed/swap/

Wellhead Protection Program (WHPP)
http://www.wvdhhr.org/oehs/eed/swap/whppknowledge.asp

Water Testing-Water Quality Laboratories Certified in WV
https://dhhr.wv.gov/ols/labs/Documents/Environmental%20Chemistry/waterqualitylabs.pdf

Reviewed by Bryan Swistock, Penn State Cooperative Extension Senior Extension Associate and Water Resources Coordinator and Richard Shaver, Geologist III. WVDHHR, BPH, OEHS, Source Water Assessment Program

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For more information contact: Georgette Plaugher, Program Coordinator-Oil and Gas, *Georgy.Plaugher@mail.wvu.edu*; *304-293-2634* or Greg Hamons, Extension Agent-Pocahontas County, *Greg.Hamons@mail.wvu.edu*; 304-799-4852. *www.extension.wvu.edu*.

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