

ANR-790-2.5.2

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Water Supply Wells Protecting The Well Site

We once thought water was filtered and cleansed of all contaminants as it percolated through the soil. Unfortunately, tests for contaminants in wells in Alabama and across the nation have shown this not to be true. Activities on the surface of the earth can affect the groundwater below. Rainwater and snow melt can carry contaminants toward the well from roofs, livestock lots, or chemical handling areas. Other sources of contaminated runoff and seepage are malfunctioning septic drain fields and chemically treated farm fields, lawns, and gardens.

You can protect the market value of your home and your family's health by following these steps to protect your well site:

- Check construction of existing wells.
- Check your septic system.
- Inspect underground fuel storage tanks.
- Evaluate your pesticide management.
- Check livestock waste handling.
- Seal abandoned wells.

Check Construction Of Existing Wells

Proper well construction protects groundwater from contaminants that flow down or around the outside of the well to groundwater.

Make Sure An Existing Well Is Properly Sealed. Bacteria often contaminate improperly sealed wells. All wells should have a cap or seal at the top of the casing to keep contaminated surface water from getting into a well.

Inspect The Condition Of Your Well Casing. Using a light, look for holes or cracks at the surface or down the inside of the casing. Try to move the casing around by pushing against it. If it moves it may need to be resealed with grout to keep out contaminants. Listen for water running down into the well when the well pump is not running. If you do hear water, there could be a crack or hole in the casing, or your well is not cased down to the water level in the well.

Check Your Septic System

Most rural and many suburban dwellings have a septic tank and absorption field. Older homes may have cesspools. Cesspools are illegal because they discharge raw sewage directly into the ground. Replace cesspools with a septic system.

A septic system settles and treats household wastes such as soapy water from the laundry and the bath, food scraps, and body wastes. The solids settle to the bottom of the tank where bacteria change some organic matter into gases. The clarified liquid flows into the absorption field where it seeps into the soil. Soil microorganisms and filtration remove most of the impurities in the liquid wastes. A properly designed, operated, and maintained septic system protects groundwater as satisfactorily as a city sewer.

Maintain Your Septic System. Avoid placing the following materials in the septic tank: paper towels, disposable diapers, rags, sanitary napkins, tampons, cat litter, or other nonsewage materials. These items may plug your plumbing, fill your tank, or even cause the early failure of your absorption field.

Do not put chemicals that could contaminate groundwater into a septic system. Septic tanks do not remove nitrate or many other chemicals.

Do not use a garbage disposal unless the tank was designed and sized to handle one. The extra solids fill the tank too rapidly. Dispose of this waste in a compost pile with yard waste.

Have The Septic Tank Pumped Regularly. Pump out the tank every 3 to 5 years or whenever it gets more than one-quarter full of sludge. The rate of sludge buildup depends on the tank size and the volume of solids in the sewage. Septic tank cleaners are not recommended and do not replace pumping.

Inspect Your Absorption Field For Leaks. Indicators of a failed absorption field are wet spots, unpleasant odor, or lush growth of water-loving vegetation. These surface flows are offensive nuisances

ANR-790

Water Quality 2.5.2

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and can be a health hazard particularly to children and pets. They may contain organisms that cause typhoid fever, dysentery, and other diseases. Pooled sewage provides an excellent breeding place for mosquitoes and other disease-carrying insects. If a septic system is no longer treating wastes as designed, groundwater and drinking water from nearby wells may also be contaminated. Have your city or county health department investigate your septic system to determine corrective measures.

Inspect Underground Fuel Storage Tanks

Surveys in several states have shown that underground fuel tank leaks and fuel spills contribute significantly to groundwater contamination. Petroleum fuels contain toxic compounds including benzene, toluene, and xylene. Fuels may also contain additives such as ethylene dibromide and organic lead compounds. Even small amounts of these substances can cause big problems. One part per million of petroleum renders the taste and odor of water unacceptable for drinking. In addition, lifetime exposures to extremely small amounts (parts per billion) of these substances may lead to increased cancer rates.

Check Your Tank For Leaks. An underground storage tank has a maximum life span of 15 to 25 years, and the chance of a tank leaking increases with age. Consider having your fuel tank tested for tightness yearly.

If a leak is detected, immediately empty the tank to stop the flow of fuel into the ground. Repair the empty tank if it is otherwise sound, or replace it. Have the repairs done by qualified service personnel because fumes in a supposedly empty tank can be highly explosive.

Evaluate Your Pesticide Management

In evaluating your pesticide management, you should look for ways to reduce pesticide impacts on groundwater. Several areas to consider are pesticide selection, storage, mixing and loading, and container disposal.

Selection. One way to reduce pesticide impacts on groundwater is to use all available nonchemical options for pest management. These include pest resistant crop varieties, biological pest control, and crop rotations. When a pesticide is necessary, select the least environmentally sensitive pesticide that will control the pest. Look for less leachable and less persistent pesticides if available. Always read and follow all label instructions and precautions, especially groundwater warnings. Never apply more pesticide than the rate recommended on the label.

Storage. Carefully survey your storage areas. Spills are nearly inevitable where containers are handled.

Spilling a concentrated formulation is more serious than applying diluted material on a field where the pesticide is designed for use. Build storage areas with concrete floors and no drain so spilled concentrates can be cleaned up and disposed of without soil or water contamination.

Mixing And Loading. Pesticides can be spilled on the ground during mixing and loading. Repeated spills increase pesticide concentrations in the soil, which may be unable to absorb or degrade the pesticide. Spills increase the possibility of pesticides leaching down to groundwater. Once contaminated, the groundwater may remain unusable for years. Cleaning a well is prohibitively expensive.

To protect groundwater supplies, load spray equipment and mix pesticides in the field if possible. If you fill sprayer tanks directly from the well, use an antibacksiphoning valve. If you do not have one of these valves, keep the hose end out of the tank to prevent siphoning the pesticide into the well if the pressure drops. Never leave the tank unattended while it is filling. Clean the sprayer (inside and out) while in the field. Spray the rinse water out in the field.

Container Disposal. A pesticide container is never completely empty. The concentrated leftovers are troublesome sources of contamination. Rinse the containers three or more times or pressure rinse with a special nozzle. Add the rinse water back into the spray tank solution for field spraying. Puncture empty containers to prevent reuse. Dispose of used containers in a sanitary landfill or return recyclable containers to your pesticide dealer or a recycling center.

Check Livestock Waste Handling

Evaluate Your Sanitation Program. A clean livestock area protects your groundwater from bacteria, viruses, and nitrates. Cleanliness around grain storage and handling areas and prompt, proper disposal of garbage discourages rodents.

Locate confined feeding areas away from wells, streams, and ponds. Locate livestock and pet pens or corrals away from all wells.

Practice Routine Waste Disposal. Promptly remove dead animals. Do not stockpile manure near any water source. Keep stockpiles covered to reduce leaching. Divert runoff away from wells.

A good practice is to use the fertilizer value of animal wastes by spreading them on production fields. If you can not use the manure, perhaps gardeners or other farmers can.

Seal Abandoned Wells

Old well pits, uncapped wells, and abandoned wells are direct conduits to groundwater. They also pose safety hazards for children.

Do Not Use These Areas As Dump Sites. These may look like convenient places to dump trash, animal carcasses, used engine oil, and empty chemical containers. But disposing of these materials in old wells or sinkholes can pollute your water supply. Be sure to remove any trash already in abandoned wells or sinkholes on your property.

Do Not Locate A Septic System, Feedlot, Or Animal Waste Lagoon Near Known Or Suspected Sinkholes. You may also want to call your local Soil and Water Conservation District, county Extension agent, or Department of Public Health representative for additional advice.

Sealing abandoned wells begins by removing any pumping equipment and clearing any obstacles and debris that have entered the well. When obstructions have been cleared, the well can be sealed by filling with concrete from the bottom of the well to within 2 feet of the surface. The well casing should be cut off below plow depth, or at least 2 feet below the surface, and the hole filled with soil.

When sealing a well, it is important to fill it with a material that is less permeable to water than the native soil and rock. Otherwise, water can migrate between waterbearing layers and possibly degrade high-quality water with lower-quality water. When concrete is not practical because of volume and expense, clay or a mixture of sand and bentonite might be used to fill the hole and restore natural conditions as closely as possible.

Other procedures are used to seal wells which are large diameter, if special geologic conditions exist, or if special techniques were used in constructing the well.

You should call your municipal, county, or state health officials, water quality agency, or water management authority for any specific regulations regarding well abandonment in your area.

References

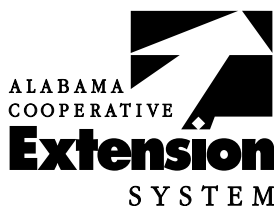
Adams, Edward B. 1991. Protect Your Groundwater: Survey Your Homestead Environment. EB1631. Washington Cooperative Extension Service. Washington State University. Pullman, WA.

Alabama Department Of Environmental Management (ADEM). 1992. Groundwater Sources And Treatment. ADEM Admin. Code R. 335-7-5 and 335-7-6. Montgomery, AL.

The Importance of Sealing an Abandoned Well. 1991. Fact Sheet. Alliance for A Clean Rural Environment. Washington, DC.

Mechenich, Chris, George Gibson, Jim Peterson, Byron Shaw, and Gary Jackson. Maintaining Your Home Well Water System. G3399. Wisconsin Cooperative Extension Service. University of Wisconsin. Madison, WI.

Sinkhole Management Protects Groundwater Quality. 1991. Fact Sheet. Alliance For A Clean Rural Environment. Washington, DC.



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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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