

**A BRIEF SUMMARY of  
Well Water Contamination:  
SWPA-EHP Ranking System and Monitoring Strategy\***

*Private well water quality is not regulated in the United States. Well owners are responsible for monitoring their water quality. This is particularly challenging in areas where industrial development such as natural gas extraction activities are present. Gas well drilling activity, if properly conducted, does not necessarily contaminate groundwater, but poorly managed drill sites, leaky wastewater pits and accidental spills certainly impact the quality of surface water and of groundwater, which are the sources of private well water. SWPA-EHP has developed a water quality ranking system and monitoring strategy to encourage well owners to stay alert to the quality of their water and to take action when it is threatened by contamination.*

**Ground Water Contamination and Hazards to Aquifers**

When pollutants are in the ground, they are carried by water through soils and aquifers in unpredictable ways. The groundwater system is dynamic and changing, therefore it is impossible for a single property owner to be sure of the safety of their well water in an aquifer that is threatened by industrial activities. Once an aquifer has been contaminated, any private well that draws water from the aquifer is at risk. A strategy of monitoring and testing well water can help keep well owners informed about water quality.

Local gas extraction activities can introduce a mixture of contaminants to groundwater. While properly drilled gas wells should keep contaminants from seeping into aquifers, some wells fail to do so, allowing methane and other chemicals to reach drinking water supplies. Unpredictable chemical releases also occur above ground. Some are caused by spills or truck accidents. Others occur when “produced water” (water that includes toxic chemicals that is stored in pits on the well site) leaks from improperly managed storage pits, or from other onsite accidents. Spilled liquids, if not cleaned up, eventually make their way into the groundwater. Some of these chemicals will alter the taste, odor, or clarity of well water while others are difficult to detect. Certain chemicals used by the industry are highly toxic to humans and animals. Combinations of chemicals may further increase toxicity. Without knowledge of local releases and spills, and without access to information on specific chemicals, a well owner’s best recourse to protecting their water supply is to monitor and test regularly.

**Our Strategy In A Nutshell**

SWPA-EHP recommends that residents test their water annually, as suggested by the PA Department of Environmental Protection (DEP), for coliform bacteria, pH, nitrates and total dissolved solids (TDS).<sup>1</sup> Other contaminants that may be naturally occurring in private well water in Southwestern Pennsylvania are methane, radon and arsenic, so testing for these may also be advisable on an annual basis. For those living in areas of natural gas extraction activities, we recommend baseline testing before drilling activity starts within three miles of your home.

We strongly advise that residents follow a strategy of monitoring with screening tests on a weekly basis. We suggest testing for specific contaminants every six months, or as soon as screening tests reveal changes in water quality, or you have other indications that your well has become contaminated. Monitoring weekly for pH and for conductivity can warn well users that a change in water chemistry has occurred, although without identifying what chemicals have caused the

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\* Please visit our website for the full version of this report. [www.environmentalhealthproject.org](http://www.environmentalhealthproject.org)

<sup>1</sup> [http://www.portal.state.pa.us/portal/server.pt/community/private\\_water\\_wells/20690#Testing](http://www.portal.state.pa.us/portal/server.pt/community/private_water_wells/20690#Testing)

change. The pH test measures the acidity level in water. Conductivity is a measure of the ability of water to conduct electrical current. Both of these measurements are sensitive to changes in water quality. This strategy alerts residents that further tests should be done. For those concerned about potential contamination, monitoring pH and conductivity is much less costly than testing repeatedly for specific contaminants related to the industry. In addition, we suggest residents sign up with the PA DEP e-notice program, which will alert you when drilling permits have been issued in your area so you will know what activities are taking place near your homes.<sup>2</sup>

We also recommend residents keep a diary of monitoring results, as well as copies of all tests performed. Notes on perceived changes in water quality, such as taste, smell or clarity, along with any new industrial activity or accidents should also be recorded. Contact SWPA-EHP for assistance with pH and conductivity monitoring. A summary of recommended tests is listed here. SWPA-EHP's full report "Well Water Contamination: SWPA-EHP Ranking System and Monitoring Strategy" is available at [www.environmentalhealthproject.org](http://www.environmentalhealthproject.org)

**Getting baseline tests done as soon as possible is important for an effective monitoring strategy. The more you can include in your baseline tests, the better. Thorough baseline tests include ALL of the following:**

**1. PA DEP suggests you test the following each year, regardless of your environment:**

- coliform bacteria
- nitrates
- total dissolved solids (TDS)
- pH

**2. We recommend you also test the following as part of your baseline test:**

- ethane/methane
- conductivity
- chloride

**3. Targeted water tests – for baseline and every 6 months during natural gas extraction activities. Although these tests are expensive, we encourage you to test for as many as you can, especially as a baseline.**

- VOCs    surfactants    oil and grease
- strontium    sodium ethane/methane
- barium glycols    fluorides
- arsenic calcium    iron  
potassium

**Monitor your water for pH and conductivity in between targeted tests.** This strategy can alert you to changes in water quality, but it may not be effective for all possible contaminants. This is why we recommend retesting every six months.

**If you cannot afford many of these tests, monitoring for conductivity and pH, which are very inexpensive, will give you at least some information about your water quality. We think it is well worth the small amount of effort it takes to conduct these weekly tests.**

*These recommendations are our best advice based on the very limited research that is available. We are working with members of the local community over the next year to determine which of these tests are most essential and most cost effective. None of these strategies for monitoring your well water are 100% effective.*