

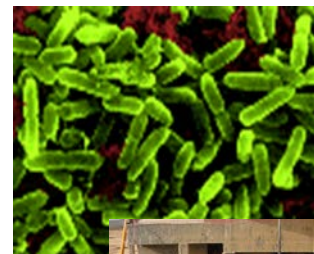
# Development of a Private Well Test Interpretation Tool for Ohioans

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## SITUATION

Ohio law requires companies drilling for oil and gas to take pre-drilling drinking well water samples within 1,500 feet of a proposed horizontal well and disclose the results to the property owner. As a result, many homeowners are receiving laboratory test results regarding the quality of their well water. State and local agencies have observed a significant increase in calls from homeowners asking for assistance with interpreting their lab test results.

Even before the rise in inquiries from well owners resulting from the shale gas drilling boom, staff at the Ohio Department of Health (ODH) and Ohio Environmental Protection Agency (OEPA) were concerned about the lack of awareness among private water well owners about the condition of their drinking water and best practices for monitoring and protecting their drinking water source from contamination.



The most common well water quality issues in Ohio include:

- *Bacteria* (e.g., *coliform*, *cryptosporidia*)
- *Arsenic*
- *Iron and manganese*
- *Dissolved gasses* (*methane & hydrogen sulfide*)
- *Organics* (*gasoline & oil*)

## SOLUTION

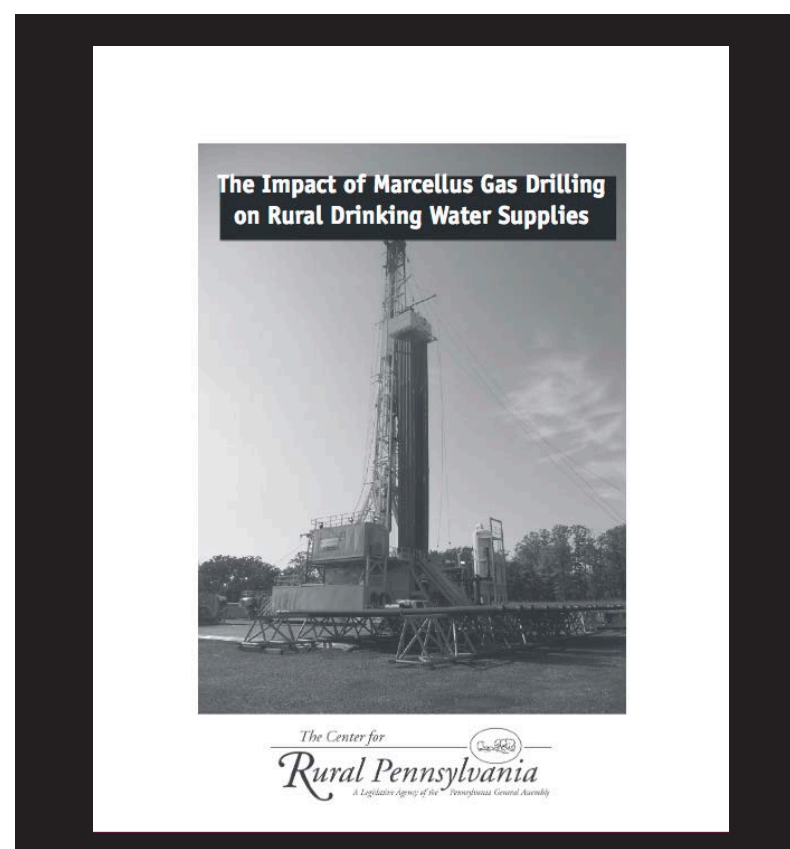
Officials from ODH and OEPA approached OSU Extension about creating a web-based tool to help private well owners interpret lab test results and make informed decisions when a contamination issue is identified. The Ohio Water Development Authority awarded a grant to OSU Extension to accomplish the following objectives:

1. Identify existing well-owner education programs.
2. Identify the specific information needs of private water well owners in Ohio.
3. Create a private well owner educational curriculum for local health department and extension educators.
4. Create a private well-owner website and well-water test interpretation tool.

## Collaborators

Anne Baird – OSU Extension  
 Joe Bonnell – OSU Extension  
 Rebecca Fugitt – Ohio Department of Health  
 Mike Eggert – Ohio EPA

## Penn State study of rural water wells



Penn State recently sampled and tested water from 233 rural drinking water wells in the Marcellus Shale region before drilling. 40% of the wells tested did not meet drinking water standards and most well-owners were unaware of the pre-existing water quality issues.

## Well Test Interpretation Tool

The well water test interpretation tool is designed to allow homeowners to enter their lab test results and get useful information about those results, including...

- How levels of contaminants in their well water compare to drinking water standards.
- Typical ranges found in Ohio drinking water wells.
- Major sources of contaminants.
- Recommendations for action (e.g., treatment options).
- Human health concerns.
- Links to additional information.

## Well Test Interpretation Tool – Data Entry Page

## Well Test Interpretation Tool – Results Page

Test Name	Lab Result	Interpretation	Acceptable values	Typical range in Ohio	Major sources in drinking water	Comments
Arsenic	20 ug/L	Action is recommended.	10 ug/L (MCL)	2 - 7	Erosion of earth materials; Runoff from orchards; Runoff from glass and electronics production wastes	<b>MCL ADVISORY - ACTION IS HIGHLY RECOMMENDED</b> Arsenic levels were detected in your water sample to exceed the maximum contaminant level (MCL).  <b>GENERAL INFORMATION</b> Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching. Arsenic cannot be destroyed in the environment. It can only change its form. Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.  <b>HEALTH EFFECTS</b> Drinking water is the main source of human exposure to arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

## METHODS

In collaboration with the Ohio Department of Health and Ohio Environmental Protection agency, the authors will complete the following:

- Literature review related to private well owner knowledge and awareness and educational interventions.
- Focus groups with well owners to identify gaps in awareness and knowledge related to well water testing, contamination risks, remediation, and best practices.
- Needs assessment of local health districts and county extension offices to identify information, curriculum, and training material needs.
- Educational curriculum and material development to meet identified needs.
- Website and well water test interpretation tool.



## ACKNOWLEDGEMENTS

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