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New groundwater study in southwest Wisconsin reveals water quality problems

MADISON — The results of the first round of groundwater sampling in Grant, Iowa, and Lafayette Counties show widespread problems with well-water contamination by nitrate and coliform bacteria. Results of random samples from 301 private wells were released today.

Overall, 42 percent of the wells tested were considered unsafe. Thirty-four percent of the samples were positive for total coliform and 4 percent were positive for *E. coli*. The presence of either total coliform or *E. coli* at any level in drinking water is considered unsafe according to state well codes and indicates possible risk of unsanitary water. Sixteen percent of the samples exceeded the health standard of 10 parts per million (ppm) for nitrate-nitrogen. High nitrate levels in drinking water have been associated with blue baby syndrome, colorectal cancer, thyroid disease, and central nervous system birth defects.

Individual well owners who participated in the study received analytical results for their own wells during the last half of December. Additional information for well owners or others who might be concerned about drinking water quality is available from fact sheets prepared by the Wisconsin DNR. <https://dnr.wi.gov/files/PDF/pubs/DG/DG0003.pdf> and <https://dnr.wi.gov/files/PDF/pubs/DG/DG0001.pdf>. These fact sheets include suggestions for actions well owners can take if contamination is found.

The causes and sources of the contamination are not yet known, and will be the focus of additional sampling and study in the coming year.

“These results are eye-opening,” said Mark Borchardt, a microbiologist with the U.S. Department of Agriculture’s Agricultural Research Service. Borchardt notes that a Wisconsin statewide survey of private wells published in 2013 found average contamination rates of coliform bacteria at 18 percent and nitrate-nitrogen at 10 percent. *E. coli* was not measured in that study.

“While possibly of concern to residents, I’m not surprised by these contamination levels,” said State Geologist Ken Bradbury, Director of the Wisconsin Geological and Natural History Survey. “The shallow bedrock and thin soils in southwest Wisconsin make this a vulnerable setting from the standpoint of groundwater contamination. Now that we’re beginning to get some solid data sets we can begin to compare the results to physical parameters such as bedrock depth, soil type, and well construction in order to determine the most important factors controlling well vulnerability.”

Samples were collected November 9–10 by homeowners across the three counties. Wells were randomly selected to assure an accurate estimate of contamination.

“The great participation we had from local well owners in this first round of sampling shows how much people value their water,” said Iowa County Conservationist Katie Abbott.

The study was initiated by Grant, Iowa, and Lafayette Counties in collaboration with researchers from the U.S. Department of Agriculture, the Wisconsin Geological and Natural History Survey-UW Extension, and the U.S. Geological Survey. Support for the study comes from the counties and agencies involved as well as other organizations, including the Lafayette Agricultural Stewardship Alliance and the Iowa County Uplands Farm-led Watershed Group.

The two-year study will collect a second set of samples in the spring and then will evaluate factors that contribute to groundwater contamination. “Once we determine how widespread contamination is,” said Joel Stokdyk with the USGS, “we’ll look at causes.” Scientists will evaluate factors that contribute to private well contamination, like precipitation, geology or bedrock, and well characteristics. The project will be completed in 2020.