

News Release

Dec. 20, 2004

John Nantz

717-730-6916

jmnantz@usgs.gov

USGS Identifies Potential Nitrate Sources in Martinsburg, PA Wells

Animal manure and chemical fertilizer are the likely sources for elevated nitrate concentrations in water from municipal-supply wells in the Borough of Martinsburg, Pa., according to a recent report by the U.S. Geological Survey (USGS). Nitrate can originate from fertilizers, manure, sewage, and other sources. Although levels in the Martinsburg well are slightly below the EPA standard of 10 milligrams per liter for safe drinking water, officials are concerned that, if nitrate levels increase, expensive treatment systems will be necessary to keep the water safe.

“Unfortunately, drilling wells in other locations around Martinsburg is unlikely to solve the problem of high nitrates,” said Bruce Lindsey, the USGS hydrologist who conducted the study. “Previous studies of ground water in the area around Martinsburg have shown that nitrate concentrations frequently exceed 10 milligrams per liter,” Lindsey said.

Recent studies indicate that trying to remove contaminants from a municipal water supply is far more costly than keeping them out in the first place. With water treatment and drilling new wells being expensive or ineffective, the Borough turned to the Pennsylvania Department of Environmental Protection (DEP) for a Source Water Protection Grant, and partnered with the USGS and the Southern Alleghenies Conservancy to study the sources of nitrate and develop a program to protect the wells from contamination. In addition, the Canaan Valley Institute provided funding to analyze water quality in the area around Martinsburg.

“Implementing a local wellhead protection program can be up to 200 times less expensive than responding to contamination of a public water system well, which could include lengthy aquifer remediation, costly treatment or possibly replacement of the well,” said Joseph Lee, chief of the Source Protection Section of DEP.

The wellhead protection study shows that ground water flows toward the Borough well fields mostly from an area that extends south to near Cranberry Road, following the trend of the geologic formations. To determine the source, scientists used nitrogen isotopes, wastewater indicators, and bacteria source tracking.

“These tools can help us determine whether ground water contaminants are from chemical fertilizer, animal manure, or leaking septic systems” Lindsey said. “The results indicated that, for most wells in the area around Martinsburg, the source of nitrate in the water is animal manure.”

Nitrogen in one municipal well field, Lindsey determined, was predominantly from chemical fertilizer, and nitrate in the water from the other well field appeared to be a mixture of chemical fertilizer and animal manure. Septic systems are not a major source of ground water contamination in the area.

The report, "Determining sources of water and contaminants to wells in a carbonate aquifer near Martinsburg, Blair County, Pennsylvania, by use of geochemical indicators, analysis of anthropogenic contaminants, and simulation of ground-water flow" is available on: <http://pubs.water.usgs.gov/sir2004-5124/>

The USGS serves the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

To receive USGS news releases go to www.usgs.gov/public/list_server.html to subscribe.

**** www.usgs.gov ****