

**Dakota County Ambient Groundwater Quality Study FAQ's
December 2005
(Frequently asked questions)**

What is the Dakota County Ambient Groundwater Quality Study (Study)?

The Study started in 1999 by sampling private water wells in the Prairie du Chien Limestone and Jordan Sandstone aquifers, which are the most heavily used aquifers in Dakota County for both private and municipal wells. Each year the same wells are sampled, to compile comparative data over time.

In 2004, some wells in the more shallow "sand and gravel" aquifer were added to the study, and laboratory analysis was done that, because of technological advances, for the first time looked for an expanded list of pesticides with lower detection levels. A total of 73 wells were sampled in 2005.

(Note: "ambient" refers to the ongoing, general condition of groundwater in an area, not groundwater known to be contaminated by a hazardous material spill, leak, or dumpsite.)

What's been found?

Varying levels of nitrate, pesticides, and compounds derived from pesticides were detected in 82% of the private wells in the study. Nitrate, pesticides, or both nitrate and pesticides exceeded drinking water standards in 21% of the wells.

What does this mean?

The results mean that anyone who gets their drinking water from a private well should consider testing their water for the presence of nitrate or other chemicals. As a precaution, it may be prudent to install a reverse osmosis filter system or use an alternate source for drinking water – especially for those who live in rural townships in the eastern half of the county.

What do the test results imply for all drinking water in the County?

Almost everyone who lives in Dakota County gets their drinking water from groundwater. If you live in a city and you do not have a private well, your drinking water is supplied by a municipal (city) source. Water quality in municipal wells in Minnesota is tested by the state Health Department at least annually.

Unlike municipal drinking water, there is no state requirement to test drinking water in private wells. However, given the Ambient Groundwater Quality study test results, it would be prudent for all private well owners in the County to test their water for the presence of nitrate, which is a health threat on its own but also can be an indicator that other harmful chemicals are also present in drinking water. Caution: the absence of nitrate doesn't necessarily mean the well water is free of impurities.

Our test results indicate more reasons for concern in rural townships in the eastern half of the county.

What is nitrate?

Nitrate is a naturally occurring chemical and is found in air, soil, water and plants. Elevated levels of nitrate may be caused by fertilizers, run-off from barnyards or feedlots, or septic systems. Earlier studies in Dakota County have found elevated nitrate to be strongly associated with row-crop farming in this area.

The study's results for 2005 found that 53% of the wells sampled had detectable levels of nitrate, 18% of those exceeded the drinking water standard for nitrate of 10 mg/L (milligrams per liter or parts per million).

What are the health risks associated with elevated nitrate levels?

High nitrate levels in drinking water can pose a special risk for infants. When an infant takes in nitrate, it's converted into another compound called nitrite. Nitrite causes the hemoglobin in the blood to change into a substance called methemoglobin. This reduces the ability of the blood to carry oxygen, causing a condition known as methemoglobinemia, or "blue baby syndrome."

When this happens, the skin turns blue -- similar in color to the blood vessels under the skin. Medical treatment should be sought immediately for this condition. Prompt medical attention usually results in a quick recovery. In severe cases, nitrate poisoning can be fatal.

What are pesticides?

Pesticides are substances intended to repel, kill, or control any species designated a "pest," including weeds, insects, rodents, fungi, bacteria, or other organisms. Pesticides include herbicides, insecticides, rodenticides, fungicides, and bactericides.

The pesticides found in the Study are not the same as those commonly used in suburban lawn care practices.

Which pesticides exceed drinking water standards?

Alachlor was found at a concentration of 2.68 ug/L (micrograms per liter or part per billion) in one well, exceeding alachlor's drinking water standard of 0.7 ug/L. Cyanazine breakdown products that exceed cyanazine's drinking water standard of 1.0 ug/L were detected in eight wells, with detections as high as 3.89 ug/L. Wells that were sampled in this study range from no pesticides to as many as 7 different pesticides. The other pesticides detected (at levels below drinking water standards) were metolachlor, atrazine, acetochlor, simazine, dimethenamid, prometon, propazine, and bromacil.

What were alachlor and cyanazine used for?

Cyanazine, alachlor, and most of the other detected pesticides are chemical compounds used to protect farm crops from weeds.

Cyanazine was used as a pre- and post-emergent herbicide to control annual grasses and broadleaf weeds, especially on sweet corn crops. Cyanazine was first introduced to the market in 1971; production stopped in 1999 and its use was no longer allowed in 2003. Trade names include: Bladex, Bladex 80WP, DW3418, Fortrol, Match, Propanenitrile, SD 15418, WL 19805 and Payze.

Alachlor is an herbicide that was widely used to control weeds in a variety of major crops including corn, soybeans, and beans. Alachlor was introduced in 1969; since 1994, it has generally been replaced with a different active ingredient, acetochlor. Trade names include: Bullet, Freedom, Lariat, Lasso, Partner, and Shroud.

What are the health risks associated with elevated cyanazine and alachlor?

The health risks associated with cyanazine are birth defects, development effects, and kidney damage. The health risks associated with exposure to alachlor are cancer or damage to the liver, kidney, spleen, or lining of nose or eyelids.

Very little information on the health effects caused by the breakdown products of cyanazine exists. Breakdown products are generally thought to be less toxic than the parent chemical. Comparing the amount of the cyanazine breakdown products to the values derived for cyanazine is considered to be a conservative approach (i.e., unlikely to underestimate potential risk).

Health risk levels are set by the state Health Department scientists; they are based on the likelihood of illness developing over a long-term exposure.

How certain/confident is the County in the recent test results?

Confirmatory sampling has been conducted on the screened wells, and the results were consistent with previous the sample results. Additional sampling will be conducted in 2006.

Are similar test results found in other counties?

Dakota County is the first county in Minnesota to test for pesticides at such low detection levels. State agriculture experts expect to duplicate Dakota County's results when similar tests were conducted on water samples from agricultural areas in other parts of the state with similar geologic conditions, but few tests have been completed so far.

What can be done about nitrate or pesticides in a well?

Drilling a new and deeper well might result in cleaner water, but our Study found pesticide degradates in even the deepest wells in our County. Treating the water used for drinking and cooking with a filter containing granular activated carbon is effective at removing pesticides from water. Reverse Osmosis systems typically include carbon filters and are effective at removing nitrate and pesticides from water, if they are maintained properly. Boiling the water will not remove pesticides or nitrate.

How can I get a reverse osmosis filtering system?

To obtain a reverse osmosis filtering system, consult a dealer listed under “Water Softening and Conditioning Equipment” in the Yellow Pages.

Can I have my well tested?

Currently there are no labs available to the consumers to conduct the sophisticated, low-level pesticide tests that we conducted. Dakota County staff can help residents have their wells tested for nitrate, coliform bacteria and many other compounds. Click on the link for more information
http://www.co.dakota.mn.us/environ/private_water_kits.htm

Who can I contact for more information?

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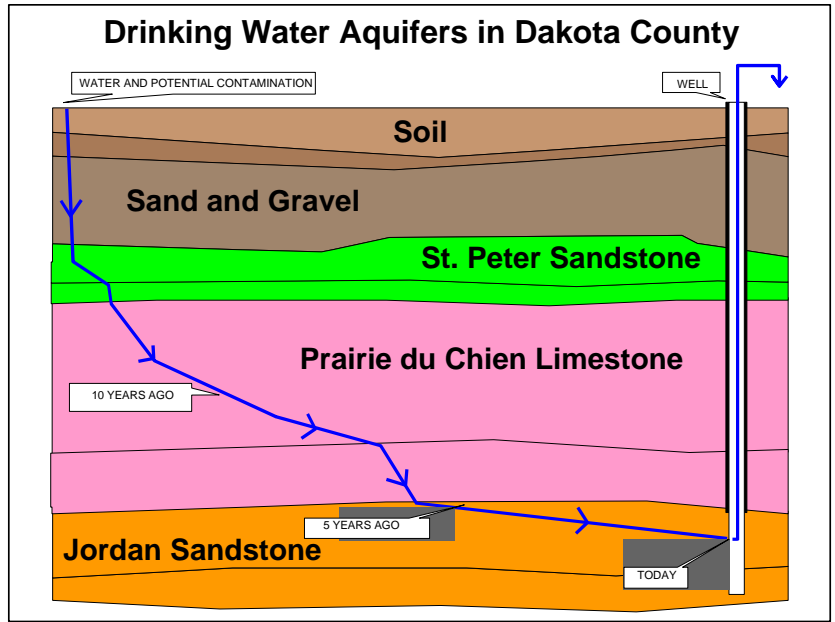
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This chart shows a cross-section of typical geology and aquifers in Dakota County. Depths of the aquifers vary.

The two main sources for drinking water in Dakota County are the Prairie du Chien and Jordan aquifers, for both private wells and municipal (city) wells. Water in sand and gravel below the surface is also a drinking water source in the County.



Nitrate and pesticides in private drinking water wells tested in Dakota County

