

Health Hazards of Nitrate

“Nitrate is a primary chemical component of fertilizer and manure that can run off farm fields and seep into drinking water supplies. Under the federal Safe Drinking Water Act, the legal limit for nitrate in drinking water is 10 milligrams per liter, or mg/L. This limit was set in 1962 to guard against so-called blue baby syndrome, a potentially fatal condition that starves infants of oxygen if they ingest too much nitrate. But newer research indicates that drinking water with 5 mg/L nitrate or even lower is associated with higher risks of colorectal cancer and adverse birth outcomes, such as neural tube birth defects. And the Minnesota Department of Health says a level of 3 mg/L indicates that “human-made sources of nitrate have contaminated the water and the level could increase over time.”

Ref: “In Minnesota’s Farm Country, Nitrate Pollution in Drinking Water Is Getting Worse,” by Anne Weir Schebinger, March 4, 2020 found at www.ewg.org The article contains further references to the data.

“In Minnesota, 5% to 10% of drinking water wells have nitrate (NO3) concentrations that exceed health standards. Well-owners incur direct costs associated with the presence of NO3, including costs related to treatment systems, well replacement, and purchasing of bottled water. About 6% of wells tested greater than the US Environmental Protection Agency health standard maximum of 10 ppm nitrate-nitrogen (NO3). Less than one-third of respondents had tested their water for NO3 within the past three years. Average remediation costs were \$190 per year to buy bottled water, \$800 to buy a NO3 removal system plus \$100 per year for maintenance, and \$7,200 to install a new well. Of well owners with nitrate-nitrogen over 10 mg/L:

- 24% bought bottled water,
- 21% installed treatment systems,
- 24% installed new wells, and
- 31% were unaware of the contamination and took no actions.

Source: Groundwater nitrate contamination costs: A survey of private well owners (2008) Journal of Soil and Water Conservation May 2008

Nitrate is but one contaminant. Its presence indicates often that other contaminants are present such as agricultural chemicals. “...an ever-increasing number and diversity of drinking water contaminants, arising from industrial, agricultural, and domestic sources will contaminate source waters.”

Polluted Drinking Water Represents an Externalization of Costs: The Costs are Transferred to the Users.

Agriculture pollution often disproportionately affects low-income rural Americans who cannot afford to buy bottled water or install effective but expensive in-home filter systems. Of the 72 Minnesota systems analyzed, 61 percent were in a U.S. Census block group with median household income below the state’s average. Installation of expensive treatment technologies to reduce nitrate levels can be a struggle in these communities.

The type of test data available for community water systems is not available for private wells.

Hastings: “...in 2008, the city spent \$3.5 million on a new water treatment plant to lower nitrate levels, ...estimated cost of \$410 per household.

Adrian: The community water system in Adrian, serves 1,211 people from groundwater wells. They were forced to shut down a water treatment plant multiple times “...treating the water for nitrate is now Adrian’s largest non-salary expenditure.”

As of 1989, contaminated groundwater cost 17 Minnesota cities and 18 Minnesota companies a total of \$150,241,280 in 2022\$. Source: MN PCA

Contaminants are common: Coliform bacteria detected in 27 percent of private wells tested in Minnesota. Manganese is estimated to occur at concentrations above MDH’s health-based guidance value in about 50 percent of Minnesota private wells. Nitrate is more likely to get into groundwater in areas with a lot of agricultural activities and sandy soils. Recent testing by the Minnesota Department of Agriculture has shown over 40 percent of private wells in some Minnesota townships, especially in SE MN, have unsafe nitrate concentrations.

That something is listed as legal may not mean it is safe. Getting a passing grade from the federal government does not mean the water meets the latest health guidelines.

There are 101 potential polluting chemicals of our drinking water and this does not include hormones (Ed. note: as far as I can tell.)

A new concern has risen: That of emerging pollutants. These are contaminants for which no regulations currently require monitoring or public reporting of their presence in our water supply. Think, for example, hormones.

Find references and links to the sources used for these articles on our web site.

The purpose of this scholarship

is to provide financial aid to individuals growing up in southeast Minnesota who are committed to sustainability in the fields of agriculture and forestry, have demonstrated leadership and communication skills, and are interested in pursuing a career in fields related to and advancing practices of sustainable agriculture and/or forestry. Sustainable practices ensure clean water, healthy regenerative soils, and vibrant rural communities for future generations.

The scholarship fund seeks to find the next generation of professionals who will learn how to manage our environment on a completely sustainable basis, provide food, fiber and shelter for people, and in the process protect our precious natural resources for our children and those yet to come.

If you too are concerned about the indiscriminate use of chemicals which are killing our pollinators, polluting our water, and negatively effecting our food supply, then JOIN US by donating today. Contributions to the Fund are fully tax deductible.

Methods of contributions are numerous:

- ☆ A check or credit card* is wonderful.
- ☆ Matching funds from your employer.
- ☆ Direct transfers from an IRA.¹
- ☆ Endowments through your Estate Plan, wills or life insurance policies.¹

1) See website for method and be sure to contact your financial advisor, accountant or lawyer for advise.

The Scholarship Endowment Fund is structured such that only earnings from the invested capital are used to pay for scholarship(s) and Fund operating expenses. This rule assures that the Fund will operate in perpetuity. The Rochester Area Foundation (RAF) is the steward of the Fund. RAF’s administrative fees are 1.25% of the annual fund balance and are amply covered by RAF’s investment performance. Neither scholarships nor fees are reducing the endowment equity!

* There is a cost to the Fund for credit card donations.

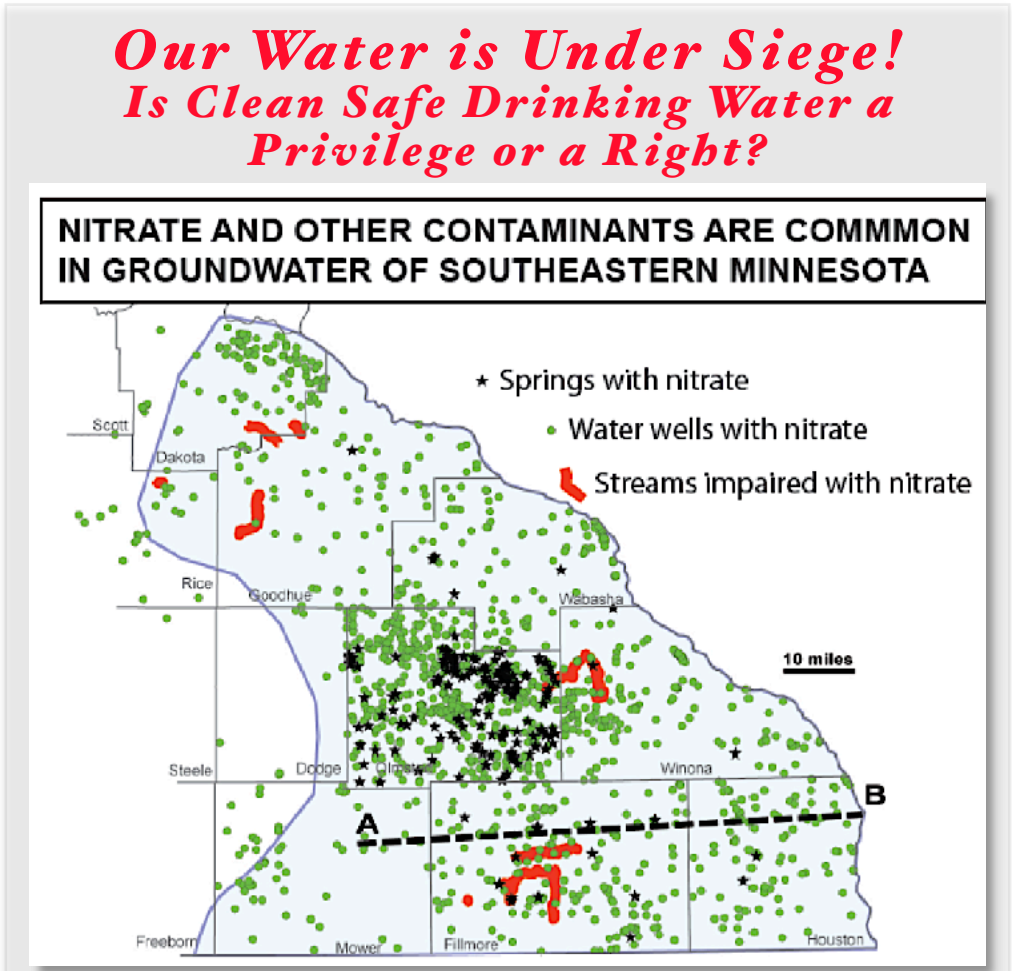
Join others who already have included the Scholarship in their will or trust and help advance sustainability for future generations.



For more details and references related to articles in this newsletter, visit our website: www.protectourresources.org

Printed on at least 30% post consumer recycled paper. Forest Stewardship and Rainforest Alliance Certified.

100% of your donation goes to build this endowment fund!*



From: Environment and Natural Resources Trust Fund (ENRTF) M.L. 2019 ENRTF Work Plan (Main Document) https://www.lccmr.mn.gov/projects/2019/work_plan_drafts/2019_04m.pdf

“Nutrient impacts are widespread. Excessive nutrients pose a significant problem for Minnesota’s lakes, rivers, and groundwater, as well as downstream waters including the Great Lakes, Lake Winnipeg, the Mississippi River, and the Gulf of Mexico. Nutrients are important for human and aquatic life; however, when levels exceed normal conditions, problems can include excessive algae growth, low levels of oxygen, toxicity to aquatic life and unhealthy drinking water.

Substantial nutrient reductions are needed across much of Minnesota. For example, in 433 Minnesota lakes with impairments related to nutrients, an average of 45 percent phosphorus reduction is needed to meet water quality standards. Phosphorus levels in 48 river stretches exceeding the pending river eutrophication standards need an average 41 percent reduction. Many of these rivers flow toward the Mississippi River and into Lake Pepin, where similar levels of phosphorus reduction are needed to achieve a healthy lake. Nitrate, a dominant form of nitrogen in polluted waters, commonly exceeds the levels established to protect drinking water, especially in wells located below sandy soils and shallow soils above fractured bedrock. Nitrate levels are high enough to harm the food chain for fish in some rivers and streams fed by groundwater and drainage ditches.

(Source: Minnesota Nutrient Reduction Strategy—September 2014 report <https://www.pca.state.mn.us/sites/default/files/wq-sr-80.pdf>)

The 2022 Scholarship Application Portal Opened on January 15. Please help us find qualified candidates.

Tell friends and neighbors about the scholarship. Two of our recipients did learn about it this way. Feel free to send us contacts to whom we can send information. The scholarship is for \$5,000 and recipients are free to apply again in following years. The purpose of this scholarship is to provide financial aid to individuals growing up in southeast Minnesota who are committed to sustainability in the fields of agriculture and forestry, and have demonstrated leadership and communication skills.

Details are available on our website: www.protectourresources.org

Help Us Spread The News Share this newsletter with others

TEST YOUR DRINKING WATER. Contact the Minnesota Well Owners Organization for information and guidance on treatment options: www.mnwoo.org

MNWO’s purpose is to provide education, technical and legal services, and advocacy to those who own and who rely on private wells for their drinking water. To preserve, protect, and restore the quality and quantity of Minnesota’s water resources and to ensure the safety of those who use them.

Hope for the Future

Did you notice the stamp on the envelope? It is featuring a bold graphic of an Amur tiger cub. This is part of USPS’s Save Vanishing Species™ postal stamps. Our purchase of these stamps benefit conservation funds that are helping creating hope for the future. Net proceeds are transferred to the US Fish & Wildlife Service Conservation Fund.

← Dramatic impacts of the Anthropocene Period → Pre Anthropocene



Soil Health:
The continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.

Soil Health Quality...also referred to as soil health, is defined as how well soil does what we want it to do. Healthy soil gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes.

Soil degradation results from

- Chemical disturbance, such as over-application of nutrient and pesticides which can disrupt the soil food web functions.
- Physical disturbance, such as tillage, which exposes soil organisms to harsh sun and kills them.
- Runoff which happens when soil is laid bare from lack of cover crops.

Soil Organic Matter is the energy-rich portion of the soil profile that's made up of plant and animal residue, along with the tissues of living and dead microorganisms. Organic matter makes up 5 percent of the soil, but controls 90 percent of its functions. Organic matter is approximately 58 percent carbon, so for every percentage increase in organic matter, there is a corresponding rise in carbon in the soil. (*From: Soil Health, Water & Climate Change: A Pocket Guide to What You Need to Know—Land Stewardship Project*).

Solutions

Examples of successful farming without, or greatly reduced, use of chemicals are plentiful. One example reported in Washington Post (8/4/2017) showed that ***despite using nearly 90 percent less fertilizer, corn and soybean yields increased, soil quality improved, and soil erosion decreased by 25 percent, all without decreasing profitability.***



Healthy soil allows plants to grow to their maximum productivity without disease or pests, and without a need for off-farm supplements.

—Rodale Institute.org/FST

Achieved with: Rotational crops, no till, and multiple species cover crops combined with rotationally grazed livestock.

Healthy soil ...

- ◆ Provides more available nutrients.
- ◆ Increases yield in our foods.
- ◆ Reduces greenhouse gas emissions and returns carbon to the soil.
- ◆ Provides clean and safe water.
- ◆ Reduces droughts and floods.
- ◆ Increases water retention and supply.
- ◆ Brings farms back to life:
 - Ecologically
 - Financially

Regenerative Farming is an approach to food and **farming** systems that rejects pesticides, artificial fertilizers and aims to regenerate topsoil, increase biodiversity, improve water cycles, enhance ecosystem services, increase resilience to climate fluctuation and strengthen the health and vitality of farming.

https://en.wikipedia.org/wiki/Regenerative_agriculture

For more details, visit our web site: www.protectourresources.org