



“ The ultimate goal is to implement enough changes — whatever those changes might be — to (meet drinking water) standards so the city doesn’t have to have treatment in place.



— Aaron Meyer, Minnesota Rural Water Association

Adrian secures wellhead protection



A south-facing view from the city’s water treatment plant shows the wellhead protection area.

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Ed Lenz, BWSR

Land acquisition ensures permanent cover continues to filter nitrates from city drinking water supply. Clean Water Fund project involves willing landowners, Nobles SWCD, Minnesota Rural Water Association.

ADRIAN — A Clean Water Fund-backed land purchase will lower nitrate levels in Adrian’s drinking water supply by keeping intact more than 30 acres of perennial grass within the city’s wellhead protection area, and by acquiring a parcel along a creek that feeds three wells on the north edge of town.

The first Minnesota Board of Water and Soil Resources (BWSR) wellhead protection grant used to buy land ensures the three parcels totaling 58.5 acres will continue to filter nitrates.

Expiring Conservation Reserve Program (CRP) contracts on two of the three

parcels prompted the city of Adrian, Nobles Soil & Water Conservation District (SWCD) and the Minnesota Rural Water Association to find a way to keep that property in permanent cover.

“If that land use were to change, it would have had a negative impact,” said Aaron Meyer. A sourcewater protection specialist with the nonprofit Minnesota Rural Water, he helped Adrian to develop its wellhead protection plan.

The third parcel was farmed through last fall’s harvest, when it was prepared for spring seeding.

Sales with the two landowners, the Morgenthaler Family Trust and Pat



Three wells supply Adrian's 648 residential and business customers. The wells lie within 1,000 feet of each other on the northern edge of the city.

and Cammie Dorn, were finalized in early 2020.

"We've been trying cover crops. We've been trying all these other things. For the city, to have a guarantee of their water quality, owning it was the next step," said John Shea, Nobles SWCD manager. The SWCD will oversee the conservation plan for the parcels.

The city had leased the Morgenthaler land for about two years, after the CRP contract expired.

"Now we are looking at some wellhead protection options to do some restoration to (bring) the land back to more of a natural state, so it's in the best condition to filter the water as it seeps into the ground," said Adrian City Administrator Jill Wolf, the city's fiscal agent for the project.

The SWCD and city this winter will determine what other nitrate-reducing practices to install with about \$148,000 in

“ It may not fix the problem, but it’s definitely going to help, and it’s going to guarantee that it’s protected. ”

— John Shea, Nobles SWCD manager

remaining grant funds. The \$426,590 Clean Water Fund grant, part of a legislative appropriation for wellhead protection that BWSR awarded through a request for proposals, covered 90% of the property's appraised value. The Kanaranzi-Little Rock Watershed District (KLRWD) contributed an \$89,620 match. The sale price was higher than the appraised value; the city's water fund made up the difference.

"It was the whole reason why we were able to proceed," Meyer said of the Clean Water Fund grant, which runs through December 2021.

"This grant allows us a whole lot more flexibility to work with individual landowners and individual communities to find what works best with them,"

Meyer said. "Without it we wouldn't have a project. It's as simple as that."

Meyer said past monitoring showed field tile lines contributed to higher nitrate levels. Haying the land kept in perennial cover encourages plants' nitrogen uptake. Keeping it out of row crops means nitrogen fertilizer isn't being added.

Meyer and Shea aim to work with farmers to find solutions.

"With our rich soils, we use nitrates to grow corn and compete in the world market. We get leaching in some of these sandier soils. The only way to protect that in full is to not allow nitrogen to be added — and that pretty much takes the farming aspect out of it. That's not an option for the farmers," said Shea, who is

also the KLRWD executive secretary.

The U.S. Environmental Protection Agency's standard for nitrates in drinking water is 10 parts per million (ppm). For treatment to stop, nitrate levels must remain under 7 ppm for a certain length of time.

Consuming too much nitrogen can affect how the blood carries oxygen. The Minnesota Department of Health (MDH) links nitrates to blue baby syndrome.

Adrian opened a water treatment plant in 1998 to reduce nitrogen levels. When water treatment equipment broke down for three months about five years ago, the city supplied pregnant or breastfeeding customers with bottled water.

"The best goal would be to get our nitrogen levels down to where we don't have to do treatment. A realistic goal is just to lower or maintain our

costs for treating the water, and hopefully lower it," said Adrian Utilities Superintendent Adam Henning, who has since taken a different job. Henning also serves on Kanaranzi-Little Rock Watershed District's board of managers.

The city aims to keep nitrogen levels under 3 parts per million.

Three wells supply Adrian's 648 residential and business customers. Previously, three other wells were closed and the existing wells were dug about one block north to avoid a plume of volatile organic compounds (VOCs) and high nitrate levels.

Once a week, the city tests pre- and post-treatment nitrate levels. Once a month, it sends samples to Minnesota Valley Testing Laboratories.

The water treatment plant can reduce nitrate levels to 5 ppm or less. But more treatment requires more salt water, which costs more. To keep levels within limits, the plant mixes water from the three wells.

Well No. 6 is closest to the creek. It has tested highest for nitrates, with levels at times exceeding 30 ppm. In 2017, the city started pumping and treating water from well No. 6 to lower nitrate levels in the other wells by preventing



A south-facing view from the city's water treatment plant shows the wellhead protection area. Adrian's location just off Interstate Highway 90 has made it more challenging to plant cover crops. The powerlines that parallel the freeway make aerial seeding impossible. In recent years, equipment has become more available for ground seeding.

the water from traveling through the aquifer to the north. Nitrate levels fluctuate throughout the year, depending partly upon rainfall totals and timing, and what crops were grown.

Since 2017, individual wells' pre-treatment nitrate levels have been as low as 4.5 ppm.

Over the past few years, Henning said the levels had been trending downward.

"Since we started doing some of these different things, I have noticed a drop in our nitrates," Henning said. "I couldn't tell you what's doing it because we're doing about five different things."

Those include best management practices on cropland.

MDH grants offset the financial risk to farmers who

planted cover crops within Adrian's 1,865-acre Drinking Water Supply Management Area (DWSMA). The Kanaranzi-Little Rock Watershed District added \$10 to the grant's \$40 an acre payment.

Two producers planted cover crops on 236 acres within the wellhead protection area in fall 2018. One of them, the renter who farmed the Morgenthaler land, enrolled 96 acres for a second year.

"These are our ultimate goals. This is what we'd like to see within our wellhead area," said Laura DeBeer, a Pipestone County-based regional water resources specialist who works with highly vulnerable wellhead protection areas in six southeastern Minnesota counties.

Fifteen producers own agricultural land within the

DWSMA. One of those is in the area classified as highly vulnerable.

The MDH implementation grant awarded in 2017 for the 2018 season was followed by another grant for 2019.

DeBeer also has worked with producers to more efficiently and effectively deliver nitrogen fertilizer through manure management.

"What's going to be good for the wellhead protection area is also going to be good for the application," DeBeer said.

The SWCD will continue to work with farmers on cover crops, split nitrogen application and other practices that maintain productivity.

"This isn't the only shallow aquifer in Nobles County, so this is the first step," Shea said

"I would like to see all of the upland farms using best management practices and still utilizing their property for their cash flow of their operation. If we can get it to work and put in permanent grass, that's even better. But I don't think everybody needs to give up farming in this watershed. I just want them to be aware that what they put on the field might affect their neighbor," Shea said.



The Minnesota Board of Water and Soil Resources' mission is to improve and protect the state's water and soil resources by working in partnership with local organizations and private landowners.
Website: www.bwsr.state.mn.us