



# Drinking Water Protection

## Perham Wellhead Protection – A Case Study

*Developed cooperatively between the Minnesota Department of Agriculture and the Minnesota Department of Health*



Perham is located in the heart of Minnesota’s west-central lakes region in Ottertail County. The city boasts an impressive business community based upon industry, agriculture, and tourism. Approximately 325 million gallons of water are supplied each year to businesses, industry, and its 2600 residents. Elevated nitrate levels in the community’s drinking water supplies have forced the city to take immediate and long-term corrective actions. Providing quality drinking water is an important component for future growth and viability of this region.

### *Perham’s Water Quality and Challenges*

- ◆ Five supply wells vary in depth from 95 to 120 feet deep. Two supply wells were recently idled due to low output and will only be used under emergency or backup situations. A new well, yielding high quality water, was put online in 2000 to replace them.
- ◆ Individual city wells have sporadically exceeded the safe drinking water standard of 10 parts per million (PPM). Currently city staff blends water to keep the levels of the finished drinking water between 6 to 8 PPM of nitrate. Deeper aquifers with lower nitrate levels contain high levels of iron. More than likely, finding adequate supplies of low nitrate water will become more and more difficult.
- ◆ A nitrate removal system was considered, but not put into practice because of the very high costs involved
- ◆ Water quality is impacted by factors such as land use activities from a combination of growing high nitrogen consuming crops, large areas being irrigated, coarse-textured soils which allow rapid water movement, and relatively shallow wells.
- ◆ Perham’s wellhead protection area covers approximately 11,500 acres. Within this area, 1600 acres are of significant importance, because surface water can reach the aquifer within 10 years.
- ◆ In the remaining protection area it typically takes between 10 to 30 years for water to reach the aquifer. This means that we may not enjoy many of the environmental benefits of improved nitrogen management for years to come.



### *Successful Action Steps*

- ◆ A wellhead protection plan was completed to address the amount of nitrogen escaping from cropland, lawns, septic tanks, and feedlots. Management goals and strategies in the plan define implementation steps to protect and improve drinking water quality. This approach was highly successful due to cooperation among community residents, farmers, businesses, industry, and state/local agencies.
- ◆ Residents in the wellhead protection area, including farmers, businesses and city homeowners, are being provided with information on specific actions they can take to protect drinking water. Information is being distributed through public meetings, press releases, utility bill inserts, demonstration projects and curriculum being taught in local schools.
- ◆ Signs have been installed identifying the boundaries of the wellhead protection area. Residents, landowners, and producers have a better understanding of the size of the protection area when they can visually see it.



- ◆ In 1993, the Perham wellhead protection team partnered with the Minnesota Department of Agriculture to establish a volunteer groundwater monitoring network using about 100 privately owned wells. Nitrate trends are monitored in outlying areas and within the water supply management area.
- ◆ In 1999 and 2000, most farmers who farm in the wellhead protection area participated in a study to evaluate their current nutrient management practices, fertilizer, manure rates, and review associated management. This information helped educators design appropriate programs and served as the baseline to determine where improvements have been achieved
- ◆ Farmers are trying a new variety of potato that produces good crop yields with less nitrogen fertilizer.
- ◆ Livestock producers are improving the way they manage manure by developing nutrient management plans and taking nitrogen credits for those applications.
- ◆ Landowners have been encouraged to take sensitive land out of crop production where nitrate leaching is a risk. This land is enrolled in long-term easements through the Conservation Reserve Program (CRP). Native grasses planted on this land are helping to filter out pollutants moving into ground water.
- ◆ Homeowners are learning efficient ways to manage nitrogen fertilizer applications on their lawns. Regular maintenance of septic systems is encouraged and failing systems are upgraded.

### Future Activities and Needs

- ◆ Future research is needed on perennial cropping systems within the protection area. Perennial forages, such as alfalfa, are being evaluated by USDA-ARS researchers for nitrate removal and potential benefits of phytofiltration.
- ◆ Slow release nitrogen fertilizers will continue to be evaluated for crop response, profitability, and water quality.
- ◆ Modeling will help identify the most sensitive lands for nitrate loss potentials. Landowners with sensitive land will be encouraged to enter long-term conservation easement programs.
- ◆ Continued monitoring of nitrate levels in private and city wells will provide water planners with valuable trend information and a base to evaluate water quality improvements.

### For more information:

Minnesota Department of Agriculture - [www.mda.state.mn.us/appd/waterprotect.htm](http://www.mda.state.mn.us/appd/waterprotect.htm)

Minnesota Department of Health - [www.health.state.mn.us/divs/eh/water/index.html](http://www.health.state.mn.us/divs/eh/water/index.html)

Minnesota Rural Water Association - [www.mrwa.com](http://www.mrwa.com)

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