

Title: Groundwater Quality Investigation of Selected Townships in Jefferson County, Wisconsin (Study No. 53)

Investigators: Principal Investigator

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Period of Contract: December 27, 1988 through July 1, 1989

Objectives: To assess the groundwater quality of selected regions within Jefferson County with an emphasis on nitrate-nitrogen.

Background/Need: A previous evaluation suggested that Jefferson County had the highest per acre loadings of nitrogen in the state.

Methods: 183 monitoring wells were sampled and a water quality inventory was conducted between January and April of 1989. Water samples were analyzed for nitrate-nitrogen, conductivity, hardness, chloride, iron, pH, alkalinity and sulfate. A computer-generated water table map was constructed to delineate groundwater flow; this information was used to assess groundwater contamination.

Results: The average nitrate concentration in samples taken was 2.4 milligrams per liter (mg/l), while the Wisconsin drinking water standard is 10 mg/l. 7% of the sites exceeded this drinking water standard. Chloride averaged concentrations of 24.7 mg/l and iron averaged 5.2 mg/l. Hardness averaged 343 mg/l which is considered very hard. Specific conductance ranged from 400 to 1710 micromhos per centimeter. The alkalinity concentration averaged 272 mg/l while sulfate averaged 51 mg/l.

Conclusions: Nitrate-nitrogen did not exceed the drinking water standard in a significant number of wells sampled in Jefferson County.

**Recommendations/
Implications:** Nitrates are relatively mobile constituents and are not easily absorbed into soil or rock particles. They persist in groundwater once they enter an aquifer and are difficult to eradicate. Additional cooperative county groundwater surveys should be conducted to assess nitrate contamination and increase public awareness of human impacts on groundwater quality. In Jefferson County, additional sampling should be conducted with particular emphasis on shallow wells.

Availability of Report: This report is available for viewing and loan at:

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