

**Title:** Drinking Water and Groundwater Quality in the Lower Wisconsin River Valley

**Project I.D.:** DNR Project No. 78

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**Period of Contract:** July 1, 1990 through December 31, 1991

**Background/Need:** The Lower Wisconsin River Valley is an area highly susceptible to drinking water and groundwater contamination because of the sandy soils and shallow depth to water. Previous sampling of household wells by the Department of Natural Resources (DNR) has shown levels of atrazine and nitrate above the enforcement standard (3.5 ppb Atrazine only and 10 ppm NO<sub>3</sub>-N) in an area from Arena to Lone Rock. Samples from Department of Agriculture, Trade and Consumer Protection (DATCP) monitoring wells downgradient of irrigated sandy fields in the valley have shown atrazine and high nitrate levels. This study was conducted to assess drinking water and groundwater quality in areas of the LWRV which had not been previously sampled.

**Objectives:** To expand drinking water and groundwater sampling in irrigated and non-irrigated areas in the Lower Wisconsin River Valley (LWRV) from Prairie du Sac to Boscobel.

**Methods:** 78 samples were taken from wells in the LWRV, some along the valley flanks and a few outside the valley. Most of the wells were private drinking water wells. Pesticide concentrations for atrazine, alachlor (Lasso<sup>TM</sup>), metolachlor (Dual<sup>TM</sup>), simazine (Princep<sup>TM</sup>) and cyanazine (Bladex<sup>TM</sup>) were determined by the State Lab of Hygiene. Analyses for metabolite detections of these pesticides were provided by the State Lab during the course of the study which involved 66 of the 78 (75%) samples taken. Concentrations of individual metabolites were determined for 24 of the samples. Nitrate-nitrogen concentrations as well as other water quality parameters were determined by a university lab. Samples were collected from October 1990 through June 1991.

**Results:** Atrazine and its metabolites were detected throughout the LWRV. Of the 66 samples for which both parent atrazine and metabolites were determined, 28 (42%) had detects. Atrazine metabolites were found in 11 (17%) of the samples when the parent compound was not present. Other pesticides were also detected including metolachlor, alachlor and simazine. Nitrate concentrations exceeded the drinking water standard in 27 of the 78 (35%) samples taken. 8 of the samples (10%) had nitrate concentrations exceeding 20 ppm.

**Conclusions:** These results show that agricultural chemicals (pesticides and fertilizers) move to the groundwater easily with percolating water in this highly susceptible area. Local variations were found that appeared to depend on land use immediately upgradient of the well.

**Implications/  
Recommendations:** Highly susceptible areas in the state (sandy soils, shallow water table, shallow depth to bedrock) where agricultural use of the land can affect groundwater quality, should be analyzed for nitrate and pesticide contamination. Educational efforts to address

cropping practices and farmstead management of potential contaminants are more likely to be successful when water analyses are available.

**Key Words:** Lower Wisconsin River Valley, atrazine, nitrate, pesticides, metabolites

**Funding:** DNR

**Project Report:** A final report containing more detailed information on this project is available for loan from Wisconsin's Water Library, University of Wisconsin - Madison, 1975 Willow Drive, Madison, Wisconsin 53706 (608) 262-3069.