



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Nebraska

## Land Treatment Practices Lower Atrazine Levels

### Waterbody Improved

Routine monitoring conducted by the Nebraska Department of Environmental Quality (DEQ) in 1997 identified high concentrations of atrazine in southeast Nebraska's Swan 5A Reservoir, prompting DEQ to add it to the state's 1998 Clean Water Act section 303(d) list of impaired waters for atrazine. In response, stakeholders developed and implemented a watershed management plan. The reservoir's atrazine levels dropped, and DEQ removed Swan 5A Reservoir's atrazine impairment from Nebraska's 2006 303(d) list.

### Problem

The 95-acre Swan 5A Reservoir was designed and developed as a multipurpose, flood-control/public use area in Saline County, Nebraska, and falls within the Big Blue River Basin. Approximately 52 percent of the reservoir's 4,590-acre watershed is used for crop production (2,399 acres). Monitoring data collected in 1997 showed that the reservoir had elevated levels of the herbicide atrazine. This herbicide is typically applied to crops such as corn and sorghum—both of which are grown in the watershed.

The Nebraska water quality standard for chronic exposure to atrazine is 12 micrograms per liter ( $\mu\text{g/L}$ ), which is equivalent to 12 parts per billion (ppb). Eight of the 24 samples collected from the reservoir in 1997 exceeded the chronic water quality standards with a median concentration of 5.6 ppb and a maximum concentration of 42.56 ppb. For the reservoir to meet standards, regulations would allow only 4 exceedances of the standard in a sample size of 24. Consequently, DEQ added the reservoir to the state's 1998 303(d) list of impaired waters due to an impairment of the aquatic life use from high atrazine concentrations.

### Project Highlights

The majority of watershed landowners (35 of 43) participated in the project. Participants implemented numerous pollution control measures, including placing an additional 65 percent

of the cropped ground (1,550 acres) under no-till and nutrient and pesticide management practices, installing 29,345 linear feet of terraces on highly erosive crop ground, constructing or restoring 16 water quality basins to original holding capacity, converting 237 acres of crop ground to grass, installing 2 new waterways, planting 7 acres of trees, decommissioning 5 abandoned wells and bringing 6 septic systems into compliance with current standards (Figures 1 and 2).



Figure 1. Watershed landowners and operators attended water quality workshops to learn about the benefits of no-till farming and nutrient and pesticide management.

Figure 2. Constructing a weir has established a wetland area directly above the reservoir. The wetland will complement other nonpoint source controls in the watershed aimed at reducing sediment, nutrient and pesticide loads.



In 2003 the Lower Big Blue Natural Resources District partnered with several local, state and federal agencies to initiate a Community Based Planning process. Through this locally led process, the partners developed a Watershed Management Plan that incorporated a unique mix of cost share and incentives to encourage farmers to implement a host of agricultural management practices. The plan also requires that landowners upgrade septic systems and close abandoned wells.

## Results

Water quality data collected between 2004 and 2006 showed that all 13 atrazine samples were below the standard with a post-project median concentration of 2.85 ppb, which led DEQ to remove Swan 5A Reservoir from the state's 303(d) list in 2006 (Figure 3). Two samples collected in 2007 exceeded the chronic standard; however, Swan 5A remained off the 2008 303(d) list because of a large sample size.

Loadings of other targeted pollutants such as sediment and nutrients have also decreased. To date, land treatment measures in the watershed have helped reduce sediment loading by almost 69 percent and phosphorus loading by 58 percent—exceeding the 50 percent reduction goals established for both.

## Partners and Funding

The project was made possible through a strong partnership of the Lower Big Blue Natural Resources District, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service, Nebraska Environmental Trust, Nebraska DEQ, U.S. Environmental

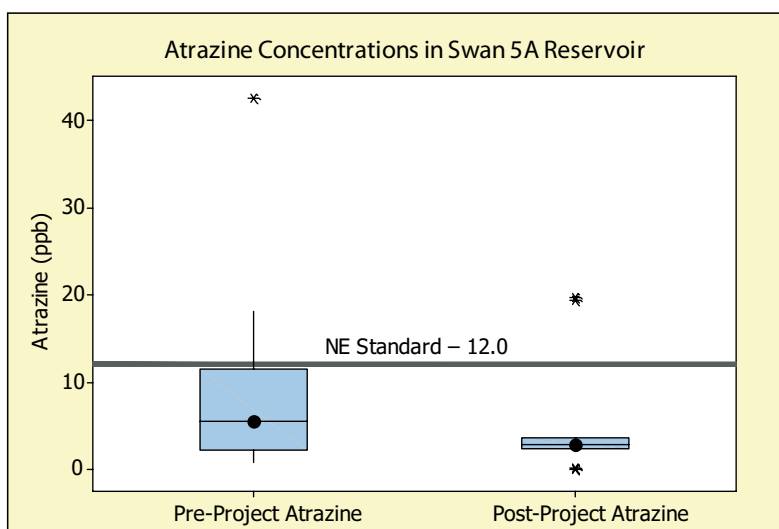


Figure 3. Boxplots indicate the interquartile range (25th–75th percentile), median (represented by dots) and outliers (represented by asterisks) of the date in each of two periods: Pre-project data (years 1997 and 2003) and post-project data (2004–2007).

Protection Agency, Saline County Cooperative Extension, Nebraska Game and Parks Commission, Swan Reservoir Watershed Council and watershed landowners and operators. Section 319 funding supported efforts to conduct resource inventories (\$7,500), engineering design (\$100,000) and management practice cost-share and incentives (\$300,000). Additional sources of cost share and incentive funds include the USDA Environmental Quality Incentive Program (\$215,000), Nebraska Environmental Trust (\$275,000), Lower Big Blue Natural Resources District (\$124,000) and landowners (\$175,000). This project to implement land treatment measures began in 2004 and will continue through fall 2008. Maintaining a high-quality reservoir will continue to be a priority for the resource management agencies, so they will maintain and implement traditional and nontraditional practices as needed in the future.



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