

SECTION 319 NONPOINT POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

LAKE HENDRICKS WATERSHED PROJECT

By

BROOKINGS CONSERVATION DISTRICT

December, 2002

This project was conducted in cooperation with the State of South Dakota and the United States Environmental Protection Agency, Region 8.

Grant # C9998185-98-0

## EXECUTIVE SUMMARY

PROJECT TITLE: Lake Hendricks Watershed Project

PROJECT START DATE: 1998    PROJECT COMPLETION DATE: 2002

FUNDING:	TOTAL BUDGET	\$498,233.00
	TOTAL EPA GRANT	\$213,152.00
	TOTAL EXPENDITURES OF EPA FUNDS	\$161,105.48
	TOTAL CONSERVATION COMMISSION GRANT	\$ 50,388.00
	TOTAL EXPENDITURES OF COMMISSION GRANT	\$ 43,318.05
	TOTAL SD CONSOLIDATED WATER FACILITIES FUNDS	\$ 60,000.00
	TOTAL EXPENDITURES OF CONSOLIDATED FUNDS	\$ 60,000.00
	MATCH ACCRUED CASH MATCH	\$ 87,257.94
	<b>TOTAL EXPENDITURES</b>	<b>\$351,681.47</b>

## **PROJECT SUMMARY:**

The goal of the Lake Hendricks / Deer Creek Watershed project was to reduce the mean in-lake total phosphorus concentration to less than 0.1 mg/L, to reduce the potential for fecal coliform bacteria, and to reduce soil erosion and sediment loading to the lake. Water quality data were not collected as part of the project to determine achievement of the goal.

Lake Hendricks is a shallow prairie lake located at the headwaters of the Lac Qui Parle River, a major tributary of the Minnesota River. The 1,532-acre lake lies along the South Dakota-Minnesota border. Its 25,600-acre watershed contains areas in South Dakota and Minnesota. The South Dakota portion of the watershed is 18,000 acres or 70% of the total watershed. The land use in the Lake Hendricks watershed indicates that approximately 94% is agriculture, involved in crop and livestock production.

Water quality of the lake has deteriorated due to excessive nutrient and sediment loading associated with the land use practices in the watershed and immediate lakeshore area. The City of Hendricks, Minnesota with a population of 684 residents, is located on the eastern side of the lake. Many of the retail businesses in Hendricks rely heavily on those who use the lake for recreational purposes.

The project received funding from the SD Conservation Commission (\$50,388); SD Consolidated Water Facilities Construction Program (\$60,000 shoreline stabilization); and EPA 319 (\$213,152).

### **Successes and Failures of the Lake Hendricks/Deer Creek Watershed Project**

Two programs that enrolled a large number of acres and that will protect the landscape and improve water quality for years to come are the general CRP program and Continuous CRP. We were able to enroll large tracts of land that had a high potential for soil loss through the general CRP sign-up. By enrolling these tracts in CRP, erosion on the average has been reduced by four to five tons per acre per contract year (10 to 15 years). The following items: field windbreaks, shelterbelts, waterways, wetland restoration, filter strips, riparian buffers, and living snow fences, are all practices that qualify for great incentives under the Continuous CRP program. These two programs were used when higher incentives and cost-share benefited the producer.

The practice of installing cattle (rock) crossings received high interest from area producers. Following construction of the first few crossings, other producers became interested as they learned how effective the crossings are. Now, producers outside of the watershed are interested in and are constructing rock crossings.

Due to the small size of the watershed and the limited number of producers it was difficult to find willing producers and projects for every line item and conservation practice on the budget sheet. Due to the limited size of the watershed and small farm size, we were unable to find a producer interested in constructing an animal nutrient management system. Many of these producers are getting to the point of retiring and putting additional resources into their operation is not a preferred option for them.

The Brookings Conservation District plans to do semi-annual follow-up on all of the Best Management Practices (BMPs) that were installed in the watershed for the next several years. Through news releases we plan to inform producers and promote current USDA conservation programs. We are currently working with several producers who want to install conservation buffers within the watershed next year.

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## **Project Goals, Objectives & Accomplishments**

### **Objective 1.**

Reduce the phosphorus loads and fecal coliform bacteria entering Lake Hendricks from Deer Creek.

#### **Task 1.**

Reduce nutrient and fecal coliform loading of Deer Creek by implementing livestock grazing management and animal waste management systems.

#### Product 1:

Construct off-creek dugouts sufficient in volume to reduce use of the creek as a primary watering source by cattle.

#### Accomplishments:

Constructed two new dugouts and two cleanouts. These structures will be used as primary water sources for livestock reducing the use of creeks as livestock water sources.

Constructed two sedimentation retention/wildlife dams to prevent nutrients and sediment from reaching Lake Hendricks.

#### Product 2:

Implement grazing management practices. Grazing management is the implementation of rotational or deferred grazing systems to increase forage quality and quantity.

#### Accomplishments:

Over a three-year period, producers volunteered to defer grazing on 502 acres allowing grass to rejuvenate for better range quality. The improved grass stands improved water filtration, reduced soil erosion, and allowed riparian areas to rest.

During the course of the project nine cattle (rock) crossings were constructed in cooperation with seven different producers. Cattle crossings provide livestock with a protected area to cross a stream and prevent livestock from increasing stream turbidity.

A total of 6,450 linear feet of fence was constructed to exclude cattle access to Lake Hendricks, and to allow the natural re-vegetation of the banks and shoreline.

**Product 3:**

Design and construct innovative animal waste systems to reduce nutrients and fecal coliform bacteria entering the creek.

**Accomplishments:**

No producers were interested in this practice.

**Task 2.**

Install Best Management Practices (BMPs) in the watershed to reduce nutrient and sediment loading.

**Product 1:**

Promote crop residue management practices (no-till and conservation tillage).

**Accomplishments:**

A total of 1,666 acres of Conservation Tillage were enrolled over a three-year period.

**Product 2:**

Promote integrated crop management consulting for proper application of fertilizers and pesticides.

**Accomplishments:**

A total of 640 acres of Integrated Crop Management (ICM) were implemented over a two-year period. The project worked with two operators on getting started with ICM. Numerous producers in the watershed were doing ICM on their own before the project started; these acres were not included in the final report.

Product 3:

Promote the construction and use of grass waterways.

Accomplishments:

Interested producers were informed about the project cost-share program and were provided with service under the USDA Buffer Assistance Program. One grass waterway (2,050 linear feet) was constructed as part of the Buffer Assistance Program.

Product 4:

Promote the construction and use of terraces to control soil erosion.

Accomplishments:

No producers were interested in this practice.

### **Task 3.**

Management of riparian and wetland areas.

Product 1:

Tree plantings to reduce soil erosion along critical areas.

Accomplishments:

Planted 1,054 trees (approx. 3.5 acres, 560 rods) on steep slopes (critical areas) to reduce wind and water erosion, and to provide habitat for wildlife.

Product 2:

Promote seeding critical areas, prone to soil loss, back to grass.

Accomplishments:

Converted 96 acres of erosion-prone crop ground to grass/hay, reducing soil loss and conserving soil moisture. These acres were regarded as critical areas due to steep slopes and proximity to streams and Lake Hendricks.



Product 3:

Promote the restoration of wetlands within the watershed.

Accomplishments:

Promoted wetland restoration and preservation by enrolling fields in the general Conservation Reserve Program (CRP). Approximately 3,500 acres were enrolled during the course of the project. These areas were planted back to native grass for a contract period of 10 to 15 years. Several hundred acres of wetlands were restored as part of the general CRP enrollment.

**Task 4.**

Technical assistance for design and implementation of BMPs.

Product 1:

Provide engineering consulting services for applicable BMPs.

Accomplishment:

Engineering for most BMPs was done in-house using local knowledge and resources.

**Objective 2.**

Reduce shoreline sediment loading of Lake Hendricks.

**Task 1.**

Stabilize critical areas of the lake shoreline.

Product 1:

Provide engineering consulting for design and construction inspection.

Accomplishments:

The project hired an engineering firm to design and oversee the construction of a shoreline stabilization project.

Product 2:

Installation of “hard” shoreline erosion control practices. This utilizes riprap and filter fabric.

Accomplishment:

The planned amount of “hard” shoreline stabilization was 1,000 feet. During the course of the project 1,575 linear feet of shoreline was stabilized with the use of filter fabric and granite quartzite rock riprap. This reduced shoreline erosion and sedimentation on three separate areas around Lake Hendricks.

Product 3:

Installation of “soft” shoreline erosion control practices.

Accomplishments:

Shoreline owners were informed about the possibility of protecting their shoreline using “soft” practices. However, no suitable sites for “soft” practices were found. Interested residents with severe bank erosion problems used “hard” shoreline erosion control practices.

Product 4:

Soil testing for fertilizer application.

Accomplishments:

Lakeshore residents were encouraged to use phosphorus-free lawn fertilizer. Residents also received newsletters on proper lawn care, litter disposal and lake protection tips to practice every day. They were very receptive to these recommendations. Many lakeshore residents implemented yearly soil samples before applying fertilizer. Soil samples were done at cabin owners’ expense.

### **Objective 3.**

Reduce the nutrient and fecal coliform loading from failing septic systems around the lake.

#### **Task 1.**

Cooperate with the SD Sanitary Sewer District, the City of Hendricks and East Dakota Water Development District in funding a feasibility study for wastewater treatment options around the lake.

Product 1:

Contract and coordinate with an engineering consultant to conduct a wastewater feasibility study.

Accomplishments:

An engineering firm was hired to conduct a feasibility study and complete a printed Diagnostic and Feasibility plan for the construction of a sanitary sewer around Lake Hendricks. The study was completed in cooperation with the East Dakota Water Development District, City of Hendricks, Lake Hendricks (SD) Sanitary Sewer District, and the Brookings Conservation District. Construction of a lake sewer system is still under consideration.

#### **Objective 4.**

Implement an information and education program for landowners in the watershed and around the lake. Also, establish a monitoring and evaluation program to track and report progress of the restoration project.

#### **Task 1.**

Initiate pollution prevention programs to ensure nutrients and pesticides used near the shoreline do not enter the lake.

Product 1:

Completed public meetings, brochures for lake residents, and newspaper releases throughout project.

#### **Task 2.**

Initiate pollution prevention programs for the watershed residents. Promotion of conservation practices and project participation.

Product 1:

Completed public meetings, landowner contacts, brochures on conservation practices and pollution reduction, and newspaper releases on project progress. An advisory group of local landowners met several times each year to give input on project progress, to share ideas, to address environmental concerns, and to get up-dates on all aspects of the project. The project coordinator met one-on-one with producers in the watershed to discuss questions and concerns, and to encourage their participation in the project.

### **Task 3.**

Establish points in the watershed to monitor and evaluate project progress. Prepare reports for participating agencies on project progress.

#### **Product 1:**

Monitoring and evaluation to document progress of the project.

#### **Product 2:**

Document progress with the use of photopoints.

#### **Accomplishments:**

Held numerous public meetings in Lake Hendricks, MN and in White, SD to inform producers about the project goals and types of cost-share available. Completed newspaper releases and newsletters on the project and current practices being installed. Watershed fact bulletins and information postcards were mailed to producers in the watershed, and news articles were published in local papers about the project and available programs. Documented projects with photopoints at various locations throughout the watershed.

## **Project Sponsors & Supporting Agencies**

#### **Partners involved in the project:**

Department of Environment and Natural Resources (DENR)  
Lake Hendricks Improvement Association (LHIA)  
East Dakota Water Development District (EDWDD)  
Lake Hendricks SD Sanitary Sewer District (LHSSD)  
City of Hendricks  
City of Toronto  
Deuel County Conservation District (DCD)  
Minnekota Sportsman's Club  
Oak Lake Township Board  
Lincoln County Water Management Task Force  
Lincoln County Soil & Water Conservation District (LCSWCD)  
Hendricks Kiwanis Club  
Hendricks Economic Development Authority  
Lake Hendricks Working Group  
Natural Resources Conservation Service (NRCS)  
US Fish & Wildlife Service  
Numerous watershed residents and producers



Cattle (rock) crossings were a very popular conservation practice in the watershed. Crossings provided livestock with a location to cross the creek and helped reduce the amount of suspended solids in the creek.



The Lake Hendricks/Deer Creek watershed project promoted conservation tillage and Integrated Crop Management. Both of these practices reduce soil erosion, increase moisture retention, and reduce nitrogen and phosphorus loss.



During the course of the Lake Hendricks project 1,575 linear feet of shoreline was stabilized with the use of filter fabric and granite quartzite rock riprap. This reduced shoreline erosion and sedimentation on three separate areas around Lake Hendricks.



Wetland restoration and preservation were promoted by enrolling fields under the general Conservation Reserve Program (CRP). Approximately 3,500 acres were enrolled during the course of the project. These areas were planted back to native grass for a contract period of 10 to 15 years. The project also converted 96 acres of erosion-prone crop ground to grass/hay, reducing soil loss and conserving soil moisture.

### Final Project Budget

	<b>EPA 319</b>	<b>Conservation</b>	<b>SD Consolidated</b>	<b>Local Funds</b>	<b>Total</b>
	<b>Grant</b>	<b>Commission</b>	<b>Water Project</b>		
<b>Line Item</b>					
Salary	\$69,249.54				<b>\$69,249.54</b>
Administration	\$1,185.47			\$1,459.98	<b>\$2,645.45</b>
Information & Education	\$609.10			\$300.00	<b>\$909.10</b>
Engineering	\$13,703.75	\$11,317.49			<b>\$25,021.24</b>
Conservation Tillage	\$3,154.00	\$8,640.00		\$13,196.00	<b>\$24,990.00</b>
Integrated Crop Management		\$1,925.10		\$1,417.14	<b>\$3,342.24</b>
Critical Area Seeding	\$900.00	\$4,192.68		\$3,081.00	<b>\$8,173.68</b>
Tree Planting		\$2,753.01		\$1,652.47	<b>\$4,405.48</b>
Cattle (rock) Crossing	\$7,035.00	\$6,533.25		\$4,479.05	<b>\$18,047.30</b>
Exclusion fence	\$5,346.00	\$3,075.82		\$661.50	<b>\$9,083.32</b>
Dam-Dugout	\$10,244.41	\$3,880.70		\$4,796.54	<b>\$18,921.65</b>
Deferred Grazing				\$7,525.50	<b>\$7,525.50</b>
Shoreline Stabilization	\$49,386.11		\$60,000.00	\$43,688.76	<b>\$153,074.87</b>
Water Quality	\$292.10	\$1,000.00			<b>\$1,292.10</b>
Sanitary Sewer				\$5,000.00	<b>\$5,000.00</b>
<b>Total</b>	<b>\$161,105.48</b>	<b>\$43,318.05</b>	<b>\$60,000.00</b>	<b>\$87,257.94</b>	<b>\$351,681.47</b>