SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

LAKE THOMPSON / LAKE HENRY / LAKE PRESTON / WHITEWOOD LAKE

KINGSBURY LAKES WATER QUALITY IMPLEMENATION PROJECT

By

ROGER STROM
WATERSHED PROJECT COORDINATOR

KINGSBURY CONSERVATION DISTRICT
JODY MACKEY
DISTRICT MANAGER

JULY, 2008

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

Grant # C9-99818505-0

EXCUTIVE SUMMARY

PROJECT TITLE: KINGSBURY LAKES WATER QUALITY IMPLEMENATION PROJECT

Grant # C9-99818505-0

PROJECT START DATE June 28, 2005

PROJECT COMPLETION DATE June 30, 2008

FUNDING:	BUDGET	
	INITIAL	AMENDED
	$1,145,510.00	$1,241,843.00
EPA GRANT # C9-99818505-0	$ 412,650.00	$ 412,650.00
OTHER FEDERAL	$ 353,333.00	$ 366,761.00
LOCAL MATCH	$ 379,527.00	$ 462,432.00
TOTAL MATCH	$ 732,860.00	$ 829,193.00

EXPENDITURES	
319 EPA FUND EXPENDITURES	$ 251,658.33
OTHER FEDERAL FUNDS	$ 247,298.43
STATE FUND EXPENDITURES	$ 68,508.23
LOCAL FUND EXPENDITURES	$ 575,204.77
TOTAL EXPENDITURES	$1,142,669.76

SUMMARY OF ACCOMPLISHMENTS:

The goal of the Kingsbury Lakes Water Quality Implementation Project is to protect and restore the beneficial uses of Lakes Thompson, Henry, Preston and Whitewood by implementing Best Management Practices that reduce nutrient and sediment loading and prevent bacteria contamination in the 263,000 acre watershed. Attaining this goal will maintain or improve the Trophic State Index (TSI) for Lake Henry and Lake Thompson near the regional criteria, and improve the TSI for Lake Preston and Whitewood Lake.

To achieve the reduction, nutrient and sediment loads originating from critical areas were reduced by installing best management practices (BMPs). Critical areas were those identified during the Lakes Preston, Whitewood and Thompson Phase I Watershed Assessment.

Activities selected to attain the project goal were divided among the following objectives: Erosion Control, Phosphorus Loading Reduction, and an Educational Program.

Erosion control practices installed included 10 grazing systems; 23 acres of filter strips and grassed waterways; 12.6 acres of trees planted into grassland and 25.1 acres of trees planted into cropland; 37 acres of permanent vegetation entered into the farmable wetland program; and 21.7 acres entered into the marginal pasture wetland buffer.

Actions completed to reduce phosphorus loading included construction of an animal waste management system on an animal feeding operation (AFO), the closing of an AFO, and activities completed on eight concentrated animal feeding operations (CAFOs). There was one clean water diversion constructed.

A comparison, by objective, of the number of practices and activities planned, versus installed/completed, is shown in Table 6 on page 17.

Estimates of the phosphorus loading reductions achieved indicated 13.7, 6.3, and 9.7 percent loading reductions for Lakes Thompson, Preston and Whitewood respectively. A summary of the load reductions is shown in Table 26 found on page 44. The reductions are below the 24 percent reduction goal for Lake Thompson which was to be attained by reducing phosphorus loadings from the watershed to Lake Preston by 40%, to Lake Whitewood by 32% and to Lake Henry by 24%. The principle reason for not attaining the goal is the voluntary nature of EPA Section 319 watershed projects. Not everyone who was approached chose to invest financial resources and land to install nonpoint source reduction practices.

TABLE OF CONTENTS

EXCUTIVE SUMMARY **2**

INTRODUCTION **7**

DESCRIPTION OF THE PROJECT AREA 7

WATERSHED WATER QUALITY PROBLEMS 7

PROJECT GOALS, OBJECTIVES, AND ACTIVITIES **12**

PLANNED VERSUS ACTUAL MILESTONES AND PRODUCTS 17

NUTRIENT LOAD REDUCTIONS 44

COORDINATION EFFORTS **45**

STATE AGENCIES 45

FEDERAL AGENCIES 46

USDA PROGRAMS (ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP), CONSERVATION RESERVE PROGRAM) 46

BUDGET **46**

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL **60**

FUTURE ACTIVITY RECOMMENDATIONS **60**

LITERATURE CITED **61**

KEY TO ACRONYMS **62**

APPENDIX: MEDIA AND PUBLIC INFORMATION **63**

TABLES

Table 1: Beneficial Uses for Lakes Thompson, Whitewood, Preston, and Henry 8
Table 2: Land uses within the Lake Thompson watershed, eastern South Dakota 9
Table 3: Drainage and basin attributes for Lakes Thompson, Whitewood and Preston, Kingsbury County, South Dakota 11
Table 4: Kingsbury study lakes total phosphorus TSI values and overall TSI values. 13
Table 5: Estimated Type and Extent of Best Management Practices Needed by Project Segment 16
Table 6: Milestone Table 17
Table 7: Grazing Systems Developed 19
Table 8: Grazing Systems Funding 19
Table 9: Load Reductions Achieved through the Installation of Grazing Systems 24
Table 10: Grass Lands that were converted to Tree Plantings 24
Table 11: Conservation Reserve Program (CRP) 27
Table 12: Load Reduction for Permanent Vegetative Cover 27
Table 13: Cropland Converted to Tree Plantings and Funding Amount by Source 28
Table 14: Load Reductions Gained by Converting Cropland to Trees 29
Table 15: Funds Expended for the BMP Installation 30
Table 16: The Largest Feedlots in the Watershed and Their Status 32
Table 17: Feasibility Reports Prepared for Feedlots 33
Table 18: Engineering Designs Completed 33
Table 19: Load Reductions Achieved through Implementations of BMPs 38
Table 20: Construction Cost for the Animal Feeding Operations 40
Table 21: Feedlot Site Reclamation Cost 42
Table 22: Construction Cost for the Clean Water Diversion 42
Table 23: Outreach Products 44
Table 24: Project Tours 44
Table 25: Nutrient Load Reductions in Pounds by Lake Watersheds 44
Table 26: Phosphorus Load Reductions Achieved through BMPs Installed 44
Table 27: Phosphorus Load Reduction Achieved 45
Table 28: State and Federal Grant Funding and Expenditures 47
Table 29: Summary of Project Funds Received From all Sources 47
Table 30: General Budget for the Watershed Project 48
Table 31: EPA 319 Budget for the Watershed Project 49
Table 32: USDA Budget for the Watershed Project 51
Table 33: US F&W Budget for the Watershed Project 52
Table 34: Game Fish and Parks Budget for the Watershed Project 54
Table 35: Soil and Water Conservation Commission Budget for the Watershed Project – Tree Planting 55
Table 36: Soil and Water Conservation Commission Budget for the Watershed Project – Feedlot Reclamation 57
Table 37: Local Budget for the Watershed Project 58

FIGURES

Figure 1: Pie Chart Showing the land uses within the Lake Thompson watershed 9
Figure 2: Locations of reference lakes Alice, Brant and Cochrane and study lakes Preston, Whitewood, Henry and Thompson 10
Figure 3: Map of the four Kingsbury County lakes showing their positional relationships to each other in the watershed 15
Figure 4: Water tank that was installed to provide rural water to two paddocks 20
Figure 5: One of the perimeter fences that were constructed 21
Figure 6: Contractor trenching across road for burial of water pipeline 22
Figure 7: An area used to exclude livestock for grass growth monitoring when not disturbed 23
Figure 8: Multiple row shelterbelt 25
Figure 9: Waterway picture 26
Figure 10: New shelterbelt planting 27
Figure 11: New shelterbelt planting with fabric to help preserve water, control weeds 28
Figure 12: Feedlot number nine (9) that closed and was abandoned 35
Figure 13: Building that replaced feedlot number nine (9) 36
Figure 14: Feedlot number 11 36
Figure 15: Feedlot number 11 viewed from the southeast looking west 37
Figure 16: Feedlot number 11 after construction 37
Figure 17: Feedlot reclamation site viewed to the west 40
Figure 18: Feedlot reclamation looking to the northwest 41
Figure 19: Feedlot reclamation after the concrete and the buildings are removed 41
Figure 20: Clean water diversion that was being built in conjunction with the animal waste management system for feedlot number 11 42

INTRODUCTION

Lakes Preston, Thompson and Whitewood are in natural prairie pothole lake basins whose watersheds drain portions of Kingsbury and Lake Counties in South Dakota. Outlets of these lake basins contribute water to the Vermillion River. These lake basins are a part of the Vermillion River Basin with a hydrologic unit code, HUC, number of 10170103. Lakes Thompson, Henry, Preston and Whitewood experience heavy recreational use and moderate shoreline development. All receive contributions of agricultural runoff from upstream land uses. Inlet creeks receive runoff from agricultural operations while outlet creeks receive water from upstream lake basins and adjacent agricultural operations. The Thompson, Preston and Whitewood project area has a total drainage of approximately 263,044 acres (106,452.45 ha). Cropland and grazing are the predominant land uses. Additional information will be provided on land uses in Table 2, Lake Thompson basin descriptions and Figure 1, Pie Chart Showing the Land uses within the Lake Thompson watershed. This project was the implementation phase of a multi-basin restoration project. Results of this effort will reduce the impact of impairments to three lake basins.

Description of the Project Area

Lake Thompson is the largest lake in South Dakota and receives extensive recreational use as a freshwater fishery. According to the South Dakota Statewide Fisheries Survey 2102-F-21-R-39 for Lake Thompson, the lake received 197,878 hours of recreational fishing pressure in 1999. This does not include other forms of recreation such as camping, boating, swimming, hunting and wildlife observation. This was the peak year for fishing usage. Since that year water levels have declined along with the recreational use.

Drainage to the Vermillion River occurs along low-gradient, temporary and intermittent stream channels and through a series of small and large pothole basins. Lake Thompson itself was a shallow slough through the early 1980's, prior to filling in response to a series of wet years through the 1990's. Lakes Thompson, Whitewood and Preston have greatly increased in depth throughout this period and are now managed as freshwater lakes.

Watershed Water Quality Problems

Lake Thompson and Lake Preston were listed on the State's 303(d) list in 1998. Lakes Thompson, Whitewood and Preston were listed on the State's 303(d) list in 2002. Watersheds for these three lake basins fall within the Vermillion watershed (HUC # 10170103). Quoting from the 2002 Total Maximum Daily Load (TMDL) Waterbody report: "The goal of TMDLs is to ensure that waters of the state attain or maintain the beneficial uses established for each waterbody."

The following table addresses the beneficial uses for the waterbodies in the watershed.

Table 1. Beneficial Uses for Lakes Thompson, Whitewood, Preston, and Henry

Beneficial Use = X Impaired = I	Lake Thompson	Lake Whitewood	Lake Preston[1/]	Lake Henry	Tributary Streams to Lakes
4. Warmwater Permanent Fish Life Propagation	X				
6. Warm Water Marginal Fish Life Propagation		I		X	
7. Immersion Contact Recreation	X	X		X	
8. Limited Contact Recreation	X	X		X	
9. Wildlife Propagation and Stock Watering	X	X		X	
Semi-permanent Wetland			X		
Fish and Wildlife Propagation					X
Recreation					X
Stock Watering and Irrigation					X

1/ As a semi-permanent wetland, Lake Preston is protected under state law as waters of the state against: 1.) the discharge of visible pollutants, acids, alkalis, taste and odor producing materials, and petroleum products, 2.) the introduction of nuisance aquatic life, and 3.) the protection of biological integrity.

Streams in the watershed drain predominantly agricultural lands with both cropland and grazing acres. Winter feeding areas for livestock are present in the watershed. The streams carry sediment and nutrient loads, which degrade both stream and lake water quality, leading to eutrophication.

Lakes Thompson, Preston and Whitewood fall within one watershed with a total surface area of approximately 263,044 acres (106,452.45 ha). The Lake Thompson drainage encompasses this entire area. Lakes Preston and Whitewood are upstream of Thompson with watershed areas of approximately 58,687 acres (23,750.30 ha) and 106,134 acres (42,951.84 ha), respectively. Larger cities within the project area include De Smet (population - 1164), Arlington (population - 992) and Lake Preston (population - 737) according to the 2000 census.

Watershed Description

Major soil associations found in the watershed include Poinsett-Waubay-Buse, Poinsett-Hetland, Renshaw-Sioux-Marysland, Clarno-Ethan-Bonilla and Vienna-Brookings-Egeland-Embden.

The Kingsbury Lakes Implementation Project area falls within a Humid Continental Type B climate. Average annual precipitation is 24 inches per year and average seasonal snowfall is 38 inches per year. Most precipitation falls during the period April to

September. Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration and occasionally produce heavy rain fall events.

The project area falls within the Northern Glaciated Plains Ecoregion. This glaciated landscape consists of rolling terrain above drift plains. There is a high density of prairie pothole wetlands and a poor drainage network encompassing 234,420 acres (94,989.88 ha). Elevations range from approximately 1500 to 2000 feet (450 to 600 meters) with local relief ranging from 50 to 150 feet (15 to 45 meters). Potential natural vegetation consists of tall grass prairie species. Average temperatures vary from 0 degrees Celsius or 32 degrees Fahrenheit during the winter months to 16 degrees Celsius or 61 degrees Fahrenheit during the summer. Over 70% of this drainage area is managed for field crops and livestock production (Table 2). Land use in the watershed is primarily agricultural cropland and grazing. Small grains, corn and soybeans are the main crops on cultivated lands while areas with rolling terrain are used for grazing. Some winter animal feeding areas are located in the watershed.

Table 2. Land uses within the Lake Thompson watershed, eastern South Dakota

Land Use	Hectares	Acres	Percent
Field Crops	59,240.51	146,383.30	62.44
Water	11,768.11	29,079.16	12.40
Pasture	11,313.58	27,955.85	11.93
Non-Crop	6,076.94	15,016.13	6.41
Trees	1,515.25	3,744.18	1.60
Homestead	1,465.01	3,620.03	1.54
Urban	681.37	1,683.67	0.72
Water bank	327.09	808.24	0.34
Conservation Reserve	229.39	566.83	2.42
Wetland Reserve	187.17	462.50	0.20
Total	94,868.43	234,419.89	100.00

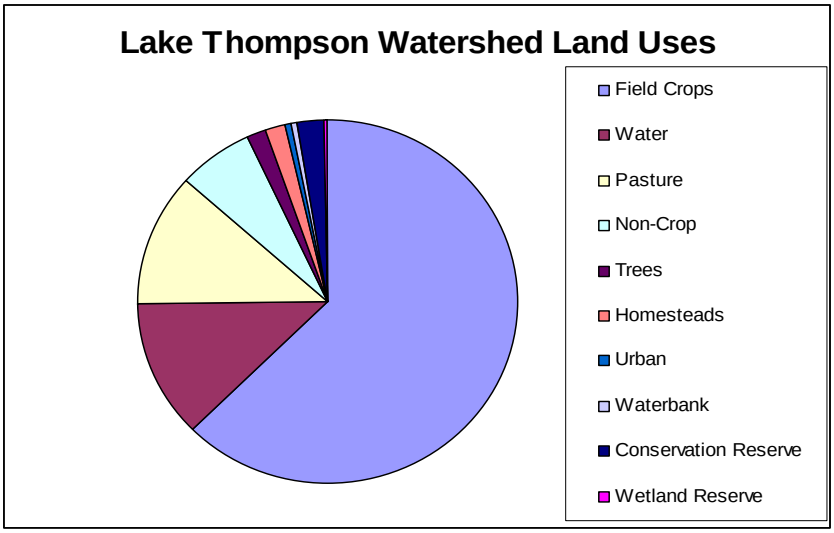

Figure 1. Pie Chart showing land uses within the Lake Thompson watershed

Basin Descriptions

Lakes Preston, Thompson and Whitewood (Figure 2) have all been listed by the South Dakota Department of Environment and Natural Resources for TMDL studies due to nutrient loading and eutrophication issues. Characteristics of each basin are listed below in Table 3.

Lake Thompson

Lake Thompson is the largest freshwater lake basin in South Dakota. This basin has witnessed dramatic changes in hydrologic condition over the past 20 years. A cattail marsh 20 years ago, Lake Thompson began filling during a wet period in the middle eighties. Today, depths within the middle of this basin normally exceed 20 feet (6 meters). Slight thermal stratification may occur during calmer periods of the summer. However, this stratification is easily broken due to frequent high winds that blow along the fetch of the lake.

Lake Thompson is managed to support warmwater permanent fish life propagation, immersion contact recreation, limited contact recreation, wildlife propagation and stock watering. Each of these designated uses is supported by a different set of water quality criteria. The most stringent values for each protected parameter constitute the water quality standards for this and each of the other basins.

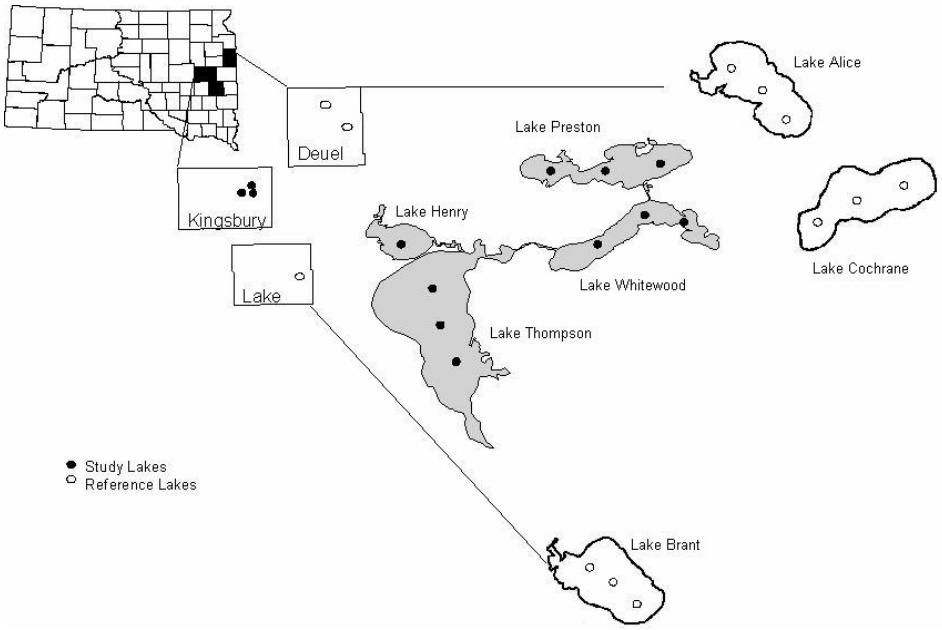

Figure 2. Locations of reference lakes Alice, Brant and Cochrane and study lakes Preston, Whitewood, Henry and Thompson. Sampling locations within each basin are indicated by open and closed circles.

Lake Henry

While not listed for TMDL development, Lake Henry does contribute water to Lake Thompson within the designated project area. Water within Lake Henry is managed for warmwater marginal fish life propagation, immersion contact recreation, limited contact recreation, fish and wildlife propagation and stock watering. One basin site and the Lake Henry outlet were sampled to facilitate load estimation to Lake Thompson.

Whitewood Lake

Like Lake Thompson, Whitewood Lake was once a cattail marsh but filled rapidly during the middle eighties. This basin is shallower and covers approximately one-third the area covered by Lake Thompson (Table 3). Water depth within this basin fluctuates seasonally around an average value of 7 feet (2 meters). Water in the Lake Whitewood basin is managed for warmwater marginal fish life propagation, immersion contact recreation, limited contact recreation, wildlife propagation and stock watering.

Table 3. Drainage and Basin Attributes for Lakes Thompson, Henry, Whitewood and Preston, Kingsbury County, South Dakota

Attribute	Thompson	Henry	Whitewood	Preston
Drainage Basin	Vermillion River	Vermillion River	Vermillion River	Vermillion River
County	Kingsbury	Kingsbury	Kingsbury	Kingsbury
Longitude	44 °17'09"N	44 °20' N	44°20'20"N	44 °22'49"N
Latitude	97 °28"17"W	97 °28' W	97 °18'26"W	97 °28'14"W
Legal Description	T109N; R55,56W; Sect's 1,4,9,16-17,20-21	T 110N R55, 55W; Sect's 3-4,25-28, 31-36	T110N; R53,54W; Sect's 18,19,9-21,29-30	T110,111N; R54,55W; Sect's 3-4,25-28,31-36
Basin Area-Hectares / Acres	106,452.45 ha 263,044 ac	40,064.75 ha 99,000 ac	42,951.84 ha 106,134 ac	23,750.3 ha 58,687 ac
Maximum Depth-2006 GFP Report	7.93 m 26 ft.	NA	2.13 m 7 ft.	NA
Volume	183000000 m3	NA	NA	NA
Basin Type	Natural	Natural	Natural	Natural
Inlets	Yes	Yes	Yes	Yes
Outlet	Yes	Yes	Yes	Yes
Shoreline Length	71.7 km 45 miles	14.5 km 9 miles	29.9 km 19 miles	31.3 km 20 miles
Mean Depth-2006 GFP Fishery Report	4.42 m 14.5 ft.	NA	1.16 m 3.8 ft.	NA
Watershed / Lake Area Ratio	16 / 1	38 / 1	21 / 1	11 / 1
Thermal Stratification	Yes	No	No	Yes
Ownership	State	State	State	State
TSI (2002 TMDL)	78	NA	80	83

Lake Preston

Lake Preston is not currently classified as a lake by the South Dakota Department of Environment and Natural Resources. However, Lake Preston covers roughly the same area and is slightly shallower than Lake Whitewood. The state record perch (*Perca flavescens*) was caught from Lake Preston. In fact, the performance and protection of the fishery has led some state biologists to suggest reclassification of this basin as a lake. Lake Preston is currently classified as a semipermanent wetland and is protected as follows under South Dakota Administrative Rule 74:51:01:11, Protection of wetlands as waters of the state.

- Discharge of visible pollutants.
- Discharge of acids and alkalis
- Discharge of taste and odor-producing materials
- Introducing nuisance aquatic life
- Discharge of petroleum products
- Protection of biological integrity

Streams Contributing Water to Lakes

The eastern portion of the watershed generally drains to Lakes Preston and Whitewood and then to Lake Thompson. The western portion of the drainage area contributes water to Lake Henry and then to Lake Thompson. A few small intermittent stream channels contribute water directly to Lake Thompson during snowmelt runoff and following intense rainfall events. None of the streams within the study watershed are listed as perennial flowing channels. Water within these channels is designated for use to support fish and wildlife propagation, recreation, stock watering and irrigation.

PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

The goal of the Kingsbury Lakes Water Quality Implementation Project is to protect and restore the beneficial uses of Lakes Thompson, Henry, Preston, and Whitewood by implementing Best Management Practices (BMPs) that reduce nutrient and sediment loading and prevent bacterial contamination in the 263,044 acre watershed. Attaining this goal will maintain or improve the Tropic State Index (TSI) for Lakes Henry and Thompson near the regional criteria, and improve the TSI for Lakes Preston and Whitewood.

Table 4. Kingsbury study lakes total phosphorus TSI values and overall TSI values. Target values and percent reductions needed to achieve the regional TSI criterion are reported with current median values.

Parameter	Lake			
	Preston	**Whitewood**	**Henry**	**Thompson**
Median Total P	0.659	0.610	0.332	0.308
Target Total P	0.068	0.068	0.068	0.068
% P Reduction Needed to reach the target P	89.7	88.9	79.5	77.9
Overall TSI	83.5	77.6	66.1	68.6
Target TSI	65	65	65	65
% TSI Reduction Needed to reach the target (65)	22.2	16.2	1.7	5.2

Phosphorus (P) load reductions necessary to achieve the total phosphorus TSI criterion for the lakes (TSI = 65) range from a 77.9 % reduction of phosphorus loading to Lake Thompson, to a 89.7% phosphorus loading reduction for Lake Preston (see Table 4). It is unlikely that load reductions of this magnitude can be accomplished through BMP implementation in the watershed. Based on the BMPs modeled, a 24% reduction of phosphorus loading to Lake Thompson may be attainable in the long term (15-20 years). To attain a 24% load reduction to Lake Thompson, phosphorus loads to Lake Preston, Lake Whitewood, and Lake Henry would need to be reduced 40%, 32% and 24% respectively.

This proposed project's long term reduction of phosphorus loadings to Lake Thompson by 24% would maintain the Trophic State Index for Lakes Thompson and Henry at or near the regional criteria (TSI=65), and move the Lakes Preston and Whitewood TSI values closer to the regional criteria.

In addition to trophic state concerns, several other water quality standards, based on the designated beneficial uses, were exceeded as follows:

- The pH standard of 9.0 was exceeded by 12.5% of the Lake Whitewood samples, and 8.4% of the Lake Thompson samples.
- Unionized ammonia in excess of state standards was observed for 15.3% of Lake Whitewood, 33.3% of Lake Henry, and 26.4% of Lake Thompson samples.
- Lake stratification rarely occurred throughout the study period in any of the study sub basins. However, 2.6% of bottom dissolved oxygen samples fell below standards for support of warm water fisheries in Lakes Whitewood and Thompson.
- Fecal coliform bacteria exceeded the state standard in 11.1% for Lake Preston, 5.6% for Lake Whitewood, and 8.3% for Lake Henry samples.

Other indicators of water quality impairment of the sub-basin lakes and their tributaries that were not protected by standards include:

- Lake shorelines were dominated by agricultural development, had low vegetative cover, and exhibited evidence of bank erosion.
- Lake littoral zones were dominated by fine sediments with little macrophyte vegetation.
- Integrated phytoplankton and invertebrate Index of Biological Integrity (IBI) values suggest slight impairment of all study lakes.
- A small number of pH measurements from several stream sites exceeded the water quality standard of 9.0.
- 9.4% of study stream samples had unionized ammonia concentrations exceeding 0.05 mg/L.
- More than 25% of fecal coliform bacteria samples collected from Lake Preston and Whitewood stream samples exceeded 200/100 ml.

While the streams are not protected by ammonia and fecal coliform standards, high levels of these contaminants may impair receiving lake waters at points of confluence.

The assessment of the streams and lake sub-basins within the Lake Thompson watershed identified several impairment concerns. Excessive high loadings of sediment, nitrogen, phosphorus and fecal coliform bacteria impair stream and lake beneficial and aquatic life uses, and contribute to total loads entering the basins of the watershed. The beach at the state recreation area at Lake Thompson has been closed temporarily once a year for the last several years. The most recent beach closure was August 15th of 2007 due to high levels of fecal coliform bacteria according to the park manager. The standard requires the swimming beach to be closed if there is a test result of over 400 per 100 mL. The beach was reopened the following week when the test results were within acceptable limits.

In the assessment, total nitrogen (N), total phosphorus (P) and suspended solids fluxes and loadings from tributaries to each study lake were estimated using the US Army Corps of Engineers (COE) FLUX model, and nutrient and sediment loads were estimated using the Annualized Agricultural Nonpoint Source (ANN AGNPS) computer model. Use of the model results as a guide was considered the most effective way to improve TSI values. ANN AGNPS simulations identified the location of critical nutrient and sediment loading cells within the watershed. These cells are predictions of where the placement of implementation practices should occur. A total of 84 animal feeding operations were identified and evaluated using the ANN AGNPS model. Of these feedlots, twenty-eight (28) were found to exceed the AGNPS feedlot model rating of 50, and were yielding significant amounts of nutrients to receiving waters. Two operations were not assigned a rating even though they were the largest operations in the watershed.

Estimates were made for phosphorus, nitrogen, and sediment reductions from the implementation of BMPs in the watershed. The Annualized AGNPS loading estimates based on BMP implementation in critical cells showed the following reductions were needed to restore/protect beneficial uses:

- A 20% reduction in phosphorus loading and a 20% reduction in sediment loading to Lake Thompson from implementation of riparian buffers and waterways in the top 25% of the nutrient loading critical cells in the subwatersheds.
- A 3% reduction in phosphorus loading and an 11% reduction in sediment loading to Lake Thompson from the implementation of no-till or fertilizer management on the 26% to 50% highest nutrient loading critical cells in subwatersheds.
- A 2% reduction in phosphorus loading to Lake Thompson from the implementation of 21 Ag Waste Systems.

Through implementation of BMPs in the watersheds, along with in-lake restoration activities, it was intended that this project would improve and/or maintain water quality to support designated beneficial uses and meet the TDML to be set for these watersheds. The completion of this project was also intended to maintain the Trophic State Index for Lakes Thompson and Henry at or near the regional criteria (TSI=65), and to move the Lakes Preston and Whitewood TSI values closer to the regional criteria.

2.2 Kingsbury Lakes Water Quality Implementation Project Watershed

Lakes Thompson, Henry, Preston, and Whitewood, Figure 3, comprise one watershed, with a total surface area of approximately 263,044 acres (106,452.45 ha). The watershed is the headwaters of the Vermillion River. Lake Thompson, which receives all drainage from the watershed, overflows (very intermittently) into the Vermillion River. Lake Preston has a watershed of approximately 58,687 acres (23,750.30 ha). The lake overflows into Lake Whitewood. In addition to the Lake Preston overflows, Lake Whitewood also has an additional drainage area of 106,134 acres (42,951.84 ha). Lake Whitewood overflows into Lake Thompson through a three mile tributary. The remaining 99,000 acres (40,064.75 ha) of the watershed drains predominantly into Lake Henry which overflows into Lake Thompson. Only a small acreage of the watershed drains directly into Lake Thompson.

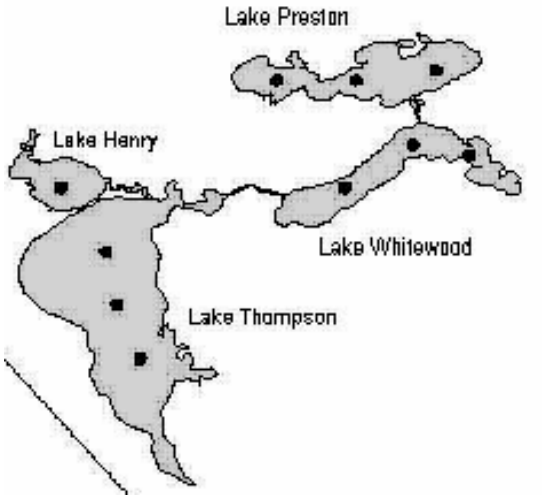

Figure 3. Map of the four Kingsbury County lakes showing their positional relationships to each other in the watershed

Wetlands cover 10% to12% of the watershed. They range in size from small potholes to large semi-permanent wetlands or lakes. These semi-permanent wetlands are in addition to the four natural lakes shown in Figure 3. Streams in the watershed are intermittent with low gradients, and flow primarily as a result of heavy rainfall or snow melt. The wetlands in the basin have a large capacity to hold runoff water. After a period of dry years, runoff events must first fill the wetlands prior to significant stream runoff. Lakes Thompson, Henry, Preston, and Whitewood function similarly to the wetlands in the basin, fluctuating in depth over the years. During the 1980s, these lakes were small in size and marsh like. They filled to high levels during the wet years of the 1990's. Since the late 90's, the lakes have decreased in depth. Thus, movement of water from lake to lake, or from Lake Thompson to the Vermillion River, is intermittent. Local landowners reported the overflow of water from Lake Henry to Lake Thompson is the most frequent, and occurs about once every ten years. Overflows from Lake Preston to Lake Whitewood, Lake Whitewood to Lake Thompson, and Lake Thompson to the Vermillion River occur on a less frequent basis than once in 10 years.

Table 5. Estimated Type and Extent of Best Management Practices Needed by Project Segment

Best Management Practices needed based on the Phase I, Watershed Assessment	**Estimated Quantities of BMPs Needed**	**Estimate of acres/practices to be completed during Segment 1**	**Estimate of acres/practices to be completed during Segment 2**
Ag Waste Systems	21 each	12*	9
Clean Water Diversions	3 each	2	1
Cropland BMPs	7576 ac.		
Riparian Buffers/Filter Strips/Waterways		175 ac.	161ac.
Grass Seeding (planting)		500 ac.	500ac.
New use of No-till		500ac.	500ac.
Fertilizer Management (reductions in #)		2000	3240ac.
Grazing Systems**	5880 ac.	5000 ac.	5000 ac.

* Six (6) of these 12 ag waste systems were CAFOs, which were to receive primary assistance from resources other than this grant project.
** Acres of grazing systems implemented will exceed estimated needs. This is a BMP that is in demand by producers in the watershed, and installation of grazing systems usually includes adjacent less critical pastures to complete the system.

Total phosphorus load reductions in inlet streams contributing water to Lake Thompson were estimated at 24% as a result of conversion of tilled land to pasture and no-till agriculture, 50% reductions in fertilizer application, and installing animal waste management systems. This represents an average annual reduction from 121,184.1 kg per year to 92,099.9 kg per year, which is a reduction of 29,084.2 kg of total phosphorus. By converting kilograms to pounds of phosphorus, this equals 64,119 pounds.

Total phosphorus load scenarios were modeled for Lake Thompson over the range of 121,184 kg per year to 12,118 kg per year in 10% steps using the BATHTUB model. This range represents a 90% reduction in total phosphorus loads to this basin.

A 24% reduction in TP load was predicted to reduce in-basin concentrations in Lake Thompson from 326.6 ug/L to 267.7 ug/L (18%). The total phosphorus TSI was predicted to fall 3.3% from 87.6 to 84.7. Chlorophyll a TSI and Secchi TSI values were predicted to fall 0.6% and 1.0%, and chlorophyll and Secchi TSI values would average 62 and 41, respectively.

Predicted concentrations and indicator values generated by the BATHTUB model display some departure from current conditions, even with calibration factors applied. Thus, percent reductions predicted by the model were applied to current TSI indicator values to estimate actual improvements. Predicted percent reductions applied toward current Lake Thompson average indicator values would result in a total phosphorus TSI of 83.3, a Secchi disk TSI of 55.0, and a chlorophyll *a* TSI of 58.2. Thus, chlorophyll and Secchi disk trophic state indicators are predicted to remain below the state regional criterion of 65, but total phosphorus TSIs are expected to remain well above that criterion.

Table 6. Milestone Table

Goal / Objective / Task Objective 1. BMP Installation	UNITS	Goal	Accomplished
Planned Grazing System	Acres	5,000	1,960.8
Fencing	Linear Feet	120,000	57,560
Grass Seeding	Acres	500	536.7
Pipelines	Linear Feet	11,500	16,641
Rural Water Hook-up	Each	5	6
Wells	Each	3	2
Solar Pumps	Each	1	0
Tanks	Each	12	13
Ponds/Dugouts/Cleanouts	Each	8	0
Pasture/Grassland Buffers	Acres	25	21.7
Tree Planting	Acres	20	12.6
Streambank Plantings	Acres	2	0
Streambank/Shoreline Stabilization	Acres	2	0
Products: Cropland BMPs			
Filter Strips/Waterways	Acres	150	20.7
No-till	Acres	500	0
Fencing (cropland buffers)	Linear Feet	5,000	0
Tree Planting	Acres	40	25.1
Farmable Wetland Program	Acres	120	53.1

Nutrient Management / Ag Waste Systems			
Engineering Services	Each	6	2
System Installation	Each	6	2
Nutrient Management Plans	Each	6	2
Clean Water Diversions	Each	2	1
Feedlot Reclamation*	Each	0	1
Objective 2. Outreach and Reporting			
Information Campaign			
Newsletters	Each	6	3
Tours	Each	3	1
Informational Meeting	Each	4	0
Presentations	Each	6	2
News Releases	Each	6	4
Monitoring and Reports			
Semi-annual Reports	Each	3	3
Annual Reports	Each	3	3
Final Report	Each	1	1
PIP for Segment II	Each	1	**

*This Activity was added and funding obtained in 2006 and 2007.
**The Conservation District board decided that there was insufficient interest to justify continuing the project into phase II implementation.

3.2 Objectives and Tasks:

Objective 1: Implement best management practices in the watershed to reduce phosphorus loading to lakes and streams in the 263,044 acres that results in an 8% reduction of phosphorus loading to Lake Thompson, by June 30, 2008.

Task 1: Plan and Install Grassland and Cropland Management
Provide assistance to landowners to install BMPs that reduce nutrient and sediment loadings from grasslands and cultivated cropland, with emphasis for installation placed on identified critical sub-watersheds and critical cells in the subwatersheds.

Products:

- Five thousand acres of planned grazing systems and grassland restorations that reduce sediment and nutrient transfer through reduced runoff, improved streambank vegetation, and improved vegetation on riparian grasslands.
- BMPs will be implemented using funds available through existing and new 319 projects, EQIP, and wildlife programs. Practices used to install the BMPs will include but are not limited to: planned grazing systems, water developments (pipelines, tanks, solar pasture pumps, dugouts, dams, wells), fencing (cross fencing, perimeter fencing, riparian area fencing), tree planting (riparian and upland), and grass seeding. The implementation of grazing systems will be targeted to grasslands that include riparian areas along major tributaries in subwatersheds, and to areas that will buffer runoff from identified critical cells.

ACCOMPLISHMENTS:

Early in the project Kingsbury county was in several years of drought conditions. This helped to generate interest in the farming and ranching community. Many of the producers were faced with limited or poor quality water supplies. Some operators had to haul water to the pastures that had dry stock dams. This made promoting grazing systems much easier. Any activity that would maintain production on the grass land was received very positively.

With the return of wetter conditions there was a drop in interest. There has been an increase in the number of landowners who are now looking at plowing sod and planting more corn and soybeans. That is being driven by the high corn and soybean prices.

Table 7. Grazing Systems Developed

Contract	Acres	Fence-LF	Pipeline-LF	Tanks	Water Source
SD-64560-06-01G	330.0		3,140	3	Well
SD-64560-05-09G	160.0	21,535			
SD-64560-05-10G	146.0		1000	1	RW
42-001-2006	283.0	12,180	3,151	3	Well & RW
42-002-2006	295.5	2,061	1,400	1	RW
42-003-2006	347.5	4,235	5,410	2	
42-005-2006	52.0	960	1,780	1	RW
42-006-2006	70.2	6,200	70	1	RW
42-003-2007	276.6	8800			
42-004-2007	87.0	1589	690	1	RW
TOTAL	2,047.8	57,560	16,641	13	6 RW 2 Wells

RW stands for operation where Rural Water was hooked up.

Table 8. Grazing Systems Funding

Funding Sources	USF&W	SD GFP	SWCC	EPA 319	NRCS EQIP	Other Local	LO	TOTAL
SD-64560-06-01G	7179.47	3192.11					8758.78	19130.36
SD-64560-05-09G	2480.83	969.08				426.39	3876.30	7752.6
SD-64560-05-10G		198.83	631.60			1496.78	1742.40	4069.61
42-001-2006		3112.20		7765.64			14464.50	25342.34
42-002-2006		1003.12		3190.96	3425.41		5623.66	13243.15
42-003-2006		862.62		6245.07	4837.00		6661.21	18605.90
42-005-2006		448.50		3393.00			2710.50	6552.00
42-006-2006	592.09	3196.65		310.40	1547.25		2547.04	8193.43
42-003-2007		5532.00					5192.39	10724.39
42-004-2007				1324.17	4845.34		3087.07	9256.58
TOTAL	10252.4	18515.11	631.60	22229.24	14655.00	1923.17	54663.85	122870.36

During the project there were ten grazing systems developed, taking advantage of a variety of funding sources. The first three had United States Fish and Wildlife as the prime sponsor. The first grazing system was funded with North American Wetlands Conservation Act (NAWCA) Pheasant funds, South Dakota Game, Fish and Parks (SD GFP) and the landowner.

The second system was funded in part by the Tall Grass Prairie Commission Grant (TGPCG), SD GFP, Ducks Unlimited (DU), and the landowner.

The third grazing system was a joint effort using funds from the South Dakota Association of Conservation Districts (SDACD), the Soil and Water Conservation Commission (SWCC), SD GFP, Ducks Unlimited and the landowner.

The fourth project involved about 280 acres of pasture land. One portion was divided into two paddocks and the other portion had three paddocks. Figure 4 shows one of the three tanks used in the system.

Figure 4. The water tank that was installed to provide rural water to two paddocks of the 122.5 acre portion of a three paddock grazing system. The fencing portion had not been completed when the picture was taken.

This project was cooperatively completed with funds from Game Fish and Parks, the EPA-319 grant, and the land owner. NRCS assisted with the development of the grazing plan. The United States Fish and Wildlife Service was going to participate but the landowner decided that he did not like some of the proposed limitations.

Figure 5. One of the perimeter fences that were constructed

The fifth producer project was funded by Game Fish and Parks, EPA-319, NRCS EQIP and the land owner. One of the reasons that the owner worked with both EQIP and the watershed project was that EQIP funds could not be used to bring the water line across the road right-of-way, and the maximum price available through EQIP for some services is below what is being charged in the local area. The landowner appreciated the additional assistance that the project could provide. Without it the owner did not think that he could have been able to get this work completed.

During the spring of 2006 trees were planted and a protective fence was constructed. Then in the fall of 2007 the pipeline and cross fence was completed for the grazing system number six (Tolzin). In 2008 another section of pipeline was installed after determining that a prior pipeline was not able to meet the needs of the producer. This project was funded by the Soil and Water Conservation Commission Grant, Game Fish and Parks, EPA-319, NRCS EQIP and the land owner.

The seventh (Gullickson) grazing system involved bringing rural water across the road to the center of the two paddocks and the construction of a cross fence. An added challenge was the intermittent creek that flows through the pasture. The project was funded by EPA 319, Game Fish and Parks and the landowner. The next figure shows the contractor excavating the road and right of way where he buried the waterline after hooking up to rural water.

Figure 6. Contractor trenching across road for burial of water pipeline

Project number eight-one (Vedvei) has been spread over a number of years. The first year involved the planting of thirty acres of grass. The following year he was able to get the cross fence built and he now has four paddocks. In 2008, he completed the project by hooking up to rural water and installing the water fountain. This project has been funded by Game Fish and Parks, EPA-319, NRCS EQIP and the land owner.

Project number eight-two (Vedvei) was started in 2007 and completed in 2008 by hooking up to rural water and installing the water fountain. This project has been funded by Game Fish and Parks, EPA-319, NRCS EQIP and the land owner.

Project number nine (Wallum) was planned for 2007 but the landowner was not able to get started until 2008. He has completed the perimeter fence and is working on the cross fences. This project has been funded by Game Fish and Parks, EPA-319, NRCS EQIP and the land owner.

On one of the grazing systems we installed an eight foot by eight foot area to exclude livestock so the grass could be monitored and forage production could be calculated for the year. In 2008, three of these structures were installed for two producers as part of the scheduled tour for area producers that will be hosted by the Kingsbury Conservation District; Game, Fish and Parks; and the Natural Resources Conservation Service.

Figure 7. An area used to exclude livestock for grass growth monitoring when not disturbed. Pictured is the project coordinator assisting with the building of the barrier.

Grazing System Milestones

	GOALS	ACHIEVED	
Grazing Systems	5,000	1,336.7	Acres
Fencing	120,000	57,560	LF
Grass Seeding	500	766.9	Acres
Water Development:			
Pipeline	11,500	16,641	LF
Rural Water Hook-ups	5	6	
Wells	3	2	
Solar Pumps	1	0	
Tanks	12	13	
Ponds/Dugouts/Cleanouts	8	0	
Pasture/Grassland Buffers	25	0	Acres
Tree Planting	20	12.6	Acres
Streambank Plantings	2	0	Acres
Streambank/Shoreline Stabilization	2	0	Acres

Table 9. Load Reductions Achieved through the Installation of Grazing Systems

Grazing System	Nitrogen Reduction lb/year	Phosphorus Reduction lb/year	BOD Reduction lb/year	Sediment Reduction t/year
1	1,771.2	305.0	1,110.7	173.5
2	997.5	201.3	816.0	127.5
3	1,532.8	266.9	980.1	153.1
4	914.5	185.3	753.1	117.7
5	1,596.4	277.1	1,015.2	158.6
6	1,859.5	319.0	1,158.3	181.0
7	344.2	73.1	305.2	47.7
8-1	457.1	95.8	396.8	62.0
8-2	560.0	116.2	478.8	74.8
9	1,500.2	261.6	962.0	150.3
TOTAL	11,533.4	2,101.3	7,976.2	1,246.2

Kingsbury County has had an active tree planting program. Thus far there have been 16 acres of trees planted in the grass portions of the watershed. The table below shows the tree planting activity that took place on the grass land areas.

Table 10. Grass Lands that were Converted to Tree Plantings

Grassland Site 2006	Acres	SWCG	USDA	KCD	LO	Total
ST	2.6	2881.17	72.65	1009.35	2120.83	6084
DA	2.8		72.65	145.00	5845.90	6063.55
JL	0.5		72.65	145.00	1200.03	1417.68
C	1.0	0.00	72.65	145.00	1696.00	1913.65
Subtotal	6.9	2881.17	290.6	1444.35	10862.76	15478.88
Grassland Site 2007						
SH	2.8	3292.12	72.65	1103.64	2318.48	6786.89
SJ	1		72.65	145.00	601.56	819.21
JH	0.6		72.65	145.00	1150.20	1367.85
Subtotal	4.4	3292.12	217.95	290	4070.24	7874.71
Grassland Site 2008						
JH	0.2		72.65	145.00	396.88	614.73
AJ	0.7		72.65	145.00	1489.3	1707.65
L	0.4		72.65	145.00	930.99	1149.04
Subtotal	1.3		217.95	435.00	2817.17	3471.42
Total	12.6	6173.29	726.5	2169.35	17750.17	26825.01

Figure 8. Multiple row shelterbelt

The project worked with one producer who installed 3,737 feet of fence to protect an 80 acre wetland. There was a 7.8 acre buffer strip between the pasture and the edge of the wetland. That buffer strip was enrolled into the CP30 practice for the Conservation Reserve Program.

Products:

- Three thousand seven hundred sixty five acres of cropland benefited by BMPs to reduce nutrient and sediment loading through protective vegetative cover, conservation tillage, and crop nutrient management. BMPs will be implemented using funds available through existing 319 projects, USDA programs such as EQIP, Continuous CRP, Farmable Wetlands Program, and through state and federal wildlife programs. Practices used to install the BMPs will include but are not limited to: filter strips, grassed waterways, fertilizer management, no-till, tree plantings and wetland improvements. Fertilizer management will be implemented in critical phosphorus loading cells, and involves soil testing with samples analyzed by a land grant university lab and documentation that shows a reduction in phosphorus fertilizer usage.

Figure 9. Waterway picture

Ducks Unlimited had the following comments about the Conservation Reserve Program (CRP). "CRP was established in the 1985 Farm Bill and reauthorized in the 1990, 1996 and 2002 Farm Bill. The program encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to resource-conserving vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips or riparian buffers. The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land, and it provides cost-share assistance for up to 50 percent of the participant's costs in establishing approved conservation practices. Participants compete nationally to enroll in CRP contracts and receive an annual rental payment for 10 to 15 years.

The Conservation Reserve Program (CRP) has been a valuable resource when it comes to the financial assistance that it provides the owner / operator. This program has multiple benefits. U.S. taxpayers are benefiting from cleaner air and improved water quality, because CRP removes greenhouse gases from the atmosphere and reduces soil erosion and nutrient runoff into our waterways. Recovering wildlife populations are enjoyed by sportsmen and wildlife watchers across the nation generating millions of dollars and jobs for rural economies. Additionally, increasing wildlife populations are helping to diversify income sources for farmers who are responding to strong demand for fee hunting opportunities by operating hunting-related businesses. Many producers also have opened up the land they have enrolled in CRP to public access for hunting and fishing, thus improving the relationship between landowners, state fish and wildlife agencies and the hunting and fishing public." A number of practices were enrolled on lands in the watershed during the project period. Most fall under the Continuous provision of CRP. Table 11 shows the new enrollments.

Table 11. Conservation Reserve Program (CRP)

CRP Summary

Code	Description	Acres
CP 2	Est. Permantent Native Grasses	65.5
CP 18c	Est. Permantent Native Grasses	5.5
CP 21	Filter Strip	9.1
CP 27	Farmable Wetland Program Wetland	9.1
CP 28	Farmable Wetland Program Buffer	28
CP 30	Marginal Pasture Wetland Buffer	21.7
	Continuous CRP Total	131.1
NON CRP	Permanent Vegetation Established	665.4
	Waterway	13.8
	TOTAL Permanent Cover Established	**941.4**

Table 12. Load Reduction for Permanent Vegetative Cover

Watershed	LOAD REDUCTIONS			
	NITROGEN	PHOSPHORUS	BOD	SEDIMENT
	LBS/YR	LBS/YR	LBS/YR	T/YR
Lake Preston				
2005	56.5	16.4	63.5	9.9
2006	221.8	63.8	243.9	38.1
2008	33.2	9.8	38.5	6
Preston Total	311.5	90	345.9	54
Lake Whitewood				
2005	215.9	62.6	241.8	37.8
2006	458	128.5	473.1	74
SUBTOTAL	673.9	191.1	714.9	111.8
Whitewood Total	985.4	281.1	1060.8	165.8
Lake Thomson				
2005	55.8	16.5	65.2	10.2
2006	261.1	201.4	734.7	114.8
2007	622.9	173.7	632.5	98.8
2008	189.3	53.3	197.6	30.9
SUBTOTAL	1129.1	444.9	1630	254.7
Thompson Total	2,114.5	726.0	2,690.8	420.5

Figure 10. New shelterbelt planting

Figure 11. New shelterbelt planting with fabric to help preserve water and control weeds

Table 13. Cropland Converted to Tree Plantings: Funding Amount by Source

Crop Land Sites 2006	Acres	SWCG	USDA	GFP	KCD	LO
DP	0.7	625.68	72.65		332.70	465.98
CR	0.5	489.64	72.65		291.89	362.76
RC	0.9		72.65		145.00	1731.98
TC	0.6		72.65		145.00	676.19
SJ	0.6		72.65		145.00	431.34
JL	0.3		72.65		145.00	584.12
BL	1.7		5661.25		145.00	688.96
JL	1.2		1447.85		145.00	200.80
CS	1.0		1040.15		145.00	147.50
ES	1.8		3159.65		145.00	414.76
EC	2.3	0.00	72.65	419.00	145.00	317.71
Subtotal	11.6	1115.32	11817.45	419.00	1929.59	6022.1
Crop Land Sites 2007						
BK 1	1.9		3676.07		145.00	476.38
BK 2	0.6	663.82	72.65		116.00	469.67
TC	0.9		1142.46		145.00	158.87
BM	3.0	0.00	6361.63	0.00	145.00	818.78
Subtotal	6.4	663.82	11252.81	0.00	551.00	1923.70
Crop Land Sites 2008						
TH	0.9	910.63	72.65		418.19	647.44
DDD	0.5		72.65		145.00	1180.34
TH	1.4		2634.37		145.00	298.63
JH	2.5		5406.55		145.00	617.66
DN	1.0		1345.83		145.00	151.46
WS	0.8		755.71		145.00	85.90
Subtotal		910.63	10287.76		1143.19	2981.43
Total	18.0	2689.77	33358.02	419.00	3623.78	10927.23

Table 14. Load Reductions Gained by Converting Cropland to Trees

Crop Land Sites 2006	Nitrogen Reduction Lb/Year	Phosphorus Reduction Lb/Year	BOD Reduction Lb/Year	Sediment Reduction T/Year
DP	6.9	2.4	11.6	1.8
CR	5.1	1.8	8.6	1.4
RC	8.7	3.0	14.5	2.3
TC	6.00	2.1	10.1	1.6
SJ	6.00	2.1	10.1	1.6
JL	13.70	4.7	22.6	3.5
BL	15.40	5.3	25.2	3.9
CS	9.60	3.3	15.9	2.5
ES	16.20	5.6	26.5	4.1
EC	20.20	6.9	32.90	5.1
Subtotal	107.8	37.2	178.00	27.8
Crop Land Sites 2007				
BK -1	17.00	5.8	27.8	4.3
BK-2	6.00	2.1	10.1	1.6
TC	8.70	3.0	14.5	2.3
BM	25.60	8.8	41.50	6.5
Subtotal	57.3	19.7	93.90	14.7
Crop Land Sites 2008				
TH	8.7	3.0	14.5	2.3
DDD	5.1	1.8	8.6	1.4
TH	12.9	4.5	21.3	3.3
JH	21.7	7.4	35.4	5.5
DN	9.6	3.3	15.9	2.5
WS	7.8	2.7	13	2.00
Subtotal	65.8	22.7	108.7	17.00
Total	230.9	79.6	380.60	59.5

Crop Land Milestones

	GOALS	ACHIEVED	
Filter strips and grassed waterways	150	22.9	Acres
New use of No-till	500 Acres	Not able to document	
Fencing	5000	0	LF
New Shelterbelts	40	18.0	Acres
Farmable Wetlands CRP	120	37.1	Acres

Milestone: 5,000 acres of planned grazing systems and grassland restorations.
3,765 acres of cropland BMPs, which reduced nutrient and sediment loading.
Milestone Table - see Table 6 for the Project Milestones

Responsible Agencies:

Technical Assistance Coordination:

Kingsbury Conservation District
Project Coordinator

Information Transfer:

Project Coordinator
SD Association of Conservation Districts
Natural Resources Conservation Service

Implementation:

Project Coordinator
US Fish and Wildlife Service
Farmers and Ranchers
SD Game, Fish and Parks
SD Association of Conservation Districts
USDA – Natural Resources Conservation Service (NRCS)

Financial Assistance:

USDA – NRCS/Farm Service Agency
Water Quality 319 Projects
SD Department of Agriculture – Conservation Commission
US Fish and Wildlife Service
SD Game, Fish and Parks

Monitoring Assistance:

Project Coordinator
SD Department of Environment and Natural Resources

Budgeted: Total Cost: $508.250.00 319 Funds: $47,710.00

Table 15. Funds Expended for the BMP Installation

Funding Source	Budgeted	Expended
EPA	$ 47,710.00	$ 14,349.59
USDA -NRCS- EQIP	$ 171,600.00	$ 27,004.22
US F&W	$ 74,013.00	$ 10,833.21
SD GFP	$ 48,200.00	$ 10,122.09
Soil & Water Conservation	$ 27,000.00	$ 8,584.03
SD ACD		$ 3,930.83
Ducks Unlimited		$ 473.17
District Cash		$ 2,385.73
District In-Kind		$ 3,132.00
Local Cash	$ 139,727.00	$ 44,516.75
Local In-Kind		$ 11,045.54
TOTAL	$ 508,250.00	$ 136,377.16

Task 2: Design and Construct Livestock Nutrient Management BMPs - Ag Waste Systems & Nutrient Management Plans

Assist livestock producers with installation of six (6) livestock waste management systems with nutrient management plans, and two (2) clean water diversions, to reduce nutrient and fecal coliform levels in the watershed and lakes.

Product Goal:

Six (6) agriculture waste systems with nutrient management plans installed by livestock producers that were identified as priority feedlots (50 plus rating) in the watershed assessment. Six (6) Ag Waste Systems will be designed during the project period, with installation of additional systems planned for segment II of this project. This product will be completed with assistance also requested from existing 319 projects to include: the Animal Nutrient Management Project for nutrient management planning and the 303(d) Watershed Planning and Implementation Project for assistance with livestock waste management system designs. In addition to the six livestock waste management systems provided assistance through this project segment, there are six CAFOs in the watershed that were identified as priority feedlots in the assessment. These CAFOs are in the design phase, and are expected to complete system construction during this proposed project utilizing assistance from other state and federal sources. The six livestock waste systems planned for this project, along with the six planned CAFO systems, will include approximately 50% of the livestock animal units in the watershed.

Agricultural Waste Systems with Nutrient Management Plans		
Engineering ($12,000 each)	6	$ 72,000.00
Construction ($65,000 each)	6	$390,000.00

Two (2) clean water diversions installed by landowners to reduce nutrient and fecal coliform bacteria loadings.

Clean Water Diversions ($6,000 each) (Design included in the cost)	2	$ 12,000.00

Milestone Goal:

Six (6) engineering designs for ag waste systems completed.
Six (6) livestock waste systems/nutrient management plans implemented.
Two (2) clean water diversions installed.
For detailed annual BMP schedule, see Table 6 Milestone Table.

Accomplishments: In an ideal world, the top six (AFO) owners and the concentrated animal feeding operations (CAFO) owners would be approached, they would say yes, and the systems would be built with no problems. Unfortunately this was not the case in Kingsbury County.

The next table shows the top rated CAFOs and AFOs in the watershed. Table 17 contains the AFO operators that expressed some interest in building an animal waste management system and feasibility studies were secured for their operations. The third table (Table 18) shows the systems for which engineers designed animal waste management systems.

Table 16. The Largest Feedlots in the Watershed and Their Status

#/ID#	Rating	Twp/Sec/Range	Class	Status	Number of Head / Type
1 / 19	NR	32-112-56	CAFO	CLOSED	2970 / cattle
2 / 00	NR	23-109-53	CAFO	BUILT	62,000 Turkeys, 110,500 Laying Hens, 1,400 Broilers
3 / 64	86	7-109-54	CAFO	UC	1200 / cattle
4 / 33	83	1-110-55	CAFO	BUILT	1000 / cattle
5 / 34	82	12-110-55	CAFO	BUILT	1000 / cattle
6 / 37	81	11-110-56	AFO	NC	950 / cattle
7 / 77	80	11-111-55	CAFO	UC	2000 / cattle
8 / 23	75	10-111-54	AFO	NC	950 / cattle
9 / 81	75	28-111-56	AFO	CLOSED*	999 / cattle
10 / 36	73	5-110-55	AFO	NC	980 / cattle
11 / 71	72	17-110-54	AFO	BUILT	750 / cattle
12 / 62	71	32-112-55	AFO	NC	600-999 / Cattle
13 / 20	68	33-111-56	AFO	NC	600 / cattle
14 /60	68	6-111-54	AFO	NC	250 / cattle
15 / 46	65	9-111-54	CAFO	UC	625 / cattle
16 / 47	65	16-111-54	CAFO	BUILT	625 / cattle
17 / 52	65	8-111-54	AFO	NC	400 / cattle
18 / 78	63	9-111-55	AFO	NC	700 / cattle
19 / 15	62	8-108-53	AFO	NC	300 / dairy heifers
20 / 14	60	5-108-53	AFO	NC	150 / dairy heifers
21 / 18	60	25-108-54	AFO	NC	80 cows, 80 calves, 280 ewes, 300 lambs
22 / 39	57	14-111-56	AFO	NC	200 / cattle
23 / 22	57	7-109-55	AFO	NC	220 / cows, 160 / heifers
24 / 79	57	18-111-54	AFO	NC	350 / calves to yearlings
25 / 31	56	35-111-56	AFO	NC	200 / cattle
26 / 57	56	29-111-56	AFO	NC	400 / cattle
27 / 5	52	30-110-53	AFO	NC	150 / cattle
28 / 28	51	11-111-55	AFO	NC	100 / heifer and bull calves
29 / 55	51	7-111-55	AFO	NC	150 / cattle & 500 / sheep
30 / 49	50	15-110-55	AFO	NC	170 calves, 50 cows

CAFO Concentrate Animal Feeding Operation UC Under Construction
AFO Animal Feeding Operation NC No Change
* Feedlot lot was closed and the animals were relocated to an approved system

Table 17. Feasibility Reports Prepared for Feedlots

Rank # / ID #	When Prepared	AGNPS Rating
17 / 52	March, 2005	65
19 / 62	March, 2005	71
8 / 23	March, 2005	75
31 / 2	June, 2005	49
77 / 45	June, 2005	23
30 / 49	July, 2005	50
14 / 60	August, 2005	68
9 / 81	September, 2005	75
62 / 10	October, 2006	27 / 44 revised rating
Not assigned-BL	September, 2006	45 & 50*
52 / 68	September 2007	39 **
TOTAL	11	

*Originally not rated, later determined the two sites that were to be impacted had the above ratings. The original plan was to close the one site and consolidate the animals in the second one.

**This feedlot has gone from having 60 cows and 60 calves to having 950 dairy heifers. The facility is now used to background dairy heifers for use at a local operation. The animals are about 400 pounds when they are brought in, and weigh about 1,300 pounds and expected to give birth to a calf within 30 days. This would have raised the rating significantly.

Table 18. Engineering Designs Completed

Rating #	Design Completed	Nutrient Management Plan Completed
Not Rated	X*	X
86	X*	X
83	X*	X
82	X*	X
80	X*	X
75	X*	X
72	NRCS	X
65	X*	
Not Rated	-	X
TOTAL	8	8

*Engineering was completed in cooperation with another program sponsored by the Department of Agriculture and Kingsbury Conservation District.

Six of the first seven systems in Table 16 are classed as CAFO. They have more than one thousand (1,000) animal units. These systems do not qualify to receive funding from the EPA 319 program. They are eligible to receive assistance from the NRCS EQIP funding. The Animal Feeding Operations (AFOs) are those systems that have less than one thousand (1,000) head and they qualify for both NCRS/EQIP and EPA 319 funding, with a cap on the amount of funding they receive.

The largest feedlot (1 / ID # 19) in the watershed was not given a rating. This lot has been closed under pressure from the Department of Environment and Natural Resources and the lack of a good method to correct the problems. All of the assets were liquidated in 2007. The feeding operation covered 54 acres and housed 2,970 head of cattle. The nitrogen reduction was 44,909.3 pounds per year, and the phosphorus reduction was 8,290.9 pounds per year. This is according to Step L 4.0 that has been adopted by the South Dakota Department of Environment and Natural Resources.

The second system (2 / ID # 00) did not feed cattle, but they were raising broiler chickens, laying hens and turkeys. A stacking yard has been constructed and the operation is now working with a nutrient management plan. The colony poultry operation covered 100 acres and housed 1,400 broiler chickens, 62,000 turkeys and 110,500 laying hens. The nitrogen reduction was 33,583.7 pounds per year, and the phosphorus reduction was 8,277.0 pounds per year.

The third system on the list (3 / ID # 64) is having construction problems with the holding pond. The system should have been completed by the end of 2007, but has requested and received as extension to complete the work in 2008. The engineers have proposed a modification to enable the pond side walls to be able to withstand the outside water pressure. The feeding operation covered 22 acres and housed 1,200 head of cattle. The nitrogen reduction will be 18,145.2 pounds per year and the phosphorus reduction will be 3,349.9 pounds per year once the system is operational.

Systems four (4 / ID # 33) and five (5 / ID # 34) are owned by the same individual. System four was built in 2006 and system five was built in 2007. A concern that came up during the first year of operation was disposal of the liquid from the holding pond. A change was needed in the definition that was contained in the county ordinances. The liquid manure definition was too broad, and a new ordinance was needed to allow the application of the liquid from the holding pond to cropland. The changes were made in 2007. The two feeding operations covered a total 38.8 acres and housed 2,000 head of cattle. The nitrogen reduction for each system was 15,121.0 pounds per year, and the phosphorus reduction was 2,791.6 pounds per year. This will give total reductions of 30,242.0 pounds of nitrogen per year, and 5,583.6 pounds of phosphorus per year.

Systems six and ten are owned by the same individual and he did not express interest in doing anything at this time. One site was being used. The second facility appeared to be unoccupied; there was no livestock present.

System seven (7 / ID # 77) has experienced a similar problem that the third system did. The construction problem is again with the holding pond side walls being able to withstand the outside pressure. The same engineering firm is working with both projects that are having problems. The repair work needed to complete the system is planned for 2008. The feeding operation covered 10 acres and housed 2,000 head of cattle. Once completed the nitrogen reduction will be 15,121.0 pounds per year, and the phosphorus reduction will be 2,791.6 pounds per year.

The eighth producer (8 / ID # 23) has been having difficulty in deciding what he wants to do. Several years ago he was provided with a plan by the NRCS for an Animal Waste Management System. This plan is now outdated and would need to be replaced. A new feasibility study was completed for him. He was offered assistance on several occasions to complete the engineering and construct an Animal Waste Management System or building. The feedlot contains less than one thousand head of cattle, and it appears that he is not going to address the problem until he is forced to decide.

Feedlot number nine (9 / ID # 81) was located next to the city limits of De Smet. This presented added problems to start construction of an Animal Waste Management System. It was discovered that if constructed as it was designed it would not be able to meet Natural Resources Conservation Service construction specifications. The holding pond would have been located within six hundred feet of one of the City of De Smet water wells. The City of De Smet was not interested in abandoning its well. If constructed as designed it would not have been eligible to receive federal cost share funding. After reviewing the limited number of options that were available to the producers it was decided that relocating the facility to a new location was the most desirable. The original site was to be abandoned in order to receive financial assistance for the construction at the new site. At the new site, a mono slope structure was built in 2007 and populated with cattle in late summer. This project was funded by Natural Resources Conservation Service EQIP funds, EPA 319 funds and the landowner. Because of the limits on funding that a producer can receive, the majority of the costs were paid by the owners. The original feeding operation covered 7.5 acres and housed 999 head of cattle. If an on-site system would have been built, the nitrogen reduction would have been 11,340.7 pounds per year, and the phosphorus reduction would have been 2,093.7 pounds per year. Since the operation has been closed, the reduction could be greater than this.

Figure 12. Feedlot number nine (9) that closed and was abandoned. This area was reclaimed and seeded to grass. Figure 19 shows the same area during the reclamation process.

Figure 13. Building that replaced feedlot number nine (9)

Number eleven (11 / ID # 71) is located adjacent to Whitewood Lake southeast of Lake Preston. The new system will make a significant reduction to the nutrient loading of both Lake Thompson and Whitewood Lake, because previously there was no buffer between the feedlot and Whitewood Lake. There were times when animal waste material would flow directly to the lake. The plan for the Animal Waste Management System was developed by the Natural Resources Conservation Service engineer in Brookings. This project was funded by Natural Resources Conservation Service EQIP funds, EPA 319 funds and the landowner. The feeding operation covered 6.3 acres and housed 750 head of cattle. The nitrogen reduction was 9,526.2 pounds per year, and the phosphorus reduction was 1,758.7 pounds per year.

Figure 14. Feedlot number 11

This is a before photograph showing the site for the sediment basin and holding pond. Note Whitewood Lake in the background. There was a problem with some seepage of water from the west side which prompted the NRCS engineer to have a French drain installed under the sediment basin. That was successful in stopping the seepage of water into the basin. The water flow from the French drain was captured and pumped into the holding pond. In November, 2007, monitoring was started to determine the amount of water coming from the French drain. In the first six months of monitoring, only 127 gallons were recorded on the meter.

The south perimeter fence of the feedlot was within fifty feet of the lake. The next picture gives a better view showing the short distance between the lake and the feedlot.

Figure 15. Feedlot number 11 viewed from the southeast looking west

Figure 16. Feedlot number 11 after construction

The owner of System twelve (12 / ID # 62) decided after receiving a feasibility report that he was not interested in proceeding.

System 14 (14 / ID # 60) is owned by two elderly individuals and operated by another individual. The operator was interested in making improvements on the property. A feasibility study was completed and the operator was interested in proceeding. It was determined that the owners did not want to share in the expense. The operator was going to cover all the expenses incurred. It was recommended that he should secure a longer term lease, or an agreement that would insure that he could recoup his investment. When the group met to draw up an agreement, the owners wanted to place several limitations on the operation that were more restrictive than the operator was willing to accept.

Feedlot system numbers 15 (15 / ID # 46) and 16(16 / ID # 47) are owned by the same individual and are located across the road from each other. Individually, they would be considered AFOs, but together they are considered one system and classified as a CAFO. The owner worked with the state to receive engineering assistance, but then he decided that the construction of the mono slope would be built with his own funds. The two feeding operations covered a total of 8 acres and housed 1,250 head of cattle. The reductions for each system were 7,444.2 pounds of nitrogen per year, and 1,674.9 pounds of phosphorus per year. The total reductions were 14,888.4 pounds of nitrogen per year, and 3,349.8 pounds of phosphorus per year.
Once the animal waste systems are completed, Step L 4.0 Model calculations indicate that the following load reductions will be achieved. This is the model that has been adopted by the South Dakota Department of Environment and Natural Resources.

Table 19. Load Reductions Achieved Through Implementations of BMPs

Feedlots Number	Nitrogen Load	Phosphorus Load
1 / 19	55,272.9	12,436.4
2 / 00	33,795.3	8,316.1
3 / 64	22,332.5	5,024.8
4 / 33	18,610.4	4,187.3
5 / 34	18,610.4	4,187.3
7 / 77	18,610.4	4,187.3
9 / 81	18,591.8	4,183.2
11 / 71	11,724.6	2,638.0
15 / 46	7,444.2	1,674.9
16 / 47	7,444.2	1,674.9
Total	177,756.50	33,673.20

Challenges in the nutrient management area.

A number of the producers in the area like to haul manure during the winter months. They are not willing to give up this practice. Placing manure on frozen or snow covered ground is not an acceptable practice according to South Dakota NRCS EQIP and nutrient management guidelines.

Another major concern has been with holding pond construction. Three producers in Kingsbury County have encountered problems in 2006 and 2007 with the side walls of holding ponds not remaining stable. This has caused delays and added cost for construction. Until systems are designed that will work, producers do not want to incur the expense of designing systems, and then have construction and operation problems. Many feel that they are being held responsible to build operational systems but are not getting proper guidance from engineers.

Holding ponds need to be pumped anywhere from once each year, to once ever three or four years. There is a significant cost for pumping approximately a million gallons of liquid from a holding pond. At this time, CAFOs are not authorized to use vegetative treatment areas (VTAs) instead of holding ponds. With a VTA, the land will produce a crop of grass that can be used by the livestock.

The average age of producers is getting older. If they do not have a relative who is going to take over the operation in a few years, they do not want to incur the expense and potential problems associated with construction of systems. Owners/operators weigh a number of factors. They look at the construction cost to build an animal waste management system. Will the changes improve the productivity of the feeding operation? When will they have to change their system to meet new requirements? How much space will be needed to build a system? Then they question the logic of giving up productive crop land to build sediment basins and holding ponds that generate no income.

These factors had an influence on the number of people in the watershed project area who wanted to make commitments in these economically challenging times.

Responsible Agencies:

Technical Assistance Coordination:
Project Coordinator
Kingsbury Conservation District

Information Transfer:
Project Coordinator
SD Association of Conservation Districts
Natural Resources Conservation Service

Implementation:
Project Coordinator
Farmers and Ranchers
Kingsbury Conservation District
USDA – Natural Resources Conservation Service (NRCS)

Financial Assistance:
Water Quality 319 Projects
USDA – NRCS EQIP program

Monitoring Assistance:
Project Coordinator
SD Department of Environment and Natural Resources

Total Cost: $484,000 319 Funds: $235,000

Table 20. Construction Cost for Animal Feeding Operations. This includes the Engineering, Construction and Nutrient Management Planning.

EPA 319	EQIP	Landowner Cost	Landowner In-Kind	TOTAL
$ 91,118.82	$ 114,302.20	$ 418,994.52		$ 624,415.54
$ 18,924.10	$ 59,867.80	$ 20,077.53	$ 4,155.40	$ 103,024.83

RECLAMATION PROJECT

The closed site for feedlot number nine (9) needed a major reclamation to insure that it would never be used for a feedlot in the future. A Reclamation Project was developed to address the financial assistance to the producers. The Project Coordinator worked on the plan to reclaim the site and secured funding from several different sources. The Soil and Water Conservation Grant administered by the SD Department of Agriculture would provide up to $22,500. The Conservation Innovation Grant, also administered by the Department of Agriculture would provide up to $13,428. The Consolidated Grant administered by the Department of Environment and Nature Resources would assist with up to $20,000. The landowner would be required to cover twenty five percent (25%) of the cost. The City of De Smet discounted the normal rate that they charge for the disposal of the waste material from the demolition site. This served as their contribution. EPA funds were used for costs that were excluded by the other grants.

The Reclamation Project was started in the middle of June, 2007, and the majority of the work was completed by the fall.

Figure 17. F**eedlot reclamation site viewed to the west. All the man made objects in this picture were to be removed.**

Figure 18. Feedlot reclamation looking to the northwest. All of the man made structures in this picture were to be removed.

Figure 19. Feedlot reclamation after the concrete and the buildings were removed

Table 21. Feedlot Site Reclamation Cost

EPA 319	Consolidated Grant	Soil & Water Conservation Grant	Conservation Innovation Grant	City of DeSmet	Landowner	TOTAL
$ 4,797.59	$ 10,740.80	$ 12,374.80	$ 6,618.20	$ 530.00	$ 10,584.13	$ 45,645.52

Clean Water Diversion

The one clean water diversion was built in connection with feedlot project number 11. The water came from the north. It would have entered the sediment basin area if it had not been for the diversion that diverted the clean water to the east, where it then entered Whitewood Lake.

The engineering was provided by NRCS and the construction cost was funded jointly by NRCS, EPA 319 and the landowner.

Figure 20. Clean water diversion that was being built in conjunction with the animal waste management system for feedlot number 11

Table 22. Construction Cost for the Clean Water Diversion

EPA 319	EQIP	Landowner	Cost	TOTAL
$ 971.44	$ 5,717.33	$ 2,932.31	$ 9,621.08	

Objective 2: Provide project and BMP information to 250 watershed landowners and 5,000 members of the general public to inform them on the project need and progress, maintain local support and involvement, and educate landowners on BMP implementation alternatives.

Task 3: Information Campaign:

Products:

One of the informational meetings will target fertilizer management and no-till. Cost of information activities includes supplies, postage, and staff contributions from the Kingsbury Conservation District and their local partners.

- Newsletters (6 @ 4 pages both sides @ 2 x per year)
- Tours (3 @ one per year)
- Project information and progress presentations (4 @ 1 per year). Annual meeting to update landowners on progress and assistance available.
- Project Stakeholder Outreach: (6 presentations to landowners, shoreline landowners/residents, or organizational stakeholders through group meetings).
- Project Media Outreach (6 news releases to local and/or area newspapers on project activities, project goals, project accomplishments).

Milestone:	Newsletters	6 (2 per year)
	Tours	3 (1 per year)
	Information meetings	4 (1 per year)
	Presentations	6 (2 per year)
	News Releases	6 (2 per year)

For a detailed annual informational activity schedule, see Table 6, Milestone Table.

Responsible Agencies:

Technical Assistance Coordination:
Project Coordinator
Kingsbury Conservation District

Information Transfer:
Coordinator
SD Association of Conservation Districts
Natural Resources Conservation Service

Implementation:
Project Coordinator
Kingsbury Conservation District
USDA – Natural Resources Conservation Service (NRCS)

Financial Assistance:
Water Quality 319 Projects
Kingsbury Conservation District

Total Cost: $2,900 319 Funds: $600

Table 23. Outreach Products

Newsletter Mailing	1,500 Rural Residences	September, 2005
News Article	The De Smet News	February 22, 2006
Flyer	Cost-Share Program	February, 2006
News Article	Lake Preston Times	March 2, 2006
Newsletter Mailing	1,465 Rural Residences	March, 2006
Flyer	Cost-Share Program with Response Form	March, 2006
Brochure	Distribute to Landowners	
Brochure	Distribute to Urban and Lake Residents	May, 2006
Newsletter Mailing	1,465 Rural Residences	September, 2006
News Article	The De Smet News	October 18, 2006
News Article	Watertown Public Opinion	June 29, 2007

Table 24. Project Tours

Producer Tour, Lake County Animal Waste Systems	March 4, 2004
Task Force Tour	Aug 5, 2005
EPA Region VIII and SD DENR Personnel	April 6, 2006
DENR Personnel	July 1, 2008

NUTRIENT LOAD REDUCTIONS

Overall nutrient load reductions for the project by water body are shown below.

Table 25. Nutrient Load Reductions in Pounds by Lake Watersheds

Load Reductions	Thompson	Whitewood	Preston
Phosphorus	36,580.1	18,841.4	8,236.5
Nitrogen	167,931.3	82,232.8	38,129.2

Phosphorus load reductions achieved by best management practices are summarized in Tables 26 and 27. The data was derived using the ANNAGNPS model.

Table 26. Phosphorus Load Reductions in Pounds Achieved through BMPs Installed

Best Management Practice's	Phosphorus Reduction	Delivered		
		Thompson	Whitewood	Preston
Animal Waste Management	33,673.20	33,673.2	18,549.7	7,537.1
Trees	79.60	79.6	10.6	5.3
Grazing Systems	2,101.30	2,101.3		604.1
Conservation Reserve Prog.	726.00	726.0	281.1	90.0
Total	**36,580.10**	**36,580.10**	**18,841.40**	**8,236.5**

Table 27. Phosphorus Load Reduction Achieved

	Lake Preston Watershed	
	Pounds	Kilograms
Initial Estimate	130587.5	59234.1
Achieved Reductions	8236.5	3736.05
Reduction Goal of 40.3%	64119	29084.2
% Reduction Achieved	6.3%	6.3%

	Lake Whitewood Watershed	
	Pounds	Kilograms
Initial Estimate	193594.3	87813.8
Achieved Reductions	18841.4	8546.40
Reduction Goal of 32%	64119	29084.2
% Reduction Achieved	9.7%	9.7%

	Lake Thompson Watershed	
	Pounds	Kilograms
Initial Estimate	267162.5	121184.1
Achieved Reductions	36580.1	16592.62
Reduction Goal of 24%	64119	29084.2
% Reduction Achieved	13.7%	13.7%

COORDINATION EFFORTS

The Kingsbury Lakes Water Quality Implementation Project was supported by a number of individuals and organizations. The groups that played an active role in the project are listed below.

- **Kingsbury County Conservation District: S**erved as the project sponsor; district staff made up of the district manager, project coordinator, and the District Board of Supervisors. Project staff addressed all facets of the 319 project including coordinating project activities, reporting project progress, processing requests for reimbursement of grant funds, record keeping, planning, information and education activities, inventory, and technical assistance for BMP implementation.
- **Kingsbury County:** The project coordinator met with the county commissioners a number of times to discuss landowner issues, and worked with them when they rewrote the county's zoning ordinances.
- **City of De Smet:** The project coordinator met with City Personnel and City Commissioners to discuss the construction of an animal waste management system and then the disposal of waste material for the Reclamation Project.

STATE AGENCIES

- **Department of Agriculture:** Administered the Soil and Water Conservation Grant and the Conservation Innovation Grant funds that where provided to the watershed project. They provided technical assistance on matters pertaining to land use and quality.

- **Department of Environment & Natural Resources:** Administered the EPA 319 Grant and Consolidated Grant Funds and provided technical assistance on matters pertaining to water quality. DENR provided computer support on the Grant Tracking System and the use of the Step L 4.0 Load Reduction software.
- **South Dakota Game Fish and Parks:** Provided funds for the development of grazing systems and permanent grass planting. Assistance was provided with activities impacting the state recreational areas in the watershed.
- **South Dakota State Extension Service:** Assisted with the educational effort in areas of Integrated Crop Management, Tree Planting, Herbicide and Pesticide use. The service was involved with AWMS design, primarily with the vegetative treatment strips used in the animal waste management systems.
- **319 Animal Nutrient Management Assistance Team:** Provided nutrient management plans and assisted with nutrient application and equipment calibration.

FEDERAL AGENCIES

- **US Fish and Wildlife Service:** Technical assistance for project activities in their area of expertise. The service was active in the development of small dams and grazing systems.
- **Natural Resources Conservation Service:** The Kingsbury County service office provided engineering and technical assistance for design and construction of BMPs. The NRCS state office provided cost-share funds for installation of BMPs including AWMSs.

BUDGET

The project received funds from many different state and federal sources. Among these were:

- Environmental Protection Agency Clean Water Act Section 319 grant funds through DENR;
- Consolidated Water Facilities Construction Program (Consolidated Grant) overseen by SD Board of Water and Natural Resources and administered by South Dakota Department of Environment and Natural Resources; and,
- Coordinated Soil and Water Conservation Grant Fund (Conservation Commission Grant) overseen by State Conservation Commission and administered by South Dakota Department of Agriculture.

Other funding was received for special purposes. Sources of funds are listed in Tables 28 and 29. The general budget for the project is shown in Table 30. Tables 31 through 37 show project expenditures by funding sources for project activities.

Table 28. State and Federal Grant Funding and Expenditures

EPA 319 Grant			
FISCAL YEAR	**GRANT AMOUNT**	**EXPENDED**	**AVAILABLE**
FY 2005	$ 412,650.00	$ 251,658.33	$ 160,991.67
CONSOLIDATED GRANT			
GRANT NUMBER	**GRANT AMOUNT**	**EXPENDED**	**AVAILABLE**
2008-203	$ 20,000.00	$ 13,000.55	$ 6,999.45
COORDINATED SOIL AND WATER CONSERVATION GRANT			
GRANT NUMBER	**GRANT AMOUNT**	**EXPENDED**	**AVAILABLE**
2007-CSW-010	$ 22,500.00	$ 12,374.80	$ 10,125.20

CONSERVATION INNOVATION GRANT administered by Department of Agriculture

GRANT NUMBER	GRANT AMOUNT	EXPENDED	AVAILABLE
2007-RBR-001	$ 13,428.00	$ 12,393.20	$ 1,034.80

GAME FISH and PARKS

GRANT NUMBER	GRANT AMOUNT	EXPENDED	AVAILABLE
2005	$ 48,200.00	$ 29,615.22	$ 18,584.78

Table 29. Summary of Project Funds Received From all Sources

Source	Initial Budget	Amended Budget	Total Received
Federal			
319 Funds Awarded through DENR	412,650	412,650	251,658.33
Conservation Innovation Grant	0	13,428	12,393.20
Fish & Wildlife Service	74,013	74,013	10,833.21
USDA-EQIP	279,320	279,320	224,072.02
Total Federal	**765,983**	**779,411**	**498,956.76**
State			
Consolidated Grants	0	20,000	13,000.55
Soil and Water Conservation Grants	27,000	49,500	25,892.46
Game Fish and Parks	48,200	48,200	29,615.22
Total State	**75,200**	**117,700**	**68,508.23**
Local			
Kingsbury Conservation District	20,000	20,000	24,832.81
Landowner Match	284,327	324,732	545,437.98
City of DeSmet			530.00
South Dakota Assc. of Conservation Dist.			3,930.83
Ducks Unlimited			473.17
Total Local	**304,327**	344,732	**575,204.79**
Total Project	**1,145,510**	**1,241,843**	**1,142,669.78**

Table 30. General Budget for the Watershed Project

GENERAL BUDGET	INITIAL	REVISED	EXPENDITURES
Personnel Support			
Project Coordinator			
Salary and Benefits (20%)	$ 93,900	$ 119,800	$ 90,221.46
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565	$ 19,565	$ 11,456.23
Financial Audit	$ 2,400	$ 0	
Insurance (Errors/omissions/liability)	$ 5,000	$ 5,000	$ 2,734.65
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475	$ 1,725	$ 1,078.13
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500	$ 4,000	$ 3,002.50
(10,000mi/yr. + 3 days per dim/yr.)			
Office Space (Kingsbury CD @ $300/mo.)	$ 10,800	$ 10,800	$ 10,800.00
(includes phone, FAX, Copier, etc)			
Internet Access ($20/mo.)	$ 720	$ 720	$ 2,900.00
Miscellaneous Expenses			$
Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems - 5,000 ac.			
Fencing - 120,000 LF @ $.75.LF (75% c/s)	$ 90,000	$ 90,000	$ 46,953.46
Grass Seeding - 500 ac. @ $100/ac. (75% c/s)	$ 50,000	$ 50,000	$ 10,594.60
Pipelines -11,500LF @ $2.50/LF (60% c/s)	$ 28,750	$ 6,750	$ 45,880.56
Rural Water Hook-ups - 5 @ $1200 each (60% c/s)	$ 6,000	$ 14,167	$ 10,816.00
Wells-3 @ $4,500 each (60-300ft @ $24.75/ft) (60%)	$ 13,500	$ 9,500	$ 5,171.33
Solar Pump (alternative water) (60% c/s)	$ 2,500	$ 2,500	
Tanks - 12 @ $800 each (60% c/s)	$ 9,600	$ 9,600	$ 13,978.65
Ponds/Dugouts/Cleanouts - 8 @ $3000 each (60%)	$ 24,000	$ 24,000	
Pasture/Grassland Buffers - 25 ac. @ $150/ac. (75%)	$ 3,750	$ 3,250	
Tree Planting - 20 ac. @ $1800/ac.	$ 36,000	$ 36,000	$ 27,922.95
Streambank Plantings - 2 ac. @ $1000/ac. (75% c/s)	$ 2,000	$ 2,000	
Streambank/Shoreline Stabilization - 2 ac. @$1000	$ 2,000	$ 2,000	
Livestock Excluder			$ 306.74
Products: Cropland BMPs			
Filter Strips/Waterways - 150 ac. @ $100/ac.	$ 150,000	$ 143,000	
Fencing (cropland buffers) - 5000LF @ $.75/LF (75%)	$ 3,750	$ 3,750	
Tree Planting - 40 ac. @ $1800/ac.	$ 72,000	$ 72,000	$ 51,216.95
Farmable Wetlands Program - 120 ac. @ $120/ac.	$ 14,400	$ 14,400	

Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Six (6) Ag Waste Systems			
Engineering Services - 6 @ $12,000 each	$ 72,000	$ 142,000	$ 46,194.90
System Construction - 6 @ $65,000 each	$ 390,000	$ 315,167	$ 684,243.27
Nutrient Management Plans - 6 @ $2000	$ 12,000	$ 14,750	$ 1,500.00
Feedlot Reclamation	$ 0	$ 84,500	$ 70,888.40
Product: Two (2) Clean Water Diversions			
Feeding Area Diversions - 2 @ $5000 each	$ 10,000	$ 7,000	
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters - 6 @ $100 each	$ 600	$ 600	$ 146.50
Tours - 3 @ $200 each	$ 600	$ 600	
Information Meetings - 4 @ $200 each	$ 800	$ 800	
Presentations - 6 @ $100 each	$ 600	$ 600	
News Releases - 6 @ 50 each	$ 300	$ 300	
Meetings - Board & Landowner In-kind			$ 4,662.50
Task 4: Monitoring and Reports			
Products:			
(costs covered by personnel/supplies budget)			
Semi-Annual Reports - 3 each			
Annual Reports - 3 each			
Final Report - 1 each			
Completion of PIP for Project Segment # 2			
Total	$1,145,510.00	$1,210,844.00	$ 1,142,669.78

Table 31. EPA 319 Budget for the Watershed Project

EPA 319 Budget	INITIAL	REVISED	EXPENDITURES
Personnel Support			
Project Coordinator			
Salary and Benefits (20%)	$ 93,900	$ 119,800	$ 90,221.46
Administrative and Support			
Support Staff Salary and Benefits	$ 14,565	$ 13,565	$ 11,456.23
Financial Audit	$ 2,400	$ 0	
Insurance (Errors/omissions/liability)	$ 2,500	$ 2,500	$ 1,526.33
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 5,475	$ 1,725	$ 1,076.63
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500	$ 4,000	$ 2,986.18
(10,000mi/yr. + 3 days per dim/yr.)			
Office Space (Kingsbury CD @ $300/mo.)			
(includes phone, FAX, Copier, etc)			
Internet Access ($20/mo.)			
Miscellaneous Expenses			

Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems - 5,000 ac.			
Fencing - 120,000 LF @ $.75.LF (75% c/s)			
Grass Seeding - 500 ac. @ $100/ac. (75% c/s)			
Pipelines -11,500LF @ $2.50/LF (60% c/s)	$ 23,250	$ 21,250	$ 16,934.12
Rural Water Hook-ups - 5 @ $1200 each (60% c/s)	$ 7,600	$ 9,100	$ 2,635.10
Wells-3 @ $4,500 each (60-300ft @ $24.75/ft) (60%)	$ 8,100	$ 4,100	$
Solar Pump (alternative water) (60% c/s)	$ 1,500	$ 1,500	$
Tanks - 12 @ $800 each (60% c/s)	$5,760	$ 5,760	$ 2,660.01
Ponds/Dugouts/Cleanouts - 8 @ $3000 each (60%)			
Pasture/Grassland Buffers - 25 ac. @ $150/ac. (75%)	$ 1,000	$ 500	
Tree Planting - 20 ac. @ $1800/ac.			
Streambank Plantings - 2 ac. @ $1000/ac. (75% c/s)	$ 1,500	$ 1,500	
Streambank/Shoreline Stabilization - 2 ac. @$1000	$ 1,500	$ 1,500	
Livestock Excluder			
Products: Cropland BMPs			
Filter Strips/Waterways - 150 ac. @ $100/ac.	$ 7,500	$ 500	
Fencing (cropland buffers) - 5000LF @ $.75/LF (75%)			
Tree Planting - 40 ac. @ $1800/ac.			
Farmable Wetlands Program - 120 ac. @ $120/ac.			
Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Six (6) Ag Waste Systems			
Engineering Services - 6 @ $12,000 each	$ 24,000	$ 46,000	$ 25,949.15
System Construction - 6 @ $65,000 each	$ 193,500	$ 164,000	$ 86,495.68
Nutrient Management Plans - 6 @ $2000	$ 0	$ 2,750	$
Feedlot Reclamation	$ 0	$ 7,500	$ 8,672.75
Product: Two (2) Clean Water Diversions			
Feeding Area Diversions - 2 @ $5000 each	$ 7,500	$ 4,500	$ 971.44
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters - 6 @ $100 each	$ 300	$ 300	$ 73.25
Tours - 3 @ $200 each	$ 300	$ 300	
Information Meetings - 4 @ $200 each			
Presentations - 6 @ $100 each			
News Releases - 6 @ 50 each			
Meetings - Board & Landowner In-kind			

Task 4: Monitoring and Reports			
Products:			
(costs covered by personnel/supplies budget)			
Semi-Annual Reports - 3 each			
Annual Reports - 3 each			
Final Report - 1 each			
Completion of PIP for Project Segment # 2			
Total	$ 412,650.00	$ 412,650.00	$ 251,658.33

Table 32. USDA Budget for the Watershed Project

USDA BUDGET	General	USDA	Expenditures
Personnel Support			
Project Coordinator			
Salary and Benefits	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565		
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000		
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475		
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		
Office Space	$ 10,800		
Internet Access	$ 720	$ 720	
Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems			
Fencing	$ 90,000		$ 3,681.82
Grass Seeding	$ 50,000		
Pipelines	$ 28,750		$ 4,712.00
Rural Water Hook-ups	$ 6,000		$ 2,661.35
Wells-	$ 13,500		
Solar Pump	$ 2,500		
Tanks	$ 9,600		$ 4,761.93
Ponds/Dugouts/Cleanouts	$ 24,000		
Pasture/Grassland Buffers	$ 3,750	$ 1,800	0.00
Tree Planting	$ 36,000	$ 18,000	$ 726.50
Streambank Plantings	$ 2,000		
Streambank/Shoreline Stabilization	$ 2,000		
Products: Cropland BMPs			
Filter Strips/Waterways	$ 150,000	$ 105,000	0
Fencing (cropland buffers)	$ 3,750		
Tree Planting	$ 72,000	$ 36,000	$ 33,358.02
Farmable Wetlands Program	$ 14,400	$ 10,800	0

Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Animal Waste Management Systems			
Engineering Services	$ 72,000	$ 36,000	$ 11,100.00
System Construction	$ 390,000	$ 65,000	$ 161,570.00
Nutrient Management Plans	$ 12,000	$ 6,000	$ 1,500.00
Feedlot Reclamation		$ 13,428	$ 12,393.20
Product: Clean Water Diversions			
Feeding Area Diversions	$ 10,000		
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters	$ 600		
Tours	$ 600		
Information Meetings	$ 800		
Presentations	$ 600		
News Releases	$ 300		
Task 4: Monitoring and Reports			
Products:			
Semi-Annual Reports			
Annual Reports			
Final Report			
Completion of PIP for Project Segment # 2			
Total Project Cost:	$1,145,510.00	$ 292,748.00	$ 236,465.22

Table 33. US F&W Budget for the Watershed Project

GENERAL BUDGET	TOTAL	BUDGET	EXPENDITURES
Personnel Support			
Project Coordinator			
Salary and Benefits (20%)	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565		
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000		
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475		
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		
(10,000mi/yr. + 3 days per dim/yr.)			
Office Space (Kingsbury CD @ $300/mo.)	$ 10,800		
(includes phone, FAX, Copier, etc)			
Internet Access ($20/mo.)	$ 720		
Miscellaneous Expenses			

Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems - 5,000 ac.			
Fencing - 120,000 LF @ $.75.LF (75% c/s)	$ 90,000	$ 31,800	$ 5,266.54
Grass Seeding - 500 ac. @ $100/ac. (75% c/s)	$ 50,000	$ 25,000	
Pipelines -11,500LF @ $2.50/LF (60% c/s)	$ 28,750		$ 3,021.70
Rural Water Hook-ups - 5 @ $1200 each (60% c/s)	$ 6,000		
Wells-3 @ $4,500 each (60-300ft @ $24.75/ft) (60%)	$ 13,500		$ 1,809.97
Solar Pump (alternative water) (60% c/s)	$ 2,500		
Tanks - 12 @ $800 each (60% c/s)	$ 9,600		
Ponds/Dugouts/Cleanouts - 8 @ $3000 each (60%)	$ 24,000	$ 14,400	$ 735.00
Pasture/Grassland Buffers - 25 ac. @ $150/ac. (75%)	$ 3,750		
Tree Planting - 20 ac. @ $1800/ac.	$ 36,000		
Streambank Plantings - 2 ac. @ $1000/ac. (75% c/s)	$ 2,000		
Streambank/Shoreline Stabilization - 2 ac. @$1000	$ 2,000		
Livestock Excluder			
Products: Cropland BMPs			
Filter Strips/Waterways - 150 ac. @ $100/ac.	$ 150,000		
Fencing (cropland buffers) - 5000LF @ $.75/LF (75%)	$ 3,750		
Tree Planting - 40 ac. @ $1800/ac.	$ 72,000		
Farmable Wetlands Program - 120 ac. @ $120/ac.	$ 14,400		
Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Six (6) Ag Waste Systems			
Engineering Services - 6 @ $12,000 each	$ 72,000		
System Construction - 6 @ $65,000 each	$ 390,000		
Nutrient Management Plans - 6 @ $2000	$ 12,000		
Feedlot Reclamation	$ 0		
Product: Two (2) Clean Water Diversions			
Feeding Area Diversions - 2 @ $5000 each	$ 10,000		
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters - 6 @ $100 each	$ 600		
Tours - 3 @ $200 each	$ 600		
Information Meetings - 4 @ $200 each	$ 800		
Presentations - 6 @ $100 each	$ 600		
News Releases - 6 @ 50 each	$ 300		
Meetings - Board & Landowner In-kind			

Task 4: Monitoring and Reports			
Products:			
(costs covered by personnel/supplies budget)			
Semi-Annual Reports - 3 each			
Annual Reports - 3 each			
Final Report - 1 each			
Completion of PIP for Project Segment # 2			
Start Up Funds			
Total	$1,145,510.00	$ 74,013.00	$ 10,833.21

Table 34. Game Fish and Parks Budget for the Watershed Project

Game Fish and Parks Budget			**Water**
ITEM	**General**	**SD GF&P**	**Project**
Personnel Support			**Funds**
Project Coordinator			
Salary and Benefits	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565		
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000		
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475		
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		
Office Space	$ 10,800		
Internet Access	$ 720		
Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems			
Fencing	$ 90,000	$ 35,700	$ 16,554.94
Grass Seeding	$ 50,000	$ 12,500	$ 9,750.00
Pipelines	$ 28,750		$ 1,493.84
Rural Water Hook-ups	$ 6,000		
Wells-	$ 13,500		$ 775.70
Solar Pump	$ 2,500		
Tanks	$ 9,600		$ 315.00
Ponds/Dugouts/Cleanouts	$ 24,000		
Pasture/Grassland Buffers	$ 3,750		
Tree Planting	$ 36,000		$ -
Streambank Plantings	$ 2,000		
Streambank/Shoreline Stabilization	$ 2,000		
Fence Enclosure			$ 306.74
Products: Cropland BMPs			
Filter Strips/Waterways	$ 150,000		
Fencing (cropland buffers)	$ 3,750		
Tree Planting	$ 72,000		$ 419.00
Farmable Wetlands Program	$ 14,400		

Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Animal Waste Management Systems			
Engineering Services	$ 72,000		
System Construction	$ 390,000		
Nutrient Management Plans	$ 12,000		
Feedlot Reclamation			
Product: Clean Water Diversions	$ 10,000		
Feeding Area Diversions			
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters	$ 600		
Tours	$ 600		
Information Meetings	$ 800		
Presentations	$ 600		
News Releases	$ 300		
Task 4: Monitoring and Reports			
Products:			
Semi-Annual Reports			
Annual Reports			
Final Report			
Completion of PIP for Project Segment # 2			
Total Project Cost:	$1,145,510.00	$ 48,200.00	$ 29,615.22
		GFP TOTAL	
Percentage of Overall Project Costs	100%	4%	

Table 35. Soil and Water Conservation Commission Budget for the Watershed Project – Tree Planting

Soil and Water Conservation Commission Grant – Tree Planting		**Trees**	**Trees**
ITEM	**General**	**Budget**	**Expenses**
Personnel Support			
Project Coordinator			
Salary and Benefits	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565		
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000		
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475		
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		
Office Space	$ 10,800		
Internet Access	$ 720		

Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems			
Fencing	$ 90,000		
Grass Seeding	$ 50,000		
Pipelines	$ 28,750		$ 631.60
Rural Water Hook-ups	$ 6,000		
Wells-	$ 13,500		
Solar Pump	$ 2,500		
Tanks	$ 9,600		
Ponds/Dugouts/Cleanouts	$ 24,000		
Pasture/Grassland Buffers	$ 3,750		
Tree Planting	$ 36,000	$ 9,000.00	$ 6173.29
Streambank Plantings	$ 2,000		
Streambank/Shoreline Stabilization	$ 2,000		
Products: Cropland BMPs			
Filter Strips/Waterways.	$ 150,000		
Fencing (cropland buffers)	$ 3,750		
Tree Planting	$ 72,000	$ 18,000.00	$ 2,689.77
Farmable Wetlands Program	$ 14,400		
Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Animal Waste Management Systems			
Engineering Services	$ 72,000		
System Construction	$ 390,000		
Nutrient Management Plans	$ 12,000		
Feedlot Reclamation $84,500 Added			
Product: Clean Water Diversions			
Feeding Area Diversions	$ 10,000		
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters	$ 600		
Tours	$ 600		
Information Meetings	$ 800		
Presentations	$ 600		
News Releases	$ 300		
Task 4: Monitoring and Reports			
Products:			
Semi-Annual Reports			
Annual Reports			
Final Report			
Completion of PIP for Project Segment # 2			
Total Project Cost:	$1,145,510	$ 27,000	$ 9,494.66

Table 36. Soil and Water Conservation Commission Budget for the Watershed Project – Feedlot Reclamation

Soil and Water Conservation Commission Grant – Reclamation		Reclamation	Reclamation
ITEM	**General**	**Budget**	**Expenses**
Personnel Support			
Project Coordinator			
Salary and Benefits	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565		
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000		
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475		
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		
Office Space	$ 10,800		
Internet Access	$ 720		
Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems			
Fencing	$ 90,000		
Grass Seeding	$ 50,000		
Pipelines	$ 28,750		
Rural Water Hook-ups	$ 6,000		
Wells-	$ 13,500		
Solar Pump	$ 2,500		
Tanks	$ 9,600		
Ponds/Dugouts/Cleanouts	$ 24,000		
Pasture/Grassland Buffers	$ 3,750		
Tree Planting	$ 36,000		
Streambank Plantings	$ 2,000		
Streambank/Shoreline Stabilization	$ 2,000		
Products: Cropland BMPs			
Filter Strips/Waterways.	$ 150,000		
Fencing (cropland buffers)	$ 3,750		
Tree Planting	$ 72,000		
Farmable Wetlands Program	$ 14,400		
Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Animal Waste Management Systems			
Engineering Services	$ 72,000		
System Construction	$ 390,000		
Nutrient Management Plans	$ 12,000		
Feedlot Reclamation $84,500 Added		$ 22,500.00	$ 16,397.80
Product: Clean Water Diversions			
Feeding Area Diversions	$ 10,000		

Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters	$ 600		
Tours	$ 600		
Information Meetings	$ 800		
Presentations	$ 600		
News Releases	$ 300		
Task 4: Monitoring and Reports			
Products:			
Semi-Annual Reports			
Annual Reports			
Final Report			
Completion of PIP for Project Segment # 2			
Total Project Cost:	$1,145,510	$ 22,500.00	$ 16,397.80

Table 37. Local Budget for the Watershed Project

LOCAL BUDGET			
ITEM	**Total**	**Local**	**EXPENDITURES**
Personnel Support			
Project Coordinator			
Salary and Benefits	$ 93,900		
Administrative and Support			
Support Staff Salary and Benefits	$ 20,565	$ 6,000	$ -
Financial Audit	$ 2,400		
Insurance (Errors/omissions/liability)	$ 5,000	$ 2,500	$ 1208.32
Supplies/Office Equipment/Travel			
Equipment and Supplies	$ 6,475	$ 1,000	$ -
Travel: Vehicle, Ins. Mileage, Lodging	$ 10,500		$ 16.32
Office Space	$ 10,800	$ 10,800	$ 10,800.00
Internet Access	$ 720		$ 2,900.00
Miscellaneous			$ 1.50
Objective 1: BMPs Installation			
Task 1: Cropland/Grassland BMP installation			
Products: Grassland BMPs			
Planned Grazing Systems			
Fencing	$ 90,000	$ 22,500	$ 21,450.16
Grass Seeding	$ 50,000	$ 12,500	$ 844.60
Pipelines	$ 28,750	$ 15,500	$ 92,086.90
Rural Water Hook-ups	$ 6,000	$ 5,067	$ 5,519.55
Wells-	$ 13,500	$ 5,400	$ 2,585.66
Solar Pump	$ 2,500	$ 1,000	
Tanks	$ 9,600	$ 3,840	$ 5,506.69
Ponds/Dugouts/Cleanouts	$ 24,000	$ 9,600	$ -
Pasture/Grassland Buffers	$ 3,750	$ 950	
Tree Planting	$ 36,000	$ 9,000	$ 21,230.16

Streambank Plantings	$ 2,000	$ 500	
Streambank/Shoreline Stabilization	$ 2,000	$ 500	
Products: Cropland BMPs			
Filter Strips/Waterways	$ 150,000	$ 37,500	$ -
Fencing (cropland buffers)	$ 3,750	$ 937	$ -
Tree Planting	$ 72,000	$ 18,000	$ 10,750.16
Farmable Wetlands Program	$ 14,400	$ 3,600	$ -
Objective 1: BMP Installation			
Task 2: Livestock Nutrient Management			
Product: Animal Waste Management Systems			
Engineering Services	$ 72,000	$ 60,000	$ 9,145.75
System Construction	$ 390,000	$ 86,167	$ 435,206.15
Nutrient Management Plans	$ 12,000	$ 6,000	$ -
Feedlot Reclamation			$ 20,424.10
Product: Clean Water Diversions			
Feeding Area Diversions	$ 10,000	$ 2,500	
Objective 2: Outreach and Reporting:			
Task 3: Information Campaign			
(Cost below does not include Personnel Costs)			
Products:			
Newsletters	$ 600	$ 300	$ 73.25
Tours	$ 600	$ 300	
Information Meetings	$ 800	$ 800	
Presentations	$ 600	$ 600	
News Releases	$ 300	$ 300	
Meeting with Landowners/Board meetings			$ 4,662.50
Task 4: Monitoring and Reports			
Products:			
Semi-Annual Reports			
Annual Reports			
Final Report			
Completion of PIP for Project Segment # 2			
Total Project Cost:	$1,145,510.00	$ 323,660.34	$ 575,204.77
Percentage of Overall Project Costs		27%	

ASPECTS OF THE PROJECT THAT DID NOT WORK WELL

Whenever there is a voluntary program that is available to landowners and operators, there are going to be a percentage in favor, neutral or opposed to it. It makes it difficult to get the participation level that you would like. The financial incentive will bring some around. Any program is a give and take situation: the program will give them something, usually money; in return they are going to need to make changes to how things are done. If they are not interested, or willing to change, then we will not be able to provide any help. Then it comes down to: how much is the financial incentive, and what do I need to change?

An example would be the grazing systems. We needed to sell the benefits of the grazing system, and the landowner / operator would weigh the cost / benefit ratio. It becomes very complex when one looks at the number of paddocks, number of animals, frequency that you need to move the animals and duration of the contract.

Others are not going to make changes until they are forced to change. This pressure will come when the EPA or Department of Environment and Natural Resources set deadlines for compliance. Next the agencies need to demonstrate the willingness to take action if the producer does not make changes. Even then there will be some who will procrastinate as long as possible.

No-till was another area in which it was difficult to determine success. When one does not have financial incentive and an enrollment program, how do you measure success? The only way would be to do an assessment again to measure the percent of change.

For the Conservation Reserve Program, CRP, to be a viable program, rental rates need to keep up with the current market value. Presently the high corn and soybean prices have been the driving force behind escalating rental prices. The market value of the land is driven by many factors. They include the market value of products produced, rental rates, the recreational value of hunting, and other factors.

FUTURE ACTIVITY RECOMMENDATIONS

There were many goals in the original project implementation plan that were met. It was set up to have a phase one and a phase two. At this time it does not appear to be the right time to move into phase two.

Why is this not the correct time? In the area of animal waste management systems, there are a number of producers who have had bad experiences trying to build approved systems. In a small community when three large producers and the contractors are having problems building animal waste management systems, everyone knows it. Most of the bad experiences were a result of the plans for the systems not being designed to factor in the impact of the soil types and the high water tables in the watershed. These proved to be expensive errors. Many of the systems had been designed by the same firm at the same

time. Thus the engineers and producers were not able to learn from past experiences. Once the design problems have been corrected, and the systems have been operating a few years, other producers will be more receptive to addressing the problems of their operations.

At this time the smaller producers do not feel the pressure that the status quo is not acceptable. The smaller feedlots classed as animal feeding operations, having less than one thousand animal units, have not been given deadlines that they must meet. Once the feedlot operators in the watershed decide that they must change to comply with more restrictive standards, that would be the time to move forward with a continuation of the project.

The high corn and soybean prices have many livestock producers questioning the logic of raising cattle. They can sell the corn and soybeans at excellent prices today. This is having an impact on farmers trying to decide about planting grass or trees. For the next few years, it can be expected that agricultural producers will follow the markets and maximize the production of corn and soybeans.

The current economic climate does not lend itself to having producers invest large sums of money into capital improvement of their animal feeding operations.

LITERATURE CITED

Nels H. Troelstrup, Jr. & Jessica M. Michalski. 2004 Phase I Watershed Assessment Final Report. Lakes Preston, Whitewood, Thompson, Kingsbury and Lake Counties, South Dakota.

2005 Exhibit A. Project Summary Sheet, Kingsbury Lakes Water Quality Implementation Project.

South Dakota Department of Environment and Natural Resources, South Dakota Total Maximum Daily Load Water Body List, 2002.

South Dakota Game Fish and Parks, South Dakota State Wide Fisheries Survey, 2102-F-21-R-39, Lake Thompson, Kingsbury County.

South Dakota Game Fish and Parks, South Dakota State Wide Fisheries Survey, 2102-F-21-R-39, Whitewood Lake, Kingsbury County.

U.S. Environmental Protection Agency, Total Maximum Daily Loads cycle, 2004.

KEY TO ACRONYMS

AFO-	Animal Feeding Operation
AGNPS-	Agricultural Nonpoint Source Computer Model
ANMP-	Animal Nutrient Management Plan
ANMT-	Animal Nutrient Management Team
ANN AGNPS-	Annualized Agricultural Nonpoint Source Computer Model
BMP-	Best Management Practice
CAFO-	Concentrated Animal Feeding Operation
CCG-	Soil and Water Conservation Grant
CCRP-	Continuous Conservation Reserve Program
CNMP-	Comprehensive Nutrient Management Plan
COE-	Army Corps of Engineers
CRP-	Conservation Reserve Program
CWA-	Clean Water Act
DENR-	Department of Environment and Natural Resources
DO-	Dissolved Oxygen
EQIP-	Environmental Quality Incentive Program
EPA-	Environmental Protection Agency
GF&P-	SD Department of Game Fish and Parks
HUC-	Hydrologic Unit Code
KCD-	Kingsbury Conservation District
KLWIP-	Kingsbury Lakes Water Quality Implementation Project
MIP-	Model Implementation Program
N-	Nitrogen
NAWCA-	North American Wetlands Conservation Act
NPDES-	National Pollutant Discharge Elimination System
NPS-	Nonpoint Source
NRI-	Natural Resources Inventory
NRCS-	Natural Resources Conservation Service
QA-	Quality Assurance
P-	Phosphorus
QC-	Quality Control
SD-	South Dakota
SDSWQS-	South Dakota Surface Water Quality Standards
SWD-	Surface Water Discharge Program
TDS-	Total Dissolved Solids
TGPC-	Tall Grass Prairie Conservation Initiative
TMDL-	Total Maximum Daily Load
TSI-	Carlson (1977) Trophic State Indices or Trophic State Index
TSS-	Total Suspended Solids
USGS-	United States Geological Survey
WQM-	Water Quality Monitoring
WQS-	Water Quality Standards

APPENDIX

MEDIA AND PUBLIC INFORMATION