CLEAN WATER ACT SECTION 319

NONPOINT SOURCE CONTROL PROGRAM

FINAL REPORT

MEDICINE CREEK WATERSHED PROJECT

SPONSOR

AMERICAN CREEK CONSERVATION DISTRICT

PROJECT COORDINATOR

JOSEPH JESSOP

September 2010

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

Grants C998185-05 and 998185-09

EXECUTIVE SUMMARY

Project Title: Medicine Creek Watershed Project

Grants: C9998185-05 and C998185-09

Project Start Date: June 21, 2005 Project Completion Date: September 30, 2010

Funding:	Project Budget		$986,825.00
	Section 319 Grants	FFY 2005	$196,968.21
		FFY 2009	46,685.20
	Total Section 319 Grants		$243,653.41
Expenditures:	Section 319 Grants		$243,653.41
	State and Local – Cash		247,511.00
	State and local Inkind		54,785.00
	Total Section 319		545,949.41
	Other Federal		405,902.41
	Total		$951,851.41

Summary of Accomplishments

The project goal was:

> "Restore and protect the beneficial uses of Medicine Creek by implementing best management practices (BMPs) in the Medicine Creek watershed that reduce sediment and nutrient loading and prevent bacterial contamination."

To attain the goal, BMPs were installed to:

- reduce total phosphorus levels in Fate Dam, Byre Lake, and Brakke Dam by 19.5 percent, 19.6 percent and 18.9 percent respectively;
- reduce sediment delivery to Medicine Creek by 15 to 20 percent; and
- prevent bacterial contamination of the creek.

Four articles were published in the Lyman County Herald, six articles were printed in the American Creek Conservation District newsletter and more than 90 personal contacts made to:

- inform watershed residents of project progress,
- promote the installation of BMPs by landowners and operators, and
- provide landowners and operators with the assistance needed to design and install the BMPs.

The BMPs installed to achieve the load reductions included:

- Marginal pastureland riparian buffers - 633 acres along 17.6 miles of streambank,
- Cropland filter strips - 164 acres along 11 miles of streambank,
- Cropland converted to permanent grass cover - 5,544 acres
- Managed Grazing – 27,634 acres,
- Dams repaired or replaced – 10,
- Animal waste management systems constructed –3.

The calculated load reductions that resulted from the installation of the BMPs versus the reduction goal are summarized in the table below. Water quality samples to determine fecal coliform bacteria reductions data were not collected.

Watershed	**Phosphorus Load (kg)**	**Reduction (kg)**	**% Reduction**	**Goal (%)**
Fate Dam	2,205	682	31	19.5
Brakke Dam	618	246	40	18.9
Byre Lake	9,391	208	2	19.6
Medicine Creek	59,501	10,245	17	
	Sediment Load (kg)			
Medicine Creek	15,310,140	6,767,181	44	15-20

The load reduction milestones established for Medicine Creek and all subwatersheds except Byre Lake were accomplished. While the reduction milestones for Lake Byre were not accomplished, based on visual observations, the reductions realized appear sufficient to protect the beneficial uses of the lake.

With the exceptions cited, the project goal was attained.

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INTRODUCTION

The Medicine Creek Watershed Project was developed to implement the Total Maximum Daily Loads (TMDLs) for Medicine Creek, Fate Dam, Byre Lake, and Brakke Dam (Figure 1). Using data collected during the watershed assessment (2003 – 2005), it was determined that the dams and lake:

- were eutrophic with impairment from the accumulated nutrients and sediment, and
- needed protection from bacterial contamination to support realization of designated beneficial uses.

These same pollutants were linked to conductivity and total dissolved solids (TDS) impairments of Medicine Creek.

The project was completed by a partnership that included several agencies and organizations. See Table 11 located in the Coordination Section of this report for a list of project partners and their contributions to the project.

The partnership's activities were coordinated by an advisory committee that consisted of representatives from the:

- American Creek, Stanley and Jones Conservation Districts and United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) field offices;
- South Dakota Department of Environment and Natural Resources (DENR) Watershed Protection Program;
- South Dakota Department of Agriculture (SDDA);
- South Dakota State University Cooperative Extension Service; and
- South Dakota Association of Conservation Districts (SDACD).

The committee met periodically, with most of the meetings being held during the early portion of the project period, to address challenges encountered with project start-up.

Progress in implementing the project workplan was behind schedule during much of the first three years of the project period. The status was moved to on schedule after an agreement for coordinator services was entered with the South Dakota Association of Conservation Districts (SDACD). The coordinator provided by SDACD was an association employee whose hiring was made possible because of the association's Section 319 funded Watershed Planning and Assistance Project.

The coordinator used periodic reports and direct contacts to ensure the project partners were:

- knowledgeable of project accomplishments and opportunities for involvement and
- secure the financial and technical assistance required to implement the PIP.

The installation of cropland and grassland BMPs was accomplished using financial and technical assistance provided by this grant, the USDA Farm Service Agency's (FSA) Conservation Reserve Program (CRP), United States Fish and Wildlife Services (USFWS) habitat funds, and the SD Conservation Commission's Natural Resources Conservation Grant Program.

Assistance for the design of animal waste management systems (AWMS) was provided by USDA NRCS animal nutrient management specialists, this grant and the joint DENR – SDDA Manure Management System Engineering and Design Assistance Program for Existing Confined Animal Feeding Operations (CAFO) Program. Construction of the systems used funds from the Environmental Quality Incentive Program (EQIP) administered by NRCS and the SD Conservation Commission's Natural Resources Conservation Grant Program and this grant.

A description of the TMDL waterbodies included in this project follows. See Figures 1 and 2 for maps of the Medicine Creek Watershed and land use in the project area.

Description of the Medicine Creek Watershed

Medicine Creek is a natural stream that drains portions of Lyman and Jones Counties in south central South Dakota. Its tributaries were dammed to form Brakke Dam, Fate Dam, and Byre Lake in Lyman County (Figure 1). The center of the Medicine Creek Watershed is located at 43.803492°N Latitude, 99.410058°W Longitude. The creek drains approximately 390,072 acres of which 11,288 are above Brakke Dam, 17,202 above Fate Dam and 22,946 above Byre Lake. Most of the runoff entering the creek and lakes passes through agricultural operations. Runoff carried by the creek drains into the Missouri River near the town of Lower Brule. The municipality is located on the Lower Brule Indian Reservation at 44.04732 degrees N, 099.34887 degrees west.

Assigned beneficial uses for Medicine Creek, Fate Dam, Brakke Dam, and Byre Lake are shown in Table 1 (SD Surface Water Quality Standards: http://legis.state.sd.us/rules/rules/7451.htm).

Table 1. Beneficial Uses of Waterbodies in the Medicine Creek Watershed.

Beneficial use	Medicine Creek	Fate Dam	Brakke Dam	Byre Lake
Domestic water supply waters				X
Warmwater permanent fish life propagation waters		X	X	X
Warmwater semipermanent fish life propagation waters				
Warmwater marginal fish life propagation waters	X			
Immersion recreation waters		X	X	X
Limited contact recreation waters	X	X	X	X
Fish & wildlife propagation, recreation, & stock watering Waters	X	X	X	X
Irrigation waters	X			X

Trophic State Index (TSI) values indicated that the nutrients and sediment from the watershed were the probable cause of the decline in water quality in both the creek and lakes with the resulting impairments impacting the use of the waterbodies for swimming, boating, recreation, wildlife, and quality of life. The three impoundments are important to the economic health and sustainability of the communities of Reliance, Kennebec, Presho, Vivian, Draper and surrounding rural residents and agricultural producers.

Most of the Medicine Creek watershed is located in the Northwestern Great Plains (43) ecoregion (Level III). The 1998 South Dakota Unified Watershed Assessment identified the Medicine Creek Hydrologic Unit Code (HUC 10140104) as a watershed in need of restoration. Factors used in making

the determination included land use, treatment needs and point source density. Using a weighted ranking system based on density of river miles and TMDL acres within the HUC, Medicine Creek was ranked 4th of the 39 South Dakota HUC watersheds identified as in need of restoration by DENR during 1998.

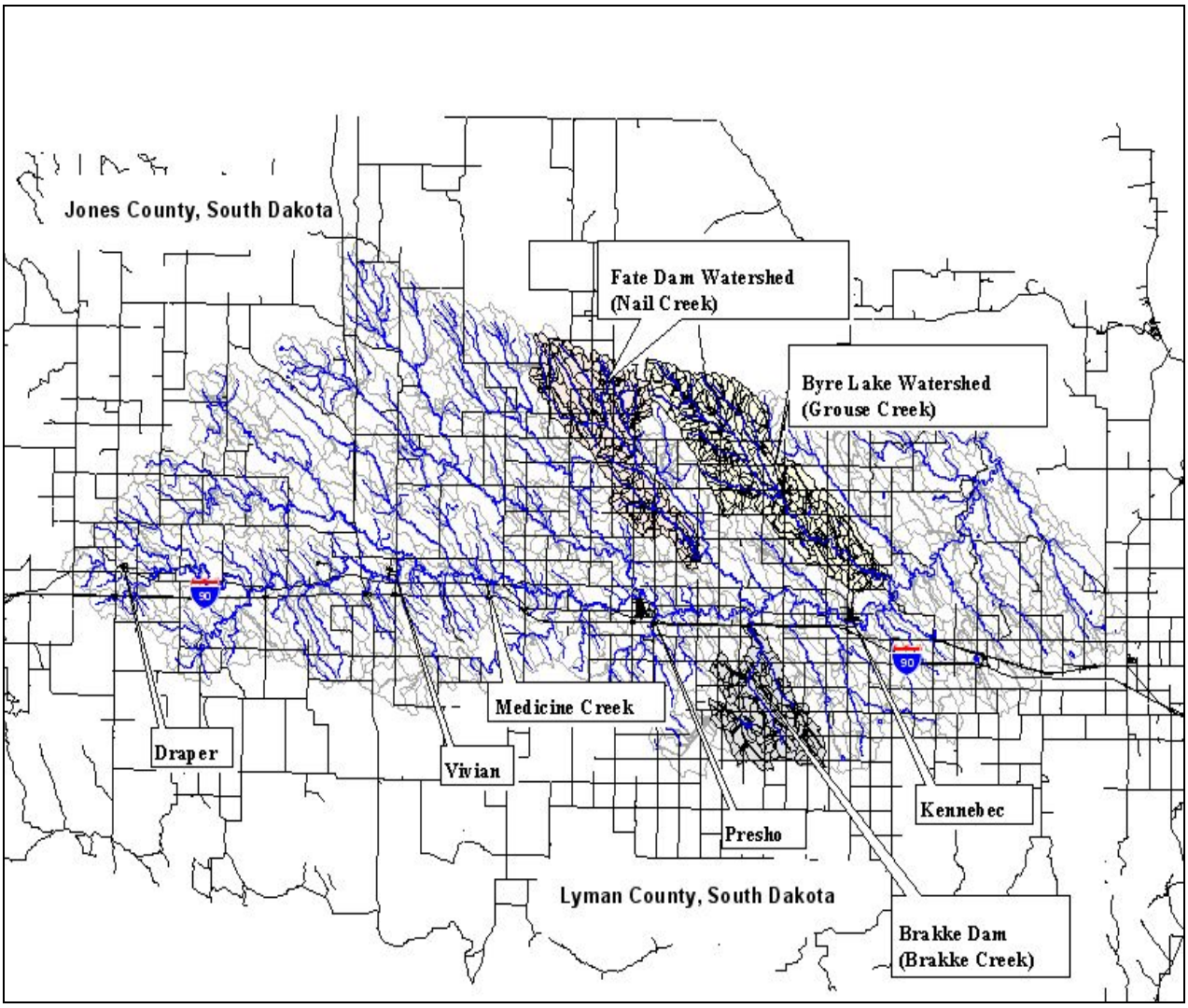


Figure 1: Medicine Creek Watershed Project Map.

Land use in the watershed is primarily agricultural (Figure 2). Approximately 31 percent of the land is cultivated and non-cultivated cropland; 59 percent range and pastureland. Wheat, row crops and hay are the main crops on cultivated lands. Animal feeding areas in the watershed are primarily associated with winter feeding activities.

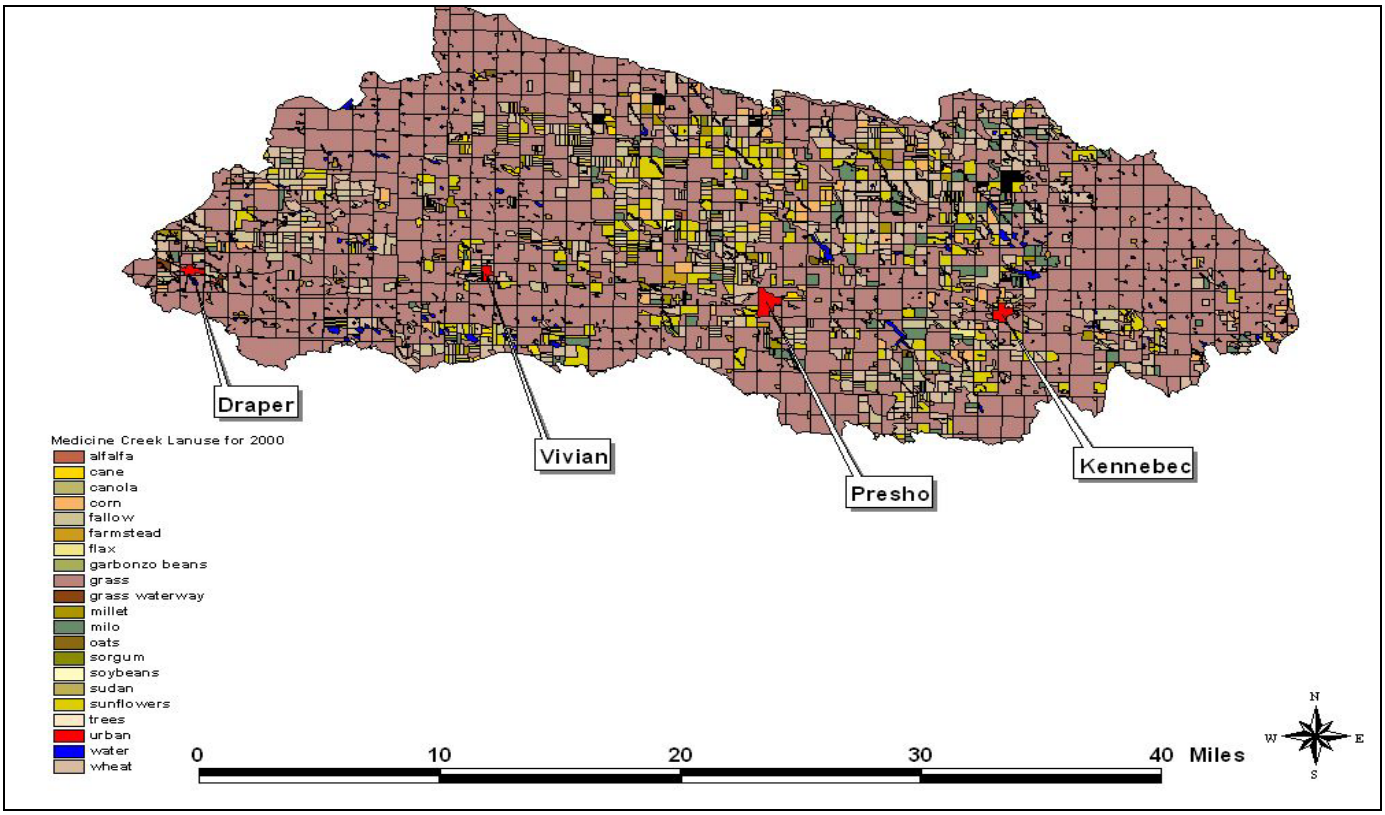


Figure 2: Medicine Creek Watershed Land Use Map.

The landscape is dominated by an upland plain that is moderately dissected by streams and entrenched drainage ways. Elevation ranges from about 2,090 feet mean sea level (msl) in the west and north parts of the watershed to about 1,742 feet msl in the east. Millboro and Opal-Sansarc are the major soil associations in the watershed.

Average annual precipitation is approximately 17 inches of which 13 inches, nearly 80 percent of the total, is from rain fall events during the months of April through September. The remainder is from snow melt. The average annual snowfall is 30.9 inches (USDA, 1987). The mean summer, temperature is about 73º F; winter; 20º F. During the summer months, tornadoes and severe thunderstorms strike occasionally. While these storms, usually local and of short duration, occasionally produce heavy rainfall and runoff.

Nail Creek, a tributary to Medicine Creek, drains approximately 6,961 ha (17,202 acres) of the watershed. The creek was impounded to form Fate Dam during 1938 (Figure 1). The dam, also known as Nail Creek Lake, is located near Presho, Lyman County, SD, (43.938726°N Latitude, 100.007263°W Longitude. The 60.7 ha (150 acres) recreational lake has an average depth of approximately 3.0 meters (9.8 feet), maximum depth of 7.6 meters (25 feet), more than 5.9 kilometers (3.7 miles) of shoreline and holds 1,500 acre-feet of water. The lake is impacted by periodic algal blooms and has increasing TSI values. Fate Dam is listed on the 1998 and 2002 303(d) Impaired Waterbody List and the 2004 Integrated Report for TSI.

An unnamed tributary of Medicine Creek, henceforth Brakke Creek, drains a subwatershed of approximately 4,568.1 ha (11,288 acres) in Lyman County, South Dakota (Figure 1). A dam was constructed at 43.927642°N Latitude, 99.939203°W Longitude during 1935 by the Civilian

Conservation Corp (CCC). Waters impounded by Brakke Dam form a 52.6 ha (130 acre) recreational lake on land owned by South Dakota Department of Game, Fish and Parks (SD GF&P). The lake has a maximum depth of 5.8 meters (19 feet), average depth of 2.08 meters, holds 1,300 acre-feet of water (6.84 feet) and over 5.9 kilometers (3.7 miles) of shoreline. The lake outlets back into Brakke Creek. The lake is impacted by periodic algal blooms, has increasing TSI values, and is listed on the SD 1998 and 2002 303(d) Impaired Waterbody List, and 2004 Integrated Reports for TSI.

Grouse Creek drains approximately 9,286 ha (22,960 acres) of the Medicine Creek watershed (Figure 1). A dam constructed across the creek near the town of Kennebec, Lyman County, South Dakota, by the Works Progress Administration (WPA) during 1937 formed Byre Lake. Located at 43.927642°N Latitude, 99.939203°W Longitude, the recreational lake holds 7,258.5 acre-feet of water and covers approximately 51.5 ha (127.3 acres). The lake is owned by the Town of Kennebec. It has a maximum depth of 5.49 meters (18 feet), average depth of 2.15 meters (7.06 feet, and over 5.44 kilometers (3.38 miles) of shoreline. The outlet for the lake empties into Grouse Creek.

Byre Dam was breached during May 1986. Repairs to the dam were completed during fall 1990. The primary spillway was repaired and renovated during 1994. During spring 2000, the outlet was cleared of debris. While impacted by periodic algal blooms, Byre Lake was not listed on either the 1998 or 2002 South Dakota 303(d) Impaired Waterbody List.

Nonpoint Source Pollutants

The Medicine Creek Watershed Assessment Project was initiated at the request of local organizations and citizens concerned about water quality. The main concerns expressed were algae blooms and use of the waterbodies for boating and swimming. An assessment was completed during 2003 – 2005 to develop TMDLs for Medicine Creek and the lakes located in the watershed. Activities completed during the assessments included:

Stream, tributary, and outlet water sampling
Review of previous water quality data co
Aquatic Macrophyte Survey
Quality Assurance
Watershed modeling using AnnAGNPS
Biological Monitoring
Sediment Survey

Water quality impairments identified during the assessments included:

- TSI (Phosphorus) - Brakke Dam, Fate Dam and Byre Lake in Lyman County
- Total dissolved solids (TSS) - Medicine Creek
- Fecal Cloiform bacteria - Medicine Creek
- Total suspended solids (TSS) - Medicine Creek
- Conductivity - Medicine Creek

Based on water quality samples taken during this project, Medicine Creek was delisted for sediment and conductivity after the project workplan was approved.

Most fecal coliform bacteria standard violations (Table 2) were determined to be associated with increased hydrologic flows. This finding lead to the hypothesis that runoff from land-applied manure,

animal feeding areas, riparian areas where cattle have access to the waterbodies and other manure management practices were the likely source of the bacteria.

Table 2. Fecal Cloiform Standard Violations.

Site	Date	Fecal Coliform Bacteria (colonies/100 ml)	Total Samples	Total Violations	Percent Violations
MC Test Sites					
MCT[1]-1A	7/18/2000	34,000			
MCT-1	7/18/2000	5,600			
MCT-13	7/10/2000	4,800			
MCT-9	6/14/2000	2,200			
MCT-2	6/29/2000	2,200			
All MTC Sites			32	5	15.6
Site (WQM Data)					
WQM[2]-141 (MCT-13)	6/18/2001	2,200			
WQM-141 (MCT-13	7/15/2003	2,500			
All WQM Sites			26	2	7.7
Total			58	7	12.1

1 - Medicine Creek Test
2 – Water Quality Monitoring

TMDLs were developed for the impairments identified. Parameters addressed were TSS, TDS, conductivity, and fecal Cloiform bacteria. EPA approved TSI TMDLs for Fate Dam, Brakke Dam, and Byre Lake and Medicine Creek for TDS, fecal coliform bacteria TSS and conductivity. Based on WQ samples taken during this project, Fate Dam and Medicine Creek (except fecal coliform bacteria) were delisted.

The TMDLs are available by visiting:

Fate Dam: http://www.state.sd.us/denr/DFTA/WatershedProtection/TMDL/TMDL_FateAll.pdf
Brakke Dam: http://www.state.sd.us/denr/DFTA/WatershedProtection/TMDL/TMDL_BrakkeAll.pdf
Brye Lake: http://www.state.sd.us/denr/DFTA/WatershedProtection/TMDL/TMDL_ByreAll.pdf
Medicine Creek: http://denr.sd.gov/dfta/wp/tmdl/TMDL_MedicineCreek.pdf

Data collected to determine sediment and nutrient load sources was used to identify critical cells (Table 3) for prioritization of best management practice (BMP) installation.

BMP reductions were modeled for fertilizer, grazing management, conservation tillage, buffer strips and feedlots (Table 4). Based on the model, grazing management and conservation tillage were projected to provide the greatest overall sediment reduction; BMPs installed to improve fertilizer and grazing management the greatest nitrogen and phosphorus loading reductions.

Table 3. Critical Cell Acres by Priority Ranking.

Priority	Sediment	Nitrogen	Phosphorus

Ranking						
	Acres	Percent of watershed	Acres	Percent of watershed	Acres	Percent of watershed
1	3,673	0.9	3,724	0.9	9,542	2.4
2	5,780	1.5	22,107	5.7	2,415	0.6
3	32,184	8.3	22,203	5.7	16,519	4.2
Total	41,637	10.7	48,034	12.3	28,476	7.3

Table 4. Estimated Load Reductions by BMP to Implement the TMDLs.

	Sediment		Nitrogen		Phosphorus	
Best Management Practice	Reduction (tons/acre/yr)	Percent Reduction	Reduction (lbs/acre/yr)	Percent Reduction	Reduction (lbs/acre/yr)	Percent Reduction
Fertilizer Reduction	0.000	0.0	0.002	0.74	0.054	1.47
Grazing Management	0.001	20.0	0.028	10.29	0.020	0.54
Conservation Tillage	0.001	20.0	0.002	0.74	0.002	0.05
Buffer Strips	0.0005	10.0	0.002	0.74	0.000	0.0
Feedlots	0.000	0.0	0.000	0.0	0.000	0.0
Estimated Total Reduction	**0.0025**	-	**0.034**	-	**0.074**	-

The 3,440 kg/yr total phosphorus load reduction to Medicine Creek determined during the assessments does not appear to fit ecoregion-based beneficial use criteria. Therefore, it was proposed, that decreasing sediment, nitrogen, and phosphorus from tributaries to the creek (Table 4) will reduce Medicine Creek TSI values for these parameters.

The results of an Annualized Agricultural Nonpoint Source (AnnAGNPS) model exercise rated nine (= 25 percent) of the 38 animal feeding areas in the watershed as critical with a rating >60. Of the priority areas, feedlot cells 4,663, 1653, 1673, 1,533 (Table 5) ranked highest. It was recommended that AWMS should be constructed at these animal feeding areas to reduce nutrient loading to and fecal coliform levels in Medicine Creek. Construction of the systems was expected to reduce sediment, nitrogen and phosphorus loading by 1, 3, and 2 percent respectively.

Table 5. Feedlot Priority Ranking for Nitrogen and Phosphorus Reduction

Feedlot Cell Number	Nitrogen		Phosphorus	
	lbs/acre reduction	Priority rank	lbs/acre reduction	Priority rank
822	0.004	8	0.020	7
1,473	0.188	6	0.137	5
1,653	1.805	2	1.092	2
1,672	0.021	7	0.007	8
1,673	0.860	3	0.329	3
1,533	0.647	4	0.246	4
2,563	0.239	5	0.128	6
4,663	6.699	1	2.548	1
4,752	0.000	9	0.001	9

Watershed treatments recommended to reduce impacts from livestock grazing and feeding near the creek included constructing fences or other barriers to reduce livestock access to riparian areas,

livestock cross-over structures and alternative sources. Alternative treatments included seasonal access or rotational grazing Reductions from rotational grazing are expected to be lower than the BMPs cited previously as livestock would still impact the riparian areas seasonally. Riparian restoration alternatives recommended included, but were not limited to, laying back steep banks, revegetation of or rip rapping selected areas, and replanting barren and susceptible areas and willow planting.

Project Goals, Objectives and Activities

The project goal was:

> "Restore and protect the beneficial uses of Medicine Creek by implementing best management practices (BMPs) in the Medicine Creek watershed that reduce sediment and nutrient loading and prevent bacterial contamination."

Three objectives were established to facilitate attaining the goal:

> Objective 1: Through the application of BMPs in the watershed, reduce sediment, nutrient and fecal coliform bacteria loading to Medicine Creek by 20 percent.
> Objective 2: Through personnel contacts, on-site visits, workshops, demonstration site tours, news media and direct mailings to keep stakeholders informed and involved.
> Objective 3: Comply with program reporting requirements.

To reach the objects, BMPs were selected to:

- reduce total phosphorus levels in Fate Dam, Byre Lake and Brakke Dam by 19.5 percent, 19.6 percent and 18.9 percent respectively;
- decrease sediment delivery to Medicine Creek by 15 to 20 percent; and
- prevent bacterial contamination of the creek.

During the first year of the project period it was determined that the practices selected to attain the goal did not accurately reflect those needed to address animal feeding areas and include BMPs that producers would implement. Therefore, the BMPs included in the workplan were amended as shown in Table 9. The project budget (Table 13) was reduced accordingly and milestones for completion of all project activities incorporated into the Segment 1 PIP. In addition, it was determined that Section 319 funding should be used for feedlot relocations, alternative water facilities, alternative winter protection, and grass or tree plantings on land without a cropping history and therefore not fundable by USDA programs such as the EQIP and CRP.

The sources of funds accessed for financial assistance included:

- SDDA - SD Natural Resource Conservation Grant (South Dakota Conservation Commission Grant) and the SD Manure Management System Engineering and Design Assistance Program for Existing Confined Animal Feeding Operations (CAFO) Program;
- DENR – Manure Management System Engineering and Design Assistance Program for Existing CAFOs Program;
- USDA NRCS – Environmental Quality Incentive Program (EQIP);
- USDA FSA – Conservation Reserve Program (CRP);
- USFWS – Annual appropriation for SD habitat projects and
- EPA - Clean Water Act Section 319 Implementation Project Grant, to include 303(d) Watershed planning and Assistance Grant awarded SDACD through DENR.

Technical assistance for the design and installation of the BMPs was provided by:

- NRCS District Conservationists (DCs) – Grassland and Cropland BMPs,
- NRCS Ag Waste Management Team – Ag waste management systems (AWMS),
- SDACD - 303(d) Watershed Assistance and Planning Project and
- NRCS certified private sector technical service providers (TSPs).

The BMPs were installed using the conservation practices listed in Table 6 and in the legend at the bottom of Figure 6. Many of the BMPs were installed using Continuous Sign-up CRP buffer programs and State Acres for Wildlife Enhancement (SAFE). For a description of the practices, refer to USDA FSA standards for Conservation Practices or the USDA NRCS electronic Field Office Technical Guide (efotg). The guides are available by accessing fsa.usda.gov and nrscs.usda.gov respectively.

Table 6. Practices Used to Install BMPs.

Best Management Practice	Practices	Practice Code
Grassland Management	Riparian Buffers (Marginal Pasture and Riparian Continuous Conservation Reserve Program)	342 Critical Area Planting 380 Windbreak/Shelterbelt Establishment 472 Access Control 595 Pest Management
	Windbreaks (Fabricated and Earth Constructed)	561 Heavy Use Protection
	Grazing systems Fence Pipeline Water Tanks Pond/Dugout Cleanout	528 Prescribed Grazing 382 Fence 516 Pipeline 614 Watering Facility 378 Pond
	Wetland Restoration	657 Wetland Restoration
Cropland Management	Grass Seeding (CRP)	327 Conservation Cover 342 Critical Area Planting
	Buffer Strips and Grassed Waterways (CCRP and RAM rentals)	412 Grassed Waterway 393 Filter Strip
Livestock Nutrient Management	Animal Waste Management system Nutrient Management Plan	313 Waste Storage Facility 590 Nutrient Management

Prior to construction of a BMP, compliance with cultural resource and threatened and endangered species requirements was completed and 401 and 404 permits obtained.

Project cooperators provided assistance for BMP design and installation were required to enter an agreement that outlined the responsibilities of the cooperator and project sponsor. The agreement included an operation and maintenance (O&M) clause which specified the operation and maintenance requirements, procedures for BMP failure or abandonment, time period (life span) for which the BMP will be maintained and the responsibilities of the parties to the agreement.

The milestones for the BMPs listed in the Accomplishments by Tasks summarized are as amended. The reader is directed to the Monitoring and Evaluation section of this report for the original milestones for this project segment and a comparison of how the accomplished levels relate to that required for full TMDL implementation.

The location of the BMPs installed was mapped (Figure 5) using data entered into the DENR Project Management System (Tracker) and the (Figure 6) NRCS Program Contacts system (PROTRACTS)

Load reductions realized from the BMPs installed were determined using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) developed by EPA Region 5. The load reductions achieved during each project year were provided to DENR in partial fulfillment of reporting requirements. The data was included in annual reports prepared using the format provided by DENR to facilitate entry into EPA's Grants Reporting and Tracking System (GRTS).

Accomplishments by Task

Objective 1: Through the application of best management practices in the watershed, reduce sediment; nutrient; and fecal coliform bacteria loading to Medicine Creek by 20 percent.

Task 1: Grassland/Cropland Management

BMPs installed to reduce sediment, nutrient and bacterial loads originating from livestock grazing and feeding areas included managed grazing systems, riparian buffers and wind breaks.

Cost share assistance accessed to implement grassland BMPs included funding from the:

- EPA Clean Water Act Section 319 Grant Program,
- FSA CRP Program
- NRCS EQIP Program, and
- USFW funds appropriated for habitat projects in South Dakota.

Drought conditions in the watershed during the early portion of the project period resulted in increased producer interest in developing grazing plans. The plans led to the installation of managed grazing systems (Figure 3) on 27,634 acres of managed grazing operated by 24 livestock producers.

Development of the grazing systems included developing a grazing plan and installing riparian buffers, alternative water sources and cross fencing. See Table 6 for the NRCS/FSA practices used; Table 7 for the amount of each practice. The alternative water sources and cross-fences were readily accepted by producers. Alternative water sources installed were required to be located out of wetland or riparian zones.

The riparian buffers installed to limit livestock access to Medicine Creek and its tributaries resulted in the protection of 17.6 miles of streambank. The 633 total acres installed using funds provided by the CCRP Marginal Pastureland program exceeded the project milestone of 500 acres. Priority for installation of the riparian buffers was given those sites to which livestock had year around access.

Windbreaks were added to the project to provide producers with an alternative to wintering cattle along the creek for protection from winter weather. Therefore, construction of a windbreak was often used in tandem with the installation of a CRP Marginal Pastureland buffer. Eight constructed windbreaks were installed. Of the total, six were installed using lumber and steel sheeting; two earth berms. In addition three acres of trees were planted to provide a protected wintering area off the creek.
In addition to the grazing related BMPs cited, a 220 acre wetland was restored using FWS funds.

The grassland BMPs installed reduced nitrogen, phosphorus and sediment loading 38,881.1 lb/yr, 8,485.6 lb/yr. and 5,558 tons/yr. respectively.

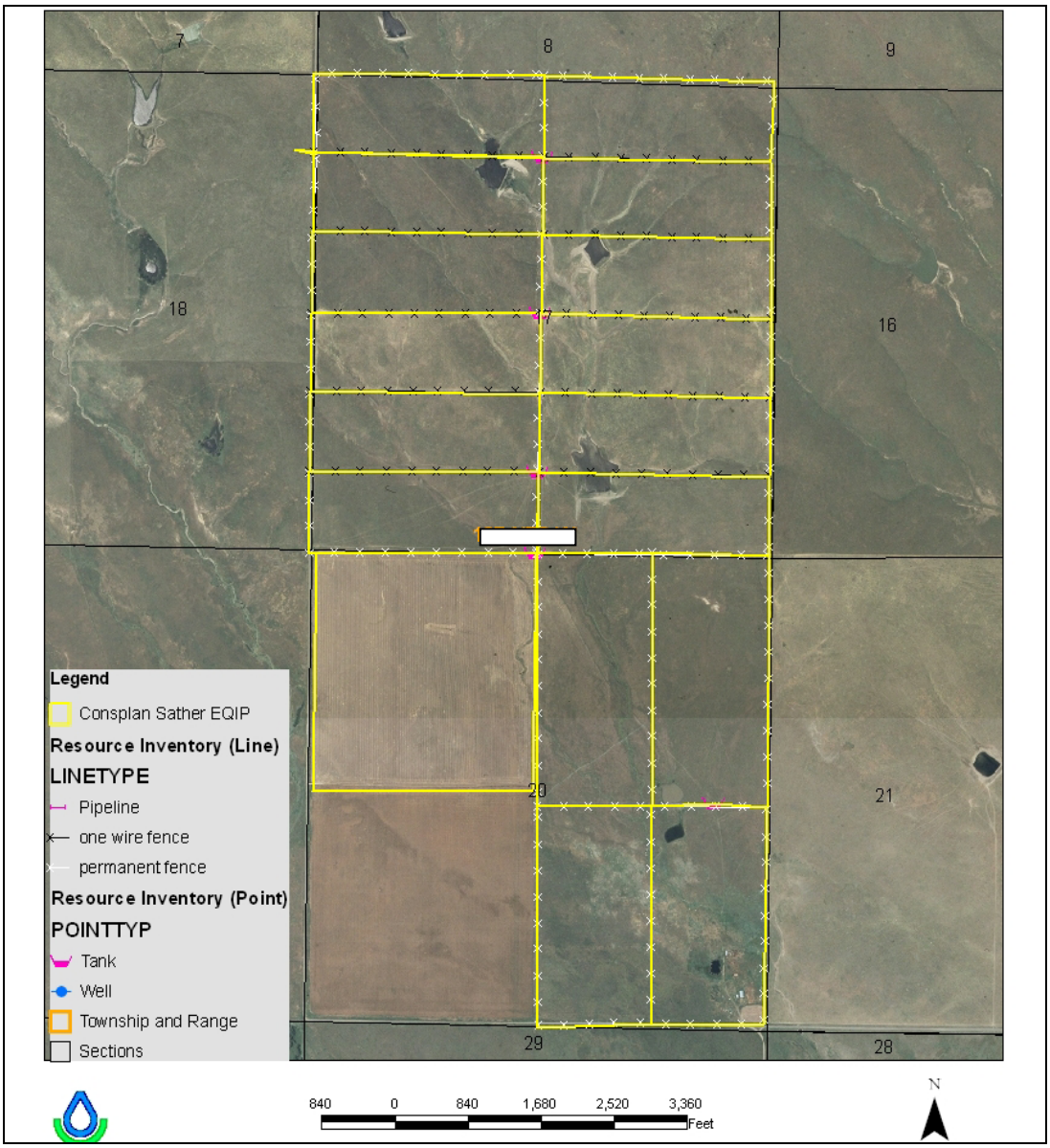


Figure 3. Multiple paddock rotational grazing system plan.

Cropland practices installed included buffer strips, grassed waterways and grass plantings. Installation of each BMP exceeded the milestone.

The CCRP Filter Strip program and a riparian area management rental contract (RAM) were used to install 164 acres of buffers (Figures 4a and b) that reduce NPS pollution to approximately 11 miles of streambank along Medicine Creek and its tributaries. Of the total, 113 acres is operated by one producer.

Offering riparian area management (RAM) contracts was added to rent additional acres adjacent to CCRP funded buffers to make CCRP a more feasible option for landowners and also provide the

opportunity to extend the term of a CRP buffer contract. One landowner in the project area took advantage of the RAM option to install filter strips on cropland. Funding for the 12.2 acre RAM installed was provided by this 319 Grant.

Figure 4a. Site prior to installing field buffer strip.

Figure 4b. Field buffer strip installed.

Cropland planted to perennial grasses using funds provided by either the general or State Acres for Wildlife Enhancement (SAFE) CRP programs totaled 5,544 acres (Sites not mapped Figure 5) SAFE is a continuous sign up CRP program. The calculated annual load reductions realized from planting permanent cover total 27,256 lbs/yr nitrogen, 9,184 lbs/yr phosphorus and tons/yr 6,623 sediment.

A planned versus accomplished comparison of grassland and cropland milestones is shown in Table 7.

Table 7 Grassland/Cropland Management Milestone Comparison.

	Planned	Accomplished
Livestock Grazing and Feeding areas		
Managed Grazing Systems	29,500 ac.	27,634 ac.
Fence	105,000 ft.	121,440 ft.
Pipeline	40,000 ft.	115,240 ft
Water Tanks	50	62
Ponds and /Dugout Cleanout	10	10
Riparian Buffers	500 ac.	633 ac.
Fabricated Windbreaks	2	6
Earth Constructed Windbreaks	16	2
Cropland		
Buffer Strip/Grassed Waterways	20 ac.	152 ac.
Riparian Area Rentals	160 ac.	12.2 ac.
Conversion of Cropland to Grassland	2,000 ac.	5,544 ac.

Task 2: Livestock Nutrient Management - Ag. Waste Systems and Nutrient Management Plans.

During the project, three animal waste management systems (AWMS) were constructed. One was a relocation. Funding for the design and earthwork of the "relocated" system was provided by the EQIP. The remainder of the relocation costs was paid by the landowner with additional cost-share provided by the Medicine Creek Watershed Project Section 319 Grant. The contrast in conditions along Medicine Creek between the original site of the AFO and new site is shown in Figures 7 a and b. Note that the creek evident in Figure 7a is not in 7 b.

One of the sites for construction of an AWMS was found to include a CAFO. The CAFO portion of the site was a livestock auction barn; the AFO portion a feedlot that did not require a permit. Financial assistance for the design and construction of the CAFO was provided by the DENR -SDDA Ag Manure Management System Engineering and Design Assistance for CAFOs Project and EQIP; the AFO EQIP. The designs were completed by an NRCS certified TSP.

Nitrogen and phosphorus load reductions realized from the installation of AWMS were 41,916.12 lbs/yr. and 9,431 lbs/yr. respectively.

Milestones:	Planned	Accomplished
Nutrient Management Plans	3	3
Design of Animal Waste Facilities	3	3
Constructed Ag. Waste Systems	3	3

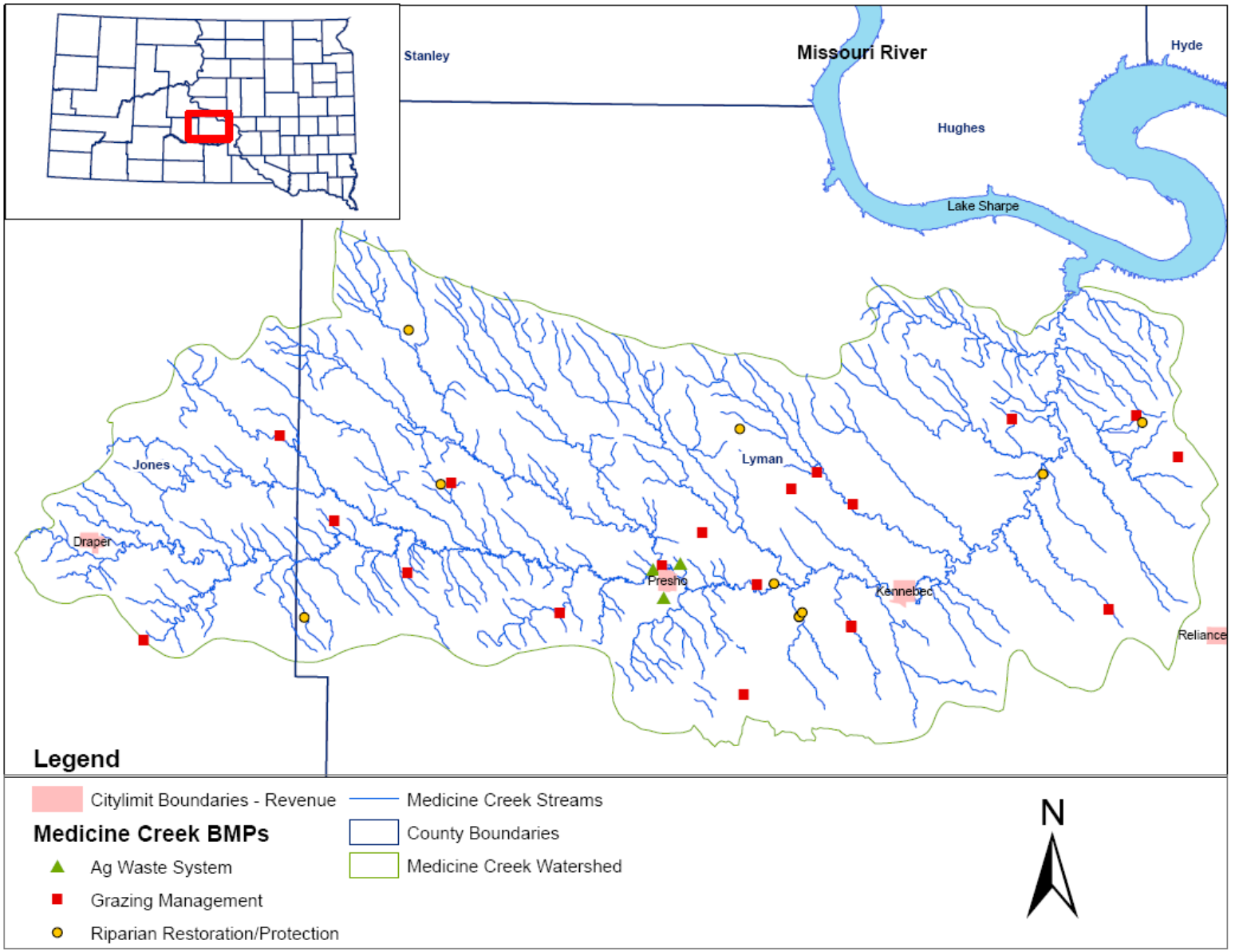


Figure 5. Location of BMPs installed using 319 and local funds.

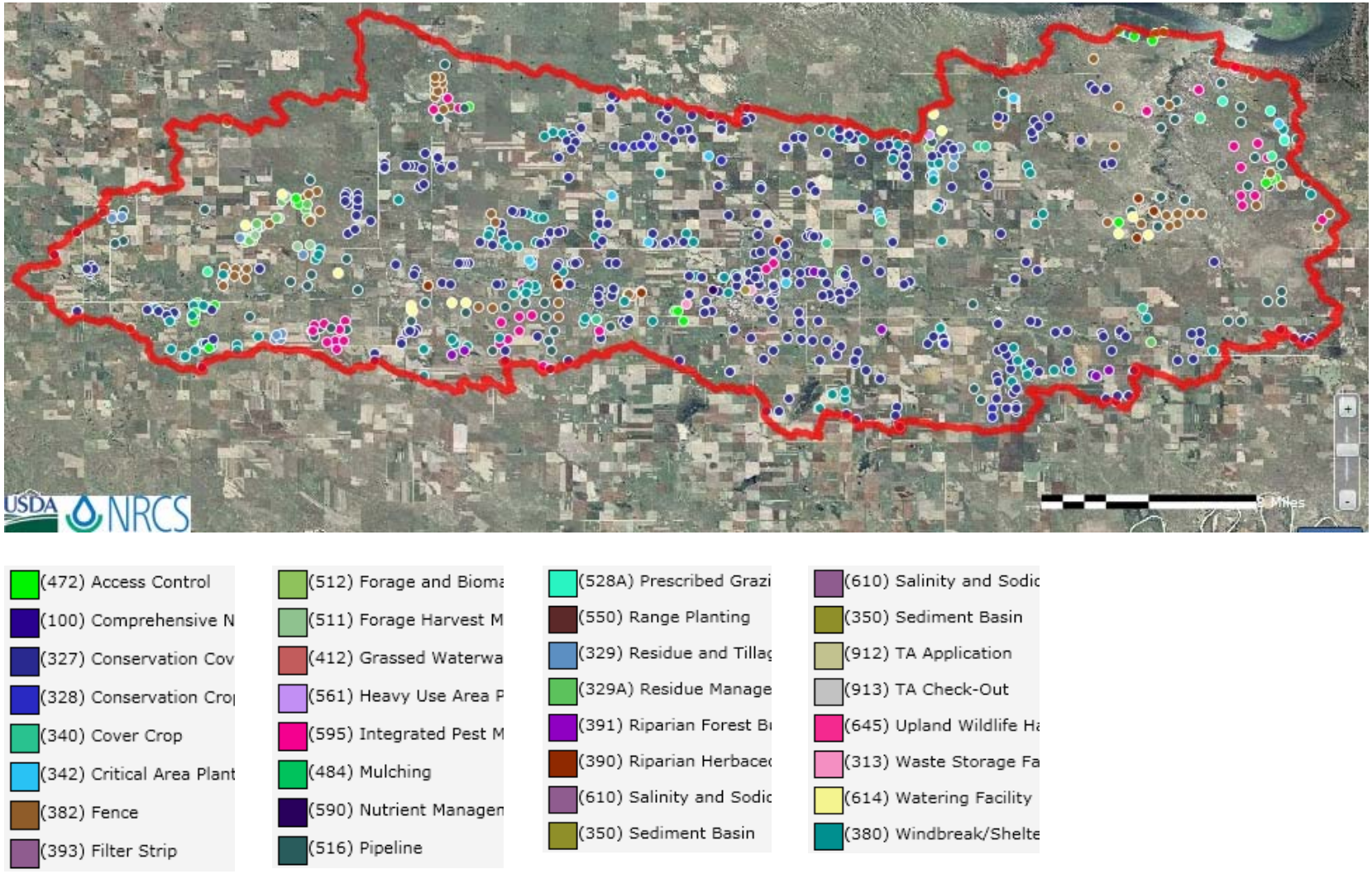


Figure 6. Location of BMPs using USDA FSA and NRCS Programs.

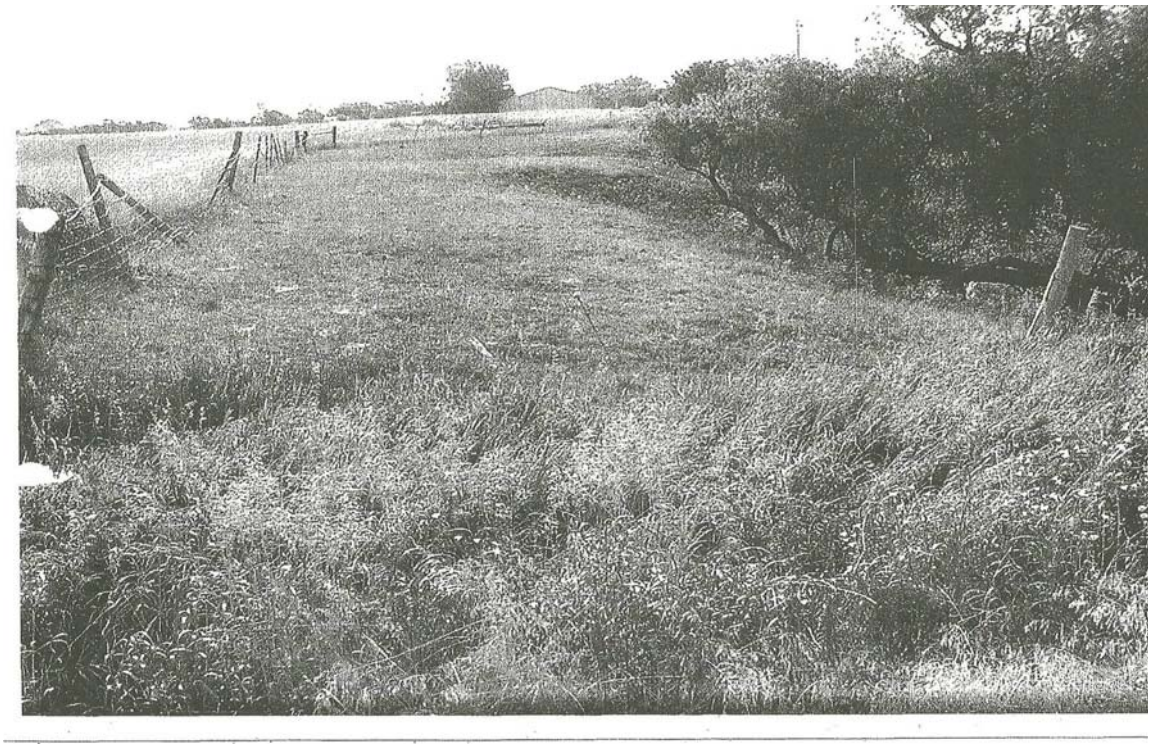


Figure 7a. Feedlot proximity to Medicine Creek prior to relocation.

Figure 7b. Relocation site away from Medicine Creek.

Objective 2: Through personnel contacts, on-site visits, workshops, demonstration site tours, news media, and direct mailings keep stakeholders informed and involved.

Task 3: Progress Reports

Four articles published in the Lyman County Herald provided information about the project to area residents. The paper, with circulation across the project area, is the publication in which county governmental agencies publish public notices. The text for one of the articles with accompanying list of practices for which cost share was available appears in Figure 8.

To inform landowners and producers of assistance available to install BMPs:

- more than 90 personal contacts were made by the project coordinator and
- six articles were placed in American Creek Conservation District newsletter.

The newsletter to the 350 producers who manage land in the district is sent twice each year. A copy of the article which was printed in the fall 2009 American Creek Conservation Newsletter is shown in Figure 9. The 700 copies sent exceeds the 500 copy milestone.

Milestones:	New releases/ Newsletters (Mailing)	Meetings/Workshops	Personal contacts
Planned:	5/5	4	0
Accomplished	4/6	1	90

Objective 3: Comply with program reporting requirements.

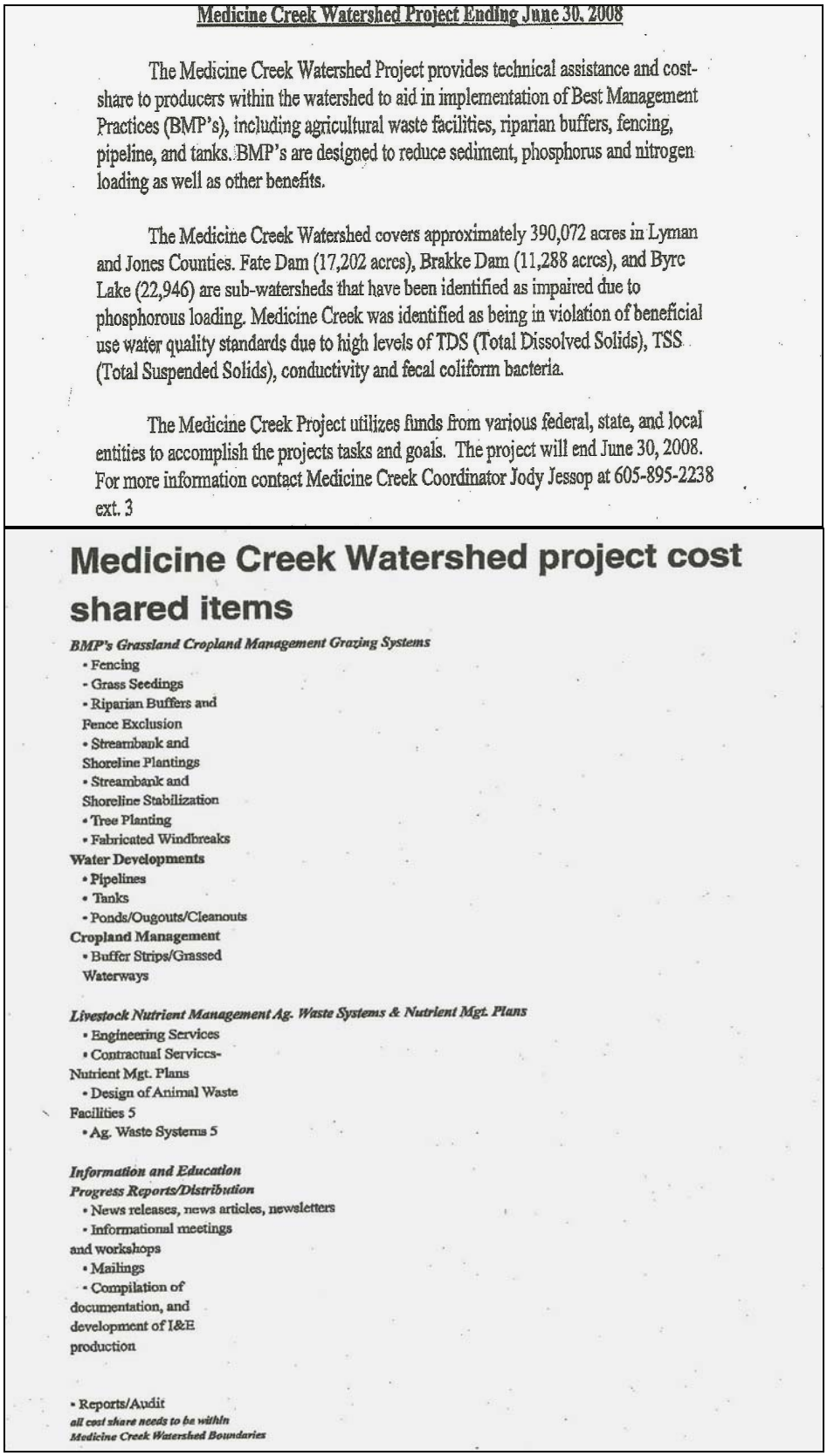
Task 4: Mid-Year and Annual Reports

Midyear and annual reports were submitted to DENR electronically for entry in the EPA Grants Reporting and Tracking System (GRTS). The reports were prepared using the format provided by DENR. The annual reports included load reduction and wetland restoration data. During the project period, the requirement to submit mid-year reports was changed to "required only if the project is behind schedule". With the change, the submission of only two midyear reports was required.

An interim final and a final report describing the activities completed to implement the PIP were:

- prepared following the format provided by DENR and
- submitted to DENR electronically.

Milestones:	Midyear Reports	Annual Reports	Final Report
Planned	2	5	1
Accomplished	2	5	1interim; 1 final report



Medicine Creek Watershed Project Ending June 30, 2008

The Medicine Creek Watershed Project provides technical assistance and cost-share to producers within the watershed to aid in implementation of Best Management Practices (BMP's), including agricultural waste facilities, riparian buffers, fencing, pipeline, and tanks. BMP's are designed to reduce sediment, phosphorus and nitrogen loading as well as other benefits.

The Medicine Creek Watershed covers approximately 390,072 acres in Lyman and Jones Counties. Fate Dam (17,202 acres), Brakke Dam (11,288 acres), and Byre Lake (22,946) are sub-watersheds that have been identified as impaired due to phosphorous loading. Medicine Creek was identified as being in violation of beneficial use water quality standards due to high levels of TDS (Total Dissolved Solids), TSS (Total Suspended Solids), conductivity and fecal coliform bacteria.

The Medicine Creek Project utilizes funds from various federal, state, and local entities to accomplish the projects tasks and goals. The project will end June 30, 2008. For more information contact Medicine Creek Coordinator Jody Jessop at 605-895-2238 ext. 3

Medicine Creek Watershed project cost shared items

BMP's Grassland Cropland Management Grazing Systems

- Fencing
- Grass Seedings
- Riparian Buffers and Fence Exclusion
- Streambank and Shoreline Plantings
- Streambank and Shoreline Stabilization
- Tree Planting
- Fabricated Windbreaks

Water Developments

- Pipelines
- Tanks
- Ponds/Ougouts/Cleanouts

Cropland Management

- Buffer Strips/Grassed Waterways

Livestock Nutrient Management Ag. Waste Systems & Nutrient Mgt. Plans

- Engineering Services
- Contractual Services-Nutrient Mgt. Plans
- Design of Animal Waste Facilities 5
- Ag. Waste Systems 5

Information and Education

Progress Reports/Distribution

- News releases, news articles, newsletters
- Informational meetings and workshops
- Mailings
- Compilation of documentation, and development of I&E production

- Reports/Audit

all cost share needs to be within Medicine Creek Watershed Boundaries

Figure 8. Newspaper Article.

American Creek Conservation District

Serving Lyman County Since 1938

Fall 2009 Newsletter

USDA Conservation Stewardship Program (CSP)

The USDA has announced a continuous sign-up for the new program called Conservation Stewardship Program otherwise known as **CSP**. Sign-up for this new program will run through September 30th. The first round of contracts will be funded this fall. Applications received after September 30th will go through this same procedure starting January 15th, 2010.

The new **CSP** is voluntary and is designed to assist producers to maintain their current conservation activities and adopt additional conservation activities to their operations. Eligible lands for this program include the following: cropland, pastureland, rangeland, and non-industrial forestland. CSP is not a crop set aside program; CSP pays producers to farm and ranch in a conservation minded way.

To find out more about this program or to see if your operation qualifies, please stop by the Natural Resources Conservation Service (NRCS) office located at 110 South Main Street in Kennebec and visit with District Conservationist Shane Reis or you can contact him by phone at (605) 869-2238 X3.

CRP: Farmable Wetlands Program

FWP is continuous CRP practice that is in place to protect wetlands that are currently being cropped. This program offers producers significant enrollment incentives, including a Signing Incentive Payment of $100 per acre, a Practice Incentive of 40% of the cost to establish the practice, 50% cost-share, and a competitive rental rate. Some associated uplands can also be placed into CRP. For more information on this program, please call Shane Reis at (605) 869-2238 X3.

Medicine Creek Watershed Project

Operators in the Medicine Creek Watershed have the opportunity for a cost-share on water quality enhancing practices. The practices include the following:

- Riparian Area Rental Contracts
- Water Enhancement Projects
- Fabricated Windbreaks for Alternate Shelter Away From Riparian Area
- Cross Fencing
- Grass Plantings
- Feeding Area Relocation

Cost-share rates are 50% to 75% depending on practice. The Medicine Creek Project ends on June 30, 2010. For more information, please contact Medicine Creek Watershed Coordinator Jody Jessop at (605) 869-2238 X3.

Figure 9. Newsletter Article.

RELATIONSHIP TO SD NPS MANAGEMENT PLAN

Activities completed during the project supported attaining the goal of the SD NPS Program as outlined in the SD NPS Management plan. Examples of support provided by the Medicine Creek Project include but are not limited to the following SD NPS Management tasks:

Tasks 1 and 7 – Use Monitoring data gathered to complete a TMDL for a 303(d) listed waterbody.

Water quality data collected during the project period resulted in Medicine Creek being delisted for sediment, conductivity, fecal coliform bacteria, and total suspended solids. Fate Dam was also delisted during the project period for TSI.

Task 4 – Implement a TMDL within two years of completion.

The Medicine Creek Watershed Project was implemented within two years of the development of the Medicine Creek and Brakke, Byre and Fate Dams TMDLs.

Tasks 5 and 14– Annual GRTS reports with load reduction data.

GRTS reports with load reduction data were provided to DENR for use in meeting the agency's 319 Program reporting requirements The reductions were calculated using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL).

Task 8 – Implemented clusters of TMDLs in a 12 or 8 digit Hydrologic Code (HUC).

The project area implemented a cluster of a cluster of TMDLs in eight digit HUC 10140104 using approved BMPs.

Task 10 – Implemented multiple TMDLs of several waterbodies across county and conservation district boundaries using financial and technical assistance from federal, state and local project partners sources to expand the TMDL implementation capabilities of the SD NPS Program.

The Medicine Creek Project:

1. was completed to implement the TMDLs for three lakes and Medicine Creek,
2. encompassed an area that included land in Lyman and Jones Counties,
3. was sponsored by the American Creek Conservation District in partnership/using technical and financial assistance provided by the several local state and federal project partners (See Table 12)

BEST MANAGEMENT PRACTICES DEVELOPED OR REVISED

The development or revision of BMPs was not included in the project workplan. All BMPs installed were those approved in the South Dakota NPS Management Plan.

MONITORING and EVALUATION

Monitoring and evaluation activities included:

1. tracking project finances and milestone accomplishment using the DENR project management program (TRACKER),
2. evaluating quality and effectiveness of BMPs installed using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL), and
3. determining goal attainment based on load reductions achieved.

Milestones Planned/Accomplished Comparison

A comparison of the milestones accomplished versus the amount estimated to be required to fully implement the TMDLs and as amended is shown in Table 8.

While the 27,634 acres of grazing systems installed was approximately 2,000 less than both the original and amended milestone for the BMP, the acres of systems installed provided a sediment load reduction to Medicine Creek greater than the TMDL goal (Table 10).

Riparian buffers were installed on 633 acres of pastureland adjacent to Medicine Creek 17.6 miles to protect streambank. While the project milestone of 500 acres was met, there are additional areas along the creek and its tributaries that would benefit from this practice. The targeted areas are often used for winter feeding. Ranchers hesitated to enroll these acres because of the winter protection afforded by trees along the creek and proximity to the ranch headquarters.

The 164 acres of buffer (filter) strips installed in cropland was less than the 200 acre combined 20 acre buffer strip/grassed waterway, 160 acre riparian area rental, and 20 acre streambank and shoreline planting milestone. It is interesting to note that 20 acre streambank and buffer strip milestones in essence refer to the same practice. Therefore, it is suggested that one or the other should have been deleted when the workplan was amended. The portion of the total installed in fields farmed up to the creek bank reduced nonpoint source loading along approximately 11 miles of Medicine Creek.

Windbreaks were added to use in tandem with the CRP Marginal Pastureland buffers to provide an alternative to wintering cattle in the creek bottom. The eight total fabricated and earth constructed windbreaks were about one-half the project milestone.

The ten AWMS originally planned was reduced to three when it was found that most of the identified critical areas targeted were winter feeding areas along the creek rather than an AFO. The three systems constructed addressed the actual feedlots located in the watershed.

Dam construction and repair were added as a managed grazing related practice. After the ten dam built or repaired milestone was accomplished, cost share for the practice was discontinued. The decision was based on concerns relative to the water quality benefits that would be realized from the dams versus that from other practices such as installing pipelines and tank.

Table 8. Planned Versus Accomplished Milestone Comparison.

Objective/Task/BMP	Milestones		
Objective 1: BMPs	**Original**	**Amended**	**Completed**
Task 1: Grassland/Cropland Management			
Grassland			
Grazing Systems	29,500 ac.	29,500 ac.	27,634 ac.
Riparian Buffers	500 ac.	500 ac.	633 ac.
Streambank and Shoreline Stabilization	600 ft	0	0
Fabricated Windbreaks	0	2	6
Earth Constructed windbreaks	0	16	2
Tree Plantings	20	40 ac.	3
Fence	105,000 ft.	105.000 ft.	121,440 ft
Water Development			
Pipelines	65,500 ft	40,000 ft	115,240 ft.
Tanks	50	50	62
Ponds/dugouts/cleanouts	0	10	10
Cropland Management			
Buffer Strips/Grassed Waterways	20 ac.	20 ac.	152 ac.
Riparian Area Rentals	0	160 ac.	12.2 ac.
Streambank and Shoreline Plantings	20 ac.	0 ac.	0
Conversion of Cropland to Grassland	2,000 ac.	2,000ac.	5,544ac.
Task 2: Livestock Nutrient Management			
Ag. Waste Systems & Nutrient Mgt. Plans			
Engineering Services	10	3	3
Contractual Services – Nutrient Mgt. Plans	10	3	3
Design of Animal Waste Facilities	10	3	3
Ag. Waste Systems	10	3	3
Objective 2: Information and Education			
Task 3: Progress Reports/distribution			
News releases , newsletters*****	5/5	5	10
Informational meetings and workshops		1	1
Mailings (Newsletter)*****			6
Personal Contacts			90
BMP implementation and TMDL reduction results	1	1	1
Objective 3: Reporting			
Task 4 GRTS Reports			
Mid-year reports	3	2	2
Annual reports	3	5	5
Final Report	1	1	1
Monitoring and Evaluation			
Water Quality Monitoring	As Scheduled	Responsibility transferred to DENR - Statewide Monitoring Program	
In-lake (includes QAQC)	As Scheduled		

Evaluating the effectiveness of the information and education activities possess somewhat of a dilemma. While the activities selected to plan and initiate completion of the workplan were less than effective, those employed later, especially the personal contacts, were. This result is the same as found during the implementation of the 303(d) Watershed Planning and Assistance Project by SDACD.

The 10 newspaper plus newsletter articles exceeds the project milestone. Of the publication related activities, the district newsletter articles and ad in Lyman County Herald were judged more effective than the feature articles published in the Herald as they provided information specifically direct to producer which in turn lead to requests to meet with project staff.

Accomplishing the water quality milestones became moot as the activity was transferred to the DENR Statewide Monitoring Program.

Load Reductions

The effectiveness of BMPs installed relative to water quality improvement was evaluated using the STEPL model to estimate load reductions realized from BMP installation. The Nitrogen, Phosphorus and sediment load reductions achieved are shown in Table 9; a comparison to the reductions identified to fully implement the TMDL for each waterbody in Table 10

Table 9. Load Reductions Calculated Using STEPL.

BMP/Location	Acres	Nitrogen (lb/yr)	Phosphorus lb/yr	Sedimentation tons/yr
CRP Buffers-Pasture	633.0	2,223.7	415.3	250.5
CRP Buffers-Cropland (Fate Dam)	164.2	1,555.0	549.1	415.7
General & SAFE CRP-				
Medicine Creek	4,281.4	18,851.0	6,284.9	4,482.5
Fate Dam	788.3	3,975.1	1,351.2	982.8
Byre Lake	213.1	1,313.5	457.3	340.3
Brakke Dam	261.3	1,561.5	541.8	402.0
Total	5,544.1	25,701.1	8,635.2	6,207.6
Planned Grazing	27,634	36,657.4	8,070.3	5,307.5
Animal Feeding Operations	186.0	41,916	9,431	0.0
TOTALS	**34,1161.3**	**108,053.3**	**27,101**	**12,181.3**

The project and TSI TMDL goals for Fate, Byre and Brakke Dams were predicated on reducing phosphorus. As shown in Table 10, calculated reductions achieved for Fate and Brakke Dams exceeded to goal. Those for Byre did not.

While the Medicine Creek was delisted for TDS, TSS and conductivity based on water quality data collected during the early portion of the project period, the sediment reduction achieved was nearly

twice the goal. Data was not available to compare fecal coliform reductions achieved to that needed to implement the TMDL.

Table 10. Load Reductions Achieved – TMDL Implementation Comparison.

Watershed	Phosphorus Loads (kg)	Reduction (kg)	% Reduction	Goal (%)
Fate Dam	2,205	682	31	19.5
Brakke Dam	618	246	40	18.9
Byre Lake	9,391	208	2	19.6
Medicine Creek	59,501	11,159.9	18.7	
	Sediment Load (kg)			
Fate Dam	1,237,166	1,031,909	83.4.0	
Brakke Dam [1]	82,656			
Byre Lake	4,797,761	309,364	6.4	
Medicine Creek	15,310,140	9,127,727	59.6	15-20

1 – Data error

Water Quality

Water quality monitoring completed during this project segment resulted in delisting Medicine Creek for TDS, TSS and conductivity, and fecal coliform bacteria and Fate Dam for TSI. For additional information, access http://denr.sd.gov/dfta/wp/tmdl/TMDL_MedicineCreek.pdf.

The sponsor was advised by DENR that, given the results of quality sampling completed during the early stages of the project and decision to not complete a second project segment, additional planned water quality sampling of the three dams and Medicine Creek was not completed.

While the calculated phosphorus and sediment reductions achieved cited previously, with the exception of Lake Byre, met or exceeded that need to reduce the TSI for the waterbodies, data is not available to comment if that indeed was accomplished.

Data relative to reducing fecal loading of Medicine Creek was also not available when this report was drafted. It is suggested that this information will be available from DENR's statewide monitoring activities.

COORDINATION AND PUBLIC PARTICPATION

Coordination

As project sponsor, the American Creek Conservation District was responsible for providing the leadership, administration, and coordination necessary to complete the project tasks so that the objectives were reached and the goal attained.

The contributions to project success made by local, state, and federal project partners are summarized in Table 11. As indicated by the information included in the table, the Natural Resources Conservation Service and US Fish and Wildlife Service were major contributors of financial assistance. The EQIP and CRP programs were used to cost share most of the practices installed. EQIP funds were used to cost share all of the Ag Waste Systems constructed and many of the grazing systems installed. CRP was used extensively to cost share grass plantings, tree plantings, marginal pastureland buffers, and filter strips. USFW funds were used to build or repair dams and fund a 220 ac. Wetland Restoration.

Table 11. Project Partner Contributions.

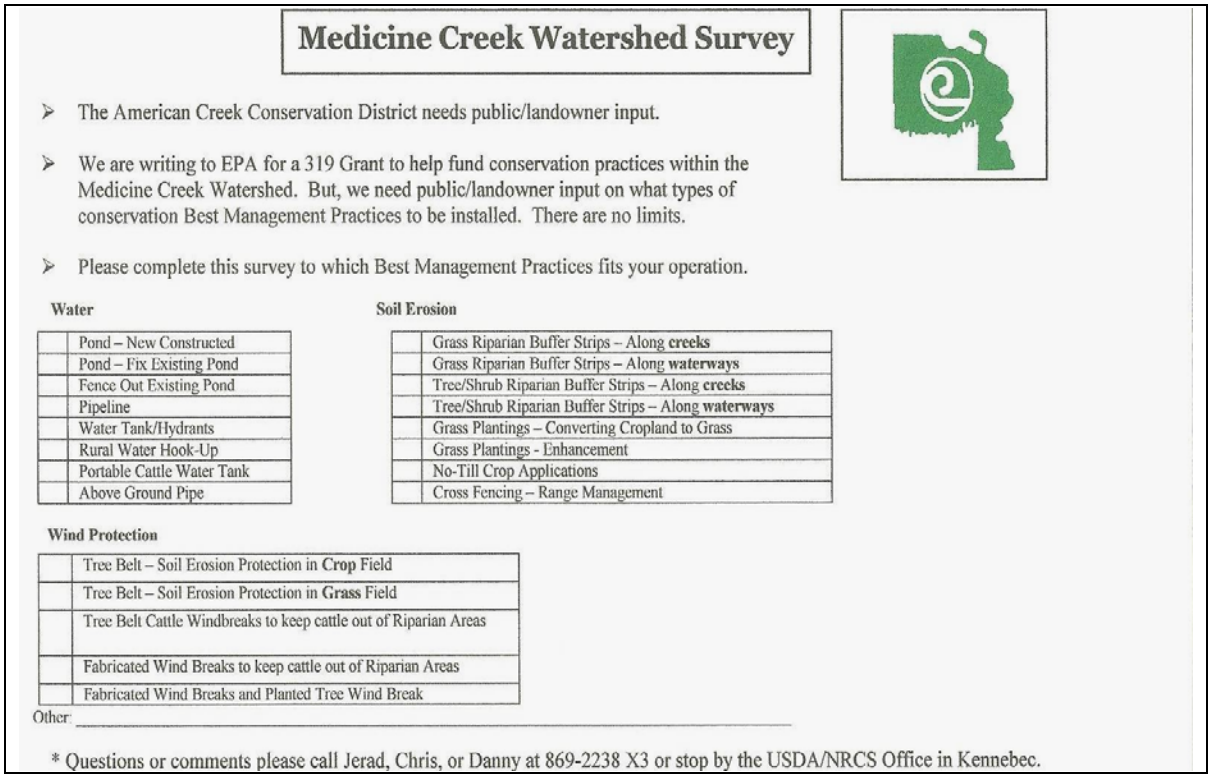
Agency/Organization	Contribution
Nongovernmental	
SD Association of Conservation Districts	Provided coordinator through contractual services; technical assistance for administration and BMP planning through the 319 funded Watershed Planning and Assistance Project.
Governmental	
State	
SD Department of Agriculture	Financial assistance for BMP installation through the SD Conservation Commission's Soil and Water conservation Grant Program and project management technical assistance; financial assistance for engineering and design of the CAFO through the SD Manure Management System Engineering and Design Assistance for Existing CAFOs Project.
SD DENR	Technical assistance and training with water quality sampling and data interpretation, project management and BMP installation through the 319 Program. Financial assistance for the design of the CAFO through the SD Manure Management System Engineering and Design Assistance for Existing CAFOs Project.
Federal	
North Central RC&D	Technical assistance for project management and obtaining USDI FWS funds for wildlife habitat related BMPs.
US EPA	Financial assistance through Clean Water Act Section 319 and Pollution Prevention Grant to DENR
USDA FSA	Financial assistance for BMP installation through the CRP Program.
USDA NRCS	Financial and technical assistance for BMP installation through the EQIP Program.
USDI FWS	Financial assistance for BMP installation.

Public Participation

Project activities completed during the project to encourage public involvement included a:

- workshop held during the interim period between the assessment and implementation projects to present the results of the assessment and present restoration alternatives,
- survey (Figure 10)was sent to 175 landowners in the watershed to determine the practices that would be offered during the implementation project (See Problems Encountered and Recommendations Section of this report.),
- progress report published in the Lyman County Herald,
- articles explaining BMP cost-share were included in the district newsletters sent to landowners and operators, and
- a brochure (Figure 11) was distributed at ag-related meetings in the project area.

See Objective 2, Task 3 of this report for additional activates completed to inform project area residents about project activities and learn about assistance available for the installation of BMPs.



Medicine Creek Watershed Survey

- The American Creek Conservation District needs public/landowner input.
- We are writing to EPA for a 319 Grant to help fund conservation practices within the Medicine Creek Watershed. But, we need public/landowner input on what types of conservation Best Management Practices to be installed. There are no limits.
- Please complete this survey to which Best Management Practices fits your operation.

Water

	Pond – New Constructed
	Pond – Fix Existing Pond
	Fence Out Existing Pond
	Pipeline
	Water Tank/Hydrants
	Rural Water Hook-Up
	Portable Cattle Water Tank
	Above Ground Pipe

Soil Erosion

	Grass Riparian Buffer Strips – Along **creeks**
	Grass Riparian Buffer Strips – Along **waterways**
	Tree/Shrub Riparian Buffer Strips – Along **creeks**
	Tree/Shrub Riparian Buffer Strips – Along **waterways**
	Grass Plantings – Converting Cropland to Grass
	Grass Plantings - Enhancement
	No-Till Crop Applications
	Cross Fencing – Range Management

Wind Protection

	Tree Belt – Soil Erosion Protection in **Crop** Field
	Tree Belt – Soil Erosion Protection in **Grass** Field
	Tree Belt Cattle Windbreaks to keep cattle out of Riparian Areas
	Fabricated Wind Breaks to keep cattle out of Riparian Areas
	Fabricated Wind Breaks and Planted Tree Wind Break

Other: _____

* Questions or comments please call Jerad, Chris, or Danny at 869-2238 X3 or stop by the USDA/NRCS Office in Kennebec.

Figure 10. Watershed Survey.

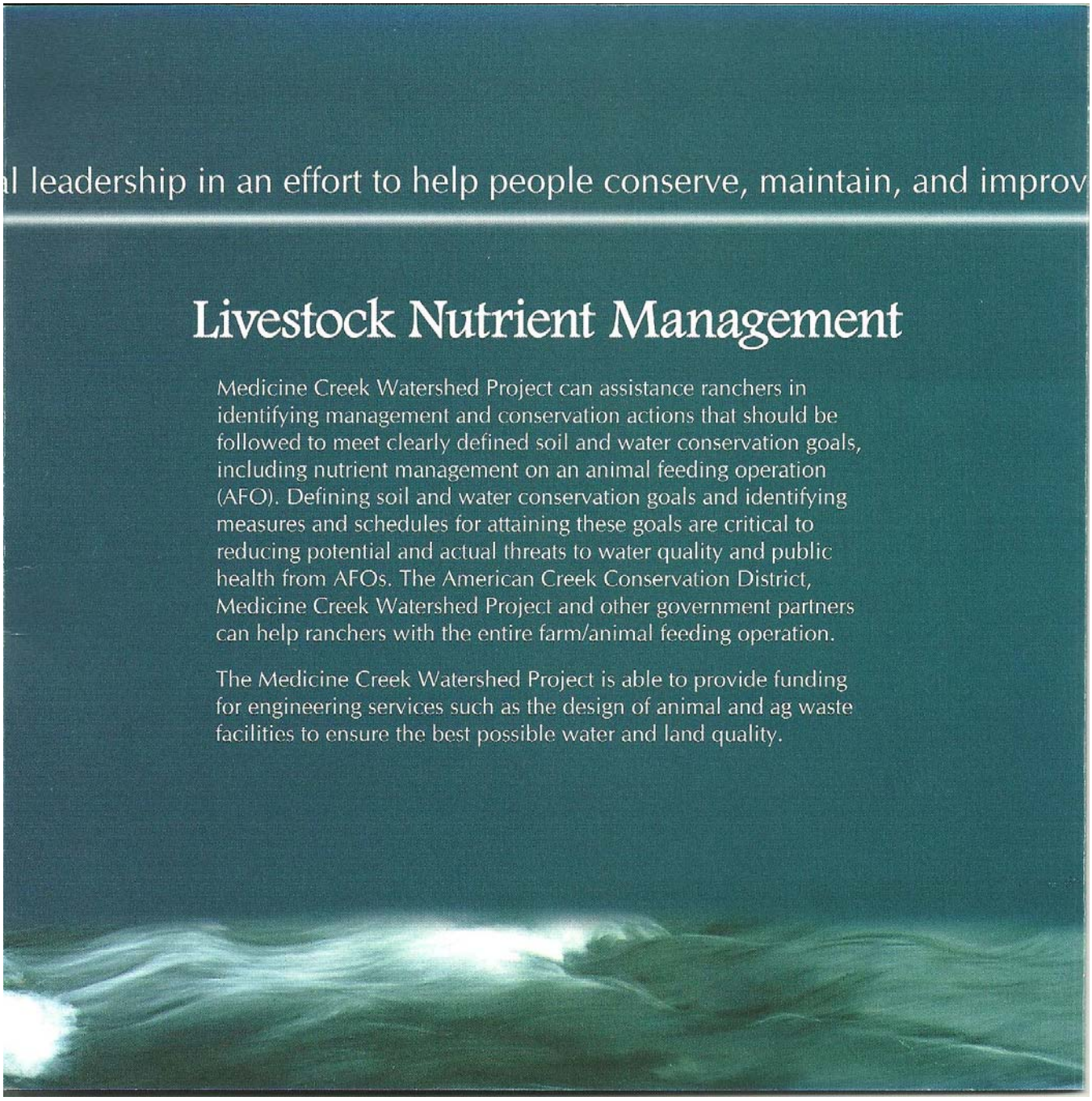


Figure 11. Excerpt from project brochure.

PROBLEMS ENCOUNTERED/RECOMMENDATIONS

The challenges encountered were related to, staff turnover, BMP acceptance by producers in the project area and the initial feedlot assessments.

Staff Turnover

Staff turnover during the early portion of the project period contributed to BMP implementation falling behind schedule and contributed to reporting being behind schedule during the first years of the project period.

It is recommended that projects planned by the sponsor and other entities should consider contracting for coordinator services from the SD Association of Conservation Districts. The Association's 319 funded 303(d) Watershed Planning and Assistance Project has a proven record of providing trained staff that has the necessary support services needed to ensure projects are completed as planned.

BMP Selection

Based on the need to amend the workplan to offer BMPs producers were more willing to consider, it is evident that the results of the pre-implementation survey were either not correctly interpreted or not returned by producers in sufficient number to guide workplan development.

BMP acceptance/installation by producers was minimal during the first year plus of the project. News articles published generated little response. The prevalent attitude was "I'll do something when I have to." However, when approached on a one on one basis by the new project coordinator and offered practices that better fit their operation, producers were generally receptive and BMP installation moved forward as planned in the amended workplan.

It is recommended that care be used in developing and interpreting the results of surveys used to determine producer support. Assistance from professionals with expertise in these activities is available thought the SD Cooperative Extension Service and NRCS.

Feedlot Assessments

The assessment identified nine feedlots with AnnAGNPS ratings of 60 or greater. After the project was initiated, it was determined that only three met the criteria to be classified as an animal feeding operation. The other areas were better described as wintering lots. Of the three feedlots, one was identified as a CAFO and not eligible for 319 funding. Consequently, funding for Ag Waste Systems was over budgeted.

It is recommended that ground truthing of the model become a standard practice during the assessment to ensure the results of the modeling exercise are valid.

PROJECT BUDGET

The project budget was amended to reflect changes in the:

- practices and amounts of each selected to install the BMPs,
- decision to rely primarily on funding for installation of the BMPs from financial resources provided by project partners and
- the reclassification of several feedlots to winter feeding areas.

A summary of project expenditures by funding source is in Table 12; a comparison of the original to the amended 319 budget and expenditures by expense item in Table 13.

Several amendments to the project were necessary to:

- allocate funds to BMPs landowners and operators would install,
- change the project from a two to a one segment restoration effort, and
- increase the use of EQIP and CRP funds rather than 319 for practice installation.

Table 12.Funds Allocated/Expended By Source.

Grant/Source	Match	Budget[1]		Expended[1]	Percent 319 Expenditures
		Original	Amended		
Section 319	No	341,900	243,653	243,653	44.6
State/Local					
SD Natural Resource Conservation Grant	Yes	61,950	34,712	34,712	55.4
SD Consolidated Construction Fund	Yes	35,000	0	0	
Local (Conservation District)	Yes	345,975	3,500	4,950	
Local Cash (Landowner/Operator)	Yes		147,900	207,849	
Local In-kind	Yes		155,150	54,785	
Other Federal					
USDA NRCS	No	135,000	135,000	288,148	
USDA FSA	No			69,300	
USFWS	No	50,000	50,000	48,454	
Total		969,825	769,915	951,851	

1 – To nearest dollar.

Table 13. 319 Budget Comparison.

Budget Item	Original	Final
Personnel Support	$71,500.00	**78,145**
Administration/Support	$12,400.00	**12,678**
Supplies/Office/Equipment	$12,500.00	**2,073**
Travel		**8,404**
Objective 1: BMPs		
Task 1: Grassland/Cropland Management		
Grazing Systems - 14,750 Acres		
Fence - 105,000 lin./ft.@$1.00/ft.	$ -	
Grass Seeding	$ -	
Riparian Buffers/Fenced Exclusion.	$ -	**10,781**
Streambank and Shoreline Plantings	$5,000.00	**6,559**
Streambank and Shoreline Stabilization.	$15,000.00	
Tree Planting - 40 acres@$1,000/acre	$ -	
Fabricated Windbreaks 20@2,000.00	$ -	
Earth Constructed Livestock Windbreaks 16@$2,500	$ -	**16,234**
Water Developments		
Pipeline - 65,500 lin.ft.@$2.00/ft.	$ -	
Tanks - 50 tanks @$1,000	$ -	**30,798**
Ponds/Dugouts/Cleanouts	$ -	
Riparian Area Rentals		**8,930**
Cropland Management		
Buffer Strips/Grassed Waterways 500	$ -	
Task 2: Livestock Nutrient Management		
Ag. Waste Systems & Nutrient Mgt. Plans		
Engineering Services		
Contractual Services - Nutrient Mgt. Plans		
Design of Animal Waste Facilities	$20,000.00	
Ag. Waste Systems 3 @$80,000	$200,000.00	**69,052**
Objective 2: Information and Education		
Task 3: Progress Reports/Distribution		
News releases, news articles, newsletters	$1,000.00	
Informational meetings and workshops	$500.00	
Mailings	$1,000.00	
Compilation of documentation, and devel. of I&E production	$1,500.00	
Reports/Audit	$500.00	
Objective 3: Reporting		
Task 4 GRTS	$ -	
Final Reports	$ -	
Monitoring and Evaluation		
Water Quality Monitoring	$1,000.00	
Totals	$341,900.00	**243,654**

CONCLUSIONS

Conclusions that can be made based on the information used to prepare this report include:

1. Individual and agencies involved with project planning should take steps to ensure survey data and information provided by models accurately reflect the actual situation.

2. Personal contacts are more effective than newspaper and newsletter articles for increasing producer interest in activities that lead to BMP installation.

3. The activities completed to implement the PIP, as amended, resulted in accomplishing most of the milestones established to monitor and evaluate project success.

4. The calculated load reductions realized from the BMPs installed were sufficient to attain the TMDL goals for waterbodies in the project area, with the exception of Byre Lake.

With the exception(s) cited previously, the project goal was attained.