

**Belle Fourche River
Watershed Management and
Project Implementation Plan
Segment 8**

**319 Watershed Project
October 1, 2016**

Sponsored By:

Belle Fourche River Watershed Partnership

Submitted to:

South Dakota Department of
Environment and Natural Resources
Pierre, South Dakota 57501

PROJECT SUMMARY SHEET

PROJECT TITLE: Belle Fourche River Watershed Management and Project Implementation Plan
Segment 8

PROJECT PERIOD: July 2017–July 2019

PROJECT SPONSOR:

Belle Fourche River Watershed Partnership
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319 NONPOINT-SOURCE FUNDS: \$1,144,000
MATCH: \$1,068,500
OTHER FEDERAL FUNDS: \$918,400
TOTAL PROJECT COST: \$3,130,900
319 FUNDED FULL-TIME PERSONNEL: 2

PROJECT TYPES: [] PLANNING [] WATERSHED [] I&E [] GROUNDWATER

PROJECT LOCATION

WATERSHED: Belle Fourche River Watershed

303(d) LISTED STREAM: Yes. The following streams are 303(d) listed:

- Belle Fourche 1: Wyoming to Fruitdale, SD-BF-R-BELLE_FOURCHE_01 (*E. coli*, TSS)
- Belle Fourche 2: Redwater R.to Whitewood Cr, SD-BF-R-BELLE_FOURCHE_02 (TSS)
- Belle Fourche 3: Whitewood Cr. to Willow Cr., SD-BF-R-BELLE_FOURCHE_03 (*E. coli*, TSS)
- Belle Fourche 4: Willow Cr. to Alkali Creek, SD-BF-R-BELLE_FOURCHE_04 (TSS)
- Belle Fourche 5: Alkali Cr. to mouth, SD-BF-R-BELLE_FOURCHE_05 (*E. coli*, TSS)
- Horse Creek, Indian Creek to mouth, SD-BF-R-HORSE_01_USGS (*E. coli*, TSS)
- Deadwood Creek, Rutabaga Gulch to Whitewood Creek, SD-BF-R-DEADWOOD_01 (*E. coli*)
- Strawberry Creek, Bear Butte Creek to S5, T4N, R4E, SD-BF-R-STRAWBERRY_01(Cadmium)
- Whitewood Creek: Deadwood Creek to Spruce Gulch, SD-BF-R-WHITEWOOD_04 (*E. coli*)
- Whitewood Creek: Sandy Creek to I-90, SD-BF-R-WHITEWOOD_05 (pH)
- Whitewood Creek: I-90 to Crow Creek, SD-BF-R-WHITEWOOD_06 (*E. coli*, pH)
- Whitewood Creek: Crow Creek to mouth, SD-BF-R-WHITEWOOD_07 (*E. coli*, TSS)

HYDROLOGIC UNIT CODE: 10120201, 10120202, 10120203

Counties: Butte, Lawrence, Meade

Latitude: 45 N

Longitude: -101 W

NPS CATEGORY

- | | |
|---|---|
| <input checked="" type="checkbox"/> AGRICULTURE: 100% | <input type="checkbox"/> CONSTRUCTION |
| <input type="checkbox"/> AFOs | <input type="checkbox"/> HYDRAULIC MODIFICATION |
| <input type="checkbox"/> URBAN RUNOFF | <input type="checkbox"/> SILVICULTURE |
| <input type="checkbox"/> RESOURCE EXTRACTION | <input type="checkbox"/> OTHER |

NPS FUNCTIONAL CATEGORY

- | | |
|---|---|
| <input checked="" type="checkbox"/> BMP IMPLEMENTATION (78%) | <input type="checkbox"/> TECHNICAL ASSISTANCE |
| <input checked="" type="checkbox"/> INFORMATION AND EDUCATION (11%) | <input type="checkbox"/> PLANNING |
| <input type="checkbox"/> WATERSHED ASSESSMENT | <input type="checkbox"/> GROUNDWATER |
| <input checked="" type="checkbox"/> WATER QUALITY MONITORING (11%) | <input type="checkbox"/> OTHER |

NPS POLLUTANTS TO BE ADDRESSED

- | | |
|--|---|
| <input type="checkbox"/> EXCESS NITROGEN | <input type="checkbox"/> PESTICIDES |
| <input type="checkbox"/> EXCESS PHOSPHORUS | <input type="checkbox"/> OIL AND GREASE |
| <input checked="" type="checkbox"/> SEDIMENTATION | <input type="checkbox"/> TEMPERATURE |
| <input checked="" type="checkbox"/> PATHOGENS/BACTERIA | <input type="checkbox"/> pH |
| <input type="checkbox"/> METALS | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> LOW DISSOLVED OXYGEN | <input type="checkbox"/> OTHER |

SUMMARY STATEMENT: The original project goal was to bring the Belle Fourche River into compliance for total suspended solids (TSS) and *Escherichia coli* (*E. coli*) by implementing the recommended best management practices (BMPs) by 2014 and implementing additional BMP recommendations from other Total Maximum Daily Load (TMDL) studies for waterbodies within the watershed as they became available.

This project will exceed the 2014 timeline, and a new 10-year plan is being developed to analyze the effectiveness of BMP implementation, assess the effects of the work done, and focus the efforts of the project on securing the compliance of the Belle Fourche River with its assigned beneficial uses. While progress is being made on affected waterbodies, the continued impairment listing of all segments on the Belle Fourche River and certain tributaries justifies additional work to be done in the area. Further implementation will be prioritized within the Horse Creek Watershed where measurable water quality improvements are likely to be attained.

PROJECT GOALS:

The goals of Segment 8, as set forth in the Belle Fourche River Watershed TMDL study, include:

- Continue implementing BMPs in the watershed to reduce TSS and working toward the goal of 158 milligrams per liter (mg/L) in impaired reaches, which currently include all Segments 1–5 of the Belle Fourche River and the priority impaired Horse Creek Watershed.
- Continue implementing BMPs to reduce *E. coli* in the Belle Fourche River and the priority Horse Creek Watershed to not exceed 1,178 colony-forming units per 100 milliliter

(cfu/100 mL). Currently, Belle Fourche River Reaches 1 (Wyoming to Fruitdale), 3 (Whitewood to Willow Creek) and 5 (Alkali Creek to Mouth) are impaired for bacteria.

- Continue public education and outreach programs to stakeholders within the Belle Fourche River Watershed.
- Continue tracking the progress made toward reaching the goals of the TMDL to ensure that the BMPs are effective and that the proper BMPs are implemented.

PROJECT DESCRIPTION: The Belle Fourche River Watershed Partnership is the project sponsor for this 2-year project. This is the eighth segment that addresses seven TMDLs. Completed activities planned for this segment will continue implementing BMPs that reduce *E. coli* and advance the BMP implementation for TSS pollutants. These BMPs include: (1) installing irrigation sprinkler systems, (2) implementing grazing management systems, (3) installing riparian vegetation improvements, (4) implementing improved cropping systems, (5) relocating livestock feeding grounds.

2.0 STATEMENT OF NEED

2.1 The Belle Fourche River Watershed Partnership (BFRWP) developed and implemented an assessment project to determine the Total Maximum Daily Load (TMDL) for the Belle Fourche River. The project started in April 2001. The purpose of the assessment was to (1) assess the current physical, chemical, and biological integrity of the Belle Fourche River and its tributaries; (2) determine the sources of total suspended solids (TSS) in the Belle Fourche River Watershed; and (3) define management prescriptions for identified nonpoint-source critical areas in the watershed. The draft TMDL was completed during 2003 and approved by the U.S. Environmental Protection Agency (EPA) in 2005. The TMDL report includes the Belle Fourche River and Horse Creek. The TMDL approved by the EPA addresses a cluster of TMDLs.

The Belle Fourche River is identified in the 1998 and 2002 *South Dakota 303(d) Waterbody Lists* and the 2004 and 2006 *Integrated Report for Surface Water Quality Assessment* (IR) as impaired because of elevated TSS concentrations. According to the 2006 IR, the Belle Fourche River from the Wyoming border to the Cheyenne River, South Dakota, failed to support its assigned uses because of high TSS concentrations. In the report, agricultural activities were listed as a probable source of occasional impairment. This report also states that a natural source of TSS may be the erosion of exposed shale beds that lie along the river and its tributaries. The 2008 IR shows that all segments of the Belle Fourche River, with the exception of the segment from the Wyoming border to Fruitdale, were delisted after water quality standards for TSS were met. The 2010 IR reports that four out of the five stream segments are listed as nonsupporting for TSS warm-water permanent fish life assigned beneficial use. The 2012 IR reports that all of the segments are listed for TSS and two segments are listed for fecal coliform and *E. coli*. The 2014 IR reports that all of the segments are listed for TSS and two segments are listed for fecal coliform and *E. coli*. The 2016 Draft Integrated Report has all of the Belle Fourche River segments listed for TSS and Segments 1, 3, and 5 as impaired for *E. coli* (see Table 2-1). Table 2-1 contains a summary of the TMDL segments within the Belle Fourche River Watershed that are listed as impaired for TSS, fecal coliform, *E. coli*, temperature, and pH in the 2016 IR. The table also lists the impaired beneficial use, impairment parameter, water quality data, and possible source.

Horse Creek was listed in the 1998 impaired waterbody list for TSS; this listing was later determined to be an error. The Horse Creek listing was corrected to conductivity during 2002. During this assessment, approximately 10 percent of the samples collected from Horse Creek exceeded the water quality standard for TSS. The 2012 IR lists Horse Creek as nonsupporting for conductivity alone. The 2014 IR does not list Horse Creek as impaired because of the lack of data reporting rather than clean water. In 2016, Horse Creek is listed for *E. coli* and TSS.

The Belle Fourche River from the Wyoming border to the Redwater River was first listed for pathogens in the 2002 South Dakota Report to Congress 305 (b) Water Quality Assessment and continued to be listed for fecal coliform in successive IRs (2004, 2006, 2008, and 2010) as failing to support its immersion recreation beneficial use because of elevated levels of *E. coli*. The South Dakota Department of Environment and Natural Resources (SD DENR) developed a TMDL in 2012 that identified livestock, wildlife, and stormwater from the city of Belle Fourche as potential sources of *E. coli* impairments in the watershed. The Belle Fourche River from Alkali Creek to the mouth was listed as nonsupporting for fecal coliform (2010) and for *E. coli* (2012, 2014, 2016) with 97 percent of the bacterial load attributed to livestock according to the TMDL.

Table 2-1. Summary of the Belle Fourche River Watershed Exceedance Water Quality Data From 2016 Integrated Report

Stream	Stream Reach	Beneficial Use	Impairment Parameter	Water Quality Criteria	Source
Belle Fourche River	Wyoming Border to Redwater River, South Dakota	Immersion Recreation	<i>E. coli</i>	126(a)/235(b)	Wildlife, Livestock, Urban Runoff
		Immersion Recreation	Fecal Coliform (per/100 mL)	200 ^(a) /400 ^(b)	Wildlife, Livestock, Urban Runoff
		Limited Contact Recreation	<i>E. coli</i>	126 ^(a) /235 ^(b)	Wildlife, Livestock, Urban Runoff
		Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	Irrigated Crop Production
Belle Fourche River	Redwater River to Whitewood Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	NA
Belle Fourche River	Whitewood Creek to Willow Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	NA
		Immersion Recreation	<i>E. coli</i>	126(a)/235(b)	NA
Belle Fourche River	Willow Creek to Alkali Creek	Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	NA
Belle Fourche River	Alkali Creek to Mouth	Immersion Recreation	Fecal Coliform (per/100 mL)	200 ^(a) /400 ^(b)	Livestock
		Immersion Recreation	<i>E. coli</i>	126 ^(a) /235 ^(b)	Livestock
		Limited Contact Recreation	Fecal Coliform (per/100 mL)	1,000 ^(a) /2,000 ^(b)	Livestock
		Limited Contact Recreation	<i>E. coli</i>	630 ^(a) /1,178 ^(b)	Livestock
		Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	NA
Horse Creek	Indian Creek	Limited Contact Recreation	<i>E. coli</i>	126(a)/235(b)	NA
		Warm-Water Permanent Fish Life	TSS (mg/L)	90(a)/158(b)	NA
Deadwood Creek	Rutabaga Gulch to Whitewood Creek	Immersion Recreation	<i>E. coli</i>	126 ^(a) /235 ^(b)	NA
Strawberry Creek	Bear Butte Creek to S5, T4N, R4E	Fish/Wildlife Prop. Rec. Stock Waters	Cadmium (mg/L)	(c)	Mining Impacts
Whitewood Creek	Deadwood Creek to Spruce Gulch	Immersion Recreation	<i>E. coli</i>	126 ^(a) /235 ^(b)	Combined Sewer Overflows
Whitewood Creek	Spruce Gulch to Sandy Creek	Immersion Recreation	<i>E. coli</i>	126 ^(a) /235 ^(b)	NA
Whitewood Creek	Sandy Creek to I-90	Cold-Water Marginal Fish Life	pH	6.5–8.8	Natural Sources
Whitewood Creek	I-90 to Crow Creek	Warm-Water Permanent Fish Life	pH	6.5–9.0	NA
		Limited Contact Recreation	<i>E. coli</i>	126(a)/235(b)	NA
Whitewood Creek	Crow Creek to Mouth	Limited Contact Recreation	<i>E. coli</i>	126(a)/235(b)	NA
		Warm-Water Permanent Fish Life	TSS (mg/L)	90 ^(a) /158 ^(b)	NA

(a) 30-day average.

(b) Daily maximum.

(c) Cadmium concentration $< (1.136672 - [(\ln(\text{hardness}) \times 0.041838)] \times \exp[1.128 \times (\ln(\text{hardness})) - 3.828])$.

TSS BMP implementation recommended in the Belle Fourche River TMDL began during 2004. The first year of implementation included funding from local ranchers and farmers, BFRWP, Lawrence County, Belle Fourche Irrigation District (BFID), Wyoming Department of Environmental Quality (WY DEQ), National Resource Conservation Service (NRCS), US Army Corps of Engineers, Bureau of Reclamation (BOR), and the U.S. Geological Survey (USGS). Two products of the project were the *Ten-Year Belle Fourche River Watershed Strategic Implementation Plan* (10-Year Plan) and the *Belle Fourche Irrigation District Water Conservation Plan* (5-Year Plan). These two plans outline the work that has been completed to date. Currently, a new 10-year plan is being developed to guide the project in future years. Table 2-2 list the BMPs installed above and below the reservoir to date. The total planned number of each BMP to be installed in this segment is also shown. Segments 1–6 were completed on schedule and within budget. Segment 7 is on schedule to be completed in June 2017 within the proposed budget.

Table 2-2. Best Management Practices Installed and Scheduled Above and Below the Belle Fourche Reservoir

Best Management Practice	Planned for Segment 8	Amount Implemented October 2016	Total Amount Scheduled From 10-Year Plan
Flow-Automation Units (number)	0	41	42
Upgraded Water Card and Water Order System	Complete	Phase III	Three Phases
Portable Stage/Flow-Measuring Devices (number)	0	6	15
Real-Time Stage Flow-Measuring Devices (number)	0	9	15
Alternative Keyhole Water Delivery Study	0	0	1
Alternative Keyhole Water Supply Method	0	0	1
Line Open Canals and Laterals (feet)	0	2,600	16,000
Replace Open Canals and Laterals With Pipelines (feet)	8,000	14,514	25,000
Nonused Water Storage Pond (number)	0	0	3
Inlet Canal Lining (feet)	0	7,760	10,560
Pipeline Projects Delivering Water to Fields (feet)	16,000	58,082	9,000
Irrigation Sprinkler Systems (number)	19	105	36
Managed Riparian Grazing (acres)	1,500	33,188	34,000
Public Meetings (number)	6	46	40
Project Tours and Events (number)	6	17	8
Irrigation Scheduling (acres)	300		NA
Cover Crops (acres)	200	200	NA

While the next 10-year plan has not been completed, the SD DENR did evaluate the progress that has been made reducing sediment loads within the watershed. The most direct measure of success is a summary of the BMPs implemented throughout the watershed and associated load reductions (nitrogen, phosphorus and sediment), which are reported annually to the EPA. Grazing and riparian reductions are calculated by using the Spreadsheet Tool for Estimating Pollutant Loads (STEPL)

model. Irrigation reductions are not able to be calculated in STEPL, and so reductions are based on literature values [Dressing, 2002]. While BMPs reduced sediment and other pollutants before 2009, the reductions in Tables 2-3 and 2-4 were reported in the same manner, are stored in the TRACKER database and so are easily comparable.

Table 2-3. Reported 319 Nonpoint-Source Reductions 2009–2015

Stream Reach	Nitrogen (lbs/year)	Phosphorous (lbs/year)	Sediment (tons/year)	<i>E.coli</i>/Fecal Coliform (mpn)
Belle Fourche 1	185	162	600	32
Belle Fourche 2	2,246	2,127	9,826	129
Belle Fourche 3	1,494	1,281	3,610	11
Belle Fourche 4	1,210	1,075	5,192	161
Belle Fourche 5	170	151	1,290	70
Horse Creek	745	639	1,450	4
Spearfish 6	105	90	200	
Willow Creek	114	101	1,304	49
Crow Creek			1,118	
Redwater			138	
Other	683	653	1,659	21
Total	6,952	6,279	26,387	477

MPN: most probable number

Table 2-4. Reported 319 Nonpoint-Source Reductions 2009–2015

Project Implementation Segment	Best Management Practice	Nitrogen (lbs/year)	Phosphorous (lbs/year)	Sediment (tons/year)	Number of Projects
4	Grazing/Riparian	586	793	616	5
5	Grazing/Riparian	528	495	2,140	6
6	Grazing/Riparian	586	793	2,730	19
7	Grazing/Riparian	45	41	225	3
Subtotal	Grazing/Riparian	1,745	2,122	5,711	33
4	Irrigation			7,107	22
5	Irrigation	2,118	1,800	5,327	21
6	Irrigation	3,045	2,610	7,180	29
7	Irrigation	630	540	1,200	5
Subtotal	Irrigation	5,793	4,950	20,814	77
Grand Total		7,538	7,072	26,525	110

In addition to BMPs reported in TRACKER, recent evaluations of the sediment rating transport equations show that, given a flow, less sediment is being transported in post-bmp years (2005–2015) relative to pre-bmp years (1995–2004) both at Horse Creek and WQM 21 (Belle Fourche River, east of Sturgis, downstream of implementation). High flows in recent years still result in exceedances because of the load-flow relationship where higher TSS concentrations are proportional to flows.

2.2 The Belle Fourche River Watershed is shown in Figure 2-1. The ecoregions in the watershed include the Black Hills Foothills, Black Hills Plateau, Black Hills Core Highlands, River Breaks, Semiarid Pierre Shale Plains, Dense Clay Prairie, and Missouri Plateau. The Belle Fourche River is a tributary to the Cheyenne River. Currently, 13 stream segments in the Belle Fourche River Watershed are listed in the South Dakota 2016 IR as impairment-related TMDL waters. These segments include Bear Butte Creek (two listings), the Belle Fourche River (five listings), Redwater River (one listing), Strawberry Creek (one listing), and Whitewood Creek (five listings).

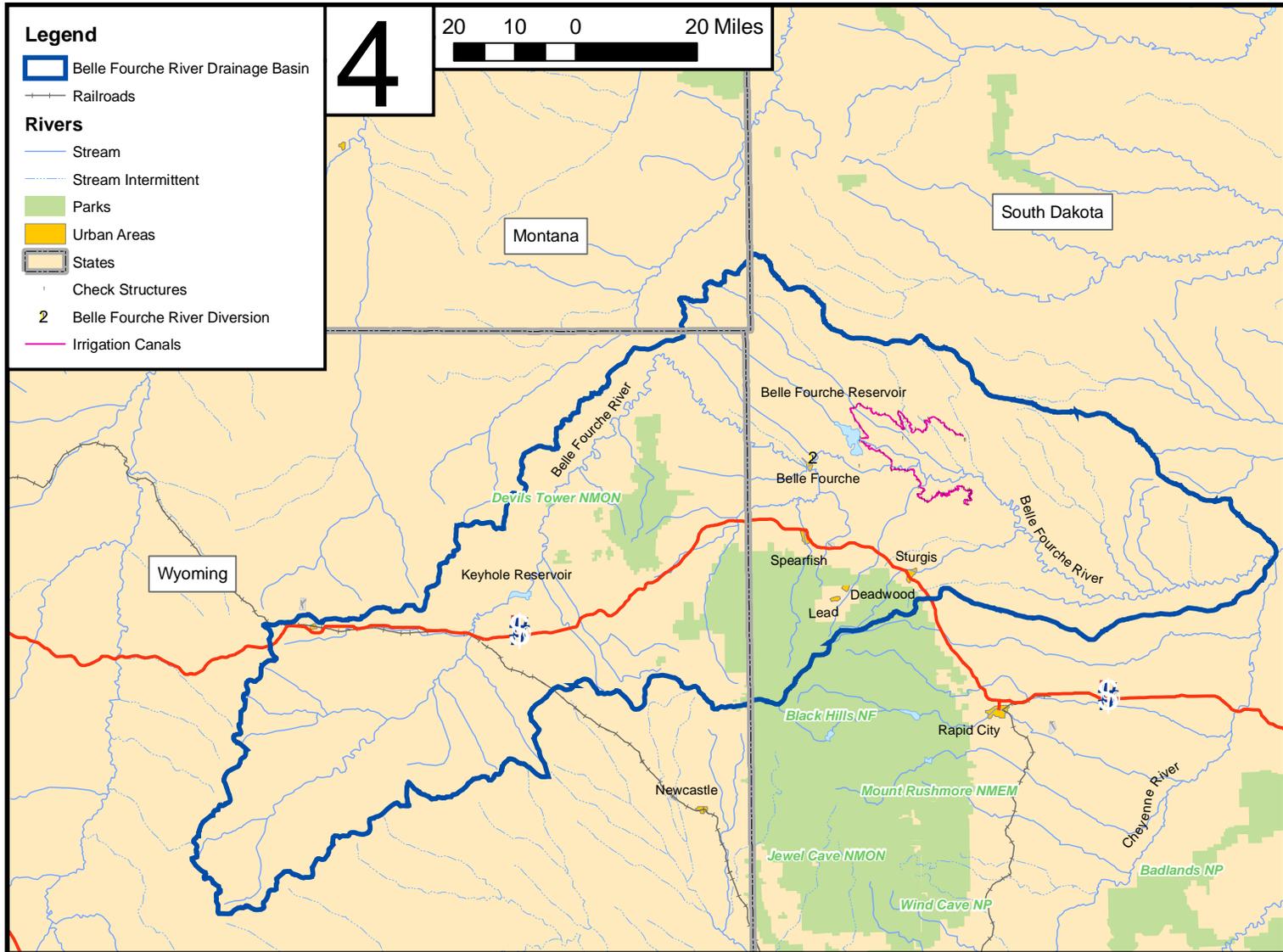
The surface area of the South Dakota portion of the Belle Fourche River encompasses approximately 2,103,040 acres and includes Hydraulic Units 10120201, 10120202, and 10120203. The city of Spearfish (population 10,495) is the largest municipality located in the Belle Fourche River Watershed. Other small communities in the watershed include Belle Fourche (population 4,565), Sturgis (population 4,442), Lead (population 3,027), Deadwood (population 1,380), Newell (population 646), Nisland (population 204), and Fruitdale (population 62).

Land use in the watershed is primarily livestock grazing with some cropland and a few urban and suburban areas. Wheat, alfalfa, native and tame grasses, and hay are the main crops. Corn, wheat, and barley are grown within the BFID. Some winter animal feeding areas are located in the watershed. Gold mining, while reduced in scope from the past, is conducted in some headwater areas of the watershed, and some of the land is used for silviculture. Approximately 11 percent of the watershed is U.S. Forest Service (USFS) land (primarily the Black Hills National Forest), and 4 percent is Bureau of Land Management land.

Major soil associations found in the watershed include Winler-Lismas, Pierre-Kyle, Grummit-Shale, Epsie, Midway-Penrose, Cabbart-Absher, Butche-Colby, Arvada-Stetter, Lohmiller-Glenberg-Haverson, Caputa-Satanta, Delphill-Assinniboine, Nunn-Satanta-Zigweid, Blackpipe-Savo-Manvel, Blackpipe-Assinniboine-Savo, Canyon-Lakoa-Maitland, Tilford-Nevee, St. Onge-Keith, Lohmiller-Glenberg, Winler-Lismas-Swanboy, Kyle-Pierre-Hisle, Samsil-Lismas-Pierre, Nevee-Vale-Tilford, Butche-Satanta-Boneek, Nunn-Kyle-Pierre, Barnum-Swint-St. Onge, Grummit-Snomo-Rock, Paunsaugunt-Rock, Lakoa-Maitland, and Citadel-Vanocker-Grizzly.

The average annual precipitation in the Belle Fourche River Watershed ranges from 15 to 29 inches, 70 percent of which is usually received from April through September. Tornadoes and severe thunderstorms strike occasionally. These storms are local, of short duration, and occasionally produce heavy rainfall events. The average seasonal snowfall ranges from 155 inches in the higher elevations of the western part of the watershed to 23 inches per year in the eastern portion of the watershed. The average water allocation to the BFID is approximately 15 inches. The water added to the fields from irrigation nearly doubles the amount of water available for crop production.

The landscape in the watershed is characterized by prairies with some mountains in the south and west. Land elevation ranges from approximately 2,500 feet above mean sea level (msl) to approximately 7,071 msl. The Black Hills are steep, and the hills near the Cheyenne River are not as steep.



6

Figure 2-1. Location of the Belle Fourche River Watershed.

2.3 The Belle Fourche River Watershed within South Dakota encompasses over 2 million acres. TSS are contributed from natural, urban, agriculture, forest, and mining sources. The TMDL study identified that the primary contributor of TSS to the Belle Fourche River and Horse Creek are the natural bank sloughing, quantity of nonused irrigation water discharged to the natural waterways, and riparian habitat impairment. Stream entrenchment and bank failure are responsible for approximately 75 percent of the TSS in the Belle Fourche River system (2004 TSS TMDL). Stream energy causes natural bank failure (particularly in the eastern portion of the watershed). These areas are dominated by high banks composed primarily of clay soils that supply suspended solids to the channel. Riparian areas and improper grazing or overgrazing in the uplands facilitate natural bank failure and add to TSS in the watershed. Increased quantities of water resulting from the nonused irrigation flows are the major driving cause of the channel incision and result in additional bank failures and resultant suspended solids.

According to the TSS TMDL, irrigation and return-flow, nonused irrigation water are responsible for approximately 20 percent of the TSS in the Belle Fourche River system. Much of the irrigation in the watershed is flood irrigation. This type of irrigation results in sediments that are mobilized by three processes: (1) tail water/runoff crossing fields, (2) water in the canals and laterals, and (3) water in the intermittent streams carrying tail water/runoff to the perennial streams within the watershed. Rangeland erosion contributes the remaining 5 percent of the TSS load.

The *E. coli* TMDL study identified livestock as the main contributor to excess loading in the lower reach of the Belle Fourche River, with wildlife contributing approximately 3 percent of the load. To meet the standard for immersion recreation, *E. coli* loads need to be reduced 99, 56, 21, 29, and 80 percent during high, moist, midrange, dry, and low flow, respectively.

3.0 PROJECT DESCRIPTION

3.1 GOALS

The project goal is to bring the Belle Fourche River into compliance for its warm-water permanent fish life and immersion recreation beneficial uses by implementing the BMPs included in the 10-year implementation plan and by implementing additional BMP recommendations from the *E. coli* TMDL in the bacteria-impaired reaches of the Belle Fourche River. The goals of this project segment, as set forth in the Belle Fourche River TSS and *E. coli* TMDL studies, include the following:

- Continue implementing BMPs in the watershed to reduce TSS and working toward the goal of 158 milligrams per liter (mg/L) in impaired reaches, which currently include all Segments 1–5 of the Belle Fourche River and the priority impaired Horse Creek Watershed.
- Continue implementing BMPs to reduce *E. coli* in the Belle Fourche River and the priority Horse Creek Watershed to not exceed 1,178 colony-forming units per 100 milliliter (cfu/100 mL). Currently, Belle Fourche River Reaches 1 (Wyoming to Fruitdale), 3 (Whitewood to Willow Creek) and 5 (Alkali Creek to Mouth) are impaired for bacteria.
- Continue public education and outreach programs to stakeholders within the Belle Fourche River Watershed.
- Continue tracking the progress made toward reaching the goals of the TMDL to ensure that the BMPs are effective and that the proper BMPs are implemented.

3.2 OBJECTIVES AND TASKS

The strategy outlined in the Belle Fourche River Watershed Implementation Plan is to progressively implement BMPs, such as water management and grazing management systems in the riparian areas, within the Belle Fourche River Watershed to reduce TSS in Horse Creek and the Belle Fourche River and continue implementing BMPs to reduce *E. coli*. This project segment focuses on BMPs that reduce the amount of sediment-laden nonused irrigation water that is discharged to the local waterways by the delivery and application of irrigation water as well as riparian vegetation improvement. Baseline and seasonal monitoring will be performed to measure improvement. The project strategy will be reviewed annually to measure overall success to determine adjustments and to obtain funding for the following project segment. Federal, state, and private funding will be used to fund BMPs. A final report will be produced for each 319 project segment that is completed.

Specifically, this project segment will fund the 10th and 11th years of BMP installation in the Belle Fourche River Watershed to continue TSS reduction as well as continue implementing BMPs that target *E. coli* reduction.

OBJECTIVE 1: Implement BMPs Recommended in the Belle Fourche River Watershed TMDL to Reduce TSS and *E. coli*

The Belle Fourche River TSS TMDL recommends BMPs that focus on reducing the amount of nonused irrigation water discharged to the waterway from irrigation as well as implementing riparian vegetation improvements. Nonused water reduction activities include water delivery and water application improvement. Nonused water picks up sediment from the irrigation ditches themselves along with sediment from crop fields. The nonused water then returns to the Belle Fourche River and Horse Creek, and hence, increases the sediment loads. Horse Creek has been identified by the SD DENR and the BFRWP as a special focus area. Horse Creek itself is impaired; focusing efforts within a smaller geographic area may allow water quality effects to be more readily observed than in the much larger Belle Fourche Watershed. Suitable irrigation and range improvement projects within Horse Creek will be prioritized whenever possible.

Task 1

Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems

The BFID maintains and operates irrigation facilities for the BOR. The BFID has an active water-conservation program. Historically, the program included lining the canals, piping, and operational and maintenance procedures to conserve water. Irrigation significantly impacts the Belle Fourche River, Horse Creek, and other streams within the BFID's 57,000 (+) acres (irrigable land). The impact is primarily from the additional water added to the system during the irrigation season (June–September), and the average TSS concentrations at USGS Gaging Station Sites 06430500 (at the South Dakota-Wyoming border) and USGS 06438000 (upstream of the Cheyenne River).

Approximately 64 percent of the water released from the reservoir was delivered to the field. Approximately 32 percent of the water was used by crops, and the rest was lost through evaporation and nonused water was discharged to adjacent waterways. This nonused water also carried TSS from the flood-irrigation water in fields. This task will increase the overall irrigation delivery and application efficiency through sprinkler systems, pipelines, and water control and monitoring structures and equipment. While conservation effects on irrigation within the Belle Fourche Watershed have not been directly measured at the field level, the Conservation Effects Assessment Project in the

<i>Project Timeline</i>		2017						2018						2019											
		June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
OBJECTIVE 1	<i>Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and E. coli</i>																								
Task 1.	Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems																								
Product 1	Improve Irrigation Water Delivery and Application																								
Product 1a	Replace Open Laterals with Pipe																								
Product 1b	Convert Flood Irrigation to Sprinklers																								
Product 1c	Replace Open Ditches to Pipe																								
Product 1d	Irrigation Scheduling																								
Task 2.	Range and Riparian Area BMP Implementation																								
Product 2	Implement Riparian Improvements																								
Task 3	Improved Cropping Practices																								
Product 3	Implement Cover Crops																								
OBJECTIVE 2	<i>Project Management and Administration</i>																								
Task 4	Project Management and Administration																								
Product 4	Public Outreach, Project Management and Administration																								
OBJECTIVE 3	<i>Complete Essential Water-Quality Monitoring</i>																								
Task 5	Water Quality Monitoring to Assess BMPs																								
Product 4.	Water-Quality Monitoring																								

Figure 4-1. Timeline of the Project.

4.1 PERMITS

Before any new construction can begin, required permits will be obtained. An example of a permit that may need to be obtained is the National Environmental Policy Act (NEPA) permit required to perform work on BOR lands. Other required permits may be needed for stormwater or construction work. Additionally, the need for 401 and 404 stream permits will be verified for the riparian work.

4.2 LEAD PROJECT SPONSOR

The BFRWP is the local sponsor for this implementation project and is a 501C(3) nonprofit group. The leaders of the BFRWP include the conservation districts within the watershed and the BFID. The BFRWP was the recipient of past 319 assessment and implementation grants for the Belle Fourche River TMDL.

4.3 OPERATION AND MAINTENANCE QUALITY ASSURANCE

Responsibilities for operation and maintenance of 319 funded BMPs will be provided through conservation district/landowner contracts. Contracts developed for BMP installation will specify operation and maintenance needs, procedures for BMP failure or abandonment, and the life span of the BMPs terms agreed upon in the contract. The NRCS and consultants will be responsible for completing operation and maintenance scheduling, on-site evaluations, and follow-up with landowners when actions are necessary to ensure BMP operation for its designated life span.

The NRCS; Farm Service Agency; the Butte, Lawrence, and Elk Creek Conservation Districts; District Supervisors; BOR; and consultants will be responsible for ensuring BMPs cost-shared with the EPA 319 funds are properly installed and maintained. Compliance with BMPs implemented with 319 funds will follow the same rules and regulations as the EQIP (these rules are found in Section 515.113 of the EQIP Program Manual). Landowners and operators who do not maintain practices funded by this project for the length of the agreed contract will be required to repay all cost-share funds and any liquidated damages incurred. Conservation district personnel who are supported by the agent who acts on behalf of the BFRWP will be responsible for landowner contacts, developing a landowner/producer mailing list, maintaining records, submitting vouchers and reports, and recording cash and in-kind matches. Where BOR funds are used, the BOR will be responsible to ensure that the BMPs are operated and maintained properly for the life of the contract.

5.0 COORDINATION PLAN

5.1 PARTICIPATING GROUPS AND AGENCIES

The BFRWP has been working together for over 13 years, has completed monitoring and evaluation work, and submitted a TMDL study for approval. Some of the BMPs recommended in the TMDL have been implemented (one flow-automation unit and partial completion of replacing open ditches with pipeline, pipeline projects from BFID to fields, sprinkler systems installation, and riparian vegetation improvement projects). The following groups/agencies have been participating and continue to participate in the Belle Fourche River Watershed implementation project:

- **Butte Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **Belle Fourche Irrigation District (BFID)** – Voting member of the BFRWP, implements many BMPs, provides financial support and match funding.
- **Belle Fourche River Watershed Partnership (BFRWP)** – Local project sponsor.

- **Elk Creek Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **Lawrence County** – Local support, provides funding.
- **Lawrence Conservation District** – Voting member of the BFRWP, provides financial support and EQIP funding.
- **South Dakota Association of Conservation Districts** – New, active participant of the BFRWP, full-time effort under the 319 grant program titled *303 (d) Watershed Planning and Assistance Project*.
- **South Dakota Conservation Commission** – Provides financial support.
- **South Dakota Department of Environment and Natural Resources (SD DENR)** – Active participation in the BFRWP, provides technical support and financial support.
- **South Dakota Game, Fish and Parks (SD GF&P)** – Participant in the BFRWP, provides technical and financial support.
- **South Dakota Grassland Coalition** – Grassland management project, provides financial support.
- **South Dakota School of Mines and Technology (SDSM&T)** – Active participant in the BFRWP, provides technical support through Dr. Kenner and graduate students (SDSM&T performed the initial TMDL study).
- **South Dakota State University (SDSU)** – Provides technical support, West River Ag Center personnel.
- **U.S. Bureau of Reclamation (BOR)** – Active participation in the BFRWP, provides technical support through drawings and designs as requested by the BFID, provides financial support.
- **U.S. Environmental Protection Agency (EPA)** – Provides 319 and 106 funding and technical guidance.
- **U.S. Geological Survey (USGS)** – Active participant in the BFRWP, fieldwork, and provides technical and financial support.
- **U.S. Fish and Wildlife Service (USFWS)** – Participant in the BFRWP, provides technical and financial support.
- **U.S. Natural Resources Conservation Service (NRCS)** – Participant in the BFRWP, provides technical and financial support.
- **Wyoming Department of Environmental Quality (WY DEQ)** – Provides local and financial support for flow measurements at the South Dakota-Wyoming state line.

5.2 COORDINATION WITH OTHER PROGRAMS

The BFRWP will continue to coordinate activities with state, federal, and local government agencies through frequent personal communication and quarterly partnership meetings. The SD GF&P, USFWS, NRCS, SD DENR, local organizations, and local government agencies will provide input and involvement in this implantation project. Coordination with these agencies will include work related to other grassland improvement projects and other 303(d) assessment work. Extra coordination with local NRCS personnel will be necessary for the riparian vegetation and irrigation improvement projects.

5.3 SIMILAR ACTIVITIES IN THE WATERSHED

All practices within the Belle Fourche River Watershed are included in the funding table.

6.0 EVALUATION AND MONITORING PLAN

6.1 QUALITY CONTROL AND ASSURANCE

Field data will be collected in accordance with the SD DENR's *Standard Operating Procedures for Field Samplers, Tributary and In-Lake Sampling Techniques*. A minimum of 10 percent (one sample) of all samples collected will be quality assurance/quality control (QA/QC) samples. QA/QC samples will consist of field duplicates or field replicate samples.

6.2 DATA

The data will be provided to the SD DENR. The data and analysis for this project will be documented in a final report that the BFRWP will provide for the SD DENR.

Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) and Hydrological Simulation Program - FORTRAN (HSPF) were used to model the Belle Fourche River Watershed when the TMDL was developed. To develop the TMDL and determine the necessary load reductions, several BMPs were modeled in these programs to reduce TSS concentrations in the streams within the Belle Fourche River Watershed. The sources of TSS identified were range erosion, irrigation and on-farm waste, free cattle access to streams, riparian degradation, natural geologic processes, hydraulic alteration by irrigation, and reduced stream miles. To understand the progress made in achieving the goals of the TMDL plan, the BFRWP monitors present progress against planned progress in midyear and annual reports (load reductions are reported annually).

Evaluating the project's success in reaching the objectives and goals will be accomplished by (1) comparing the scheduled versus the actual milestone completion dates; (2) comparing the flow rates and chemistry for irrigation-water application, delivery, and riparian BMPs; (3) measuring the reduction in nonused water from BFID discharged into streams; and (4) developing a sustainable watershed implementation project measured in part by the participation and approval of additional grant money for BMP implementation. Project monitoring will be reviewed by the BFRWP in quarterly meetings to report progress toward the goals and objectives.

6.3 LONG-TERM OPERATION AND MAINTENANCE FUNDING

The long-term Operation and Maintenance (O&M) funding for irrigation delivery improvements will be funded and maintained by the BFID. Stream riparian habitat and on-farm irrigation improvements will be managed and supported financially in part by the NRCS and EQIP funding.

7.0 BUDGET

Table 7-1 defines the acronyms used in Table 7-2. Table 7-2 identifies the funding sources and cash flow during the project. Tables 7-3 and 7-4 present the budget for the 319 funds as well as the matching funds for the project. EPA 319 funds represent less than 30 percent of the total project budget. Table 7-5 shows the total budget, and Table 7-6 summarizes the other funds being spent on the project that cannot be used as matching funds.

Table 7-1. Table of Acronyms

Acronym	Definition
SD DENR	South Dakota Department of Environment and Natural Resources
NRCS EQIP	Natural Resources Conservation Service Environmental Quality Incentives Program
COE	Corps of Engineers
BOR	Bureau of Reclamation
USGS	United States Geological Survey
BFID	Belle Fourche Irrigation District
WY DEQ	Wyoming Department of Environmental Quality

Table 7-2. Cash Flow

Budget	July 2017–June 2018 (\$)	July 2018–June 2019 (\$)	Total (\$)
319 Funds	572,000	572,000	1,144,000
Subtotal	572,000	572,000	1,144,000
Nonmatching Funds			
SD DENR (Water Rights)	35,000	35,000	70,000
NRCS EQIP	207,500	207,500	415,000
COE	7,000	7,000	14,000
BOR	53,500	53,500	107,000
USGS	86,700	86,700	173,400
Other Grants	69,500	69,500	139,000
Subtotal	459,200	459,200	918,400
Matching Funds			
Producer	500,000	500,000	1,000,000
Butte Conservation District	15,000	15,000	30,000
Lawrence County	7,000	7,000	14,000
BFID	5,250	5,250	10,500
WY DEQ	7,000	7,000	14,000
Subtotal	534,250	534,250	1,068,500
Total Budget	1,565,450	1,565,450	3,130,900

Table 7-3a. Budget of 319 Funds

Project Description	Consultants (\$)	Producer (\$)	BFRWP (\$)	Butte Conservation District (\$)	Totals (\$)
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and E. coli					
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems					
Product 1. Improved Irrigation Water Delivery and Application					
1a. Replace Open Laterals with Pipe					
1b. Convert Flood Irrigation to Sprinklers		600,000			600,000
1c. Replace Open Ditches to Pipe		20,000			20,000
1d. Irrigation Scheduling					
Task 2. Range and Riparian Area BMP Implementation					
Product 2. Implement Riparian Improvements		150,000			150,000
Task 3. Improved Cropping System					
Product 3. Implement Cover Crops					
Objective 2. Conduct Public Outreach, Project Management and Administration					
Task 4. Project Management and Administration					
Product 4. Public Outreach, Education and Project Management and Administration	265,000		30,000	40,000	335,000
Objective 3. Complete Essential Water Quality Monitoring					
Task 5. Water Quality Monitoring to Assess BMPs					
Product 5. Water Quality Monitoring	39,000				39,000
Total	304,000	770,000	30,000	40,000	1,144,000

Table 7-3b. Task 3 Explanation of 319 Fund Distribution

Supplemental Breakdown of 319 Project Management Budget	Hours/ Mileage	Rate	Cost
Financial Audit (Contracted)	NA	Actual Cost	22,000
Information and Education Events (BFRWP)	NA	Actual Cost	8,000
Administrative Assistant (Butte Conservation District)		55% Gross Salary 2 years	40,000
Project Travel Mileage (Consultant)	24,000	0.42/mile	10,080
Travel Expense (Consultant)	NA	Actual Cost	3,000
BMP Project Planning and Certification (Consultant)	1,538	\$80/Hour	123,000
Grant Tracking, Documentation, Proposal Writing (Consultant)	874	\$80/Hour	69,920
Meetings, Technology Transfer, Information and Education Events (Consultant)	468	\$80/Hour	37,440
Archeologist Contracted for State Historic Preservation Office Requirements (Consultant)	NA	Actual Cost (one survey estimated)	1,650
Miscellaneous (Engineer Design, GIS, Geologist, Proposal Writing)	181	\$110/Hour	19,910
Total			335,000

Table 7-4. Budget of 319 and Matching Funds Budget

EPA 319 and Matching Funds Budget	EPA 319 (\$)	Matching Funds (\$)					Sum of Matching Funds (\$)
		Producer (Cash and In-kind) (\$)	Butte Conservation District (Cash) (\$)	Lawrence County (Cash) (\$)	BFID (Cash and In-kind) (\$)	WY DEQ (Cash)	
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and <i>E. coli</i>							
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems							
Product 1. Improved Irrigation Water Delivery and Application							
1a. Replace Open Laterals with Pipe							
1b. Convert Flood Irrigation to Sprinklers	600,000	900,000					900,000
1c. Replace Open Ditches to Pipe	20,000	50,000	30,000				80,000
1b. Irrigation Scheduling							
Task 2. Range and Riparian Area BMP Implementation							
Product 2. Implement Riparian Improvements	150,000	50,000					50,000
Task 3. Improved Cropping Practices							
Product 3. Implement Cover Crops							
Objective 2. Conduct Public Outreach, Project Management and Administration							
Task 4. Project Management and Administration							
Product 4. Public Outreach, Project Management and Administration	335,000						
Objective 3. Complete Essential Water Quality Monitoring							
Task 5. Water Quality Monitoring to Assess BMPs							
Product 5. Water Quality Monitoring	39,000			14,000	10,500	14,000	38,500
Total	1,144,000	1,000,000	30,000	14,000	10,500	14,000	1,068,500

Table 7-5. Total Budget

Total Budget	EPA 319 (\$)	Matching Funds (\$)	Nonmatching Funds (\$)	Line Item Total (\$)
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and <i>E. coli</i>				
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems				
Product 1. Improved Irrigation Water Delivery and Application				
1a. Replace Open Laterals with Pipe			100,000	100,000
1b. Convert Flood Irrigation to Sprinklers	600,000	900,000	150,000	1,650,000
1c. Replace Open Ditches to Pipe	20,000	80,000		100,000
1b. Irrigation Scheduling			10,000	10,000
Task 2. Range and Riparian Area BMP Implementation				
Product 2. Implement Riparian Improvements	150,000	50,000	384,000	584,000
Task 3. Improved Cropping Practices				
Product 3. Implement Cover Crops			10,000	10,000
Objective 2. Conduct Public Outreach, Project Management and Administration				
Task 4. Project Management and Administration				
Product 4. Public Outreach, Project Management and Administration	335,000			335,000
Objective 3. Complete Essential Water Quality Monitoring				
Task 5. Water Quality Monitoring to Assess BMPs				
Product 5. Water Quality Monitoring	39,000	38,500	264,400	341,900
Total	1,144,000	1,068,500	918,400	3,130,900

Table 7-6. Nonmatching Funds Budget

EPA 319 and Nonmatching Funds Budget	Nonmatching Funds						Sum of Nonmatching Funds (\$)
	SD DENR (Federal) (\$)	NRCS EQIP (Federal) (\$)	COE (Federal) (\$)	BOR (Federal) (\$)	USGS (Federal) (\$)	Other Grants (Conservation Commission, and others)	
Objective 1. Implement BMPs Recommended in the Belle Fourche River TMDL to Reduce TSS and <i>E. coli</i>							
Task 1. Reduce Nonused Water Discharged to the Local Waterways From the Delivery and Application Systems							
Product 1. Improved Irrigation Water Delivery and Application							
1a. Replace Open Laterals with Pipe				100,000			100,000
1b. Convert Flood Irrigation to Sprinklers		150,000					150,000
1c. Replace Open Ditches to Pipe							
1b. Irrigation Scheduling		10,000					10,000
Task 2. Range and Riparian Area BMP Implementation							
Product 2. Implement Riparian Improvements		250,000				134,000	384,000
Task 3. Improved Cropping Practices							
Product 3. Implement Cover Crops		5,000				5,000	10,000
Objective 2. Conduct Public Outreach, Project Management and Administration							
Task 4. Project Management and Administration							
Product 4. Public Outreach, Project Management and Administration							
Objective 3. Complete Essential Water Quality Monitoring							
Task 5. Water Quality Monitoring to Assess BMPs							
Product 5. Water Quality Monitoring	70,000		14,000	7,000	173,400		264,400
Total	70,000	415,000	14,000	107,000	173,400	139,000	918,400

8.0 PUBLIC INVOLVEMENT

Communicating with the major stakeholders in this project is critical to its success. Public involvement in the project will continue through public meetings with stakeholders, tours sponsored by the BFRWP, newsletters sent out by conservation districts, radio advertisements, word of mouth, and the website developed by the partnership (www.bellefourchewatershed.com).

9.0 THREATENED AND ENDANGERED SPECIES

The following endangered species are identified by the SD GF&P as located within and/or migrating through the Lawrence, Butte, and Meade Counties: bald eagle, whooping crane, least tern, and the black-footed ferret. Project implementation is not expected to impact any of these species. An Endangered Species Act Compliance Assessment letter dated May 18, 2004, from Mr. Doug Lofstedt (South Dakota Section 319 Project Officer) documents the “no affect” determination for the endangered species in the project area.

The procedure to ensure that threatened and endangered species are not adversely affected by project activities is based on the following three main premises, which are the same as those used for Segments 1–4:

- The managed grazing systems, both planned and implemented, will promote restoring or preserving critical grassland habitat.
- Anticipating many of the grazing systems are anticipated to be planned and implemented within areas that have compliance plans in place.
- The involvement of the NRCS and the USFWS in planning and construction grazing systems ensures that personnel trained for mitigating threatened and endangered species will be involved with designing and implementing project BMPs.

The species that are most likely to be encountered during the project, as well as the procedure to follow should the species be encountered, are included below.

9.1 Bald Eagle

The bald eagle is a threatened species with a known certainty of occurrence in all three counties. According to the USFWS, bald eagles are known to nest in the floodplain forest along the Missouri River in Yankton, Bon Homme, Union, and Gregory Counties; along the James River in Brown, Spink, Sanborn, and Hutchinson Counties; and in forested areas in Meade, Charles Mix, and Brown Counties of South Dakota.

The 319-funded activities will be very low intensity and widely dispersed over the landscape. The activities will not significantly increase or expand the level of human activity. Activities that disturb possible nesting sites or reduce food sources are not anticipated. Therefore, EPA-funded activities are expected to have no effect on the bald eagle, and no consultation with the USFWS is planned.

9.2 Whooping Crane

The whooping crane is an endangered species with a known certainty of occurrence in all three counties. This species is often found in South Dakota during spring and fall migrations. Migration through the state occurs from mid- to late-April and mid- to late-October. Although a variety of habitats are used during migration, a wetland is always used for night roosting and frequently for foraging. While migrating, whooping cranes roost in wide, shallow, open water areas, including

marshes, flooded crop fields, artificial ponds, reservoirs, and rivers. Roosting sites must also be isolated from human disturbances.

The EPA-funded monitoring activities will be of low intensity, will be widely dispersed over the landscape, and will not significantly increase or expand the level of human activity. Additionally, if any cranes are observed at any project work site, “all mechanical activities at the site will be suspended until the bird(s) leave the site under their own volition” (Section 8.1). Thus, the EPA-funded activities are expected to have no effect on the whooping crane, and no consultation with the USFWS is planned.

9.3 Least Tern

The least tern is listed as an endangered species with a known certainty of occurrence in Meade County. This species historically breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems. The least tern is a local summer resident of the Missouri and Cheyenne Rivers in South Dakota, and can be found migrating through virtually all of South Dakota with the exception of the Black Hills. Least terns usually nest on open expanses of sand or small pebble beaches along shorelines, riverbanks, sandbars, and islands. Least terns typically select nesting sites that are well-drained and away from the water line (usually near a small ridge or piece of driftwood). Their food source consists almost entirely of small fish, and feeding requires shallow water areas with an abundance of fish near the nesting area.

Major losses and alterations of habitat occur from shoreline, bank, and channel modification from the construction of locks, dams, dikes, levees, and reservoirs. Flooding can prevent or destroy nesting and can be a byproduct of habitat alteration. Habitat losses can also result from increased development, recreational uses, natural erosion, human and domestic pet disturbances or harassment, and trampling by cattle. Pollution that affects fish populations can also impact least terns.

The 319-funded monitoring activities will be of low intensity, will be widely dispersed over the landscape, confined to a few isolated stream channel areas, and will not significantly increase or expand the level of human activity. Activities that disturb possible nesting sites or reduce food sources are not anticipated. If any least terns are observed near any project work site, “all mechanical activities at the site will be suspended until the bird(s) leave the site under their own volition” (PIP Section 8.2). Therefore, EPA-funded activities are expected to have no effect on the least tern, and no consultation with the USFWS is planned.

9.4 Black-Footed Ferret

The black-footed ferret is an endangered species with a possible certainty of occurrence in all three counties. This species is a member of the weasel family, and feeds primarily on prairie dogs and uses their burrows for denning and shelter. Their historic range included Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming, Alberta, and Saskatchewan. The South Dakota population that disappeared in the wild in 1974 was thought to be the last remaining population. However, a captive propagation program was started from a Meeteetse, Wyoming, population that was discovered in 1981. Reintroductions have since occurred in Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. The South Dakota sites include the Conata Basin, Badlands National Park, and Cheyenne River Sioux tribal land in Dewey and Ziebach Counties.

Primary threats to the black-footed ferret include predation, disease, and loss of habitat. The ferrets can be affected by predators such as coyotes, golden eagles, great-horned owls, prairie falcons,

badgers, bobcats, and foxes. Canine distemper will kill ferrets, and sylvatic plague can eliminate entire prairie dog towns. In South Dakota, sylvatic plague currently poses the biggest threat to ferret populations. However, poisoning prairie dogs and converting native prairie to cropland are main threats to ferret habitats.

The existence of black-footed ferrets is directly linked to the presence of prairie dogs. The sponsor will address the black-footed ferrets by complying with the South Dakota Prairie Dog Management Plan. If any actions are planned that may adversely affect the survival of a native or introduced population of black-footed ferrets, the sponsor will consult with the USFWS.