Alternative Plan for Goodman Creek Watershed in Mercer and Dunn Counties, North Dakota

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INTRODUCTION:

This is an alternative plan for E. coli bacteria submitted for the Goodman Creek Watershed Project. The North Dakota Department of Environmental Quality (NDDEQ), Watershed Management Program believes that since Best Management Practices (BMPs) have been initiated through a Section 319 Nonpoint Source Pollution Program grant, the watershed is moving towards meeting water quality standards. Monitoring will be conducted as a part of the grant to determine the effectiveness of the BMPs and the project. If the BMPs implemented do not resolve the E. coli bacteria impairment in a reasonable amount of time following implementation, a Total Maximum Daily Load (TMDL) will be written. The data gathered as a part of this Section 319 Grant will be beneficial to a TMDL, if deemed necessary in the future.

This document is a modified version of the FY2019 Section 319 Project Implementation Plan (PIP) for the Goodman Creek Watershed Project. A crosswalk for how this document meets the Environmental Protection Agency's (EPA) considerations for an alternative plan is presented in Appendix 4.

UPDATE:

This PIP was submitted in 2019, with funding and implementation beginning in 2020. The Natural Resource Conservation Service (NRCS) office which houses the Soil Conservation District project staff, was closed or operating with limited staff and inaccessible to the public during 2020 and early 2021 due to COVID-19, so 319 project staff were not able to spend much time planning with producers. Though funding for the project was maintained throughout 2020, the limited activity will likely mean the project is extended another year.

The table below summarizes the funded BMPs that were applied as of August 31, 2021. A more descriptive summary of tasks completed through the end of 2020 is included in the Annual Report attached in Appendix 8. The 2021 Annual Report is not available at this time.

Description	Amount	Units
Cropland Management		
Cover Crop	115	Acres
Grazing Management		
Fencing (barbed)	3,640	Linear Feet
Pasture/Hayland Planting	446	Acres
Pipelines	9,634	Linear Feet
Rural Water Hookup	2	Systems
Trough and Tank	9	Number
Well (Livestock only)	3	Number
Misc. Practices		
Cultural Resource Review	2	Number
Solar Pumps	1	Number

A total of 75 water samples were collected May 4, 2020, through September 28, 2020 and will serve as a baseline for parameters pre-implementation. Since few BMPs had been applied by that time, evidence of improvement in E. coli concentrations was not expected or shown. The severe drought across North Dakota has resulted in an increase in concentrations of water quality parameters statewide. Water quality data for a project are typically reviewed 2-3 years following implementation of BMPs, and a full water quality report will be produced and submitted at the end of this project. A decision on whether sufficient progress is being made towards attaining water quality standards will occur at that time.

1.0 Project Overview

Mercer County Soil Conservation District
1400 Hwy 49 North # 102
Beulah, ND 58523
701-873-2101
E-mail: mcscd@westriv.com

State Contact Person: Greg Sandness
Phone: 701-328-5232
E-mail: gsandness@state.nd.us

State: North Dakota
Watershed: Goodman Creek Watershed
Hydrological Unit Codes: 101302010905
101302010906
101302010907
High Priority Watershed: Yes

TMDL Development and/or Implementation (check any that apply)

Project Types	**Waterbody Types**	**NPS Category**
[ ] Staffing and support	[ ] Groundwater	[x] Agriculture
[x] Watershed	[ ] Lakes/Reservoirs	[ ] Urban Runoff
[ ] Groundwater	[ ] Rivers	[ ] Silviculture
[ ] I&E	[x] Streams	[ ] Construction
	[ ] Wetlands	
	[ ] Other	

Project Location: Mercer and Dunn Counties, ND

Major Goal: The Goodman Creek Watershed Project is designed to provide technical, financial, and educational assistance to landowners within the watershed. The areas targeted for assistance are designated from the assessment phase of the project. The major goal of the project is to achieve and maintain "fully supporting" status for recreational uses of the Goodman Creek watershed by decreasing the annual Escherichia coli bacteria (E. coli) amounts entering the creek and restoring riparian habitat.

Project Description: The project sponsors intend to 1) prioritize technical and financial assistance to lands that have the most impact on water quality, 2) track water quality trends over the life of the project to rectify any concerns as they surface, 3) develop working partnerships with other agencies to aid in the effort of refurbishing our natural resources and 4) conduct outreach and education focused on the next generation of producers that will improve the long-term sustainability of their operations.

Goodman Creek Funding Allocations

319 funding needed for 3 years:	$274,590
Producer Cost and Match:	$132,620

Other local/state/federal funds:	$149,940
Total Project Cost:	**$557,150**

2.0 Statement of Need

2.1 Assessment Unit

The Goodman Creek Watershed, assessment unit ND-10130201-020-S_00, is listed on the *2018 List of Section 303(d) TMDL Waters for the Missouri River Basin in North Dakota* as not supporting recreational uses due to E. coli. Data was collected at each sample site in the Goodman Creek Watershed during the recreation season of May 1 to September 30. Data was compared to the North Dakota water quality criteria for the pathogen indicator, E. coli bacteria, to the data collected at each site. The beneficial use impaired is recreation due to surface runoff through areas with accumulated manure and direct deposit of manure on or near the creek.

2.2 Watershed Description

The Goodman Creek Watershed is within the Knife River Basin. Goodman Creek is an intermittent stream and tributary of Spring Creek, which has an approved E. coli bacteria TMDL developed to address the impaired recreational uses in that waterbody. The Hydrological Unit codes for the Goodman Creek Watershed have been updated to 12 Digit Hydrological Unit Codes (HUC): 101302010905, 101302010906 and 101302010907. Two of these HUCs (101302010905 and 101302010907) include the listed segment. The third HUC (101302010906) is a contributing watershed to the listed segment. Water samples taken in 2012 through 2017 showed high concentrations of E. coli with concentrations often well over 409 CFU/100 ml. A few water samples were labeled too numerous to count, over 8,000 CFU's. These samples show an increasing trend. Additional information follows in section 2.5.

2.3 Maps:

See Maps, Appendix 1.

2.4 General Information:

The Goodman Creek Watershed is in the northwestern corner of Mercer County. The watershed's topography is characterized by rolling hills with elevation ranges from 1,900 feet in the southwest to 2,200 feet in the northeast. Soils vary greatly in different areas of the county and range from soft shale plains to extreme sand. The watershed has a semi-arid climate with an average annual precipitation of 17 inches. Goodman Creek enters Spring Creek, a major tributary of the Knife River, one mile west of the city of Golden Valley. The water ultimately ends up in the Missouri River. The watershed is approximately 63,251 acres or 99 square miles in size. The average agricultural operations are running both livestock and small grain operations.

The primary natural resource management concern is impaired water quality due to high concentrations of E. coli from riparian grazing resulting in direct deposit of manure in the creek,

and spring runoff from accumulations of manure in winter feeding areas and summer grazing within a two-mile corridor of the creek, see Appendix 1 Maps.

Other concerns include range practices for summer grazing, cropland erosion and water erosion on rangelands, and confined areas for feeding livestock that are close and directly on the creek.

2.5 Water Quality:

Station 380139 is located on Goodman Creek two miles west of Golden Valley, ND and monitors the entire Goodman Creek watershed including 12-digit HUCs 101302010905, 101302010906 and 1013020010907, see Figure 2. Station 380139 is included in the Spring Creek Watershed Project and has a total of 146 E. coli bacteria samples collected and analyzed from 2012-2017. Analysis of E. coli bacteria data was examined by pooled month for the period of 2012 to 2017. The analysis of E. coli bacteria data shows that over the entire period, May and September are classified as 'fully supporting but threatened' with a geometric mean below 126 CFU (criteria 1) but a percent of samples exceeding 409 CFU greater than 10 percent (criteria 2). The months of June, July and August classified as 'not supporting' the recreational beneficial uses due to high geometric means of E. coli bacteria. A yearly analysis indicates that all six years of sampling (2012-2017) would be considered 'not supporting'. Data for this site is provided in Table 1 and Figure 4.

Stations 380140 and 380141 are located upstream of station 380139 and monitor the upper portions of the Goodman Creek watershed. Stations 380140 and 380141 were monitored for one year (2015) during the National Water Quality Initiative in Goodman Creek watershed. The analysis of E. coli bacteria data at station 380140 shows that, during 2015, July and August classified as 'fully supporting' recreational uses with both the geometric mean (criteria 1) and percent of samples exceeding 409 CFU (criteria 2) were below criteria limits. The months of May and June classified as 'not supporting' the recreational beneficial uses due to high geometric means of E. coli bacteria. Finally, the month of September classified as 'fully supporting but threatened' with a geometric mean below 126 CFU but a percent of samples exceeding 409 CFU greater than 10 percent. Station 380141 shows that the months of May and June classified as 'not supporting' the recreational beneficial uses due to high geometric means of E. coli bacteria. While the month of July classified as 'fully supporting but threatened' with a geometric mean below 126 CFU but a percent of samples exceeding 409 CFU greater than 10 percent. There were no samples collected during the months of August and September due to the lack of flowing water. A yearly analysis indicates that 2015 would be considered 'not supporting' for both 380140 and 380141. Data for these sites are provided in Tables 2-3.

2.5a Recreational Use Support Assessment Methodology

Recreational use is any activity that relies on water for sport and enjoyment. Recreational use includes primary contact activities such as swimming and wading and secondary contact activities such as boating, fishing, and bathing. The status of recreational use in rivers and streams is considered "fully supporting" when there is little or no risk of illness through either primary or secondary contact with the water. The State's recreational use support assessment

methodology for rivers and streams is based on the State's numeric water quality standard for E. coli bacteria.

For each assessment based solely on E. coli data, the following criteria are used:

- Assessment Criteria 1: For each assessment unit, the geometric mean of samples collected during any month from May 1 through September 30 does not exceed a density of 126 colony forming units (CFUs) per 100 milliliters (mL). A minimum of five monthly samples are required to compute the geometric mean. If necessary, samples may be pooled by month across years.

- Assessment Criteria 2: For each assessment unit, less than 10 percent of samples collected during any month from May 1 through September 30 may exceed a density of 409 CFUs per 100 mL. A minimum of five monthly samples is required to compute the percent of samples exceeding the criteria. If necessary, samples may be pooled by month across years.

The two criteria are then applied using the following use support decision criteria:

- Fully Supporting: Both criteria 1 and 2 are met

- Fully Supporting but Threatened: Criteria 1 is met while 2 is not met

- Not Supporting: Criterion 1 is not met. Criteria 2 may or may not be met

Based on the data, recreational use assessments for the Goodman Creek Watershed are not supporting recreational use due to E. coli bacteria impairment. The target for the watershed project is to achieve fully supporting status for recreational beneficial use by meeting both assessment criteria in the water quality standards.

2.5b Sources of Pollution

The primary concern is impaired water quality due to high concentrations of E. coli from riparian grazing resulting in direct deposition of manure in the creek, and spring runoff from accumulations of manure in winter feeding areas and summer grazing within a two-mile corridor on the creek, see Appendix 1 Maps. Other concerns include range practices for summer grazing, cropland erosion and water erosion on rangelands, and confined areas for feeding livestock that are close and directly on the creek.

There are no permitted point sources within the Goodman Creek watershed.

Excessive amounts of fecal bacteria in surface waters used for recreation have been known to indicate an increased risk of pathogen-induced illness to humans. Infections due to pathogen contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat, and skin disease (EPA, 1986). The fecal bacteria known to cause the most harm to humans is E. coli bacteria and

is the parameter used in NDDEQ water quality standards. A summary of E. coli bacteria data is shown in Appendix 1.

Funds will be targeted to reduce E. coli bacteria inputs through the implementation of BMP's.

3.0 Project Description

3.1 Goal:

The primary goal of this watershed project is to restore and maintain the recreational uses of the Goodman Creek project area.

3.2 Objectives and Tasks

Objective 1:
Reduce monthly geometric mean concentrations for E. coli to levels below 126 cfu/100ml with less than 10% of the samples exceeding 409cfu/100 ml and achieve an IBI score of Good, or greater than 38, at all established monitoring sites.

Task 1:
Fill one FTE to provide watershed conservation in Mercer County, providing one on one conservation planning assistance to producers in the project area.

> **Product:** Watershed conservationist to administer contracts in the Goodman Creek Watershed and provide technical assistance.
>
> **Cost:** $ 81,000 (319 Funds)

Task 2:
Minimize livestock impacts to the riparian corridor by improving grazing management on 3,264 acres in the 2-mile priority corridor and installing BMPs to improve riparian vegetation and stream bank stability focusing on producers who operate on or directly adjacent to the creek.

> **Product:** 3,264 acres of prescribed grazing systems, implementation of 3 winter-feeding areas, pasture/hayland plantings to convert crop land to useful grazing, and installation of BMPs to improve vegetative cover (i.e. vegetative buffers, vegetative plantings, riparian buffers, etc.). See Supplemental BMP Table in Appendix 3 for details on specific BMPs related to grazing management.
>
> Land management along and adjacent to the creek will be the priority focus for the Goodman Creek Watershed. As such, financial and technical assistance will be targeted toward producers in the priority area throughout this phase of the project. The goal is to review all the acres in the priority area with the producers to determine resource management needs and, if needed, identify feasible solutions to any resource concerns.

The Goodman Creek Watershed Project is partnering with the Mercer County Water Resource Board (MCWRB) to provide additional cost share for BMP installation. Producers have been reluctant to add plantings to their operations when it involves taking land out of crop production, this partnership may offer additional options to local producers. Possible BMPs could include pasture/hayland plantings to convert cropland to useful seasonal grazing, riparian buffers, vegetative buffers, etc. The MCWRB is an active partner and will be evaluating potential partnership and cost-share projects on an individual basis.

Cost: $126,180 (319 Funds) Specific BMP likely to be installed are listed in Appendix 3.

Task 3:
Improve manure management in livestock feeding areas through the implementation and the development of manure management systems for winter feeding areas (see description below) within one mile of the creek.

Product: Three Feeding Areas with Manure Management plans. See Supplemental BMP Table in Appendix 3.

Cost: $54,000 (319 Funds)

Task 4:
Conduct follow-up contacts to assist with conservation plan updates and monitor O&M of 319 cost shared practices.

Product: Up to date database of applied BMPs.

Cost: Included in Task 1

The BMP Tracker database will be used to generate reports of all producer planned and installed practices. A summary of select practices is attached in Appendix 3.

The Goodman Creek Watershed consists of mostly stock cow operations with most of the winter feeding being done on open range or cropland after harvest. These operations have a more direct need of being moved away from the creek and drainage ways to minimize impacts related to excess feeding in the riparian corridor and runoff through concentrated feeding areas with accumulated manure. This can be accomplished by establishing alternative water sources other than streams, using portable windbreaks, planting cover crops, fencing cropland acres, and implementing winter feeding management plans that rotate livestock through multiple fields/areas to disburse livestock and prevent excess manure accumulations.

Objective 2:
Provide outreach and information to both new and existing producers, district supervisors, water resource boards and county commissioners relating to water quality, conservation and the Goodman Creek watershed project.

Task 5:
Continue to inform the producers and land managers of the Goodman Creek Watershed Project and the benefits of implementing BMPs though meetings and tours. Present information at other agency meetings in the area.

Product: Successful meetings and tours that inform producers and landowners about the Goodman Creek Watershed Project. Show producers examples of implemented practices. Discuss which BMPs are available and the benefits of implementing them. Specific outreach will be conducted to reach out to the next generation of producers in Mercer County. These producers will be or are taking over family operations and we will strive to provide them with information on conservation practices that will improve the long-term sustainability of their operations. Inform producers and landowners of the Goodman Creek Watershed through newsletters from Mercer County.

The Goodman Creek Watershed will team up with the Mercer County Soil Conservation Districts, NDSU Ext Mercer County Office and NRCS to provide 6 informational meetings to producers and landowners. In addition, 2 tours will be hosted, and 12 newsletters/publications completed. We plan to have future meetings with FSA to include the new Farm Bill information and include our local ag lenders for additional resources.

Cost: $2,220 (319 Funds)

Task 6:
Work with SCD Board Supervisors, Water Resource Board members and County Commissioners to increase awareness of watershed management objectives and resources through meetings, classes, and tours.

Product: Successful education and outreach on watershed management practices and objectives. Participants will be able to actively engage in informed decision making as it relates to watershed projects and issues within watersheds. Education and outreach will provide for sustainable management of the proposed project along with future projects. Activities will include monthly updates at meetings and participation in the Soil and Water Conservation Leadership Academy.

Cost: $450 (319 Funds)

Objective 3:
Secure additional cost share opportunities for Goodman Creek producers to improve water quality and riparian areas.

Task 7:
Work with other agencies to seek out additional cost share dollars for producers. Look for other grant opportunities to provide additional cost share.

Product: Additional funding to offset producer's cost. Producers are reluctant to install BMPs that can take land out of production. Additional funding will provide more of an initiative to install BMPs, such as filter strips and riparian buffers. Potential contacts include ND Game and Fish, NRCS, Pheasants Forever and other conservation groups in the area.

Cost: Included in Task 1

Objective 4:
Document current water quality and beneficial use conditions as well as identify the types and sources of pollutants that may be (or are) impairing the beneficial uses of other creeks and waterbodies in the county.

Task 8:
Coordinate with NDDEQ to complete a 2-year Watershed Assessment to collect water quality, macroinvertebrate, and land use data to identify all resource concerns in the Goodman Creek watershed. Also conduct landowner/producer surveys to gauge potential interest in participating in future watershed management projects.

Product: Sufficient data for developing a watershed-based plan to address identified beneficial use impairments.

Cost: $0 (Financial support for the assessment(s) will be provided through other grants available through the NDDEQ)

3.3 See Milestone Table, Appendix 3

3.4 Permits
All necessary permits will be acquired. These may include COE Section 404 permits and 401 certifications through the NDDEQ, if project activities have the potential to impact the creek and/or wetlands. The project will work with the NDDEQ to determine if National Pollution Elimination System permits are needed for proposed livestock manure management systems. Cultural Resource concerns and issues will be addressed by following the procedures of the NDDEQ in consulting with the North Dakota State Historical Preservation Officer.

3.5 Appropriateness of the Lead Sponsors
The Mercer County Soil Conservation District will act as the lead sponsor on the project. The sponsor will work with the North Dakota Department of Environmental Quality (NDDEQ) and Natural Resource Conservation Service (NRCS) to determine the need for any environmental permits, such as livestock waste management systems. Project staff will consult with the NDDEQ to determine applicability of current ND livestock manure management regulations.

The Mercer County Soil Conservation District will be responsible for auditing Operation & Maintenance (O & M) agreements on BMP's. After completion of projects, yearly status reviews

will be conducted on all 319 contracts. The life span of each BMP will be listed with each individual contract to ensure longevity of the practice. The producer will be required to sign the "EPA 319 Funding Agreements Provision" form, which explains in detail the consequences of destroying a BMP before its life span is up. The SCDs are locally elected volunteer conservation organizations that serve all people of their counties.

4.0 Coordination Plan

4.1 Agency Roles:

1) The Mercer County SCD will be the lead agency liable for project administration. Conservation planning, technical assistance, educational campaign, clerical assistance, access to equipment and supplies, and annual financial support will be provided by the Mercer County SCD. The Mercer County SCD will prioritize scheduling, coordinate activities and ideas and request letters of support. District personnel will serve as a liaison between watershed residents and USDA program participation.

2) USDA Natural Resources Conservation Service (NRCS). The NRCS will provide technical assistance by coordinating project activities, facilitating local involvement, providing technical support and participating in educational outreach programs during the project. Staff will incorporate existing USDA programs (financial and technical ex. EQIP) and target resources to enhance efforts within the watershed. Existing office space and office equipment use will be made available to the project. An annual review will be conducted with the Field Office, DC and the SCD to reconfirm and acknowledge NRCS's commitment to the project.

3) North Dakota Department of Environmental Quality. The NDDEQ will oversee Section 319 funding and develop the quality assurance project plan (QAPP) along with the sampling and analysis plan (SAP). Training will be provided by the NDDEQ for proper water quality sample collection, preservation and transportation to ensure that reliable data is obtained. NDDEQ will also complete and cover the expense of analysis of water samples.

4) The Mercer County Local Work Group. This work group meets to discuss and set priorities for the SCD. The work group will be engaged to help review and prioritize work within the watershed. The group consists of FSA County Board member, FSA CD, NRCS, SCD Supervisors, County Commissioners, and the general public is always welcome to attend.

5) USDA Farm Service Agency (FSA). The FSA will provide cost-share assistance through the Conservation Reserve Program and will serve as participants on the Local Work Group.

6) North Dakota Extension (NDSU). NDSU Extension will assist in project information and education activities. Local agents will be invited to participate and promote education and outreach events as well as provide materials and/or presentations on relevant topics.

7) The NDSU Manure Management Specialist stationed at the Carrington Research Extension Center will also be used as a resource. This program provides technical assistance to 319 projects and producers to evaluate manure management options for winter feeding areas (confined and unconfined). Coordination and presentation at education and outreach events will also take place.

8) Water Resource Board. The Mercer County Water Resource Board has committed to providing technical and financial assistance of $30,000 for the term of the project. They have state and local funding available to supplement cost-share practices within the project.

9) ND State Forest Service (NDFS). The NDFS has been solicited for financial and technical assistance with riparian areas. Opportunities exist to leverage state funded cost-share resources for conservation practices relating to windbreak installation and renovation.

10) Dakota Prairies RC&D. The RC&D will assist in project information and education activities.

11) The NPS BMP Team. The team is available to provide engineering support for structural BMPs such as manure management systems, stream bank restoration, waterways, etc. The BMP Team is funded with 319 funds to provide free engineering support to producers installing BMPs in watershed project areas.

12) Additional coordination will be done with state and local conservation partners to provide technical support, education, and outreach materials as well as possible additional cost-share funding. These organizations may include ND Game and Fish, Pheasants Forever, and the ND Natural Resources Trust.

4.2 Local Support

Local support for watershed projects has grown in recent years. Producers in the proposed project area are seeing long term beneficial results from practices installed as a part of other projects. There is growing interest in participation to increase sustainable conservation practices on their operations. Currently, 70% of NRCS and 319 contracts are for water and grazing BMPs. The other 30% have contracts for tree plantings, cover crops and grass seedings. They have shown great interest in using 319 dollars. A large amount of support from local producers and sponsors is behind this project.

5.0 Evaluation and Monitoring Plan

A sampling and analysis plan (SAP) (Appendix 5) will be developed by the ND Department of Environmental Quality after the project is fully approved. A copy of the SAP will be included the final approved project implementation plan (PIP).

The SAP will describe the monitoring goals, objectives, and tasks to be initiated to evaluate project progress and success. The time frame for the SAP will be consistent with the approved period for the PIP. A report interpreting data collected through the SAP will be included in the final project report submitted to NDDEQ at the end of the 5-year project period. The water

quality report will summarize the data collected and describe the effectiveness of the project in progressing toward water quality targets and/or beneficial use improvement goals. The SAP will identify and describe:

- Water quality and/or beneficial use monitoring goals, objectives, and tasks
- Specific parameters to be monitored to track progress toward quantified PIP objectives and beneficial use restoration goals
- Sample collection locations, frequencies, and schedules
- Standard operating procedures for data collection, preservation, and transportation
- Responsible parties for data collection

In addition to data collection scheduled in the SAP, interim measures will also be used to evaluate short term progress and inform project management decisions. These measures will include BMP tracking and annual load reductions estimates associated with applied BMP. The NPS Program BMP Tracker Database will be used to document the type, amount, location, and cost of BMP applied in the watershed. This information will be used as a surrogate measure for evaluating producer interest and effectiveness of the technical and financial assistance delivered by the project. The data for BMP types and amounts will also be used to estimate the annual field-edge nitrogen, phosphorus and sediment load reductions associated with applied BMP. Models that may be used to generate these estimates include STEPL, Animal Feedlot Runoff Risk Index Worksheet (AFRRIW) and the Prioritize, Target and Measure Application (PTMApp). The annual load reduction estimates will provide a quantified value to help gauge potential water quality benefits at the subwatershed and/or full watershed scale. All the annual load reduction data will be provided to the NDDEQ and entered in the EPA Grants Reporting and Tracking System (GRTS).

6.0 Budget

See Part I, Part II and Supplemental BMP Budget Table, Appendix 2.

7.0 Public Involvement

Public will be kept informed of news, tours and meetings through newsletters and personnel contacts. Mercer County SCD personnel have done and plan to continue door to door stops throughout the watershed. To get producers involved, phone calls will be made to personally invite producers to meetings and tours. A monthly update is given to Mercer County Water Resource Board, which is printed in the local papers.

Goodman Creek Project Implementation Plan

Appendix List

1. **Mercer County Maps, Tables and Figures**
2. **Budget Tables**
3. **Milestone Table**
4. **Crosswalk for EPA Considerations for an Alternative Plan**
5. **Sampling and Analysis Plan (SAP) for Goodman Creek Watershed**
6. **SAP Maps**
7. **Field & Custody Forms**
8. **2020 Annual Report**

Appendix #1

Mercer County Maps, Tables, and Figures

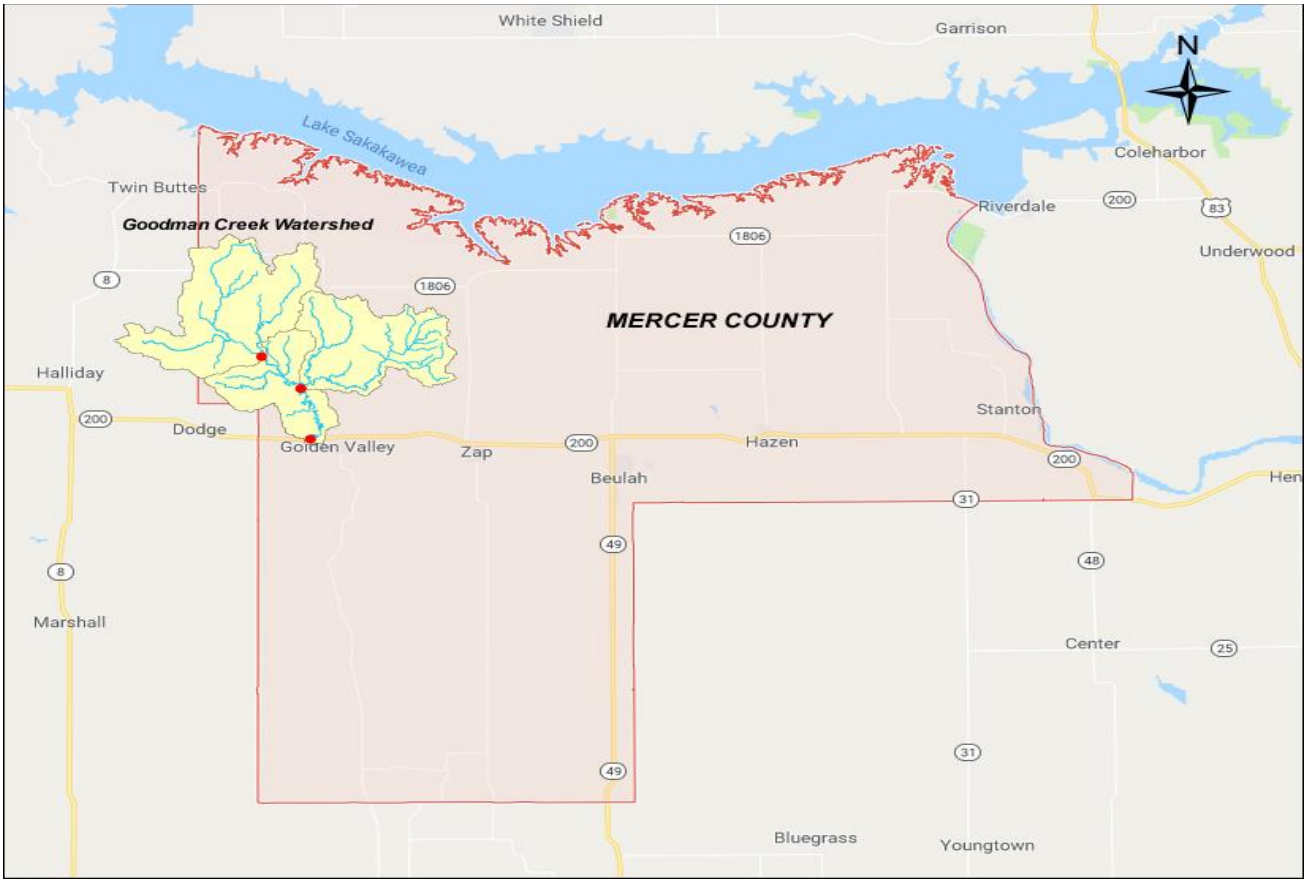

Figure 1. Goodman Creek Watershed Location in Mercer and Dunn Counties.

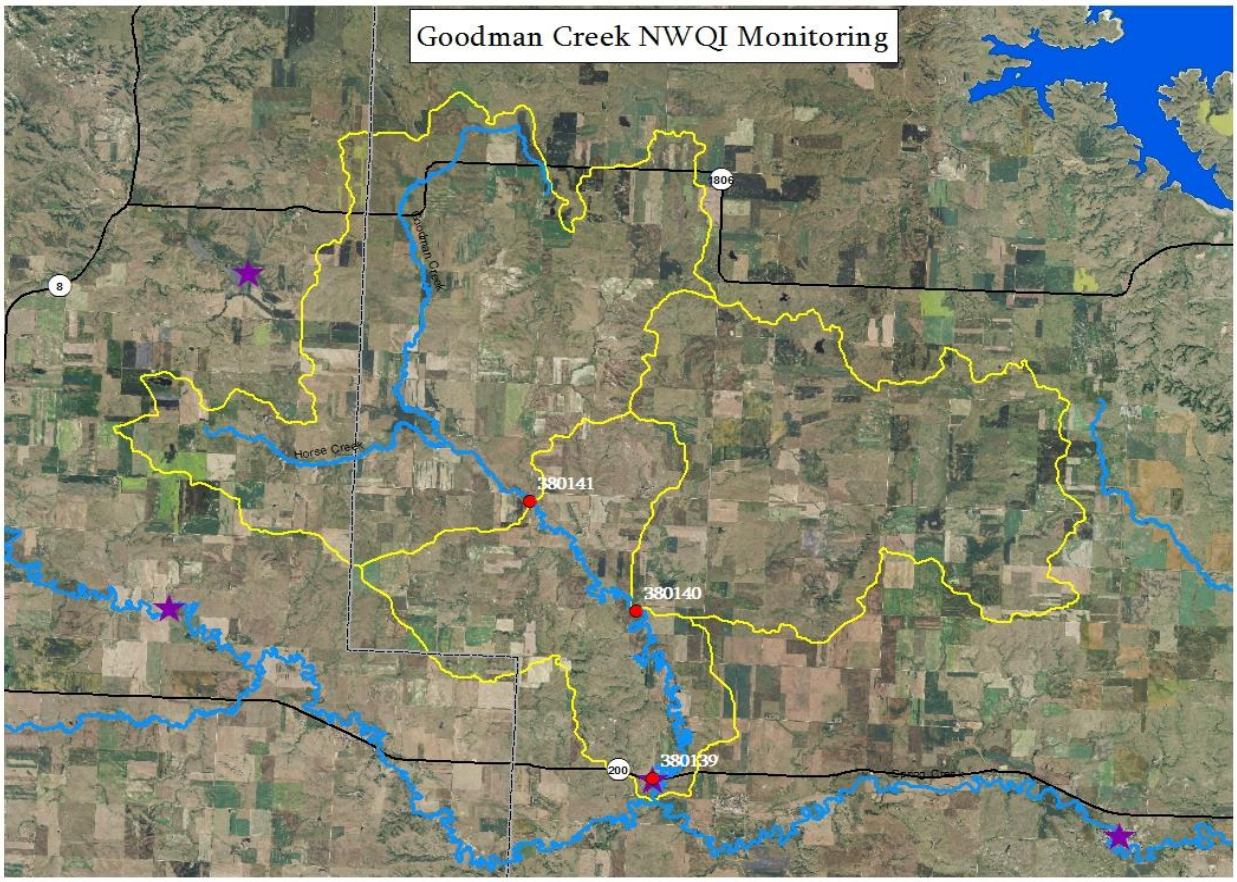

Figure 2. Goodman Creek Water Quality Sampling Locations.

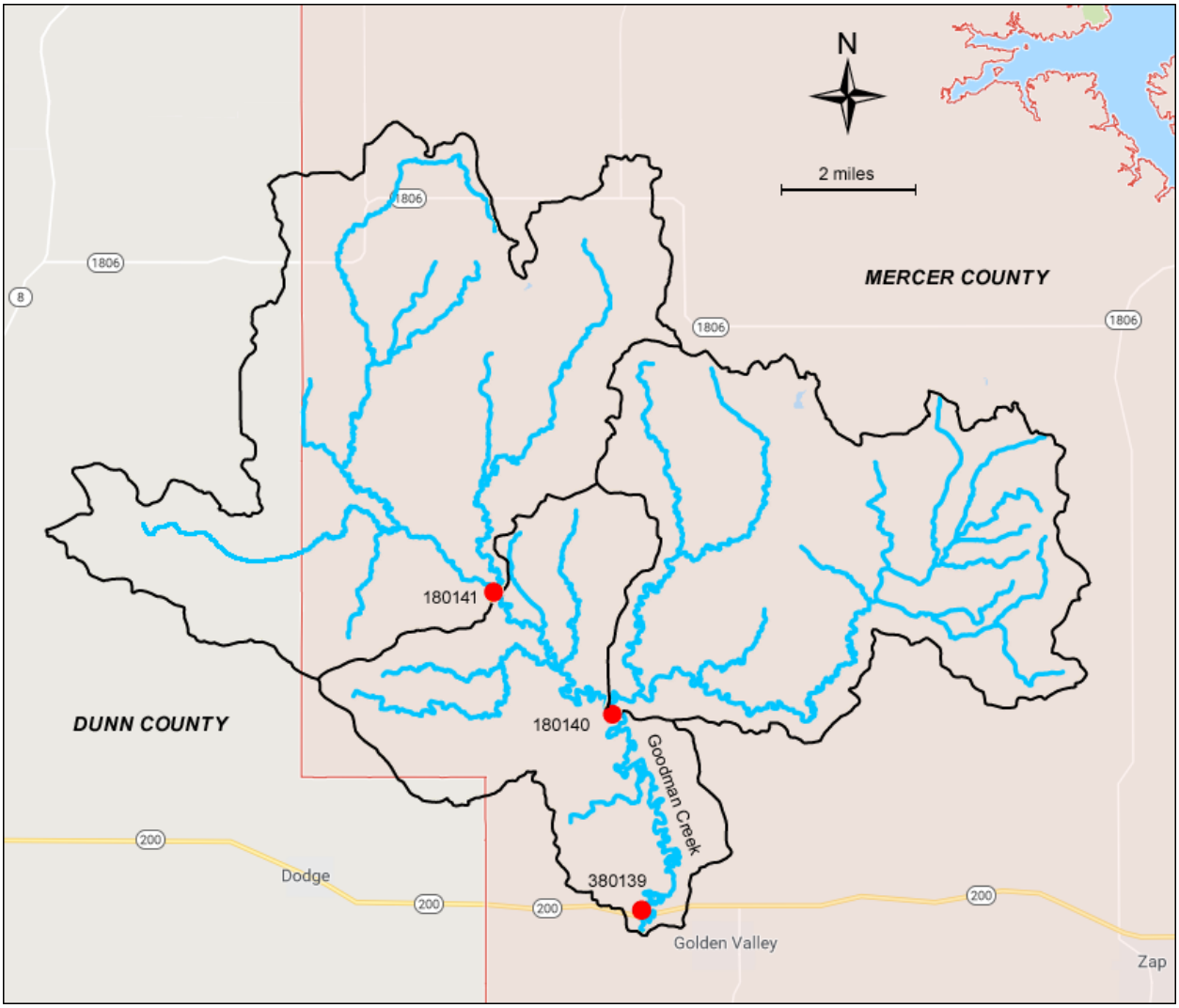

Figure 3. Goodman Creek Watershed Sampling Locations (380139, 380140, 380141) and Two-Mile Area of Interest Along Goodman Creek and its Tributaries.

Table 1. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 380139.

380139	May		June		July		August		September	
	5/8/2012	70	6/4/2012	570	7/10/2012	90	8/8/2012	30	9/12/2012	80
	5/16/2012	70	6/6/2012	8000	7/16/2012	160	8/14/2012	50	9/17/2012	10
	5/23/2012	10	6/26/2012	210	7/23/2012	60	8/15/2012	160	9/18/2012	20
	5/30/2012	150	6/26/2012	300	7/24/2012	130	8/21/2012	50	9/24/2012	10
	5/13/2013	20	6/27/2012	130	7/25/2012	330	8/27/2012	40	9/25/2012	5
	5/14/2013	110	6/4/2013	240	7/31/2012	30	8/29/2012	140	9/26/2012	5
	5/21/2013	4200	6/10/2013	180	7/10/2013	210	8/5/2013	270	9/3/2013	5
	5/12/2014	20	6/12/2013	80	7/15/2013	2500	8/14/2013	130	9/18/2013	80
	5/21/2014	5	6/18/2013	120	7/16/2013	3200	8/19/2013	90	9/23/2013	230
	5/27/2014	1600	6/24/2013	60	7/17/2013	5300	8/21/2013	140	9/24/2013	170
	5/28/2014	480	6/25/2013	300	7/30/2013	270	8/26/2013	180	9/25/2013	110
	5/5/2015	400	6/3/2014	160	7/31/2013	410	8/27/2013	50	9/30/2013	70
	5/12/2015	40	6/9/2014	420	7/1/2014	210	8/6/2014	280	9/3/2014	60
	5/19/2015	110	6/16/2014	160	7/8/2014	500	8/12/2014	310	9/9/2014	100
	5/26/2015	320	6/18/2014	330	7/9/2014	680	8/19/2014	50	9/16/2014	80
	5/3/2016	70	6/23/2014	1300	7/15/2014	450	8/25/2014	370	9/30/2014	400
	5/11/2016	70	6/3/2015	1800	7/22/2014	220	8/26/2014	160	9/15/2015	120
	5/17/2016	70	6/10/2015	270	7/29/2014	210	8/4/2015	220	9/16/2015	800
	5/25/2016	80	6/17/2015	500	7/8/2015	1600	8/5/2015	160	9/21/2015	210
	5/31/2016	160	6/30/2015	2400	7/15/2015	150	8/18/2015	250	9/6/2016	110
	5/1/2017	90	6/2/2016	80	7/21/2015	270	8/26/2015	90	9/14/2016	140
	5/8/2017	20	6/7/2016	300	7/27/2015	170	8/31/2015	80	9/20/2016	130
	5/15/2017	100	6/14/2016	130	7/5/2016	10	8/17/2016	3600	9/21/2016	50
	5/22/2017	800	6/27/2016	230	7/11/2016	70	8/22/2016	800	9/5/2017	50
	5/30/2017	350	6/5/2017	670	7/13/2016	200	8/24/2016	100	9/11/2017	540
			6/12/2017	2000	7/20/2016	70	8/29/2016	250	9/18/2017	420
			6/13/2017	4900	7/26/2016	310	8/31/2016	300	9/20/2017	370
			6/19/2017	7600	7/6/2017	7400	8/2/2017	130	9/25/2017	230
			6/26/2017	12000	7/10/2017	1400	8/7/2017	500		
					7/17/2017	610	8/14/2017	270		
					7/24/2017	250	8/21/2017	300		
					7/31/2017	120	8/28/2017	70		
Geo Mean Implementation	108		471		295		160		80	
% over	16%		38%		34%		9%		14%	
Status	FST		NS		NS		NS		FST	

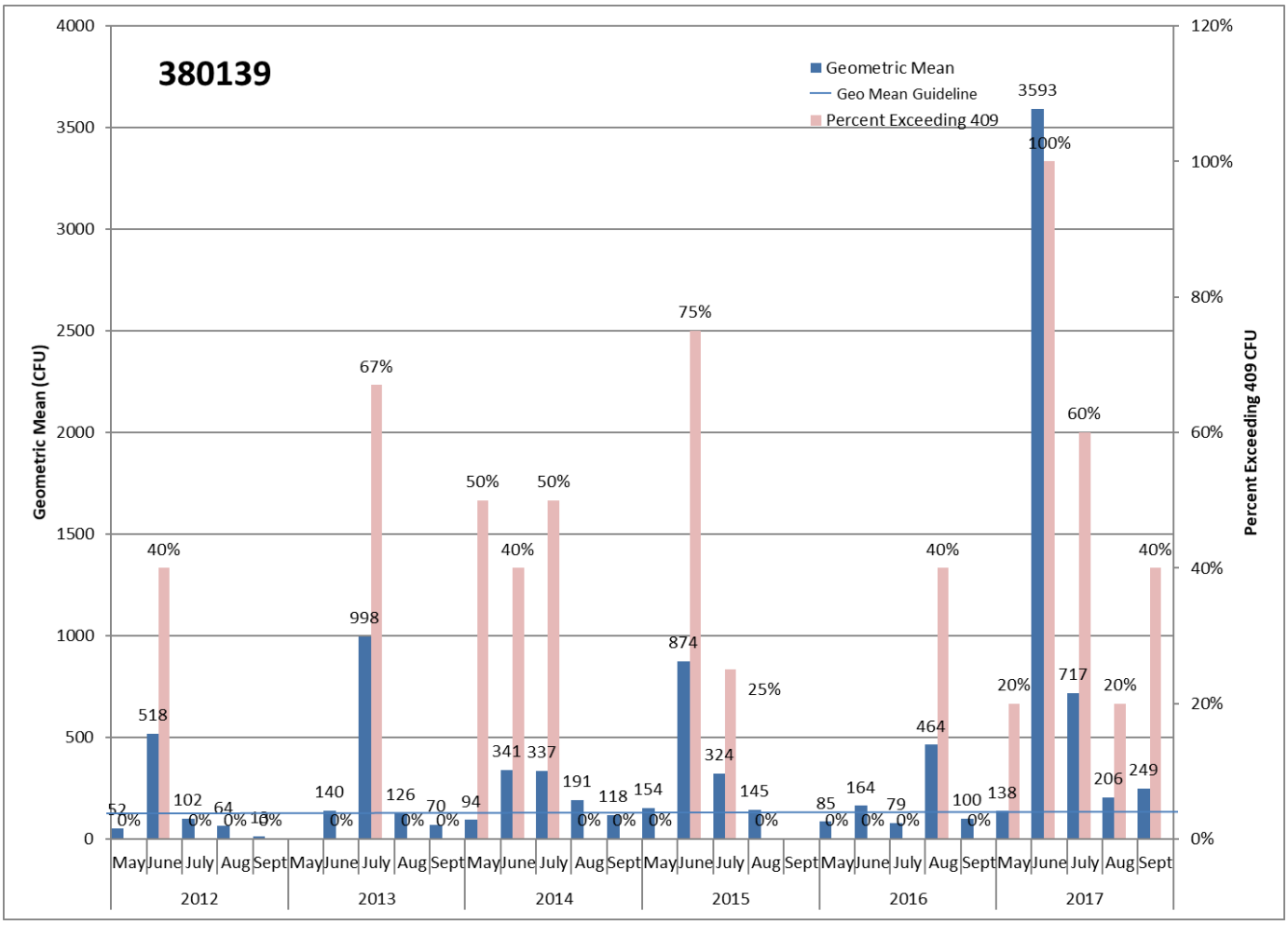

Figure 4. Water Quality Monitoring Station 380139 E. coli Bacteria 30-Day Geometric Mean and Percent Exceedance of 409 CFU During the Recreational Period May 1 through September 30, 2012-2017.

Table 2. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 380140.

380140	May		June		July		August		September	
	5/5/2015	30	6/2/2015	8000	7/8/2015	5	8/5/2015	20	9/15/2015	150
	5/12/2015	40	6/3/2015	2700	7/15/2015	30	8/5/2015	100	9/16/2015	700
	5/19/2015	720	6/10/2015	240	7/21/2015	5	8/18/2015	30	9/21/2015	2000
	5/26/2015	330	6/17/2015	160	7/27/2015	90	8/26/2015	40	9/28/2015	5
			6/24/2015	170			8/31/2015	40	9/30/2015	20
			6/30/2015	30						
Geo Mean	130		402		16		39		116	
#	4		6		4		5		5	
% over	25%		33%		0%		0%		40%	
Status	NS		NS		FS		FS		FST	

Table 3. E. coli Bacteria 30-day Geometric Mean, Percent Exceedance of 409 CFU and Support Status for Sampling Site 380141.

380141	May		June		July		August	September
	5/5/2015	290	6/2/2015	8000	7/8/2015	4500		
	5/12/2015	50	6/3/2015	3700	7/15/2015	5		
	5/19/2015	370	6/10/2015	80	7/21/2015	5		
	5/26/2015	600	6/17/2015	1700				
			6/24/2015	5600				
			6/30/2015	8000				
Geo Mean	238		2377		48			
#	4		6		3			
% over	25%		83%		33%			
Status	NS		NS		FST			

Appendix #2

Budget Tables

Goodman Creek Watershed Project Budget Table

Part I: Funding Sources	SFY20	SFY21	SFY22	In-Kind	Totals
Total EPA Section 319 Funds	$84,015	$95,520	$95,055		$274,590
Subtotal	**$84,015**	**$95,520**	**$95,055**	**$0**	**$274,590**
Other Federal & State Funds	**SFY20**	**SFY20**	**SFY20**		**Total**
Natural Resources Conservation Service (TA[1],EQIP[2], CSP[3])	$25,000	$25,000	$25,000		$75,000
Dakota Prairies Resource Conservation & Development (TA)	$1,000	$1,000	$1,000		$3,000
ND Department of Health (TA)	$3,000	$3,000	$3,000		$9,000
Subtotal	**$29,000**	**$29,000**	**$29,000**		**$87,000**
State & Local Match	**SFY20**	**SFY21**	**SFY22**		**Total**
Mercer County Soil Conservation District (TA & FA)	$4,840	$5,000	$5,000	$1,600	$16,440
Mercer County Water Resource District (TA & FA)	$10,000	$10,000	$10,000		$30,000
ND Forest Service (TA & FA[4])	$5,000	$5,000	$5,000		$15,000
NDSU Extension Service (TA)	$500	$500	$500		$1,500
Landowners (FA)	$34,800	$42,760	$42,560	$12,500	$132,620
Subtotal	**$55,140**	**$63,260**	**$63,060**	**$14,100**	**$195,560**
Total Project Budget	**$168,155**	**$187,780**	**$187,115**	**$14,100**	**$557,150**

[1] TA - Technical Assistance
[2] EQIP - Environmental Quality Incentive Programs
[3] CSP - Conservation Stewardship Programs
[4] FA - Other Financial Assistance
SFY = State Fiscal Year

Part II: Section 319 Non-Federal Budget					Funding			
	SFY20	**SFY21**	**SFY22**	**Total**	**Cash**	**In-Kind**	**319 Match**	**Total**
Personnel/Support								
Salary	$45,000	$45,000	$45,000	$135,000	$54,000		$81,000	$135,000
Administration	$3,000	$3,000	$3,000	$9,000	$2,000	$1,600	$5,400	$9,000
Travel/Training	$1,000	$1,200	$1,000	$3,200	$1,280		$1,920	$3,200
Equipment/Supplies	$2,000	$1,000	$1,000	$4,000	$1,600		$2,400	$4,000
Telephone/Postage	$700	$500	$500	$1,700	$680		$1,020	$1,700
Subtotal	**$51,700**	**$50,700**	**$50,500**	**$152,900**	**$59,560**	**$1,600**	**$91,740**	**$152,900**
Objective 1: Improve Land Management (BMPs)								
Cropland Mgmt Systems	$1,500	$2,000	$1,500	$5,000	$2,000		$3,000	$5,000
Rangeland Mgmt Systems	$48,500	$65,000	$65,000	$178,500	$71,400		$107,100	$178,500
Pasture & Hayland Mgmt Systems	$5,000	$7,900	$7,900	$20,800	$8,320		$12,480	$20,800
Partial Manure Mgmt System	$30,000	$30,000	$30,000	$90,000	$36,000		$54,000	$90,000
Riparian Buffers	$2,000	$2,000	$2,000	$6,000	$2,400		$3,600	$6,000
Prescribed Grazing (InKind)	$2,500	$5,000	$5,000	$12,500		$12,500		$12,500
Subtotal	**$89,500**	**$111,900**	**$111,400**	**$312,800**	**$120,120**	**$12,500**	**$180,180**	**$312,800**
BMP detail is provided in the following Supplemental BMP Budget Table.								
Objective 2: Education & Outreach								
Tours/Seminars	$800	$1,000	$1,000	$2,800	$1,120		$1,680	$2,800
Board outreach and education	$225	$300	$225	$750	$300		$450	$750
Newsletters/Publications	$300	$300	$300	$900	$360		$540	$900
Subtotal	**$1,325**	**$1,600**	**$1,525**	**$4,450**	**$1,780**		**$2,670**	**$4,450**
Objective 4: Water Quality Data Compilation								
Water Quality Assessment	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total 319 Non-Federal Budget	**$142,525**	**$164,200**	**$163,425**	**$470,150**	**$181,460**	**$14,100**	**$274,590**	

APPENDIX #3

Milestone Table

Appendix 3
Milestone Table

Task/Responsible Organization	Group	Output	Qty	SFY 20				SFY 21				SFY 22			
				Quarter*				Quarter*				Quarter*			
				1	2	3	4	1	2	3	4	1	2	3	4
OBJECTIVE 1: Improve Water Quality															
Task 1 - Employ one watershed conservationist	1,2,3,4	Conservation Planning	1 employee	x	x	x	x	x	x	x	x	x	x	x	x
Task 2 - Implement BMP's	1,2,3,4,5	Landowner Asst. & BMPs	10 contracts			x	x	x	x	x	x	x	x	x	x
Task 3 - Manure Management Systems	1,2,3,4,5	Winter Feeding Areas	3 systems			x	x	x	x	x	x	x	x	x	x
Task 4 - Follow- up, monitoring	1,2,3,4,5	Contacts & Assistance	10 contracts			x	x	x	x	x	x	x	x	x	x
OBJECTIVE 2: Outreach & Information															
Task 5- Informational Meetings, Pub. and Tours	1,2,3,4,5	Informational Meetings	6 meetings	x		x		x		x		x		x	
	1	Newsletter Publications	12 newsletters	x	x	x	x	x	x	x	x	x	x	x	x
	1,2,3,4,5	Demonstration Tours	2 tours					x				x			
Task 6 - Watershed Management Awareness	1,2,6	Leadership Academy	3 boards		x						X				X
OBJECTIVE 3: Additional Funding															
Task 7 - Secure additional cost share dollars	1,2,3,4	Additional Cost Share	4 sources	x	x	x	x	x	x	x	x	x	x	x	x
OBJECTIVE 4: Document Water Quality															
Task 8 - 2-year Watershed Assessment	1,4	Assessment Data	4 sources					x	x	x	x	x	x	x	x

Group 1: Mercer County Soil Conservation District - Provides administration, supplies and financial support for the project

Group 2: Mercer County Water Resource Board - Provides technical and financial assistance for the project

Group 3: Natural Resources Conservation Service - Provides technical assistance in the planning, design and installation of BMP's

Group 4: North Dakota Department of Environmental Quality - Oversees Section 319 funding, monitoring and overall evaluation of the project

Group 5: Goodman Creek Watershed Landowners - Make management decisions and provide both cash and in-kind match for BMP's

Group 6: Mercer County Board of Commissioners - Attend the Soil and Water Conservation Leadership Academy

* **Quarter 1** - July/September **Quarter 2** - October/December **Quarter 3** - January/March **Quarter 4** - April/June

APPENDIX #4

Crosswalk for EPA Considerations of an Alternative Plan

CROSSWALK FOR GOODMAN CREEK WATERSHED ALTERNATIVE PLAN AND EPA REGION 8 CONSIDERATION TABLE

This crosswalk was developed to summarize how the Goodman Creek alternative plan addresses the considerations put forth in EPA Region 8's discussion of alternative plans (Table 10.) The number in the summary corresponds to the Alt Plan Considerations Number in the table that follows.

1) Information on Assessment Units and the 303(d) list is provided on Section 2.1. Point and nonpoint sources are discussed in Section 2.5b. Because there are no permitted point sources in the watershed, all contributions are assumed to be nonpoint sources.

2) The target is identified in Section 2.5a, Implementation measures needed to achieve fully supporting recreational beneficial use are identified in Section 3.2, Tasks 2 through 7.

3) Proposed controls are identified as the product of various Tasks in Section 3.2, as well as in the milestone table in Appendix 3.

4) Funding sources are provided in the budget tables of Appendix 2.

5) Agencies involved in this project, along with their roles, are discussed in the coordination plan Section 4.1.

6) The timeframe of WQS will depend on many factors such as landowner interest, economic conditions, weather, etc. Section 5.0 discusses how monitoring and evaluation will be conducted to describe progress towards the established targets (also see Appendix 5, SAP). If progress is not deemed sufficient, a TMDL will be completed. The Implementation Project will run from 2019 to 2022.

7) Effectiveness monitoring is discussed in Section 5.0.

8) This will be done as a part of the effectiveness monitoring (Section 5.0 and Appendix 5). As stated in the introduction, upon project completion, a larger report summary will be written to see if sufficient progress towards the targets have been made. If E. coli water quality standards are not met within a reasonable period after implementation, a TMDL will be developed.

Table 4. Table of EPA Region 8 Summary of the Alternative Plan Considerations

Alt Plan Considerations Number	Alt Plan Considerations Summary Description	Potential Information to Include an Alternative Plan
1	Identify the specific impaired waters, causes, and sources	• Assessment Unit (AU) numbers, descriptions and pollutants that match state's most recent 303(d) list • Include a list or table of all contributing permitted point sources • Identify general nonpoint source (NPS) contributors by category • Include relative source contribution estimates
2	Clearly identify the target(s), consistent with water quality standards (WQS), which will be used to demonstrate restoration. Provide an analysis that shows how planned implementation actions can meet that target(s).	• Clear target(s) consistent with WQS • Load reduction estimates needed to meet the target • Description of the management measures that will need to be implemented to achieve load reductions
3	Provide an implementation plan to address all sources and a schedule with milestones and target dates	• A schedule with proposed controls and target dates • A description of interim measurable milestones
4	Identify sources of available funding to implement the plan	• A table, list, or description of the available funding sources
5	Identify all parties committed to or assisting in implementation	• A table, list, or description of all parties that are committed to or assisting in implementation
6	Provide an estimate or projection of time when WQS will be met	• An estimated date or number of months/years
7	Describe the plans for effectiveness monitoring to show restoration progress and identify corrective measures	• A plan for effectiveness monitoring designed to show restoration progress and identify corrective measures
8	Describe the plans to periodically evaluate the alternative plan to determine if it's on track to more immediately meet WQS, or if adjustments need to be made, or if impaired water should be assigned a higher priority for TMDL development.	• A plan to periodically evaluate the alternative plan to determine if it's on track to meet WQS or if adjustments need to be made

Table 4 is EPA Region 8's summary of the alternative plan considerations and potential information to include in an alternative plan. The full description of the alternative restoration approach, the circumstances to consider, the elements to consider and the use of the 5-

alternative IR category is contained in the 2016 IR memorandum, available at: *https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf*

Appendix #5

Sampling and Analysis Plan (SAP) for Goodman Creek Watershed

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918 E. Divide Avenue
Bismarck, North Dakota 58501
Phone: (701) 328 -5150
Fax: (701) 328-5200

Project Team

Title	Name	Signature
Watershed Coordinator	Mark Johannes	
Lead Watershed Coord.	Brian Kerns	
SAP Author	Jim Collins Jr.	
NPS Manager	Greg Sandness	
Program Manager	Aaron Larsen	

QUALITY CONTROL/QUALITY ASSURANCE DOCUMENTATION

Title: Goodman Creek Watershed Implementation Project SAP
Type: Sampling and Analysis Plan (SAP) – Effective March 11, 2021 thru September 30, 2022
Version: 0
Date: 03/11/2021
Author: Jim Collins Jr.
Project Code: RNIGOODM

REVISION HISTORY

Revision	Change Description	Date	Authorization
0	Document Creation: Revision Tracking Initiated	03/11/2021	

Table of Contents

List of Tables

List of Attachments

1. Monitoring Goals and Objectives

The goal of this sampling and analysis plan (SAP) is to assess the water quality trends in Goodman Creek and its tributaries and determine if the riparian habitat and beneficial uses of being restored through implementation of best management practices (BMPs). The effective period for the SAP is March 2021 – October 2022.

Monitoring objectives for this project will provide data to be used for assessment and trends and evaluation of the Total Maximum Daily Load (TMDL) report for Goodman Creek.

Specific Objectives:

- Collect samples from three (3) STORET sites to assess current water quality condition.
    - A minimum of five (5) samples per month from Goodman Creek stream sites will be collected and analyzed for E. coli bacteria.

2. Project Area Description

The Goodman Creek is a sub-watershed of the 8-digit Hydraulic Unit Code (HUC) Knife River Watershed (10130201 HUC) (Appendix A).

The Goodman Creek Watershed Project is designed to provide technical, financial and educational assistance to landowners within the watershed. The major goal of the project is to achieve and maintain "fully supporting" status for recreational uses of the Goodman Creek watershed by decreasing the annual Escherichia coli bacteria (E. coli.) entering the creek and restoring riparian habitat.

3. Project Contacts

Table 1. Sampling Project Contacts

Name	Role	Email	Phone
Mark Johannes	Watershed Coordinator	Mark.johannes@nd.nacdnet.net	701-764-5646
Brian Kerns	Lead Watershed Coord.	brian.kerns@nd.nacdnet.net	701-873-2101
Jim Collins Jr.	Sampling Plan Author	jcollins@nd.gov	701-328-5161
Greg Sandness	NPS Program Manager	gsandnes@nd.gov	701-328-5232

4. Mercer County Soil Conservation District (SCD) Roles and Responsibilities

The SCD watershed coordinator will conduct the water quality sampling following established NDDEQ standard operating procedures (SOPs). The specific SOP to follow:

- 7.08 Stream or River Grab Sample

The NDDEQ SOPs are managed by Watershed Management Program (WMP) staff. For latest versions visit https://tinyurl.com/WMPMonit or contact WMP staff.

Specifically, the sampling coordinator or SCD, collect and preserve samples for,

- E. coli bacteria

If the sampling coordinator needs more supplies, they will contact the NDDEQ in time to ensure delivery of supplies before the next scheduled sampling event.

Samples will be mailed to:

NDDEQ - Division of Chemistry
2635 East Main
P.O. Box 5520
Bismarck, ND 58501
Phone 701-328-6140

- E. Coli Bacteria samples need to be delivered to the NDDEQ Division of Laboratory Service within **48 hours of collection.**

- E Coli. Samples will not be accepted on **Fridays or Holidays.**

5. Sampling Locations

Currently, three stream water quality monitoring stations have been established by NDDEQ. (Appendix A).

Table 2. Sampling Locations

STORET Site	Description
380139	2 Mi W of Golden Valley at Hwy 200 bridge
380140	3 Mi N, 1.5 Mi W of Golden Valley
380141	6 Mi N, 3 Mi W of Golden Valley

6. Sampling Parameters and Frequency

Parameter	Period	Approximate Dates	Frequency
E. Coli Bacteria	Open, flowing water	May 1 - September 30 each year	Weekly during recreation season
Duplicate Samples Duplicate samples will be collected and submitted for the first sample and every 10th consecutive sample. The bottle will be identified by the **Site Number - 389999** in addition to the site it is a duplicate for.			
Note: The sampling schedule is primarily a guide and the dates may differ under actual conditions. Under **NO** conditions will the safety of the sampler be compromised!			

7. Sampling Preservation and Holding Times

Sites	Sample Type	Analyte Group	Bottle Size	Preservative	Agency
380139 380140 380141	E. Coli Bacteria	33130	120 mL	Chill	SCD
Holding time shall not exceed 48 hours for bacteria samples.					

8. Field Equipment

1) Clear Tape for Bottle Labels
2) Mailing Labels
3) Long-handled dipper
4) 2-Gallon non-metallic bucket
5) Latex Gloves
6) Coolers
7) Freezer Packs
8) Pencils
11) Bottles and Preservatives[2]
12) Field Logs[2]
13) Custody Forms [2]
14) Bottle Labels [2]

[2]supplied by the NDDEQ

9. Health & Safety

Safety is always a primary concern and in all sampling situations for field personnel. In any marginal or questionable situation, monitoring personnel (samplers) are required to assume worst case conditions and use safety precautions and equipment appropriate to that situation. Samplers who encounter conditions which in their best professional judgment may exceed the protection of their safety equipment (PFD, waders, boat, etc.) or may in any way represent a potential hazard to human health and safety (high water levels, ice, etc.) should immediately leave the area and sample at another safer time.

In marginal conditions, it is recommended that there be a minimum of two sampling personnel present in the field. Samplers will wash hands and arms thoroughly with bacterial soap after sampling, before eating and drinking and at the end of the sampling run.

Before heading out to sample, samplers should inform a family member, friend or supervisor when they are leaving for the field and their estimated time of return. Samplers are strongly encouraged to carry a cell phone. In case of emergency call 911.

General safety steps should be followed when on site. Wearing proper equipment (proper shoes or waders, PFD, etc.) and bringing a first aid kit is essential. Identify potential hazards (steep cliffs, barbed wire, broken glass, etc.) both on land and in the water. Follow the general standard that water flows above 1 cfs or that are deeper than knee depth can be hazardous.

10. Decontamination

Goodman Creek is not currently in an area of concern for Aquatic Nuisance Species, therefore decontamination of equipment is not currently required. If required, the NDDEQ follows the U.S. Geological Survey (USGS) recommendations for the cleaning, draining, and drying all equipment. For further instructions please contact WMP staff.

11. Methodologies

All samplers shall attend a training where they were instructed on proper techniques for sampling. Please refer to the NDDEQ Standard Operating Procedures (SOPs) if additional review is needed.

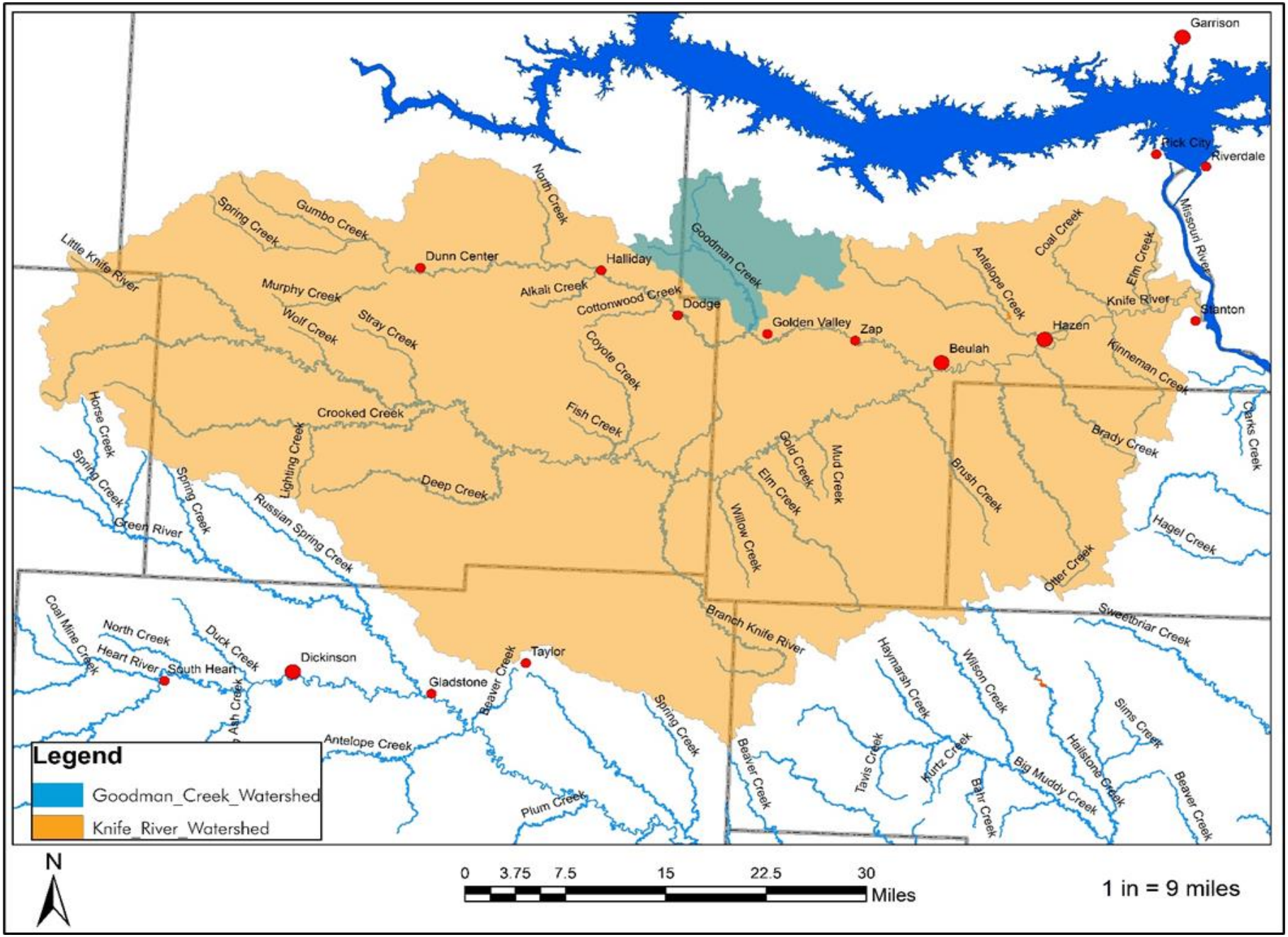
The NDDEQ SOPs are managed by Watershed Management Program (WMP) staff. For latest versions visit https://tinyurl.com/WMPMonit or contact WMP staff. Specific SOPs related to this project are listed in Section 4.

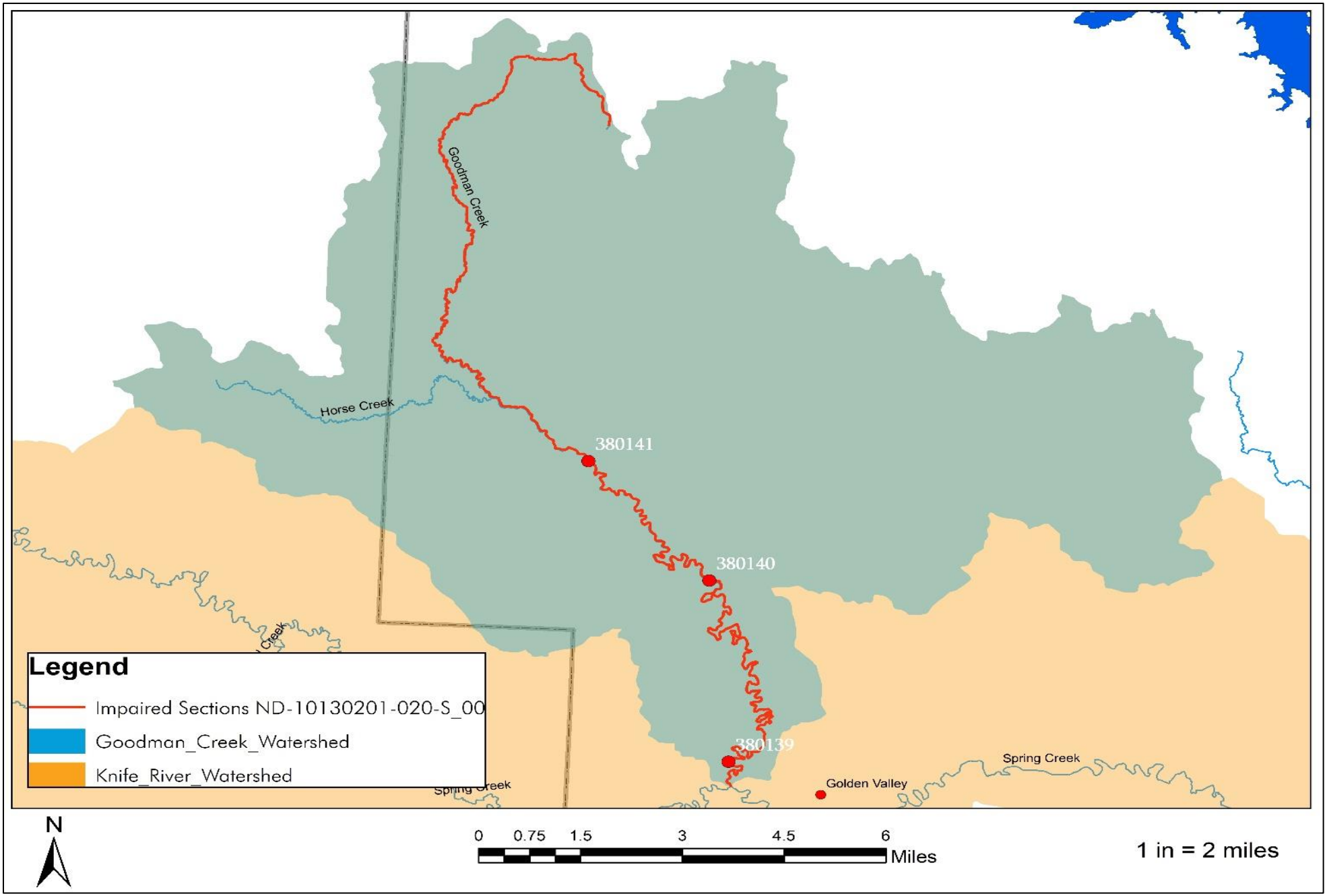
12. QAQC

Samplers are required to collect a duplicate sample on the first and every tenth sample to ensure QAQC.

Appendix #6

SAP Maps


Garrison
Rick City
Riverdale
Missouri River
Stanton
Goodman Creek
North Creek
Spring Creek
Gumbo Creek
Little Knife River
Dunn Center
Halliday
Alkali Creek
Cottonwood Creek
Dodge
Murphy Creek
Wolf Creek
Stray Creek
Coyote Creek
Fish Creek
Crooked Creek
Lightning Creek
Horse Creek
Spring Creek
Green River
Spring Creek
Russian Spring Creek
Deep Creek
Golden Valley
Zap
Beulah
Hazen
Antelope Creek
Coal Creek
Elm Creek
Knife River
Kinneman Creek
Brady Creek
Clarks Creek
Gold Creek
Mud Creek
Elm Creek
Willow Creek
Brush Creek
Hagel Creek
Otter Creek
Branch Knife River
Sweetbriar Creek
Coal Mine Creek
North Creek
Heart River
South Heart
Duck Creek
Dickinson
Gladstone
Taylor
Beaver Creek
Ash Creek
Antelope Creek
Spring Creek
Plum Creek
Beaver Creek
Haymarsh Creek
Wilson Creek
Tavis Creek
Kurtz Creek
Bahr Creek
Big Muddy Creek
Hailstone Creek
Sims Creek
Beaver Creek
Legend
Goodman_Creek_Watershed
Knife_River_Watershed
N
0 3.75 7.5 15 22.5 30
Miles
1 in = 9 miles


Goodman Creek
Horse Creek
380141
380140
380139
Spring Creek
Golden Valley
Spring Creek
Legend
Impaired Sections ND-10130201-020-S_00
Goodman_Creek_Watershed
Knife_River_Watershed
N
0 0.75 1.5 3 4.5 6
Miles
1 in = 2 miles

Appendix #7

Field & Custody Forms

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Water Quality Sample Log

Division of Water Quality
Watershed Management Program
Phone: 701-328-6210 Fax: 701-328-5200

Sample Number	Station ID and Description	Depth	Date	Time	QA/QC		Initials	Comments
					DUP	BLK		

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Mutiple Sample Set
Sheet #_____of_____

Sample Arrival Time-Stamp:_____

CUSTODY RECORD AND ANALYSIS REQUEST – Watershed Management Program

Account #	Project Code:	Project Name:	FOR LABORATORY USE ONLY Nutrient/Nitrate bottle(s) checked for preservation by: Temp of Cooler:
DEQ Program:	DEQ Project #:	DEQ Cost Center #: / Point of Contact/DPM:	
Sampled By:	Sampler Phone #:		
Analysis Requested:	*Collection Method: (See Note)	Matrix: Soil Water Other (explain) _____	Enforcement? Yes No

Lab ID (Enter # from lids of samples here)	Site ID/STORET #	Sample Location (Lat Long or TRS)	Sample Date	Sample Time	# of Bottles	Cooler #	Co-located Site ID and/or Comments	Depth in meters	Field Measurements	
									Temp °C	DO mg/L
									SC µ	pH
									Temp °C	DO mg/L
									SC µ	pH
									Temp °C	DO mg/L
									SC µ	pH
									Temp °C	DO mg/L
									SC µ	pH
									Temp °C	DO mg/L
									SC µ	pH
									Temp °C	DO mg/L
									SC µ	pH

*** Collection Methods (Record Above):** Depth Integrated (DI) ~ Depth/Width Integrated (DWI) ~ Grab ~ 0-2 meter column
When collecting lake samples, you ***MUST*** include the sampling depth(s).

Relinquished by	Date and Time	Received by	Date and Time

Revised 6/15/20

Appendix #8

Project 2020 Annual Report

(9/1/2019 – 8/31/2020)

Without Expenditures

Goodman Creek Watershed Annual Report

Project Name: Goodman Creek Watershed / 319 Nonpoint Implementation

Reporting Period: 9/1/2019 – 8/31/2020 **Project Period**: 9/1/2019 – 2/28/2023

Project Status: On Schedule

Table 5 Cumulative Expenditures on BMP 9/1/2019 – 8/31/2020

BMP Type	Units
Fencing	3640 ln. ft.
Pasture/Hayland Planting	283 ac.
Pipelines	130 ln. ft.
Rural Water Hookup	1 no.
Trough and Tank	1 no.

Project Progress:

Part I:

Goal 1: The primary goal of this watershed project is to restore and maintain the recreational uses of the Goodman Creek within the project area.

Objective 1: Reduce monthly geometric mean concentrations for E. coli to levels below 126 cfu/100ml with less than 10% of the samples exceeding 409cfu/100 ml and achieve an IBI score of Good, or greater than 38, at all established monitoring sites.

Seventy-five water samples were collected May 4, 2020 through September 28, 2020 and sent to ND Department of Environmental Quality for processing. Sampling will continue for the length of the project seasonally. BMPs were implemented to reduce runoff, promote alternate grazing, and remove cattle from direct contact with Goodman Creek and its tributaries. Refer to table 5 for a list of the implemented practices.

Objective 2: Provide outreach and information to both new and existing producers, district supervisors, water resource boards and county commissioners relating to water quality, conservation and the Goodman Creek watershed project.

Producers and land managers are kept informed of the Goodman Creek Watershed Project and the benefits of implementing BMPs through events and publications. A quarterly newsletter is sent out to all producers and managers in the Goodman Creek Watershed that features a dedicated segment to the Watershed. An annual meeting is held with invitations mailed to individuals within the Watershed. The "Coffee Talk" annual meeting, held in February 2020, had approximately fifty attendees. Watershed updates are provided to the Mercer County Water Resource Board during their monthly board meetings with minutes published in local papers. The Watershed is featured on both the Mercer County Soil Conservation District's website and Facebook page. Social media outreach has played a part in attracting "next generation" land owners and land managers.

Objective 3: Secure additional cost share opportunities for Goodman Creek producers to improve water quality and riparian areas.

Mercer County Soil Conservation District has leveraged the Bakken Working Lands ND-Natural Resources Trust program to include producers that are just outside the Watershed but with BMPs implemented, still have an effect on the Watershed's water quality. We have also implemented practices with this program within future watershed project areas to generate interest and provide education on implementing BMPs. The program has been very well received and reflects positively on the Goodman Creek Watershed. The Goodman Creek Watershed Project is partnering with the Mercer County Water Resource Board to provide additional cost share for BMP installation.

Objective 4: Document current water quality and beneficial use conditions as well as identify the types and sources of pollutants that may be or are impairing the beneficial uses of the creeks.

Watershed technicians continually sample water quality within the county to build sufficient data for developing a watershed-based plan. Onsite observations and producer/landowner interactions help define land uses and resource concerns. Watershed projects are discussed at annual meetings and the producers surveyed have provided considerable interest in participation.

Part II:

Task 1: Fill one FTE to provide watershed conservation in Mercer County, providing one-on-one conservation planning assistance to producers in the project area.

Task Status: On Schedule

Watershed conservationists have been employed since the beginning of the project. Watershed coordinators continue to take water samples, contact producers, promote and implement BMP's in the Goodman Creek Watershed area of Mercer County.

Task 2: Minimize livestock impacts to the riparian corridor by improving grazing management on 3,264 acres in the 2-mile priority corridor and installing BMPs to improve riparian vegetation and stream bank stability focusing on producers on or directly adjacent to the creek.

Task Status: On Schedule

We are currently implementing BMPs throughout the watershed. Many different contracts have been issued. Currently there are eleven producers with contracts that have been completed or are the process of being completed in the Goodman Creek Watershed. BMPs not listed in this report but currently in progress include wells, solar pumps, pipelines, fencing and watering facilities. These contracts assist in improving the riparian areas and water quality. Riparian and water quality is improved by providing alternative clean water to the creek. Land management along and adjacent to the creek has been a priority. The Goodman Creek Watershed Project is partnering with the Mercer County Water Resource Board to provide additional cost share for BMP installation.

Task 3: Improve manure management in livestock feeding areas through the implementation and the development of manure management systems for winter feeding areas within one mile of the creek.

Task Status: On Schedule

The scale and expense of manure management systems along with the limited number of producers in the watershed are proving to be challenging. Outreach and discussions on implementing these systems are ongoing. Some do not have the land resources to comply; others are overwhelmed by logistics and expense. We continue to gently promote these systems by working with producers on smaller projects such as cover crop and hayland plantings. Even with these challenges, there are several winter feeding on cropland projects in progress.

Task 4: Conduct follow-up to contacts assisting with conservation plan updates and monitor O&M of 319 cost shared practices.

Task Status: On Schedule

Producers with contracts are contacted by the watershed coordinators for updates on progress of BMP installation. BMPs are inspected when they are complete to make sure they meet specifications. Contact follow-ups are done yearly through status reviews. Contracts will be reviewed again this winter and producers will be contacted on the status of what needs to be completed.

Task 5: Continue to inform the producers and land managers of the Goodman Creek Watershed Project on the benefits of implementing BMPs though meetings and tours. Present at other agency meetings in the area.

Task Status: On Schedule

Meting producers and land managers in the field one-on-one has been very productive. Discussing other projects that are in the area and encouraging producers to talk to neighbors that have completed or are in the process of installing a watershed project. We are in the process of adapting to the current social distancing standards to design a meeting that can be safely held and still be productive promoting the watershed. We have focused on the "next generation" of producers and find these people to be concerned with conservation and very receptive to adapting BMPs. Currently there are three producers with various watershed projects.

Task 6: Work with SCD Board Supervisors, Water Resource Board members and County Commissioners

to increase awareness of watershed management objectives and resources through meetings, classes and tours.

Task Status: On Schedule

Mercer County SCD Board Supervisors have participated in the Soil and Water Conservation Leadership Academy. The yearly 5th grade tour has been cancelled this year due to social distancing restrictions within the county's school system. We are investigating alternative methods to group meetings to engage people in watershed and conservation education.

Task 7: Work with other agencies to seek out additional cost share dollars for producers. Look for other grant opportunities to provide additional cost share.

Task Status: On Schedule

Mercer County Soil Conservation District has leveraged the Bakken Working Lands ND-Natural Resources Trust program to include producers that are just outside the Watershed but with BMPs implemented, still have an effect on the Watershed's water quality. We have also implemented practices with this program within future watershed project areas to generate interest and provide education on implementing BMPs. The program has been very well received and reflects positively on the Goodman Creek Watershed. The Goodman Creek Watershed Project is partnering with the Mercer County Water Resource Board to provide additional cost share for BMP installation.

Task 8: Coordinate with NDDH to complete a 2-year Watershed Assessment to collect water quality, macroinvertebrate and land use data to identify all resource concerns in the watershed. Also conduct landowner/producer surveys to gauge potential interest in participating in future watershed management projects.

Task Status: On Schedule

Watershed technicians continually sample water quality within the county to build sufficient data for developing a watershed-based plan. Onsite observations and producer/landowner interactions help define land uses and resource concerns. Watershed projects are discussed and promoted at every one-on-one meeting with producers.

Local Comments and Recommendations:

The Mercer County SCD board is very happy with the progress of the watershed program. Updates are given to Mercer County Water Resource Boards, and they are very pleased with the project as well. There has been increased interest in alternative water sources and cost share programs for water. In addition, fall cover crops have also been used as a tool to introduce producers to the watershed project. Several historically resistant producers have inquired and have open contracts; this has led to additional discussion on other practices that can be implemented.