

Alternative Plan for Timber Coulee Watershed in Ransom County, North Dakota

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Prepared for:

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**NORTH DAKOTA DEPARTMENT OF HEALTH
Division of Water Quality**

Introduction: This is an alternative plan submitted for the Timber Coulee watershed. The North Dakota Department of Health, Watershed Management Program believes that since Best Management Practices (BMPs) have already been initiated through a Section 319 Nonpoint Source 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 impairment in a reasonable amount of time, a TMDL will be written. The data gathered as a part of this 319 grant will be beneficial to the creation of the TMDL.

This document is a modified version of the Section 319 Project Implementation Plan. A crosswalk for how this document meets EPA's considerations for an alternative plan is included in Appendix C.

1.0 ALTERNATIVE PLAN FOR TIMBER COULEE WATERSHED PROJECT

Timber Coulee Watershed Project

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State - North Dakota

Watershed – Timber Coulee

Hydrological Unit Code – 90202040406

High priority Watershed - yes

Project Type

Waterbody Types

NPS Category

Watershed

Stream/River/Lake

Agricultural

Project Location: Latitude - 46 degrees 26 minutes Longitude - 97 degrees 41 minutes

Major Goals: The main goal of this watershed project is to restore the recreational use of the Timber Coulee Watershed in Ransom County. This will be accomplished by containing livestock waste from 2 animal feeding operations (AFOs) located within the Timber Coulee Watershed (Appendix A4). These 2 AFOs were identified as being critical during a land use assessment. The recreational use can also be restored by reducing the pathogen inputs (E.coli bacteria) from 2,380 acres of pasture/rangeland in the high priority areas outlined in Appendix A5. These acres were identified as being critical during the land use assessment. The project goal will be accomplished by providing financial and technical assistance for conservation planning, best management practice (BMP) implementation and promoting a strong informational/educational (I/E) program. The I/E program will focus on providing farmers and ranchers information on the causes and effects of non-point source (NPS) pollution and ways to reduce or eliminate NPS pollution.

Project Description: Water samples collected from 2002 to 2009 show that status of Timber Coulee is “not supporting” for recreation beneficial use due to elevated levels of fecal coliform bacteria (see section 2.5). The Ransom County Soil Conservation District and (NRCS) will provide financial and

technical assistance for conservation planning and provide increased emphasis on NPS pollution within their I/E program. Through these efforts the project sponsors plan to address the following: 1) Reduce the pathogen input from 2 AFOs located within close proximity to Timber Coulee, 2) Reduce the pathogen input from 2,380 acres of pasture/rangeland within the Timber Coulee Watershed, 3) Document water quality improvements as BMPs are installed by monitoring water quality trends and land use changes through a water sampling plan, and 4) Increase public awareness to the causes, effects and solutions to NPS pollution. Funds provided by various USDA programs, the Section 319 program and the Outdoor Heritage Fund (OHF) (Appendix B1) will be used to provide financial and technical assistance for the implementation of planned BMPs and scheduled I/E activities.

Funding

FY 2015 319 Funds requested: \$324,990

Match: \$217,060 OHF Funds: \$25,000

Other Federal Funds \$40,000

Total Project Cost: \$610,650 319 Funded Full Time Personnel: 0.5

2.0 Statement of Need

2.1-2.2 Project Reference/Waterbody Description

The project will focus on Timber Coulee, which is a tributary to the Sheyenne River in Ransom County. The Timber Coulee Watershed (HUC 090202040406) begins in central Ransom and ends where Timber Coulee empties into the Sheyenne River, approximately 1.5 miles south of Lisbon, ND (Appendix A1). There are approximately 33 stream miles within the watershed and the watershed covers 29,200 acres. Timber Coulee flows intermittently throughout the year, with flows primarily influenced by spring snowmelt and spring, summer and fall rains.

The 2014 Integrated Section 305(b) and 303(d) report lists Timber Coulee (Assessment Unit ID: ND-09020204-023-S-00) as “fully supporting, but threatened” for the designated use recreation. The cause of impairment is E. coli bacteria. Water quality analysis of samples collected from 2002-2009 and 2015 indicate similar problems. The primary sources of E. coli bacteria within Timber Coulee include 2 animal feeding operations and riparian areas impacted by excessive livestock grazing. Maps showing the location of the 2 priority animal feeding operations and the priority grazing acres are provided in Appendices A4 and A5. The amount of pollutants delivered from either of these sources is dependent upon: 1) existing management practices; 2) precipitation amounts, intensities and frequencies as well as; 3) the number of livestock and duration they are in priority areas. All of these factors are extremely variable, which makes it very difficult to assign a specific annual contribution value to either source. As such, the contributions from the feeding areas versus the riparian pastures will be considered approximately equal for the purposes of delivering technical and financial assistance. All the riparian pastures identified on the Agricultural Non-Point Source Pollution Model (AnnAGNPS) maps in Appendix A5 are considered high priority areas. While the AnnAGNPS model identifies nitrogen, phosphorus, and sediment loading in riparian areas, the same livestock that contribute these pollutants also contribute E. coli bacteria along the same pathway (i.e. overland runoff) so the maps are considered useful in identifying areas to target. With livestock grazing, the areas that contribute large amounts of nutrients and sediment are also going to contribute large amounts of bacteria as well. Data collected during the project will be used to determine if more assistance needs to be shifted toward either source to better address the E. coli impairments.

Approximately 28 farmsteads, a trailer court, and one town, Elliot (population: 25), are located in the watershed. All the residents utilize privately-owned, onsite waste treatment systems to treat household wastes. At the time of the initial grant application, these were not deemed to be a significant source. Once the project was initiated, reconnaissance of the watershed located a few dwellings that needed further investigation. Approximately 12 dwellings, including those in the trailer court, near the confluence of Timber Coulee and the Sheyenne River will be evaluated in the fall/winter of 2017 to determine if any have failed. Septic systems throughout the rest of the watershed are not believed to contribute, but will be evaluated as a secondary objective. Information provided by the NDDoH NDPDES personnel indicates no permitted point sources discharging into Timber Coulee.

See section 2.5 for more water quality information.

2.3 Maps

An Annualized Agricultural NonPoint Source Pollution (AnnAGNPS) model was developed for the Timber Coulee watershed. The AnnAGNPS model uses soils, fertilization rates, cropping systems, elevation, land use, precipitation data, etc. to 1) characterize the size and shape of the watershed; 2) estimate nitrogen, phosphorus and sediment yields per cell in the watershed; and 3) identify “high priority areas” that are potentially the most significant sources of nutrients (N and P) and sediment in the watershed. This information will be used in conjunction with known livestock feeding areas to identify highest priority areas for BMPs. As mentioned above, the areas identified with the potentially significant sources of nutrients and sediment will also be the most significant sources of bacteria in areas known for livestock grazing (e.g. riparian areas, pastures, etc.).

The AnnAGNPS model delineated a total of 4,434 “assessment” cells in the watershed to evaluate the relative pollutant contributions from the different land uses and locations in the watershed. The average size of the cells is 6.58 acres.

To direct the focus of the project toward the highest priority cells delineated by AnnAGNPS, all the cells in the watershed were ranked from highest to lowest with respect to nitrogen, phosphorus and sediment yield and plotted on a chart to establish priorities. Cell #1 nearest the y-axis of the chart had the highest yield, with subsequent cells along the x-axis having declining yields. To identify the highest priority cells, a straight/best fit line was visually placed over the flattest portion of the ranked plot values. The point on the line at which the cell yield values begin to significantly deviate from the “best fit” line was used as a starting point for defining the yield values for the high priority cells. To establish a reasonable workload for the project size and length, the high priority cells initially identified by the AnnAGNPS model were adjusted further (higher/lower) to establish the final list of high priority cells shown on the AnnAGNPS priority maps in Appendix A5. Google Earth and observations were used to identify the priority animal feeding operations in the watershed and the AnnAGNPS priority maps for non-cropland will also be used to provide direction for delivering assistance for riparian grazing management.

The high priority AnnAGNPS cells will be targeted for the delivery of assistance to producers with the evaluation of resource management needs and the implementation of BMPs that reduce/prevent the delivery of E. coli bacteria to Timber Coulee. Given the sources of the E. coli

bacteria, the project will focus on assisting producers managing land within the AnnAGNPS non-cropland priority areas, unless cover crops are being used to expand forage options and improve grazing management. Under such scenarios, cropland acres would also be included in the grazing and/or manure management plans. If the project enters into a second phase, the AnnAGNPS model will be re-run to establish new high priority areas. Appendix A includes the AnnAGNPS priority maps as well as other maps of the watershed, sampling site locations, etc.

The AnnAGNPS model was not used to identify priorities for livestock concentration areas. Instead, local knowledge of the watershed and best professional judgment was used to identify the 2 priority livestock feeding operations in the watershed. Project staff will work with the owners/operators of these systems to evaluate management options and develop plans to address manure management on each site.

2.4 General Information

The Timber Coulee Watershed in Ransom County covers approximately 29,200 acres in Ransom County in Southeastern North Dakota. The watershed lies within the Central Black Glaciated Plains (Appendix A2). The two dominant soils associations in the Timber Coulee Watershed are the Barnes-Svea-Hamerly complex 70% and the Gwinner-Hamerly-Parnell complex 30%. The Barnes-Svea-Hamerly association consists of level to gently rolling topography with knolls, discontinuous ridges, and depressions. The Gwinner-Hamerly-Parnell association is characterized by nearly level topography with swales, knolls and depressions. The major land use is for cultivating crops. As a result, wind and water erosion can be a concern on these soils. The average annual soil loss (T) ranges from 2 – 5 tons/acre/year.

The climate of this region is subhumid. The average annual precipitation is approximately 19 inches. 78%, about 15 inches, occurs during the growing season of April through September. Average snowfall is approximately 34 inches. The average daily summer temperature is 85 degrees Fahrenheit. Northwest is the prevailing wind direction. 11.5 miles per hour is the average annual wind speed.

Land use within the Timber Coulee Watershed is primarily agricultural. The watershed is approximately 78% cropland, 12% range/pasture, 4% CRP, 3% developed, 2% hayland, 1% woodland. The major crops grown are corn, soybeans, spring wheat and sunflowers. Minor crops are dry beans, millet, potatoes and winter wheat. Spring wheat, corn, soybeans is a typical rotation within the watershed. The livestock enterprises are primarily cow/calf operations. Calves are backgrounded through the winter months in feedlots.

2.5 Water Quality

Fecal Coliform and E. coli Bacteria

Effective January 2011, the Department revised the state water quality standards (NDDoH, 2011). In these latest revisions, the Department eliminated the fecal coliform bacteria standard, retaining only the E. coli bacteria standard for the protection of recreational uses. Table 1. provides a summary of the current numeric E. coli bacteria criteria that apply to all streams as well as the former fecal coliform bacteria standard. The E. coli bacteria standard applies only during the recreation season from May 1 to September 30.

Table 1. North Dakota Fecal Coliform and E. coli Bacteria Numeric Standards for all Streams.

Parameter	Standard	
	Geometric Mean ¹	Maximum ²
E. coli Bacteria	126 CFU/100 mL	409 CFU/100 mL
Fecal Coliform Bacteria ³	200 CFU/100 mL ³	400 CFU/100 mL ³

¹Expressed as a geometric mean of representative samples collected during any consecutive 30-day period.

²No more than 10 percent of samples collected during any consecutive 30-day period shall individually exceed the standard.

³Previous State water quality standard.

While the state of North Dakota is now using an E. coli bacteria standard, it should be noted, very little E. coli data is available for Timber Coulee; therefore, fecal coliform bacteria data was used to calculate a geometric mean, percent exceeded and recreational use assessment for this data summary. However, to evaluate project progress, the department will assess attainment of the E. coli standard through additional monitoring consistent with the state's water quality standards and beneficial use assessment methodology.

Station 385170 is located on Timber Creek near Lisbon, ND (Appendix A3). In total, 54 fecal coliform bacteria samples were collected and analyzed from 2002 through 2009.

Analysis of fecal coliform bacteria data collected at site 385170 in 2002 through 2009, demonstrated that the months of May, June and July were not supporting the recreational beneficial use. The months of August and September could not be calculated due to an insufficient number of samples. The water quality data indicates that Timber Creek has no flow conditions during the months of August and September making data analysis and recreational use assessment difficult. Data for this analysis is provided in Table 2.

Table 2. Fecal Coliform Bacteria Number of samples, 30-day Geometric Mean, Percent Exceedance of 400 CFU/100 mL and Support Status for Sampling Site 385170.

	May		June		July		August		September	
	01-May-02	50	03-Jun-02	30	10-Jul-02	1500	08-Aug-05	90	06-Sep-05	80
	07-May-02	270	10-Jun-02	110	11-Jul-02	380				
	09-May-02	20	09-Jun-03	570	15-Jul-02	620				
	14-May-02	40	25-Jun-03	1600	16-Jul-02	320				
	28-May-02	10	06-Jun-05	320	14-Jul-03	790				
	06-May-03	1600	21-Jun-05	1600	11-Jul-05	1600				
	14-May-03	1600	27-Jun-05	660	07-Jul-09	120				
	19-May-03	270	07-Jun-06	200	13-Jul-09	360				
	03-May-05	180	14-Jun-06	1600	29-Jul-09	460				
	09-May-05	460	26-Jun-06	550						
	16-May-05	360	10-Jun-07	700						
	02-May-06	150	26-Jun-07	500						
	11-May-06	470	03-Jun-08	990						
	22-May-06	1300	16-Jun-08	440						
	01-May-07	200	24-Jun-08	350						
	09-May-07	120	03-Jun-09	500						
	16-May-07	750	08-Jun-09	2900						
	22-May-07	30	22-Jun-09	620						
	31-May-07	1000	29-Jun-09	100						
	05-May-08	530								
	12-May-08	320								
	19-May-08	70								
	27-May-08	120								
	19-May-09	460								
# Samples	24		19		9		1		1	
Geometric Mean	213		479		521		N/A		N/A	
% Exceeded 400 CFU/100	38%		68%		56%		N/A		N/A	
Recreational Use	Not Supporting		Not Supporting		Not Supporting		INSFD		INSFD	

The data indicates that the potential sources of bacteria are from grazing and watering of livestock and animal feeding operations in close proximity to Timber Coulee.

Overall, water quality results indicate serious water quality concerns within the project area. These concerns can be addressed if the project moves into implementation. The recreation use of Timber Coulee can be restored to fully supporting by positive changes in land management and land use. The installation of BMPs, such as ag waste management systems, prescribed grazing systems and riparian easements in critical areas, will reduce levels of fecal coliform bacteria in Timber Coulee.

Recreational Use Support Assessment Methodology

Recreation use is any activity that relies on water for sport and enjoyment. Recreation use includes primary contact activities such as swimming and wading and secondary contact activities such as boating, fishing, and bathing. The status of recreation 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 recreation use support assessment methodology for rivers and streams is based on the State’s numeric water quality standards for E. coli bacteria.

For each assessment based 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.

For each assessment based on fecal coliform 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 200 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: Criteria 1 is not met. Criteria 2 may or may not be met

Based on the data, recreational use assessment for Timber Coulee is not supporting recreational use due to bacteria impairment.

Sources of Pollution

Typical sources of pollution within the Timber Coulee Watershed can be linked to agricultural runoff. Overland flows contribute significant fertilizer and pesticide runoff causing nutrient impairments. Animal feeding operations and riparian grazing are also a contributor to nutrient impairments and E. Coli bacteria. Land use within the watershed consists of extensively tilled landscapes and expansive cropland acres that leave the land exposed and susceptible to wind and water erosion and contribute to sedimentation in waterways.

Within the Timber Coulee Watershed, it was determined that livestock are the main contributor to E. Coli bacteria impairments, with leaking septic systems a possible second source. Two large AFOs were identified as being a priority in the contribution of livestock waste. Reducing pathogen input from high priority pasture areas determined in a land use assessment is also critical. While all of the dwellings in the watershed use privately-owned, onsite waste treatment systems, a small group of approximately 12 dwellings that are near the confluence of Timber Coulee with the Sheyenne River will be surveyed to determine if they also contribute E. coli. Information provided by NDDoH NDPDES personnel indicate there are no permitted point

sources of E. coli bacteria located within the Timber coulee watershed. Funds will be targeted to reduce E. coli bacteria inputs through the implementation of BMP's. Tables 2 through 5 indicate how BMPs will help reduce bacteria.

Table 2. Nonpoint Sources of Pollution and Their Potential to Pollute at a Given Flow Regime.

Nonpoint Sources	Flows		
	High Flow	Medium Flow	Low Flow
Riparian Area Grazing (Livestock)	H	H	H
Animal Feeding Operations	H	M	L
Manure Application to Crop and Range Land	H	M	L
Intensive Upland Grazing (Livestock)	H	M	L

Note: Potential importance of nonpoint source area to contribute fecal coliform bacteria loads under a given flow regime. (H: High; M: Medium; L: Low)

Table 3. Management Practices and Flow Regimes Affected by Implementation of BMPs

Management Practice	Flow Regime and Expected Reduction		
	High Flow/ 70% Reduction	Moderate Flow/ 80% Reduction	Low Flow/ 74% Reduction
Livestock Exclusion From Riparian Area	X	X	X
Water Well and Tank Development	X	X	X
Prescribed Grazing	X	X	X
Waste Management System	X	X	
Vegetative Filter Strip		X	
Septic System Repair		X	X

Table 4. Bacterial Water Quality Responses to Four Grazing Strategies (Tiedemann et al., 1988)

Grazing Strategy		Geometric Mean CFU
Strategy A:	Ungrazed	40/L
Strategy B:	Grazing without management for livestock distribution; 20.3 ac/AUM.	150/L
Strategy C:	Grazing with management for livestock distribution: fencing and water developments; 19.0 ac/AUM	90/L
Strategy D:	Intensive grazing management, including practices to attain uniform livestock distribution and improve forage production with cultural practices such as seeding, fertilizing, and forest thinning; 6.9 ac/AUM	950/L

Table 5. Relative Gross Effectiveness of Confined Livestock Control Measures (Pennsylvania State University, 1992a)

Practice ^b Category	Runoff ^c Volume	Total ^d Phosphorus (%)	Total ^d Nitrogen (%)	Sediment (%)	Fecal Bacteria (%)
Animal Waste System ^e	-	90	80	60	85
Diversion System ^f	-	70	45	NA	NA
Filter Strips ^g	-	85	NA	60	55
Terrace System	-	85	55	80	NA
Containment Structures ^h	-	60	65	70	90

NA = Not Available

a Actual effectiveness depends on site-specific conditions. Values are not cumulative between practice categories.

b Each category includes several specific types of practices.

c - = reduction; + = increase; 0 = no change in surface runoff.

d Total phosphorus includes total and dissolved phosphorus; total nitrogen includes organic-N, ammonia-N, and nitrate-N

e Includes methods for collecting, storing, and disposing of runoff and process-generated wastewater.

f Specific practices include diversion of uncontaminated water from confinement facilities.

g Includes all practices that reduce contaminant losses using vegetative control measures.

h Includes such practices as waste storage ponds, waste storage structures, and waste treatment lagoons.

BMP Implementation Status Update, September 2017

The project is currently working with one of the AFO owners identified in the project plan to design a manure management system for his livestock feeding area. Pasture and riparian BMPs are underway throughout the watershed. Annual reports identifying achievements can be found on EPA's Grant Reporting and Tracking System (GRTS) website at <https://ofmpub.epa.gov/apex/grts/f?p=109:987:::NO> The septic systems that are identified after the initiation of the project as potential sources will have the owners contacted and evaluations begin in the fall/winter of 2017. Follow up will also continue to investigate if other septic systems could be potential sources. Once the extent of the issue has been identified, funds will be reallocated or a supplemental grant will be written to request funds to address reducing source contribution.

3.0 Project Description

3.1 Goals

The goal of this project is to restore the recreational use of the Timber Coulee Watershed in Ransom County. This will be accomplished by the following objectives and tasks.

3.2 Objectives

Objective 1- Hire staff to coordinate and organize the project with other local agencies (i.e. NRCS, NDSU EXT, water resource, county and city boards) and provide technical assistance to farmers and ranchers in the Timber Coulee Watershed.

Task 1- Employ one watershed coordinator to coordinate the project and provide one-on-one conservation planning assistance to producers in the project area. Includes salary/fringe, travel, equipment, training and telephone.

Product- One watershed coordinator (1/2 time)

Cost – \$130,650

Objective 2- Achieve recreational water quality standard concentrations for E. coli bacteria to a geometric mean of 126 colonies with less than 10% of the samples exceeding 409 colonies in Timber Coulee, (please reference appendix A2 for locations of the sampling site within the watershed). To achieve the recreational standard, the current monthly geometric mean concentrations during the recreational season will need to be reduced by 50% - 75%, with less than 10% of the monthly samples exceeding 409 CFU/100ml.

Task 2- Provide assistance to livestock producers to install 2 waste management plans and install prescribed BMPs.

Product – Plan to install livestock waste management systems over the next 3.5 years; one in 2015 and one in 2016 (Appendix A3)

Cost - \$155,000

Task 3 – Provide assistance to livestock producers within the Timber Coulee Watershed to install BMPs in critical riparian grazing areas (Appendix A4)

Product - BMPs on 2,380 acres of pasture/rangeland

Cost - \$313,000

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

Product – Database of applied BMPs.

Cost – Included in cost for Task 1

Objective 3 – Document long-term and short-term water quality improvements by monitoring water quality trends as BMPs are installed.

Task 5– Obtain sample collection training and collect samples throughout the project period to document changes in water quality trends as BMPs are installed. Samples will be collected according to the QAPP for Timber Coulee.

Product – Minimum of 28 water quality samples/site/year

Cost – included in Task 1

Task 6– Compile water quality data and BMP installation records to track project efficiency. Conduct survey of septic systems.

Product- Update BMP tracker as BMP's are installed over project life

Cost – Included in cost for Task 1

Product- Documentation of land use and water quality trends to incorporate into annual reports and final report. This includes the septic survey.

Cost- Included in cost for Task 1.

Objective 4- Increase public awareness on the impacts of and solutions to NPS pollution.

Task 7 – Organize and conduct I/E events that focus on NPS pollution control within the watershed and coordinate with ongoing state/federal sponsored I/E programs.

Product – Four tours/demonstrations/ meetings.

Cost - \$2,000

Task 8– Prepare newsletter articles and direct mailings to local land users, general public and media to promote project and disseminate information on water quality and NPS pollution control

Product – Minimum of four newsletters, four news releases, and four direct mailings.

Cost - \$2,000

Task 9 - Complete annual and final project reports to update the GRTS. These will be provided to NDDH, EPA and all sponsors and interested individuals.

Product – 3 Annual reports and one final report.

Cost – included in task 1.

3.3 Milestone

See attached milestone, (Appendix B5)

3.4 Permits

All necessary permits will be acquired. These may include CWA Section 404 permits. Project staff will work with the NDDH to determine if National Pollution Discharge Elimination System permits are needed for the proposed livestock waste systems. The State Historic Preservation Officer will be consulted regarding potential impacts to cultural resources during BMP installation.

3.5 Appropriateness of Lead Sponsor

The Ransom County SCD is sponsoring this water quality project. The Ransom County SCD's annual and long range plans help to prioritize and provide guidance to the field staff. The Ransom County SCD board has legal authority to employ personnel and receive and expend funds. The Ransom County SCD board has a track record for personnel management and addressing conservation issues. The Ransom County SCD has implemented 2 prior 319 watershed projects from 2005 to 2014 within the county. Approximately 30,000 acres were treated with BMP's during these projects.

3.6 Operation and Maintenance

Project staff will ensure that any Section 319 funded BMPs are properly installed and operated throughout the BMP lifespan. Cropland BMPs such as cover crops, nutrient management, and pasture/hayland plantings will be monitored every year of their lifespan. Any structural BMPs will be evaluated the first year and spot-checked thereafter. A signed O&M agreement will accompany any structural BMPs requiring engineering assistance (in the design packet). These agreements will outline proper operation and maintenance for the landowner to follow. Practices implemented with lifespans longer than the project's lifespan will be the responsibility of the NDDoH. In some cases, such as livestock containment facilities, permits from the NDDoH will enforce the O&M of the system throughout its life. If a producer abandons or destroys a BMP before the end of its lifespan, the producer will be required to pay back all Section 319 funds given previously for the installation of the BMP (Appendix B4).

4.0 Coordination Plan

4.1 Cooperating Organizations

- 1) Ransom County Soil Conservation District (RCSCD) - The Ransom County SCD will be the signer of the Section 319 contract and will be the lead agency responsible for project administration. They will provide vehicles, clerical assistance, and supplies as well as annual

financial support. The RCSCD board will oversee implementation of the scheduled project activities and provide for staff time if feasible. The board will be the primary supervisor of the watershed coordinator and all section 319 funded activities.

- 2) Ransom County Water Resource Board (RCWRB) – The RCWRB will provide technical assistance to the watershed conservationist when necessary. The RCWRB may also provide financial assistance for the Project.
- 3) Natural Resource Conservation Service (NRCS) – The NRCS will provide office space and equipment. They will also provide daily assistance in conservation planning, plan writing, contract writing, and technical assistance for construction and installation of planned BMPs. Standards and specifications for approved BMPs will be provided by local NRCS personnel from the Electronic Field Office Technical Guide (eFOTG). EQIP funds will also be available.
- 4) North Dakota Department of Health (NDDoH) – The NDDoH will oversee 319 funding as well as develop the Quality Assurance Project Plan (QAPP) for this project. The NDDoH will provide training for proper water quality sample collection, preservation, and transportation to ensure reliable data is obtained. The stated NPS information and education coordinator will assist the project staff in development and implementation of the Project's I/E activities. The NDDoH will provide the sponsor oversight to ensure proper management and expenditures of Section 319 funds. They will assist the RCSCD personnel in review of O&M requirements for Section 319 funded BMPs.
- 5) Farm Service Agency (FSA) – Programs available through FSA will be pursued for cost-share assistance.
- 6) North Dakota Extension Service (NDSU EXT) – Local and State personnel and education materials will be utilized to compliment the Project's I/E activities. The specific role of EXT will be dependent on the type of I/E activity being implemented and the availability of EXT staff and materials.
- 7) North Dakota Game & Fish Department (NDG&F) – The NDG&F will provide technical assistance through the "Save Our Lakes" (SOL) program.
- 8) North Dakota Outdoor Heritage Fund (OHF) will provide financial assistance for BMP installation.
- 9) Ransom County Crop and Livestock Improvement Association
- 10) Sheyenne James RC&D (BMP Team)

4.2 Local Project Support

Letters of support from the Ransom County WRB, NDSU EXT, the NDG&F SOL program, K2S Engineering, and NRCS are on file in the office.

4.3 Funding Coordination

The funding of BMPs in the Sheyenne River Watershed project area will be coordinated with funding from the 2014 Farm Bill. The watershed conservationist, NRCS and FSA staff will work closely to determine how 319 ,EQIP and CRP funds can be utilized to provide the most cost effective benefits to producers, the 2014 Farm Bill, and the 319 program.

4.4 Other Watershed Activities

There are no current projects dealing directly with water quality in Timber Coulee.

5.0 Evaluation and Monitoring Plan

5.1-5.3 Monitoring Strategy

The project sponsors coordinated with the NDDoH to develop the Quality Assurance Project Plan (QAPP). The QAPP describes the monitoring goals and objectives as well as the data collection needs for evaluating progress toward the targeted E. coli bacteria concentrations. Data will be collected throughout the project period to provide annual updates on concentration trends and an overall assessment of concentration reductions achieved by the end of the project. A final water quality report describing progress toward established targets is included in the final project report developed at the end of the project.

Annual progress reports focused on the accomplishments associated with each of the tasks listed in Section 3.0 will also be used to gauge progress toward land improvement and public education goals. The annual reports are provided to the ND NPS Program and entered in the GRTS in December of each year. These annual reports and monthly interactions with project staff are used to determine if the degree of progress warrants continuation of current funding; adjustment of project focus; and/or discontinuation of the project.

As previously indicated, the primary focus of the project is the reduction of E. coli bacteria concentrations in Timber Coulee. The annual and final reports, in combination with available water quality data, will be used in the final year of the project (i.e., 2019) to describe progress toward the goal. Based on these reports, the project goals will be revisited and may be adjusted to redefine the direction of the project to be consistent with any changes in 303(d) listing status, use attainment; and/or pollutant sources. This end-of-project review will aid the project sponsors and their partners in determining if the project is progressing as planned and should be continued or if a TMDL is needed to better direct future efforts to restore the recreational use (or another use) of the creek. If the water quality standards for E. coli are not met within a reasonable period of time after the implementation project is complete, a TMDL will be developed to address the E. coli impairment in Timber Coulee. Data collected throughout the project will be beneficial to the development of the TMDL.

5.5 Long-term Funding

No long-term funding by Section 319 funds is necessary. Operation and maintenance of restoration activities are the sole responsibility of the landowner, whether public or private.

6.0 Budget

6.1 Project Budget

See attached budget tables in Appendix B. The budget has been figured for a 3.5 year period 2015-2018.

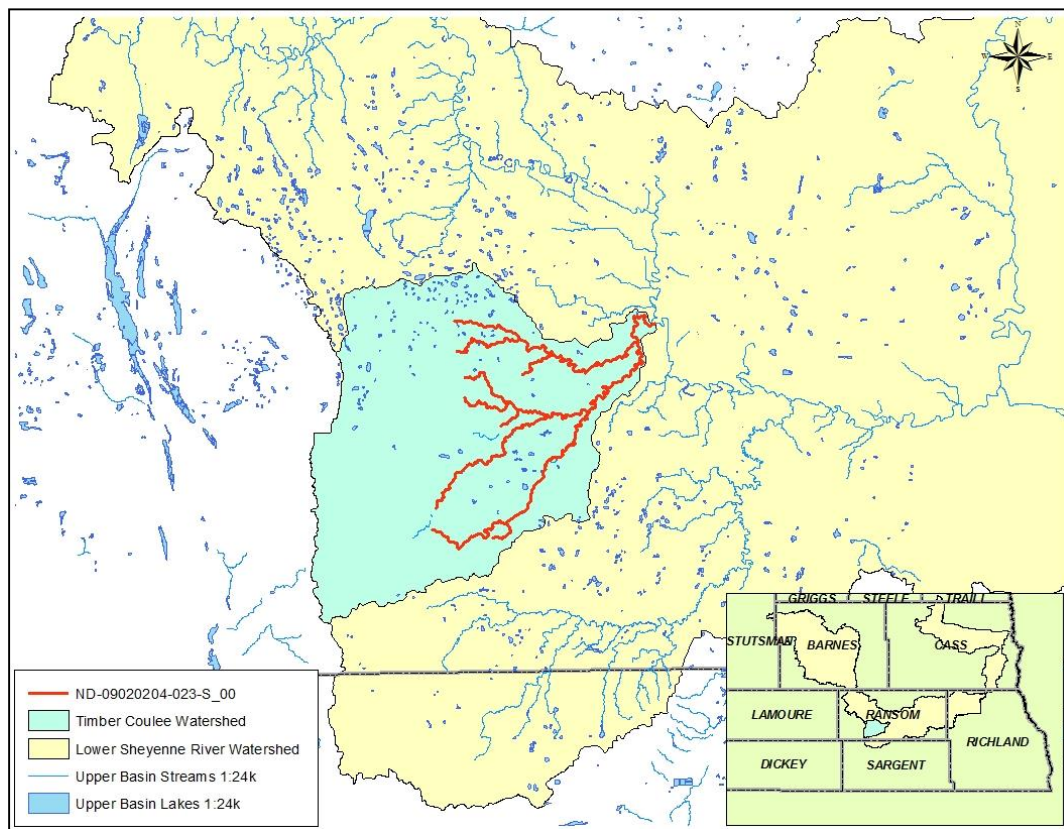
7.0 Public Involvement

The Ransom County Soil Conservation District has sponsored 2 previous 319 projects. The 2005 Ransom County Lower Sheyenne Watershed Project and the 2010 Dead Colt Creek TMDL

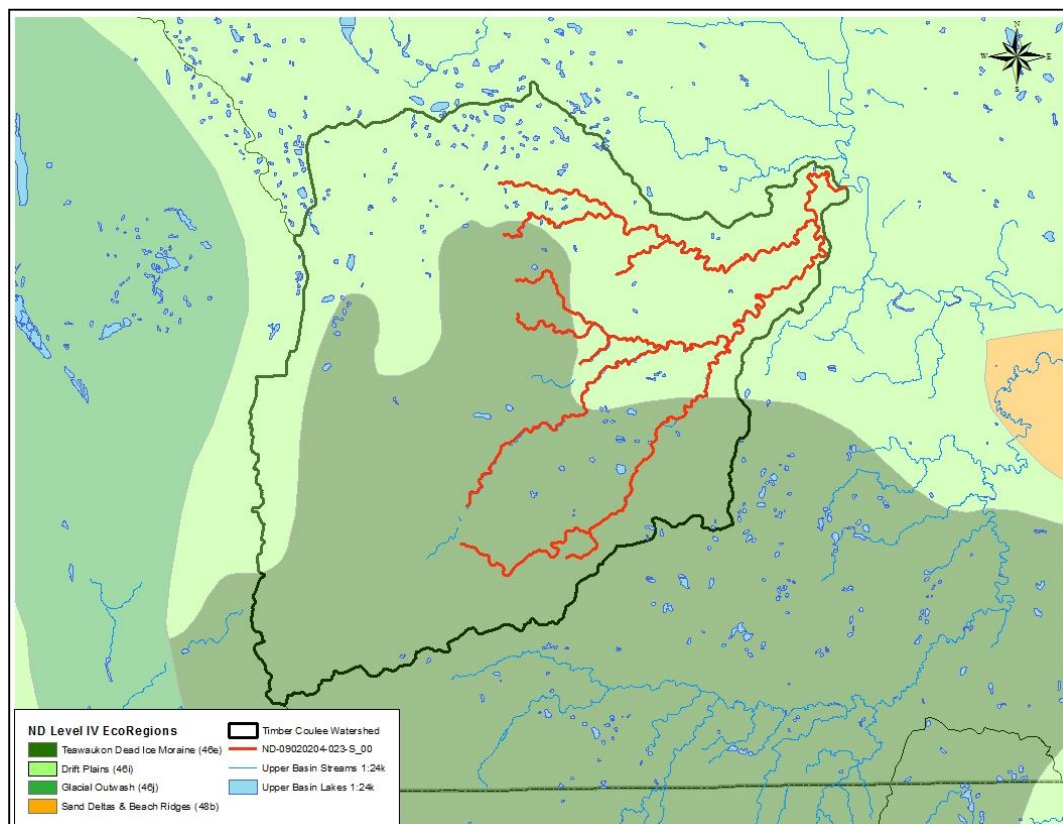
Implementation Project. They also sponsored the 2003-2004 Sheyenne River Assessment project and the 2003-2004 Dead Colt Creek TMDL project. The public was involved in all projects. The Ransom County SCD sponsors an EcoEd camp every year for local seventh grade students at the Fort Ransom State Park. This camp is used to inform youth of natural resource conservation issues. They also sponsor conservation speakers at local schools. They also sponsor educational tours and demonstrations each year in the county to inform the public on conservation measures.

Appendix A

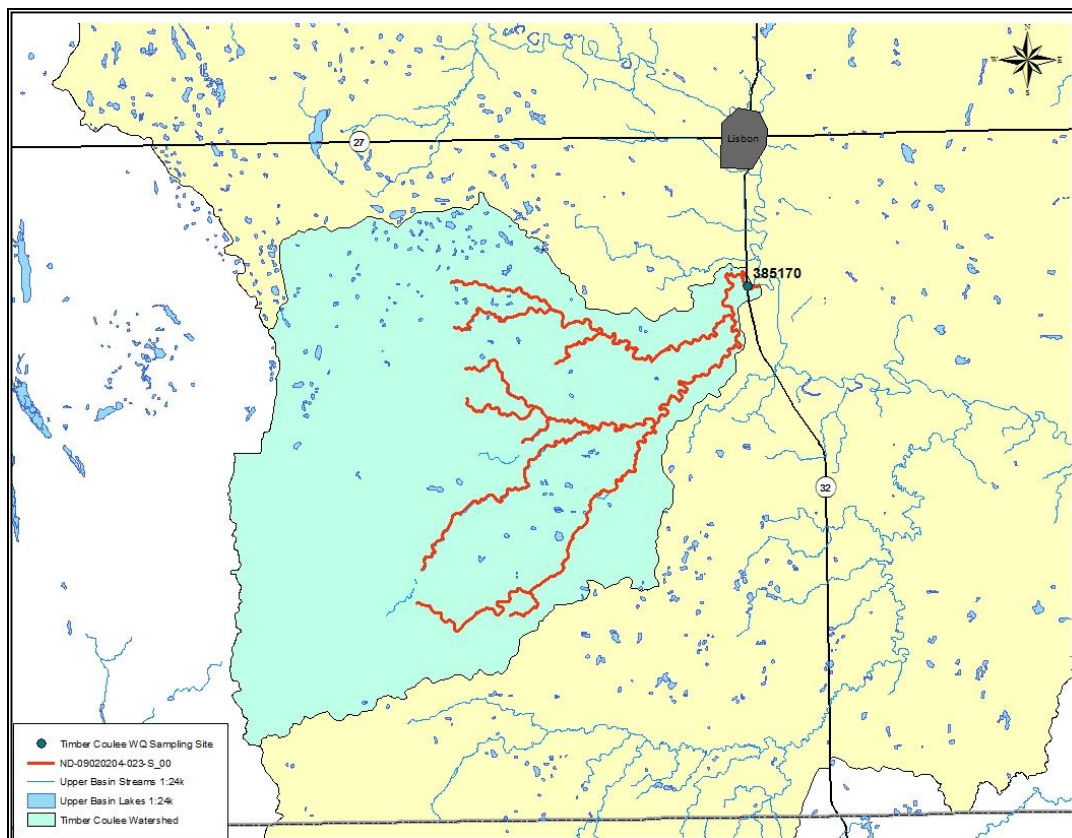
Maps



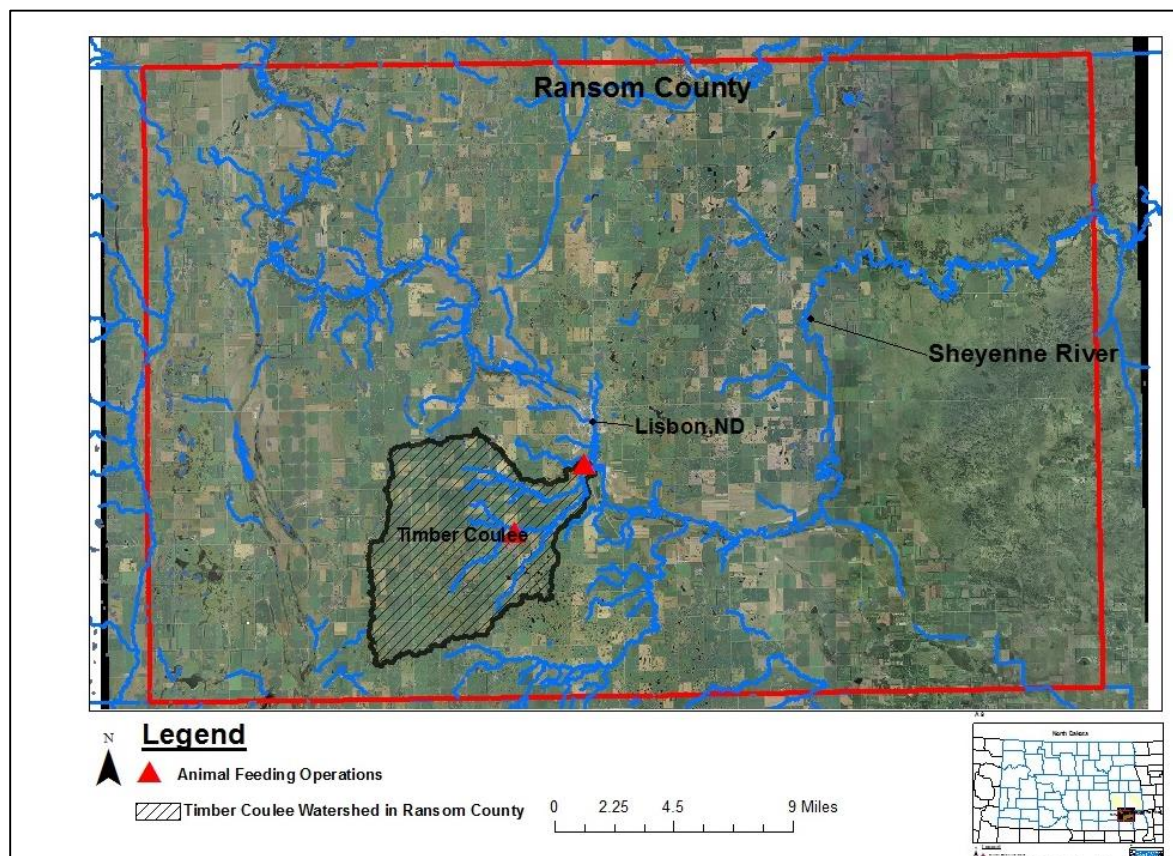
A1. Sheyenne River Watershed in Ransom County and Timber Coulee Watershed Project Implementation Focus Area.



A2. Level IV Ecoregions in the Timber Coulee Watershed



A3. Location of the E. coli bacteria Monitoring Site on Timber Coulee.



A4. Location of 2 Animal Feeding Operations to be Addressed by BMPs

Appendix B
Budget, BMP Table, O&M, Milestones

B1 Budget Table for the Timber Coulee Watershed Project

	2015	2016	2017	2018	Total Cost
EPA 319 Funds	100,800.00	100,800.00	61,800.00	61,590.00	324,990.00
Subtotal	100,800.00	100,800.00	61,800.00	61,590.00	324,990.00
Other Federal Funds					
1) NDDH (TA)	1,000.00	1,000.00	1,000.00	1,000.00	4,000.00
2) NRCS - EEQIP (FA/TA)	10,000.00	10,000.00	10,000.00	10,000.00	40,000.00
Subtotal	11,000.00	11,000.00	11,000.00	11,000.00	44,000.00
State/Local Match					
1) Ransom County SCD (TA/FA)	13,900.00	13,900.00	13,900.00	13,760.00	55,460.00
2) Outdoor Heritage Funds (OHF)	25,000.00				25,000.00
3) Landowners (TA/FA)	53,300.00	53,300.00	27,300.00	27,300.00	161,200.00
Subtotal	92,200.00	67,200.00	41,200.00	41,060.00	241,660.00
Total Budget	204,000.00	179,000.00	114,000.00	113,650.00	610,650.00

TA- Technical Assistance

NRCS - Natural Resource Conservation Service

FSA- Farm Service Agency

SCD- Soil Conservation District

OHF- North Dakota Outdoor Heritage Fund

B2 Timber Coulee Watershed Project Budget

	2015	2016	2017	2018	Total Cost	Local Cash	Section 319 Funding	NRCS EQIP Funding
Section 319/non federal budget								
Objective 1: coordination/personnel/support								
1) salary/fringe	30,000.00	30,000.00	30,000.00	30,000.00	120,000.00	48,000.00	72,000.00	
2) travel	1,000.00	1,000.00	1,000.00	700.00	3,700.00	1,480.00	2,220.00	
3) equipment/supplies	400.00	400.00	400.00	350.00	1,550.00	620.00	930.00	
4) training	500.00	500.00	500.00	500.00	2,000.00	800.00	1,200.00	
5) telephone	850.00	850.00	850.00	850.00	3,400.00	1,360.00	2,040.00	
Subtotal	32,750.00	32,750.00	32,750.00	32,400.00	130,650.00	52,260.00	78,390.00	
Objectives 2 Conservation Planning								
1) Livestock Waste Management	65,000.00	65,000.00	0.00	0.00	130,000.00	52,000.00	78,000.00	
2) Range/Pasture BMP's	18,250.00	18,250.00	18,250.00	18,250.00	73,000.00	29,200.00	43,800.00	40,000.00
3) Riparian Easements	50,000.00	50,000.00	50,000.00	50,000.00	200,000.00	80,000.00	120,000.00	
Subtotal	133,250.00	133,250.00	68,250.00	68,250.00	403,000.00	161,200.00	241,800.00	40,000.00
Objective 3 : Monitoring								
1) Postage	500.00	500.00	500.00	500.00	2,000.00	1,000.00	1,200.00	
2) Equipment	500.00	500.00	500.00	500.00	2,000.00	1,000.00	1,200.00	
Subtotal	1,000.00	1,000.00	1,000.00	1,000.00	4,000.00	2,000.00	2,400.00	
Objective 4 : IE programs								
1) workshop,tours,meetings	500.00	500.00	500.00	500.00	2,000.00	800.00	1,200.00	
2) newsletters,articles,mailings	500.00	500.00	500.00	500.00	2,000.00	800.00	1,200.00	
Subtotal	1,000.00	1,000.00	1,000.00	1,000.00	4,000.00	1,600.00	2,400.00	
Total	168,000.00	168,000.00	103,000.00	102,650.00	541,650.00	217,060.00	324,990.00	40,000.00

B3**319 BMP TABLE****Pasture/Rangeland Management:**

382 Fencing (barbed)	\$1.35/ft.
(Multiple wire electric)	\$0.67/ft
(Single wire electric)	\$0.51/ft
472 Access Control/Use Exclusion	\$20.00/ac
512 Pasture/Hayland Planting	\$35.00/ac
516 Pipelines	\$3.00/ft
378 Pond	engineer est.
528A Prescribed Grazing	\$5.00/ac
550 Range Planting	\$40.00/ac
574 Spring Development	engineer est.
614 Trough/tank	local rate/tank
642 Well	local rate/well
Alternative Power Source (solar,wind,generator)	local rate/system

Livestock Manure Management

Full System	engineer est.
Partial System	engineer est

Miscellaneous:

Culture Resource Review	\$1,800.00
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Cropland Management:

340 Cover Crop (seed cost only)	\$20.00/ac
633 Waste Utilization	\$2.00/ton
Partial manure systems limited to 5000tns	
Portable Windbreaks	\$35.00/ft

**EPA 319 Funding Agreement Provisions
(Attachment to EPA 319 CPO)**

Each undersigned person agrees to participate in the EPA 319 Water Quality Long Term Agreement (LTA) and to comply with the following terms set forth and approved by the Sponsoring Agencies for the period covered by this agreement. The terms are as follows:

1. The conservation and/or environmental problems identified herein represent all the major concerns whereby increased water quality improvements will be achieved on this land unit which will directly or indirectly improve the total water quality of the watershed project. The corrective measures needed for the identified problems are contained in the Conservation Plan of Operations (CPO) as approved by the Governing Board Sponsors. All practices shall be performed according to the CPO and in accordance with the Natural Resources Conservation Service (NRCS) standards and specifications in effect at the time the practice is performed. The practices shall be maintained for their normal lifespans even though the agreement may expire. The practices eligible for cost share assistance will be in accordance with the agreed upon CPO or subsequently revised CPO and will be shown by year scheduled and copies of revised CPO will be issued to the farm operator.
2. Application of the EPA 319 Water Quality Funds for cost share on practices performed under this agreement will be made on a Sponsoring Board approved payment application form which upon approval will become part of this agreement.
3. Each undersigned person is jointly and severally responsible for compliance with the terms and conditions of this agreement as to the conservation and environmental problems identified in the CPO which are to have corrective measures performed on the land units on which the undersigned is an owner or operator and for refund of payments determined in accordance with the following regulations for failure to comply with the terms and conditions of this agreement.
 - A. The undersigned voluntarily destroys the practice(s) installed.
 - B. The undersigned voluntarily relinquish control and/or title to the land on which the installed practices have been established and the new owner and/or operator of the land does not agree in writing to properly maintain the practices installed for the remainder of its specified lifespan and/or continue to fulfill the remaining contract requirements.
 - C. Practice failure is determined by sponsors to be caused primarily by the fault of the undersigned.
 - D. Any part of the CPO that is not followed or completed as scheduled will be a contract violation and refund of all cost shared contract items will be collected depending on the violation hearing and ruling of the Board Sponsors, unless advance notification and revision of the CPO is completed prior to the scheduled contract items completion date.
4. The undersigned is aware that all land units identified in the CPO will not be listed under any other contract through this program or any similar program. Intentional violation of this section will void the entire contract and refund of all payments will be required.

I certify that I have read and understand the provisions listed above:

Signature: _____

Date: _____

B5

Timber Coulee Watershed Project Milestone Table

Task/Responsible Organizations		Output	Qty.	Year 1 2015	Year 2 2016	Year 3 2017	Year 4 2018
Objective 1:	Entity 1						
Task 1	Employ watershed conservationist	Watershed Conservationist	0.5	0.5			
Objective 2:	Entity 1,2,3,5,						
Task 2	Waste management systems	Waste Management Plans	2	1	1	0	0
Task 3	Riparian improvements	Prescribed grazing systems riparian easements	2380 ac	595 ac	595 ac	595 ac	595 ac
Task 4	Operation/Maintenance checkups	Database of BMPs	1			ongoing	
Objective 3	Entity 1,4						
Task 5	Document water quality trends	Water quality samples	112	28	28	28	28
Task 6	Compile WQ Data and BMP records	Documentation for reports	ongoing			ongoing	
Objective 4	Entity 1						
Task 7	Organize and conduct I/E events	Workshops,tours, meetings	4	1	1	1	1
Task 8	Project promotion through media	Newsletters, articles, mailings	12	3	3	3	3
Task 9	Complete reports	annual/final reports	4	1	1	1	1

Entity 1 - Ransom County SCD - Local project sponsor, responsible for project coordination, reimbursement payments, match tracking, and progress reporting to the NDDH. Also provides technical assistance to plan, design and implement BMPs.

Entity 2 - Landowners in the Timber Coulee Watershed in Ransom County - Make land management decisions and provide cash and in-kind match for BMPs.

Entity 3 - Natural Resource Conservation Service - Provides technical assistance to the Ransom County SCD for implementation of BMPs. Also provides financial assistance for BMPs to landowners through the EQIP program.

Entity 4 - North Dakota Department of Health- Statewide section 319 program management including oversight of local 319 planning and expenditures. Also provides technical assistance for water quality analysis and documentation.

Entity 5 - North Dakota Outdoor Heritage Fund - provide financial assistance for BMP implementation

Appendix C
**Crosswalk between this Alternative Plan and EPA's Considerations for
an Alternative Plan**

Crosswalk for Timber Coulee Alternative Plan and EPA Region 8's Consideration Table

This crosswalk was developed to summarize how the Timber Coulee Alternative Plan addresses the considerations put forth in EPA Region 8's discussion of alternative plans (Table 1.) The number in the summary corresponds to the Alt Plan Considerations Number in the table that follows.

Timber Coulee Summary

- 1) This information is provided in Section 1.0 Introductions well as Section 2.1-2.2 Project Reference/Waterbody Description, and Sources of Pollution in Section 2.5. Land use is also further discussed in Section 2.4 General Information.
- 2) The WQS are identified in Section 2.5 Water Quality, and the target is identified in Section 3.2 Objectives and Tasks, Objective 2. Management measures are also identified in this Section and Objective.
- 3) Implementation goals are provided in Section 3.2 as well as the milestone table in Appendix B.
- 4) Funding sources are provided on the cover sheet, as well as in the budget table in Appendix B.
- 5) Project Sponsors are listed in Section 3.5 and the coordination plan is discussed in Section 4.0.
- 6) The timeframe of when water quality standards will be met will depend on many factors such as landowner interest, economic conditions, weather, etc. To address this, as identified in Section 3.2, Objective 3, it states that water quality sampling will be conducted as BMPs are installed to monitor effectiveness. Section 5.0 also discusses the Evaluation and Monitoring Plan along with an end of project report. If progress is not deemed sufficient, a TMDL will be completed. The Implementation Project will run from 2015 to 2018.
- 7) Effectiveness monitoring is described in #6 above.
- 8) This will be done as a part of the effectiveness monitoring. As stated in Section 5.0, at the end of the project a larger report summary will also be written to see if sufficient progress towards the targets has been made. If E. coli water quality standards are not met within a reasonable period of time after implementation is complete, a TMDL will be developed.

Table 1. EPA Region 8 Summary of the Alternative (Alt) Plan Considerations¹

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	<ul style="list-style-type: none"> • 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).	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • A schedule with proposed controls and target dates • A description of interim measurable milestones
4	Identify sources of available funding to implement the plan	<ul style="list-style-type: none"> • A table, list, or description of the available funding sources
5	Identify all parties committed to or assisting in implementation	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • An estimated date or number of months/years
7	Describe the plans for effectiveness monitoring to show restoration progress and identify corrective measures	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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

¹ Table 1 is 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.