

# **Alternative Plan for Hailstone Creek and Sims Creek in Morton County, North Dakota**

**Date:** August 2018

**Prepared for:**

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

## **Introduction:**

This is an alternative plan submitted for Hailstone Creek and Sims Creek, which are both part of the Danzig Dam and Hailstone Creek Section 319 Watershed Project. 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 #6.

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**STATE:** North Dakota

**WATERSHEDS:** Danzig Dam, Hailstone Creek, Sims (Muskrat) Creek

**ASSESSMENT UNIT CODES:** ND-10130203-007-L\_00, ND-10130203-033-S\_00, ND-10130203-034-S\_00, ND-10130203-041-S\_00

**HIGH PRIORITY WATERSHED:** YES

**PROJECT TYPES**

STAFFING & SUPPORT  
 WATERSHED  
 GROUNDWATER  
 I & E

**WATERBODY TYPES**

GROUNDWATER  
 LAKES/RESERVOIRS  
 RIVERS  
 STREAMS  
 WETLANDS  
 OTHER

**NPS CATEGORY**

AGRICULTURE  
 URBAN RUNOFF  
 SILVICULTURE  
 CONSTRUCTION  
 RESOURCE  
EXTRACTION  
 STOWAGE/LAND  
DISPOSAL

**PROJECT LOCATION:** Morton County, North Dakota

**MAJOR GOAL:** The primary goal of this project is to improve the water quality of Danzig Dam, Hailstone Creek and Sims Creek along with their tributaries and restore the riparian habitat and beneficial uses of these watersheds by implementing Best Management Practices. This will be accomplished by providing technical, financial, and educational assistance to agriculture producers and landowners within the project area.

**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 educational programs to heighten public awareness of NPS pollution concerns and solutions, and 4) develop working partnerships in the local community to benefit natural resources.

Other Federal Funds:	\$250,000	State/Local Match:	\$232,972
319 Funds Requested:	\$289,458	Total project cost:	\$772,430

## 2.0 STATEMENT OF NEED

The Danzig Dam and Hailstone Creek Watershed Project will consist of **Danzig Dam, Hailstone Creek and Sims Creek** watersheds, all of which are high priority TMDL watersheds. There were five total sampling sites during the assessment phase of this project (Appendix 1, Figure 1), four were stream sampling sites and one a lake sample site. Water quality data was collected at these sites during the years of 2011 and 2012. A TMDL report, for Danzig Dam, will be referenced in Section 2.1 and covers the data collected from the three northern sample points (385562, 381415, 385563). The two southern sample points (385564 and 685565) will be referenced later in Section 2.1, as well. Each of these watersheds have unique land uses, despite their close proximity to one another (Appendix 1, Figure 2). This project will be a comprehensive program that will address specific water quality issues in each of the watersheds.

### 2.1:

**Danzig Dam and Watershed (ND-10130203-007-L 00, ND-10130203-041-S 00):** A Total Maximum Daily Load (TMDL) report that addresses the aquatic life and recreation impairments caused by low dissolved oxygen and nutrient/eutrophication/biological indicators was approved, in May 2017, for Danzig Dam. The sediment/siltation impairment will be addressed in a separate report. In summation of the approved TMDL, water quality data collected in 2011 and 2012 showed that Danzig Dam is generally assessed as a eutrophic to slightly hypereutrophic lake based on chlorophyll-a concentrations and total phosphorus (TP), respectively. Furthermore, it is estimated that a 10% reduction in total phosphorus and total nitrogen (TN) load would be the best lake protection strategy. A reduction, of this amount, would result in the predicted chlorophyll-a average of 13.5 µg/L with all TSI targets near or below the eutrophic level. The Danzig Dam watershed (Hailstone Creek upstream from Danzig Dam, including tributaries) is further classified as “fully supporting but threatened” due to *E. coli* in the 2016 Integrated Report by the North Dakota Department of Health (NDDoH). It is also important to note that there are no known point sources upstream of Danzig Dam, making the pollutants of concern nonpoint sources.

**Hailstone and Sims Creek Watersheds (ND-10130203-033-S 00, ND-10130203-034-S 00):** This section will refer to data collected in 2011 and 2012 at sites 385564 and 385565, near Almont, ND which pertains to the second part of the project. *E. coli* bacteria was found to be a major pollutant in these waterways. At both stream sampling sites none were found to be fully supporting for more than one month out of the sampling period (Appendix 1, Figure 3) due to *E. coli*. This is likely due to the number of Animal Feeding Operations (AFOs) located in the area (Appendix 1, Figure 4) and riparian area grazing.

TN, TP and Total Suspended Solids (TSS) were three other parameters tested during the sampling period for sites 385564 and 385565. This data is summarized in Appendix 1, Table 1. Concentrations of TN ranged from a minimum of 0.587 mg/L at site 385565 to a maximum of 4.84 mg/L at site 385564. The same trend is found for TP where the minimum, of 0.029 mg/L, is found at site 385565 and the maximum is found at site 385564 with a value of 0.859 mg/L. Overall, the average concentrations throughout the year showed little variation. The periods showing elevated levels of TN and TP likely correlate to high rainfall events.

## **2.2 Watershed Description:**

**Danzig Dam Watershed:** Danzig Dam is located on the headwaters of Hailstone Creek, a tributary of the Big Muddy River, eight miles west of New Salem. Completed in the 1930's by the Works Progress Administration, the 133-acre reservoir is designed for recreational benefits (Appendix 1 Table 2 and Figure 5). It is a Class 3 warm-water fishery that can support natural reproduction and growth of warm-water fish and associated aquatic biota and marginal growth. It is generally assessed as eutrophic to slightly hypereutrophic. The watershed for Danzig Dam includes portions of both Morton and Oliver counties and spans nearly 28,000 acres.

Danzig Dam's fishery was dominated by carp and bullhead. In 2012, the North Dakota Game and Fish (NDGF) began to draw down the reservoir in preparation for eradication and the installation of a water control structure. Eradication of the undesirable fish began in September of 2013 and restocking the reservoir with northern pike and perch began in 2014. In conjunction with this project, the NDGF also dredged out approximately 20,000 yards of nutrient enriched sediment for the primary purpose of enhancing public fishing access. While limited in scope, these restoration activities are expected to help Danzig Dam continue to maintain its beneficial uses for fishing and recreation.

**Hailstone and Sims Creek Watershed:** Hailstone Creek is a tributary of Big Muddy Creek located in north-central Morton County. The headwaters of Hailstone Creek are located northwest of Danzig Dam near Oliver County. Hailstone Creek flows south from the outlet of Danzig Dam where its confluence with Big Muddy Creek is located, near Almont, ND. The total length of Hailstone Creek from Danzig Dam to its confluence with Big Muddy Creek, is 28.07 miles. The total area of the Hailstone Creek watershed is nearly 31,000 acres.

Sims Creek is a tributary of Hailstone Creek. Its headwaters are located a few miles west of New Salem, ND and the creek runs southwesterly its confluence with Hailstone Creek, 1.5 miles northeast of Almont, ND. The total length of Sims Creek from its confluence with Cut Bank Creek downstream to its confluence with Hailstone Creek is 9.01 miles. The total watershed area is approximately 35,500 acres.

## **2.3 Maps:**

See Appendix 1 – Morton County Maps, Tables, and Figures.

## **2.4 General Information:**

The Danzig Dam watershed is characterized as a semi-arid rolling plain of shale, siltstone, and sandstone punctuated by occasional sandstone buttes and badlands. The topography of this area was largely unaffected by glaciations and retains its original soils and complex stream drainage pattern. The soils present belong to the Orders Mollisols and Entisols, and are typically Haploborolls, Calciborolls and Ustorthents.

The Hailstone Creek and Sims Creek watershed topography is characterized as a semiarid rolling plain of shale, siltstone, and sandstone punctuated by occasional buttes and badlands. Soils in the watershed are formed from rocky, gravelly, or sandy glacial till and are moderately well drained. In general, soils in the watershed are moderately fertile, easily worked and highly

susceptible to wind and water erosion. Soils in the watershed are predominately silty or loamy and moderately well to well drained.

For the project area, as a whole, the average rainfall is approximately 16 inches per year.

According to the 2016 National Agricultural Statistics Service (NASS), the dominate land use in these watersheds (94,183 acres) is agricultural with 94.42% categorized as either native grassland, cropland, tamegrass/reseeded grass, or alfalfa. Developed acres cover 3.81%, water/wetlands cover 1.34%, and the remaining 0.42% is riparian woodlands/tree rows/shrubs. As seen previously, in Figure 2, cropland is the dominate land use in the northern reaches of the project area, as you head south of Interstate-94, that rapidly changes to grassland dominating the southern portion, especially near riparian areas.

## **2.5 Water Quality:**

### **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 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 assessment for Hailstone Creek and Sims Creek are not supporting recreational use due to E. coli bacteria impairment.

## Sources of Pollution

With the use of AnnAGNPS modeling, it can be seen that nearly all of the areas with a high potential to pollute, above and around Danzig Dam, are cropland acres (Appendix 1, Figure 6 and 7). Educational programs and Best Management Practices (BMPs) that focus on soil health and reducing erosion will be critical, in this area especially, to achieve the 10% nutrient load reduction referenced in the Danzig Dam TMDL. Downstream from Danzig Dam, where grassland tends to dominate, we see *E. coli* numbers begin to rise. This likely correlates to the high number of Animal Feeding Operations (AFOs) in the area as well as the use of livestock to graze riparian and upland areas that were not deemed fit to crop.

Information provided by the NDDoH NDPDES personnel indicate there are two permitted point sources in within the watershed. The city of New Salem has a permit for their small wastewater lagoons to discharge into Cut Bank Creek, which flows into Sims Creek. New Salem had been discharging around three times a year, in late fall (Oct-Nov), but has not discharged at all since 2014. There are therefore not considered a significant source. The North Dakota Department of Transportation also has a discharge permit for a rest area along I-94 for discharges into Hailstone Creek. In the history of the permit, it has only discharged once in 2002 and nothing since then, so is also not considered a significant source.

Educational programs and BMPs that assist in implementing planned grazing systems and manure management systems (full and partial containment) will be necessary to restore these waterways of their beneficial uses. It is important to note that, to our knowledge, no focused efforts have ever been made in this project area to improve water quality.

Based on surveys sent out to landowners and operators in the project area there is a high interest in BMPs such as: Pasture/Hayland Plantings, Permitted Feedlots, Partial Manure Management Systems, Water Developments and Cross-Fencing, and Cover Crops. The Morton County Soil Conservation District office has also had a positive working relationship with some producers in the project area and word-of-mouth is expected to keep interest high in all three of these high priority watersheds.

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 NDDoH 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. 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 <sup>b</sup> Category	Runoff <sup>c</sup> Volume	Total <sup>d</sup> Phosphorus (%)	Total <sup>d</sup> Nitrogen (%)	Sediment (%)	Fecal Bacteria (%)
Animal Waste System <sup>e</sup>	-	90	80	60	85
Diversion System <sup>f</sup>	-	70	45	NA	NA
Filter Strips <sup>g</sup>	-	85	NA	60	55
Terrace System	-	85	55	80	NA

Containment Structures <sup>h</sup>	-	60	65	70	90
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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.

## 3.0 PROJECT DESCRIPTION

**3.1 GOAL:** The goal of the project is to reduce TP and TN load, by 10% or more, to Danzig Dam to achieve “fully supporting” status for aquatic life and recreational uses. As a secondary goal, the recreational uses of Sims Creek and Hailstone Creek will also be fully restored by achieving state standard concentrations for *E. coli* bacteria. The state standard for *E. coli* is a geometric mean of 126 CFU/100 ml for a 30 day period with less than 10% of samples exceeding 409 CFU/100 ml.

The reduction of nutrients and sediment will be accomplished through implementing nutrient management plans, reducing erosion and runoff from cropland, addressing the need for stabilizing & revegetating riparian areas, improving soil health by implementing conservation measures that are deemed beneficial to improve water quality. The reduction of *E. coli* will be accomplished through the implementation of upland and riparian planned grazing systems, full and partial manure management systems and educational programs focusing on the proper handling of animal manure.

### 3.2 Objectives and Tasks:

**Objective 1:** Improve livestock manure management in the Hailstone Creek and Sims Creek watersheds. Address potential sources of NPS nutrient loading to Danzig Dam in order to reduce the average annual TN and TP load by 10 percent, in accordance with the TMDL. Also, Reduce *E. coli* bacteria levels to meet state standards of recreational use impairments in Hailstone and Sims Creek. State standard criteria for *E. coli* bacteria during the recreational season are a geometric mean of 126 CFU/100 ml with less than 10% of samples exceeding 409 CFU/100 ml. To achieve the recreational standard, the current monthly geometric mean concentrations during the recreational season will need to be reduced by 50% - 90%, with less than 10% of the monthly samples exceeding 409 CFU/100ml.

**Task 1:** Employ one full-time project coordinator and staff to implement the tasks in this project and develop plans for future priority initiatives addressing NPS pollution concerns in the county.

Product: One full-time project coordinator and staff focused on project development and implementation.

Cost: \$190,725

**Task 2:** Coordinate with programs such as EQIP, through NRCS, to design and install 2 full containment manure management systems for 2 high priority livestock feeding operations in the project area.

Product: 2 manure management systems.

Cost: \$350,000

**Task 3:** Develop manure management plans and install the appropriate structural practices to complete partial containment systems for 10 AFO's within the project area.

Product: 10 partial manure management systems with associated manure management plans.  
Cost: \$60,000

**Task 4:** Work with livestock producers to develop planned grazing systems and/or install vegetative buffers, riparian easements and any other practices that will positively impact water quality along the Hailstone Creek and Sims Creek and/or its tributaries. Coordinate with programs such as EQIP and/or state funded grassland improvement projects, to reduce funding needed. The O-M-G Project is one such project with funds available to Oliver, Morton, and Grant county.

Product: Planned grazing systems (with associated conservation plans) impacting 7,000 grassland acres in the Hailstone and Sims Creek watersheds.  
Cost: \$81,355

**Task 5:** Work with producers to develop conservation plans on 4,000 acres of cropland and install the necessary BMPs such as cover crops, filter strips, grassed waterways, and shelterbelts in the Danzig Dam, Hailstone Creek and Sims Creek watershed and/or its tributaries.

Product: Conservation plans on 4,000 acres of cropland with associated BMPs  
Cost: \$25,000

**Objective 2:** Increase information and education on the impacts and solutions to reduce/prevent the delivery of pollutants to surface waters.

**Task 6:** Coordinate with organizations/agencies, such as NDSU Extension Service Manure Management Specialists and NRCS Specialists, to conduct at least 4 workshops addressing manure management, composting, range management, cover crops, and/or riparian management.

Product: – At least 4 informational workshops.  
Cost: – \$4,000

**Task 7:** Utilize radio, newspaper articles, direct mailings, quarterly newsletter inserts, one-on-one contacts, etc. to disseminate information on conservation and management options using BMP's that can be used to improve water quality in the priority watersheds.

Product: – At least 4 news articles/year; 4 quarterly newsletter inserts/year, and 2 direct mailings, one on one contacts with producers.  
Cost: \$4,000

**Task 8:** Work with Morton County schools in educating their students about water quality issues.

Product: Organize an annual Water Festival for 5<sup>th</sup> graders of Morton County and the surrounding area.  
Cost: \$4000

**Task 9:** Develop and implement a Soil Health Mentoring Program (2019-2021) to assist agricultural producers with soil health improvements on enrolled fields through the use of cover crops, diverse crop rotation and sustainable agricultural systems. See attached program overview (Appendix #5).

Product: A sustainable mentoring program with no more than 4 participants from the project area. Cropping system records on enrolled fields including production records, soil sample records, economics, and climate records will be obtained. At least 2 case studies at the end of the program featuring results of individual producers. At least 2 tours of selected sites enrolled in the program. At least one educational workshop for participants per year.

Cost: \$11,500 (seed cost is covered in cropland BMPs)

**Task 10:** Coordinate with the NDDoH to develop the appropriate monitoring plans to monitor the effectiveness of BMP implementation and secure the necessary funding to support the assessment of the next highest priority watershed.

Product: – Sufficient data to produce water quality reports. Watershed assessment quality assurance project plans (QAPP) will be developed and implemented.

Costs: See Appendix 2, Covered under Personnel/Support in Table 2.

**3.3 Milestone Table:** See Appendix #3.

**3.4 Permits:** All necessary permits will be acquired. These may include CWA (Clean Water Act) Section 404 permits. Project sponsors will work with NDDH to determine if National Pollution Elimination System permits are needed for the proposed livestock systems.

**3.5 Lead Sponsor:** The Morton County Soil Conservation District is the appropriate entity to coordinate and implement this project. The SCD is a locally elected volunteer conservation organization that serves all the people in the county. They have the ability to employ the necessary personnel to carry out the project, as well as manage the funds involved.

**3.6 Operation and Maintenance:** The Morton County SCD will be responsible for auditing Operation & Maintenance Agreements (O&M) on BMP's after completion through yearly status reviews of EPA-319 contracts. The lifespan of each BMP will be listed in the individual contracts to ensure longevity of the practices. The producer signs the "EPA 319 Funding Agreement Provisions" form which explains in detail the consequences of destroying a BMP before the completion of its lifespan.

## **4.0 COORDINATION PLAN**

### **4.1 Identify Agency Roles:**

1) The Morton 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. The Watershed Coordinator will serve as a liaison between watershed projects/producers and USDA program participation.

2) USDA Natural Resources Conservation Service (NRCS) will provide technical assistance by coordinating project activities, facilitating local involvement, providing technical support, and participating in educational outreach programs during the project. NRCS will also provide cost-share assistance through the USDA conservation programs. Staff will incorporate existing USDA programs (financial and technical) 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, District Conservationist, and the SCD to reaffirm and acknowledge NRCS's commitment to the project.

3) The NDDoH will administer the Section 319 funding allocations and agreements with the Morton County SCD. Technical assistance will be provided for the development of the necessary quality assurance project plans for the watershed assessment projects and the appropriate training will be provided for the proper water quality sample collection, preservation, and transportation. The NDDoH will also provide analytical support for water quality samples collected by the project.

4) North Dakota Extension Service (EXT) will assist in project information and education activities. These activities will pertain to such topics as specific BMP publications and assistance with workshops and tours. The Extension Service Specialists will also be asked to assist with tours and demonstrations.

5) North Dakota Game & Fish Department and US Fish & Wildlife Service will provide technical and financial assistance, as needed.

6) Morton County Water Resource District – Share common water quality goals and concerns. Technical and financial support will be requested from the Morton County WRD, when needed.

7) Other potential partners include the County Commission, Dakota Prairies Resource Conservation & Development Council (RC&D), NPS BMP Team, Stockmen's Association, Burleigh County Soil Conservation District and Oliver County Soil Conservation District.

**4.2 Local support:** Producers operating land in the project area have been contacted and interest seems high based on responses to the survey. A good working relationship has been in place with many producers in the project area to get it off and running. These relationships have been built through involvement in NRCS programs, the OMG Grassland Improvement Project, and/or one-on-one contact from technical assistance inquiries.

**4.3 Coordination:** The Morton County SCD will continue to work closely with the local NRCS field offices to ensure that funds from programs such as EQIP can be used with, or in lieu of, 319 funds, for relevant projects. State funds (OMG Project) may be available in the county to fund any planned grazing systems to be completed. The project sponsors will also continue to work with other agencies (ND Stockman's, Oliver and Burleigh County SCD, etc...) to put on information/education events.

**4.4 Similar Activities:** The Morton County SCD routinely consults with the North Dakota Stockmen's Association's Environmental Services Program, and the North Dakota Department of Agriculture's Livestock Pollution Prevention Program (LP3) when interest for manure management systems arises. Duplication of effort is often avoided through daily

communication with the local NRCS personnel, as well as contacting agencies such as the ND Natural Resources Trust, Oliver County SCD/NRCS and ND Game and Fish when the proper project(s) presents itself. These methods should continue to ensure there is no duplication of efforts.

## **5.0 EVALUATION AND MONITORING PLAN**

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.

The project sponsors coordinated with the NDDoH to develop the Quality Assurance Project Plan (QAPP) for the initial phase of the project (2011). The NDDoH is moving towards developing program wide QAPPs with individual Sampling and Analysis Plans (SAP) created for each project. As the Project received funding late in 2018, installation of a significant portion of the BMPs won't begin until 2019. Sampling is then expected to be initiated in 2020. The SAP for the project will be completed spring of 2019, ahead of any sampling, and then submitted to EPA for inclusion with this Alternate Plan.

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.

While the primary focus of this section 319 project is for nutrient reduction to Danzig Dam, the secondary focus relevant to this alternate plan is the reduction of E. coli bacteria in both Hailstone and Sims Creeks. The annual and final reports, in combination with available water quality data, will be used in the final year (2022) of the project to describe progress toward these goals. Based on these reports, the project goals will be revisited and may be adjusted to account for progress in BMP implementation as well as 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 uses (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 impairments in Hailstone and Sims Creeks. Data collected throughout the project will be beneficial to the development of the TMDL.

## **6.0 BUDGET**

See Appendix #2

## **7.0 PUBLIC INVOLVEMENT**

As previously mentioned, educational and informational meetings will continue to be conducted to keep the public informed. Newsletters are published quarterly and the Morton County SCD's website is updated on a regular basis with any pertinent information.

# **Danzig Dam and Hailstone Creek Project Implementation Plan**

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## **Appendix List**

- 1. Morton County Maps, Tables, and Figures**
- 2. Budget Tables**
- 3. Milestone Table**
- 4. Danzig Dam TMDL**
- 5. Soil Health Mentor Program Overview**

## **Appendix #1**

# **Morton County Maps, Tables, and Figures**

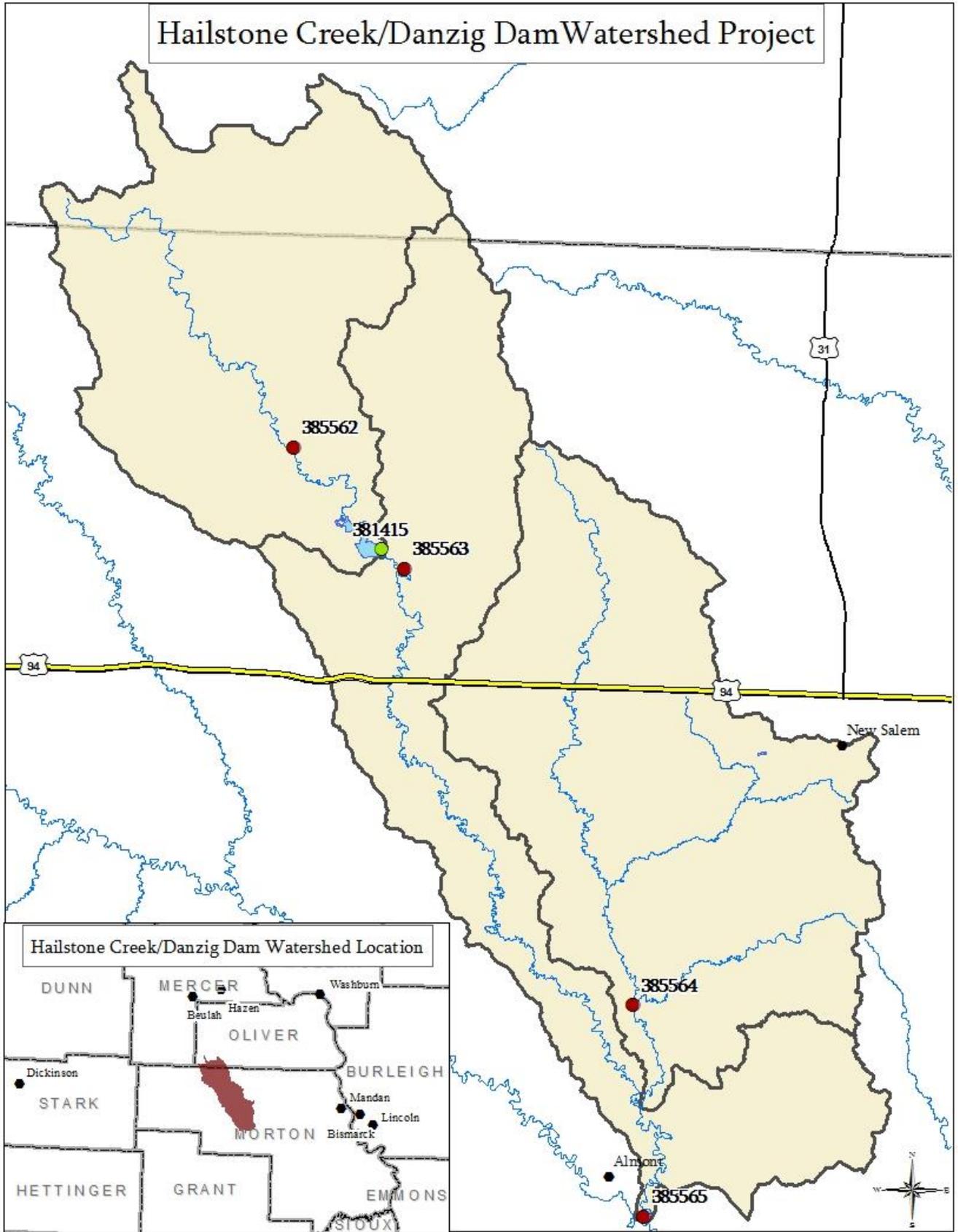


Figure 1. Danzig Dam and Hailstone Creek Project Area

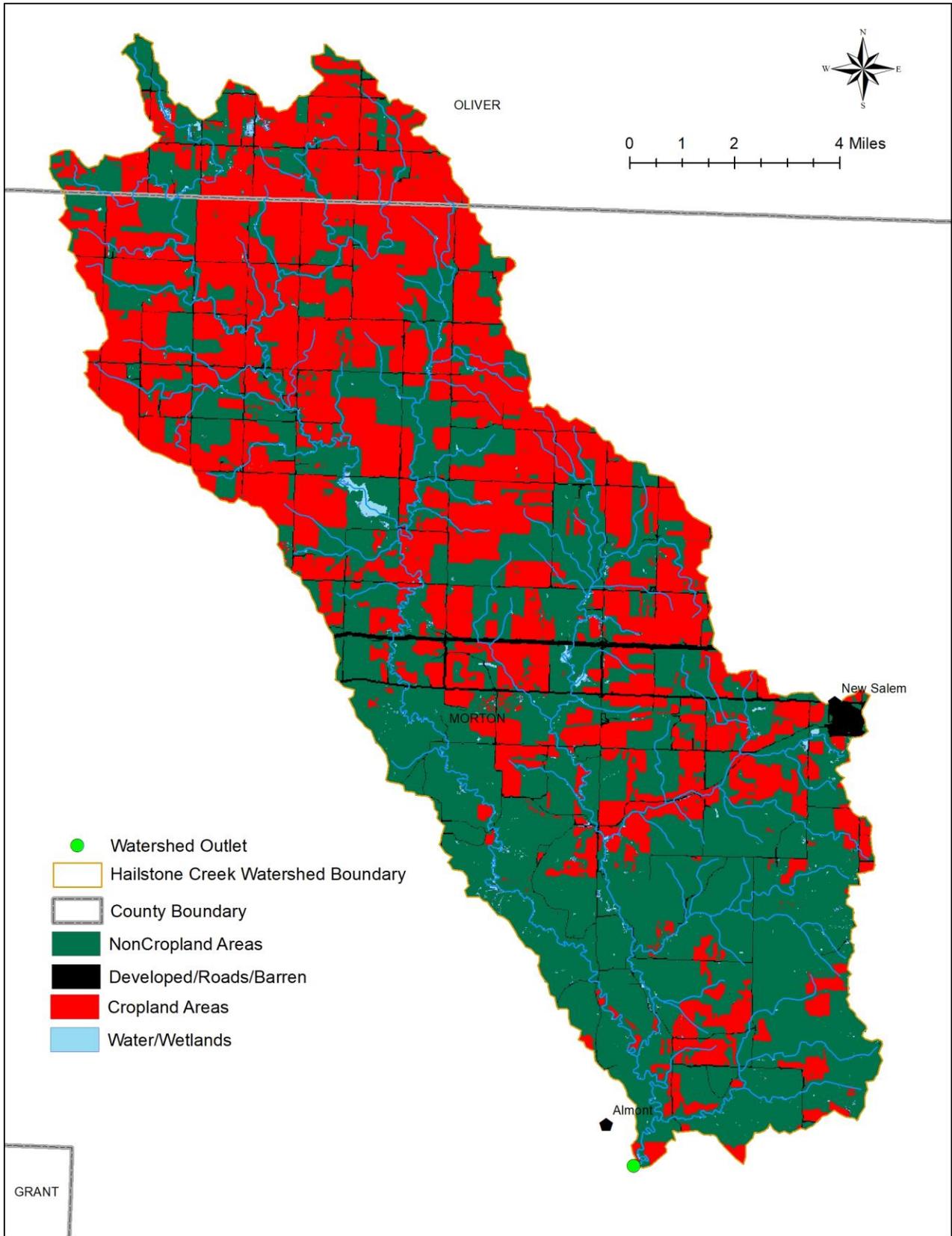


Figure 2. Project Area Land Use Map

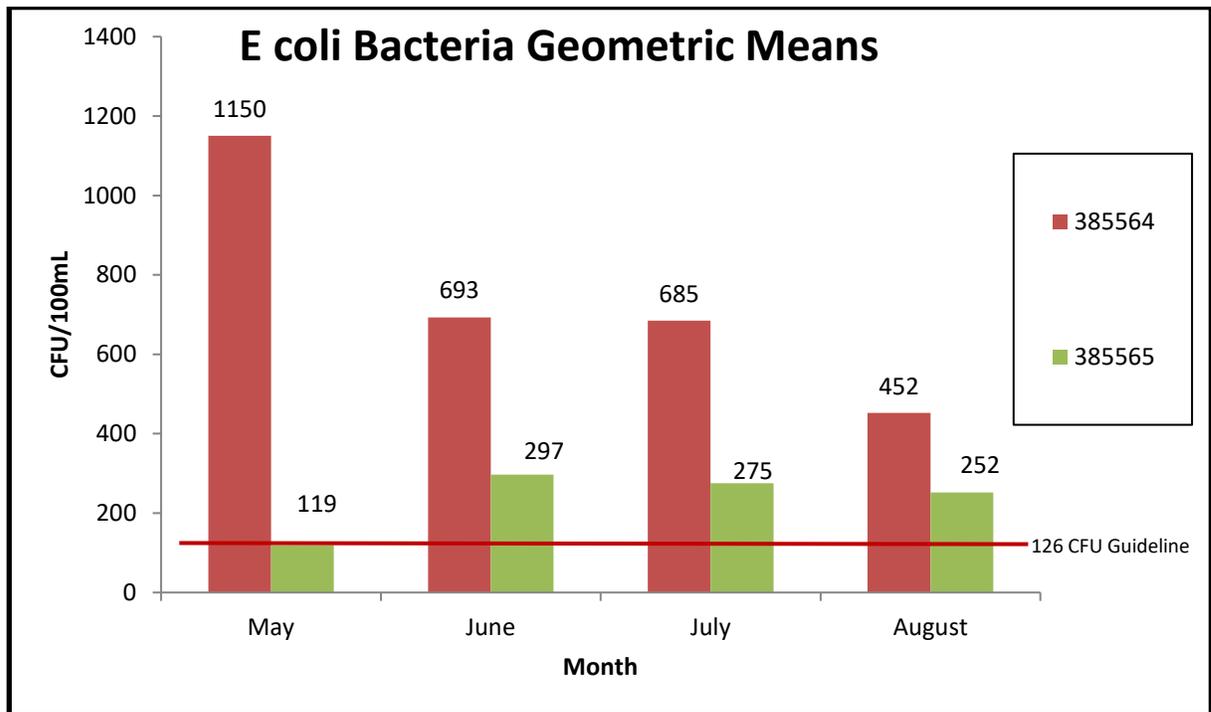


Figure 3. Monthly Geometric Means of *E. coli* Bacteria at Each Site.

Data is from 2011 and 2012, with data of same months combined.

## E. coli Data, 2011 and 2012

Hailstone Creek 385564		Sims Creek 385565	
Date	CFU/100 mL	Date	CFU/100 mL
05-May-11	10	05-May-11	170
11-May-11	200	11-May-11	1400
12-May-11	300	12-May-11	1100
16-May-11	40	16-May-11	800
17-May-11	50	17-May-11	730
23-May-11	1100	23-May-11	960
31-May-11	250	31-May-11	2100
07-Jun-11	200	07-Jun-11	540
09-Jun-11	220	09-Jun-11	630
16-Jun-11	800	16-Jun-11	1000
23-Jun-11	570	23-Jun-11	830
27-Jun-11	1100	27-Jun-11	2100
12-Jul-11	1200	12-Jul-11	1100
19-Jul-11	500	19-Jul-11	810
26-Jul-11	700	26-Jul-11	1000
03-Aug-11	600	03-Aug-11	780
04-Aug-11	280	04-Aug-11	1100
10-Aug-11	300	10-Aug-11	360
17-Aug-11	700	17-Aug-11	2000
25-Aug-11	150	25-Aug-11	670
10-May-12	130	10-May-12	4800
16-May-12	180	16-May-12	5000
31-May-12	200	31-May-12	900
04-Jun-12	200	04-Jun-12	700
18-Jul-12	240	18-Jul-12	800
14-Aug-12	230	14-Aug-12	60

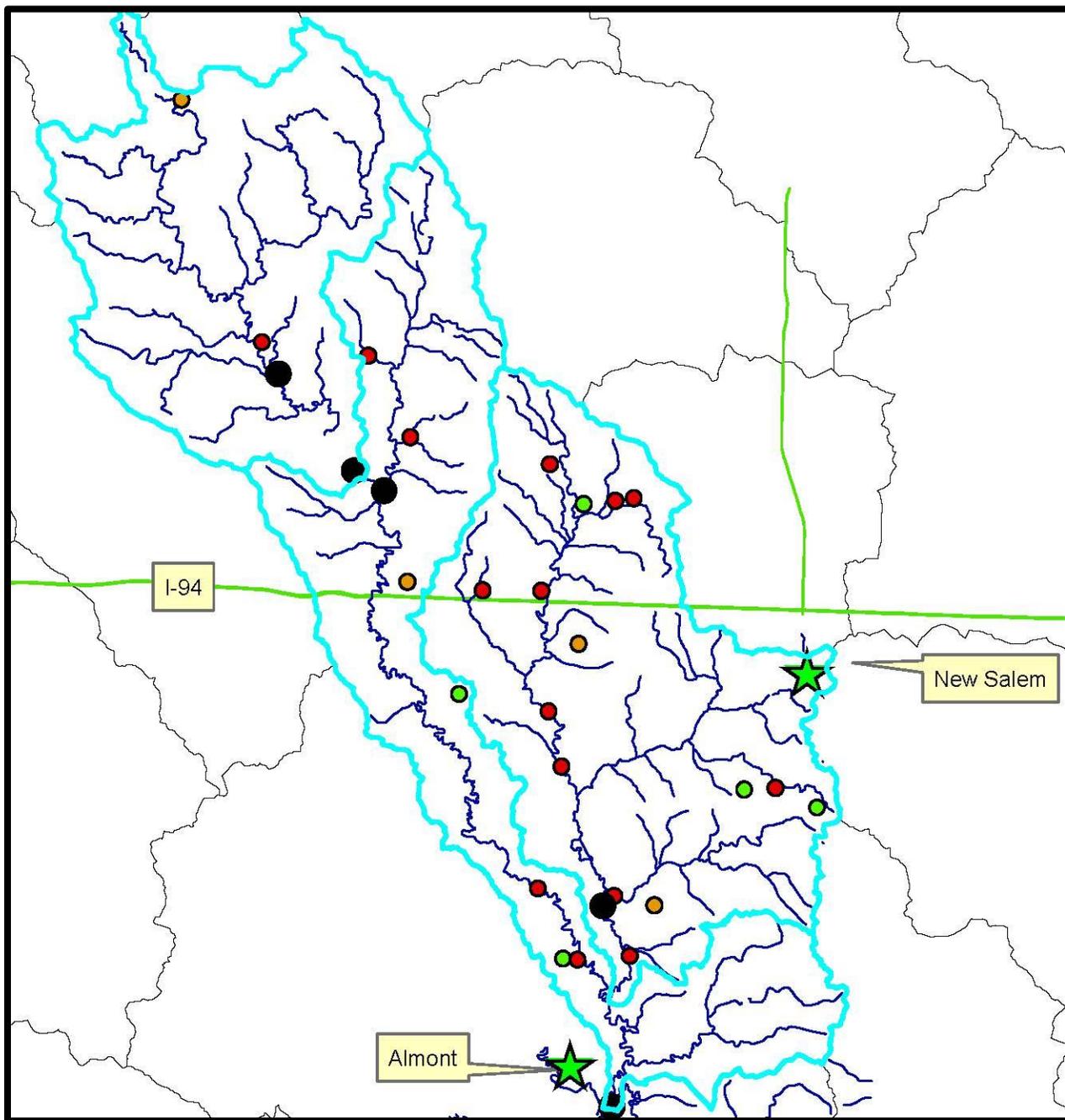


Figure 4. AFOs within the Project Area and Proximity to Surface Water.

Black – Water Sampling Sites

Green – AFO more than 1/2 mile from Surface Water (5)

Orange – AFO less than 1/2 mile from Surface Water (4)

Red – AFO less than 1/4 mile from Surface Water (15)

<b>Parameter</b>	<b>Measure</b>	<b>385564</b>	<b>385565</b>
Total Nitrogen	Mean (mg/L)	1.838	1.415
	Min (mg/L)	0.525	0.587
	Median (mg/L)	1.6	1.3
	Max (mg/L)	4.84	3.45
Total Phosphorus	Mean (mg/L)	0.137	0.09
	Min (mg/L)	0.013	0.029
	Median (mg/L)	0.085	0.083
	Max (mg/L)	0.859	0.223
Total Suspended Solids	Mean (mg/L)	17	36
	Min (mg/L)	3	3
	Median (mg/L)	13	24
	Max (mg/L)	50	163

Table 1. Statistical Summary of Nutrient Water Quality Data Collected at Each Site.

Table 2. General Characteristics of Danzig Dam and the Danzig Dam Watershed.

<b>Legal Name</b>	Danzig Dam
<b>Major Drainage Basin</b>	Big Muddy Basin
<b>Nearest Municipality</b>	New Salem, North Dakota
<b>Assessment Unit ID</b>	ND-10130203-007-L_00
<b>County Location</b>	Morton and Oliver Counties
<b>Physiographic Region</b>	Northern Great Plains
<b>Latitude</b>	46.89672
<b>Longitude</b>	-101.60165
<b>Watershed Area</b>	27,754 acres
<b>Surface Area</b>	132.7 acres
<b>Average Depth</b>	4.5 feet
<b>Maximum Depth</b>	10.7 feet
<b>Volume</b>	580.5 acre feet
<b>Type of Waterbody</b>	Reservoir
<b>Dam Type</b>	Earthen Dam
<b>Fishery Type</b>	Northern Pike and Yellow Perch

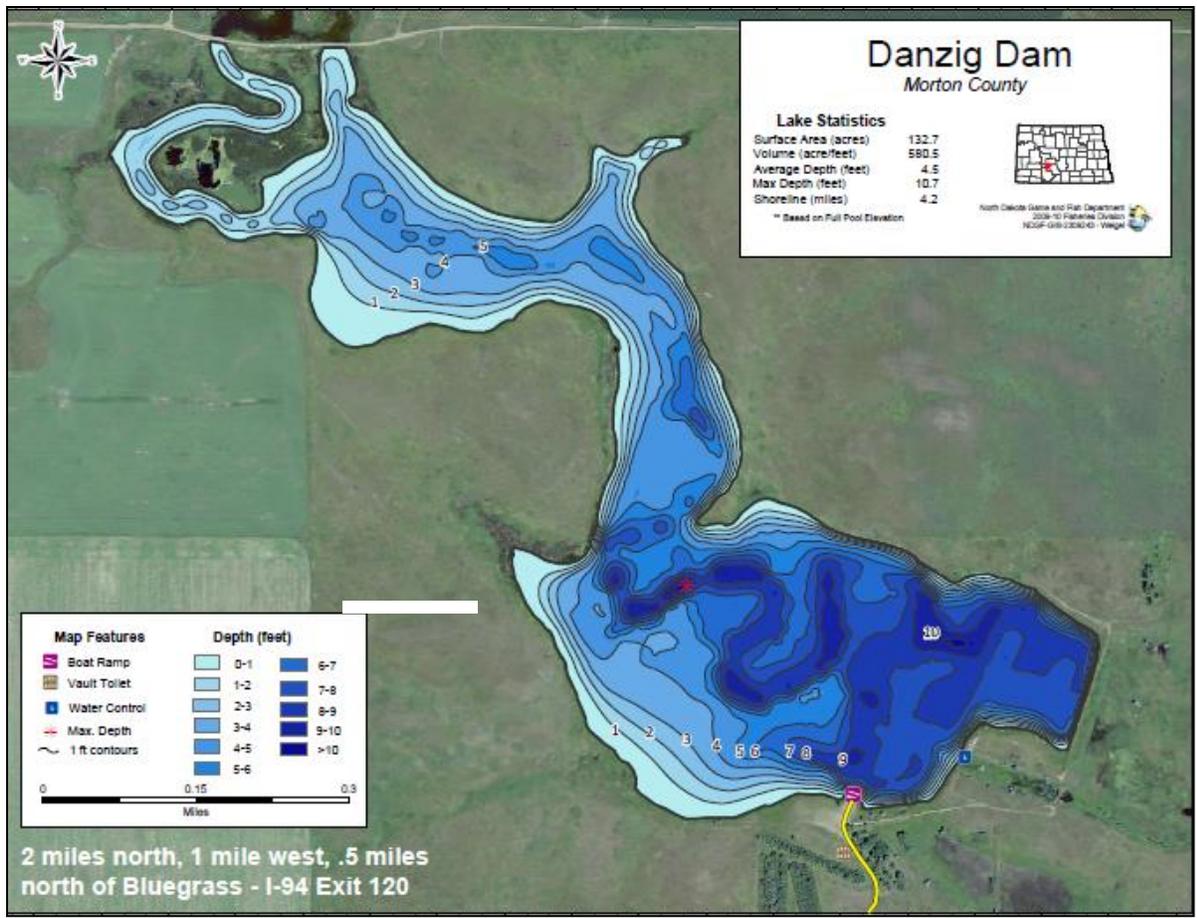


Figure 5. North Dakota Game and Fish Contour Map of Danzig Dam.

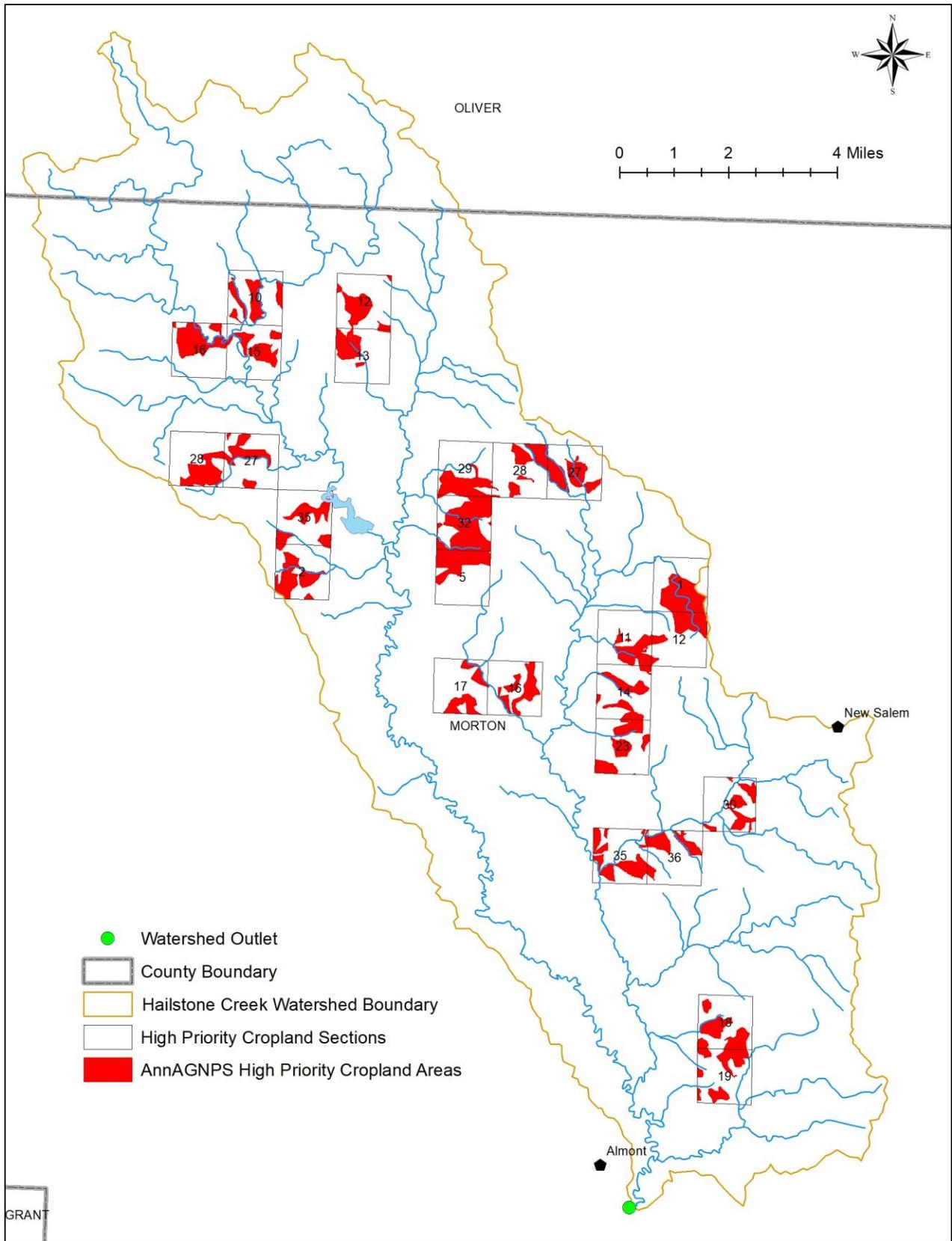


Figure 6. AnnAGNPS High Priority Cropland Areas

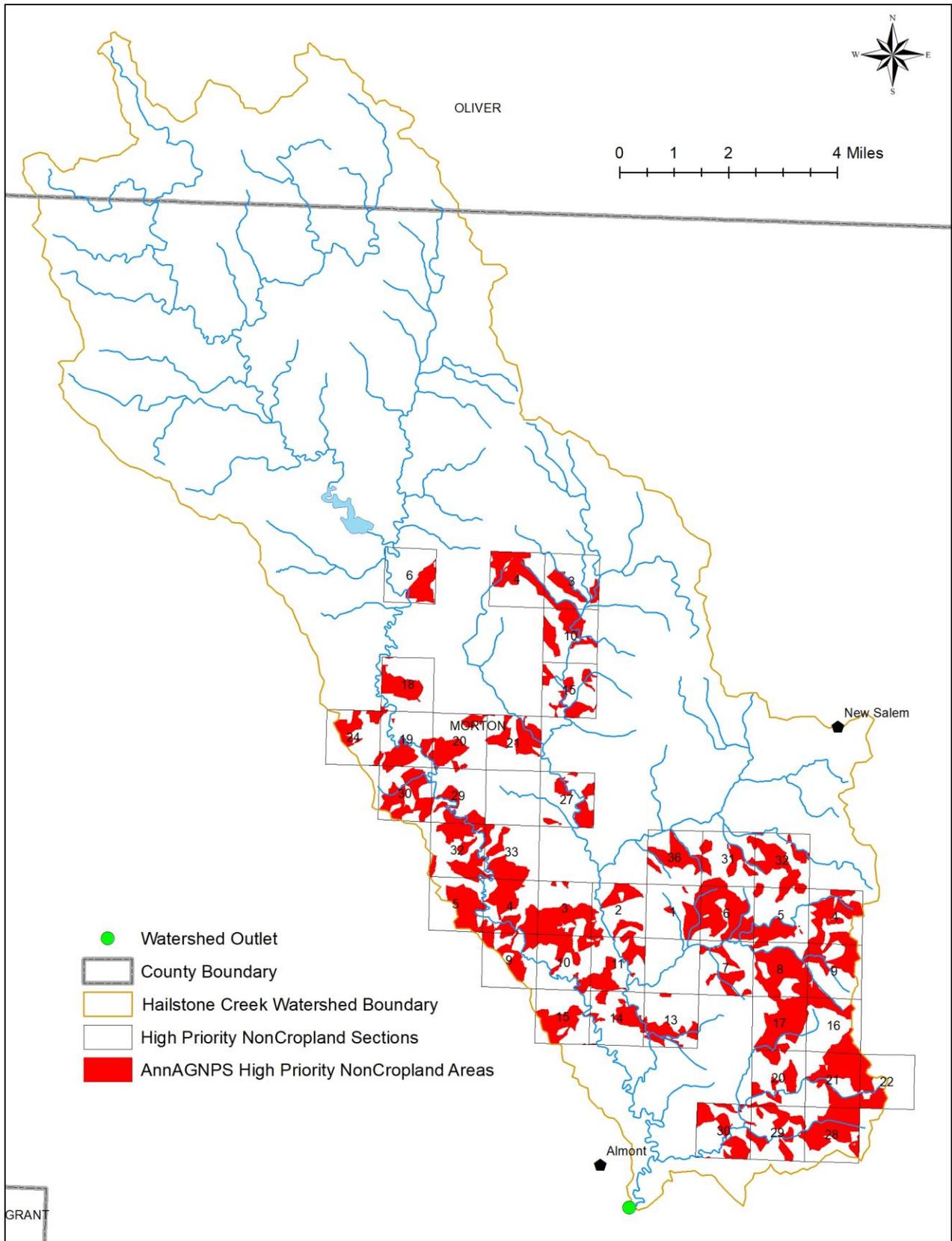


Figure 7. AnnAGNPS High Priority Non-Cropland Areas

**Appendix #2**

**Budget Tables**

Danzig Dam and Hailstone Creek Watershed Project						
Budget Table-Part 1						
Part 1: FUNDING SOURCES	2018	2019	2020	2021	2022	TOTAL
EPA SECTION 319 FUNDS						
1) FY2018 FUNDS	\$ 18,843.60	\$ 66,607.80	\$ 67,417.20	\$ 69,562.20	\$ 67,027.20	\$289,458.00
<b>Subtotal</b>	<b>\$ 18,843.60</b>	<b>\$ 66,607.80</b>	<b>\$ 67,417.20</b>	<b>\$ 69,562.20</b>	<b>\$ 67,027.20</b>	<b>\$289,458.00</b>
<b>STATE/LOCAL MATCH</b>						
1) Landowner 40% Cash Match	\$ 6,682.40	\$ 24,965.20	\$ 24,964.80	\$ 24,964.80	\$ 24,964.80	\$106,542.00
2) OMG Project In-Kind (FA)*	\$ 20,000.00	\$ 20,000.00	\$ -	\$ -	\$ -	\$ 40,000.00
3) Local SCD Match (FA)	\$ 5,880.00	\$ 19,440.00	\$ 19,980.00	\$ 21,410.00	\$ 19,720.00	\$ 86,430.00
<b>Subtotal</b>	<b>\$ 32,562.40</b>	<b>\$ 64,405.20</b>	<b>\$ 44,944.80</b>	<b>\$ 46,374.80</b>	<b>\$ 44,684.80</b>	<b>\$232,972.00</b>
<b>OTHER FEDERAL FUNDS</b>						
1) NRCS (TA & FA)	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$250,000.00
<b>TOTAL</b>	<b>\$101,406.00</b>	<b>\$181,013.00</b>	<b>\$162,362.00</b>	<b>\$165,937.00</b>	<b>\$161,712.00</b>	<b>\$772,430.00</b>

\*The O-M-G Project refers to a North Dakota Outdoor Heritage Fund project that provides cost-share for Oliver, Morton and Grant county producers to install structural practices that facilitate planned grazing systems. This grant was awarded to the 3 counties in 2016 for a total of \$900,000 in state funds.

# PART 2- Funding Danzig Dam and Hailstone Creek Project Implementation Plan

Section 319/Non-federal  
Budget

	2018**	2019	2020	2021	2022	TOTAL	CASH/INKIND*	319
						COSTS	MATCH	FUNDS
<b>PERSONNEL/SUPPORT</b>								
1) Salary/Fringe (75% of time)	\$ 9,000.00	\$ 36,050.00	\$ 37,300.00	\$ 38,625.00	\$ 40,000.00	\$ 160,975.00	\$ 64,390.00	\$ 96,585.00
2) Travel	\$ 1,500.00	\$ 1,500.00	\$ 1,000.00	\$ 3,000.00	\$ 3,000.00	\$ 10,000.00	\$ 4,000.00	\$ 6,000.00
3) Equipment/Supplies	\$ 400.00	\$ 700.00	\$ 700.00	\$ 700.00	\$ 700.00	\$ 3,200.00	\$ 1,280.00	\$ 1,920.00
4) Training	\$ 200.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 2,200.00	\$ 880.00	\$ 1,320.00
5) Telephone/Postage	\$ 200.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 2,200.00	\$ 880.00	\$ 1,320.00
<i>Subtotals</i>	\$ 11,300.00	\$ 39,250.00	\$ 40,000.00	\$ 43,325.00	\$ 44,700.00	\$ 178,575.00	\$ 71,430.00	\$ 107,145.00
<b>APPLYING BMP'S***</b>								
1) Full Containment Systems (Task 2)	\$ -	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 100,000.00	\$ 40,000.00	\$ 60,000.00
2) Partial Containment Systems (Task 3)	\$ 6,667.00	\$ 13,334.00	\$ 13,333.00	\$ 13,333.00	\$ 13,333.00	\$ 60,000.00	\$ 24,000.00	\$ 36,000.00
3) Pasture and Range*** (Task 4)	\$ 9,039.00	\$ 18,079.00	\$ 18,079.00	\$ 18,079.00	\$ 18,079.00	\$ 81,355.00	\$ 32,542.00	\$ 48,813.00
4) Cropland (Task 5)	\$ 1,000.00	\$ 6,000.00	\$ 6,000.00	\$ 6,000.00	\$ 6,000.00	\$ 25,000.00	\$ 10,000.00	\$ 15,000.00
<i>Subtotals</i>	\$ 16,706.11	\$ 62,412.23	\$ 62,412.22	\$ 62,412.22	\$ 62,412.22	\$ 266,355.00	\$ 106,542.00	\$ 159,813.00
<b>INFORMATION/EDUCATION</b>								
1) Tours/Workshops (Task 6)	\$ 400.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 600.00	\$ 4,000.00	\$ 1,600.00	\$ 2,400.00
2) Newsletter (Task 7)	\$ 500.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 500.00	\$ 4,000.00	\$ 1,600.00	\$ 2,400.00
3) Water Festival (Task 8)	\$ -	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 4,000.00	\$ 1,600.00	\$ 2,400.00
4) Soil Health Mentoring Program (Task 9)	\$ -	\$ 3,350.00	\$ 3,950.00	\$ 4,200.00	\$ -	\$ 11,500.00	\$ 4,600.00	\$ 6,900.00
<i>Subtotals</i>	\$ 900.00	\$ 6,350.00	\$ 6,950.00	\$ 7,200.00	\$ 2,100.00	\$ 23,500.00	\$ 9,400.00	\$ 14,100.00
<b>ADMINISTRATIVE</b>								
1) Secretary	\$ 1,000.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,000.00	\$ 6,500.00	\$ 2,600.00	\$ 3,900.00
2) SCD/Coordination Meetings	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 7,500.00	\$ 3,000.00	\$ 4,500.00
<i>Subtotals</i>	\$ 2,500.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 2,500.00	\$ 14,000.00	\$ 5,600.00	\$ 8,400.00
<b>TOTAL 319/NON-FEDERAL BUDGET</b>								
	\$ 31,406.00	\$ 111,013.00	\$ 112,362.00	\$ 115,937.00	\$ 111,712.00	\$ 482,430.00	\$ 192,972.00	\$ 289,458.00

\* Includes match from both State and local sources

\*\* 50% of the budget for 2018 would be supported by the Morton County Northeastern Watersheds Project

\*\*\***Eligible BMPs include, but are not limited to, livestock fencing, wells, pipeline, tanks, septic systems, dikes, diversions, nutrient management, windbreak panels, cover crop, grassed waterways, riparian easements, rural water taps, winterized tanks, holding ponds. \$250,000 in cost-share for full containment systems is planned to be funded through EQIP.**

<b>Soil Health Mentoring Program – Budget Table 3</b>					
		<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Total</b>
<b>Mentor Costs*</b>					
	<u>Hourly Wages</u>	\$ 2,000.00	\$2,000.00	\$2,000.00	\$ 6,000.00
<b>Mentee Costs**</b>					
	<u>Soil Health Tests (Haney/PLFA)</u>	\$ 1,000.00	\$ 800.00	\$1,000.00	\$ 2,800.00
	<u>Cover Crop Seed Cost</u>	Included in BMPs			
<b>Public Outreach ***</b>					
	<u>Tours/Workshops</u>	\$ -	\$1,000.00	\$1,000.00	\$ 2,000.00
<b>Administrative</b>					
	<u>Postage/Mailing/Office Supplies</u>	\$ 150.00	\$ 150.00	\$ 200.00	\$ 500.00
<b>Miscellaneous</b>					
	<u>Rain Gauges</u>	\$ 200.00	\$ -	\$ -	\$ 200.00
<b><u>TOTAL</u></b>		<b>\$ 3,350.00</b>	<b>\$3,950.00</b>	<b>\$4,200.00</b>	<b>\$11,500.00</b>

\*Dr. Don Tanaka (retired USDA-ARS agronomist) will be the chief mentor with an hourly rate of \$85.00 per hour.

\*\*Cost of the Haney and PLFA tests are \$49.50 and \$59.50, respectively. There will be a maximum of 4 participants. A total of 4 PLFA tests will occur, per field, in years 2019 and 2021. A total of 4 Haney tests will occur, per field, in 2020.

\*\*\*A minimum of 2 tours/workshops will be held during this 3-year project.

**Appendix #3**

**Milestone Table**



## **Appendix #4**

# **Nutrient and Oxygen TMDL for Danzig Dam in Morton and Oliver Counties, North Dakota**

(Contact the North Dakota Department of Health for a  
copy of the Approved TMDL)

## **Appendix #5**

### **Soil Health Mentor Program Overview**

The Morton County SCD offers a small team of Soil Health Mentors to provide personalized planning and technical assistance for individuals selected to participate in the Morton County Soil Health Mentoring Program. The mentors are led by Agronomist & Soil Scientist, Dr. Don Tanaka. The team also draws its support from specialists, professionals, scientists, and farmers & ranchers considered experts in the very important business of improving degraded soil.

Soil Health Mentors will offer advice and guidance to program participants. Participants will work with Soil Health Mentors to outline a detailed plan for each of the next three years during a primary planning meeting. The plan will focus on creating or improving a sustainable agricultural system utilizing crop rotations with the integration of cover crops.

Emphasis will be placed on minimizing or eliminating soil disturbance, protecting the soil with vegetative cover, increasing plant diversity, building organic matter, and fostering soil biology. Greater yields, reduced inputs, increased drought resistance, and numerous other benefits accompany improvements in soil health. In addition to providing education and technical support, it is intended that the Morton County Soil Health Mentoring Program will demonstrate these benefits in real-world applications. Cost-share assistance, requirements, and limitations of the program are outlined on the following page.

## **Program Requirements:**

### **Participants must:**

- Designate an annually cropped field to be enrolled in the project and provide a legal description and farm map for that field.
- Allow the District and its representative's access to the fields to collect samples and monitor progress.
- Provide the District with any and all results from independent soil sampling that occurs during the project.
- Commit to using low disturbance seeding methods on the enrolled fields for the 3 year period of this project.
- Plant an annual cover crop mix for a minimum of one partial season during the 3 year term. The cover crop may be utilized by the cooperator. Haying and grazing are acceptable. Other uses may be acceptable but must be approved by the District.
- Allow workshops/tours to be conducted on the designated fields during the period of the project.
- Provide historic records on annual crop production costs and income on enrolled fields.
- Provide records on annual crop production costs and income on enrolled fields for the duration of the project.
- Record monthly precipitation for enrolled fields using equipment provided by the District.
- Attend educational, informational, and planning opportunities that pertain to soil health.
- Provide well documented notes and photographs of enrolled fields.
- Provide contact information that will be made available to all participants in the program network.

### **Limitations of the Program:**

- A maximum of 1 field totaling no more than 80 acres may be enrolled, with cost-share.
- 10% of the acreage of each enrolled field must be designated as an untreated check strip. This means that current management practices will be used in this spot. Check strips will be placed near the center of each field.
- Mentors will not provide crop consultation services to participants.
- Participant time and expenses are not reimbursable.

# **Appendix #6**

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

## **Crosswalk for Hailstone Creek and Sims Creek Alternative Plan and EPA Region 8's Consideration Table**

This crosswalk was developed to summarize how the Hailstone Creek and Sims Creek 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.

- 1) This information is provided on page 2 as well as in Sections 2.1, 2.2, 2.5, and as Figures and Tables in Appendix 1.
- 2) The WQS are identified in Section 2.5 Water Quality, and the target is identified in Section 3.2 Objectives and Tasks, Objective 1. Management measures are also identified in this Section and Objective. Specific practices are also mentioned at the end of Section 2.2.
- 3) Implementation goals are provided in Section 3.2 as well as the milestone table in Appendix 3.
- 4) Funding sources are provided in the budget table in Appendix 2.
- 5) Project Sponsors are listed in Section 3.5 and the coordination plan is discussed in Section 4.0.
- 6) The timeframe of when WQS will depend on many factors such as landowner interest, economic conditions, weather, etc. To address this, as identified in Section 3.2, Task 10, it states that water quality sampling will be conducted as BMPs are installed to monitor effectiveness. Section 5.0 discusses how monitoring and evaluation will be conducted to describe progress towards the established targets. If progress is not deemed sufficient, a TMDL will be completed. The Implementation Project will run from 2018 to 2022.
- 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 Considerations<sup>1</sup>

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"> <li>• Assessment Unit (AU) numbers, descriptions and pollutants that match state's most recent 303(d) list</li> <li>• Include a list or table of all contributing permitted point sources</li> <li>• Identify general nonpoint source (NPS) contributors by category</li> <li>• Include relative source contribution estimates</li> </ul>
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"> <li>• Clear target(s) consistent with WQS</li> <li>• Load reduction estimates needed to meet the target</li> <li>• Description of the management measures that will need to be implemented to achieve load reductions</li> </ul>
3	Provide an implementation plan to address all sources and a schedule with milestones and target dates	<ul style="list-style-type: none"> <li>• A schedule with proposed controls and target dates</li> <li>• A description of interim measurable milestones</li> </ul>
4	Identify sources of available funding to implement the plan	<ul style="list-style-type: none"> <li>• A table, list, or description of the available funding sources</li> </ul>
5	Identify all parties committed to or assisting in implementation	<ul style="list-style-type: none"> <li>• A table, list, or description of all parties that are committed to or assisting in implementation</li> </ul>
6	Provide an estimate or projection of time when WQS will be met	<ul style="list-style-type: none"> <li>• An estimated date or number of months/years</li> </ul>
7	Describe the plans for effectiveness monitoring to show restoration progress and identify corrective measures	<ul style="list-style-type: none"> <li>• A plan for effectiveness monitoring designed to show restoration progress and identify corrective measures</li> </ul>
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"> <li>• 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</li> </ul>

<sup>1</sup> 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](https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf).

