

SECTION 1

STATEMENT OF PROBLEMS AND EXISTING CONDITIONS

A. General Description of the High Island Creek Watershed

The High Island Creek Watershed (33) is a rural watershed that drains 153,219 acres in Sibley, McLeod and Renville counties. Buffalo Creek is a sub-watershed of the High Island Creek watershed and drains 18,004 acres. The High Island watershed is a minor watershed of the Lower Minnesota River basin and is one of the few rural watersheds of the Lower Minnesota. The watershed begins in eastern Renville, where approximately 10% of the watershed is located. McLeod County and Sibley County have respectively 25% and 65% of the watershed located within their county boundaries. The current population living in the watershed is estimated at 9760.

The High Island Creek Watershed is mostly level or slightly rolling agricultural land of high productivity. Nearly 85% of the land is used for agricultural purposes. There are ravines on the eastern end of the watershed. The boundary of two biomes runs through the watershed, the Big Woods in the east and the Prairie in the west.

Two towns are located within the watershed, New Auburn and Arlington. A portion of the city of Stewart also is located within the watershed. 17 townships are located entirely or partially within High Island Watershed. In addition, ten lakes, fifteen wildlife management areas and three city/county parks are located in the watershed.

B. Why the Project is Taking Place

The High Island Creek Watershed Assessment Project grew from environmental pressure put on by past Governor, Arne Carlson, to restore the Minnesota River Basin to a "swimmable and fishable" condition by the year 2002. The Minnesota River is a major source of pollution to the Mississippi River, which was determined by the Minnesota River Assessment Project (MRAP 1994). Results from the University of Minnesota (D. Mulla) show that the Lower Minnesota watershed produces high levels of sedimentation and excess nutrient levels. This put pressure on the rural watersheds of the Lower Minnesota to improve water quality.

The issues of concern to local citizens are varied with how they use and perceive the resource. There are people who are concerned with the high levels of excess nutrients and pesticides that may exceed state standards. The landowners on the lower end of the watershed are concerned with water quantity. The High Island Lake Conservation Club is concerned with sedimentation along with water quality. The Minnesota Waterfowl Association is concerned with water storage available for wildlife habitat.

A diagnostic study will allow prioritization of key areas in the watershed, which will reduce pollutant loads reaching the MN River.

C. Water Quality Problems

The Minnesota Pollution Control Agency monitored the High Island Creek from May 12, 1999 to August 23, 1999 for fecal coliform bacteria and transparency (using transparency tubes) at five sites in the watershed. Results of the monitoring revealed low transparency tube readings and high fecal coliform counts at a majority of the monitored sites. The results of these monitoring efforts are shown in Appendix A.

The current state of water at the mouth of High Island Creek is high levels of fecal coliform, phosphorus, nitrates and total suspended solids based on the Minnesota River Assessment Report published in 1994.

D. Suspected and Potential Water Quality Problems

Sediment appears to be a significant problem in High Island Creek and Buffalo Creek. Transparency tube readings obtained during 1999 revealed low transparency tube readings at a number of monitored sites. The High Island Watershed Assessment Project will provide a thorough examination of where sediment loading is occurring in High Island Creek and Buffalo Creek.

Turbidity is a chronic problem in both High Island Lake and Bakers Lake. High Island Creek flows directly through Bakers Lake and is thought to contribute much of its siltation. High Island Creek does not directly flow into High Island Lake but high flows can cause water to overflow a dam (located near the southwest corner of the lake) and enter the lake. During a year with normal rainfall, water in the High Island Creek tops the dam about two or three times.

E. Economic Significance of the Water of Concern

Agricultural use accounts for 85% of the land use in the watershed. Thus, from an agricultural standpoint drainage is very important. High Island Creek is highly channalized and subject to flooding. Many private and public drainage systems in this area depend on High Island Creek for an outlet. During periods of extended high flows, the drainage system is impaired, which is of great concern to landowners.

Wildlife habitat located in High Island Watershed is valued for hunting and aesthetics. The watershed is home to a wide variety of wildlife including Deer, Bald Eagles, Red Tail Hawks, turkey vultures, turkeys and many species of songbirds. High Island Sportsmen's Park, located along High Island Lake, is a popular picnic spot for citizens in the watershed. Many campers stay at High Island County Park, located along High Island creek in eastern Sibley County. Horseback riding, and innertubing also bring tourists into the watershed.

F. Land Use Information

Land use in the watershed consists of:

- 84.9% Agricultural
- 2.7% Urban/Suburban
- 5.1% Forest
- 1.1% Wetland
- 1.4% Water
- 4.8% Hay, Pasture, Grassland and other

The watershed consists primarily of agricultural activity with crops of corn, soybeans, small grains and forage. Agricultural land is found in all but the furthest east portions of the watershed, which is predominately woodland.

Arlington, New Auburn and a portion of Stewart are cities located within the watershed. Treated water from the waste water treatment plant in Arlington enters High Island Creek at the western edge of Arlington. Wastewater from New Auburn is treated and spread over fields near the city. Additionally, the wastewater treatment from Green Isle (Bevens Creek Watershed) and half of the wastewater from Stewart (Crow River Watershed) discharge to the High Island Creek. Poultry industry is located in the Rush River Watershed but poultry manure is spread on agricultural land in the High Island Creek Watershed. A vegetable canning plant and other light industry is also located within the watershed.

SECTION 2 STATEMENT OF PROJECT GOALS AND OBJECTIVES

A. Overall Resource Goals

The overall purpose of the diagnostic phase of the project is to obtain water quality data that will be used to implement land use changes to improve water quality. Flow data will be used in correlation with water quality data to determine loading at the five primary sampling sites. Quantity and quality data will also be used for future management of water quantity issues. The collected data will be used to determine priority areas to implement best management practices that will reduce sediment and nutrient loading to the High Island Creek. The data will also be used to create a plan that will work toward a reduction of fecal coliform bacteria in High Island Creek and its tributary, Buffalo Creek.

The goal of the Phase I diagnostic study is to assess the quality and quantity of water in the High Island Creek watershed through a cooperative effort between local governments, state agencies, local residents/landowners and operators while promoting a viable economy for agriculture, industry and recreation.

B. Water Quality Characterization Goals

1. Characterize sediment, phosphorus, nitrogen and bacteria concentrations and loading for the High Island Creek and its tributary, Buffalo Creek during periods of base flow and storm events.
2. Identify land use and land use practices of the watershed and correlate their relationship to observed water quality results.
3. Identify the pathways of fecal coliform and nutrient loading into High Island Creek and Buffalo Creek.
4. Develop load/concentration reduction goals for each parameter in the watershed.

C. Preliminary Quantitative Goals

Quantitative reduction goals will be set during the preparation of the final plan and include input from the technical committee and residents of the watershed.

D. Information and Education Goals

1. To raise awareness of watersheds, watershed management, and the correlation between water quality, flow and land use among residents including students, living in the watershed.
2. Identify priority areas for educational contact to promote and implement Best Management Practices.
3. Utilize the activities, methodologies, and information resulting from this study to guide other major watershed projects.

SECTION 3 PROJECT ORGANIZATION AND RESPONSIBILITY

A. Project Structure

The project sponsor for the High Island Creek Watershed Assessment Project is Sibley County. Sibley County will also serve as the fiscal agent for the duration of the project. The project representative will work out of Sibley Soil and Water Conservation District in Gaylord, MN. High Island Watershed District will serve as co-sponsor of the project. Contributing sponsors include many local, state, and federal organizations. Hydrologic and water quality monitoring will be conducted cooperatively by the USGS and project personnel.

The project technical committee is composed of local, regional, state and federal personnel that will advise and direct project goals. The major responsibilities of the technical committee will include:

Assistance with development of the project workplan.
Direction of project activities.
Interpretation of water quality/quantity data.
Development of watershed goals.
Assistance in development of implementation plan strategy.

Appendix B contains an organizational chart for all members involved in the High Island Watershed Assessment Project. Appendix C contains the name, address and phone number of all technical committee members.

B. Contributing Sponsors

The following is a description of the activity each contributing sponsor will perform towards the project.

Sibley County Water Plan Office: Staff will serve on the Technical Committee, provide diagnostic assistance, and provide education and outreach. The Water Plan Office will provide \$7,000 in-kind for GIS work to Minnesota State University, Mankato – Water Resource Center. They will also provide \$150 in-kind for 6 transparency tube kits.

Cash Contribution	\$8,000
In-Kind Contribution	up to \$14,950

Sibley County Environmental Service: Staff will provide in-kind service through feedlot basin inspections, follow-up inspections on feedlots and septic systems, and follow-up inspections on waste dumps. Sibley County Environmental Services will also commit up to two ISCO 3700 series automatic samplers for the duration of the project.

Cash Contribution	\$5,000
In-Kind Contribution	up to \$13,800

Sibley County SWCD: Sibley SWCD will provide use of vehicle and office equipment for two years. Staff will further provide in-kind services through collection of the necessary data to run the land use inventory modeling program, GLEAMS, on two minor watersheds in Sibley County. Staff will conduct transect survey for the High Island Watershed. Staff will also serve on the project technical committee.

In-Kind Contribution	up to \$7,600
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Sibley County NRCS: Will provide in-kind through use of vehicle, office equipment, and office space for the Clean Water Partnership coordinator. Staff will also serve on the technical committee.

In-Kind Contribution	up to \$6,190
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Sibley County Extension Service: Staff will provide in-kind through participation in demonstration projects and educational events. Will also provide technical expertise when necessary.

In-Kind Contribution up to \$5,000

Sibley County Development Commission: Staff will serve on the steering committee for the duration of the project.

In-Kind Contribution up to \$2,000

Sibley County Auditor: Provide fiscal management for the duration of the HICWAP – Clean Water Partnership.

In-Kind Contribution up to \$6,720

High Island Watershed District: District member/s will serve on the project technical committee.

Cash Contribution \$10,000

In-Kind Contribution up to \$6,000

McLeod County Water Plan Office: Assist with monitoring and assessment, provide education, and serve on the project technical committee.

In-Kind Contribution up to \$4,800

McLeod County SWCD: Will collect the necessary data to run the land use inventory modeling program, GLEAMS, on a minor watershed in McLeod county. Provide technical support for the duration of the project and serve on the project technical committee.

In-Kind Contribution up to \$2,500

McLeod County NRCS: Staff will locate areas of concern in the watershed and inform/educate landowners of various programs to aid in correcting water quality and quantitative problems.

In-Kind Contribution up to 2,500

Renville County Water Plan Office: Staff will serve on the project technical committee and assist with site selection for monitoring sites.

Cash Contribution \$4,000

In-Kind Contribution up to \$2,000

Renville County NRCS: Staff will assist with providing technical expertise, assisting with implementation plan and strategy, and assessing land use practices.

In-Kind Contribution up to \$2,500

Renville County SWCD: Staff will assist with monitoring, work plan development and watershed assessment. Staff will also serve on the project technical committee.

In-Kind Contribution up to \$1,000

Renville County Planning and Zoning: Will assist with data interpretation and integration.

In-Kind Contribution up to \$1,000

Brown-Nicollet-Cottonwood Water Quality Board: Staff will provide assistance in work plan development, data management, implementation planning, monitoring and lab analysis, and assessment of data.

In-Kind Contribution up to \$5,000

City of New Auburn: Provide sample analysis of New Auburn's wastewater treatment facility.

In-Kind Contribution up to \$2,600

City of Arlington: Assist with water quality monitoring, summarize and characterize land use influences, assist with implementation plan and strategy, and assess land use practices in the city of Arlington.

Cash Contribution \$500
In-Kind Contribution up to \$500

United States Geological Survey: Will provide 50% of the cost of their monitoring and assessment as in-kind. The USGS will do the following:

- 1) Streamflow measurements will be made at five automated monitoring sites during high, medium, and low flow. Streamflow measurements also will be made at up to five non-automated sampling sites during six synoptic samplings.
- 2) Base gauges consisting of staff or wire-weight, as appropriate, will be installed and surveyed to stable reference marks. Stage-discharge relations will be determined for five automated sampling sites. Stage-discharge relationships will also be determined at up to five non-automated sampling sites where development of such relations is feasible and practical.
- 3) Synoptic sampling will be undertaken at up to ten monitoring sites. Synoptic sampling will be done six times at approximately one-month intervals

In-Kind Contribution up to \$6,900

3 Rivers RC&D: Will attend approximately six meetings per year of the Lower Minnesota River Valley Task Force / Friends of the Minnesota River.

In-Kind Contribution up to \$660

Rivers Council of Minnesota: Assist in project activities, summarize and characterize land use influences, assess water quality data, and assist with implementation and strategy plans.

In-Kind Contribution up to \$2,000

The Coalition for a Clean Minnesota River: Staff will serve on the project technical committee.

In-Kind Contribution up to \$2,000

Sibley County Pork Producers:

Cash Contribution \$500

Mallard Over McLeod Chapter of the MN Waterfowl Association

Cash Contribution \$500

Sibley Wings Chapter of the MN Waterfowl Association

Cash Contribution \$500

Tree Island Chapter of the MN Waterfowl Association

Cash Contribution \$500

Waldbaum Egg Products: Will provide assistance with monitoring and assessment.

Cash Contribution \$300

In-Kind Contribution up to \$450

River Friendly Faith Community-Dee Czech:

Cash Contribution \$20

Social Concerns Committee of Church of St. Mary:

Cash Contribution \$50

Hamline University – Center for Global Environmental Education: Staff of CGEE will conduct a day-long teacher-training workshop focusing on key issues addressed by the High Island Watershed Assessment Project. The CGEE will supply four free demonstration CD's of their Waters to the Sea: Rivers of the Mississippi and additional copies at a discounted price. They will provide scholarships and space on their Rivers of Life web site for the education portion of the project. The CGEE also will provide orientation and training as needed for the High Island Creek Watershed Assessment Project.

In-Kind Contribution up to \$5,000

Minnesota New Country School: Staff and students will assist in water quality monitoring, educational events, and other services. Students will also undertake a macroinvertebrate study in the watershed.

In-Kind Contribution up to \$4,000

Sibley East High School: Students will assist with monitoring at a site to be determined.

In-Kind Contribution up to \$6,000

University of Minnesota: Will collect eight samples from all ten sampling sites. Will analyze samples by DNA fingerprinting to determine sources of Fecal Coliform in each sampling shed.

In-Kind Contribution up to \$4,000

Minnesota State University, Mankato – Water Resource Center: Will provide up to 42% of the GIS project cost as in-kind to produce the analysis and metadata for the High Island Creek Watershed Assessment Project.

In-Kind Contribution up to \$5,000

Volunteers: Volunteers will provide in-kind support for the project by serving as staff gauge readers, turbidity tube readers, and assisting with stream clean up events.

In-Kind Contribution up to \$15,600

Township Halls: A total of eight township halls will be made available to the project as a meeting a place during collection of well samples during 2001.

In-Kind Contribution up to \$2,000

Braun Intertect: Will provide shipping, bottles and coolers for collecting water samples for the duration of the project.

In-Kind Contribution up to \$560

Minnesota Pollution Control Agency: The MPCA will assist with the establishment of monitoring sites, provide technical assistance and modeling assistance. MPCA staff will assist with installation of monitoring equipment, data analysis, and interpretation. Staff will serve on the project technical committee.

Total Cash Contribution	\$29,870.00
Total Inkind (As included in work plan)	<u>\$139,362.50</u>
Total Project Support	\$169,232.50
Total Possible Inkind (Best Case Scenerio)	\$189,930.00

SECTION 4 **IDENTIFICATION AND SUMMARY OF PROJECT ACTIVITES**

Program Element 1: Preliminary Activities

The Project Coordinator will organize a Technical Committee made up of representatives of local, state and federal agencies, and active citizens involved in water and natural resources protection and preservation. This Technical Committee will meet quarterly to discuss the progress of the project and to bring together input from its members. The Technical Committee will assist the project coordinator with developing a workplan for the project. The Steering Committee members will also provide technical assistance for project staff.

The project coordinator will develop a transparency tube and rain gauge network, utilizing volunteers throughout the High Island Watershed. These volunteers will assist in assessing the sediment loading to High Island Creek and Buffalo Creek.

Program Element 2: Monitoring and Assessment

To assess the water quality and quantity within the High Island Watershed, 10 sites have been selected for monitoring. These sites were selected by a reconnaissance team, with members from the MPCA, USGS, and Sibley County Water Plan Office on October 21, 1999.

The reconnaissance team selected a total of 10 sample/flow sites. Five of the sample/flow sites are classified as primary sites where electronic equipment is installed to continuously measure and record stage. The remaining five sites will be secondary sites, where samples will be collected but electronic monitoring equipment will not be installed. A description of the proposed primary and secondary sites can be found in Appendix C.

The USGS will collect baseline samples once per month from April through September in 2000. Baseline sampling will be conducted from April through September of 2001 by project staff. Project staff will collect 20 storm samples over 2000/2001 from each of the ten monitoring sites.

The USGS will develop rating curves for the 5 primary sites during 2000 and 2001. Wire weight gauges and staff gauges will be installed at all primary and secondary sites by the USGS and the Project Coordinator.

The parameters that will be tested include: Total phosphorus, orthophosphate, ammonia, nitrate, nitrite, total suspended solids, chlorophyll A, turbidity, fecal coliform, pH, dissolved oxygen and biological oxygen demand. Project and USGS staff will also determine transparency, temperature, pH, specific conductivity, dissolved oxygen and saturated dissolved oxygen.

Transparency tube readings and precipitation monitoring will be done throughout the High Island Watershed for the duration of the project through the use of volunteers. At this time, project staff have selected nine transparency tube sites.

In addition to the water quantity/quality monitoring performed by the USGS and Project Staff, many other projects will be taking place.

Sibley SWCD and McLeod SWCD will collect the necessary data and run the GLEAMS model on three minor watersheds in the High Island Watershed. This model will be used to assess the impact of management practices on potential pesticide and nutrient leaching within, through, and below the root zone.

The University of Minnesota will conduct a DNA fingerprinting study on the High Island Watershed during the summer of 2001. DNA fingerprinting will be used to determine the sources of the fecal coliform in the High Island Watershed. The UofM and Project Coordinator will work together in the collection of samples and in correlating results.

During the winter of 2000/2001 lake core samples will be extracted from High Island Lake and Bakers Lake. These samples will be used to determine if the deposition in the lakes is from sediment or plant detritus.

Program Element 3: Data Interpretation and Integration

The Project Coordinator and members of the Steering Committee will analyze water quality and quantity data collected during the project. Analysis of the data will include development of sediment and nutrient loading curves for the monitoring sites. Total loading at each of the primary sites will also be assessed. Information obtained will identify the specific parameters that need priority attention. This information will be used to establish implementation priority areas.

GIS work will be done by Minnesota State University, Mankato, utilizing data obtained from the project study. Layers that the project workplan will include are surface hydrology, potential sites for wetlands, land-use, non-point pollution potential, and soils.

Program Element 4: Education and Outreach

A great deal of importance will be placed on informing the public and media about the High Island Assessment Project. The project coordinator will be responsible for

informing and educating the public through newsletters, brochures, news releases, stream field days, and other activities developed through the duration of the project. The project coordinator will utilize the assistance of Water Planners, SWCDs, NRCSs and Extension offices in the development of watershed educational events. Project staff will also be responsible for the dissemination of data obtained during the project.

Education and Outreach will also include working with the educators and youth in the watershed, sharing data, education on watershed management, training and demonstrations for educational land use curriculum and Rivers of Life. Web space will be given to the project for students to document the activity going on in the High Island Watershed. The project coordinator will utilize the assistance of Hamline University CGEE; Water Planners, SWCD, and Extension offices in the development of youth oriented watershed educational events.

By participating in a transparency tube network, citizens will educate themselves and their friends and neighbors about water quality/quantity problems in the High Island Watershed.

Well testing will be provided to all residents in the watershed during the spring of 2001. The project will offer free nitrate and fecal coliform testing at eight township halls throughout the watershed. The coordinator will discuss the results of the well tests with the citizens, as well as informing them on the water monitoring efforts of the High Island Project.

Project staff will work with Minnesota Department of Agriculture in setting up a study in the watershed to compare different types of tile intake designs (blind intakes, open intakes, etc.) by comparing sediment transportation. These sites will be used for demonstration purposes to educate farmers and local citizens during 2001.

Program Element 5: Development of Implementation Strategy

The project steering committee, project coordinator, MPCA and DNR will take an active role in developing an implementation strategy. The water quality/quantity results will allow priorities to be established for the High Island Watershed. The project coordinator will obtain input from committee members as well as the public in determining the best management practices. The project coordinator will work closely with the SWCD offices during this program element.

Program Element 6: Administration

Sibley County will serve as Project Sponsor, with High Island Watershed District as co-sponsor, for the watershed project during CWP Phase 1. Sibley County will serve as the project administrator. The project coordinator will be hired by and work out of Sibley Soil and Water Conservation District. Sibley County will be the fiscal agent and responsible for issuing cash expenditure reports and fiscal/administrative support. The Project Coordinator will be responsible for semi-annual and annual progress/expenditure reports and in-kind reports.

**SECTION 5
MILESTONE SCHEDULE**

Program Element	Start Date-End Date	Responsibility
Program Element 1: Work Plan Development		
Establish Technical Committee	4/00 – 5/00	Proj. Coord.
Workplan Development	4/00 – 8/00	Proj. Coord., Tech. Committee
Program Element 2: -Monitoring and Assessment		
Site Selection	3/00 - 4/00	Tech. Committee
Installation of Monitoring Equipment	4/00 - 5/00	USGS, MPCA, Proj. Coord.
Baseline Sampling	5/00 –11/01	USGS, Proj. Coord.
Storm Event Sampling	5/00 –11/01	Proj. Coord.
High Island Sechi Disk Readings	5/00 – 9/01	High Island Conservation Club
Turbidity Tube Readings	5/00 - 9/01	Proj. Coord., Volunteers
Development of Rating Curves	5/00 – 9/01	USGS
Precipitation Monitoring	3/00 – 12/01	Proj. Coord., Volunteers
Transect Survey	6/00 – 6/01	Sibley SWCD
GLEAMS Modeling	9/00 – 9/01	Sibley SWCD, Mcleod SWCD
Surveying Staff Gauges, Benchmarks	9/00 – 9/01	DNR-Hydrology
DNA Fingerprinting	6/01 –8/01	UofM
New Auburn WWTP Sample Analysis	4/00 –12/01	City of New Auburn
Macroinvertebrate Study	4/01 –6/01	MN New Country School
Core Sample Analysis of High Island Lk. & Bakers Lk.	12/00	Proj. Coord,
Program Element 3:-Data Interpretation and Integration		
Compiling & Interpreting Data	9/00 – 2/02	Technical Committee
Modeling	9/00 – 2/02	MPCA, Proj. Coord.
GIS Analysis / Packaging	11/00 – 2/02	MN State University, Mankato
Loading Estimates	11/00 –2/02	MPCA, Proj. Coord.
Program Element 4: Education and Outreach		
Promotional events and workshops	6/00 – 12/01	Proj. Coord.
Publications	6/00 – 12/01	Proj. Coord.
Well testing	4/01 – 6/01	Proj. Coord.
Intake Study and Demonstrations	9/00 – 12/01	MDA and Proj. Coord.
Development of Website Documenting the Project	9/00 – 4/02	Rivers of Life – CGEE
Program Element 5: Dev. of Implementation Strategy		
Determination of Priority Areas	10/00 – 2/02	Technical Committee
Determination of Implementation Projects	6/01 – 2/02	Technical Committee
Development of Phase 1 Implementation Plan Report	6/01 – 4/02	Proj. Coord.
Program Element 6: Administration		
Fiscal Management	4/00 – 4/02	Sibley County Auditor
Project Coordination	4/00 – 4/02	Proj. Coord.
Semi Annual Report	9/00	Proj. Coord.
Mid-Project Report	12/00	Proj. Coord.
Annual Report	12/00 & 12/01	Proj. Coord.
Final Report	4/02	Proj. Coord.