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April 30, 2010

Don Baloun, State Conservationist
Natural Resources Conservation Service
375 Jackson Street
St. Paul, MN 55101-1810

RE: Mississippi River Basin Initiative (MRBI) Application

Dear Mr. Baloun,

Enclosed you will find the MRBI applications for the Upper Cedar in Minnesota. We have an application for CCPI and WREP.

The 4 County area of the Upper Cedar has become a priority area for a variety of resource investigation and restoration efforts. We have partnered with the Cedar River Watershed District as well as state agencies in gathering excellent baseline monitoring and modeling data which future progress can be measured.

Our strong partnership with the Cedar River Watershed District has brought leverage dollars for the federal funding as well as a strong state agency and agricultural groups commitment to this project.

Our wide variety of conservation practices that include bioreactors, control drainage structures and corn stalk nitrate testing will be beneficial for the area where agricultural is the economic engine. This MRBI application maintains ag productivity, provides the ag community tools to monitor, apply best management practices, minimizes the nutrient runoff coming off their land along with improved wildlife habitat.

Thank you for your consideration for this MRBI application.

Sincerely,

A handwritten signature in black ink, appearing to read "Bev Nordby".

Bev Nordby
District Manager

**Green Valley/Austin Watershed Initiative
For the Upper Cedar River Watershed
CCPI
Mississippi River Basin Initiative (MRBI)**

- a. Bev Nordby, District Manager, bev.nordby@mowerswcd.org 507-434-2603
- b. Mower Soil and Water Conservation District (SWCD)
- c. 1408 21st Ave NW Suite 2
Austin, MN 55912

Collaborating Partners:

Cedar River Watershed District
Freeborn Soil & Water Conservation District
Dodge Soil and Water Conservation District
Steele Soil and Water Conservation District
MN Pollution Control Agency
MN Board of Water and Soil Resources
MN Department of Agriculture
Nature Conservancy
Environmental Defense Fund
Ag Technology and Environmental Stewardship Foundation

- d. The Upper Cedar River in Minnesota (HUC 07080201) is the Designated 8 digit Focus Area for this CCPI application. It includes a drainage area that lies in southeastern Minnesota, with the very upper region in Minnesota, and continues through Iowa. This application for the 12 digit HUCs is in the headwaters in Minnesota. It includes portions in Minnesota in the Counties of Mower, Freeborn, Dodge and Steele.

This application focuses on two 12 Digit HUC(s) in the Upper Cedar River Watershed—Green Valley Ditch (HUC 070802010204), which is part of the headwaters, and the City of Austin, Cedar River (HUC 070802010206). The Green Valley watershed is 66,058 acres, while the Austin/Cedar River watershed is 35,030 acres. For the purposes of this application, the combined watershed is called the Green Valley/Austin Watershed.

This area is in the 1st Congressional District in Minnesota.

- e. **Description of the project and resource issues:** The natural resource issues in the Green Valley/Austin Watershed that relate to the MRBI priorities and objectives are soil erosion, excess nutrient loading and degraded water quality. Nitrates, fecal coliform bacteria, and sediment are the contaminant challenges we face in the Green Valley/Austin watershed, especially in our agricultural areas. In this area, we also face high nitrate concentrations in our ground water, because of our karst topography. The karst topography creates many interconnections between our surface water and groundwater, bypassing the natural filtering capacity of the soil. These two watersheds contain waterbodies that are included in the Impaired Waters list for fecal coliform and turbidity. A TMDL is complete for fecal coliform, and we are in the process of developing the TMDL for turbidity.

The Upper Cedar River Watershed has experienced severe flooding over the last 30 years. The watershed has gone through land use changes that include intensive agricultural practices that lead to accelerated

stormwater runoff and increased demands on drainage systems. These changes have resulted in degradation to water quality and major hydrologic changes, subjecting the Cedar River to dangerous flash flooding during or following heavy rainfall events. The September 2004 flood caused the loss of 2 lives and damages of 17 million dollars on private and public properties. To address the flooding challenges and the degradation of the surface waters, the Cedar River Watershed District (CRWD) was formed. The CRWD is a local government unit governed by a local board of managers who are appointed by the boards of the counties with land in the watershed district. Their mission is to reduce flooding and improve water quality in the watershed. With the coordinated efforts of the CRWD, the 4 Soil and Water Conservation Districts, state agencies and other organizations, we have the ability to draw upon strong technical and financial resources to 1) address the issues and implement best management practices through a systems approach, and 2) monitor the effectiveness of the BMPs at the field, subwatershed and watershed scales. The purpose of the practices put forth in this MRBI application is to avoid, control and trap nutrient runoff. The proposed practices include the use of cover crops, nutrient management (including evaluation and monitoring of nutrient management to generate increased improvement and benefits), residue management, grassed waterways, woodchip bioreactors, streambank restoration and water and sediment control basins. In addition to reducing and controlling runoff, these practices will also help to keep valuable topsoil on the land and maintain agricultural productivity. The separate WREP proposal calls for restoring drained wetlands in the Green Valley/Austin watershed; the restored wetlands will trap sediments and nutrients in the Upper Cedar River watershed before it drains into Iowa.

In 2007, the Mower Soil and Water Conservation District solicited services to study wetland restoration sites in the Cedar River Watershed. The study focused on identifying priority areas that would optimally provide optimum opportunities for wetland and native prairie restoration. The study also reviewed the flood reduction potential of the restoration sites. The study yielded 51 sites that were located within the focus area of this application. The study showed that there are ample opportunities to use federal farm programs to control and trap sediment and nutrients that have led to the impairment listings in this watershed. The 51 sites that were identified for restoration provided an incentive for the SWCD and the cooperators in the watershed to begin promoting programs in this area. We will build and draw upon the close working relationships that developed between the SWCD and the cooperators during the project to ensure the success of this MRBI project. One of the greatest challenges in addressing nutrient loading to critical waterbodies, such as Upper Cedar Creek, is improving nitrogen management to improve efficiency and reduce loss while avoiding compromising yields. Because it is so highly variable and affected by so many factors and has such a significant impact on yields, managing nitrogen effectively is very difficult. But nitrogen is also expensive, so tools and approaches that help farmers use nitrogen more efficiently without reducing yields offer opportunities to benefit water quality, benefit farmers, and thus be more sustainable over time.

To advance effective evaluation, monitoring, and documentation of the effectiveness of nutrient management efforts and advance real change, the Cedar Creek CCPI will implement the On-Farm Network®, an adaptive management strategy and framework for real time evaluation and fine-tuning of nutrient management practices and documentation of impact that has been demonstrated and validated in multiple regions. The adaptive management approach of the On-Farm Network® enables farmers to compare the economic impacts of different management options based on field-specific information, including making comparisons to the more generalized recommendation. To adopt an adaptive management strategy, farmers need access to new evaluative tools such as the cornstalk nitrate test and inexpensive aerial imagery, and they need a process to take the information from these evaluative tools and feed it back into

field-level management decisions. Equally important, they need a network that facilitates discussion, exchange and comprehension of their data to make better management decisions that lead to accelerated nutrient reductions. The On-Farm Network® accomplishes these objectives.

The On-Farm Network® collects and analyzes key indicators of nutrient use efficiency, enables growers to compare the relative efficiency and effectiveness of different management practices, and effectively monitors and documents change over time. The extensive data collected, managed, and analyzed through the On-Farm Network® proves very valuable not only to growers who are directly involved, but to the wider grower community and to NRCS as it provides a science-based, quantitative method for benchmarking practices, documenting change, and prioritizing the most effective practices for a given area.

We will leverage EQIP and partner assistance to conduct cornstalk nitrate testing, aerial imagery, and replicated strip trials on 30-50 fields per year within the Cedar Creek Watershed. This project builds from the extensive and growing work using adaptive management in seven states in which participating farmers have reduced their N use by one-third after participating for two or more years, with 80% of participating farmers making changes (Data available online at <http://www.isafarmnet.com/nitrogen.html>).

f. Description of planning completed at the field and watershed scales that identify conservation practices needed to address resource concerns:

The CRWD, in cooperation with several stakeholders, just completed their 10 Year Watershed Management Plan in 2009. Stakeholders included 4 counties, 4 Soil and Water Conservation Districts, 11 cities, 25 townships, State agencies and several residents in the Watershed. To achieve the CRWD's 20% flood reduction and water improvement goals, the CRWD plan focuses on public involvement and education, implementing best management practices on agricultural land, and implementing a comprehensive water quality and water quantity monitoring program throughout the watershed. After the 2004 flood event, Mower and Freeborn Counties, along with the SWCDs, formed an ad hoc committee to address the flooding challenges in the 4 county area and the impacts of the frequent flooding on the water quality conditions of the streams and river. A surface water management plan was completed. This plan assigns flow rate goals in each subwatershed, which can be achieved through a systems approach of best management practices, as well as wetland restorations through WREP. The CRWD plan incorporates the results of the surface water management plan.

In 2007, the District partnered with Ameri Corps volunteers to gather visual data on the health and condition of the Cedar River and its tributaries in the upper portion of the watershed. The volunteers spent two months meticulously walking the banks and documenting areas of concern. The Ameri Corps work resulted in the creation of an inventory that includes photographs and GPS information to highlight specific areas of concern. The inventory results have been used to identify sensitive land and willing cooperators who are interested in repairing the stream banks and incorporating filter strips into their riparian cropland. The MRBI initiative funds will be used to accelerate this effort.

In 2009, the SWCD/CRWD completed a study for a watershed directly adjacent to the focus area for the MRBI. The purpose of the study was to review the relationships between soil erosion and surface water runoff and how they affect water quality. As part of the study, the SWCD/CRWD developed a Soil and Water Assessment Tool model of the watershed. Conditions in this area were analyzed at the 12-digit HUC watershed scale and the study identified specific conservation practices that were needed to address the resource concerns. The study recommended a combination of selected best management practices that

would provide the most benefit for water quality, while assuring program participation from area cooperators. BMPs identified in the study included wetland restoration/water retention, targeted stream bank stabilization and conservation tillage practices. Because of the study's proximity to the MRBI study area, the results of the study can be transferred to the MRBI study area.

The Upper Cedar River watershed has been identified by the Environmental Protection Agency as an impaired watershed for turbidity and fecal coliform. Total maximum daily load studies needed to be prepared for both impairments. The fecal coliform TMDL is complete, with implementation currently underway, while the turbidity (sediment) TMDL is in the monitoring phase. The impairments are evidence that appropriate steps need to be taken immediately to maintain and improve the quality of life that come with clean water. Upon approval of the turbidity TMDL and the implementation plan, the SWCD, CRWD, and others will cooperate/collaborate to implement the recommended BMPs.

In addition to the watershed planning described above, the local SWCD and NRCS staff have a long history of working successfully with agricultural producers in the watershed. Through our cooperative efforts, landowners have shown interest in implementing several BMPs on their land. Listed below are the practices that have been implemented:

Wetland Restorations	67 acres,	CCRP	100 acres
Cover Crops	841 acres	Residue Management	1500 acres
Nutrient Management	600 acres		

g. List of approved FOTG practices to address concerns:

This project proposes to use the following approved NRCS FOTG practices:

Core practices

Avoiding	340	Cover Crops
	590	Nutrient Management
Controlling	329	No-till & Strip till
	412	Grass Waterway
	554	Drainage Water Management
	643	Restoration & management of declining habitat
	645	Upland wildlife habitat management
Trapping	393	Filter Strip (CRP)
	558	Roof runoff structure
	657	Wetland restoration (WREP)
	658	Wetland creation (WREP)
	659	Wetland enhancement (WREP)
	587	Structure for Water Control

Supporting Practices

Controlling	410	Grade stabilization structure
	484	Mulching
	607	Surface drainage
	620	Underground Outlet
Controlling/trapping	342	Critical area planting
	638	Water and sediment control basin

In addition, the project will implement the new Monitoring and Evaluation Standard (799), in particular to monitor, evaluate, and document opportunities and improvements in nutrient management efforts.

i. Proposed project start and end date June 30, 2010 to September 30, 2015

2. **Project Natural Resource Objectives and Actions**

a. Identify and provide detail about natural resource concerns.

The 10 year watershed plan developed by the Cedar River Watershed District has identified priorities in the Upper Cedar River watershed. The plan is one of the most important tools for identifying (and addressing) challenges in the watershed. This MRBI application will utilize the plan's goals and objectives.

Natural Resource Concerns

Nitrogen and Fecal Coliform

Goal: To 1) reverse the trend of increasing nitrogen concentrations, and 2) to reduce fecal coliform concentrations in the streams.

Nitrogen concentrations in the Mississippi River Basin and its tributaries (including the Upper Cedar River) have been increasing for several decades. High nitrogen concentrations cause local water quality problems and contribute to the hypoxia problems in the Gulf of Mexico. The Minnesota Pollution Control Agency milestone monitoring program's trend analysis shows that nitrate concentrations are increasing in the Cedar River. Nitrate concentration data have been collected in this river system since the 1970's. Detections of high concentrations >10 ppm in wells and rivers/streams are common. The karst topography in this part of Minnesota creates many interconnections between surface and ground water so that applications of nutrients on the landscape can easily enter groundwater. According to statewide estimates, soil organic matter and nitrogen fertilizer are the leading sources of inorganic nitrogen, which is the biggest concern for our groundwater. In the Upper Cedar River watershed, nitrogen is a specific concern because the City of Cedar Rapids relies on the Cedar River for its drinking water supply. High nitrate concentrations above the EPA's 10 mg/L (ppm) standard for drinking water supplies caused the EPA to list the Cedar River as impaired by nitrate. Nitrate in drinking water can cause many problems. It is especially harmful to infants, as excess concentrations may cause methemoglobinemia, or blue baby syndrome, a potentially fatal blood disorder that limits the intake of oxygen and can lead to suffocation (U.S.EPA, 1996). In response to the impaired waters listing, a total maximum daily load (TMDL) was completed in 2006. The TMDL assumed a 35% reduction in the total nitrate loading from Minnesota. Reductions in nitrate loading to the Upper Cedar River in Minnesota will be important for meeting water quality standards in Iowa.

Farm nutrient management evaluations conducted by the MN department of Agriculture show that farmers often apply more nitrogen fertilizer than necessary in the Lower Mississippi River Basin. The result is increased potential for nitrate leaching and runoff.

Fecal Coliform: Reduce fecal coliform levels by 10% over the next 5 years.

According to the 2007 Implementation Plan for the Lower Mississippi River Basin Fecal Coliform Bacteria TMDL "the widespread problem of fecal coliform impairment is caused by thousands of ubiquitous pollutant sources spread across the Basin - feedlots, manured fields, wildlife and failing septic systems to name the main ones - rather than by a few large discrete sources." There are 857 feedlots in the Cedar River Watershed District; 137 of these feedlots are located in the Green Valley/Austin Watershed. Of the 137 feedlots, 28 facilities have a NPDES permit; all but three of these are swine operations. All are over a 1000

animal units. Typically, swine facilities dominate in the area. The facilities confine livestock under a roof with a pit for liquid manure. Feedlot runoff tends not to be a problem from these facilities; however land application of manure can be a major source of non-point pollution.

Objective 1: Implement the core practices of nutrient management on 15,000 acres to avoid, control, and trap nutrients and bacteria.

Action 1.: Complete at least 10 new comprehensive nutrient management plans by 2015.

Action 2: Implement the new Monitoring and Evaluation Standard (799) via the On-Farm Network® on at least 50 fields in the watershed to collect and analyze necessary data to evaluate current nutrient management practices, identify opportunities to fine tune and improve nutrient use efficiency, and engage farmers in making documentable changes to utilize nutrients more efficiently and reduce nutrient losses. (See below for more information about the On-Farm Network)

Action 3: Promote and construct 2 woodchip bioreactors

Action 4: Restore 200 acres of drained wetlands (see WREP application)

Turbidity/Erosion

Goal: Minimize erosion and its effects on water quality by reducing erosion and turbidity. Agriculture is the dominant land use in the Upper Cedar River Basin. It is flat and intensively drained with many small tributary streams and drainage ditches. The Green Valley/Austin Watershed area is heavily tilled and large portions of the area are planted to vegetable crops. It has several stream reaches (segments) listed as impaired waters by the MPCA. Water quality in the Cedar River Basin in Minnesota is also a concern for Iowa, where the Cedar River is used for as a supply for drinking water and for recreation. Iowa is conducting its own TMDL study of the river and watershed for nitrate impairment. The Cedar River TMDL workplan states that the Cedar River Basin in Minnesota has ten separate impaired waters. Of these ten impaired waters, five stream reaches are impaired for turbidity.

The major source of phosphorus loading to surface water is from nonpoint pollution. Nonpoint sources include surface runoff from agricultural land and urban areas. Most phosphorus is exported from cropland as sediment-attached runoff. High erosion rates generally are associated with high phosphorus runoff. For example, University of MN data show that conventionally tilled corn fields experience approximately four times as much phosphorus runoff as no-till corn fields.

Objective 1: Use core MRBI BMP practices to avoid (cover crops), control (grassed waterway), and trap (filter strips) sediment with a goal of implementing practices in the watershed in five years.

Action 1: Develop an erosion problem inventory for prioritized applications by using Lidar data.

Action 2: Work with the landowners one-on-one to implement whole-field planning and implementation of BMPs.

Action 4. Enroll 15 farmers into CSP over the course of the 5 years.

Action 3: Work with landowners in Mower, Steele and Dodge Counties to implement a systems approach of using cover crops to avoid, conservation tillage to control, and filter strips on ditches to trap in the Green Valley/Austin Watershed.

2000 acres of cover crops 870 acres of no-till 50 acres of filter strips, 5 waterways

Water Quantity/Flow

Goal: Decrease the risk of flooding throughout the watershed.

Flooding in the Upper Cedar has been severe over the last 30 years. The watershed has gone through land use changes that include intensive agricultural practices that lead to accelerated stormwater runoff and increased demands on drainage systems. These changes have resulted in degradation to water quality and major hydrologic changes subjecting the Cedar River to dangerous flash flooding during or following heavy rainfall events in Minnesota and Iowa. Significant damaging floods have occurred in 1978, 1993, 2000, 2004 and 2008. Flood levels have generally increased over time. The September 2004 flood caused the loss of 2 lives and damages at 17 million in private and public properties. Changing the landscape to include restored wetlands, conservation tillage practices and cover crops slow the surface water down.

Specific Issues regarding the water quantity issues include:

- Significant flooding across the entire watershed.
- Significant flooding occurs during events smaller than the 100 year event.
- Flood damage to buildings and infrastructure has experienced in Austin, Lansing and Udolpho Townships
- Frequent significant streambank and stream bed erosion occurs in all reaches of the Cedar River because of high bankfull flows occurring more frequently and for longer duration.
- The draining of wetlands has reduced the flood storage capacity.

Objective 1: Focus on implementing flood control features and measures by decreasing water quantity and flows in priority watersheds.

Action 1: Restore 150 acres of drained wetlands through WREP.

Action 2: Work with landowners in Mower, Steele and Dodge Counties to implement a systems approach of cover crops to avoid, conservation tillage to control, and buffer the ditches to trap water in the Green Valley/Austin Watershed.

Action 3: Promote and design best management practices for water control that includes 5 water and sediment control basins and 30 grade stabilization structures over the next 5 years.

3. Detailed Proposal Criteria:

a. A description of the partner history

The Mower Soil & Water Conservation District, as well as Dodge, Freeborn and Steele SWCDs have spent the last 55+ years working with agricultural producers in applying conservation practices to their land. Part of our success in working with rural landowners is to bring them a conservation program that works with their management style for their farming operation. It is important to us that farmers have the ability to stay productive and at the same time be good stewards of their land. We have been very successful at promoting and installing wetland restorations, buffers, waterways, sediment control basins and innovative practices that include two stage ditches, controlled drainage, surge ponds, and edge of field monitoring.

MPCA and MDA work with producers and local governments to monitor and evaluate many conservation practices. MPCA assists the Cedar River Watershed District in setting up comprehensive monitoring programs and MDA is assisting us with an edge of field monitoring site.

The Nature Conservancy offers leveraging funds, technical knowledge and support of BMPs. They coordinated several innovative practices with landowners that include two-stage ditches, surge ponds and other practices. They have also partnered with several agricultural cooperative businesses to put practices on the ground.

Environmental Defense Fund (EDF) is a national nonprofit conservation organization dedicated to working collaboratively to devise practical, economically sustainable solutions to environmental challenges. EDF has significant experience developing and implementing on-the-ground projects with farmers and other partners, many of which leverage NRCS and FSA programs such as EQIP and CREP. In collaboration with the Iowa Soybean Association through the Ag Technology and Environmental Stewardship Foundation (ATESF), EDF is currently managing On-Farm Networks® in 6 states. EDF brings leveraging resources to work in collaboration with ISA, the District, and other watershed partners to coordinate and implement the On-Farm Network® program within the watershed. This includes coordinating outreach to producers through publications, meetings, and on-on-one interactions and helping coordinate training for the SWCD and crop consultants on the tools of the On-Farm Network®, and implementation of the On-Farm Network® through a CCPI and the EQIP program.

Iowa Soybean Association is a grower organization dedicated to expanding profit opportunities while promoting environmentally sensible production. ISA currently manages the On-Farm Network® in Iowa, which engages more than 500 producers implementing guided stalk sampling and replicated strip trials, among a number of other large-scale conservation initiatives. ISA brings leveraging resources to manage all data submitted by producers through On-Farm Network®. To expand the On-Farm Network beyond Iowa, the ATESF was created. Through ATESF, ISA will analyze and communicate nutrient data on the level of the individual farm as well as aggregate. From the data analysis, ATESF will provide guidance on nutrient management practices within the watershed to enable adaptive nutrient management farming practices as producers react to the datasets. ISA will oversee training of the SWCD and crop consultants on collecting and using aerial imagery, setting up strip trials, collecting cornstalk nitrate samples, and managing producer engagement and participation.

- b. **Detailed Description of the Watershed:** The Upper Cedar River watershed in Minnesota is 278,463 acres located in southeast Minnesota; the river flows into central Iowa through Cedar Rapids, where it joins the Iowa River and flows on to the Mississippi River. There are 21 12-digit HUCs in the Upper Cedar River watershed in Minnesota and we are concentrating on the watersheds close to the headwaters, in the Green Valley/Austin watershed (two 12-digit HUCs). Those two HUCs make up about 66,058 acres.

In pre-settlement times, this area was burr oak savanna, with areas of tallgrass prairie and maple-basswood forest. It is now 83% cropland. In the Mower County Water Plan, the area is ranked 10th in Minnesota for corn and soybean production.

Many ditches were constructed in the early part of the 20th century to aid in the development of land for agriculture. The goal of these ditches is to remove water from agricultural lands. In addition to the ditches, the majority of the cropland is patterned tiled, which further assists farmers in draining their farmland.

In this small watershed area, the Ramsey Mill Pond Wildlife Management Area (WMA) is a 335-acre mixture of wetlands, upland woods and established native prairie managed for deer, small game, pheasant, waterfowl and other non-game species. Just downstream from the WMA, there is a boat access on the

Cedar River, which provides access for people to enjoy this wildlife area. Also in the watershed is the 90-acre Lost Lake Fish and Wildlife Refuge.

The Cedar River also provides habitat for the Wood Turtle and the Blanding Turtle and represents the western limit of this species in Minnesota. This species occupies forested rivers and streams and adjacent upland habitats. It will forage in the upland forest habitat, but also uses grassy openings to feed and nest. Threats to this population include loss of forest habitat, reduced water quality, and flooding of nesting and feeding areas. Also in this watershed is the federal endangered species, Prairie Bush Clover.

The SWCD and its partners in conservation have dedicated many years to building relationships with the people in the targeted areas. The culmination of all of these years of dedicated effort is corridor projects that trap nutrients on a large and effective scale. The SWCD has a very successful CCRP program with buffers, Conservation Reserve Enhancement Program (CREP) easements as well as WRP easements. These areas also promote and control every form of wildlife available to our area. These landowner-led initiatives have brought numerous agencies and program opportunities to the landscape to work toward a common goal of building on protection and enhancement of our most critical corridors.

c. Conservation Priorities in Watershed

Agriculture is the economic engine in this watershed. We want to offer a ramped-up conservation program to assist farmers in this area to be better stewards of their land, while maintaining agricultural productivity. We will voluntarily implement conservation practices using a systems approach to avoid, control and trap nutrient runoff, and we will restore drained wetlands on a voluntary basis. The end result will be improved stream quality and improved wildlife habitat in the area.

This CCPI application is integrated with a WREP application for the same areas.

d. A description of partners and roles and responsibilities

Mower SWCD: administer this MRBI application, provides assistance to cooperators with implementation of practices in the watershed.

Freeborn SWCD: provide assistance to cooperators with implementation of practices in the watershed.

Steele SWCD: provide assistance to cooperators with implementation of practices in the watershed.

Dodge SWCD: provide assistance to cooperators with implementation of practices in the watershed.

Cedar River Watershed District: financial assistance for water quality monitoring and modeling

Nature Conservancy: technical and financial assistance for the 5% WREP match

MN Pollution Control Agency: technical assistance for water quality monitoring

Department of Agriculture: research and evaluate the effectiveness of BMPs

State of Minnesota: \$100,000 for technical assistance for 2 years

Environmental Defense Fund: technical and financial assistance for implementation of the On-Farm Network®

Ag Technology and Environmental Stewardship Foundation: technical and financial assistance for implementation of the On-Farm Network®.

e. Description of project duration, plan of action and implementation schedule:

The duration of this project is five years. A final report will be completed in 2015 after practices have been implemented and monitoring data can be compiled and analyzed.

Potential producers have already been identified for WREP, cover crop and no-till. The SWCDs in this project area will be working one-on-one with producers in the watershed to identify future needs, which may be funded through this proposal.

Plan of Action

Action	Timeline	Responsible Party
Enroll first WREP sites	Fall of 2010	Mower SWCD
Identify and enroll fields for On-Farm Network	Fall of 2010	EDF, ATEFS in collaboration with partners
Work with producers for no till	August 2010	Mower/Dodge/Steele/Freeborn SWCD
Work one on one systems approach	Winter of 2010/2011	Mower/Dodge/Steele/Freeborn SWCD
Promote, enroll and implement WREP sites	2011-2014	Mower/Dodge/Steele/Freeborn SWCD
Set up & implement monitoring	2011-2014	Cedar River Watershed District
Work with producers for no till	August 2011-2014	Mower/Dodge/Steele/Freeborn SWCD
Work one on one systems approach	Winter of 2011-2014	Mower/Dodge/Steele/Freeborn SWCD
Enroll, plan, design and implement BMPs	2011-2014	Mower/Dodge/Steele/Freeborn SWCD
Enroll, plan, design, and implement On-Farm Network® to implement Monitoring and Evaluation (799) on 50 fields enrolled in nutrient management	2011-2014	EDF, ATEFS in collaboration with partners
Final report	2015	Mower SWCD

e. Description of financial and technical assistance resources requested from EQIP and CSP

Program	Resources Requested	Partner Non-Federal	Contribution Leveraged
		Financial Assistance	
EQIP	\$590,520.00		
	Technical Assistance	State of MN	\$150,000.00
	Technical Assistance	Dodge SWCD	7,600.00
	Monitoring Evaluation	EDF & ATEFS	\$200,000.00
	Monitoring	CRWD	53,092.70
CSP	\$125,000.00		

f. A description of the plan for monitoring, evaluating, and reporting on progress made toward achieving the objectives of the agreement. The MRBI is adopting a three-tiered monitoring and evaluation approach designed to assess environmental outcomes at the field, 12 digit, and 8 digit watershed scales. Higher priority will be given to projects that adopt this three tiered approach where the partner can provide resources or services. Higher priority will also be given to projects that utilize environmental indicators to monitor water quality and evaluate effects of conservation practices and activities implemented through the project on a field or edge of field scale as well as at selected downstream monitoring points.

Tier 1 Edge of Fields:

The monitoring of these two subwatersheds will continue as they have in the past. Extensive monitoring in the Upper Cedar River watershed in MN has been an important role for the CRWD. It provides baseline data that

will help in evaluating conservation practices. The Root River (just adjacent to the Upper Cedar River) small watershed project, for which the MN Dept of Ag has taken the lead, includes edge of field monitoring to study and quantify the effects of BMPs on water quality within the Root River. Although this edge of field monitoring is not in the project area, there are similarities that should allow for extrapolation. The Root River project design is comparable to the small watershed project for this MRBI application.

During periods of concentrated flow, grab samples of field runoff will be collected. The samples will be analyzed for TP and NO₃-N. Field measurements, such as water transparency (transparency tube), will also be taken at the time of sampling.

Tier 2 - Stream monitoring:

Upper watershed stream monitoring sites include the Cedar River Middle Fork (Site # S000-805), and the following MPCA SWAG sites: Blooming Prairie Creek, Hayfield Creek, Roberts Creek, Lansing Creek, and one site on the Cedar River north of Lansing. These sites have 2 years of water chemistry data (2008-2009) – we will investigate funding options to maintain these stream monitoring sites, so that better evaluation and modeling can be accomplished.

The main Tier 2 monitoring site will be the Cedar River, north of Lansing. This monitoring site captures flows from the Green Valley Ditch 12-digit HUC, and several other subwatersheds to the north and east. This is a State (MDNR) flood warning gauge, with an established stream discharge rating, and 2 years of water quality monitoring. Nutrient loads will be estimated at this site, using the flow and water chemistry data sets.

The existing network of volunteer stream monitors will be maintained, and new volunteers will be recruited. The citizen stream monitoring program (CSMP) is a program administered by the State of MN Pollution Control Agency, which assists citizens to monitor a stream or river in their neighborhood. The main measurement is of water transparency, using a transparency tube calibrated in centimeters. Water transparency is related to suspended sediment concentration, which is often directly related to total phosphorus concentrations. This is a simple and sustainable field measurement that engages local landowners and citizens, and provides data at a variety of small to intermediate stream scales.

During the 2009 field season, State of Minnesota biological survey crews assessed the fish and benthic macro invertebrates at 4 sites in the selected subwatersheds. These data allow for the assessment of the streams using an index of biotic integrity. While these biotic indices may not be directly correlated with N and P concentrations/loads, they are an important overall measure of stream water quality.

A comprehensive water assessment includes chemical, biological and physical components. Stream physical measurements were collected at 8 sites on the main stem of the Cedar River in 2009 by the MDNR. In 2010, two additional stream channel assessment methods will be used. The first is an assessment of several stream reaches for bank erosion. The second method includes basic stream cross sections, longitudinal surveys, and stream classifications to be done on the tributary streams to the Cedar River. This will include the Green Valley Ditch, Hayfield Creek, Blooming Prairie Creek, Lansing Creek, Wolf Creek, and Roberts Creek. This effort will provide quantitative data on the condition of the stream channel. Collected data can be used to improve watershed modeling efforts, and help site riparian corridor practices.

Tier 3 – Major Watershed Stream Monitoring:

Located just downstream from the City of Austin is a USGS gage. This is a long-term flow monitoring site, with data going back into the early part of the 1900s. Having access to long-term flow data is critical in assessing trends, and improving estimates of N and P loading using various routines and modeling tools. This site is part of Minnesota's stream outlet monitoring program, and will be monitored for flow and water chemistry for the next several decades. Water sample collection began by the State in 2008. This site is also monitored by the City of Austin (Minnesota), as part of its municipal wastewater management program.

The Cedar River also has USGS gages in Iowa, at Waverly, Janesville, Charles City, and Cedar Rapids. These could be considered part of the Tier 3 network of sites, which could allow for segmenting the stream system into more assessable and understandable components.

Modeling Evaluations:

Data collected from the above activities will be used for watershed modeling purposes. Several watershed models have been developed for the Dobbins Creek watershed, just adjacent to Green Valley/Austin watershed. A SWAT model was developed in 2009 for Dobbins Creek, and the GSSSHA model will be finalized later in 2010. The entire upper Cedar River watershed in Minnesota will be the focus of a SWAT model that is being employed for the current sediment/turbidity TMDL project. Various modeling scenarios will be used in the next several years to ascertain how land use/land management practices affect stream hydrology and pollutant loading.

In Field Monitoring and Evaluation of Nutrient Management:

The On-Farm Network® will demonstrate how the new Monitoring and Evaluation practice standard can be used to verify and document quantifiable results from nutrient management through data collected from each farmer each year, combined with CSNT results that provide a report card on N use efficiency for that growing season, strip trials comparing the relative effectiveness of different practices, and aerial imagery. In addition, farmers are surveyed annually to verify improvements in N management. The data are reported back to the farmers as their individual farm data and as aggregate results. Aggregate results are used publically for educational purposes. Field history information is collected from every participating farmer – previous crop, manure history, manure applications, commercial N applications (including timing of application, form, and rate), and tillage. This information is combined with analysis of results from on farm evaluation plots comparing different management practices (timing, form, application rate, etc).

Assessing and distributing information on the economic benefits of the network and its tools is critical to the success of the On-Farm Network® and to the adoption of an approach by farmers to continually improve. As detailed above, we will gauge the cost-effectiveness of the tools and the overall approach by developing a cost/benefit analysis based on our data. The analysis will be a partial budget analysis of N costs, costs of using the CSNT, costs for data collection, aerial imagery, and for winter meetings. We will collect information to assess the relative nutrient use efficiency of different management practices through strip trials, which will be developed into a method of benchmarks to rank practices. Preliminary analysis of data from Iowa and the Chesapeake Bay using survey logistic regression indicates that timing and form of N (which includes different forms of both fertilizer and manure N) and crop rotation are important factors affecting N use efficiency.

The progress of the project in terms of EQIP enrollments and practice implementation; aggregate data results, especially from CSNT and on farm evaluation plots; and economic evaluation will be reported to NRCS and other interested stakeholders at minimum on an annual basis, and more frequently as requested. Results and impacts will be published via fact sheets, brochures, and other means

g. Potential criteria to be used by NRCS to prioritize and rank producer applications

Criteria used for selection of funded practices will follow the EQIP National, State of MN and local EQIP working group priorities. The local MRBI issues to be added and given extra points will include:

- Will the treatment using EQIP practices eliminate a direct discharge of pollutants to surface waters by controlling an erosion or runoff problem in riparian zones?

- Will the treatment using EQIP practices result in long term erosion control?
- Are the practices to be installed with EQIP part of a conservation system that demonstrates a high degree of stewardship?
- Will a nutrient management plan be implemented through EQIP on sensitive areas?
- Will the practices through EQIP improve wildlife habitat and result in acceptable habitat diversity?
- Will the practices installed through EQIP result in an increase in hay acreage on cropland or cover crops planted after low residue crops or manure applications?
- Will the producer accommodate practices installed during the growing season, which allow for critical area planting prior to September 10th seeding date, so that dormant seeding can be avoided?

h. An estimate of percentage of producers that would participate

Priority will be given to landowners that want to implement a systems approach. Our intent is to employ a whole-field approach, which would result in the treatment of a large area, instead of employing individual practices that only fix part of the problem and not the entire challenge with the particular field. Therefore, we estimate our participation percentages to be lower, although our results should be better; we estimate 15% of producers will participate.

i. A statement describing participation by beginning farmers, socially disadvantaged farmers and limited resource farmers.

In this MRBI area, to the best of our knowledge we do not have any socially disadvantaged farmers. We do have beginning and limited-resource farmers that we work with and will put aside 10% of the funding for them.

j. A listing and description of conservation practices, conservation activity plans, conservation enhancements and partner activities.

Activity	Timeframe	NRCS/Partner	Financial Commitments , Incentives and Inkind
Promotion of Programs & BMPs	2010	Mower/Dodge/Freeborn and Steele SWCD	\$150,000.00 State of MN Funding
Installation of Bioreactors	2011 & 2012	Dodge SWCD	7600.00 Inkind Services
Implementation of BMPs and Programs	2010-2014	SWCDs	Same as number 1
Implementation of Monitoring and Evaluation (799) on 50 fields enrolled in nutrient management per year	2010-2014	NRCS, SWCDs, EDF, and ATESF	Matching funds provided by EDF and ATESF (estimated at \$35,000-\$40,000/year) \$200,000.00
Monitoring	2010 – 2015	Cedar River Watershed District	\$53,092.70
Wetland Restorations Easement Payment (WREP)	2010 – 2015	Nature Conservancy	\$20,000.00
Incentative Program for Wetland Restorations and Filterstrips (WREP & CRP)	2010 – 2015	Cedar River Watershed District	32,000.00
Final Report	2015	Mower SWCD	Total dollars leveraged \$462,692.70

Conservation Practices	Feet, acres, number	2010	2011	2012	2013	2014	Financial needs
Nutrient Management	5000 acres X 3 years	500	1500	1000	1000	1000	98,100.00
On-Farm Network® to implement Monitoring & Evaluation (799)	50 fields per year X 3 years	50 fields	\$32,000/year \$160,000.00				
Water & Sed. Control	5 Structures		1	2	1	1	36,130.00
Cover Crops	3000 acres	300	675	675	675	675	69,000.00
Woodchip Bioreactor ¹	2		1	1			9,000.00
No Till	870 acres	70	200	200	200	200	104,400.00
Waterways	5 acres	1	1	1	1	1	20,000.00
Grade Stabilization	30	2	7	7	7	7	85,890.00
Structure for Water Control & Planning	8 Structures		2	6			\$8000.00
Total							590,520.00

Woodchip Bioreactors and Water Control Structures are one of the new practices to be introduced to the ag community. Both the Mower and Dodge SWCD have worked with landowners on using these and look forward to introducing the practice to others.

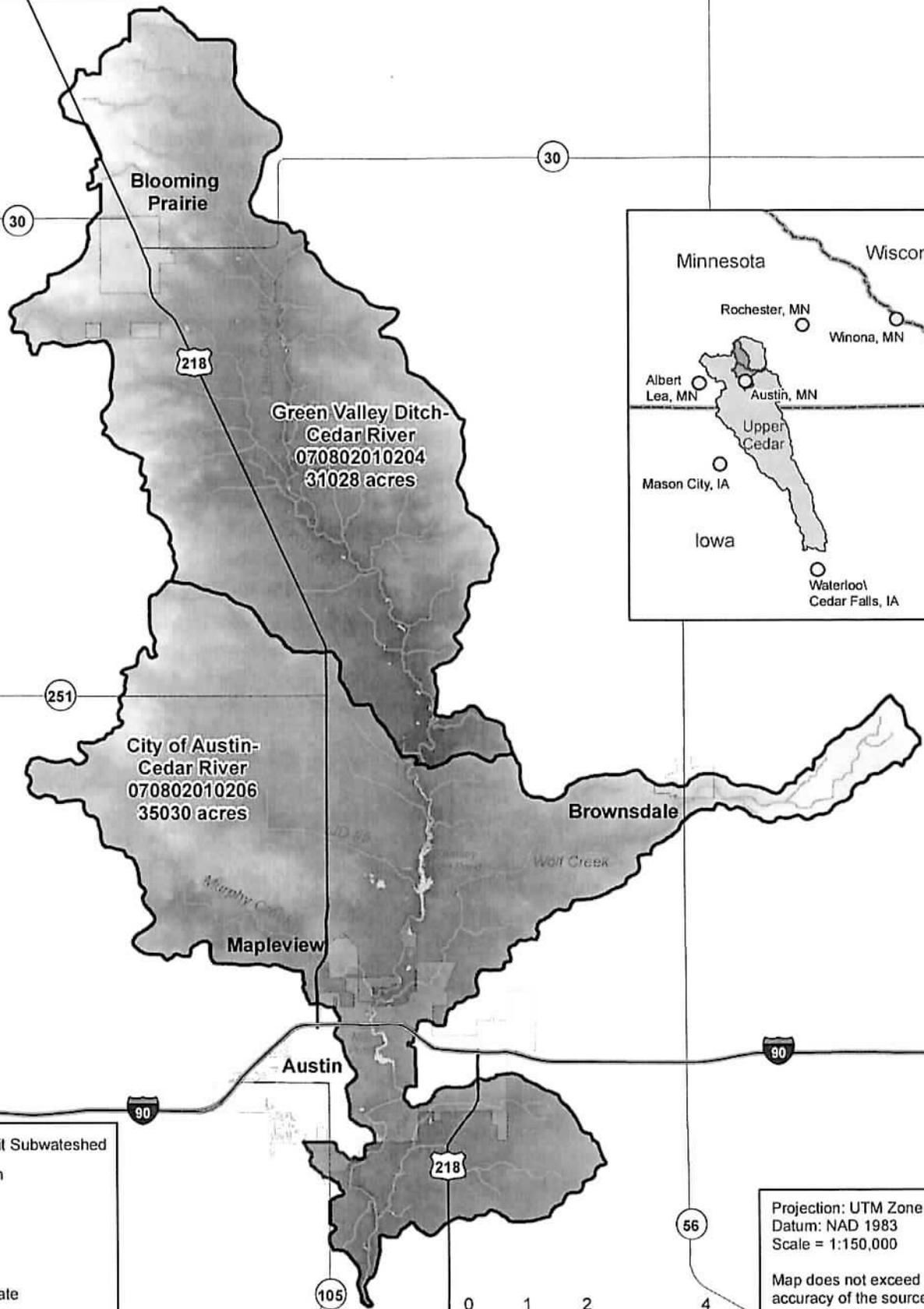
k. Description of the Amount of Funds Need Annually

Program	2010	2011	2012	2013	2014	Financial Needs
EQIP	\$55976.00	136043.00	\$128817.00	\$124,317.00	\$124,317.0092,317.00	\$590,520.00
CSP	5,000.00	30,000.00	30,000.00	30,000.00	30,000.00	\$125,000.00
Total	28,976.00	134,043.00	126,817.00	122,317.00	122,317.00	\$707,520.00

l. Description of any requested policy, procedure and technical adjustments, by program, needed to achieve these objectives.

We would like to request an increase in the payment rate for Practice Standards 329 & 346 – Residue and Tillage Management - No-till, Strip Till and Ridge Till from \$23/ac to \$40.00/ac. Many farmers are reluctant to pursue practice standards 329 & 346 because of the risk of reduced yield due to poorly drained soils which has been documented by the University of Minnesota. The increased payment rate may increase farmer participation and cover potential yield losses.

**Cedar River Watershed
07080201
Digit Subwatersheds**



12 Digit Subwatershed

Stream

Lake

City

Road

Interstate

US Highway

MN ST Highway



Projection: UTM Zone 15N
Datum: NAD 1983
Scale = 1:150,000

Map does not exceed the accuracy of the source data.

Minnesota Pollution Control Agency
April 2010