

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

LCCMR ID: 032-B

Project Title: Conservation-Based Approach for Assessing Public Drainage Benefits

Category: B. Water Resources

Total Project Budget: \$ \$189,900

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2011 - June 2014

Other Non-State Funds: \$ 0

Summary:

This project will develop an alternative framework to assess drainage benefits on public systems, shifting the paradigm from a production-based approach to one that encourages and rewards water conservation.

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Sponsoring Organization: Board of Water and Soil Resources

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Location

Region: NW, Central, SW

Ecological Section: Statewide

County Name: Statewide

City / Township:

<input type="checkbox"/>	Funding Priorities	<input type="checkbox"/>	Multiple Benefits	<input type="checkbox"/>	Outcomes	<input type="checkbox"/>	Knowledge Base				
<input type="checkbox"/>	Extent of Impact	<input type="checkbox"/>	Innovation	<input type="checkbox"/>	Scientific/Tech Basis	<input type="checkbox"/>	Urgency				
<input type="checkbox"/>	Capacity	<input type="checkbox"/>	Readiness	<input type="checkbox"/>	Leverage	<input type="checkbox"/>	Employment	<input type="checkbox"/>	TOTAL	<input type="checkbox"/>	%

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Conservation-Based Approach for Assessing Public Drainage Benefits

I. PROJECT STATEMENT

Artificial drainage impacts about 25% of the State (USGS, undated). Developing a contribution-based assessment method for Minnesota's public drainage systems (administered by Minnesota State Statute Section 103E) presents a unique opportunity to shift the paradigm in public drainage from a crop production-based approach to an approach that encourages wise stewardship of our precious water resources.

Work and maintenance in public drainage systems is funded by assessing benefitted landowners. The amount a landowner is assessed is based on 'highest and best use'. That is, the benefit that COULD be attained by using the drainage system. This assessment does not directly take into account actual use or contribution to a drainage system, thereby providing *no incentive to a landowner to implement a conservation plan* that would reduce their contribution to a drainage system. **The outcome of this project would allow for assessments to be reduced if certain conservation measures are implemented, providing an incentive to implement conservation measures on lands contributing to public drainage systems.**

We propose to develop a Public Drainage Benefits Assessment Framework, that would assess benefitted landowners in a drainage system according to their use of that system. We envision that this framework could form the basis for a pilot project and eventually an alternative assessment methodology in drainage law. Aside from providing a direct conservation incentive for reduced runoff, an additional benefit would include the ability to more easily update assessments incrementally without the cumbersome redetermination of benefits framework currently being used. This proposed framework would not change the fact that agricultural producers benefitting from drainage are being assessed to maintain their drainage system; however, it shifts the paradigm to encourage conservation of water on the landscape. This proposed framework would provide the technical basis for an alternative assessment methodology.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: Inventory contribution- and drainage-based assessment methods

Budget: \$ 7,000

Conduct an inventory of how contribution-based fees are prescribed and how drainage assessments on public systems (similar to MN 103E systems) are conducted in MN, other states, and Canada. This inventory will be used to identify strengths and weaknesses in current methods than can be adapted as desired for MN. Results will be presented and discussed with the stakeholder Drainage Work Group.

Outcome	Completion Date
1. Interim Report – Inventory of Contribution-Based and Public Drainage System Assessment Methods	Feb 1, 2012
2. Presentation to stakeholder Drainage Work Group	

Activity 2: Develop Technical Framework for Contribution-based Assessment

Budget: \$ 161,500

An alternative method for public drainage system assessment will be developed in this task by the University of Minnesota. The methodology is anticipated to be an innovative GIS-based tool that relies on land use, soils, topography and position in the watershed to determine relative water volume contribution to a drainage system on a parcel basis. The project team will coordinate frequently (approximately 4 meetings – more if needed) with the Drainage Work Group, a broad stakeholder group. The project team will also coordinate and receive input from state agencies having expertise and knowledge in drainage.

Outcome	Completion Date
1. Interim Report – Conservation-Based Approach for Assessing Public Drainage Benefits	July 1, 2013

Activity 3: Test the Framework through a Case Study

Budget: \$ 21,400

Using the framework developed in Activity 2, we will develop a case study showing how the framework might be implemented on a selected watershed (on a ditch system scale). The case study will test three scenarios: existing conditions and two levels of conservation practice adoption to demonstrate the effect of voluntary adoption on monetary assessment to landowners and the effect of these two different practice adoption rates on system water yield.

Outcome	Completion Date
1. Final Report Documenting Project and Case Study	Dec 15, 2013
2. Presentation of Study at key venues (Water Resources Conf, Isaak Walton League Summit, etc.)	Dec 15, 2013

III. PROJECT STRATEGY

A. Project Team/Partners

Dr. Joel Peterson, Board of Water and Soil Resources (project manager, providing in-kind support);

Dr. Bruce Wilson, Dr. Gary Sands, University of Minnesota (in-kind technical support and managers of graduate students, LCCMR funds for graduate student/research assistant support)

Greg Eggers, Mn DNR (in-kind technical support and review)

Bruce Henningsgaard, Mn PCA (in-kind technical support and review)

B. Timeline Requirements

The project is anticipated to require 2.5 years to complete (July 1, 2011 through December 31, 2013).

C. Long-Term Strategy and Future Funding Needs

We anticipate that the current proposal is Phase 1 of a two-phase project. The second phase would entail identification of a drainage system to implement this framework on a pilot project basis. Phase II is dependent on identification of a willing partner, which is premature at this point and thus no long-term funding requirement has been determined.

2011-2012 Detailed Project Budget

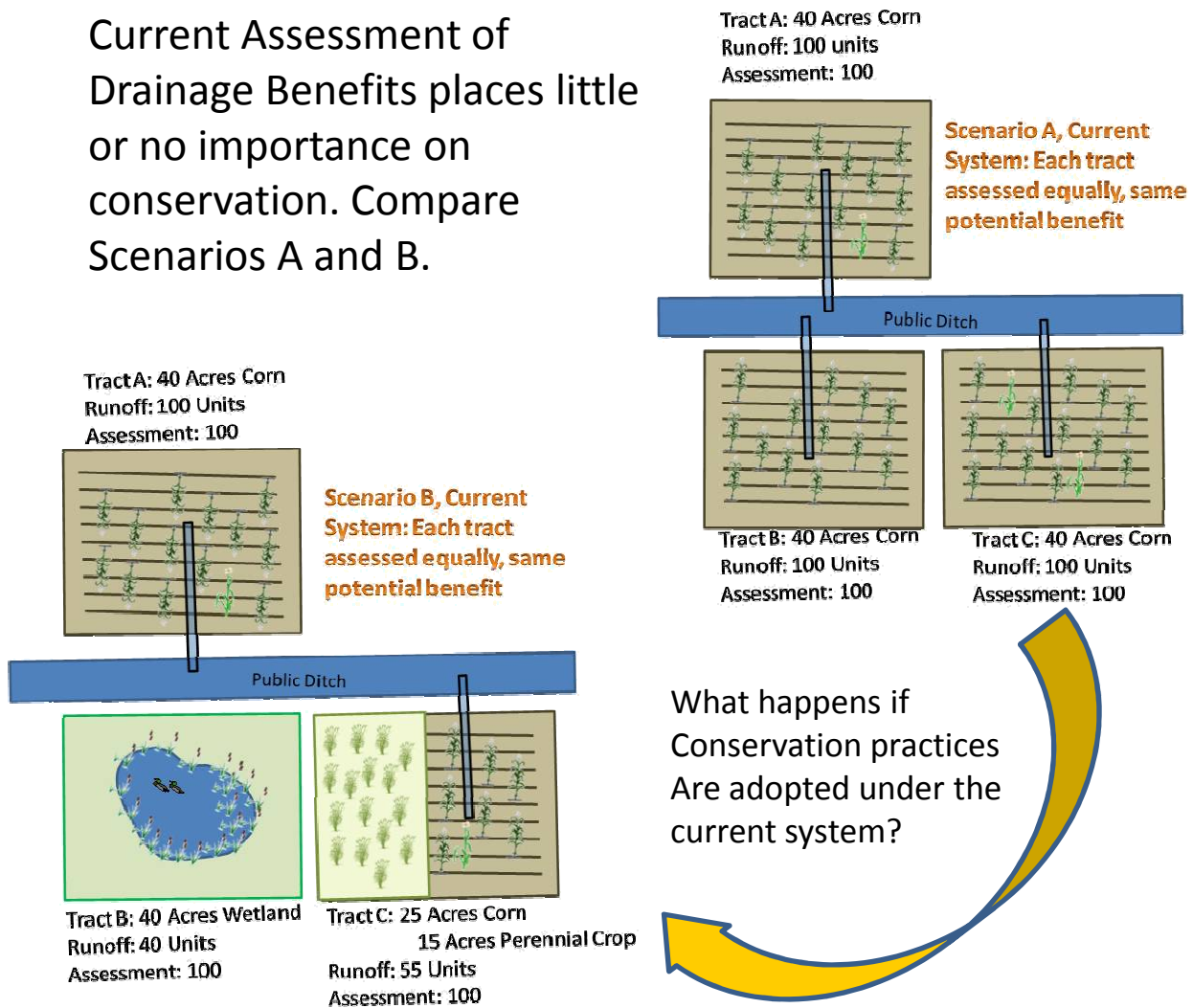
IV. TOTAL TRUST FUND REQUEST BUDGET 3 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>	<u>% FTE</u>
Personnel:	\$	-
Contracts: University of Minnesota, Funding for 2 research assistants to perform work under supervision of Drs. Wilson, Sands, Peterson		
University of Minnesota - Bioproducts and Biosystems Engineering (Result 1) Research Associate Salary + Fringe	\$ 90,000	50%
University of Minnesota - Bioproducts and Biosystems Engineering (Result 1) Grad Research Asst Salary + Fringe	\$ 94,600	85%
University of Minnesota (Results 1, 2, 3), Supplies, In-state travel, Computer Equipment	\$ 5,300	
Equipment/Tools/Supplies:	\$	-
Travel:	\$	-
Additional Budget Items:	\$	-
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST	\$	189,900

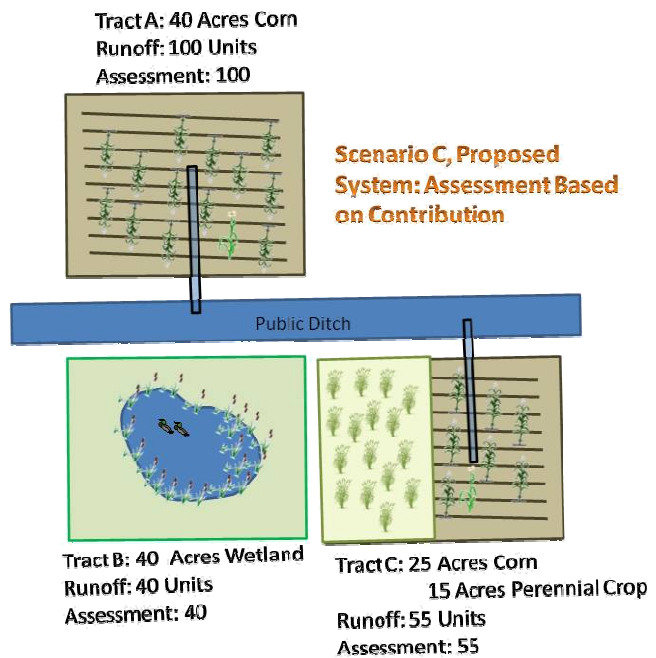
V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
In-kind Services During Project Period: Percent denotes % FTE BWSR Staff Time: (10% Peterson, 2% Kean) \$31,050 University of Minnesota Staff Time: (10% Wilson, 5% Sands): \$37,500 DNR Staff Time: \$6,750 MPCA Staff Time: \$6,750	\$ 82,050	Committed

Current Assessment of Drainage Benefits places little or no importance on conservation. Compare Scenarios A and B.



This Assessment Methodology rewards and thereby encourages Stewardship of water resources



MANAGER QUALIFICATIONS AND ORGANIZATION

Manager Qualifications:

Dr. Joel Peterson is a registered professional engineer in the State of Minnesota and has worked in academia, private consulting and in the public sector for over 10 years. At the BWSR he is the lead technical and administrative engineer in the drainage area. His areas of responsibility include leading the interagency Drainage Management Team, providing technical assistance to drainage authorities, leading the writing of the update of the Minnesota Public Drainage Manual. Dr. Peterson is also an Adjunct Assistant Professor at the University of Minnesota in the Department of Biosystems and Bioproducts Engineering. He is currently managing a \$341,000 EPA 319 grant to investigate improved designs for agricultural runoff management.

As a consulting engineer, Dr. Peterson served as a project engineer and project manager on water resources projects. These projects included rain garden design, regional infiltration basin design, stream restoration design, channel embankment protection, and modeling studies. Construction costs of these projects ranged from \$10,000 to multi-million dollar projects. Dr. Peterson also worked for the US Army Corps of Engineers on ecosystem restoration projects and served as Water and Sanitation project manager for the Corps in Baghdad, Iraq from August through December 2003.

During graduate school and as a Visiting Assistant Professor focused on hydrologic modeling and erosion mechanics and taught junior level water resources engineering.

Dr. Peterson received his BS, MS, and PhD degrees from the University of Minnesota, The Pennsylvania State University, and Purdue University, respectively, in Agricultural Engineering with emphasis in Water Resources Engineering.

Organization Description:

The mission of the Board of Water and Soil Resources is to assist local governments to manage and conserve their irreplaceable water and soil resources.

Minnesota Statutes 103B.101 directs the BWSR to facilitate communication and coordination among state agencies and between state and local units of government to make the expertise and resources of the state agencies involved in water and soil resources management available to local units of government. This includes engineering assistance for conservation on private lands.

The BWSR facilitates the stakeholder Drainage Work Group and interagency Drainage Management Team and thus is acutely aware of drainage policy and research in Minnesota. The BWSR is leading the update of the Minnesota Public Drainage Manual, which will include chapters on engineering and Best Management Practices (BMPs).