

**Environment and Natural Resources Trust Fund
2020 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 097-B

Engaging Private Well Owners in Groundwater Protection

Category: B. Water Resources

Sub-Category:

Total Project Budget: \$ 381,000

Proposed Project Time Period for the Funding Requested: June 30, 2023 (3 yrs)

Summary:

Private well owners' level of engagement in groundwater management is not well understood. We propose to apply a social-science based approach to engage private well owners in groundwater protection.

Name: Amit Pradhananga

Sponsoring Organization: U of MN

Job Title:

Department: Dept. of Forest Resources

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St. Paul MN 55108

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Web Address:

Location:

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Pollutants threats to groundwater in Minnesota

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity	_____ Readiness	_____ Leverage	_____ TOTAL _____%



Environment and Natural Resources Trust Fund (ENRTF) 2020 Main Proposal Template

PROJECT TITLE: Engaging private well owners in groundwater protection

I. PROJECT STATEMENT

Three-quarters of Minnesotans depend on groundwater for drinking water. Protecting groundwater requires not only science-driven planning at the watershed scale, but also the engagement and action of local community members. Private well owners make up 21% of the state's population and are key stakeholders in addressing groundwater problems, yet their level of engagement in and their perceptions about groundwater management are not well understood. In particular, we have limited understanding of their beliefs, attitudes, and actions related to groundwater protection, despite their being primary implementers of groundwater initiatives. In statewide studies previously conducted by this study's PIs, Soil and Water Conservation District (SWCD) and Local Government Unit staff identified community engagement as a critical need in addressing groundwater quality and quantity issues. Further, that work also suggests that lack of meaningful feedback about groundwater protection is a severe constraint to engaging diverse stakeholders in groundwater management. The overall goal of this project is to assess community capacity for groundwater protection. Specific objectives are to:

- 1) Identify constraints to and opportunities for effective civic engagement in groundwater management
- 2) Develop and evaluate benchmarking as a tailored feedback tool to engage local communities in groundwater protection

To meet these objectives, we will apply a mixed-methods approach that includes three activities. In activity 1, we will collect quantitative social data using a mail survey of private well owners. In the second activity, we will conduct focus groups with private well owners in various parts of the state. In the third activity, we will develop and evaluate benchmarking as an engagement tool for groundwater management. This project will provide multiple benefits to stakeholders and resource managers throughout Minnesota. This study fills a much needed gap in our understanding of community capacity for groundwater protection. Study findings will provide baseline information to help develop community engagement initiatives that speak to the values, needs, and concerns of local communities. Social data collected from this study can be used to develop community engagement strategies that are tailored to individual communities.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1 Title: Mail survey of private well owners to identify constraints to and opportunities for their engagement in groundwater management

Description: We will develop and administer a mail survey of 4000 private well owners across Minnesota. The survey will investigate private well owners' beliefs about groundwater problems and groundwater protection, their willingness to engage in groundwater management, and support for groundwater management strategies. Survey data will be analyzed using descriptive and inferential statistics (e.g., regression) to identify factors that influence private well owners' engagement in groundwater protection. Findings from this activity will inform participant recruitment in activity 2.

ENRTF BUDGET: \$149,584.00

Outcome	Completion Date
1. Develop survey questionnaire	December, 2020
2. Administer survey questionnaire	June, 2021
3. Conduct survey data analysis	September, 2021



Environment and Natural Resources Trust Fund (ENRTF)
2020 Main Proposal Template

Activity 2 Title: Focus groups with private well owners to assess motivations for and constraints to their engagement in groundwater protection

Description: We recognize that private well owners across the state are a diverse group with varying land uses and groundwater concerns. We will conduct three focus groups with private well owners that represent the diversity of well owners across the state. The focus groups will provide in-depth qualitative data about well owners' motivations for and constraints to engagement in groundwater protection. Focus group questioning will follow a semi-structured format (Brinkman and Kvale, 2015). Standard qualitative data analysis (e.g., Corbin and Strauss, 2008) will be conducted to identify key capacities and constraints.

ENRTF BUDGET: \$117,208.00

Outcome	Completion Date
<i>1. Develop focus group questions and study materials (e.g., agenda, script)</i>	<i>September, 2021</i>
<i>2. Conduct focus groups</i>	<i>December, 2021</i>
<i>3. Conduct qualitative analysis of focus group data</i>	<i>April, 2022</i>

Activity 3 Title: Randomized control trials and post-intervention survey to determine effectiveness of intervention strategy

Description: Findings from activities 1 and 2 will be used to develop a benchmarking tool to provide tailored feedback about groundwater issues, and actions private well owners can take to address groundwater issues. A randomized control trial followed by a post-intervention survey will be conducted. Participants will be selected from the pool of survey respondents in activity 1. Participants will be randomly assigned to one of two experimental groups: a treatment group that receives a benchmarking report, and a control group that does not receive the intervention. Six months after the intervention, a post-intervention survey will be administered. The survey will inquire about participants' beliefs and concerns about groundwater problems, and their conservation and engagement behaviors. Inferential statistics (e.g., repeated measures analysis of variance) will be used to evaluate any changes in beliefs and behaviors before and after intervention.

ENRTF BUDGET: \$114,208.00

Outcome	Completion Date
<i>1. Develop and distribute benchmarking tool</i>	<i>June, 2022</i>
<i>2. Administer post-intervention survey</i>	<i>January, 2023</i>
<i>3. Conduct pre/post-intervention analysis and prepare final report</i>	<i>June, 2023</i>

III. PROJECT PARTNERS AND COLLABORATORS:

Mae A. Davenport, University of Minnesota (Project Team, Co-PI)

Jeffrey Broberg, Minnesota Well Owners Organization (Collaborator)

Sharon Pfeifer, Minnesota Department of Natural Resources (Collaborator)

IV. LONG-TERM IMPLEMENTATION AND FUNDING:

Project findings will have broad relevance for natural resource professionals, policymakers, and planners who work in the area of groundwater management. In particular, it will inform statewide and community-specific community engagement initiatives. Project findings and reports will be made available on an open access platform. Project findings will also be shared with stakeholders through an outreach workshop. We also anticipate producing peer-reviewed publications in high quality journals.

Attachment A: Project Budget Spreadsheet
 Environment and Natural Resources Trust Fund
 M.L. 2020 Budget Spreadsheet

Legal Citation:

Project Manager: Amit Pradhananga

Project Title: Engaging private well owners in groundwater protection

Organization: University of Minnesota

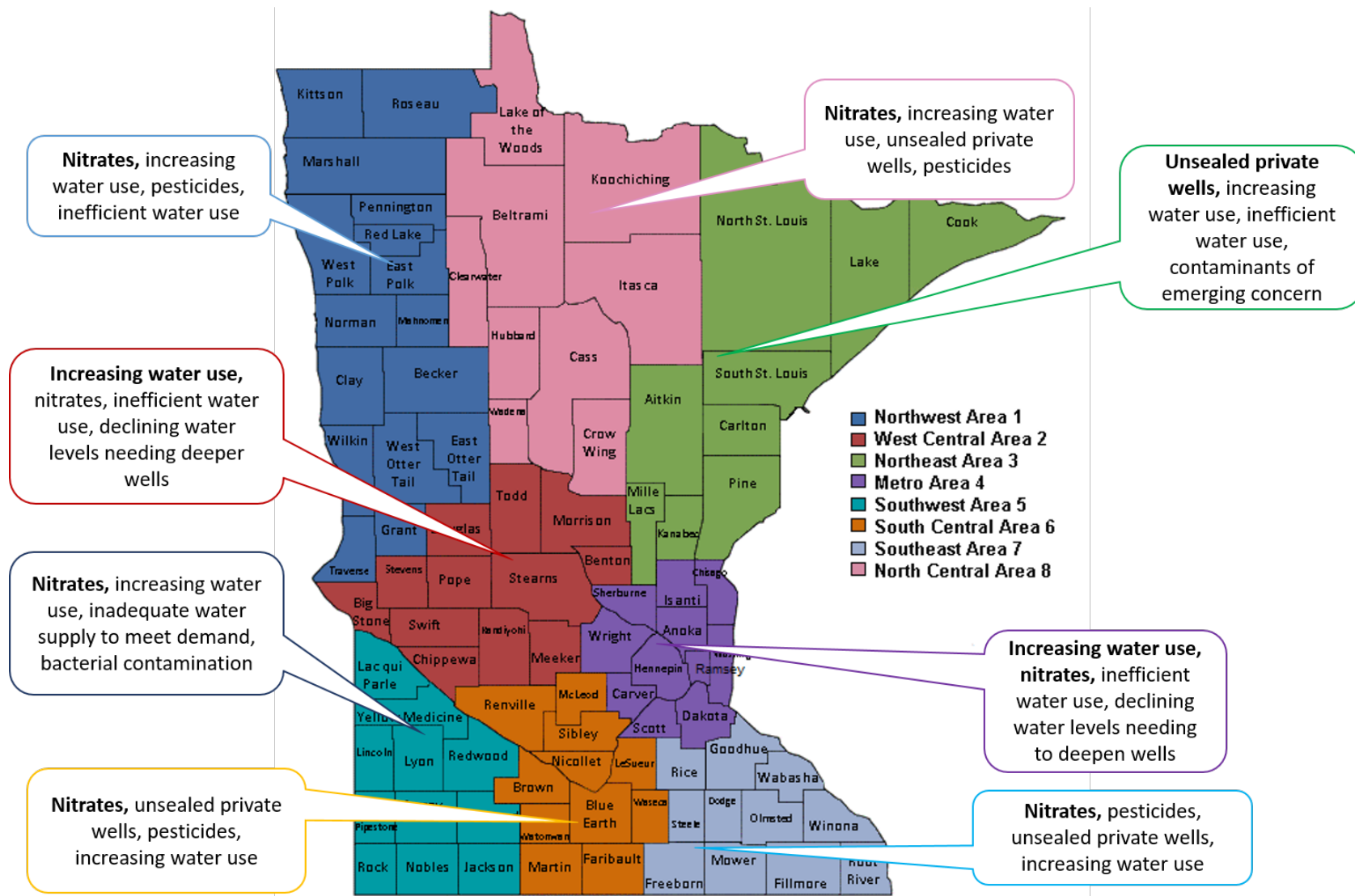
Project Budget: \$381,000

Project Length and Completion Date: 3 years, June, 2023

Today's Date: 04/15/2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
Personnel (Wages and Benefits)		\$ 327,624	\$ -	
Professor: Salary and fringe for Davenport - 1 month summer salary over project period, 0.08 FTE over project period) (project management and coordination, assist with study design and protocol development) (16,989) 74% salary 26% fringe				
Researcher 6: Salary and fringe for 1 Researcher 6 (Pradhananga) at 30% FTE/yr for 3 years (project management, survey development and administration in activities 1 and 3) (110,409) 74% salary 26% fringe				
Graduate Research Assistant: Salary and fringe for 1 University of Minnesota graduate student at 50% FTE for 2 years. Graduate fringe is budgeted at 83% of salary and includes tuition for the academic year, health care for the fiscal year and social security and medicare for 6.5 pay periods (summer) (assist with survey development in activities 1 and 3, data collection and analysis in activities 1, 2, and 3) (90,249) 55% salary 49% fringe				
Researcher 3: Salary (\$25.50/hr) and fringe for 1 Researcher 3 at 25% FTE/yr for 3 years (lead focus group development and analysis in activity 2, assist with survey development and data collection in activities 1 and 3) (56,308) 77% salary 23% fringe				
Researcher 1: Salary (\$16/hr) and fringe for 1 Researcher 1 at 25% FTE/yr (520 hrs/yr) for 3 years (assist with data collection and data management in activities 1, 2, and 3) (34,469) 77% salary 23% fringe				
Undergraduate Research Assistants: Salary for 4 undergraduate research assistants at \$12/hr, no fringe (1600 hrs over 3-yr project period) (survey data entry in activities 1 and 3, focus group transcription in activity 2) (19,200) 100% salary				
Professional/Technical/Service Contracts				
N/A		\$ -	\$ -	\$ -
Equipment/Tools/Supplies				
Survey printing and mailing (print 4000 surveys, cover letters and mailing x 3 waves of mailing) (Activity 1)		\$ 40,376	\$ -	
Focus group supplies (analysis and transcription software, participant incentive, food and beverages for participants) (Activity 2)		\$ 5,000		
Supplies for randomized control trials (printing and distributing reports, participant incentives) (Activity 3)		\$ 5,000		
Capital Expenditures Over \$5,000				
		\$ -	\$ -	\$ -
Fee Title Acquisition				
		\$ -	\$ -	\$ -
Easement Acquisition				
		\$ -	\$ -	\$ -
Professional Services for Acquisition				
		\$ -	\$ -	\$ -
Printing				
		\$ -	\$ -	\$ -
Travel expenses in Minnesota in accordance with the UMN Travel Policy				
Travel for focus groups (Travel to and from locations across the state to conduct 3 focus groups in activity 2)		\$ 3,000	\$ -	
Other				
		\$ -	\$ -	\$ -
COLUMN TOTAL		\$ 381,000	\$ -	\$ -
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT				
	Status (secured or pending)	Budget	Spent	Balance
Non-State:		\$ -	\$ -	\$ -
State:		\$ -	\$ -	\$ -
In kind:		\$ -	\$ -	\$ -
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
		\$ -	\$ -	\$ -



Pollutant threats to groundwater

Based on a survey of Soil and Water Conservation District staff (Pradhananga, Davenport, and Perry, 2015)

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Professional Preparation

Ph.D. Natural Resources Science and Management, University of Minnesota, St. Paul, Minnesota, 2014

M.S. Environmental and Technological Studies, St. Cloud State University, St. Cloud, Minnesota, 2009

B.S. Environmental Studies, St. Cloud State University, St. Cloud, Minnesota, June 2006

Appointments

2014 – present Research Associate, Center for Changing Landscapes, University of Minnesota

2010 – 2014 Research Assistant, Department of Forest Resources, University of Minnesota

Relevant publications

Fellows, S., Pradhananga, A., Meier, H., Davenport, M.A., & Pfeiffer, S. (2018). Groundwater management: Capacity assessment at the local level. A final technical report prepared for the Minnesota Department of Natural Resources, 91pp.

Pradhananga, A. & Davenport, M.A. (2017). The influence of beliefs and norms on landowners' civic engagement in water resource protection. *Journal of Soil and Water Conservation*.

Pradhananga, A., Green, E. & Davenport, M.A. (2017). Building local capacity for groundwater protection: An evaluation of groundwater management workshops. A final technical report prepared for the University of Minnesota Regional Sustainable Development Partnerships and the Minnesota Department of Natural Resources, 46 pp.

Pradhananga, A., Davenport, M.A. & Perry, V. (2015). Groundwater management: Capacity assessment at the local level. A final technical report prepared for the Minnesota Department of Natural Resources. 94pp.

Pradhananga, A., Davenport, M.A. & Olson, B. (2015). Landowners' motivations for civic engagement in water resource protection. *Journal of American Water Resources Association*. DOI: 10.1111/1752-1688.12346

Synergistic activities

- Led and conducted 14 social science projects focused on water resource management funded by National Science Foundation, Minnesota Pollution Control Agency, Minnesota Board of Soil and Water Resources, and several counties and watershed districts. In these projects, I have applied survey methodology including online, onsite, and mail surveys.
- Planning committee member, Chair of Student and Early Career Professional Engagement subcommittee, Minnesota Water Resources Conference, 2016 - present

Organization description: The College of Food, Agricultural and Natural Resource Sciences (CFANS) embodies the land-grant mission in its research, teaching and service. CFANS is committed to promoting the principles of equal opportunity, affirmative action and multiculturalism.