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

LCCMR ID: 031-B

Project Title: Understanding Groundwater Sustainability in the I-94 Growth Corridor

Category: B. Water Resources

Total Project Budget: \$ \$594,000

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

Other Non-State Funds: \$ 276,000

Summary:

This project builds understanding of how the corridors groundwater responds to land and water use, and helps communities understand their part in the broader community of corridor water interests.

| Name: Princesa VanBuren Hanson | | | | | |
|---|--|--|--|--|--|
| Sponsoring Organization: Environmental Quality Board | | | | | |
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| Web Address www.eqb.state.mn.us | | | | | |
| Location | | | | | |
| Region: Metro | | | | | |
| Ecological Section: Minnesota and NE Iowa Morainal (222M) County Name: Sherburne | | | | | |
| City / Township: Twin Cities to St. Cloud | | | | | |

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

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Understanding Groundwater Sustainability in the I-94 Growth Corridor

I. PROJECT STATEMENT

This project will assess groundwater sustainability in the I-94 growth corridor between the Twin Cities and St. Cloud and engage affected communities in discussions of the implications for land and water use. Building on the ENRTF investment in Sherburne and Wright county atlases, groundwater sustainability will be assessed by measuring flows in the groundwater system and the hydrogeologic properties of the aquifers through which these flows take place. Assessment of groundwater resources from the Twin Cities to St. Cloud is considered a priority because of the corridor's expected growth, the inherent natural limits of ground water in the area, and the vulnerability of that resource to contamination due to its sandy soils and proximity to the land surface. Further, at some point in the not-too-distant future, some corridor cities will need to invest in costly regional water supply treatment and distribution systems using a combination of surface water and groundwater supplies. In fact, within the next 25 years, the equivalent population of another two-to-three St. Clouds is expected to move into the corridor. Given these factors, local governments must carefully consider their plans for the corridor and water managers, likewise, must incorporate a new understanding of the system and its limits into their management framework. The information and understanding developed by the project will help both ensure that the corridor's communities meet the needs of the new population in a sustainable way.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: <u>Assessing flows through the corridor's groundwater</u>

Just as appropriations from the Mississippi River are limited by the river's flow, flow through the groundwater system determines the amount of water that people can safely appropriate over time. Under this activity, flows will be measured in each major part of the corridor's groundwater system, beginning with groundwater discharged to the Mississippi River. If sustained river low flows do not occur in the first year of the project, measurements could be made in the second year. In addition, that portion of the flow of groundwater that people use will be compared to the flows required for surface waters dependent on groundwater discharge. This will enable water managers to understand the effect of increasing groundwater withdrawals on other parts of the overall hydrologic system, a key step in determining the sustainability of current or future groundwater withdrawals.

| Outcome | Completion Date |
|--|-----------------|
| 1. Flow patterns in the corridor's groundwater system understood | 10/31/13 |

Activity 2: <u>Determining aquifer properties</u>

Budget: \$ 60,000

Budget: \$354,000

In addition to an understanding of flow through the groundwater system, sustainable groundwater management requires information about the properties of the aquifers through which these waters move. This activity will use county atlas information about aquifer extent, depths and thickness to determine the corridor's hydrogeologic properties, describe how water flows through the corridor's geologic materials, and allow calculation of groundwater flows between aquifers.

| Outcome | | Completion Date |
|---------|---|-----------------|
| 1. | Aquifer properties measured for use in groundwater management tools | 11/30/13 |
| 2. | Sustainability of current and future groundwater withdrawals assessed | 6/30/14 |

Activity 3: Engaging local government and other stakeholders

Budget: \$180,000

The goal of this activity is to give local governments and other corridor water users an explicit understanding of how the groundwater system works, what its limits may be, and how future local plans and activities throughout the corridor collectively will affect the resource. A key to water sustainability in the corridor will be to get cities, counties and townships to see themselves as part of the larger community of growth corridor water interests. With this in mind and working with various state and federal partners in year two, EQB will engage local governments and other major water users to accurately characterize current and future land use plans, current and future water use, and drinking water quality and protection efforts. In year three, EQB will develop an interactive model representing corridor land and water use demands and expected groundwater system responses, which it will use to help each community understand the model's implications for, and its role in, sustainable land and water management throughout the corridor.

| Outcome | Completion Date |
|---|------------------------|
| 1. Corridor-wide discussions of current and expected land use, water use and water | 7/31/13 |
| quality | |
| 2. Widespread understanding among the corridor's communities of the nature and | 6/30/14 |
| quality of the groundwater resource and its limits, and their roles in sustaining the | |
| corridor's water resources | |

III. PROJECT STRATEGY

A. Project Team/Partners

Environmental Quality Board: Princesa VanBuren Hansen and John Wells; coalition building, information transfer and project management (Activity 3). U.S. Geological Survey: Tim Cowdery, Erich Kessler, James Fallon, and Dave Lorenz; data collection and technical analysis (Activities 1 & 2). The Department of Natural Resources and the Minnesota Geological Survey will be particularly important non-funded project collaborators, along with other EQB member agencies and the University of Minnesota.

B. Timeline Requirements

This project will take three years to complete. The first two are required to collect and analyze river and groundwater flow data. The third is required to assess groundwater sustainability and integrate the information with data on water quality and land use to build a comprehensive understanding of how the system works, how it can be expected to respond to land and water use demands, and how communities may need to adapt to a new picture of groundwater sustainability.

C. Long-Term Strategy and Future Funding Needs

This project is designed as the second of three needed to develop the science and tools required to manage the corridor's water resources sustainably. In the first, the Minnesota Geological Survey is providing the necessary geologic data in the area under the ENRTF-supported County Atlas Program. This proposal would characterize groundwater sustainability in the corridor and explain its implications to local governments and other interests. Both sets of information would be combined with surface water, ecological and economic data in a third project to be proposed in 2015 to produce the full set of tools, understanding and awareness needed to sustainably manage the corridor's water and land resources.

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IV. TOTAL TRUST FUND REQUEST BUDGET 3 years

| BUDGET ITEM | | AMOUNT |
|--|----|---------|
| Personnel: EQB personnel - Senior Planner (1.0 FTE) to lead the development | | |
| of all elements under Activity 3 (beginning in year 2) and coordinate the | | |
| participation of local, state and federal partners under the activity. | | |
| | \$ | 150,000 |
| Contracts: The Environmental Quality Board will contract with the U.S. Geological | | |
| Survey for work under activities 1 and 2 to determine groundwater characteristics | | |
| and sustainability of the I-94 Growth Corridor. | | 414,000 |
| Contracts: EQB also will contract with the Minnesota Geographic Information Office | | |
| for the development of a model to represent the corridor's land and water activities | | |
| in the context of the project's groundwater sustainability findings. | \$ | 25,000 |
| Equipment/Tools/Supplies: N.A. | | |
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| Acquisition (Fee Title or Permanent Easements): NA | | |
| | | |
| | | |
| | \$ | - |
| Travel: This project will require extensive travel by EQB staff throughout the Twin | | |
| Cities to St. Cloud corridor. | \$ | 5.000 |
| Additional Budget Items: N.A. | * | 0,000 |
| | ¢ | |
| | Φ | - |
| | | |
| TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST | \$ | 594,000 |

V. OTHER FUNDS

| SOURCE OF FUNDS | AMOUNT | <u>Status</u> |
|---|-----------------|---------------|
| Other Non-State \$ Being Applied to Project During Project Period: USGS will | | Secured |
| contribute \$276,000 to the project | \$276,000 | |
| Other State \$ Being Applied to Project During Project Period: N.A. | \$- | |
| In-kind Services During Project Period: EQB will provide project management | | Secured/Pe |
| and guidance throughout the project's life. A number of other state agencies will | | nding |
| participate in the project and donate in-kind services. | | |
| | \$75,000/25,000 | |
| Remaining \$ from Current ENRTF Appropriation (if applicable): N.A. | | |
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| Funding History: N.A. | | |
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| | \$- | |



Project Manager Qualifications – Princesa VanBuren Hansen

Princesa VanBuren Hansen is a Principal Planner with the Environmental Quality Board. Her background is in Biosystems and Agricultural Engineering, and she has recently been working on projects that integrate her technical expertise with planning and interdisciplinary coordination functions. Her work activities demand a strong ability to lead interagency coordination specific to water quantity and quality, as well as integrate considerations for land use and the potential impacts of climate change. She is leading the 2010 EQB State Water Plan effort, is active in the University of Minnesota sustainable water framework development, and provides leadership to a number of interagency technical and policy work teams.

In 2008 she led development of a novel GIS prototype tool to provide context for relative intensity of water use in Minnesotaⁱ in support of the EQB effort to construct a policy and data framework for evaluating the impacts of high water-using industries as described in the report, "*Managing for Water Sustainability*", released December 2008. Prior to that she was involved in the development of "*Protecting Minnesota's Waters: Priorities for the 2008-2009 Biennium*," the Clean Water Cabinet and EQB's report on state water priorities. In 2007 she led the technical assessment effort that contributed the foundation to the EQB 2007 study, "*Use of Minnesota's Renewable Water Resources: Moving toward Sustainability*," an interagency assessment of the availability of water to meet the state's future demands. This was the state's first regional-scale assessment of ground and surface water sustainability.

Prior to joining the EQB, Princesa was staff member of the University of Minnesota's Department of Bioproducts and Biosystems Engineering. She was brought on in 2005 to coordinate and oversee a large team of researchers working on Total Maximum Daily Load activities for the Minnesota Pollution Control Agency and the Environmental Protection Agency. She was also an instructor for the University's Erosion and Sediment Control Certification Program, providing education to those working with the MPCA and the Minnesota Department of Transportation on construction sites.

She also has experience working in the private sector with Delta Environmental Consultants and for the federal government through the U.S. Department of Agriculture, Agricultural Research Service. In the ten years before the USDA assignment, she worked on projects ranging from water quality in watersheds of Karst geology, evaluation of surface tile inlet designs and effectiveness, depression-focused recharge, erosion control stabilization for MN/DOT, wetland delineation, TMDL development for southeastern Minnesota, septic system installation certification, mine land tailing stabilization, mobilization of heavy metals in plant materials, supercomputer modeling, and nitrogen cycling in alfalfa.

Organization Description – Minnesota Environmental Quality Board

The Environmental Quality Board consists of a Governor's representative (by law the board chair), nine state agency heads and five citizen members. Minnesota Statutes, Chapters 103A, 103B, 116C, 116D and 116G (Statutes and Rules of the EQB), direct EQB to:

- Ensure compliance with state environmental policy
- Coordinate agencies and programs that affect the environment
- Study environmental issues
- Develop biennial water priorities, policy reports and the state water plan
- Develop the state water plan
- Administer critical areas designation and management
- Advise the Governor and the Legislature

ⁱ http://www.eqb.state.mn.us/eqb_w/