# PROJECT TITLE: Groundwater: Education to Action

# I. PROJECT STATEMENT

**Project type or category: Category H – Small Projects (Environmental Education)**

This project addresses two serious, clearly identified gaps in how Minnesota protects groundwater. The purpose of this two-part project is 1) to leverage existing state funded projects providing a mechanism for water professionals (SWCDs and others) to move from understanding to action, to address specific local groundwater/surface water projects; and 2) to repackage existing materials in support of Minnesota’s revised Grade 9 Earth Science Standards for groundwater.

The proposal leverages other existing projects and programs to address several specific and well documented gaps in our ability to manage the state natural resources, and in particular, challenges related to groundwater. First, many professionals with responsibilities for groundwater challenges lack the knowledge, confidence and ability to access the rich data available and translate that into specific actions in their geography (Pradhananga and others, December 2015). Secondly, young adults lack the basic knowledge of groundwater to be effective partners in the future best management of our state resources (Minnesota Ground Water Association, December 2016).The management information gaps can lead to misinformation and misunderstanding when dealing with water issues.

Communication of “complex science and statutes” can be more effective with an educated populace, and this project would help working professionals address urgent groundwater issues today, and young adults understand and address water resource challenges of the future. Recommendation number eight in the “2019 Legislative Recommendations: Legislative Water Commission” memorandum of January 2, 2019 is to “Enhance Water Education.” The recommendation states that, “The timing is right to educate and engage youth to become water stewards.” This project responds to that recommendation.

## II. PROJECT ACTIVITIES AND OUTCOMES

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| Activity 1: Learning Alliances: Understanding to Action | Budget: $95,000 |

DNR will leverage the work being completed by Minnesota Department of Health, Freshwater (a non-profit that has an explicit mission to protect groundwater), and the University of Minnesota Water Research Center (WRC), by organizing and hosting half-day Learning Alliance events for SWCDs and others. The DNR will assist in developing online groundwater training, then work with the state and local water resource professionals who have completed the training to address one or two specific groundwater and surface-water projects in their geography and take action.

State professionals with the departments of Natural Resources, Health, Agriculture, Pollution Control Agency, and the Board of Water and Soil Resources have access to and knowledge of the immense volume of raw data available to address the complex issues facing local resource managers (e.g., county geologic & groundwater atlases, groundwater observation wells, stream flow and precipitation, water chemistry, etc.). The goal of each half-day Learning Alliance event is to move from understanding to action, from data to Best Management Practices, focusing on one or two high priority local projects.

To accomplish this the local professionals in the three Groundwater Management Areas will complete the new WRC groundwater training (available Winter 2020), then bring one or two specific high priority groundwater/surface-water projects to the Learning Alliance event. The goal will be to develop specific actions to address those challenges by the end of the event. The DNR will host and lead the event, with other agency participation as available.

| **Outcome** | **Completion Date** |
| --- | --- |
| Compile existing information from the groundwater agencies as needed for the Learning Alliance events. | October 31, 2020 |
| Organize and host Learning Alliance events within groundwater management areas with participating SWCDs. Outcome: Action plan on specific projects.  | June 30, 2021 |
| Activity 2: Training Next Generation Groundwater Resources Managers | Budget: $85,000 |

In Activity 2, the DNR will leverage and repackage existing groundwater training materials (videos, groundwater atlas and other workshops, online resources, booklets, etc.) to prepare materials that target and align with the groundwater goals of Minnesota’s new Grade 9 Earth Science standards currently in development.

Subject matter experts will be interviewed including educators and educational media coordinators (e.g., Washington County school districts, DNR Project WET, FWS, etc.). Pilot materials will be developed that include a downloadable **booklet** illustrating how groundwater works, how it is studied, who is involved in Minnesota, and potential careers, common groundwater scenarios based on frequently asked questions, and exercises in how to deal with them and take action.

The booklet would be accompanied by an instructional **video** of a live groundwater model with animation and voice-over that illustrates the basics of how aquifers work, how groundwater travels, and how our actions affect others. The video will be based on a live groundwater sand model with dye representing how groundwater moves after a rain through aquifers, lakes, sceptic systems, and pumps. Specific effects of pumping and surface contamination will be addressed. Karst geology and groundwater conditions may be included. Animation effects are planned to make it more engaging.

The materials will be presented to the Washington County school district earth science teachers for comment and trial as they have experience with and avid interest in water issues, then made available statewide for other earth science teachers.

**ENRTF BUDGET: $85,000**

| **Outcome** | **Completion Date** |
| --- | --- |
| Compile existing educational requirements from the Minnesota revised Grade 9 Earth Science Standards for groundwater. | December 30, 2020 |
| Repackage and refine existing materials to address the Minnesota revised Grade 9 Earth Science Standards for groundwater.  | March 30, 2021 |
| Produce the booklet and video with script. | October 1, 2021 |
| Distribute final products through print and online. | December 30, 2021 |

## III. PROJECT PARTNERS AND COLLABORATORS:

DNR project staff will collaborate as needed with Freshwater, University of Minnesota Water Resource Center, Washington County school district, and other organizations that work with earth science education.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

This proposal will span two years. When complete the booklet and video will be posted on a DNR website in groundwater and Project WET. The DNR will offer teacher professional development opportunities at conferences, district professional development events and workshops. An announcement with the links and a description of the project will be distributed by GovDelivery, MGWA, the school district, and other educational organizations such as the Minnesota Science Teachers Association, Minnesota Earth Science Teachers Association and Minnesota Groundwater Association.

Feedback for future updates will be accomplished through normal interactions with students and educators and the project team.