Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2020 ENRTF Work Plan (Main Document)

Today's Date: November 22, 2019

Date of Next Status Update Report: April 1, 2021

Date of Work Plan Approval:

Project Completion Date: June 30, 2022

Does this submission include an amendment request? No

PROJECT TITLE: County Groundwater Atlas

Project Manager: Paul Putzier

Organization: Minnesota Department of Natural Resources

College/Department/Division: Ecological and Water Resources Division

Mailing Address: Box 25, 500 Lafayette Rd N.

City/State/Zip Code: St. Paul, MN 55155

Telephone Number: 651-259-5692

Email Address: paul.putzier@state.mn.us

Web Address: http://www.dnr.state.mn.us/waters/groundwater_section/mapping

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Location: Statewide – Includes work in at least these eight counties: Hubbard, Hennepin, Dodge, Olmsted, Kandiyohi, Rock, Nobles and Atkin.

Total Project Budget: $1,125,000

Amount Spent: $0

Balance: $1,125,000

Legal Citation: M.L. 2020, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

PROJECT STATEMENT:

The County Groundwater Atlas (CGA) program provides 'Information Infrastructure", at the county scale, including a report and series of accompanying maps, figures and tables that describe the location and size of an area's aquifers and groundwater resources and other important information like direction of groundwater flow, sensitivity to pollution, age and chemistry of groundwater and connections to surface water resources. Information provided in an atlas is used in water, zoning and development planning and environmental protection efforts. Each county atlas (or report) is used by a wide variety of local, state and federal government agencies and by private citizens, ag-producers, companies and organizations. The complete atlas for each county is prepared in two parts:

- Geologic (Part A) – First, the geology of a county is mapped by the Minnesota Geological Survey (MGS).
- Groundwater (Part B) – Next, the groundwater is mapped by the Department of Natural Resources (DNR).

This project supports continuing development of the Groundwater Atlas by the DNR for counties across the state. The Groundwater Atlas defines aquifer boundaries and helps identify the interconnection of aquifers, their sensitivity to pollution, and their connection to the land surface and surface water resources. Delineation and mapping of aquifers, recharge areas, and karst systems (sinkholes, caves) is an essential step to inform management for water supply planning, water supply protections, public health, ecological systems and the groundwater resources. Counties with a complete atlas (Geologic & Groundwater) enjoy some economic benefits especially with respect to water resource use and management. Resource managers frequently comment on the value of a completed Atlas:

Mike Smith, County Manager, Dakota County: "The citizens of Dakota County will greatly benefit from a completed Atlas. The Atlases are a valuable information tool used by private industries and government agencies. They help inform land use policy decisions, transportation planning, water supply planning, and mining/aggregate work. The depth and breadth of geologic understanding that is developed during the creation of the Atlases is irreplaceable. The Geologic Atlas is an essential resource for Dakota County's Delegated Well Program to ensure safe and reliable drinking water for county residents."

Stan Karwoski, County Board Chair, Washington County: "The county specific Groundwater Atlas includes maps and reports identifying the direction of groundwater flow, aquifer properties, groundwater chemistry, and pollutions sensitivity of aquifers. Our county has and will benefit greatly from the development of this information (Groundwater Atlas). The greatest benefit and value to individual counties is having a complete atlas comprised of both parts, Geology (MGS) and Groundwater (DNR)."

Jim Almendinger, PhD. Director, St. Croix Watershed Research Station, Science Museum of Minnesota: "The Atlases serve as basemaps for many of our projects. They set the stage for describing land-water interactions and thus help us understand how human activities ultimately impact Minnesota's water resources."

The Groundwater Atlas is an important tool for counties to use to help to protect both the quantity and quality of groundwater, and in turn public health. Local government, citizens, industry, agriculture and others all benefit from the Atlas Program.

Each Groundwater Atlas project includes some or all of the following work components: assembly of data layers (from Part A atlas); development of conceptual hydrogeologic models; development of flow direction maps of the water table and deeper aquifers; groundwater sample collection for analysis and interpretation of water age and chemistry data (including arsenic and chlorides); geophysics field data collection and analysis; construction of hydrogeologic cross sections; construction of maps of pollution sensitivity; preparation and publication of the final atlas report, training of local atlas users, and dissemination of information. Depending on the geologic or

hydrologic setting of a specific county, other data or field data may also be assembled or collected. The karst landscape of southeast Minnesota is an example where additional data may be collected to further define the hydrogeologic system and could include defining additional related karst features and karst system analysis (including dye traces and karst system maps).

This project will provide approximately 12-18 months of funding to complete, continue, or initiate Groundwater Atlas projects for the following counties: Hubbard, Hennepin, Dodge, Olmsted, Kandiyohi, Rock, Nobles and Atkin.

II. OVERALL PROJECT STATUS UPDATES:

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Final Report between project end (June 30) and August 15, 2022

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: County Groundwater Atlas (Part B)

Description: Building on the geologic atlas data from the MGS, the DNR will collect groundwater samples, compile field chemistry, analyze groundwater samples for natural chemistry and age-dating isotopes, and assemble aquifer characteristics data. The project includes preparing groundwater maps, cross sections, and interpretations of pollution sensitivity of each aquifer for publication in completed Groundwater Atlas reports. As data are finalized and new reports are completed, the project will continue to add and assemble GIS and other data onto statewide data layers to be available online. Project design and data collection for counties in southeast Minnesota (Dodge and Olmsted) may include specialty karst system mapping in support of the groundwater atlas. The goal is to complete Activity 1 work in approximately two years.

DNR will obtain the MGS GIS files, evaluate and modify those GIS files to reflect county groundwater resources, plan for and collect groundwater samples, compile field water chemistry, analyze groundwater samples for natural chemistry and age-dating isotopes at specialized analytical laboratories, and assemble the aquifer characteristics data.

Following collection and evaluation of all the data, a final Groundwater Atlas report will be prepared, which includes a detailed description of the groundwater resources in the county, groundwater maps, groundwater cross sections, and interpretations of pollution sensitivity of aquifers in the county. As data are finalized and new reports are completed, the project will continue to add and assemble GIS and other data onto statewide data layers to be available online to everyone who needs the information.

Project design and data collection for counties in southeast Minnesota may include specialty karst system mapping and field studies in support of the completed or in-progress Groundwater report. As part of this engagement, county geologic atlas staff will provide support, training and consultation to local resources managers in understanding special features and concerns related to the karst geology in southeast Minnesota as established in the CGAs.

ACTIVITY 1 ENRTF BUDGET: $1,125,000

Outcome	Completion Date
1a. Publish completed Groundwater Atlas reports (up to four counties per year).	June 30, 2022
1b. Continue ongoing work on Groundwater Atlas projects (up to four counties).	June 30, 2022
1c. As new projects are completed, continue to add data to compiled GIS data layers.	June 30, 2022
1d. Start new Groundwater Atlas projects (up to two per year).	June 30, 2022

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Final Report between project end (June 30) and August 15, 2022

IV. DISSEMINATION:

Description: At the completion of a Groundwater Atlas, DNR provides notification to county partners, LCCMR staff and to approximately 3,000 email recipients (listserv: http://www.dnr.state.mn.us/emailupdates) who have signed up to receive such notifications. DNR also uses official news releases that are picked up by media outlets across the state. Additional dissemination outlets include articles or updates in newsletters for organizations such as the Legislative Water Commission, the Minnesota Ground Water Association, internal DNR agency news releases, and presentations at conferences across Minnesota.

Each completed Groundwater Atlas is printed in paper format (approximately 300 copies) and distributed to the county, libraries, state agencies, and other organizations. County representatives are provided with up to 100 paper (hard) copies of the final Atlas to distribute to local stakeholders. Project data, including water chemistry data and GIS data are available on the DNR web site. Water chemistry data are also incorporated into an interagency Equis database used by all state government entities. Printed copies are available at the MGS. PDF versions of the complete report are posted to the DNR web site.

Following the publication of each Groundwater Atlas, a local workshop is held in the county to introduce the report contents and train users in its application. County representatives host the workshop, inviting interested parties. Real-life exercises based on the specific groundwater resources of the county are used to walk stakeholders through the use of the comprehensive information provided in the CGA for their county. Following dissemination and the local workshop, DNR staff are available to answer questions and assist in the continued application and use of the atlas.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the ENRTF Acknowledgement Guidelines.

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Final Report between project end (June 30) and August 15, 2022

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than $5,000: N/A

Explanation of Use of Classified Staff: N/A

Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:

Enter Total Estimated Personnel Hours for entire duration of project: 13,520	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: 6.5

Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Contract Personnel Hours for entire duration of project: N/A	Divide total contract hours by 2,080 hours in 1 yr. = TOTAL FTE: 0

VI. PROJECT PARTNERS:

The DNR requests county sponsorship for training workshops intended for local staff and the public (meeting space, staffing, planning, invitations, and refreshments) as in-kind support (not from ENTRTF) held at the completion of a Groundwater Atlas.

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
N/A			

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
N/A			

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

The County Atlas program is the primary vehicle to provide comprehensive geologic and groundwater system mapping and associated databases at appropriate scales statewide. The goal is to complete an atlas for all 87 counties as soon as is practicable. Counties with a complete Atlas (Geologic & Groundwater) enjoy economic benefits especially with respect to water resource use and management. Once the Atlas is completed for a county, updates (GIS, web access, etc.), if requested, can be funded by the county making the request in conjunction with DNR general funds, and other funds as become available.

The MGS receives funding from DNR and also leverages federal dollars from the National Cooperative Geologic Mapping Program of the USGS. The MGS competes annually for these federal cost-share dollars. MGS Geologic atlas development is also supported by ENRTF and Clean Water Fund though direct appropriation. DNR is a cooperator and funding partner with the MGS. The Groundwater Atlases are currently supported by a combination of state general fund, Clean Water Fund and ENRTF appropriations to DNR. Springshed mapping and research to investigate and understand groundwater flow in the complex geologic systems in southeast Minnesota has been supported by ENRTF; the results of that work will be utilized in the completion of atlases in southeast Minnesota.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted April 1 and October 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2022

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

A. Budget Spreadsheet - Included

B. Visual Component or Map – Included

C. Parcel List Spreadsheet – N/A

D. Acquisition, Easements, and Restoration Requirements – N/A

E. Research Addendum – N/A

Attachment A: Project Budget Spreadsheet
Environment and Natural Resources Trust Fund
M.L. 2020 Budget Spreadsheet - REVISED
Legal Citation: M.L. 2020 XXXXXXX
Project Manager: Paul Putzier
Project Title: County Groundwater Atlas
Organization: Minnesota Department of Natural Resources
Project Budget: $1,125,000.00
Project Length and Completion Date: Two years; June 30, 2022
Today's Date: November 22, 2019

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)	$ 756,976	$ -	$ 756,976
Personnel: Continuation of nine existing ENRTF-funded staff (Commitment: approx. 6.5 FTE): Hydrologist Supervisor (classified, 0.5 FTE for one year) Res Sci 3 (classified, 1 FTE for one year) Hydrologist 3 (classified, 0.5 FTE for one year) Hydrologist 3 (classified, 0.5 FTE for one year) Hydrologist 2 (classified, 1 FTE for one year) Hydrologist 2 (classified, 1 FTE for one year) Hydrologist 1 (classified or unclassified, 1 FTE for one year) Information Officer 2 (classified or unclassified, 0.5 FTE for one year) Research Analyst Sn-GIS (classified or unclassified, 0.5 FTE for one year) Salaries include ~15-25% fringe benefits as per state union contracts.ENRTF funds will not be used as a substitute for traditional sources of funding. Staff salaries for these positions are currently paid with ENRTF funds.			
Professional/Technical/Service Contracts			
Contracts: Laboratory analysis for four counties of approximately 110 water samples per county (Approx. 440 total) for primary analysis. Lab budget for existing state contracts with MN Department of Agriculture ($35,500/county), University of MN ($7,000/county) and University of Waterloo ($16,500/county).	$ 236,000	$ -	$ 236,000
Equipment/Tools/Supplies			
Non-capital equipment including: water sampling and measurement tools and field analytical meters and equipment (est $7,500 total for replacement multiple, individual meters: Trimble, Hack water quality meters, Rugged Pro field probes and titrate system). Supplies, including expendable water sampling supplies (Approx. 440 samples total. $30/sample: high volumn mico filters; valves and tubing for each well sampled, titration supplies (est $12,500). Shipping costs for water samples to laboratories (est $1,000).	$ 21,000	$ -	$ 21,000
Printing			
Each Atlas Part B includes printing (off-set and digital) of approximatley 300 copies: 1) One 40-60 page bound report with up to 40 color figures, maps and tables 2) Three to four, full color map plates that are each approximatley 24-inches by 36-inches in size. Some Atlases require a second, figures only, bound report. Printing costs also includes preparing 1,000 post cards for each county and postage to mail to citizens to obtain permission for water well sampling. Total anticipated per county printing costs estimated to be $9,000. Printing costs for four (4) county atlas estmated to be $36,000.	$ 36,000	$ -	$ 36,000
Travel expenses in Minnesota			
In-state vehicle mileage (est $13,500) and travel expenses (est $13,478), primarily for water sampling and field data collection in up to eight counties. All travel per DNR travel policy.	$ 26,978	$ -	$ 26,978
Other			
***Direct and Necessary expenses:** HR Support (~$9,962), Safety Support (~$1,803), Financial Support (~$10,061), Communication Support (~$1,388), IT Support (~$23,695), and Planning Support (~$1,138) necessary to accomplish funded programs/projects.	$ 48,046	$ -	$ 48,046
COLUMN TOTAL	$ 1,125,000	$ -	$ 1,125,000

*Direct and Necessary expenses include Department Support Services (Human Resources, IT Support, Safety, Financial Support, Communications Support, and Planning Support). Department Support Services are described in the agency Service Level Agreement and billed internally to divisions based on rate that have been developed for each area of service. These services are directly related to and necessary for the appropriation. Department leadership services (Commissioner's Office and Regional Directors) are not assessed. Those elements of individual projects that put little or no demand on support services such as large single-source contracts, large land acquisitions, and funds that are passed through to other entities are not assessed Direct and Necessary costs for those activities.

SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State:	N/A	$ -	$ -	$ -
State: General Fund, atlas staff and support, estimated $1,200,000 for 2-year project period to support completion of groundwater atlases in base program.	pending (estimate)	$ 1,200,000	$ -	$ 1,200,000
In kind: County/local government assistance to arrange water sampling access and sponsor local training workshop. Approximately $4,000/county.	pending (estimate)	$ 32,000	$ -	$ 32,000

Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS	Amount legally obligated but not yet spent	Budget	Spent	Balance
M.L. 2013, Chp. 52, Sec. 2, Subd. 03c, $1,200,000;	Balance will be zero by FY20.	$ 1,200,000	$ 1,200,000	$ -
M.L. 2015, Chp. 76, Sec. 2, Subd 3b, $2,000,000.	Balance will be zero by FY20.	$ 2,000,000	$ 2,000,000	$ -
M.L. 2019, First Special Session, Chapter 4, Article 2, $2,400,000		$ 2,400,000	$ 100,000	$ 2,300,000

County Groundwater Atlas

- Water supply planning
- Land use decisions
- Resources development
- Resource protection
- Transportation planning
- Agricultural water supply
- Groundwater studies
- Government, industry, citizens
- Research