# Environment and Natural Resources Trust Fund (ENRTF)
# M.L. 2018 ENRTF Work Plan (Main Document)

**Today's Date:** February 19, 2018

**Date of Next Status Update Report:** January 31, 2019

**Date of Work Plan Approval:**

**Project Completion Date:** June 30, 2020

**Does this submission include an amendment request?** No.

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**PROJECT TITLE:** County Geologic Atlas Part-B

**Project Manager:** Paul F. Putzier

**Organization:** Minnesota Department of Natural Resources

**College/Department/Division:** Ecological and Water Resources Division

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**Location:** Statewide, with focus on these specific counties: Becker, Brown, Cass, Dodge, Hubbard, Isanti, Kanabec, Olmsted (update), Redwood, Wadena, Washington (update).

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**Total Project Budget:** $1,500,000

**Amount Spent:** $0

**Balance:** $1,500,000

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**Legal Citation:** M.L. 2018, Chp. xx, Sec. xx, Subd. xx

**Appropriation Language:**

**I. PROJECT STATEMENT:**

The county geologic 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 companies and organizations. The complete atlas for each county is prepared in two parts:

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

This projects supports continuing development of the Part B atlases by the DNR for counties across the state. The Part B 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 is an essential step to inform management decisions that will and in water supply planning, and protect water supplies, public health, ecological systems and the groundwater resource. Some of the many typical applications and uses of the atlas are noted by the following selected resource managers:

Heather Cunningham, Zoning and Environmental Services Administrator, Carlton County: "I would say that I use the atlas on a monthly basis. In the last 6 months, I have used it for the review of an Environmental Assessment Worksheet (EAW), pollution sensitivity for a proposed mixed use development, groundwater contamination at our closed landfill, and in working with a lake association."

Joe Hudak, Assistant Engineering Geologist, Minnesota Department of Transportation: Joe commented that, "We typically use the county atlases for subsurface information prior to conducting any geophysical field work or drill rig borings/CPT soundings. Most of our investigations involve gathering geotechnical information for various transportation related foundations, such as bridges/structures/embankments over poor soils etc. We also use them (CGA) for areas where karst terrain may be present, areas with shallow water tables and for writing EAW reports for upcoming projects.

Martin Larsen, Olmsted County Feedlot Technician, Landowner & Farmer, Olmsted County: "The County Geologic Atlas is an important tool for the Olmsted Soil and Water Conservation district. It is used for animal feedlot permitting and nutrient management planning to locate sinkholes, depth to bedrock and first encountered bedrock. It is referenced for location of sensitive Decorah edge seeps and large springs of interest. The springshed maps included in some Part B atlases are utilized for local education and outreach. The maps of surface and groundwater interaction are shared with landowners and producers to encourage implementation of manure application setbacks and other best management practices for protection of groundwater resources."

Each Part B 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 maps of the water table and deeper aquifers; groundwater sample collection and comprehensive laboratory analysis; analysis and interpretation of water age and chemistry data; geophysics field data collection and analysis; technical analysis and maps of groundwater systems; 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 18 months of funding to complete, continue, or initiate Part B atlas projects for the following counties: Becker, Brown, Cass, Dodge, Hubbard, Isanti, Kanabec, Olmsted (update), Redwood, Wadena, Washington (update).

This project will continue with the assembly of atlas groundwater maps into geospatial (GIS) data layers for use in decision-support systems, such as the Department of Natural Resource (DNR) electronic permitting process (MPARS), county GIS data sets and the DNR's online web-based applications such as the Watershed Health Assessment Framework (WHAF). These assembled data layers and electronic tools make the information more accessible for local, state and federal decision makers, scientists and citizens.

**II. OVERALL PROJECT STATUS UPDATES:** See Activity 1 below

**III. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1: County Geologic Atlas, Part B**
**Description:** Building on the Part A atlases prepared by the MGS, this project will provide approximately 18 months of funding to complete, continue, or initiate Part B atlas projects for the following counties: Becker, Brown, Cass, Dodge, Hubbard, Isanti, Kanabec, Olmsted (update), Redwood, Wadena, Washington (update). 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 Part B 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.

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 Part B 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.

Following completion of each Part B atlas, DNR will disseminate the information (see Dissemination section below), and be available to assist stakeholders in the application and use of the atlas.

**ENRTF BUDGET: $1,500,000**

| Outcome | Completion Date |
|---|---|
| 1a. Publish completed Part B reports (up to four counties per year). | June 30, 2020 |
| 1b. Continue ongoing work on Part B projects (up to eight counties). | June 30, 2020 |
| 1c. As new projects are completed, continue to add data to compiled GIS data layers. | June 30, 2020 |
| 1d. Start new Part B projects (up to four per year). | June 30, 2020 |

**First Update:** January 31, 2019

**Second Update:** July 31, 2019

**Third Update:** January 31, 2020

**Final Update:** July 31, 2020

**IV. DISSEMINATION:**
**Description:** At the completion of a Part B atlas, DNR provides notification to 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 county geologic atlas Part B is printed in paper format 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. Copies are available for sale at the MGS. PDF versions of the report are posted to the DNR web site: http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status.html. Project data, including water chemistry data and GIS data are also available on the DNR web site.

Following the publication of each Part B atlas, a local workshop is held 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 Part B atlas. Following dissemination and the local workshop, DNR staff are available to answer questions and assist in the application and use of the atlas.

**First Update:** January 31, 2019

**Second Update:** July 31, 2019

**Third Update:** January 31, 2020

**Final Update:** July 31, 2020

**V. PROJECT BUDGET SUMMARY:**

**A. Preliminary ENRTF Budget Overview:** See attached budget spreadsheet

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

**Explanation of Use of Classified Staff:**
Any classified position paid for with ENRTF funds will either be 1) backfilled with a new position or 2) the work previously done by this position will be delayed, eliminated, or completed by the start of the project. In anticipation of this work continuing into the future, new positions in this project will be created as classified due to the experienced difficulty in attracting high-quality candidates to fill the unclassified positions. This work plan is modified to accommodate the option of hiring either unclassified or classified staff for any positions that become available through attrition. Allowing the option of reclassifying one or more of the positions as classified when a position vacancy occurs provides the most flexibility in hiring high-quality candidates who might not otherwise apply to a limited unclassified position.

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

| | |
|---|---|
| Enter Total Estimated Personnel Hours: 13,000 | Divide by 2,080 = TOTAL FTE: 6.25 |

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

| | |
|---|---|
| Enter Total Estimated Personnel Hours: N/A | Divide by 2,080 = TOTAL FTE: 0 |

**B. Other Funds:**

| SOURCE OF AND USE OF OTHER FUNDS | Amount Proposed | Amount Spent | Status and Timeframe |
|---|---|---|---|
| **Other Non-State $ To Be Applied To Project During Project Period:** | | | |

| | | | |
|---|---|---|---|
| N/A | $ 0 | $ 0 | N/A |
| **Other State $ To Be Applied To Project During Project Period:** | | | |
| General Fund (Cash):<br>Base program support for atlas staff, supplies, and support, estimated at $1,000,000 for 2-year project period ($500,000/yr.) to support completion of Part B atlases. | $ 1,000,000 | $0 | Pending. |
| Clean Water Fund (Cash):<br>M.L. 2017, Chapter 91, Article 2, Section 6 (h) | $ 125,000 | $0 | Secured for current biennium. |
| **Past and Current ENRTF Appropriation**: | | | |
| M.L. 2015, Chp. 76, Sec. 2, Subd 3b.<br>LCCMR: County Geologic Atlas – Part B | $2,000,000 | $1,700,000 | Secured.<br>Estimated unspent of up to $300,000 by June 30, 2018, and expected to roll to FY19. This secured funding is required to complete the two year project funded by the FY18 proposal. |
| **Other Funding History:** | | | |
| N/A | $ 0 | $ 0 | N/A |

**VI. PROJECT PARTNERS:**

The Minnesota Geological Survey completes Part A of county geologic atlases. To determine priority of counties, the MGS considers groundwater sensitivity, resource demand, and the size of the population served. At the completion of the Part A work, DNR completes Part B, the groundwater portion, of the atlases. DNR requests local government sponsorship for training workshops (in-kind support) intended for local staff and the public held at the completion of a Part B 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 Geologic Atlas program is the primary vehicle to provide comprehensive geologic and groundwater system mapping and associated databases at appropriate scales statewide. 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 Part A 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 Part B atlases are currently supported by a combination of state general fund, ENRTF, and Clean Water Fund appropriations to DNR. Springshed mapping and research to investigate and understand

groundwater flow in complex geologic systems in southeast Minnesota has been supported by ENRTF; the results of that work will be utilized in any ongoing or future atlas work in southeast Minnesota.

**VIII. REPORTING REQUIREMENTS:**

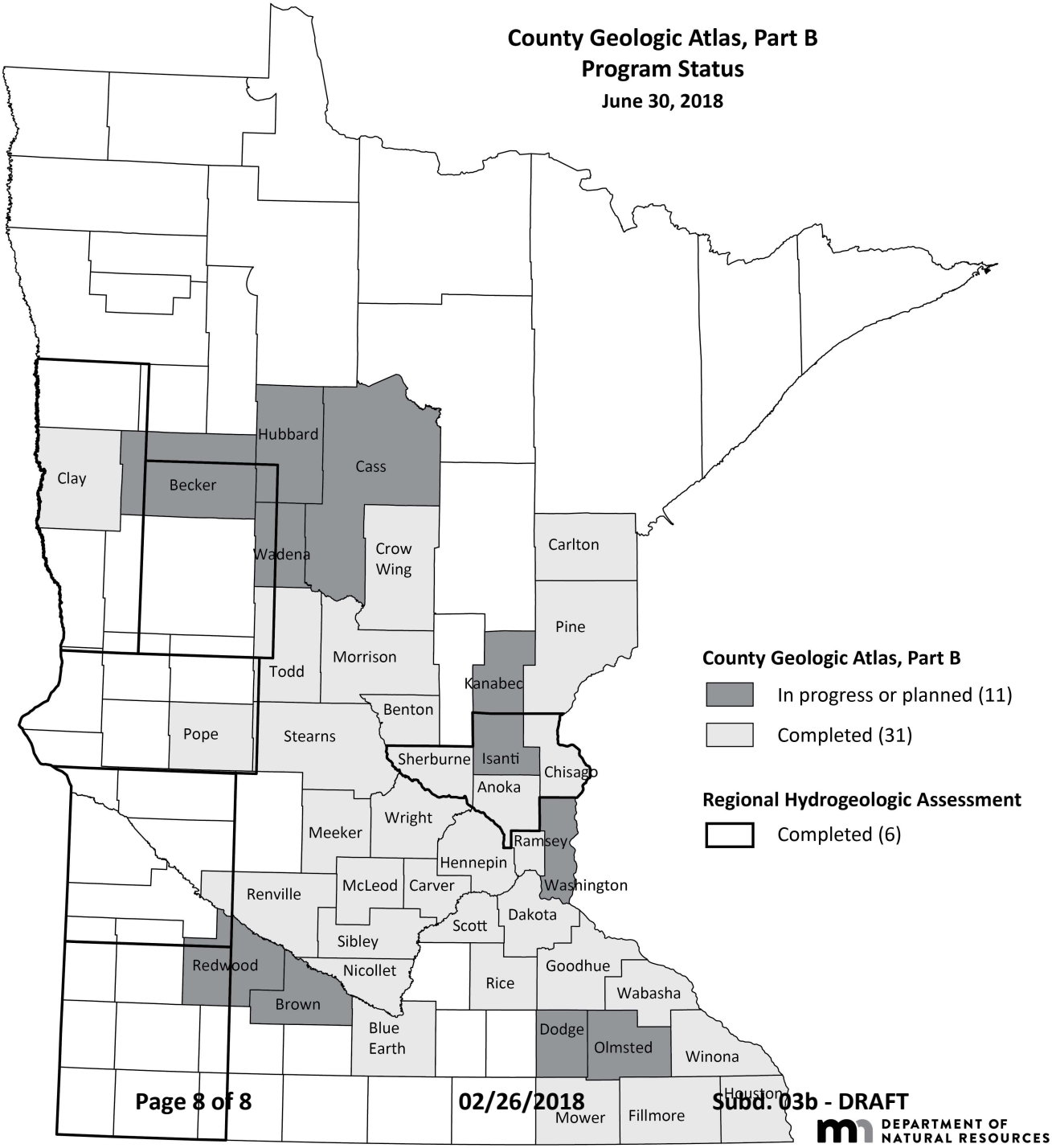
- **The project is for 2 years, will begin on July 1, 2018, and end on June 30, 2020.**
- **Periodic project status update reports will be submitted January 31 and July 31 of each year.**
- **A final report and associated products will be submitted between June 30 and August 15, 2020.**

**IX. SEE ADDITIONAL WORK PLAN COMPONENTS:**

**A. Budget Spreadsheet (Attached)**
**B. Visual Component or Map (Attached)**
**C. Parcel List Spreadsheet (N/A)**
**D. Acquisition, Easements, and Restoration Requirements (N/A)**
**E. Research Addendum (N/A)**

**Attachment A:**
**Environment and Natural Resources Trust Fund**
**M.L. 2018 Budget Spreadsheet**
**Project Title:** County Geologic Atlas Part-B
**Legal Citation:**
**Project Manager:** Paul F. Putzier
**Organization:** Minnesota Department of Natural Resources
**College/Department/Division:** Ecological & Water Resources
**M.L. 2018 ENRTF Appropriation:** $1,500,000
**Project Length and Completion Date:** 2 years. June 30, 2020
**Date of Report:** February 19, 2018

| ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET | Budget | Amount Spent | Balance |
|---|---|---|---|
| **BUDGET ITEM** | | | |
| Personnel: Total salary for each position is 18 months (1.5 years) at listed FTE rate. Total of 6.25 FTE. Salaries include ~15-25% fringe benefits as per state union contracts. Note: In the first part of the project year (FY19) some positions will be funded by existing ENTRF budget. | $863,625 | $0 | $863,625 |
| Hydrologist Supervisor - (one, half-time classified): $126,000; 0.5 FTE | | | |
| Res Sci 3 - (one, full-time classified): $126,000; 1 FTE | | | |
| Hydrologist 3 - (one, half-time classified): $119,000; 0.5 FTE | | | |
| Hydrologist 2 - (two, full-time unclassified or classified): $88,000; 2 FTE | | | |
| Hydrologist 1 - (two, half-time classified or unclassified, at 50% time each): $70,000; 1.0 FTE | | | |
| Information Officer/Production - (one, 3/4-time classified): $71,000; 0.75 FTE | | | |
| GIS Research Analyst (one, half-time unclassified): $56,000; 0.5 FTE | | | |
| **Professional/Technical/Service Contracts (8 Counties)** | $440,000 | $0 | $440,000 |
| University of Minnesota - Analytical Laboratory ($54,400) | | | |
| Minnesota Department of Agriculture - Analysitcal Laboratory ($265,600) | | | |
| University of Waterloo - Analytical Laboratory ($120,000) | | | |
| **Equipment/Tools/Supplies** | $42,000 | $0 | $42,000 |
| Water sampling supplies, water sampling field equipment, shipping water samples. | | | |
| **Printing** | $56,000 | $0 | $56,000 |
| Each Atlas Part B includes printing (off-set and digital) and mailing of approximatley 250 copies ($7,000/Atlas). Printing costs also includes preparing and postage for 1,000 post cards for each county mailed to citizens to obtain permission for water well sampling. | | | |
| **Travel expenses in Minnesota** | $33,050 | $0 | $33,050 |
| In-state vehicle mileage (est $16,463) and lodging & meals expenses (est $16,587), primarily for water sample and field data collection. | | | |
| **Other** | | | |
| Report publication specialty software (ex. Avenza Map Publisher) for three DNR Atlas production staff (est $2,000). Speciality software training for DNR Atlas production staff, such as Adobe InDesign, Map Publisher, ArchGIS (est. $2,000). | $4,000 | $0 | $4,000 |
| Direct and necessary costs cover HR Support ($13,917), Safety Support ($3,197), Financial Support ($13,048), Communication Support ($1,271), IT Support ($28,820), and Planning Support ($1,072), necessary to accomplish funded programs/projects (Total $61,325). | $61,325 | $0 | $61,325 |
| **COLUMN TOTAL** | $1,500,000 | $0 | $1,500,000 |






DEPARTMENT OF NATURAL RESOURCES