# Environment and Natural Resources Trust Fund (ENRTF)
# M.L. 2013 Work Plan

**Date of Status Update Report: _____**

**Date of Next Status Update Report: January 15, 2014**

**Date of Work Plan Approval: _____**

**Project Completion Date: 3 years, June 30, 2016** **Is this an amendment request? ____**

**PROJECT TITLE: County Geologic Atlas (Part B) for Water Resource Sustainability**


**Project Manager: Jan Falteisek**

**Affiliation: Minnesota Department of Natural Resources**

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**Location:** Anoka, Blue Earth, Clay, Houston, Morrison, Nicollet, Renville, Sherburne, Sibley, Winona, Wright

| **Total ENRTF Project Budget:** | | |
|---|---|---|
| | **ENRTF Appropriation:** | **$1,200,000** |
| | **Amount Spent:** | **$0** |
| | **Balance:** | **$1,200,000** |

**Legal Citation:** M.L. 2013, Chp. xx, Sec. xx, Subd. xx

**Appropriation Language:**

# DRAFT

**I. PROJECT TITLE: County Geologic Atlas (Part B) for Water Resource Sustainability**

**II. PROJECT STATEMENT:**

A geologic atlas provides information that is essential to sustainable management of Minnesota's groundwater resources by identifying key areas to protect our drinking water and ensure sustainable use. Atlases define aquifer boundaries and identify the interconnection of aquifers to other aquifers, to the land surface, and to surface water resources. Delineation and mapping of aquifers, recharge areas, and springsheds is an essential first step to inform management decisions that will protect water supplies, public health, and the resource. This project will complete, continue, or initiate up to seven Part B projects initiated or planned under previous funding, including Anoka, Blue Earth, Clay, Nicollet, Renville, Sibley, and Wright counties. Work may be initiated on Morrison and Sherburne counties.

Each atlas project includes some or all of the following work components: assembly of data layers and development of conceptual hydrogeologic models; development of maps of the water table; development of maps of aquifers; groundwater sample collection and laboratory analysis; analysis and interpretation of chemistry data; geophysics field data collection and analysis; preliminary technical analysis and maps of groundwater systems; construction of hydrogeologic cross sections; construction of maps of pollution sensitivity; preparation of final atlas report and publication, training of local atlas users, and dissemination of data.

This project will also initiate the assembly of previously published county atlas groundwater maps into geospatial data layers for use in decision-support systems, such as DNR's new electronic permitting process and DNR's on-line web-based applications such as Watershed Assessment Tool. These assembled data layers and electronic tools make the information more accessible for local, regional, and state decision makers.

Many of Minnesota's surface water resources, such as the trout streams in Southeastern Minnesota, are dependent on groundwater discharge. Trout streams rely on cold water from springs and are under increasing pressure from changing land use patterns and groundwater withdrawals. Delineation of the recharge areas (springsheds) for springs is crucial for the protection of the southeastern Minnesota trout fisheries and the restoration of degraded fisheries. These springsheds are formed in the karsted bedrock units of southeast Minnesota. This project will continue springshed mapping with a focus on Winona and Houston counties. This project will also begin preparation of draft karst plates for each of the Winona and Houston county geologic atlases, Part B, for publication with future completed reports.

**III. PROJECT STATUS UPDATES:**

**Project Status as of January 15, 2014**:

**Project Status as of July 15, 2014:**

**Project Status as of January 15, 2015:**

**Project Status as of July 15, 2015:**

**Project Status as of January 15, 2016:**

**IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1:** County Geologic Atlas, Part B
**Description**: Building on Part A atlas data, compile field chemistry, analyze groundwater samples for natural chemistry and age-dating isotopes, and assemble aquifer characteristics data. Prepare groundwater maps, cross sections, and interpretations of pollution sensitivity for publication in completed Part B atlas reports. Continue or begin new Part B projects.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: $ 899,604**
**Amount Spent: $ 0**
**Balance: $ 899,604**

**Activity Completion Date:**

| Outcome | Completion Date | Budget |
|---|---|---|
| **1.** Publish completed Part B reports (up to two): Publish reports underway at the start of the project period, including Blue Earth, Nicollet, or Sibley; continue Part B projects (up to four), including, Anoka, Wright, Renville, and Clay; if possible start new Part B projects (up to two): Sherburne and Morrison if possible. Includes contract services for laboratory analysis of water samples.<br><br>Part B Atlas program personnel supported by the General Fund base program may be assigned to one or more of these projects or may work on specific components of projects so funds from both General Fund and ENTRF will be used to complete these atlases. | June 30, 2016 | $ 899,604 |

**Activity Status as of January 15, 2014**:

**Activity Status as of July 15, 2014:**

**Activity Status as of January 15, 2015:**

**Activity Status as of July 15, 2015:**

**Activity Status as of January 15, 2016:**

**Final Report Summary:** A final report will be submitted

**ACTIVITY 2: Initiate Assembly of Published County Geologic Atlas, Part B, Geospatial Data.**
**Description:** Construct necessary County Geologic Atlas, Part B geospatial data definitions and protocols needed to digitally assemble previously published groundwater maps and implement the data protocols for future projects. If possible, begin data assembly of priority data onto geospatial data layers in multiple formats.

**Summary Budget Information for Activity 2:**

**ENRTF Budget: $ 116,361**
**Amount Spent: $ 0**
**Balance: $ 116,361**

**Activity Completion Date:**

| Outcome | Completion Date | Budget |
|---|---|---|
| **1.** Construct groundwater geospatial data protocols; implement for future projects. If possible, begin assembly of geospatial data layers. Includes contract services with Minnesota Geological Services for assembly and/or interpretation of legacy aquifer or groundwater data previously published by the MGS. | June 30, 2014 | $116,361 |
| | | |

**Activity Status as of January 15, 2014**:

**Activity Status as of July 15, 2014:**

**Activity Status as of January 15, 2015:**

**Final Report Summary:**

**ACTIVITY 3: Springshed Mapping Continuation and Draft Karst Plates for Two Atlases**
**Description:** Continue springshed mapping to focus on Winona and Houston counties and if possible include priority locations within the Galena karst of Fillmore County. The mapping will be combined with karst feature mapping and landscape analysis to produce karst-landscape and hydrology maps for Part B of the Winona and Houston atlases, to be published as part of the completed Part B reports.

**Summary Budget Information for Activity 3:**

**ENRTF Budget: $ 184,035**
**Amount Spent: $ 0**
**Balance: $ 184,035**

**Activity Completion Date:**

| Outcome | Completion Date | Budget* |
|---|---|---|
| **1.** 1:100,000 or smaller scale maps of delineated springsheds | June 30, 2014 | $ 39,000 |
| **2.** Maps and reports of completed dye traces; includes contract services for traces, lab services, and database support | June 30, 2014 | $ 106,100 |
| **3.** Initial development of karst plates for Winona and Houston county geologic atlases, Part B | June 30, 2014 | $ 38,935 |

* Estimated amount per Outcome task; amounts may vary per task but total activity budget will not exceed the budget of $ 184,035.

**Activity Status as of January 15, 2014:**

**Activity Status as of July 15, 2014:**

**Activity Status as of January 15, 2015:**

**Final Report Summary:**

**V. DISSEMINATION:**

**Description:**

Activity 1 and 2, County Geologic Atlas -- Each county geologic atlas, Part B completed is printed in paper format distributed to county, libraries, state agencies, and other organizations. They are available for sale at the MGS. PDF versions of the report are posted to the DNR web site and are available through http://www.dnr.state.mn.us/waters/groundwater_section/mapping/status.html . Project data, including water chemistry data and GIS data are also posted to the DNR web site. Following publication of each Part B report, a local workshop is held to introduce the report content and train users in its application.

Activity 3, Springshed mapping and draft karst plates -- GIS-based maps and written reports of the springsheds will be prepared and disseminated to the LCCMR, interested residents and to local, regional and state resource managers and regulators interested in specific targeted areas. Interim dye trace results will be available as GIS shape files and derived products on a dye trace by dye trace basis. Data tables of discharge and chemistry will be available as developed. The draft karst plates for Winona and Houston counties will be published with the respective Part B reports.

**Status as of January 15, 2014:**

**Status as of July 15, 2014:**

**Status as of January 15, 2015:**

**Status as of July 15, 2015:**

**Status as of January 15, 2016:**

**Final Report Summary:**

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget: See also project Attachment A Budget Detail**

| Budget Category | $ Amount | Explanation |
|---|---|---|
| Personnel: | $ 788,953 | 10 positions, 9.5 FTE for direct project activities. One-year funding for FY14, all are state employees with fringe benefits approx. 21% to 37% per state union contract. Most positions require specialized professional skills in hydrogeology and groundwater systems, including sampling design, sample collection and interpretation, geospatial analysis, data management, and report preparation. Staff skills focused on report development and communication of results are needed this project period to meet deadlines for published and web-based products.<br><br>Hydrologist Supervisor: est. $52,000 (1 classified @ 0.5 FTE)<br>Research Scientist 3: est. $98,000 (1 classified @ 1.0 FTE)<br>Hydrologists: est. $167,953 (2 unclassified @ 1.0 FTE)<br>Hydrologists: est. $339,000 (4 classified @ 1.0 FTE)<br>Information Officer: est. $79,000 (1 unclassified @ 1.0 FTE)<br>Research Analyst: est. $53,000 (1 unclassified @ 1.0 FTE) |
| Professional/Technical/Service Contracts: | $ 244,500 | Laboratory analysis of groundwater and dye trace samples; technical analysis of field and laboratory data; interpretation of isotope data; karst database support; assembly and/or interpretation of legacy aquifer or groundwater data previously published by the Minnesota Geological Survey. Sample plan for each Part B atlas is 100 chemistry/isotope groundwater |

| | | |
|---|---|---|
| | | samples at $350 ea. and 10 carbon-14 samples at $600 ea. |
| Direct and necessary services for the appropriation | $ 79,216 | Direct and necessary services for the appropriation |
| Equipment/Tools/Supplies: | $ 28,831 | Data collection equipment, tools, and supplies including expendable water sampling or necessary field work supplies. Where possible existing equipment from previous projects will be used. Includes computer fleet charges prorated for up to 9.5 FTE paid through this appropriation (est. $8,602, about $500/year/FTE/computer). Field positions require field-use computers in addition to office-based computers. |
| Capital Expenditures over $3,500: | $0 | None planned. |
| Printing: | $ 20,000 | Each Part B report includes 4 map plates per atlas (approx. 30 x 30 inches), 1,200 sheets per plate, 4,800 sheets per atlas. |
| Travel Expenses in MN: | $26,100 | Necessary travel for water sample collection, dye traces, collaboration with project partners, project results dissemination; mileage, lodging, meals. |
| Other: report production software; GIS and field computers; GIS training; water sample shipping: | $12,400 | Report production software licenses and software upgrades (Adobe Acrobat, Illustrator, Photoshop, InDesign; Avenza Map Publisher). Includes a new Adobe Creative Suite license for the Research Scientist 3 (approx.$2,000). Software upgrades (approx. $200 to 500 per license) must be purchased periodically to avoid lapse of active licenses. Report production software licenses and upgrades are the responsibility of the work unit. New atlas project staff require specialized computers capable of advanced GIS operations and training; a ruggedized field computer will withstand water, dirt, and temperature extremes encountered in field conditions; water samples must be shipped to laboratory. |
| | | |
| **TOTAL ENRTF BUDGET:** | **$1,200,000** | |

* Estimated amount per budget category; amounts may vary per category but total project budget will not exceed the Total ENRTF budget of $ 1,200,000.

**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.

There is one classified position currently working on this project to be paid partially by this grant. The hydrologist supervisor provides overall atlas program direction, on-going program management, and is the technical supervisor for staff assigned to specific atlas projects or who support the atlas program as GIS or report production specialists. A portion of the hydrologist supervisor's time (0.5 FTE) will be paid by this grant and the remaining portion will be paid by General Fund, subject to an approved DNR budget.

**Explanation of Capital Expenditures Greater Than $3,500:** none planned

**Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation:** 9.5 FTE

**Number of Full-time Equivalent (FTE) estimated to be funded through contracts with this ENRTF appropriation:** NA

**B. Other Funds:**

| Source of Funds | $ Amount Proposed | $ Amount Spent | Use of Other Funds |
|---|---|---|---|
| **Non-state** | | | |
| In-kind Services During Project Period: County assistance to arrange sampling access and sponsor local training workshop | $5,000 | $ | County assists staff in local access to well owners and sponsors the training workshop at the conclusion of the project. |
| **State** | | | |
| Other State $ Being Applied to Project During Project Period: General Fund base program support, estimated $410,000 for the FY14 one-year project period to complete one, continue several, and possibly initiate an additional Part B atlas.<br>Clean Water Fund, M.L. 2009 Ch 172 Art 2 Sec 5(f), July 1, 2009 thru December 31, 2014; estimated $100,000 of CWF appropriation will be used during FY14 project period. | $510,000 | $ | General Fund base program support provides personnel, laboratory analysis and interpretation, printing, travel expenses, water sampling equipment and supplies, and related expenses.<br><br>Clean Water Funds primarily intended to expand and improve subsurface data acquisition in support of atlases. |
| Remaining from current ENRTF appropriation:<br>Atlas --<br>M.L. 2011, 1st Sp. Session,Ch. 2, Art. 3, Sec. 2, Subd. 03b2, ($552,299 unspent as of July 15, 2012);<br>Springshed --<br>M.L. 2011, 1st Sp. Session, Ch. 2, Art. 3, Sect. 2, Subd. 5(b)-LCCMR-Springshed Phase III July 1, 2011 ($127,839 unspent as of July 30, 2012) | $680,138 | $ | Personnel, laboratory analysis and interpretation, printing, travel expenses, water sampling equipment and supplies, and related expenses.<br><br>The Atlas M.L. 2011 springshed M.L. 2011 grants are fully budgeted for FY13, and not available for use in the current work plan for FY14. |

| | | | |
|---|---|---|---|
| **TOTAL OTHER FUNDS:** | **$1,195,138** | **$** | |

**VII. PROJECT STRATEGY:**

*See also Minnesota Geologic Survey County Geologic Atlas, Part A, Work Plan submitted separately to LCCMR.*

**A. Project Team/Partners:**

The Minnesota Geological Survey completes Part A of county geologic atlases (see MGS Main proposal for county atlas continuation). To determine priority, the MGS requires that the counties participate either with funding or with in-kind services and also 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 intended for local staff and the public held at the completion of a Part B atlas. Project partners for the springshed mapping work will include the MGS, Dr. Calvin Alexander (University of Minnesota Dept. Earth Science) and the Root River partnership.

**B. Project Impact and Long-term Strategy:**

The County Geologic Atlas program is the primary vehicle to provide comprehensive geologic 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 and has been ongoing in southeast Minnesota for many years; some of this work has been supported by ENRTF. While there has been significant progress in certain areas, such as Fillmore County, unmapped areas remain and future support will be needed to extend the mapped areas.

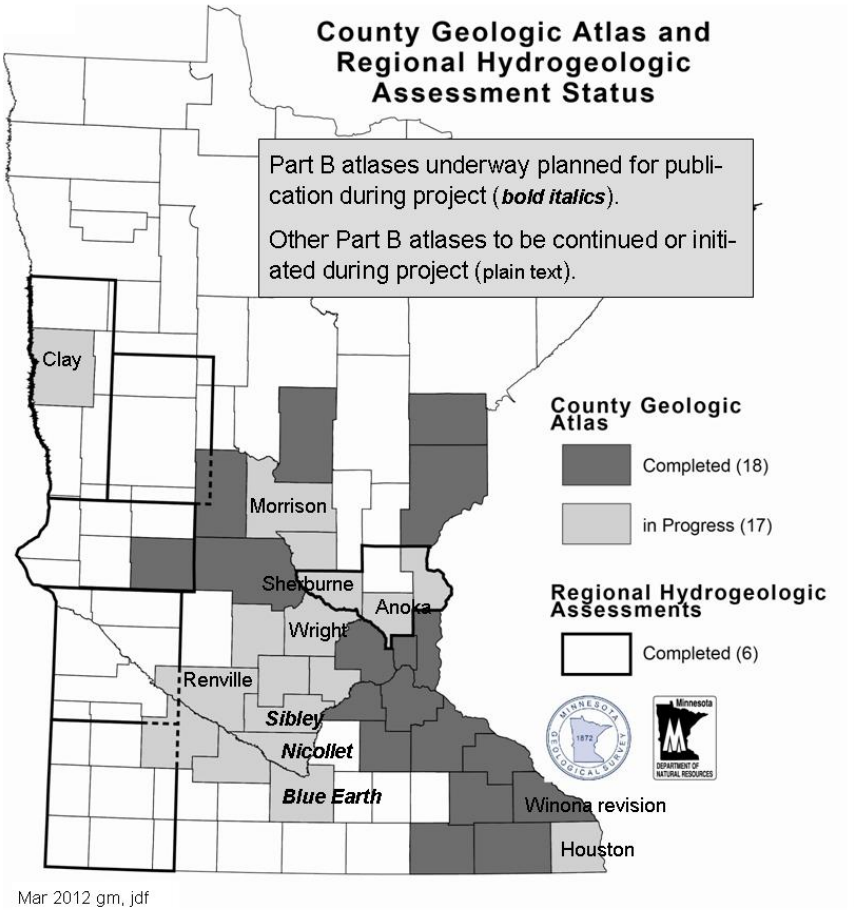
**C. Spending History:**

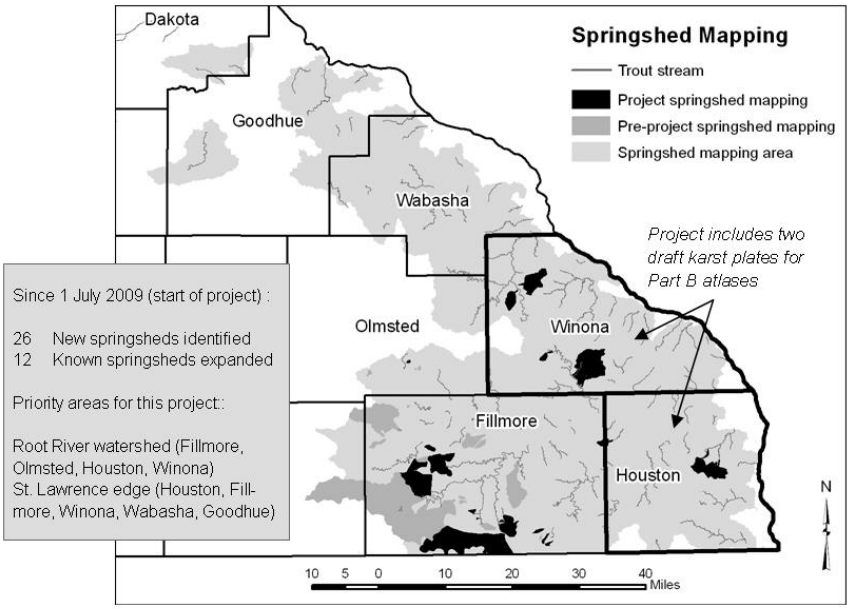
| **Funding Source** | **M.L. 2007 or FY08** | **M.L. 2008 or FY09** | **M.L. 2009 or FY10** | **M.L. 2010 or FY11** | **M.L. 2011 or FY12-13** |
|---|---|---|---|---|---|
| ENRTF (FY9-11) to DNR. Total appropriation was $1,600,000; a portion funded Phase 1 of the Mt. Simon aquifer investigation; $706,000 appropriated directly to MGS for atlas continuation | | Subd. 4(h) $861,000 Mt. Simon aquifer | | | |
| (Part B atlas) ENRTF (FY10-12) to DNR. Total appropriation was $2,695,000; a portion funded DNR county atlas continuation; a portion funded Phase 2 of the Mt. Simon aquifer investigation; $820,000 appropriated directly to MGS for atlas continuation. | | | Subd. 3(b) $890,000 county atlas continuation $895,000 Mt. Simon aquifer. | | |
| (Part B atlas) ENRTF (FY12-13) to DNR | | | | | $600,000 Subd. 03b2 |
| (Springshed mapping) ENRTF via | $125,000 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| contract with of MN | | | | | |
| (Springshed mapping) ENRTF DNR | | | $250,000 | | |
| (Springshed mapping) ENRTF DNR | | | | | $220,000 Subd. 05b1 |

**VIII. ACQUISITION/RESTORATION LIST: N/A**

**IX. MAP(S):**




LCCMR2013 MNDNR WorkPlan atlas/springshed cont

**X. RESEARCH ADDENDUM: N/A**

**XI. REPORTING REQUIREMENTS:**

**Periodic work plan status update reports will be submitted not later than January 15, 2014, July 14, 2014, January 15, 2015, July 14, 2015, and January 15, 2016. A final report and associated products will be submitted between June 30 and August 15, 2016 as requested by the LCCMR.**

**Attachment A: Budget Detail for M.L. 2013 Environment and Natural Resources Trust Fund Projects**

**Project Title:** County Geologic Atlases (Part B) for Water Resource Sustainability
**Legal Citation:** *M.L. 2013, Ch*
**Project Manager:** Jan Falteisek
**M.L. 2013 ENRTF Appropriation:** $1,200,000
**Project Length and Completion Date:** 1 year appropriation FY14, all deliverables to be completed by June 30, 2016 (three years)
**Date of Update:**

| ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET | Activity 1 Budget | Amount Spent | Balance | Activity 2 Budget | Amount Spent | Balance | Activity 3 Budget | Amount Spent | Balance | TOTAL BUDGET | TOTAL BALANCE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BUDGET ITEM** | ***County Geologic Atlas, Part B*** | | | ***Hydrogeologic geospatial data assembly*** | | | ***Springshed mapping and karst plates*** | | | | |
| **Personnel (Wages and Benefits)** 10 positions, 9.5 FTE for direct project activities. One-year funding for FY14, all are state employees with fringe benefits approx. 21% to 37% per state union contract. Most positions require specialized professional skills in hydrogeology and groundwater systems, including sampling design, sample collection and interpretation, geospatial analysis, data management, and report preparation. Staff skills focused on report development and communication of results are needed this project period to meet deadlines for published and web-based products. | 588,953 | 0 | 588,953 | 96,000 | 0 | 96,000 | 104,000 | 0 | 104,000 | 788,953 | 788,953 |
| Hydrologist Supervisor: est. $52,000 (1 classified @ 0.5 FTE) | | | | | | | | | | | |
| Research Scientist 3: est. $98,000 (1 classified @ 1.0 FTE) | | | | | | | | | | | |
| Hydrologists: est. $167,953 (2 unclassified @ 1.0 FTE) | | | | | | | | | | | |
| Hydrologists: est. $339,000 (4 classified @ 1.0 FTE) | | | | | | | | | | | |
| Information Officer: est. $79,000 (1 unclassified @ 1.0 FTE) | | | | | | | | | | | |
| Research Analyst: est. $53,000 (1 unclassified @ 1.0 FTE) | | | | | | | | | | | |
| **Professional/Technical/Service Contracts** | | | | | | | | | | | |
| Act. 1: Laboratory analysis of water samples . State contract or University of Minnesota. | 177,500 | 0 | 177,500 | | | | | | | 177,500 | 177,500 |
| Act. 2: Interpretation of legacy geologic and groundwater data. Minnesota Geological Survey. | | | | 10,000 | 0 | 10,000 | | | | 10,000 | 10,000 |
| Act. 3: Springshed mapping technical, laboratory, and database. Minnesota Geological Survey and University of Minnesota. | | | | | | | 57,000 | 0 | 57,000 | 57,000 | 57,000 |
| Direct and Necessary Services for the Appropriation ($79,216; distributed propor. activity budget) | 59,032 | 0 | 59,032 | 8,761 | 0 | 8,761 | 11,423 | 0 | 11,423 | 79,216 | 79,216 |
| **Equipment/Tools/Supplies** | | | | | | | | | | | |
| Act. 1: Atlas water sampling and measurement tools, field analytical meters and equipment, field safety equipment, est. $8,953; water sampling and field supplies, including expendable sampling and testing supplies, est. $8,000; Act. 3: Springshed mapping equipment and tools, est. $2,076, water testing, tracing, and field supplies, including expendable field and testing supplies, est. $1,200. This item includes computer fleet charges prorated for 9.5 FTE paid through this appropriation (est. $8,602, about $500/year/FTE/computer). | 23,719 | 0 | 23,719 | 600 | 0 | 600 | 4,512 | 0 | 4,512 | 28,831 | 28,831 |
| **Capital expenditures over $3,500** - *none planned* | | | | | | | | | | | |
| **Printing** | | | | | | | | | | | |
| Act. 1: Printing up to two completed atlas reports, est. $10,000 ea. MinnCor state contract. | 20,000 | 0 | 20,000 | | | | | | | 20,000 | 20,000 |
| **Travel expenses in Minnesota** | | | | | | | | | | | |
| Fleet charges for cars, trucks, minivans, est. $ 16,600; lodging, meals, mileage as per state contracts, est. $ 9,500. | 18,000 | 0 | 18,000 | 1,000 | 0 | 1,000 | 7,100 | 0 | 7,100 | 26,100 | 26,100 |
| **Other** | | | | | | | | | | | |
| Act. 1: Report preparation and production software licenses and continued upgrades to assure efficient report preparation and publication, est. $5,600; One (1) GIS workstation for new project hydrogeologist 2 hire and one (1) ruggedized field computer for new field hydrogeologist 1 hire, est. $5,000; GIS training new hydrogeologist hires, est. $800; Shipping costs for water samples to laboratory, est. $1000. | 12,400 | 0 | 12,400 | | | | | | | 12,400 | 12,400 |
| **COLUMN TOTAL** | **$899,604** | **$0** | **899,604** | **$116,361** | **$0** | **$116,361** | **$184,035** | **$0** | **$184,035** | **$1,200,000** | **$1,200,000** |