



Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-512

Proposal Title: Updating the Twin Cities Aggregate Resources Inventory

Project Manager Information

Name: Heather Arends

Organization: MN DNR - Lands and Minerals Division

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Project Basic Information

Project Summary: The DNR will update the seven-county metro aggregate resource inventory to address a projected shortage by 2029, ensuring sustainable land-use planning and infrastructure

ENRTF Funds Requested: \$300,000

Proposed Project Completion: June 30, 2028

LCCMR Funding Category: Small Projects (G)

Secondary Category: Resiliency (A)

Project Location

What is the best scale for describing where your work will take place?

Region(s): Metro

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

The Twin Cities metropolitan area is running out of locally available aggregate, which include sand, gravel, and crushed stone used to build road, bridges, and other publicly funded infrastructure. A 2000 study by the Minnesota Geological Survey estimated that supplies could be depleted as early as 2029, yet no comprehensive update has been conducted since. As demand grows and urban expansion continues, local governments and state agencies are making decisions without current data, which could lead to higher construction costs, longer hauling distances, and supply shortages in the near future.

This project will update the seven-county metro aggregate resource inventory, providing accurate, up-to-date information on where aggregate resources remain and how long they will last. Led by the Minnesota Department of Natural Resources (DNR) in collaboration with the Minnesota Geological Survey (MGS) and the Minnesota Department of Transportation (MnDOT) (per MS 84.94), this effort will ensure decision-makers have the data they need to plan for future infrastructure projects, secure local resources, and plan for future accessibility.

By identifying remaining aggregate reserves and forecasting future demand, this study will help reduce reliance on long-haul material transport, cut construction costs, and lower carbon emissions, making infrastructure development more sustainable and cost-effective.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

By identifying remaining aggregate reserves and forecasting future demand, this study will help reduce reliance on long-haul material transport, cut construction costs, and lower carbon emissions, making infrastructure development more sustainable and efficient for Minnesota's growing communities. To address the projected aggregate shortage, the DNR will lead an effort to update the region's aggregate resource inventory in collaboration with the Minnesota Geological Survey (MGS), the Minnesota Department of Transportation (MnDOT), and other state agencies.

The DNR will use the latest bedrock and surficial geology mapping conducted by MGS to merge datasets and assess the location, quality, and quantity of remaining aggregate resources. To better understand demand, DNR will collaborate with MNDOT to develop an updated aggregate consumption model for the twin cities, as well as, work with the state demographers office to look at population and urban expansion projection. Additionally, the DNR will research land-use and zoning restrictions to identify regulatory barriers that could impact future aggregate availability.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

This project supports Minnesota's Climate Action Framework by identifying local aggregate sources, reducing long-haul transportation emissions, and promoting sustainable infrastructure development. It aligns with MnDOT's Environmental Product Declarations (EPDs) by providing updated data to assess environmental impacts in construction materials. Additionally, it advances the Department of Administration's sustainable procurement goals by ensuring access to locally sourced materials that meet environmental standards. By integrating accurate resource data with climate and procurement policies, this project helps reduce carbon footprints, improve resource planning, and support Minnesota's commitment to responsible, low-impact infrastructure development.

Activities and Milestones

Activity 1: Complete seven-county aggregate resource inventory

Activity Budget: \$300,000

Activity Description:

The DNR will update the aggregate resource inventory of the seven-county Twin Cities metropolitan area using a similar methodology applied in the 2000 MGS report (Information Circular 46) with additional analysis on land use designations and zoning. First, existing geological data will be compiled, including bedrock and surficial geology maps, well logs, and soil surveys. These data will be analyzed to identify potential aggregate deposits and determine their thickness, distribution, and quality. Next, aggregate potential maps will be created, incorporating geological interpretations, past mining activity, and land-use constraints. These maps will categorize areas as high, moderate, or low aggregate potential based on deposit characteristics. To refine demand projections, DNR will obtain data from MnDOT and the State Demographic Center to develop an updated aggregate consumption model, urban expansion, and demographic trends. The DNR will also survey zoning regulations to assess land-use restrictions that may limit future extraction.

Finally, findings will be compiled into an updated aggregate inventory report with GIS-based mapping tools for decision-makers. This will ensure local governments, MnDOT, and planners have the necessary data to manage Minnesota's aggregate resources sustainably and support future infrastructure development.

Activity Milestones:

Description	Approximate Completion Date
Create consumption model vs population projection	April 30, 2027
Produce final report and aggregate resource maps	June 30, 2027
Compile and merge existing geologic datasets	July 31, 2027
Derive aggregate resource potential, inventory current aggregate operations	December 31, 2027

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

The DNR will provide data to MnDOT, counties, and municipalities for infrastructure decision-making. Findings will support MnDOT's Environmental Product Declarations (EPDs) and sustainability initiatives, helping to guide material sourcing and reduce transportation-related emissions. Results will be publicly available through state web sites, data warehouses, and shared with stakeholders. As no additional work is planned, this project will serve as a standalone resource.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Aggregate Resource Mapping	M.L. 2022, , Chp. 94, Art. , Sec. 2, Subd. 10a	\$500,000

Project Manager and Organization Qualifications

Project Manager Name: Heather Arends

Job Title: Manager of the Mineral Potential Section

Provide description of the project manager's qualifications to manage the proposed project.

Heather Arends is a geologist with over 25 years of experience in natural resource management and currently serves as the Mineral Potential Section Manager at the Minnesota Department of Natural Resources (DNR). She has spent her career working with local and state government agencies, industry leaders, and stakeholders to address aggregate resource challenges, ensuring responsible land use planning and long-term resource availability to support infrastructure and community development. Previously, she led Minnesota's Aggregate Resource Mapping Program, which provides counties and municipalities with critical geologic data for land-use planning. She also co-led the state's Silica Sand Rulemaking process, coordinating efforts across multiple agencies and stakeholders to develop science-based guidance for responsible resource management.

She has successfully secured and administered over \$2 million in state grants and federal subawards, including projects funded by the U.S. Geological Survey (USGS) Earth MRI and the National Geologic and Geophysical Data Preservation Program. Her work supports resource assessment, data-driven decision-making, and land-use planning efforts to promote sustainable natural resource use in Minnesota.

Arends holds a Master of Science in Geological Sciences from the University of Minnesota Duluth and a Bachelor of Arts in Geology from UMN Morris. Her research background includes field investigations in Iceland, Brazil, and the Midwest, with publications on Quaternary geology, landform evolution, and aggregate resource assessments.

Organization: MN DNR - Lands and Minerals Division

Organization Description:

A leader in natural resource policy and geoscience, Arends serves on multiple advisory boards, including the Minnesota Mineral Coordination Committee and the Minnesota Center for Mineral Research and Education. She is committed to collaborative, data-driven approaches that balance resource needs with environmental and community considerations.

The Minnesota Department of Natural Resources (DNR) is committed to managing the state's natural resources for the

benefit of current and future generations. Its mission is to conserve and enhance Minnesota's natural lands, waters, and wildlife, ensuring their sustainable use for recreation, economic development, and ecological health.

The DNR oversees state parks, forests, public lands, fisheries, and wildlife habitats, balancing conservation efforts with responsible resource management. It plays a key role in protecting water resources, supporting outdoor recreation, regulating mineral and aggregate resource use, and fostering resilient ecosystems.

Through science-based decision-making, education, and community engagement, the DNR works to protect Minnesota's environmental legacy while supporting industries and communities that rely on natural resources. The agency prioritizes sustainability, public access to outdoor spaces, and collaborative planning to ensure that Minnesota's environment remains healthy, diverse, and accessible for generations to come.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Research Scientist		Project lead			20%	2		\$200,000
GIS Analyst		Cartographer			20%	0.5		\$50,000
							Sub Total	\$250,000
Contracts and Services								
TBD	Service Contract	Assisting with report writing				0.5		\$16,009
							Sub Total	\$16,009
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
							Sub Total	-
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								

	Printing	Printing final report and maps	Hardcopy report and maps					\$5,000
							Sub Total	\$5,000
Other Expenses								
		Direct and Necessary Cost	Administrative Costs					\$28,991
							Sub Total	\$28,991
							Grand Total	\$300,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Total Project Cost: \$300,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [8f575a8b-c3a.pdf](#)

Alternate Text for Visual Component

Three figures illustrating the projected depletion rate of aggregate resources, incorporating the natural distribution of aggregate, projected urban expansion, and a consumption model. The model predicts resource exhaustion as early as 2029...

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

N/A

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

No

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Robert Tipping, Executive Director, Minnesota Geologic Survey, University of Minnesota

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

Yes, I understand

