



Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-128

Proposal Title: Best Practices for PFAS Phase-Outs in Minnesota

Project Manager Information

Name: Alison Ling

Organization: University of St. Thomas

Office Telephone: (651) 962-7749

Email: aling@stthomas.edu

Project Basic Information

Project Summary: This project seeks to protect Minnesota's natural resources from ongoing PFAS pollution by providing guidance and resources to help companies identify, phase-out, and limit PFAS in products.

ENRTF Funds Requested: \$385,000

Proposed Project Completion: June 30, 2029

LCCMR Funding Category: Water (B)

Project Location

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

Statewide

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

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

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

Per- and poly-fluoroalkyl substances (PFAS) are a broad class of anthropogenic chemicals that are both persistent and mobile. This means that once released to the environment, they stay there indefinitely and can move between different parts of the environment, leading to ongoing human exposure. These characteristics have earned PFAS the moniker “forever chemicals.” Previous work by this project’s PI has highlighted the unaffordability of managing PFAS in the environment after they are released. Limiting PFAS as far upstream as possible, ideally by limiting production in the first place, is the most cost-effective way to limit the building of PFAS in the environment and associated known and unknown health risks.

Minnesota has responded to this need by passing a law restricting the use of PFAS in products, with phased implementation between 2025 and 2032. This legislation has been a key first step in protecting Minnesota resources from future PFAS pollution. But more work is needed to help companies reduce PFAS use. Specifically, companies need guidance for how to identify which products and processes contain PFAS, where it comes from, what alternatives exist, how to phase them out, and how to limit their use in future products.

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.

Our solution involves researching and developing guidance to identify current PFAS inputs, phase-out PFAS from current products and processes, and limit PFAS use in future products. Our team will establish partnerships with businesses across Minnesota, targeting industry sectors previously identified as likely to use PFAS, and work with those partners to collect data, perform case studies, and develop and share guidance around reducing PFAS in products.

Identifying current PFAS inputs requires developing and executing product testing and/or supply chain evaluations. Once PFAS inputs are identified, phasing them out requires alternative identification, product reformulation, and process updates. Additionally, ongoing compliance will require continued verification testing and updated design and manufacturing best practices. Our team will conduct interviews with industry partners and model specific case studies related to both PFAS identification and phase-out. Current best practices and lessons learned will also be used to develop guidance around PFAS-free product design. Study results will inform guidance documents designed to facilitate and ease the transition away from non-essential use of PFAS and related chemicals. This guidance will be shared in the form of open-source publications as well as industry-specific white papers and workshops developed with partner input.

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?

Minnesota has already demonstrated its commitment to phasing PFAS out of products, with that legislation based on the connection between PFAS use, environmental PFAS contamination, and human health effects. PFAS in products directly contribute to PFAS in the environment through emissions at the point of manufacture, point of use, and through waste management routes like wastewater management and landfiling. This project seeks to accelerate and ease statewide phase-out process by providing guidance to help companies identify, phase-out, and limit future uses of PFAS in products, thus protecting Minnesota’s natural resources from ongoing PFAS pollution.

Activities and Milestones

Activity 1: Outreach, Dissemination, and Technical Assistance

Activity Budget: \$66,000

Activity Description:

Project partners will work to recruit companies who may be interested in this information, targeting complex, medium sized companies across sectors with high-risk for PFAS use and potential partnerships with professional organizations.

1. Recruit companies that have recently phased out PFAS or plan to in the future and segment into participation tiers.
 - a. Tier 1 = wants to participate in the study and collaborate on a case study related to their work in identification, phase-out, and/or limiting of future use
 - b. Tier 2 = wants to provide general feedback during the study, but not collaborate on a case study
 - c. Tier 3 = wants to be informed and trained as guidance becomes available
2. Work with 2-3 Tier 1 companies to develop case studies
3. Work with 3-5 Tier 2 companies to solicit feedback at key project milestones
4. Collaborate with 5-10 Tier 3 companies to share guidance and outcomes.

Activity 1 covers coordination with partners, but recruitment, feedback, training, and case studies will be joint with Activities 2 through 4. This activity will be led by Kelsey Klucas at MnTAP with support from Ali Ling, Kyle Goldschmidt, and Jason Pattit at the University of St. Thomas

Activity Milestones:

Description	Approximate Completion Date
Recruit and categorize partner companies	January 31, 2027
Complete case studies with Tier 1 companies	March 31, 2028
Develop guidance documents and solicit feedback	June 30, 2028
Training and workshops to disseminate guidance and tools	June 30, 2029

Activity 2: Guidance for Identifying PFAS in Products and Supply Chains

Activity Budget: \$85,000

Activity Description:

Identifying PFAS sources, especially those that are not intentionally added, can be challenging due to complex and expensive testing methods, lack of supply chain transparency, and lack of reporting requirements. To meet this challenge, we propose the following steps:

1. Summarize current regulations relevant to Minnesota companies on PFAS use and emissions, including the Minnesota PFAS in Products Law and Federal requirements for the Toxic Releases Inventory (TRI) and Toxic Substances Control Act (TSCA)
2. Evaluate most likely sources of PFAS for given market sectors and products, based on existing data
3. Develop guidance regarding existing and upcoming analytical testing methods that can be used to measure targeted or general PFAS levels in products, based on interviews with analytical labs and
4. Build on existing resources for supply chain evaluation, including draft text to request information, most likely products, and SDS screening resources
5. Assemble roadmap for PFAS identification processes and disseminate results via peer-reviewed publication, white paper, and targeted outreach to Minnesota companies

This activity will be led by Ali Ling at the University of St. Thomas, with support from Kelsey Klucas at MnTAP (supply chain and outreach) and Kyle Goldschmidt (operations and modeling).

Activity Milestones:

Description	Approximate Completion Date
Summarize current state and Federal regulations relating to PFAS in products	December 31, 2026
Develop database of likely sources and testing/supply chain guidance	June 30, 2027
Assemble PFAS identification roadmap, share in open source publication	March 31, 2028
Develop materials for outreach to Minnesota companies (joint with Activity 1)	June 30, 2028

Activity 3: Guidance and Best Practices for PFAS Phase-outs

Activity Budget: \$138,000

Activity Description:

The team will develop a Decision Support System (DSS) to help Minnesota businesses phase out PFAS while minimizing costs and ensuring regulatory compliance. The DSS will provide customized guidance, cost modeling, supplier engagement tools, and regulatory compliance tracking. We propose to integrate Life Cycle Analysis (LCA) to assess the economic impact of alternatives and identify how to minimize the total supply chain costs of PFAS phase out. To achieve this, we propose the following steps:

1. Build on likely PFAS sources from Task 2 and develop database of cost-effective, functionally equivalent, lower-hazard PFAS-free alternatives and impact of necessary changes to operational processes, modeling the cost and impact to business operations.
2. Model economic factors, using a cost-benefit tool to compare phase-out costs vs. penalties for non-compliance.
3. Engage and monitor suppliers, and identify best practices to assist businesses in managing supplier data for PFAS compliance.
4. Develop materials for industry training and dissemination, including workshops, produce research/white papers, and conferences presentations.

This activity will be led by Kyle Goldschmidt and Iva Rashkova at the University of St. Thomas, with support from Kelsey Klucas at MnTAP (outreach) with support from Ali Ling and Jason Pattit at the University of St. Thomas.

Activity Milestones:

Description	Approximate Completion Date
Alternative research and feasibility study	March 31, 2027
Economic modeling and decision framework	March 31, 2027
Supplier engagement and compliance tools	June 30, 2027
Develop PFAS phase-out framework for open source publication and training Minnesota companies (with Activity 1)	June 30, 2028

Activity 4: Guidance for limiting the use of PFAS in new products

Activity Budget: \$96,000

Activity Description:

Project partners will develop a decision framework to help product designers determine when there is an “Essential Use” versus a “Functional Substitute” for PFAS in new products through the following primary activities:

1. Review product development literature to uncover the best practices that have been developed to limit or

eliminate the use of other hazardous materials in new products.

2. Conduct site visits to local companies that have already limited/eliminated PFAS or are in the process of limiting/eliminating PFAS to learn about their processes.
3. Develop white paper and training materials that will be shared with Minnesota companies, disseminating outcomes to help them comply and plan.
4. Develop a peer-reviewed journal article that presents a decision framework integrating the best practices from the literature (activity 1) with the lessons learned from the company visits (activity 2). The framework and its implications for PFAS management in Minnesota will be presented at local and national conferences and the resulting paper can be referenced by others working in the field.

This activity will be led by Jason Pattit (University of St. Thomas).

Activity Milestones:

Description	Approximate Completion Date
Literature review to support decision framework	October 31, 2026
Site visits to learn from companies limiting/eliminating PFAS from new products	April 30, 2027
Develop limiting PFAS framework and share in open access publication	December 31, 2027
Develop limiting PFAS materials for outreach to Minnesota companies (joint with Activity 1)	January 31, 2028

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Kyle Goldschmidt	University of St. Thomas	Associate Professor - phasing PFAS out of current processes	Yes
Jason Pattit	University of St Thomas	Professor - limiting future PFAS use	Yes
Iva Rashkova	University of St. Thomas	Assistant Professor - process modeling	Yes

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?

Results from the three main project focus areas, identification, phase-out, and limiting future use, will be shared in a phased rollout to Minnesota companies interested in participating, including events outside the Twin Cities metro. Project partners will work to recruit companies who may be interested in this information and part of the project budget and the last year of the project is dedicated to working with companies to share this guidance and provide technical assistance to aid in compliance.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Breaking the PFAS Cycle with a Full-Scale Demonstration	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 04k	\$1,481,000

Project Manager and Organization Qualifications

Project Manager Name: Alison Ling

Job Title: Assistant Professor

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

Ali has ten years of consulting experience managing projects in environmental engineering, and is a leading expert on costs and considerations for managing environmental PFAS.

Organization: University of St. Thomas

Organization Description:

This project would be operated jointly out of the Civil Engineering and Supply Chain and Operations Departments at the University of St. Thomas. Civil Engineering includes environmental engineering as a discipline, and is closely related to the consequences of ongoing PFAS use as well as PFAS testing methods. Supply Chain and Operations faculty will lead parts of the project related to business operations and actions needed to phase out PFAS, based on understanding of business operations and supply chains.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Ali Ling, PI		Lead general aspects of the project, plus technical aspects related to PFAS testing (Activity 2)			16%	0.45		\$71,000
Kyle Goldschmidt, process and supply chain lead		Lead PFAS phase-out decision framework (Activity 3)			9%	0.27		\$63,000
Iva Rashkova, process modeling lead		Contribute to PFAS phase-out decision framework (Activity 3)			7%	0.24		\$53,000
Jason Pattit, future products lead		Lead product development decision framework (Activity 4)			26%	0.24		\$74,000
							Sub Total	\$261,000
Contracts and Services								
Minnesota Technical Assistance Program	Subaward	Lead Activity 1, including outreach, feedback, and workshops. Budget breakdown is \$64,000 for personnel (including 23% fringe benefits) and \$2,000 for in-state travel to support partner outreach and training workshops				0.6		\$66,000
							Sub Total	\$66,000
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Expenditures								
							Sub Total	-

Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	approximately 60 trips with 1-2 people each within Minnesota to coordinate and meet with partners for case studies and feedback. Assumes half of trips will require hotel stay, assuming average distance of 150 miles roundtrip at \$0.70/mile	Travel for case studies and feedback gathering for Activity 3 and 4					\$15,000
	Miles/ Meals/ Lodging	Assumed eight workshops, half in Twin Cities metro and half in greater Minnesota. Events outside Twin Cities includes hotel for each project staff plus mileage assumed at 150 miles x \$0.70/mile. Includes facility rental, assumed to be \$2000/event	Travel for training workshops and funds for facility rental and support					\$18,000
	Conference Registration Miles/ Meals/ Lodging	Two conferences in Minnesota, assuming \$500 registration fee each for one person each	Share outcomes and frameworks with broader academic and industrial community, including tools for application within Minnesota					\$1,000
	Miles/ Meals/ Lodging	Two conferences in Minnesota, assuming miles, housing, and meals for one person at \$500 per conference	Share outcomes and frameworks with broader academic and industrial community, including tools for application within Minnesota					\$1,000
							Sub Total	\$35,000
Travel Outside Minnesota								
	Conference Registration Miles/ Meals/ Lodging	Includes presentation at two conferences, assumed to cost \$3,000 in combined flights, housing, and meals each for one person each	Share outcomes and frameworks with broader academic and industrial community, including tools for wider dissemination outside Minnesota	X				\$6,000
	Conference Registration Miles/ Meals/ Lodging	Registration for two conferences to present results, assumed fee of \$1,000 per conference for one person each	Share outcomes and frameworks with broader academic and industrial community, including tools for wider dissemination outside Minnesota	X				\$2,000
							Sub Total	\$8,000
Printing and Publication								

	Publication	Open source fees for three open source publications (one each for Activity 2, 3, and 4), assumed to be \$5,000 each	To disseminate outcomes of this study more broadly and provide a written resource for companies					\$15,000
							Sub Total	\$15,000
Other Expenses								
							Sub Total	-
							Grand Total	\$385,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	Includes presentation at two conferences, assumed to cost \$3,000 in combined flights, housing, and meals each for one person each	Formal presentation of study results to industry and academic audience
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	Registration for two conferences to present results, assumed fee of \$1,000 per conference for one person each	To formally present study outcomes to industry and academics outside Minnesota

Non ENRTF Funds

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

Total Project Cost: \$385,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [6c6bf310-45f.pdf](#)

Alternate Text for Visual Component

Shows the route of PFAS entering environment, originating from manufacturers and sellers. Amara's Law addresses PFAS contamination at the source, but Minnesota companies need resources to identify, phase-out, and limit future PFAS in their products. This project aims to develop and disseminate those resources....

Financial Capacity

Title	File
Non-Profit Status Filing	ff320f32-356.pdf
2023 Financial Audit	fd78463e-374.pdf
2022 Form 990	b3144550-c24.pdf

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
UST authorization letter	115083c8-2e0.pdf
UST Business School support letter	cd8a3949-751.pdf
MPCA support letter	5d0d1d44-974.pdf
UMN support letter	0639463f-8a1.pdf
MnTAP support letter	970a34a7-3a7.pdf

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?

Yes, I understand the Commissioner's Plan applies.

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?

Yes

Does the organization have a fiscal agent for this project?

Yes, UST Sponsored Programs

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:

Ali Ling, Jason Pattit, Kyle Goldschmidt, Mike Warnock - University of St. Thomas; Kelsey Klucas,
MnTAP/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

N/A

