Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-248

Proposal Title: PFAS and Microplastics: Potential Impacts of Environmental Co-Occurrence

Project Manager Information

Name: David Duffey

Organization: Minnesota Pollution Control Agency

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Project Basic Information

Project Summary: Analyze water, sediment, and fish for PFAS and microplastics to determine whether co-occurrence has an impact on bioaccumulation.

ENRTF Funds Requested: $765,000

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.

Microplastics and per- and polyfluoroalkyl substances (PFAS) are both, individually, ubiquitous in the environment and known to disrupt human health. Better understanding their co-occurrence could lead to advancements to protect human health and the environment, but this has been scarcely-researched. This leaves a gap in the knowledge of potential impacts to the environment and human health. For example, if the presence of microplastics leads to increased accumulation of PFAS in fish tissue, people who eat fish collected in waters with high levels of microplastics could be exposed to even more PFAS compared to consuming fish from waters with less microplastic pollution. We seek to sample water, sediment, and fish for both of these contaminants to determine if fish in waters with roughly the same concentration of PFAS in surface water and sediment will have higher concentrations of PFAS in their tissues, because 1) some microplastics are PFAS (e.g. polyvinyl fluoride) and 2) microplastics are known to attract PFAS.

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.

Using existing data to assist with site selection, up to 200 samples (surface water, sediment, and fish, total) will be collected and analyzed for PFAS and microplastics to help us understand the impacts of microplastics on PFAS bioaccumulation, fate, and transport. By analyzing each contaminant from one sample (i.e. analyzing for both PFAS and microplastics from one fish, one sediment, or one water sample) we will be able to determine what impacts, if any, are present when they're found together. Understanding this relationship between microplastics and PFAS accumulation will help us target pollution prevention efforts. This study will build on our foundational PFAS and microplastics datasets as well as establish a new, connected baseline of knowledge for future research.

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 research will help us identify and address concerns related to human exposure to PFAS and microplastics so that we can reduce the cumulative impacts of direct human exposure to these priority pollutants. In addition, we'll evaluate potential sources of these contaminants and consider opportunities for source reduction as outlined in MPCA's PFAS Blueprint and Monitoring Plan.

Activities and Milestones

Activity 1: PFAS Analysis

Activity Budget: $350,000

Activity Description:
Analyze up to 200 samples of water, sediment, and fish tissue from target locations using established methods to determine PFAS concentrations in each.

Perform target analysis of the 40 PFAS analytes included in US EPA standard method 1633 for up to 200 water, sediment, and fish tissue samples. The number of fish tissue samples analyzed is not-to-exceed one third of the total number of targeted samples analyzed (i.e., up to 66 fish tissue samples for 200 total target samples analyzed).

Perform additional non-target (suspect screening) analyses for a subset of up to 50 extracts initially generated for target analysis (i.e., analyses will be performed on existing extracts, such that additional extractions will not be required). Suspected screening analyses will be performed to screen for up to 2000 known or suspected PFAS analytes using a Sciex X500R quadrupole time of flight mass spectrometer coupled to a liquid chromatography system.

Activity Milestones:

Description	Approximate Completion Date
Assist with collection of water and sediment samples as necessary	January 31, 2028
Analyze up to 200 samples for 40 PFAS	June 30, 2028
Analyze up to 50 samples for PFAS using non-targeted methods	June 30, 2028
Participate in data interpretation	January 31, 2029
Manuscript Submitted for Peer Review	June 30, 2029

Activity 2: Microplastics Analysis

Activity Budget: $200,000

Activity Description:
Process and analyze up to 200 water, sediment, and fish samples for microplastics greater than 100um in size using a Bruker Lumos II microFTIR. Surface water samples, collected via 100 um Manta net, will be processed via Fenton oxidation and density separation. Surface sediment samples collected by ponar grab and processed separately. Fish fillets and gut contents will be processed separately for each fish using enzymatic degradation with additional Fenton oxidation if necessary. Method blanks and positive control samples for each sampling and processing procedure will also be analyzed. The microplastics concentrations (count/L, count per fish, count/kg dry mass) will be compared by project partners with PFAS concentrations in samples collected at the same time and in the same location.

Activity Milestones:

Description	Approximate Completion Date
Analyze up to 200 samples for Microplastics	June 30, 2028
Participate in data interpretation	January 31, 2029
Manuscript Submitted for Peer Review	June 30, 2029

Activity 3: PFAS and Microplastics Sampling

Activity Budget: $204,000

Activity Description:
Collect samples of water, sediment, and fish for laboratory analysis of PFAS and microplastics.

Activity Milestones:

Description	Approximate Completion Date
Create RFP for Contractor Selection	August 31, 2026
Contractor Selected and Awarded	April 30, 2027
Sampling Complete. Contractor Deliverable Received.	January 31, 2028

Activity 4: In-state Travel

Activity Budget: $3,500

Activity Description:
In-state travel to conference(s) to present results

Activity Milestones:

Description	Approximate Completion Date
In-state conference attendance and presentation	June 30, 2029

Activity 5: Dissemination

Activity Budget: $7,500

Activity Description:
The complete results of the study including non-targeted analysis will be submitted for peer-reviewed publication to a journal such as Environmental Science and Technology. Results will be presented at relevant scientific conferences.

All presentations, publications, and communications (electronic or printed) will acknowledge ENTRF by using the logo or language provided in ENTRF acknowledgement guidance.

Activity Milestones:

Description	Approximate Completion Date
Publication in open-access journal	June 30, 2029

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Summer Streets	MPCA	Research Scientist supporting PFAS analysis	No
Dr. Bridget Ulrich	University of Minnesota - Duluth	Overseeing laboratory analysis and interpretation of environmental samples for PFAS	Yes
Dr. Liz Minor	University of Minnesota - Duluth	Overseeing laboratory analysis and interpretation of environmental samples for microplastics.	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 will support the MPCA strategic goals to:
- Reduce direct exposures to known pollutants, including their cumulative impacts.
- Identify and address impacts from pollutants that are creating human exposures from contaminated sites.
- Reduce levels of high priority pollutants.

Results will support goal three of Minnesota's PFAS Monitoring Plan which states: "Gather data that galvanizes support for PFAS source reduction and pollution prevention."

This is a one-time study. No ongoing efforts are expected at this time.

Project Manager and Organization Qualifications

Project Manager Name: David Duffey

Job Title: Hydrologist

Provide description of the project manager's qualifications to manage the proposed project.
Project manager of statewide survey of microplastics in Minnesota waters and 18-year incumbent hydrologist at the Minnesota Pollution Control Agency overseeing background groundwater monitoring statewide.

Organization: Minnesota Pollution Control Agency

Organization Description:
The Minnesota Pollution Control Agency's mission is to protect and improve the environment and enhance human health. The MPCA monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
							Sub Total	**-**
Contracts and Services								
University of Minnesota - Duluth	Subaward	Will perform requested analyses; assist with sample collection as necessary; participate as research & reporting collaborators; serve as co-authors and presenters of research an data findings.				7.32		$550,000
Contractor (TBD pending RFP)	Service Contract	Collection of samples for PFAS and microplastics analysis				-		$200,000
							Sub Total	**$750,000**
Equipment, Tools, and Supplies								
	Tools and Supplies	Field consumables (nitrile gloves, bottles, coolers, labels, etc...)	Equipment necessary for sample collection					$4,000
							Sub Total	**$4,000**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Conference Registration Miles/ Meals/ Lodging	Conference registration (in-person or virtual)	Presentation of results					$3,500

							Sub Total	**$3,500**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Publication	Publication in peer-reviewed journal(s)	Publication in an open-access journal to disseminate findings to wider scientific audience					$7,500
							Sub Total	**$7,500**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$765,000**

Classified Staff or Generally Ineligible Expenses

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

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	MPCA staff time equivalent to 0.55 FTE per study year	MPCA staff time	Secured	$222,750
			State Sub Total	**$222,750**
Non-State				
In-Kind	University of Minnesota - Duluth	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 54% modified total direct costs. Indirect costs are those costs incurred for common or joint objectives that cannot be readily identified with a specific sponsored program or institutional activity. Examples include utilities, building maintenance, clerical salaries, and general supplies. (https://research.umn.edu/units/oca/fa-costs/direct-indirect-costs)	Secured	$284,196
			Non State Sub Total	**$284,196**
			Funds Total	**$506,946**

Total Project Cost: $1,271,946

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: 243cce22-f2b.docx

Alternate Text for Visual Component

Word document containing a cartoon illustration of PFAS and microplastics in water, sediment, and fish....

Supplemental Attachments

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

Title	File
United States Geological Survey photo of Neuston net for microplastics sampling	210cb2fb-0af.jpe

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?

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:

Summer Streets - Minnesota Pollution Control Agency

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