

**Environment and Natural Resources Trust Fund  
2020 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 098-B**

Developing Strategies to Manage PFAS in Land-Applied Biosolids

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**Category:** B. Water Resources

**Sub-Category:**

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**Total Project Budget: \$** 1,403,556

**Proposed Project Time Period for the Funding Requested:** June 30, 2023 (3 yrs)

**Summary:**

This projects helps municipal wastewater plants, landfills, and compost facilities protect human health and the environment by developing strategies to manage per- and polyfluoroalkyl substances (PFAS) in land-applied biosolids.

**Name:** Summer Streets

**Sponsoring Organization:** Minnesota Pollution Control Agency

**Job Title:** \_\_\_\_\_

**Department:** \_\_\_\_\_

**Address:** 520 Lafayette Road North

St. Paul MN 55155

**Telephone Number:** (651) 757-2761

**Email** summer.streets@state.mn.us

**Web Address:** \_\_\_\_\_

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**Location:**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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**Alternate Text for Visual:**

High-level outline of all project activities over the course of the study.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



**PROJECT TITLE: Developing strategies to manage PFAS in land-applied biosolids**

**I. PROJECT STATEMENT**

**This project helps municipal wastewater plants, landfills, and compost facilities protect human health and the environment by developing strategies to manage per- and polyfluoroalkyl substances (PFAS) in land-applied biosolids.**

Environmental contamination of PFAS is a widespread issue of global concern, and concentrations commonly found throughout Minnesota pose known risks to human and ecological health. Elevated levels of PFAS have been measured in Minnesota municipal biosolids, landfill leachate, and compost contact water. While land application of these biosolids has benefits for farming, land application is a known source of PFAS to groundwater, soil, surface water, and crops. Human health can be impacted when PFAS-contaminated water and food is consumed by people. There is still a lot we don't know about how PFAS moves out of biosolids and into the environment and food supplies. This study will allow us to proactively manage biosolids in a way that prevents environmental contamination by PFAS.

Waste managers in Minnesota are already facing urgent concerns related to disposal of PFAS-contaminated wastes. They need tools to evaluate and manage PFAS in their land-applied waste streams. This project will focus on developing cost-effective, real world approaches for prevention, treatment, and disposal of PFAS-contaminated land-applied wastes.

The goals of this study are to:

- 1) Analyze alternative disposal and treatment options and develop tools for managing PFAS-contaminated waste streams.
- 2) Evaluate and characterize PFAS concentrations in land-applied biosolids; leaching from those wastes; and subsequent movement of PFAS into water and food.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1 Title: Developing PFAS management solutions for biosolids, landfills and compost**

**Description:** We will identify real world, practical PFAS management solutions including pollution prevention, treatment, and disposal options that can be applied statewide. Engineering consultants with real world design experience will perform this work and will be selected through a competitive request for proposals (RFP).

**ENRTF BUDGET: \$300,000**

Outcome	Completion Date
1. MPCA completes administration of competitive RFP to identify project consultant	March 2021
2. Deliverable of best management practices report to MPCA	June 30, 2023

**Activity 2 Title: Quantitative analysis of PFAS in land-applied wastes and relevant media**

**Description:** Analysis of 32 PFAS compounds and their breakdown products in biosolids, ash, landfill leachate, compost, soil, water, and crops, to understand occurrence of PFAS in these wastes so that risk associated with land application can be characterized. Total oxidizable precursor (TOP) analysis will be performed to determine whether longer chain PFAS compounds that are present in these wastes can break down to PFOS and PFOA, two known PFAS compounds of concern.

**ENRTF BUDGET: \$346,805**



**Environment and Natural Resources Trust Fund (ENRTF)  
2020 Main Proposal Template**

<b>Outcome</b>	<b>Completion Date</b>
1. Collect and analyze samples of land-applied biosolids for PFAS	June 30, 2023
2. Collect and analyze environmental samples	June 30, 2023
3. Perform total oxidizable PFAS precursor analysis in soil	June 30, 2023

**Activity 3 Title: Laboratory investigation of PFAS fate and transport, and identification of 325 novel PFAS compounds in relevant media**

**Description:** Laboratory investigation of PFAS fate and transport mechanisms to evaluate leaching of PFAS from land-applied biosolids and other wastes into the environment. A standardized soil leaching method will be established for comparison of PFAS leaching between sites and waste types. Non-targeted analytical techniques will be used to identify 325 novel PFAS compounds.

**ENRTF BUDGET: \$341,751**

<b>Outcome</b>	<b>Completion Date</b>
1. Laboratory leaching study	Dec. 31, 2021
2. Novel PFAS analysis	June 30, 2023

**Activity 4 Title: Controlled plot study to evaluate leaching of PFAS**

**Description:** A two-year controlled field plot study to evaluate leaching of PFAS from land-applied biosolids in typical Minnesota field conditions. In both years, multiple soil, groundwater, and vegetation samples will be analyzed for PFAS and soil and crop health.

**ENRTF BUDGET: \$350,000**

<b>Outcome</b>	<b>Completion Date</b>
1. Develop plan for controlled plot study prior to first summer growing season	March 2021
2. Two years of controlled plot studies	June 30, 2023

**III. PROJECT PARTNERS AND COLLABORATORS:**

**A. Partners receiving ENRTF funding**

**Activity 1:** Minnesota-based consulting firm selected by competitive RFP.

**Activity 2:** SGS Axys Analytical Services is currently under state contract. This lab has been used by the state for over a decade and delivers high quality, dependable results.

**Activity 3:** Dr. Jennifer Guelfo at Texas Tech University is the leading expert in PFAS leaching from soils. She has PFAS measurement capabilities that are not possible in Minnesota without \$1 million in new instrumentation.

**Activity 4:** Dr. Carl Rosen at the University of Minnesota has extensive experience in conducting controlled plot studies to evaluate crop agronomics.

**B. Partners NOT receiving ENRTF funding**

<b>Name</b>	<b>Role</b>
Municipalities, County Governments and EPA	Project partners

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

This project will develop pollution prevention, treatment, and disposal options that can be applied statewide. Long-term implementation of these strategies will safeguard drinking water and food supplies for current and future needs. This is a one-time funding request and no additional future support is envisioned.

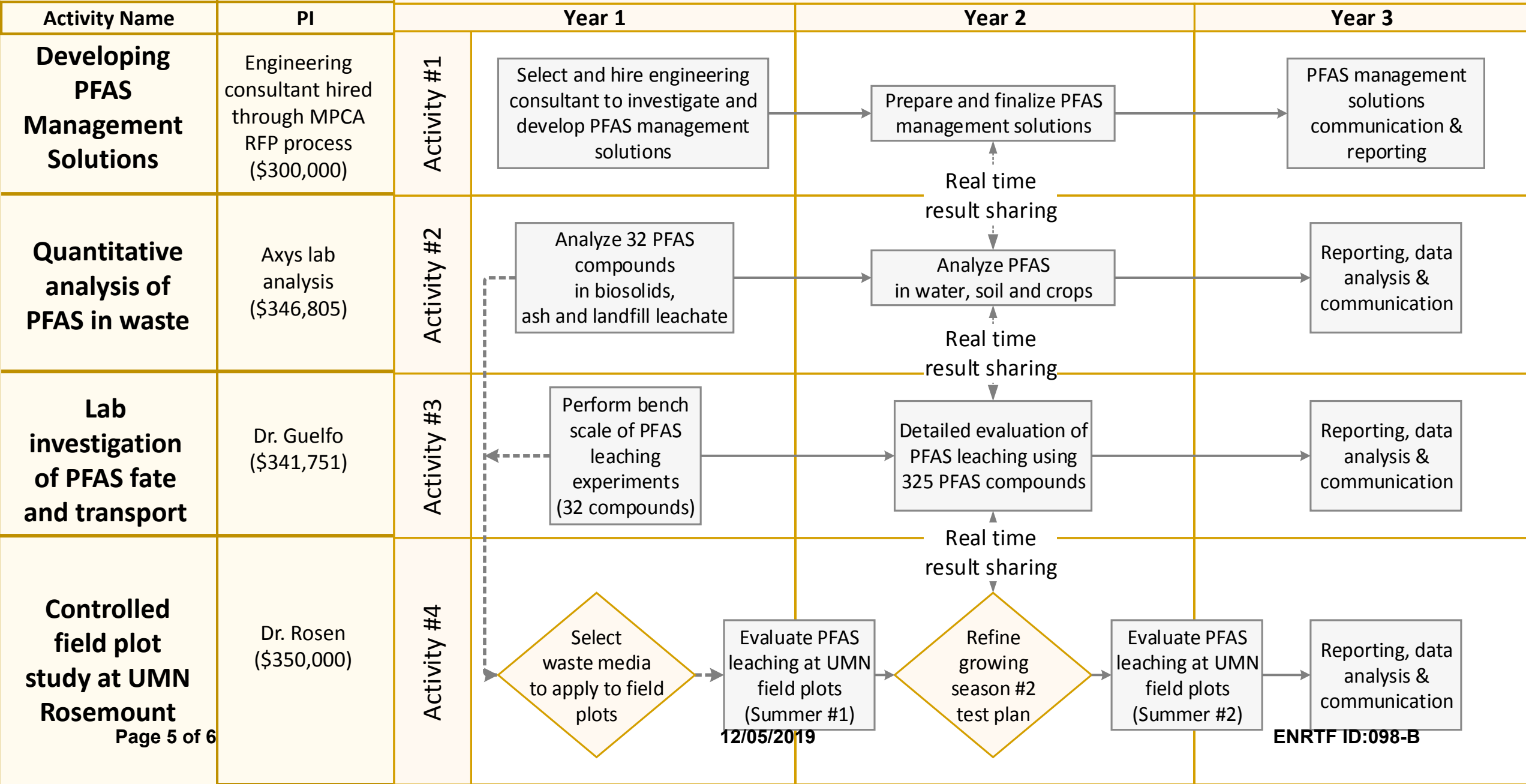
Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet



Legal Citation:  
 Project Manager: Summer Streets  
 Project Title: Developing strategies to manage PFAS in land-applied biosolids  
 Organization: Minnesota Pollution Control Agency  
 Project Budget: \$1,403,556  
 Project Length and Completion Date: 3 years; 2023  
 Today's Date: 4/15/2019

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
<b>BUDGET ITEM</b>				
<b>Personnel (Wages and Benefits)</b>		\$ -	\$ -	\$ -
<b>Professional/Technical/Service Contracts</b>				
Activity 1: Contract to develop PFAS best management practice. Contractor to be selected through competitive bid process.		\$ 300,000	\$ -	\$ 300,000
Activity 2: SGS Axys Analytical Services, Ltd. PFAS analysis under current state contract. Unique analysis not available in MN. Single source.		\$ 346,805		\$ 346,805
Activity 3: Dr. Jennifer Guelfo, Texas Tech University. Laboratory research on PFAS fate, transport, and novel compound analysis. Single source.		\$ 341,751		\$ 341,751
Activity 4: Dr. Carl Rosen, University of Minnesota. Controlled field plot study. Single source.		\$ 350,000		\$ 350,000
<b>Equipment/Tools/Supplies</b>				
General sampling equipment and disposables including sample bottles, gloves, solvents, tubing, and other small sampling equipment as needed.		\$ 10,000	\$ -	\$ 10,000
<b>Capital Expenditures Over \$5,000</b>				
		\$ -	\$ -	\$ -
<b>Fee Title Acquisition</b>				
		\$ -	\$ -	\$ -
<b>Easement Acquisition</b>				
		\$ -	\$ -	\$ -
<b>Professional Services for Acquisition</b>				
Well installation by state approved contractor.		\$ 50,000	\$ -	\$ 50,000
<b>Printing</b>				
		\$ -	\$ -	\$ -
<b>Travel expenses in Minnesota</b>				
12 trips to field sites by car, all expenses per Commissioner's plan		\$ 2,000	\$ -	\$ 2,000
2 MPCA staff presenting at 2 in-state conferences. All expenses per Commissioner's plan.		\$ 3,000		\$ 3,000
<b>Other</b>				
		\$ -	\$ -	\$ -
<b>COLUMN TOTAL</b>		\$ 1,403,556	\$ -	\$ 1,403,556
<b>SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT</b>				
	<b>Status (secured or pending)</b>	<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
<b>Non-State:</b>		\$ -	\$ -	\$ -
<b>State:</b>		\$ -	\$ -	\$ -
In kind: MPCA staff time equivalent to one FTE per study year		\$ 360,000	\$ -	\$ 360,000
University of Minnesota overhead		\$ 182,000	\$ -	\$ 182,000
<b>Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS</b>				
	<b>Amount legally obligated but not yet spent</b>	<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
		\$ -	\$ -	\$ -

# Developing strategies to manage PFAS in land-applied biosolids





**Environment and Natural Resources Trust Fund (ENRTF)**

**2020 Main Proposal**

**Project Title: Developing strategies to manage PFAS in land-applied bio-wastes**

**Project Manager Qualifications/Organization:** Minnesota Pollution Control Agency

**Project Manager**

Summer Streets is a research scientist in the Environmental Analysis and Outcomes Division of the Minnesota Pollution Control Agency. She will be lead technical administrator for the project with responsibility for MPCA’s portion of the study and overseeing management, project reporting, and contracting. Since 2008, Summer has successfully developed and conducted several complex studies on environmental contamination of PFAS in Minnesota. Staff in the Environmental Analysis and Outcomes Division have extensive experience studying environmental contamination, and managing large project budgets, including LCCMR-funded projects.

**Qualifications**

Education:

- M.S. 2012 University of Minnesota (Water Resources Science)
- B.S. 2005 University of Wisconsin-River Falls (Environmental Science and Biology)

Work Experience:

- 2007-Present Research Scientist 3, Minnesota Pollution Control Agency
- 2016 – Present Adjunct Faculty, University of St. Thomas, Department of Biology

**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.