Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-413

Proposal Title: Accelerated Low-Dimensional Simulations of Fire Pools and Engine Ignition

Project Manager Information

Name: Hessam Mirgolbabaei

Organization: U of MN - Duluth

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Project Basic Information

Project Summary: This project develops a fast, low-dimensional combustion simulation framework integrating artificial intelligence to improve biofuel fire pool modeling, reducing computational costs while enhancing predictive accuracy for cleaner, safer energy applications.

ENRTF Funds Requested: $552,000

Proposed Project Completion: June 30, 2029

LCCMR Funding Category: Energy (E)

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.

Biodiesel, a renewable energy source that can be used in existing diesel engines without significant modifications, is a mixture of many oxygenated components with varying chain lengths. The detailed chemical kinetic mechanisms of biodiesel are highly complex. For example, the detailed mechanism for methyl decanoate (MD) comprises more than 3000 species and 8000 reactions, and that for the mixture of MD, methyl-9-decenoate, and n-heptane has 3299 species and 10806 reactions [1-7], making the mechanisms for biodiesel are among the largest for practical fuels.
Accurate kinetic modeling of surrogate fuels enhances understanding of reaction-flow interactions, aiding in pollutant control, including soot formation [8-9]. Additionally, biofuel fire pools present significant safety and environmental hazards, requiring robust predictive tools to mitigate risks and enhance industrial safety [10-11]. Environmental factors, such as wind and flame buoyancy, affect the fire's dynamics, altering combustion processes. Researchers have conducted many experimental studies, developing models describing important pool fire characteristics [12-14]. However, these models rely on assumptions that may overlook critical phenomena. Simulating a biofuel fire pool with detailed mechanisms requires millions of CPU hours, making large-scale modeling impractical. Improving these models could aid in fire consequences quickly and reliably without costly experiments.

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.

A more robust mathematical models must be developed and implemented to improve predictability and enhance extrapolation capability to predict industrial plant accidents reasonably, ignition delay within compression ignition engines, flame propagation speed (in fire pools accidents and compression ignition engines), and distillation curve of biodiesel, thereby better describing biodiesel combustion. This project addresses these challenges by developing a fast, low-dimensional combustion simulation framework using artificial neural networks (ANNs) and Large Eddy Simulations (LES) which is a widely popular scheme in turbulent combustion modeling. The proposed approach drastically reduces computational costs while maintaining high predictive accuracy, potentially leading to significant cost savings. This proposal uniquely targets real-scale and real-conditions reactive flows. The proposed approach is intended to save significant computational time, resulting in the ability to model more frequently at various conditions without sacrificing accuracy. A successful attempt to systematically reduce the dimensionality of the composition space of the combustion flame has been proposed and fully developed by the PI, Mirgolbabaei [15] [16], in a simplified flame simulation model. Our comprehensive study showed that incorporating our proposed algorithm into computational fluid dynamic (CFD) can replicate a large set of thermo-chemical scalars [17-20]. Implementing the proposed approach within the existing LES codes.

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?

The outcomes will support the wider adoption of biofuels through improved combustion efficiency and contribute to environmental protection and fire safety by enabling more reliable simulations for risk assessment and mitigation. This aligns with LCCMR's goals of sustainability, resource conservation, and public safety. This project advances biofuel combustion modeling, supporting cleaner energy adoption by improving efficiency and reducing emissions. By accelerating fire pool simulations, it enhances safety measures for biofuel storage and transport, mitigating environmental hazards. The predictive framework aids in minimizing air pollution and greenhouse gas emissions, aligning with Minnesota's sustainability goals. Additionally, improved fire modeling protects natural ecosystems.

Activities and Milestones

Activity 1: High-fidelity Flame Simulations Efficient Mapping of Thermochemical Scalars θ Into Principal Components (PCs)

Activity Budget: $147,049

Activity Description:
The simulations of the desired flame, using detailed and skeletal mechanisms, are implemented to collect the initial data. While principal component analysis (PCA) is a straightforward process, efficient PCA that covers a wide range of time scales from nanoseconds to seconds, called stiffness, is crucial. This objective focuses only on those original thermochemical scalars that effectively measure mixing and reaction processes and are expected to provide the most critical insights into the flame's behavior. The remaining scalars can eventually correlate with the chosen variables. We will explore various methodologies to achieve this goal, as previous studies suggested [21]. Following the subset selection, the next step involves pre-processing and normalizing this resultant set. This is a crucial phase as it prepares the data for constructing PCs. Constructing PCs is integral to our approach as it reduces the dimensionality while retaining the most significant information. Upon maintaining the most dominant PCs, they are used as predictors to retrieve the original thermochemical scalars. Such tabulation is conducted through ANN training with PCs as inputs and Thermochemical scalars as outputs. The training data is from high-fidelity simulations of the flames. The skeletal mechanism with 118 species will be the starting point [22].

Activity Milestones:

Description	Approximate Completion Date
Traditional Simulation of Flames and Population Data Collection	August 31, 2026
Subsection of Thermochemical Scalars & Principal Component Analysis	November 30, 2026
PCA on Subset of the Original Scalars	December 31, 2026
Artificial Neural Network (ANN) Training and Thermochemical Scalars' Tabulation	April 30, 2027

Activity 2: Construction of the Principal Components' transport terms

Activity Budget: $133,448

Activity Description:
A pivotal step in our approach involves redefining the governing equations of thermochemical scalars for the PCs. This crucial transformation will be the foundation for implementing our approach within a CFD code. It is important to carefully formulate these governing equations for the PCs in a way that mirrors the characteristics of thermo-chemical scalars. The PI developed a detailed description of such transformation [17]. Then, the evaluation of the transport, diffusion, and chemical source terms is provided. Instead of constructing a diffusion flux term for the PCs transport equation, a new concept of the “diffusive coefficient” of the PCs is introduced as a property of the PCs. This formulation eliminates the role of spatial gradients for both the PCs and thermochemical scalars. One challenge in this phase is that while the thermochemical scalars' diffusion coefficients are presented as a diagonal and symmetric matrix, we expect that of the PCs to be a full matrix. There is no guarantee that the PCs coefficients are all positive. We aim to eliminate or minimize the off-diagonal entries of the diffusion coefficient matrix relative to the diagonal terms. We achieve this by implementing the eigen-decomposition, resulting in a rotation of the PCs.

Activity Milestones:

Description	Approximate Completion Date
Principal Components Source Terms	June 30, 2027

Construct Principal Components' Diffusion Coefficients	October 31, 2027
Principal Components' Rotation Analysys towards Positive Diffusion Coefficient	February 28, 2028

Activity 3: Transport of PCs instead of "θ" within the Computational Fluid Dynamics (CFD) code

Activity Budget: $136,954

Activity Description:
The Posteriori phase of the project aims to transport the PCs within CFD code. This will be achieved by solving the PCs' governing equations derived in the previous step, rather than the thermochemical scalars' equations. By doing so, we expect to capture the dynamics of the original thermochemical scalars through the solutions derived from these PCs. Chemkin-based evaluations of thermochemical scalars' reaction terms and transport properties are replaced by the tabulation of the density, the viscosity, PCs' source terms, and the PCs' diffusion coefficients. Every time an output for thermo-chemical scalar profiles is needed, a conversion from PCs to thermo-chemical scalars is implemented using an ANN tabulation.

We hypothesize that this approach can potentially enhance computational efficiency in simulating complex flames. An essential aspect of this validation will be comparing the profiles of major thermochemical scalars recovered from the PCs' solutions with those obtained from transporting the thermochemical scalars directly in the traditional LES code. The outcome of this comparison will provide valuable insights into the feasibility and efficiency of our approach for large pool fires or any general flames of biodiesel, ultimately contributing to the advancement of computational techniques in fluid dynamics and fire safety engineering.

Activity Milestones:

Description	Approximate Completion Date
Domain Initialization	March 31, 2028
Thermophysical Properties Integrations	May 31, 2028
Source Terms' Integration	June 30, 2028
Diffusion Coefficients' Integration	August 31, 2028
PCs' Transport	December 31, 2028

Activity 4: Multi-Component Biofuels Low-Dimensional Manifold Simulations (generalization of the entire proposed novel approach)

Activity Budget: $134,549

Activity Description:
Biodiesel is a complex mixture of oxygenated components with diverse chain lengths, making it impractical to model the combustion process of every fuel component. The typical models for compression ignition engines using biodiesel employs surrogate fuels like methyl butanoate (MD), which contains ester groups but has a carbon chain length that is smaller than that of authentic biodiesel. To enhance the model, mixtures of methyl decanoate (MD), methyl-9-decanoate (MD9D), and n-heptane can be tailored to improve key parameters such as ignition delay, flame propagation speed, and distillation curve, thus better representing biodiesel combustion. In this phase, detailed and skeletal mechanisms of various component combinations will be implemented using a novel low-dimensional simulation approach. This will further our understanding of different biodiesel types and will continue to be explored through additional external grants following the completion of the current LCCMR grant. All steps from prior phases—including the initial mechanisms of biodiesel flames, PCA, transport term construction, and transport of selected PCs—will be executed, with results being analyzed and discussed against experimental measurements.

Activity Milestones:

Description	Approximate Completion Date
Original Scalars' Subset Selection and PCA	March 31, 2029
PCs' Selection & Thermochemical Scalars' ANN Tabulation	April 30, 2029
Construction of PCs' Transport Terms; Diffusion Coefficients & Source Terms	May 31, 2029
Integration of Scalars', PCs' Transport Terms, and Thermophysical Properties Tabulation	June 30, 2029
Initialization of the Domain and Transporting PCs withing CFD Code	June 30, 2029

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 findings from this project will be implemented through open-source computational tools that enhance fire pool and biofuel combustion modeling. Results will be shared with researchers, industry partners, and policymakers to support clean energy adoption and fire safety planning. Ongoing work will be pursued through external funding from DOE, NSF, and industry collaborations, leveraging this project's results as a foundation for larger grants. Additionally, publications and conference presentations will disseminate key insights, ensuring continued impact in combustion science and environmental protection. Future developments will focus on expanding simulations to more complex real-world applications.

Project Manager and Organization Qualifications

Project Manager Name: Hessam Mirgolbabaei

Job Title: Assistant Professor

Provide description of the project manager's qualifications to manage the proposed project.
The project manager possesses a robust foundation of qualifications essential for overseeing the proposed research project. With a strong background evidenced by a series of peer-reviewed publications, the manager has demonstrated expertise in both linear and nonlinear low-dimensional manifold and Artificial Neural Network (ANN)-based forecasting and simulation of turbulent reactive flows. Their successful track record indicates not only a depth of knowledge but also a commitment to advancing the field.

Notably, the manager has led original research encompassing both the "a priori" and "a posteriori" stages, specifically focusing on laboratory-scale flame studies and simplified one-dimensional algorithms. This pioneering work has established crucial benchmarks and methodologies that numerous other researchers have built upon, especially in combustion and non-reactive flow studies.

Their collaborative work with PI Mirgolbabaei highlights a successful application of the principal component analysis-ANN approach in a one-dimensional turbulence model of combustion flames. This project showcased their ability to integrate complex models effectively and affirmed the potential for applying reduced-order models to more intricate, three-dimensional flame dynamics, which aligns with the objectives of the present proposal.

In addition to technical acumen, the project manager's experience in leading multidisciplinary teams and navigating the dynamics of collaborative research positions them uniquely to ensure successful project execution. Their blend of theoretical knowledge and practical application, alongside a demonstrated history of impactful research, underscores their qualifications and confidence in managing the proposed project, ensuring it meets its objectives efficiently and effectively.

Organization: U of MN - Duluth

Organization Description:
The University of Minnesota System is driven by a singular vision of excellence. We are proud of our land-grant mission of world-class education, groundbreaking research, and community-engaged outreach, and we are unified in our drive to serve Minnesota.

The Swenson College of Science & Engineering FOCUS Strategic Plan priorities, initiatives, and goals will guide the

College for the next five years. From enhancing research opportunities and nurturing a culture of discovery to fostering diversity, equity, and inclusion, this plan is a testament to our dedication to student success, community wellbeing, innovative research and teaching, and strong partnerships.

Our college mission is to inspire the next generation of STEM professionals to solve complex problems.
Our vision is to lead in building interdisciplinary, inclusive communities to create a sustainable future.
We value Student-Centered, Growth, Inclusion, Community, Creativity, Stewardship.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Hessam Mirgolbabaei		PI, two weeks summer salary Y1, one month Y2-3, one course buyout each year. Dr. Mirgolbabaei will take charge of all project tasks and is seeking a summer salary annually. His responsibilities encompass comprehensive oversight of the project's scope as outlined in the proposal. This includes the initiation and planning stages, as well as the technical, administrative, and fiscal aspects of the project. He will actively participate in research team meetings, oversee project communications, engage in data analysis, and contribute to the preparation and dissemination of manuscripts. Dr. Mirgolbabaei's aptitude for leading this research is evidenced by his extensive track record of peer-reviewed publications in both linear and nonlinear low-dimensional manifold-based forecasting and simulation of turbulent reactive flows. His more than a decade of experience in areas such as numerical simulation, machine learning, and predictive modeling makes him exceptionally well-suited to direct this project.			27%	0.54		$93,741
Postdoc		In our project centered on low-dimensional manifold simulations of turbulent reacting flows, the Postdoctoral Researcher will play a critical role in advancing our understanding and modeling capabilities. Their work will commence with data generation, utilizing the traditional CFD Large Eddy Simulation (LES) Code, C3D, to simulate the complex dynamics of turbulent reacting flows. This step involves meticulously configuring the simulations to ensure accurate data capture. Following this, the Post-Doc will delve into detailed data analysis, extracting meaningful insights from the simulation results, and understanding the intricate interactions within the turbulent flows. A key part of their responsibility will be data reduction, where they will skillfully distill the extensive simulation data into			21%	3		$237,408

		more simplified and interpretable forms, crucial for effective analysis and subsequent modeling. The final, and perhaps most innovative aspect of their role involves applying artificial intelligence techniques. Here, the Post-Doc will train AI models using the processed data, aiming to develop advanced predictive models or algorithms that can revolutionize the approach to simulating and understanding turbulent reacting flows. This process, from data production to AI training, is essential for achieving breakthroughs in the field of turbulent flow simulation.						
GRA		50% appt all three years, 25% summer appt Y1, 50% summer appt Y2-3. The first GRA will be supported for the initial two years, after which the role will transition to a second GRA for the final academic year. This phased approach ensures continuity and sustained progress throughout the project. The GRAs will engage in a multifaceted role encompassing data generation, analysis, and AI application. Their work will begin with producing data through the traditional CFD Large Eddy Simulation (LES) code, C3D, meticulously setting up and running simulations to capture detailed combustion dynamics. This phase will be followed by intensive data analysis and reduction, where GRAs will interpret complex simulation patterns and condense vast datasets into manageable formats. The crucial second and third stages involve training artificial intelligence models with these refined datasets. GRAs will identify appropriate AI methodologies, fine-tune model parameters, and validate their models to enhance predictive capabilities and deepen the understanding of combustion flame behavior. This comprehensive involvement, spanning data generation to AI integration, will ensure consistent progress and contribute significantly to advancing the understanding and simulation of combustion flames. The phased transition between GRAs will also provide opportunities for mentorship and knowledge transfer, further strengthening the research team's capacity and continuity.			46%	1.44		$163,388

Undergrad research assistant		480 hours each summer. Hiring undergraduate researchers for the summer period over three years is essential to supporting the project's objectives. Their involvement will provide critical assistance in data processing, simulation setup, and preliminary analysis, allowing graduate researchers and postdoctoral associates to focus on more complex research tasks. The justification for hiring undergraduate researchers is outlined as follows: 1) Support in Large-Scale Data Processing and Pre-Processing: The project involves computationally expensive simulations that generate vast amounts of data requiring sorting, formatting, and validation. Undergraduate researchers will assist in the pre-processing of simulation results, ensuring data integrity and preparing structured datasets for AI training. This is a fundamental step in the project's workflow, as efficient data handling will directly impact the success of subsequent AI-based modeling efforts. 2) Assisting in Artificial Neural Network (ANN) Training and Tabulation: One of the project’s key components is the application of ANN for reduced manifold-based combustion simulations. Training these models requires repeated testing and fine-tuning of parameters. Undergraduate researchers will assist in running parameter sweeps, logging results, and refining input datasets for optimal ANN performance. Their contribution will significantly speed up iterative development cycles, enabling faster validation of AI models. 3) CFD Code Setup and Routine Simulations: The project utilizes high-fidelity Computational Fluid Dynamics (CFD) simulations (e.g., C3D, OpenFOAM) to generate data on turbulent reacting flows. Undergraduate researchers will be tasked with setting up basic simulation parameters, running smaller-scale test cases, and managing simulation scripts under the supervision of GRAs and postdoctoral associates. This work ensures that the team can maintain a steady stream of computational results without bottlenecks. 4) Software Development and Automation Tasks: A portion of the project requires scripting and automating workflows			0%	0.69		$22,625

		for data collection, visualization, and reporting. Undergraduate students with programming experience (e.g., Python, MATLAB) will help streamline repetitive tasks, such as automating the extraction of thermochemical scalars from CFD output files or setting up batch processing scripts for AI training. 5) General Research Assistance and Knowledge Transfer: Undergraduate students will be mentored by graduate students and the postdoctoral researcher, contributing to a robust knowledge transfer system within the team. By involving them in key research activities, the project ensures that incoming students are familiarized with advanced combustion simulations and AI-driven methodologies, which strengthens the research group's long-term capacity. 6) Diversity and STEM Engagement: As a project led by a principal investigator from the LGBTQIA+ community with a strong commitment to diversity and inclusion in STEM, hiring undergraduate researchers provides a unique opportunity for students from underrepresented backgrounds to gain research experience in high-performance computing, machine learning, and combustion science. This aligns with broader workforce development goals, particularly in preparing the next generation of researchers in sustainable energy and fire safety engineering.						
							Sub Total	**$517,162**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
	Tools and Supplies	Wide screen monitors	The project involves analyzing large-scale combustion datasets and running computationally intensive simulations, requiring multiple simultaneous visualizations. Wide-screen monitors are critical for monitoring real-time					$500

			simulations, processing high-dimensional data, and managing AI-driven model training, significantly improving research productivity and workflow efficiency.					
							Sub Total	**$500**
Capital Expenditures								
		High-performance tower workstation.	High-Fidelity Data Collection from Computational Fluid Dynamics (CFD)	X				$12,000
							Sub Total	**$12,000**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
							Sub Total	**-**
Travel Outside Minnesota								
	Conference Registration Miles/ Meals/ Lodging	Travel for PI and student or postdoc to one conference each year, flight, lodging, per diem and conference registration	Year 1: 11th International Symposium on Energy from Biomass and Waste, Nov 2026, Venice, Italy. Year 2: American Flame Research Committee's 2026 Industrial Combustion Symposium, Location TBD, September 15–17 , 2027. Year 3: The 42st International Symposium on Combustion, 23-28 July 2028, Rio de Janeiro, Brazil. Year 4: 2029 International Symposium on Fire Safety Science, Location and Date TBD.	X				$17,529
							Sub Total	**$17,529**
Printing and Publication								

	Publication	Publication costs in Y2 and Y3	Publishing research findings in high-impact, peer-reviewed journals is essential for disseminating project results, ensuring scientific rigor, and maximizing the impact of this work on the combustion and fire safety communities. The requested $4,809 will cover the publication fees for two journal articles in the second and third years of the project. Given the project's focus on accelerating combustion simulations using AI-driven low-dimensional manifolds, the findings will be relevant to leading combustion, energy, and computational fluid dynamics journals. Open-access publishing will ensure broad accessibility to industry professionals, academic researchers, and policymakers, thereby enhancing the project's visibility and facilitating future collaborations and funding opportunities					$4,809
							Sub Total	**$4,809**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$552,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Capital Expenditures		High-performance tower workstation.	The project involves computationally intensive, high-fidelity combustion simulations, which are fundamental to the development and validation of AI-driven predictive models. Given that an initial skeletal mechanism simulation for a single-component biofuel surrogate required 24 hours on a high-end Dell Precision 7780 for less than 48 seconds of flame progression, a dedicated high-performance tower workstation is essential to efficiently handle larger, more complex simulations and reduce turnaround time. Without this computational capability, the project cannot generate the required high-fidelity data, undermining the feasibility of AI integration and combustion modeling. As such, this expense is not a general office equipment cost but a critical research tool, warranting an exception for funding approval. **Additional Explanation :** The high-performance computer (HPC) workstation will remain dedicated to the proposed research program throughout its useful life, as it is essential for generating high-fidelity combustion simulation data, which forms the foundation of the project. Given the computational demands—where even a skeletal mechanism simulation for a single-component biofuel surrogate required 24 hours on a high-end laptop for less than 48 seconds of flame progression—this workstation will be used for large-scale, AI-integrated combustion modeling throughout the project duration and beyond. After project completion, it will continue supporting biofuel combustion research, AI-driven modeling, and future extensions of this work, ensuring long-term contributions to renewable energy and fire safety studies.
Travel Outside Minnesota	Conference Registration Miles/Meals/Lodging	Travel for PI and student or postdoc to one conference each year, flight, lodging, per diem and conference registration	These international conferences are uniquely critical to the success of the project as they bring together leading experts, policymakers, and industry professionals in combustion science, sustainable energy, and fire safety, providing unparalleled opportunities for knowledge exchange, feedback, and collaboration on the latest advancements in biofuel combustion, AI-driven modeling, and fire hazard mitigation.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 54% modified total direct costs	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	$262,437
			Non State Sub Total	**$262,437**
			Funds Total	**$262,437**

Total Project Cost: $814,437

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: b9b705cf-a05.pdf

Alternate Text for Visual Component

Project workflow through two phases: a priori (Activities 1 & 2) and a posteriori (Activity 3)....

Supplemental Attachments

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

Title	File
UMN Authorization Letter	0d86e621-43e.pdf
References	a55df580-c1b.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 UMN Policy on travel applies.

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

Yes

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

Yes

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

No

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:

Hessam Mirgolbabaei

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