Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-082

Proposal Title: Study: Addressing HAB's in Pokegama Lake Using Nanobubbles Technology

Project Manager Information

Name: Kathy Nielsen

Organization: Pokegama Lake Association

Office Telephone: (952) 261-3097

Email: knielsentoo@gmail.com

Project Basic Information

Project Summary: This project will Study the use of innovation nanobubbles technology to increase dissolved oxygen in Pokegama Lake, reducing release of soluble reactive phosphorous and the resultant harmful algae blooms (HABs)

ENRTF Funds Requested: $3,802,000

Proposed Project Completion: December 31, 2030

LCCMR Funding Category: Water (B)

Project Location

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

Region(s): NE

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

Region(s): NE

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.

External and legacy nutrient loading in Pokegama lake has resulted in the persistent presence of harmful algal blooms (HABs). HABs are rapid, excessive growths of algae or cyanobacteria that form a thick green or blue-green scum in the water and produce toxins, deplete oxygen, and damage the broader ecosystem. Seasonal hypolimnetic oxygen depletion in Pokegama Lake creates conditions at the sediment–water interface that accelerate internal nutrient loading, particularly the release of soluble reactive phosphorus (SRP) and ammonia from bottom sediments. This internal loading contributes to eutrophication, HABs, and reduced water quality.

In past decades Pokegama Lake was twice treated with copper sulfate to address HABs. This resulted in the expected 8-10 year reduction of HAB's. However, the last treatment also resulted in a near total fish kill.

In 2021 the PLA began research to identifying a long-term, environmentally safe solution to prevent annual HAB's in the lake. In 2024 the PLA was introduced to Moleaer's industrial nanobubbles technology. In 2025 the PLA completed a $100,000 pilot project using nanobubbles to address oxygen depletion and the resultant HAB's. The project was extensively monitored (see attached Monitoring Plan and Pilot Summary) and greatly reduced HAB's in the treatment area.

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.

The PLA propose to address Pokegama Lake's chronic oxygen depletion and internal nutrient loading through full-lake deployment of Moleaer's nanobubbles technology.

Oxygenated nanobubbles are < 200 nanometers in diameter. Their nanoscopic size gives them properties that conventional aeration systems cannot replicate. Nanobubbles lack buoyancy to rise and off-gas at the surface. Instead, they move randomly through the water column and remain suspended for days to months, allowing them to penetrate deep into the lake and reach the sediment-water interface (SWI), where anoxic conditions drive the release of phosphorous and ammonia into the water column. By restoring and maintaining oxygen at the SWI, nanobubbles promote aerobic microbial activity that naturally suppresses this nutrient release, targeting the internal loading cycle at its source, without the water column mixing and thermal disruption that conventional aeration causes.

This project proposes deploying three containerized nanobubbles generators, two barge-mounted units and one land-based unit totaling 5,500 GPM in treatment capacity. These will be positioned at two locations in the main basin of the lake and one upstream location to optimize treatment distribution throughout the lake. Performance will be monitored and studied throughout the project period through development and implementation of a comprehensive water monitoring plan.

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 directly advances the public purposes of protection, conservation, preservation, and enhancement of Minnesota's natural resources by restoring water quality in Pokegama Lake through a scientifically rigorous, non-chemical treatment approach.

Specific outcomes include a measurable reduction in internal phosphorus and ammonia loading from bottom sediments, improved dissolved oxygen concentrations throughout the water column and at the SWI, and a significant decrease in the frequency and severity of harmful algal blooms. Together, these outcomes support healthier aquatic ecosystems, benefiting fish populations, macroinvertebrates, and the broader food web.

This project generates multi-year defensible, peer-quality monitoring data to inform adaptive lake management.

Activities and Milestones

Activity 1: Baseline Monitoring and Pre-Treatment Data Collection

Activity Budget: $214,739

Activity Description:
Establish a comprehensive, scientifically defensible baseline of pre-treatment water quality conditions across Pokegama Lake prior to full-scale nanobubble system installation.
This foundational dataset will serve as the reference point against which all treatment-period data will be compared, enabling rigorous before-and-after assessment of the technology's effectiveness. Baseline monitoring will build upon the 2025 pilot data while expanding spatial coverage to capture whole-lake conditions. Key parameters will include dissolved oxygen profiles, internal phosphorus and ammonia loading, chlorophyll-a concentrations, and thermal stratification across multiple stations throughout the lake. The monitoring plan will be developed in collaboration with the Minnesota DNR to ensure sampling methods and data quality meet standards required for scientific and regulatory defensibility.
Monitoring will commence ahead of final grant approval to capture the critical summer 2027 stratification season, the period when oxygen depletion and nutrient release dynamics are most pronounced, ensuring no annual data gap occurs before treatment begins.
Anticipated Outcome: A robust, multi-parameter baseline dataset documenting pre-treatment lake conditions across all monitoring stations, providing the scientific foundation for evaluating project effectiveness and informing long-term adaptive management.
Completion Date: September 30, 2027

Activity Milestones:

Description	Approximate Completion Date
Initiate Baseline Monitoring	May 31, 2027
Collect baseline water quality data during the 2027 open water season (May - September)	September 30, 2027
Compile and summarize pre treatment monitoring results for use in treatment performance evaluation	January 31, 2028

Activity 2: Site Preparation, Securing Easements and Electrical Installation (Phase 1)

Activity Budget: $196,825

Activity Description:
Objective: Prepare the three designated nanobubble treatment sites for equipment installation ahead of the spring 2028 deployment.
Site preparation activities will include establishing physical installation footprints for each system, securing any necessary land or utility easements for power access, and completing onshore electrical infrastructure. Specifically, shore-based electrical connections will be installed to service the two barge-mounted Moleaer L6 nanobubble generators, and electrical supply will be established for the trailer-based oxygen and ozone system. Completing this groundwork in advance of equipment arrival will ensure an efficient, uninterrupted installation process in spring 2028 and minimize any delays between installation and the start of the treatment season.

Anticipated Outcome: Three fully prepared treatment sites with established footprints and completed electrical infrastructure, ready for nanobubble system installation in spring 2028.

Completion Date: October 31, 2027

Activity Milestones:

Description	Approximate Completion Date
Secure necessary easements for placement of L2 system, and easements allowing for power to be brought	August 31, 2027
Install pad (footprint) for L2 system	October 31, 2027
Install electrical infrastructure necessary to support nanobubble system operation	October 31, 2027
Secure DNR Water Crossing Permit	October 31, 2027
Secure a DNR Aeration Permit	October 31, 2027

Activity 3: Fabrication of Nanobubble Generators

Activity Budget: $2,830,472

Activity Description:
Objective: Fabricate and deliver three Moleaer nanobubble generator systems for deployment at Pokegama Lake. All three units, two barge-mounted Moleaer L6 systems and one trailer-based Moleaer L2 O2 O3 system, will be manufactured and factory-tested at Moleaer's headquarters in California before being shipped to the project site, ensuring each system meets performance specifications prior to installation.

Anticipated Outcome: Three fully fabricated, tested, and delivered Moleaer nanobubble generator systems ready for spring 2028 installation.

Completion Date: January 31, 2028

Activity Milestones:

Description	Approximate Completion Date
Place order to begin engineering and fabrication for system in July 2027	July 31, 2027
Finalize system construction by January 2028	January 31, 2028

Activity 4: Final Site Preparation and System Deployment Readiness

Activity Budget: $361,000

Activity Description:
Objective: Complete final site preparation and deploy all three nanobubble systems following ice-out in spring 2028. Following ice-out, final deployment activities will include positioning the two barge-mounted units at their designated lake locations and extending electrical connections from shore to each barge. All electrical work will be performed by licensed electricians in compliance with the DNR Water Crossing Permit requirements. The trailer-based system will simultaneously be positioned and connected at its upstream location. Upon completion of all connections and pre-activation inspections, the systems will be ready for full operation at the start of the 2028 treatment season.

Anticipated Outcome: All three nanobubble systems fully deployed, connected, and operational at their designated treatment locations.

Completion Date: April 30, 2028

Activity Milestones:

Description	Approximate Completion Date

Complete remaining electrical construction	May 31, 2028
Deliver equipment and finalize system deployment logistics	May 31, 2028
Prepare site for system commissioning immediately following ice out	May 31, 2028

Activity 5: System Activation and First Treatment Season Monitoring

Activity Budget: $99,480

Activity Description:
Objective: Commission and operate all three Moleaer nanobubble systems through the first full lake-wide treatment season, while conducting comprehensive water quality monitoring. Following successful deployment, all systems will be commissioned by Moleaer's Global Service team in May 2028, marking the beginning of the first full season of lake-wide nanobubble treatment on Pokegama Lake. Local personnel will support ongoing system checks and routine maintenance throughout the open-water season. All water quality monitoring equipment and protocols will be established at the outset of the treatment period, ensuring continuous, high-quality data collection across all lake monitoring stations. Treatment monitoring will run concurrently with system operation, capturing dissolved oxygen levels, nutrient concentrations, and algal activity.

Anticipated Outcome: Successful operation of all three nanobubble systems through the first full treatment season, with a complete corresponding water quality monitoring dataset documenting initial treatment response.

Completion Date: September 30, 2028

Activity Milestones:

Description	Approximate Completion Date
Startup of system	May 31, 2028
Begin treatment monitoring , concurrent with system start up	May 31, 2028
Conduct monitoring throughout the 2028 open water season	September 30, 2028

Activity 6: Second Treatment Season Monitoring

Activity Budget: $99,480

Activity Description:
Objective: Resume full-system operation through the second treatment season while conducting longitudinal water quality monitoring to assess cumulative treatment effectiveness.

In spring 2029, all three Moleaer nanobubble systems will be de-winterized, inspected, and recommissioned ahead of the open-water season. Treatment will operate continuously throughout the season, with Moleaer's Global Service team and local personnel performing routine maintenance and system checks. Comprehensive water quality monitoring will continue across all established stations using consistent protocols from the first treatment season, ensuring reliable year-over-year comparisons. Data collected during this second season will be particularly valuable in identifying multi-year trends in dissolved oxygen levels, internal nutrient loading, and HAB frequency and severity.

Anticipated Outcome: Successful completion of the second full treatment season with a comprehensive monitoring dataset that, combined with baseline and first-season data, supports robust longitudinal analysis of Moleaer nanobubble technology's effectiveness on Pokegama Lake.

Completion Date: September 30, 2029

Activity Milestones:

Description	Approximate Completion Date
Resume nanobubble treatment	April 30, 2029
Conduct monitoring during the 2029 open water season (May–September)	September 30, 2029

Activity 7: Data compilation, Analysis, and Report

Activity Budget: $1

Activity Description:
Objective: Compile, analyze, and report on all project monitoring data to evaluate the effectiveness of nanobubble treatment on Pokegama Lake.

Water quality data collected during the 2027 baseline and the 2028–2029 treatment seasons will be integrated and analyzed to assess changes in dissolved oxygen, internal nutrient loading, chlorophyll-a, and HAB activity relative to pre-treatment conditions. Results will be compiled into a final report addressing the project's central hypothesis and submitted to the Minnesota DNR.

Anticipated Outcome: A final project report documenting monitoring results and conclusions, informing ongoing management of Pokegama Lake and providing a replicable evidence base for nanobubble applications on other Minnesota lakes.

Completion Date: April 30, 2030

Activity Milestones:

Description	Approximate Completion Date
Compile all monitoring data	December 31, 2029
Analyze data	February 28, 2030
Complete Report	April 30, 2030

Activity 8: Execution of Dissemination, Outreach, and Data Sharing Plan

Activity Budget: $1

Activity Description:
Please see plan.

Activity Milestones:

Description	Approximate Completion Date
Complete Dissemination, Outreach, and Data Sharing Plan	December 31, 2030

Activity 9: Treatment Operations Beyond Study Period

Activity Budget: $1

Activity Description:
Objective: Continue Moleaer nanobubble treatment operations beyond the formal study period to sustain and build

upon water quality improvements achieved during the funded project.
Following conclusion of the LCCMR-funded study, the PLA is committed to maintaining operation of all three nanobubble systems during each subsequent open-water season. Continued treatment will prevent the recurrence of hypolimnetic oxygen depletion and internal nutrient loading, protecting the water quality gains documented during the study period. (Does not require ENRTF funds input of $1 due to activity budget of $0 could not be entered)

Anticipated Outcome: Sustained long-term improvement in Pokegama Lake water quality through continued annual nanobubble treatment, preserving the ecological, recreational, and aesthetic values of the lake for future generations.

Completion Date: December 31, 2030

Activity Milestones:

Description	Approximate Completion Date
Annual collection of water quality data (ongoing Milestone)	December 31, 2030

Activity 10: Establish a Lake Improvement District to Fund Ongoing Maintenance and Operation of Nanobubbles Equipment

Activity Budget: $1

Activity Description:
Objective: Establish a legally committed funding mechanism to pay for maintenance and operation of the nanobubbles systems during the study period any beyond.

Anticipated Outcome: In 2025 the PLA raised $54,000 in donations from 203 of 400 lake owners to fund a nanobubbles pilot project in the lake's north bay. This level of support for the use of nanobubbles technology gives us confidence that the PLA will be successful in establishing a lake improvement district to fund the maintenance and operation of the nanobubbles equipment throughout the two year study period, and for years into the future.

In establishing the LID the PLA will follow the rules set forth in MN Rules 6115.0900 - 6115.0980 using the petition method for LID establishment. The process includes, in part, a written statement of the lake problems and objectives, the proposed solution proposed to funded, a statement of the proposed funding method, a map of the district boundaries. The process also includes a review by and approval of the LID by the DNR. The LID will be established by the Pine County Board of Commissioners after holding a public hearing on establishment of a LID

Completion Date: November 30, 2026

Activity Milestones:

Description	Approximate Completion Date
Draft a Proposal - identifying the problem, the proposed solution, and the method for funding	June 30, 2026
Obtain signatures on the petition to establish the LID	August 31, 2026
Submit the LID documents to the DNR for review and approval	August 31, 2026
Submit petition to Pine County and hold public hearing	October 31, 2026
Approval of the Lake Improvement District by the Pine County Board of Commissioners	November 30, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Jonathan Morales	Moleaer, Inc	Sub awardee. Jonathan is a representative of Moleaer, Inc, the company whose unique Nanobubbles technology we are seeking to use to reduce harmful algae blooms on Pokegama Lake. Jonathan comes from 10 years of experience as a program manager at the Middle Fork Crow River Watershed District.	Yes
Jill Jakusz	Pokegama Lake Association	Board Member and Co-Chair of the PLA Water Quality Committee	Yes
Denise Devota	Moleaer	Senior Limnologist, with a PhD and Master's in Limnology, worked for NOAA, U.S. Congress science policy fellow for a year in Washington, D.C., worked with U.S. Fish and Wildlife, Singapore government, and the United Nations on sustainable lake management. Denise will help guide and design the study.	No
Shane Hoyt	Moleaer	Project Limnologist, masters in limnology from Harvard. Shane will be aiding in development of the monitoring plan and analysis of the resulting data.	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

Dissemination, Outreach, and Data Sharing Plan

This project is funded by the Environment and Natural Resources Trust Fund (ENRTF) as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR). The project team is committed to ensuring that findings, data, and resulting products are widely disseminated, accessible, and usable to improve management of Minnesota's water resources.

1. Stakeholder Participation and Awareness

To ensure meaningful participation and awareness among entities that may benefit from project outcomes, the project will actively engage:

- Minnesota Coalition Lake Associations (MNCOLA)
- Watershed Districts and Watershed Management Organizations
- Soil and Water Conservation Districts (SWCDs)
- Minnesota Board of Water and Soil Resources (BWSR)
- Minnesota Pollution Control Agency (MPCA)
- Minnesota Department of Natural Resources (DNR)
- Tribal natural resource departments where applicable
- County environmental services departments

Engagement methods will include:

- Project kickoff and annual stakeholder briefings
- Mid-project technical updates
- Field demonstrations of nanobubble technology
- End-of-project public presentation in the project region
- Webinar presentations accessible statewide
- Press releases to media at appropriate intervals

These efforts will ensure that practitioners, regulators, and local decision-makers are aware of interim findings and can provide input during project implementation.

2. Sharing Results to Improve Resource Management

To ensure findings are usable and actionable:

Technical Deliverables

- A comprehensive final technical report submitted to LCCMR and made publicly available
- A management-focused summary document tailored for lake managers and watershed practitioners
- A decision-support guidance brief outlining when sediment oxygenation is likely to be effective in Minnesota lakes
- Data summaries formatted for integration into lake management plans and TMDL implementation strategies

Agency Coordination

Results will be shared directly with MPCA, DNR, and BWSR staff to inform:

- Internal load reduction strategies
- Lake restoration planning
- Clean Water Fund project prioritization
- Adaptive management frameworks

Where appropriate, results will be submitted for presentation at:

- MNCOLA Meeting
- Minnesota Water Resources Conference
- Minnesota Watersheds Conference
- BWSR Academy
- MPCA Water Quality meetings

3. Data Accessibility and Longevity

To ensure long-term availability and transparency:

- All water quality data (DO profiles, nutrient concentrations, sediment flux measurements) will be submitted to the Minnesota Pollution Control Agency's EQuIS-compatible formats where applicable.
- Metadata documentation will accompany all datasets.
- Project reports, monitoring summaries, and supporting documentation will be archived in publicly accessible digital repositories.
- Any physical monitoring infrastructure funded through ENRTF will be documented with maintenance protocols and ownership transfer agreements to ensure continued use beyond the grant term.

If sediment cores or laboratory samples are collected, they will be archived and documented according to institutional standards, with clear chain-of-custody and storage documentation.

4. Promoting Behavioral and Management Change

Project findings will be translated into clear management implications to encourage science-based decision-making. Dissemination efforts will:

- Provide comparative cost-effectiveness information relative to alternative internal load management techniques
- Clarify conditions under which oxygenation technologies are most effective
- Offer adaptive management recommendations
- Provide outreach materials suitable for lake associations and local governments

If supported by study findings, educational materials will emphasize how improved dissolved oxygen management through nanobubble oxygenation can reduce internal phosphorus loading, reduce harmful algae blooms, improve water clarity, and support aquatic ecosystem health.

5. Public Communication and Accessibility

To ensure Minnesotans understand the value of ENRTF-supported work:

- A plain-language project summary will be developed for public audiences.
- Infographics explaining internal loading and sediment oxygenation will be created.
- Project updates will be shared through partner newsletters and social media.
- A project webpage will host reports, summaries, and key graphics.

- At least one public-facing presentation will be offered locally and one virtual presentation statewide.

All materials will be written in accessible language suitable for non-technical audiences, while technical reports will remain available for professional users.

6. ENRTF Acknowledgment Requirements

All print and electronic materials, presentations, signage, technical reports, and outreach communications will include:

- The Environment and Natural Resources Trust Fund logo
- Required attribution language as specified in the ENRTF Acknowledgment Guidelines
- Appropriate social media tags when applicable

Acknowledgment will be included on:

- Equipment and installation sites
- Reports and executive summaries
- Public presentations and webinars
- Signage at monitoring locations
- Project webpages
- Outreach materials and infographics

Commitment to Transparency and Public Benefit

This dissemination plan ensures:

- Broad stakeholder participation
- Practical application of research findings
- Long-term accessibility of data and materials
- Behavior change through informed decision-making
- Clear recognition of the Environment and Natural Resources Trust Fund's investment in Minnesota's natural resources

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?

Project results will be implemented through continued seasonal operation of the nanobubble systems to maintain improved dissolved oxygen conditions and suppress internal nutrient loading in Pokegama Lake.

Monitoring data, technical reports, and management guidance developed through the project will be incorporated into the Pokegama Lake Association's long-term lake management plan and shared with state and local resource agencies to inform broader lake restoration efforts.

Ongoing operation, maintenance, and monitoring beyond the grant period are anticipated to be funded through the formation of a Lake Improvement District (LID), providing a stable, locally controlled funding mechanism for sustained implementation and adaptive management.

Project Manager and Organization Qualifications

Project Manager Name: Kathy Nielsen

Job Title: Pokegama Lake Association Board & Water Quality Committee Co-Chair

Provide description of the project manager's qualifications to manage the proposed project.
For 13 years Kathy Nielsen served as clerk of Spring Lake Township, a rural residential township in Scott County. There, she oversaw the installation of a new sewer system. She also managed several road reconstruction projects requiring adherence to public bidding and government contracting requirements. Once bids were awarded she managed the contracts, reviewing pay requests and change orders for approval by the town board. She also worked with contractors to ensure construction milestones were met. Nielsen worked with legal counsel to obtain needed easements. She also provided stakeholders with clear, consistent and timely communication to ensure the public received the information they needed throughout the construction process.
In 2017, Nielsen contracted with Scott County to serve as the first project manager for their Live, Learn, Earn initiative – a collaboration of leaders from public sector, private sector, and non-profits seeking to address emerging challenges the county was facing in the areas of Housing, Education, Transportation and Workforce Development. www.livelearnearn.org. She served in this role until relocating to Pine County in 2019.
Since joining the Pokegama Lake Association (PLA) in 2020, she has served on their board and co-chaired their Water Quality Committee, implementing and managing their aquatic invasive species program. In 2024, she co-led the PLA effort to implement a $100,000 pilot project using nanobubbles technology to reduce harmful algae blooms in the north bay of Pokegama Lake. These activities included conducting large public information meetings, fund raising $50,000 from lakeshore owners, DNR permitting, obtaining a private land use agreement, and contracting.
Nielsen is a skilled communicator who has effectively conducted numerous public meetings seeking both to disseminate critical information and to receive public input on a wide range of topics including public infrastructure projects, natural resource plans, surface water regulations, and planning and zoning issues.

Organization: Pokegama Lake Association

Organization Description:
Pokegama Lake is 1,531 acre lake located in Pine County, just and hour north of the Twin Cities. With three (3) public boat launches, it is a highly-valued regional destination for boating, fishing and recreation. It is also a tribal resource for spear fishing. Unfortunately, Pokegama Lake is the largest impaired lake in Pine County.

Pokegama Lake Association (the PLA) is a 501(c)3 organization whose purpose is the improvement and comprehensive management of Pokegama Lake and its watershed for public use. It is governed by a 9-member board of directors who serve for three-year staggered terms. The PLA has approximately 140 member households representing 35% of lakeshore owners.

The PLA's lake management activities include annual chemical treatment of curlyleaf pondweed and maintaining open channels for boating through ongoing weed cutting operations. In 2024 the PLA partnered with the Snake River Watershed Plan Partnership and Pine County Soil and Water Conservation District in the completion of a Pokegama Lake Sub Watershed Assessment, and is working with these partners on the implementation of that plan in 2026. The PLA also conducted a successful pilot nanobubbles clean water project in the lake's north bay in 2025.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
							Sub Total	**-**
Contracts and Services								
Moleaer, Inc	Subaward	Moleaer will provide all capital equipment for this project, including 2 barge-based container nanobubble systems, one land-based nanobubbles container system, 3 water monitoring buoys, a dock, container piping, and labor for installation of the above listed equipment.				6		$3,605,175
East Central Electric	Service Contract	Install 3-phase electrical connection to shoreline near the barge deployments				0		$85,000
MN DNR	Internal services or fees (uncommon)	DNR Water Crossing Permit				0		$2,325
							Sub Total	**$3,692,500**
Equipment, Tools, and Supplies								
							Sub Total	**-**
Capital Equipment								
							Sub Total	**-**
Acquisitions and Stewardship								
	Other Acquisition	Acres: 0.5 Parcels: 3 Miles: 2						$109,500
							Sub Total	**$109,500**
Travel In Minnesota								

							Sub Total	**-**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$3,802,000**

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				
			State Sub Total	**-**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**-**

Total Project Cost: $3,802,000

This amount accurately reflects total project cost?

Yes

Acquisition and Restoration

Parcel List

Name	County	Site Significance	Activity	Acres	Miles	Estimated Cost	Type of Landowner	Easement or Title Holder	Status of Work
Mid-eastern shoreline of Pokegama Lake	Pine	This site is private property where 3-phase electricity can easily be extended to the lakeshore as required for this project	Easement - Other	0.5	-	$36,500	Private	Pokegama Lake Association	Has Not Begun
North channel of Pokegama Lake (Pokegama Creek)	Pine	This is an excellent location for a nanobubbles trailer to treat water coming into lake.	Easement - Other	0.25	-	$36,500	Private	Pokegama Lake Association	Has Not Begun
Northeast corner of Lake Pokegama	Pine	This site is a commercial property with 3-phase electricity which can easily be extended to the lakeshore as required for this project	Easement - Other	0.5	0	$36,500	Private	Pokegama Lake Association	Has Not Begun
Totals				**1.25**	**0**	**$109,500**			

Easement (Other) Acquisition

1. Describe the selection process for identifying and including proposed parcels on the parcel list, including an explanation of the criteria and decision-making process used to rank and prioritize parcels.
The placement of the nanobubbles barges was determined to be the most advantageous locations to ensure dispersal of oxygenated nanobubbles through the full lake system. Secondarily, these locations also support the most efficient path for extending the needed 3-phase electrical to the equipment locations.

2. List all adopted state, regional, or local natural resource plans in which the lands included in the parcel list are identified for the acquisition purposes you propose. Include the URL to the plan if one is available.
None

3. For any parcels acquired in fee title, a restoration and management plan must be prepared. Summarize the components and expected outcomes of restoration and management plans for parcels acquired by your organization, how these plans are kept on file by your organization, and overall strategies for long-term plan implementation, including how long-term maintenance and management needs of the parcel will be financed into the future.
N/A

4. For each parcel to be conveyed to a State of Minnesota entity (e.g., DNR) after purchase, provide a statement confirming that county board approval will be obtained.
N/A

5. If applicable (see M.S. 116P.17), provide a statement confirming that written approval from the DNR Commissioner will be obtained 10 business days prior to any final acquisition transaction.
N/A

Attachments

Required Attachments

Map

File: 1627e22c-304.pdf

Alternate Text for Map

This is a map of Pokegama Lake showing the general locations of two barge-based and one land-based nanobubbles container systems. The natural flow of water from Pokegama Creek to the north to the Lake' outlet to the Snake River on the south will assist in the dispersal of oxygenated nanobubbles...

Financial Capacity

Title	File
Sec of State record of good standing	5f38f703-f59.pdf
Form 990 - Pokegama Lake Association (2024)	6bc5f12d-fe1.pdf

Board Resolution or Letter

Title	File
PLA Board Authorization Ltr	7f382aad-397.pdf
Fiscal Agent Resolution	b6f098d7-517.pdf

Supplemental Attachments

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

Title	File
2025 Nanobubbles Pilot Project Summary	81b5aa2f-999.docx
Ltr of Support - Pine County	5dcb59fa-8bc.docx
Nanobubbles trailer	22d20908-4ee.jpe
2025 Nanobubbles Pilot Project Monitoring Plan	dcd5c6c9-f3b.pdf
Ltr of Support - Snake River Watershed Plan Partnership	d7e4e536-34d.pdf
Floating Nanobubbles Barge	84fee2c4-96d.jpe
Ltr of Support - Rep. Nathan Nelson	9c155187-623.docx
Ltr of Support - Sen. Jason Rarick	1758970f-587.docx

Administrative Use

Does your project include restoration or acquisition of land rights?

Yes: Easement (Other) Acquisition,

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?

Yes

Does the organization have a fiscal agent for this project?

Yes, Pine County

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

Is the purpose of the acquisition for construction of a building(s), trail, campground, or other fixed capital asset costing $10,000 or more or large- scale stream or wetland restoration, either now or in the future?

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:

Jill Jakusz, Pokegama Lake Association
Jonathan Morales, Moleaer, Inc.
Dr. Denise Devotta, Moleaer, Inc.

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