

**Environment and Natural Resources Trust Fund  
2017 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 150-E**

District Heating with Renewable Biomass at Camp Ripley Training Center

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**Category:** E. Air Quality, Climate Change, and Renewable Energy

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**Total Project Budget:** \$ 1,969,988

**Proposed Project Time Period for the Funding Requested:** 3 years, July 2017 - June 2020

**Summary:**

This project will facilitate the effective implementation of clean energy technology for the Camp Ripley Training Center, reduce net CO2 emissions by approximately 740 metric tons.

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**Sponsoring Organization:** Department of Military Affairs

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**Location**

**Region:** Central

**County Name:** Morrison

**City / Township:** Little Falls

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**Alternate Text for Visual:**

District heating proposal for Camp Ripley Facilities

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



**PROJECT TITLE: District Heating with Renewable Biomass at Camp Ripley Training Center**

**I. PROJECT STATEMENT**

This project will facilitate the effective implementation of clean energy technology for the Camp Ripley Training Center, located in central Minnesota (See Map No.1). This project will demonstrate the use of on-site woody biomass as a source of renewable thermal energy. Camp Ripley is state owned facility with the capability to demonstrate an environmentally sound and sustainable process to heat numerous building. This proposal would offset natural gas usage by 14,100 thousand cubic feet which would reduce net CO<sub>2</sub> emissions by approximately 740 metric tons. This proposal would also provide economic benefits to the local economy and increase energy security through utilization of a closed loop biomass system using locally-produced biomass harvested on the same State of Minnesota owned property. Camp Ripley Training Center has an integral role in the continuation of government for the state of Minnesota in the event of a major disaster. The Camp's federal and state military missions also necessitate a secure and resilient infrastructure for national security. The project is not a capitol project designed to improve existing facilities but rather a means to demonstrate energy security using a locally-produced renewable energy source.

This proposed project will also demonstrate, on a significant scale, sustainable forest management for the purpose of generating energy using a locally-produced renewable energy. Currently, Camp Ripley harvests 300 acres of timber annually. With this proposed project, selective harvesting of northern hardwoods and utilization of storm blow-down material would be implemented and managed with assistance from the Minnesota Department of Natural Resources. While there are approximately 35,000 acres of forest available, the primary focus would be on 1,800 acres of Camp Ripley property located off base which is open to the public for non-motorized recreation and hunting. While managing these lands significant ecological benefits could be realized in specific parallel with wildlife habitat improvement.

The proposal is to install a 5.0 mmBtu/hr advanced biomass combustion unit and hot water boiler would replace 90% of the total natural gas usage at seven buildings located in Areas 11 and 17 of Camp Ripley (See Map No. 2). Buried pre-insulated piping would be installed to connect the central biomass plant to the existing heating systems at each building. This proposal is nested well into the LCCMR Six Year Strategic Plan. The proposal is consistent with subparts #5 and #6 of Category E of the 2017 Funding Priorities calling for renewable energy.

The Department of Military Affairs and Minnesota National Guard will use the final project as an example of cost effective locally-produced renewable thermal energy for other state agencies to replicate. A project of this magnitude will offer tremendous educational outreach for the tens of thousands of our Soldiers and other customers (including state agency staff) who train at Camp Ripley. The project will also serve as a national model since it will be the first biomass facility on a National Guard Installation. Additionally, Camp Ripley environmental staff sponsor over 100 presentations a year and reach about 6,000 students and visitors. This biomass project will be showcased as one of many sustainable initiatives underway at Camp Ripley in addition to a 10 megawatt solar array that is currently being installed on Camp Ripley by Minnesota Power which is also the largest of its kind on any National Guard Installation. Geothermal energy has also been installed at three key locations on Camp.

**II. DESCRIPTION OF PROJECT ACTIVITIES**

**Activity 1: Measurement and Verification**

**Budget: \$10,000**



Installing Btu monitors in the hot water distribution piping for existing boiler plants capable of measuring and logging Btu usage in real time. This will augment natural gas usage records by taking into account individual efficiencies of the current boiler systems.

Outcome	Completion Date
1. Confirmation or modification of 5.0 mmBtu/hr biomass boiler plant sizing	May 31, 2017

**Activity 2: Biomass Plant Siting**

**Budget: \$195,000**

This activity would include site investigation of proposed location. Utilities, geotechnical, topographical and environmental data along with data from Activity 1 would further develop the biomass plant layout.

Outcome	Completion Date
1. Verification of suitability of location	December 31, 2017
2. Final engineering plans completed	May 31, 2018

**Activity 3: Construction Phase**

**Budget: \$1,765,000**

This activity would include all site work, facility construction, installation of pre-insulated distribution piping, connection to existing systems with the seven buildings.

Outcome	Completion Date
1. Request for Proposals issued and executed	- August 30, 2018
2. Construction completed	NLT July 1, 2019

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

Project team will consist of Minnesota Department of Military Affairs employees and Minnesota National Guard Soldiers, including civil engineers, architects, energy manger, public works staff and others as needed based on project activity.

The USDA Forest Service Wood Education and Resource Center (WERC) will provide technical assistance to promote and support projects which utilize wood energy in a sustainable manner. Additionally, the Minnesota Department of Natural Resources will be instrumental in developing a sustainable timber management plan for renewable woody biomass and ecological enhancement.

The National Renewable Energy Laboratory (NREL) will also partner on the project. NREL has been instrumental in the development of the project having recently (2015) completed an updated feasibility study regarding the use of woody biomass for thermal energy on Camp Ripley.

**B. Timeline Requirements**

The proposed project will require one heating cycle to verify the sizing of the biomass plant. By ensuring proper sizing expenses and long term issues could be avoided. Through the preliminary feasibility study completed in 2012 and updated in 2015 a strong base is already in place which will expedite the final design phases and construction.

**C. Long-Term Strategy and Future Funding Needs**

The long term strategy of this project is to be part of a much larger endeavor to meet net-zero in energy. Not only with the proposed project further the net-zero vision, the Department of Military Affairs and Minnesota National Guard will use the final project as an example of cost effective locally-produced renewable thermal energy and an educational example to be shared with all who visit this great facility.

## 2017 Detailed Project Budget

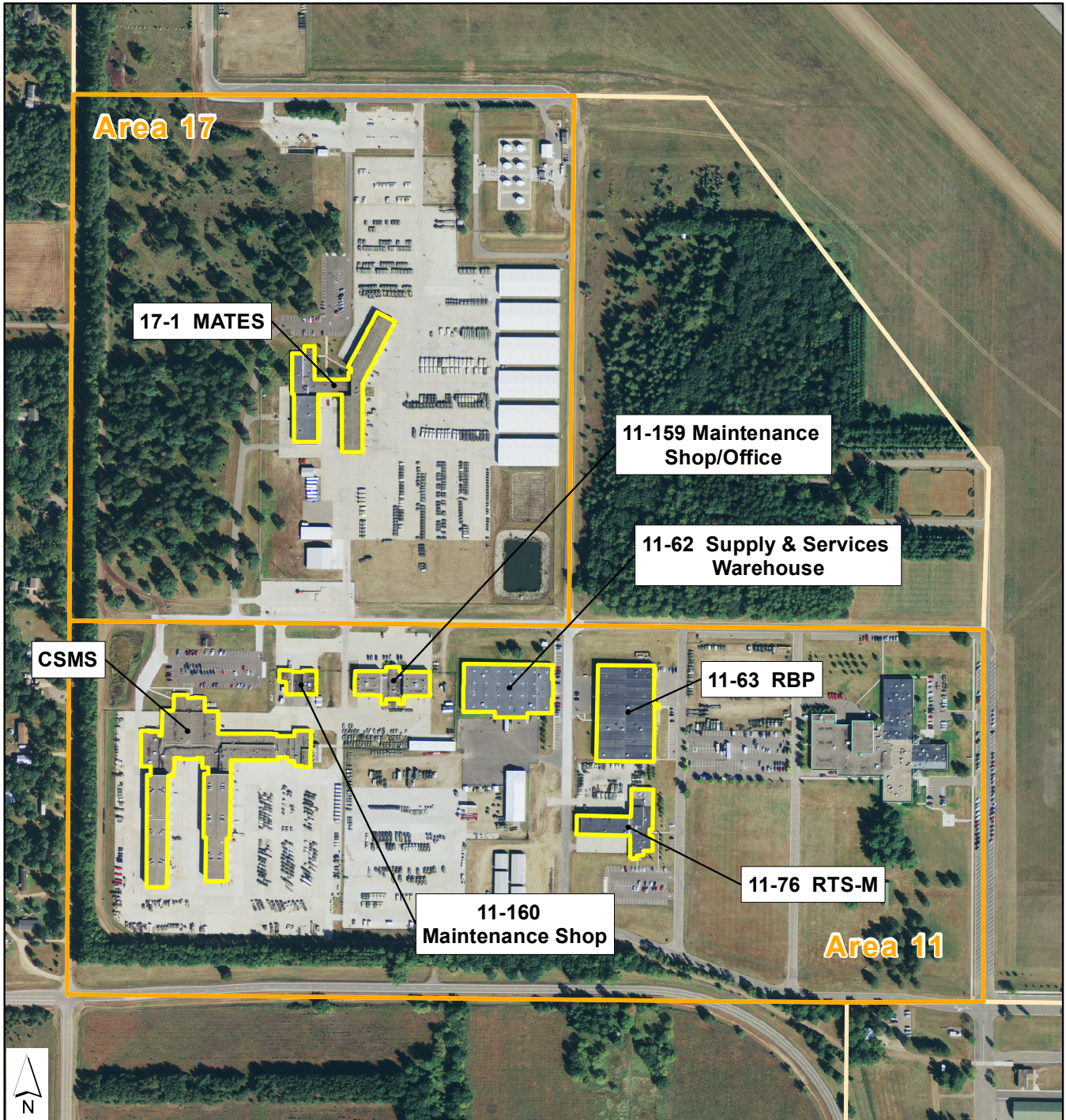
### Facilitation of

#### IV. TOTAL ENRTF REQUEST BUDGET 1 year

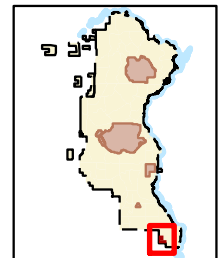
<b>BUDGET ITEM</b> <i>(See "Guidance on Allowable Expenses", p. 13)</i>	<b>AMOUNT</b>
<b>Professional/Technical/Service Contracts:</b> Site Work: Buried pre-insulated distribution piping, installed; electrical and mechanical	\$ 603,000
<b>Equipment/Tools/Supplies:</b> 5.0 mmBtu/hr biomass combuston unit, hot water boiler, controls, distribution piping installed	\$767,600
Biomass boiler room conversions and specialities	\$50,000
Fuel bunker receiving, storage, material transfer, and specialties, installed	\$60,000
5,000 gallon thermal storage tank (installed)	\$45,000
Boiler manufacturer Bid Bond and Insurance	\$10,100
Contractor overhead and insurance	\$138,880
Contingency 10%	\$100,688
Professional Construction Services 12%	\$194,720
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 1,969,988</b>

<b>V. OTHER FUNDS</b>	<b>AMOUNT</b>	<b>Status</b>
<b>SOURCE OF FUNDS</b>		
<b>Other Non-State \$ To Be Applied To Project During Project Period:</b> <i>Federal Funds to repurpose/ construction facility for storage biomass product and boiler.</i>	\$500,000	<i>Pending</i>
<b>Other State \$ To Be Applied To Project During Project Period:</b> <i>Indicate any additional state cash dollars (e.g., bonding, other grants) secured or applied for to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i>	N/A	N/A
<b>In-kind Services To Be Applied To Project During Project Period:</b> <i>Re-purposing of existing personell services, 1 FTE Public Works (3 years)</i>	\$50,000	Secured
<b>Funding History:</b> <i>Indicate funding secured but to be expended prior to July 1, 2016, for activities directly relevant to this specific funding request, including past and current ENRTF funds. State specific source(s) of fund and dollar amount.</i>	N/A	N/A
<b>Remaining \$ From Current ENRTF Appropriation:</b> <i>Specify dollar amount and year of appropriation from any current ENRTF appropriation for any directly related project of the project manager or organization that remains unspent or not yet legally obligated at the time of proposal submission. Be as specific as possible. Indicate the status of the funds.</i>	N/A	N/A

**Project Title: District Heating with Renewable Biomass at Camp Ripley Training Center**



**Buildings outlined in yellow are included in the district heating proposal.**





**PROJECT TITLE: District Heating with Renewable Biomass at Camp Ripley Training Center**

**I. PROJECT MANAGER – Mr. Josh Pennington**

Mr. Pennington is the sustainability manager for the Department of Military Affairs. Prior to this position he worked as an Environmental Protection Specialist with the U.S. Army where he has been involved in many sustainability initiatives. Mr Pennington received his Bachelor of Science degree in Natural Resource Recreation Management from the University of Missouri-Columbia and a Master of Science from Webster University.

Mr. Pennington’s role in this proposal is to be the point of contact for the project as it moves throughout the activities. There will be numerous project team members with special areas of interest that will support the project as it moves forward. Mr. Pennington will maintain reporting requirements and contact with LCCMR.

**II. ORGANIZATIONAL INFORMATION**

The Minnesota National Guard’s (MNNG’s) enduring mission is to protect the nation by providing forces and capabilities in support of the Governor, Combatant Commanders and domestic operations. The MNNG remains a community-based organization with a clear understanding of our dual role: to serve in support of our national defense and to serve the Governor and the people of Minnesota in a wide range of capabilities.

The MNNG continues to improve and develop Sustainable Infrastructure at our Air and Army facilities around the state. Sustainable Infrastructure extends critical resources; minimizes long term costs; addresses environmental considerations; improves energy security; and helps DOD and the State of Minnesota meet their energy, water, waste and other sustainability goals. Sustainability begins with individual action and behavior and extends to systems efficiencies and departmental practices. The MNNG strives to effectively manage resources and minimize waste streams, and use sustainable environmental and construction practices. This will ensure our ability to sustain our capabilities into the future and remain good stewards of our limited resources and the environment.