

## Environment and Natural Resources Trust Fund (ENRTF) 2010 Work Program

**Date of Report:** 12/30/2009  
**Date of Next Progress Report:** 1/15/2011  
**Date of Work Program Approval:**  
**Project Completion Date:** 6/30/2012

**I. PROJECT TITLE: Demonstrating Sustainable Energy Practices at Residential Environmental Learning Center's (RELC's) – Laurentian Environmental Center (7d-4)**

**Project Manager:** Nick Temali  
**Affiliation:** MN Coalition of Residential Environmental Learning Centers  
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**Location:** St. Louis County

<b>Total ENRTF Project Budget:</b>	<b>ENRTF Appropriation</b>	\$258,000
	<b>Minus Amount Spent:</b>	<u>\$ 0</u>
	<b>Equal Balance:</b>	\$258,000

**Legal Citation: M.L. 2010, Chp. 362, Sec. 2, Subd. 7d4**

**Appropriation Language:**

\$1,500,000 is from the trust fund to the commissioner of natural resources for agreements as follows: \$206,000 with Audubon Center of the North Woods; \$212,000 with Deep Portage Learning Center; \$350,000 with Eagle Bluff Environmental Learning Center; \$258,000 with Laurentian Environmental Learning Center; \$240,000 with Long Lake Conservation Center; and \$234,000 with Wolf Ridge Environmental Learning Center to implement renewable energy, energy efficiency, and energy conservation practices at the facilities. Efforts will include dissemination of related energy education.

**II. PROJECT SUMMARY AND RESULTS:** Six Residential Environmental Learning Centers (RELC's - Audubon Center, Deep Portage, Eagle Bluff, Laurentian (LEC), Long Lake and Wolf Ridge) will reduce their carbon footprints while disseminating energy education that focuses on renewable energy, energy efficiency, and conservation options. The centers, supported by Bush and Butler foundations, chose to invest in a professional energy audit utilizing the engineering and consulting firm McKinstry. The audits evaluated existing buildings, technologies, and energy uses at each centers' location and resulted in state-of-the-art recommendations for conservation and energy

efficiency measures, renewable energy possibilities, and demonstration opportunities. Due to the variations of each center's location the suggested solutions represent a variety of options and make the combined effort important for statewide dissemination. The McKinstry study is the basis for our collective energy investment and education development request.

Funding from the Environment and Natural Resources Trust Fund (ENRTF) will allow Laurentian to: 1) Insulate the Lodge and Office buildings, and replace all exterior doors and windows to seal the exterior envelope of these structures; 2) Introduce solar water heating systems for both buildings; 3) monitor energy use and energy savings to demonstrate the results of our ENRTF investments and 4) use the conservation efforts and solar applications, along with the monitoring results, to educate the visitors to Laurentian about energy conservation and alternative energy options. Over the next ten years, it is anticipated that 55,000 to 60,000 lifelong learners (youth to senior citizens) will experience the results of this work at LEC.

A web consultant will design and construct a website showing each center's energy related information for educational use while providing statewide verification of the engineering and installation results. Eagle Bluff will coordinate the efforts of the six RELCs to achieve Results 2, 3 and 4. LEC will work collectively with the other centers to develop evaluation, monitoring and outreach initiatives to be used by all centers.

### **III. PROGRESS SUMMARY AS OF: 11/30/2009**

### **IV. OUTLINE OF PROJECT RESULTS:**

**RESULT/ACTIVITY 1:** Implementation of carbon and energy reduction systems for education and demonstration purposes at Laurentian Environmental Center. Budget \$258,000. Completion Date June 30, 2012.

**Description:** The Laurentian Environmental Center (LEC) is located on Minnesota's Iron Range north of Virginia near the town of Britt. It is owned and operated by the Mounds View Public School district since 1977 on Minnesota School Trust land. LEC serves 6000 statewide users annually.

The McKinstry Study noted that at the Laurentian Environmental Center, "Building envelopes require attention, particularly the five buildings with crawl spaces under the main level. The slab-on-grade buildings are performing better. Domestic hot water is provided primarily by propane-fired storage water heaters with some minor use of electric. Except for the Lodge kitchen, and restroom exhaust fans, there is no mechanical ventilation in the buildings. Lighting is provided by a variety of fixtures and some change out of the older magnetic ballast fluorescents and incandescents is recommended. Control systems are generally lacking and will require upgrading."

A design consultant will be hired (through a competitive RFP process) to create a work plan for this project, create specifications for work to be completed and prepare bid documents for the

project. Inservicing the contractor and subs, along with monitoring the work progress will also be required of the design consultant.

The target of the LEC ENRTF work plan is sealing the lodge, a 1930's CCC construction project that serves as the LEC dining building. As stated in the 2008 McKinstry Study – "The envelope of the Lodge requires attention. Voids in the air barrier and inadequate insulation cause higher than necessary energy usage." Plans are to add significant levels of insulation and to re-establish a continuous air barrier in the walls connecting into the roof. All windows and doors will be replaced with high efficiency units.

A second priority will be to seal the office building – a 1960's former dorm cabin that was repurposed in the 1990's. Again, as stated in the McKinstry Study – "The office lacks an adequate air barrier and requires additional insulation." Insulating the walls and roof, along with sealing up the crawl space will reduce energy consumption and begin the reduction of the LEC carbon footprint. All doors and windows will be replaced with high efficiency units.

In addition, the current propane heated domestic hot water systems will be replaced with a solar system in both the lodge and office buildings. The lodge domestic solar hot water system will require electric instantaneous water heaters as a back up for cloudy days. The office solar system will not require a back up due to the infrequent need for hot water.

Monitoring equipment will be installed in both buildings to monitor improvements.

**Summary Budget Information for Result/Activity 1:**

<b>ENRTF Budget:</b>	\$258,000
<b>Amount Spent:</b>	\$ 0
<b>Balance:</b>	\$258,000

<b>Deliverable/Outcome</b>	<b>Completion Date</b>	<b>Budget</b>	<b>Estimated Carbon Reduction (#s)</b>
<b>1-1 Prof/Tech – Improvement Plans and Designs</b>	12/31/10	\$26,000	0
<b>1-2 Envelope Improvements in the Lodge and Office</b>	12/31/10	\$158,500	29,935
<b>1-3 Solar Hot Water installed for the Lodge and Office</b>	12/31/11	\$63,500	18,446
<b>1-4 Monitoring Equipment installed in the Lodge and Office</b>	12/31/10	\$10,000	0

**Result Completion Date:** *June 30, 2012*

**Result Status as of 1/15/2011:**

**Result Status as of 7/15/2011:**

**Result Status as of 1/15/2012:**

**Result Status as of 7/15/2012:**

**Final Report Summary: 7/15/2012**

**V. TOTAL ENRTF PROJECT BUDGET:**

**Contracts:** Prof/tech assistance for a design consultant (through a competitive RFP process) \$26,000

**Supplies:** \$ 0

**Capital Improvements:** Lodge and Office insulation, doors and windows \$158,500  
*(Estimate 55% for materials and 45% for installation)*

Solar Hot Water Systems \$63,500  
*(Estimate 60% for materials and 40% for installation)*

Monitoring Equipment \$10,000  
*(Estimate 85% for materials and 15% for installation)*

**TOTAL ENRTF PROJECT BUDGET: \$258,000**

**Explanation of Capital Expenditures Greater Than \$3,500:** The capital improvements made with these funds are fixed capital assets and will remain in place and will continue to be used for the same program through its useful life.

**VI. PROJECT STRATEGY:**

**A. Project Partners:** Audubon Center, Sandstone; Deep Portage, Walker; Eagle Bluff, Lanesboro; Laurentian, Britt; Long Lake, McGregor; and Wolf Ridge, Finland.

**B. Project Impact and Long-term Strategy:** This ENRTF request represents one third of the McKinstry Study improvement goal for the Laurentian Environmental Center. . The centers will continue to work together to complete the McKinstry goal through state and federal resources and the assistance of foundations.

**C. Other Funds Proposed to be spent during the Project Period:**

ITEM	Overall RELC Project	Laurentian Env. Center
In-kind Staff - \$30,000	\$30,000	\$5,000
2009 Federal Allocation - \$300,000/ctr. – 5 Northern Centers	\$1,500,000	\$300,000
Butler Family Foundation - Continue Project Development	\$30,000	
2010 Federal Allocation - \$300,000/ctr. – 6ctrs. – In Process	\$1,800,000	\$300,000

**D. Spending History:**

ITEM	Overall RELC Project	Laurentian Env. Center
Bush Foundation – McKinstry Study	\$176,000	
Butler Family Foundation – Project Development	\$30,000	

**VII. DISSEMINATION:**

Information about this project will be disseminated through a collaborative website that will be available to the public for learning about the process and successes of each individual centers projects. Laurentian Environmental Center (LEC) will have information available on its own website as well as the Mounds View Public Schools website. LEC will put this information out in its newsletter, email blasts, and through articles/press releases through local paper media.

LEC will enhance its “Earthwise Challenge” for our participants that have them conduct their own energy audit of the campus and their behaviors while they are here for three to five days, incorporating the ENRTF funded projects.

It will also be discussed in all future New Energy Resource Advisor (ERA) training seminars to be held on-site at each center. The Energy Resource Advisor (ERA) certificate, developed by Winona State University, is a new curriculum designed to accelerate public understanding of energy efficiency, clean energy, carbon emissions, resource conservation, green technologies, and green jobs. This curriculum is the *first of its kind in Minnesota*. It is a non-credit, continuing education course for adults 18 years of age and older, *using online instructional technology combined with applied, field experience at one of the six Minnesota RELCs*. Participants in this class will learn about: a) the basic components of an energy audit, b) small-scale renewable energy including site suitability, system sizing, and financial incentives that are available, c) alternative building and transportation options, d) ways to “green up” the home or business, and e) the field of emerging “green” jobs. After completing this course, the successful participant may serve as an energy resource advisor and “green” consultant in the community and workplace.

**VIII. REPORTING REQUIREMENTS: Periodic work program progress reports will be submitted not later than 01/15/2011, 7/15/2011, and 1/15/2012. A final work program report and associated products will be submitted between June 30 and August 1, 2012 as requested by the LCCMR.**

Attachment A: Budget Detail for 2010 Projects - Summary and a Budget page for each partner (if applicable)					
Project Title: Demonstrating Sustainable Energy Practices at Residential Environmental Learning Center's (RELC's) - Laurentian Environmental Center					
Project Manager Name: Nick Temali					
Trust Fund Appropriation: \$ 258,000					
2010 Trust Fund Budget	<u>Result 1 Budget:</u>	Amount Spent (date)	Balance (date)	TOTAL BUDGET	TOTAL BALANCE
	Implementation of carbon and energy reduction systems for education and demonstration purposes.				
<b>BUDGET ITEM</b>					
<b>Contracts</b>					
Professional/technical - for a design consultant to be determined after a RFP process.	26,000	0	26,000	26,000	26,000
Conservation - Envelope Improvements on the Lodge and Office (55% materials; 45% labor)	158,500	0	158,500	158,500	158,500
Renewables - Solar Hot Water system for Lodge and Office (60% materials; 40% labor)	63,500	0	63,500	63,500	63,500
Momitoring - Submetering (85% materials; 15% labor)	10,000	0	10,000	10,000	10,000
<b>COLUMN TOTAL</b>	<b>\$258,000</b>	<b>\$0</b>	<b>\$258,000</b>	<b>\$258,000</b>	<b>\$258,000</b>