

**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 Centers (RELCs)—Deep Portage Learning Center (7d-3)

Project Manager: Dale Yerger, Director of Deep Portage Learning Center
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Location: *Aitkin, Cass, Fillmore, Lake, Pine, and St. Louis Counties*

Total ENRTF Project Budget:	ENRTF Appropriation	\$212,000
	Minus Amount Spent:	\$ 0
	Equal Balance:	\$212,000

Legal Citation: ML 2010, Chap.[____], Sec.[____], Subd._____.

Appropriation Language:

II. PROJECT SUMMARY AND RESULTS: Six Residential Environmental Learning Centers (RELCs – Audubon Center, Deep Portage, Eagle Bluff, Laurentian, 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 McKinstry audit evaluated the two main campus buildings at Deep Portage Learning Center—the 54,000 square foot main lodge and the 4,500 square foot interpretive center. Both buildings are in need of significant envelope improvements; doors and windows have become worn from the extensive use, and some areas need to be reinsulated. Solar hot water systems were recommended, as well photovoltaic demos and lighting upgrades. Our refrigeration and freezer systems have become energy hogs and are in need of updates. The audit also recommended ground source heat pumps to replace the amount of propane (30,000 gallons that we use on average annually). We chose to utilize wood gasification to help trim our propane habit. During the 2008-2009 heating season we paid over \$60,000 dollars for propane; this season we plan to burn \$15,000 dollars worth of propane and \$20,000 of wood. This is a significant carbon reduction and cost savings. Next year we hope to bring our propane

cost to \$5,000 and reduce carbon by 90%. We will demonstrate and measure these improvements and will post this data on our website and blogs. We have 10,000 program participants per year and another 10,000 drop-in visitors that will have access to this information and demonstration. We will conduct workshops and lead tours. We will emphasize cost savings and carbon reduction. 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. McKinstry's study is the basis for our collective energy investment and education development request.

The Environment and Natural Resources Trust Fund (ENTRF) will allow Deep Portage Learning Center (DPLC) to: 1) Increase conservation measures and energy efficiency; 2) invest in renewable energies using appropriate technologies for our center; and 3) conduct multi-faceted educational outreach. 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.

III. PROGRESS SUMMARY AS OF 11/30/2009

IV. OUTLINE OF PROJECT RESULTS:

RESULT 1: Implementation of carbon and energy reduction systems for education and demonstration purposes at DPLC. Budget \$212,000. Completion Date June 30, 2012.

Description: DPLC is located in Cass County, Minnesota. We serve 10-20,000 participants annually—from Minnesota and Iowa, and small percentage of international groups. Our campus encompasses approximately 60,000 square feet. On October 10, 2009 we started using a \$305,000 wood gasification system at DPLC. It is enclosed in a building that we call Energy 3. It feeds hot water into the existing system, which used to run 100% off of propane. It supplies heat and hot water to a 54,000 square foot lodge at DPLC. As of January 27, 2010 we estimate that we have replaced 75 percent of the propane that was used the prior three winters (on average 28,000 gallons of propane per heating season). Thus by the end of this heating season we estimate that we will have replaced 22,000 gallons of propane. This Biomass Project was partially funded by a \$136,000 State of Minnesota DEED Grant.

Our goal is to take propane replacement to over 90% through modifying our existing system and adding features such as hydronic (hot water) storage and hydronic heat to the energy buildings that house the boilers. We also plan to update our refrigeration and freezer equipment (this will save electricity), change/seal and insulate windows in the dorm rooms (reducing propane and wood consumption), and add solar hot water (this will reduce electric and propane consumption) and a solar PV demonstration area (saving more electricity). The ENTRF 7d-3 program is expected to reduce carbon output by 101,235.5 lbs. per year.

Additionally the Deep Portage/DEED project created several jobs in Cass County. Three part-time wood burners have been hired, and three different wood cutters were contracted to supply us with 130 cords of wood. Most of the woodcutters have a least two or three employees. The ENTRF project will support this project and support additional construction positions.

Estimated Carbon Reduction: The 2009 Deep Portage/DEED project reduced 205,925 lbs. of CO₂; the ENRTF project will reduce 101,235.5. of CO₂. The cost of the 2009 project was \$305,000. Thus the ENRTF step is also a very efficient use of funds. These two projects will reduce our carbon footprint by 38%.

Summary Budget Information for Result 1: ENRTF Budget: **\$212,000**
 Amount Spent: **\$ 0**
 Balance: **\$212,000**

Deliverable/Outcome	Completion Date	Budget	Estimated Carbon Reduction (#s)
1-1 Solar Hot Water	12/31/10	\$30,000	8,883 lbs.
1-2 Envelope & Mechanical Improvements	12/31/10	\$155,000	91,590 lbs.
1-3 Photovoltaic	12/31/10	\$6,000	862.5 lbs.
1-4 Professional/Technical Contracts	12/31/10	\$21,000	0 lbs.

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: 21,000

Supplies: \$0

Capital Improvements: \$191,000 Solar Hot water, Envelope and Mechanical Improvements and Photovoltaic demonstration.

TOTAL ENRTF PROJECT BUDGET: \$212,000

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 throughout 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: We started the carbon reduction process with the aforementioned 2009 Deep Portage/DEED Project. The ENRTF project will be the second step. We have an overall campus goal of carbon reduction and energy efficiency that is expected to cost \$1,000,000 (\$6 million for the total partnership). Deep Portage will continue to work with our five other partners to implement Educational Programs and achieve our goal of modeling efficiency and carbon reduction.

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

C1 In-kind services RELC staff: \$30,000

C2 Continued Project Development, Butler Family Fund: \$30,000

C3 Federal Allocation of \$1,500,000

D. Spending History: \$176,000 Bush Foundation / McKinstry Study

\$30,000 Butler Family Foundaton – Project Development

\$305,000 Deep Portage Foundation / MN DEED project

VII. DISSEMINATION: Information about this project will be disseminated in our center's newsletters, website and blogs ,emails, and annual reports. It will also be discussed in all future New ERA training seminars held on-site at each center.

Energy Resource Advisor (ERA) Certificate

Winona State University is announcing a new curriculum, **Energy Resource Advisor (ERA) certificate**, 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. It is intended to foster understanding and leadership of environmental sustainability in our communities, homes and workplaces.

With Innovation Grant funding from the Minnesota State Colleges and Universities, the ERA curriculum was developed through a collaborative partnership among:

- Winona State University
- Eagle Bluff Environmental Learning Center
- Clean Energy Resource Teams (CERTs)
- Winona County Environmental Services
- U.S. Fish and Wildlife Service
- Other green organizations

Dr. Jeanne Franz, Professor of Chemistry at Winona State University, served as lead curriculum designer, working in collaboration with Teaching Learning Technology staff.

Course Description:

Participants in this class will have a broad exposure to issues in sustainability. They will learn the basic components of an energy audit and will learn about small-scale renewable energy including site suitability, system sizing, and financial incentives that are available. Participants will also learn about alternative building options, ways to green up the home or business, and alternative transportation options. Finally, this class will present information about emerging “green” jobs.

This class will be taught online as well as having a contextual field component. The contextual field component will give participants a chance to apply knowledge gained to real world challenges. After completing this course, the successful participant may serve as an energy resource advisor and “green” consultant in the community and workplace.

Course details:

- 40 hours **online** instruction *plus* 16 hours contextual field experience at one of the six RELC’s.
- Noncredit; 6 Continuing Education Credits (CEUs).
- First-time, introductory cost is \$225 per participant. Following the first offering, the cost will be \$525 per participant.
- Enrollment is limited to 25 students.
- Students should be at least 18 years old and be able to demonstrate strong basic math skills including introductory algebra concepts.

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 ENTRF.

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 Centers (RELCs) 7d-3 Deep Portage Learning Center							
Project Manager Name: Dale Yerger							
Trust Fund Appropriation: \$1,500,000							
2010 Trust Fund Budget	Result 1 Budget:	Amount Spent (date)	Balance (date)	Amount Spent (date)	Balance (date)	TOTAL BUDGET	TOTAL BALANCE
	Implementation of carbon and energy reduction systems for education and demonstration purposes.						
BUDGET ITEM							
Contracts							
Professional/technical: \$21,000 McKinstry contract to design hot water storage, gasification biomass for the Interpretive Center, add an hydronic heater to Energy Center 2, and generally design and specify a system to take propane replacement to over 90%.	21,000		21,000			21,000	
Capital equipment over \$3,500							
Solar Hot Water--50% equipment, 50% installation	30,000	0	30,000			30,000	
Envelope & Mechanical Improvements--50% equipment, 50% installation	155,000	0	155,000			155,000	
Photovoltaic--70% equipment, 30% installation	6,000	0	6,000			6,000	
COLUMN TOTAL							
	\$212,000	\$0	\$212,000	\$0	\$0	\$212,000	\$212,000