Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2014 Work Plan

Date of Report: May 15, 2014

Date of Next Status Update Report: January 1, 2015

Date of Work Plan Approval:

Project Completion Date: June 30, 2016

Does this submission include an amendment request? No

PROJECT TITLE: Itasca Community College Woody Biomass Utilization Project Design

Project Manager: Bart Johnson

Organization: Itasca Community College

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Location: Itasca

Total ENRTF Project Budget:	**ENRTF Appropriation:**	**$112,000**
	Amount Spent:	**$0**
	Balance:	**$112,000**

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 08i

Appropriation Language:
$112,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with Itasca Community College to develop a final design for installation of a boiler heating system using woody biomass. Students at the college must be involved in the final design process.

I. PROJECT TITLE: Itasca Boiler/Woody Biomass Utilization Project

II. PROJECT STATEMENT:

This project will provide a critical step in promoting a more community based and locally stable energy supply. In 2009, Itasca Community College (ICC) began a partnership with the Swedish Bioenergy Association (Svebio) which resulted in an education cooperative for the exchange of ideas and technology. The cooperative's charge is to promote the use of woody biomass for energy in the mid-west and bring Sweden's boiler/energy conversion technology to the US, recognizing that Sweden has experienced a nearly 80% increase in bioenergy since 1990. This shift has led to a decrease of its greenhouse gas emissions by 9% while simultaneously growing GDP by 48% during this same time period.

This project is the final design phase for the final step in a multi-year investigation into biomass heating for district sized heating needs. As ICC began its first phase of investigation in 2009, a Blandin Foundation grant allowed the college to restart its 3-decade-old woody biomass heating system. The project also allowed for a regional analysis of feedstock and characterization of the types of direct from the forest biomass feedstocks available to facilities of ICC's size. A second phase, funded through the Iron Range Resources Board granted funds to install calibration equipment on the boiler and test the direct from forest materials for heat value and cost competiveness with the alternate fuels, specifically, natural gas. Both of these grants recognized the significance of supporting a community-driven sustainable bioenergy project. The results of both phases indicated that direct from the forest fuels can be cost competitive, are readily available, and need to be promoted as a viable and sustainable locally derived fuel source.

To demonstrate the potential for woody biomass usage, ICC must address the existing boiler's fuel feed system and the amount of operator interface time required for operation of the boiler system. Work with the Svebio has identified a boiler system that can utilize these direct from the forest materials, has operator interface requirements similar to a natural gas boiler, and meets the heating needs of the College or similar size district heating loops while be cost competitive with natural gas.

By utilizing a portion of the funds from a Blandin Foundation grant and matching dollars from Svebio and the Itasca Economic Development Corporation (IEDC), pre-design specifications were developed by FVB Energy, Inc. to provide a blue print for the purchase of a more robust boiler, removal of the existing boiler, and re-fitting of the boiler room and feed handling system to utilize the more modern, robust equipment.

This project allows Itasca Community College to begin goal one of four for the final phase of the Itasca Boiler/Woody Biomass Utilization Project:

- Goal 1: Purchase of a robust biomass boiler system to develop a critical "anchor project" that will serve to systematically cultivate a sustainable mechanism that accelerates market development, expansion, and technology transfer activities between clean energy technology actors in Minnesota and in Sweden.
- Goal 2: Project will serve as a success story; a regionally and nationally-recognized commercial demonstration site that showcases a biomass-fueled district energy system utilizing direct from the forest woody biomass fuel products and know-how that delivers reliable, economically competitive (with natural gas), environmentally-friendly, and highly efficient renewable energy.
- Goal 3: The project will increase public knowledge and understanding related to bioenergy, by developing programs related to education, outreach, and training activities in joint cooperation and through knowledge sharing activities with project partners.
- Goal 4: The project will provide the platform for workforce development and certificate programs that aim to develop the necessary skill sets for current and future workers in the bioenergy sector.

III. PROJECT STATUS UPDATES:

Project Status as of January 1, 2015:

Project Status as of July 1, 2015:

Project Status as of January 1, 2016:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Develop Boiler Installation Final Design
Description:
Finalize boiler installation design utilizing pre-design specifications developed in the initial phases of this project. Final design documents will be developed and approved through the Minnesota State College and University (MnSCU) system finance office. The boiler will meet design specifications for utilization of direct from forest material, such as whole tree chipped materials derived from logging site residue.

Students within the Natural Resources and Engineering program will be involved in the boiler design through project work with the Forest Products course. First, students will identify raw material specifications generated from "in-woods" biomass operations. Using this data, students will identify critical deficiencies in the existing system and provide input on new system design features. The goal of these two components is to increase awareness of current technology, understand potential options and identify solutions which are applicable to a district sized heating project.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 112,000
Amount Spent: $ 0
Balance: $112,000

Activity Completion Date: May 30, 2015

Outcome	Completion Date	Budget
1. MNSCU process for soliciting bids and design firm selected	October 30, 2014	$ 5,000
2. Student Input to design process	May 15, 2015	$ 0
3. Completion of final boiler installation design	June 30, 2015	$ 107,000

Activity Status as of January 1, 2015:

Activity Status as of July 1, 2015:

Activity Status as of January 1, 2016:

Final Report Summary:

V. DISSEMINATION:

Description: Sharing status of development for final boiler design specifications developed in this project phase with key project partners. The RFP process and final design documents will be shared with the Minnesota State College and University System (MnSCU) finance division for the purposes of capital bonding funding and project approval. Keep the Bioenergy MOU between Sweden and Minnesota Implementation Task Force updated on status of Itasca Woody Biomass Utilization Project. This will include communications with Swedish Energy Agency, Swedish Bioenergy Association (Svebio), Bio Business Alliance of Minnesota (BBAM), and Skogforsk - Swedish Forestry Research Institution. Project status will also be disseminated to regional woody biomass industry companies, the Itasca Economic Development Corporation, and the initial project sponsors of the Blandin Foundation and the Iron Range Resources and Rehabilitation Board (IRRRB).

Status as of January 1, 2015:

Status as of July 1, 2015:

Status as of January 1, 2016:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	$ Amount	Explanation
Personnel:	$ 17,000	1 project manager for 11% FTE for year 1 and 5% FTE for year 2
Professional/Technical/Service Contracts:	$ 95,000	Professional services for final design, contract preparation and abatement. Contract will be to a single firm determined through MNSCU bidding process.
TOTAL ENRTF BUDGET:	**$ 112,000**	

Explanation of Use of Classified Staff: N/A

Explanation of Capital Expenditures Greater Than $5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 0.16 FTEs

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.5 FTEs

B. Other Funds: N/A

VII. PROJECT STRATEGY:

A. Project Partners:

Project Partners Not Receiving Funds:

- Implementation Task Force for the Bioenergy MOU between Sweden and Minnesota
- Swedish Energy Agency
- Swedish Bioenergy Association (Svebio)
- Bio Business Alliance of Minnesota (BBAM)
- Skogforsk - Swedish Forestry Research Institution
- M & R Chips

Project Partners Receiving Funds: N/A

B. Project Impact and Long-term Strategy:

The Itasca Woody Biomass Project long-term strategy is focused on demonstrating the potential for woody biomass usage as a community based and locally stable energy supply. Itasca looks to serve the education needs that are associated with this. Long-term projects goals:

- Goal 1: Purchase of a robust biomass boiler system to develop a critical “anchor project” that will serve to systematically cultivate a sustainable mechanism that accelerates market development, expansion,

and technology transfer activities between clean energy technology actors in Minnesota and in Sweden. Itasca will pursue funding through additional grant opportunities as well as through the MSNCU capital budget request to the State of Minnesota. This project is part of the 2014 MNSCU and the Governors' capital budget request.

- Goal 2: Project will serve as a success story; a regionally and nationally-recognized commercial demonstration site that showcases a biomass-fueled district energy system utilizing direct from the forest woody biomass fuel products and know-how that delivers reliable, economically competitive (with natural gas), environmentally-friendly, and highly efficient renewable energy. Itasca will pursue this goal through community outreach events and working with project partners SVEBIO, BBAM, Skogforsk, and the Implementation Task Force for the Bioenergy MOU between Sweden and Minnesota to use the Itasca Boiler as an "anchor" demonstration site for the promotion of woody biomass usage.
- Goal 3: The project will increase public knowledge and understanding related to bioenergy, by developing programs related to education, outreach, and training activities in joint cooperation and through knowledge sharing activities with project partners. Itasca will pursue this goal through the same activities listed in Goal 2. In addition, the new boiler will be incorporated into Itasca's Natural Resource and Engineering curriculum.
- Goal 4: The project will provide the platform for workforce development and certificate programs that aim to develop the necessary skill sets for current and future workers in the bioenergy sector. Itasca will work with project and industry partners to identify education opportunities and put in appropriate education programming that will support the woody biomass industry in the state of Minnesota.

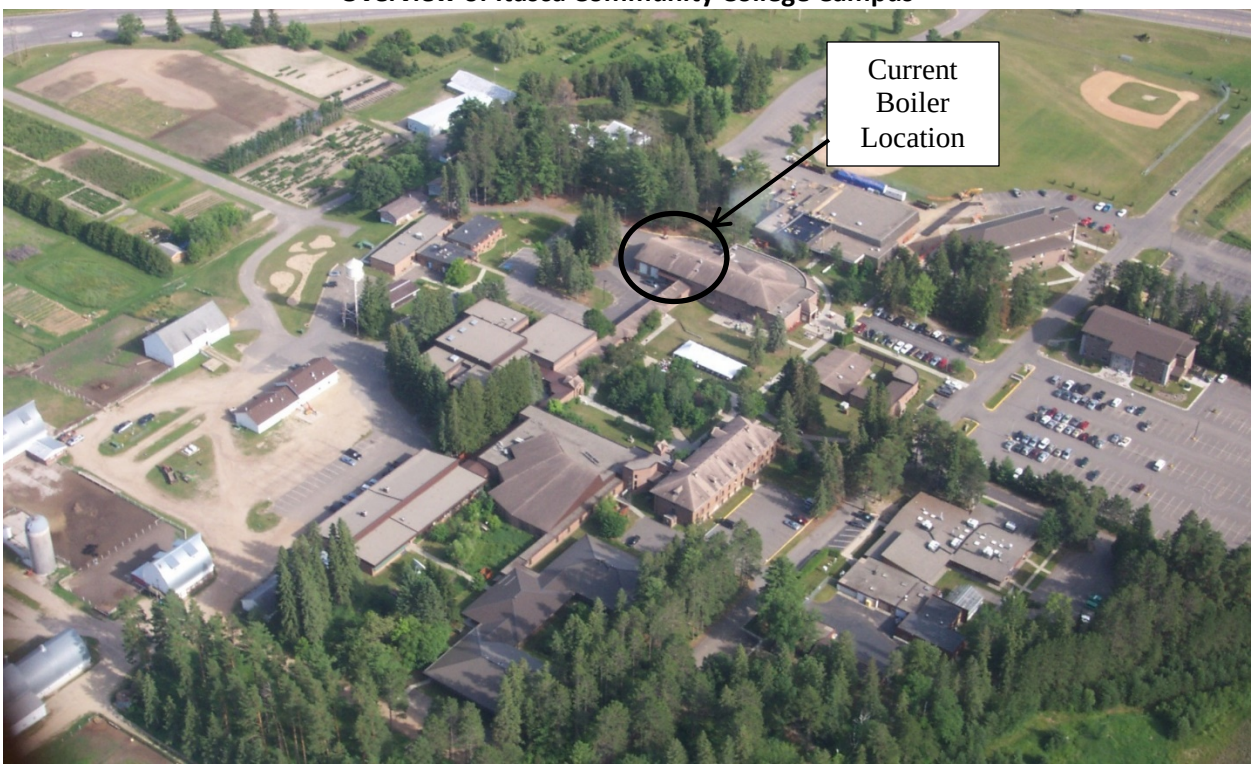
C. Spending History:

Funding Source	**M.L. 2008 or FY09**	**M.L. 2009 or FY10**	**M.L. 2011 or FY12-13**	**M.L. 2013 or FY14**
Svebio			$17,000	
Blandin Foundation	$15,000	$15,000		~$23,000
IRRRB	$15,000	$15,000		
Itasca Economic Development Corporation (IEDC)			$3000	

VIII. ACQUISITION/RESTORATION LIST: N/A

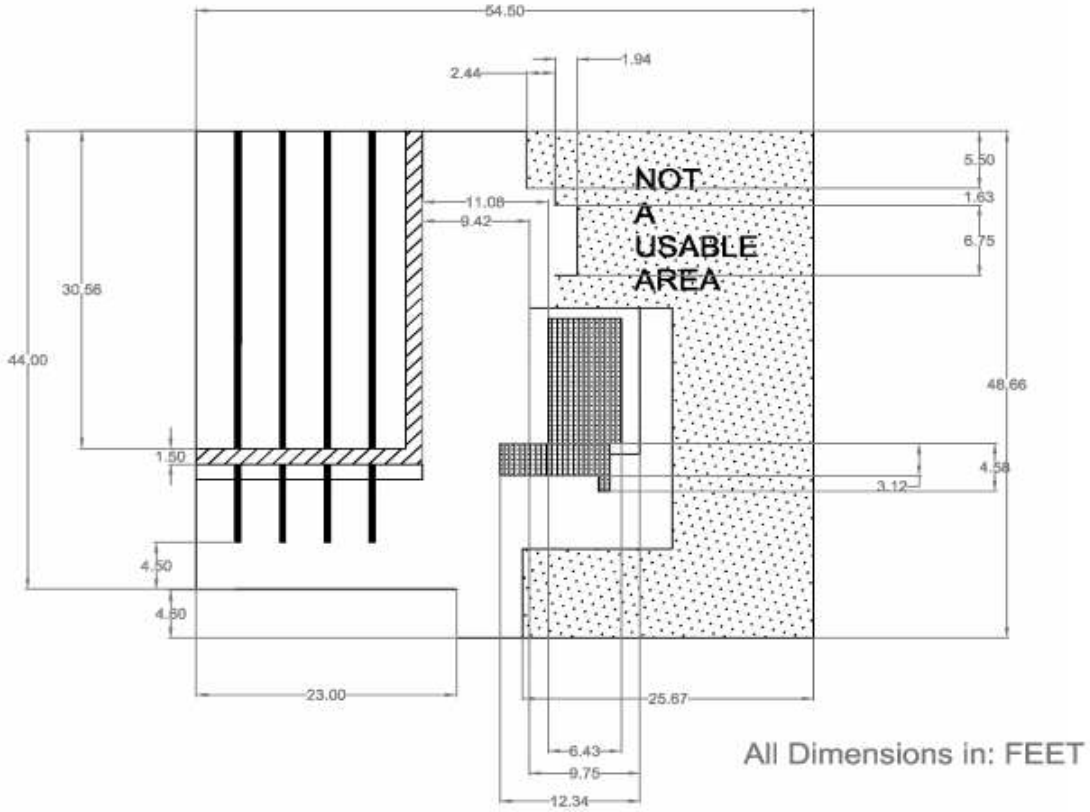
IX. VISUAL ELEMENT or MAP(S):

Overview of Itasca Community College Campus



Boiler Room Layout

(No Changes are planned for building structure)



Current Wood and Natural Gas Boilers

(Current wood boiler will be removed & replaced)

X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET: N/A

XI. RESEARCH ADDENDUM: N/A

XII. REPORTING REQUIREMENTS:
Periodic work plan status update reports will be submitted no later than January 1, 2015, July 1, 2015, and January 1, 2016. A final report and associated products will be submitted between June 30 and August 15, 2016.

Environment and Natural Resources Trust Fund					
M.L. 2014 Project Budget					
Project Title: *Itasca Boiler/Woody Biomass Utilization Project*					
Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 08i					
Project Manager: *Bart Johnson*					
Organization: *Itasca Community College*					
M.L. 2014 ENRTF Appropriation: $112,000					
Project Length and Completion Date: 2 *Years, June 30, 2016*					
Date of Report: May *14, 2014*					
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	**Activity 1 Budget**	**Amount Spent**	**Activity 1 Balance**	**TOTAL BUDGET**	**TOTAL BALANCE**
BUDGET ITEM	***Final design of boiler installation***				
Bart Johnson, Project Manager: $17,000 (70% salary, 30% benefits) (16% FTE total; 11% FTE for year 1 and 5% FTE for year 2)	$17,000	$0	$17,000	$17,000	$17,000
Professional/Technical/Service Contracts					
TBD (competitive bid): Design services for new boiler design.	$95,000	$0	$95,000	$95,000	$95,000
COLUMN TOTAL	**$112,000**	**$0**	**$112,000**	**$112,000**	**$112,000**