

FMC-EF2a

(2.04.02)

**U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION**



RECIPIENT: North Carolina A&T State University

STATE: NC

PROJECT TITLE : Renewable Energy Center

| | | | |
|---|-------------------------------|---------------------|------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| N/A | DE-EE0003138 | GFO-0003138-001 | EE3138 |

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

- B3.6** Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).
- B3.8** Outdoor ecological and other environmental research (including siting, construction, and operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis) in a small area (generally less than five acres) that would not result in any permanent change to the ecosystem.

Rational for determination:

North Carolina A & T State University proposes to use federal funding to develop an efficient conversion process of wood biomass and agriculture residues into fuel for use in an internal combustion engine for combined heat and power. This conversion will use gasification to produce synthesis gas; the gas will then be converted to fuels via catalytic processes. The gasifier will have a 5 kg/h biomass feed rate. This system is anticipated to produce less than 250 gallons per year.

This project will include the construction of a biomass gasification system to include characterization and prep, gasification chemistry, study of reactive particle flow in gasifier, advanced design and operation, investigation of hot synthesis gas cleaning technology, and integration of gasification and synthesis gas cleaning units. This project will also include Fisher-Tropsch synthesis (synthesis gas) to include catalyst screening, preparation and characterization, kinetics and optimization, and reactor design, control, and operation. The syngas will then be utilized for combined heat and power generation and will involve chemistry analysis and the investigation of a gas turbine CHP system. These steps will all be integrated together to form a system, tested, mathematically modeled, and a life cycle analysis will be performed.

The gasifier system will be constructed within a currently existing shelter at the NCA&T farm; other research work will take place in laboratory space on the main campus. Doors will be kept open during gasifier operation and an exhaust fan will also be installed. A permit from the Alcohol Tobacco & Firearms will be required prior to the addition of the Fisher-Tropsch synthesis component of this project.

The applicant has submitted an R & D Questionnaire which thoroughly addresses the chemical and safety protocols associated with this project. The University follows OSHA guidelines and is overseen by the Universities Office of Safety and Health.

This project is comprised of research and development of an optimized gasifier to liquid fuel system for energy; therefore a CX B3.6 & B3.8 apply.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

Eugene Brown 5/3/2011

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Kyrin Kee
NEPA Compliance Officer

Date: 5/26/2011

FIELD OFFICE MANAGER DETERMINATION

Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____
Field Office Manager

Date: _____