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(1.08.09.13)

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

RECIPIENT: ThermoChem Recovery International, Inc. **STATE:** MD

PROJECT TITLE: Improved Feeding and Residual Recovery System for Integrated Biorefinery (IBR)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001689	DE-EE0008249	GFO-0008249-001	

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:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
B1.31 Installation or relocation of machinery and equipment	Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.
B3.6 Small-scale research and development, laboratory operations, and pilot projects	Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to ThermoChem Recovery International, Inc. (TRI) to design, test, and validate optimized feeder and solids removal technologies for the continuous handling of heterogeneous solid materials at Integrated Biorefineries.

The types of activities associated with the proposed project would include data analysis, computer modeling, laboratory scale research and development, equipment installations, and a pilot scale demonstration involving six weeks of continuous (24/7) trials. The proposed project would modify the existing operational capabilities of TRI's 4 ton-per-day process demonstration unit (PDU) with improved systems that introduce a variety of commercially-available feedstocks (including forest residuals, agricultural waste, and sorted municipal waste) into the reactor and remove process residuals. Specifically, the proposed project would design, procure, and integrate: an advanced biomass feeder to handle a larger variety of feedstocks; a classifier system to selectively remove inerts and agglomerates from the reactor; and a residuals removal system to reduce valve wear and improve safety.

All project activities except for equipment fabrication would occur at TRI's previously developed Advanced Development Center in Durham, NC. The PDU was purpose-built for the types of activities being proposed; no physical modifications beyond the installation of new equipment would be required. No equipment would be sited or deployed outdoors. TRI has all the necessary state and local air, water, and hazardous waste removal permits in place, and does not anticipate the need to modify existing permits to perform project activities. Fabrication of the hydraulic press for the feeder would be performed by 3rd party contractor Cunningham Machine Design at their manufacturing facility in Warrendale, PA. Fabrication of the cylinders and hydraulics for the feeder pistons would be performed by 3rd party contractor Airline Hydraulics at their manufacturing facility in Bensalem, PA. No change in the use, mission or operation of existing facilities would arise out of these efforts.

The proposed project would use approximately 330 lb/hr of biomass feedstock, 2400 lbs of aluminum oxide bed

material, 250 lb/hr of steam, 150 lb/hr of nitrogen, and 8 gal/min of water (once-through non-contact cooling water supplied by the municipal water system). The feedstocks to be used are considered non-hazardous based on prior testing; if a previously untested feedstock is used by TRI, chemical analysis would be performed on collected residues to characterize toxicity. Approximately 800 lb/hr of synthetic gas (syngas) would be produced.

Non-hazardous syngas waste, ash, and wastewater would be generated during the gasification of biomass. TRI uses a hazardous waste company to transport and dispose of non-hazardous waste generated onsite. No siting, construction or major expansion of waste storage, disposal, recovery, or treatment actions/facilities would be required. Cooling water used for the hydraulic pack of the feeder and the screw would be disposed of in the city sewer according to the terms of TRI's current waste water permit; this discharge water does not contain any contaminants since it is non-contact water. The proposed project would require the management of hazardous materials including flammable gases and the various contaminants potentially contained in syngas before elimination via a currently permitted oxidizer (e.g. hydrogen sulfide, hydrogen cyanide, hydrogen chloride, ammonia, benzene, VOCs, and SVOCs). All hazardous materials would be managed in accordance with federal, state, and local environmental regulations. To mitigate exposure hazards, TRI has health and safety policies and procedures in place such as employee training, proper protective equipment, gas monitors, and engineering controls.

At the conclusion of the proposed project, the pilot plant would be decommissioned by stopping the throughput of steam and biomass feedstock and purging the system with nitrogen. The ash from the residual handling system would be properly drained along with the bed material in the steam reformer and carbon trim cell fluidized beds. No equipment would be disposed and the equipment would remain in configuration for future use.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 2/13/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 2/15/2018

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager