Department of Energy
Golden Field Office
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DOE/EA-1705

FINDING OF NO SIGNIFICANT IMPACT FOR THE CONSTRUCTION AND OPERATION OF A PROPOSED CELLULOSIC BIOREFINERY, MASCOMA CORPORATION, KINROSS CHARTER TOWNSHIP, MICHIGAN

AGENCY: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: Under the Energy Policy Act of 2005 (EPAct 2005), the United States (U.S.) Congress has directed the U.S. Department of Energy (DOE) to carry out a program to demonstrate the commercial application of integrated biorefineries for the production of ethanol from cellulosic feedstocks. Federal funding for cellulosic ethanol production facilities is intended to further the government's goal of rendering cellulosic ethanol cost-competitive with corn ethanol by 2012 and, along with increased automobile fuel efficiency, reducing gasoline consumption in the U.S. by 20% within 10 years.

In May 2007, pursuant to § 932 of EPAct 2005, DOE issued a Funding Opportunity Announcement (FOA) that requested applications to design, construct, build and operate/validate an integrated biorefinery demonstration employing terrestrial lignocellulosic feedstocks for the production of some combination of (i) liquid transportation fuel(s) that is a fungible replacement for liquid transportation fuels currently used in the existing infrastructure; (ii) biobased chemicals; and, (iii) substitutes for petroleum-based feedstocks and products. Use of a wide variety of lignocellulosic terrestrial feedstocks was encouraged other than feedstocks primarily grown for food. This FOA focused on potential integrated systems meeting the guidance in EPAct § 932(c) (1), (2) and (4). The proposed biorefinery demonstration scale was to be approximately one-tenth of the projected scale of a first-commercial facility. Mascoma Corporation (Mascoma) applied for and was selected to negotiate for an award of financial assistance to aid in the construction and operation of their planned cellulosic ethanol biorefinery that met these criteria.

Based on this selection, the DOE is proposing to provide up to $58.5 million in federal funding to Mascoma Corporation (Mascoma) for the final design, construction, and operation of a cellulose-to-ethanol biorefinery, in Kinross Charter Township, Michigan (Frontier Project). Mascoma's subrecipient, Frontier Kinross, LLC (Frontier), a subsidiary of Frontier Renewable Resources, LLC (jointly owned by Mascoma Corporation and J.M. Longyear, LLC) would develop and operate the biorefinery. DOE has authorized Mascoma to expend Federal funding for preliminary activities including preliminary engineering design, the completion of this Environmental Assessment (EA), permitting, and pilot scale testing. These activities are associated with the proposed project and do

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not significantly impact the environment nor represent an irreversible or irretrievable commitment of Federal funds in advance of the conclusion of this EA. DOE is currently proposing to authorize the expenditure of Federal funding for Mascoma to complete final design, construct, and initially operate the Frontier Project. Based on preliminary construction cost estimates, the total Frontier Project cost would be approximately $245 million.

Mascoma is proposing to use federal funding to design, construct, and operate a biorefinery that would produce ethanol and other co-products from cellulosic materials (the Frontier Project). The initial phase of proposed project would utilize approximately 770 bone dry tons (BDT) per day of clean wood chips (from hardwood pulpwood) to produce up to approximately 21.75 million gallons per year (mgy) of denatured ethanol (or 20 mgy anhydrous ethanol). Eventually the Frontier Project could be expanded to a fully commercial scale operation that utilizes 1,540 BDT per day of clean wood chips to produce 42.5 mgy of denatured ethanol (or 40 mgy anhydrous ethanol). While the DOE is currently proposing to fund the initial 20 mgy facility, the Final EA analyzes the construction and operation of the 40 million gpy facility as Mascoma may expand the facility in the future.

Before DOE can authorize funding for the Frontier Project, DOE must examine the potential environmental impacts of DOE's Proposed Action in accordance with the *National Environmental Policy Act* (NEPA). All discussion, analysis, and findings related to the potential impacts of final design, construction and operation of the Frontier Cellulosic Biorefinery Project, including mitigation measures, are contained in the *Final Environmental Assessment for the Construction and Operation of a Proposed Cellulosic Biorefinery, Mascoma Corporation, Kinross Charter Township, Michigan.* (Final EA; DOE/EA-1705). The Final EA is hereby incorporated by reference.

DOE prepared this FONSI in accordance with NEPA, the Council on Environmental Quality regulations for implementing NEPA, as amended (40 CFR Parts 1500 to 1508), and DOE NEPA regulations (10 CFR Part 1021).

ENVIRONMENTAL IMPACTS: The Final EA examined the potential environmental impacts of the Proposed Action and No-Action Alternative. Under the No-Action Alternative, DOE would not authorize the use of federal funds for the Frontier Project, which DOE assumes for purposes of the EA would not proceed without federal funding. This assumption allows a comparison between the potential impacts of the project as proposed and the impacts of not proceeding with the project.

DOE analyzed forest, biological, cultural and water (including wetland) resources, land use, meteorology, air quality, geology and soils, waste management, hazard and accidents, safety and occupational health, infrastructure, noise, aesthetics, traffic, socioeconomics and environmental justice, as well as cumulative impacts of the proposed project. DOE has determined that for all resource areas there would be no impacts or that the potential impacts would be negligible. During the preparation of the EA, DOE determined that the construction and operation of the Frontier Project would have the greatest potential for impacts on air quality, forest resources, and water resources (specifically wetlands). The analyses associated with these resource areas are discussed in

more detail below. A complete analysis of all potential environmental impacts is presented in the Final EA.

Air Quality

The Frontier Project would be a source of air emissions during both construction and operation. During construction air emissions would consist primarily of fugitive dust generated by site grading and vehicles moving on the site and exhaust emissions from construction equipment and trucks. The primary risks from blowing dust particles relate to human health and human nuisance values. Dust emissions would be minimized by using appropriate fugitive dust control measures, such as road watering, temporary vegetative cover, or dust suppressants, as needed. Therefore, impacts to air quality during the construction phase of the project would be minor and temporary.

Potential emissions during operations would come from several sources. The Michigan Department of Natural Resources and Environment (MDEQ) requires new facilities that would have air pollutant emissions to acquire an air permit to construct prior to beginning construction. The application for the air permit has been submitted to the MDEQ for review. Refined dispersion modeling for the Frontier Project (completed for PM10, SO2, and NO2, and CO) indicated that the project, as described and analyzed in the EA, would not cause or contribute to an exceedance of the National Ambient Air Quality Standards. In addition, State of Michigan requires that all facilities that emit Toxic Air Pollutants (TACs) complete an analysis to demonstrate compliance with the State screening levels that are set to protect the general population, including sensitive subgroups. Based on a combination of screening level analysis and refined modeling analysis, Frontier demonstrated compliance with the TAC requirements.

A life cycle analysis (LCA) for greenhouse gas (GHG) emissions from the proposed Frontier Project was completed using the most recent version of the SimaPro LCA program and database. Emission of all greenhouse gases were weighted according to their 100-year global warming potentials to arrive at the final GHG results. The LCA data is presented as CO_2 equivalent (CO_2e) emission per gallon of ethanol produced. According to the analysis, the proposed Frontier Project yields a net reduction of 26,822 tons per year of CO_2e emissions.

Based on the analysis completed in the air permitting process and the preparation of the EA, DOE has been determined that there will be no significant impacts to air quality as a result of implementation of the Frontier Project.

Forest Resources

The Frontier Project, as analyzed in the Final EA, would require a total of 1,129.8 thousand green tons per year of hardwood pulpwood. Approximately 71,000 acres of timber would be harvested annually to supply the fiber required for the proposed project. Mixed hardwood pulpwood and chips for the proposed Frontier Project would be sourced through the traditional hardwood pulpwood supply-chain infrastructure existing in the Michigan's Eastern Upper Peninsula and Northern Lower Peninsula. Within 150 miles of the proposed Frontier site, there are approximately 8,313,000 acres

of commercial forest lands. This is the portion of the total forest area which has traditionally been harvested and managed as timberlands since the late 1800's. It includes the timberlands of all major ownership groups Federal, State, large commercial, and large to small private forest lands. It is "second-growth", which in many cases has been harvested and re-grown multiple times over many decades. A significant portion of this forest is re-established on lands once cleared and farmed for decades and then later abandoned to return to a forested state.

Utilizing pulpwood from the Eastern Upper Peninsula and Northern Lower Peninsula forests to supply fiber for the Frontier Project would not constitute a new use of the resource. Several pulpwood facilities have closed in the region in recent years and the Frontier Project's pulpwood usage would be similar in total volume, essentially replacing pulpwood previously used by those closed facilities. The effect on the total forest resource would be no different than that created by the harvest that supported the former mills. Mascoma has committed that the Frontier Project will establish a Sustainable Forestry Initiative (SFI) certified procurement process. Mascoma would require that Frontier, through its wood fiber procurement agreements and other supply relationships, work to encourage and influence private landowners and wood suppliers to participate in forest certification initiatives. Mascoma, through Frontier would require verification of logger participation in Sustainable Forestry Education professional logger training and certification programs and conformance to Michigan Best Management Practices.

Based on the utilization of an existing supply-chain for hardwood-pulpwood, availability of feedstock within the project area, and Mascoma's commitment to implementing a certified SFI procurement plan, DOE has been determined that there will be no significant impacts to forest resources as a result of implementation of the Frontier Project.

Water Resources - Wetlands

The proposed Frontier Project site is comprised of 355 acres. The facility would be constructed on the southernmost 40-acre parcel. There were five wetlands identified within the 355 acre site, however no wetlands were identified on the 40-acre parcel where construction would occur. Mascoma, through its subrecipient Frontier, would develop a Soil Erosion and Sediment Control (SESC) Plan to protect the identified wetlands during construction activities. Requirements of the SESC plan are discussed in Section 3.6.3.3. The biorefinery would be designed and operated such that impact to the five wetlands is avoided. Therefore, no impacts to the wetlands on the proposed site would be expected as a result of the Proposed Action.

Rail service to the proposed site would be established by construction of a rail spur from the existing rail line located east of Kinross, Michigan. Frontier has completed and submitted a rail corridor alternatives analysis to the MDEQ for the proposed rail corridor. The alternatives analysis included three potential routes for the rail line and the final route has not yet been selected. A wetland delineation was completed for the entire rail corridor. Fifteen wetlands were identified and then determined to be jurisdictional. Impacts to the identified wetlands may require a joint permit from the MDEQ and the U.S. Army Corps of Engineers (USACE). Once the rail route is selected

Mascoma will work with MDEQ and USACE, in accordance with Section 404 of the Clean Water Act and Part 303 of the Natural Resources and Environmental Protection Act, Public Act 451 of 1994, to determine required mitigation. MDEQ will make the final determination regarding the necessary permitting and mitigation requirements.

Based on Mascoma's commitment to develop and implement a SESC Plan for the project site and implementation of all permit and mitigation requirements dictated by MDEQ's, DOE has been determined that there will be no significant impacts to wetland resources as a result of implementation of the Frontier Project.

PUBLIC PARTICIPATION IN THE EA PROCESS: In accordance with the applicable regulations and policies, DOE sent scoping letters to potentially interested local, state, and Federal agencies, including the U.S. Fish and Wildlife Service (USFWS), the Michigan Department of Natural Resources and Environment (MDEQ), the Michigan Department of Transportation (MDOT), and the Michigan State Historic Preservation Office (SHPO). DOE sent scoping letters to other potentially interested individuals, organizations, the Inter-Tribal council of Michigan, and the Sault Ste. Marie Tribe of Chippewa Indians. DOE also published the Scoping Letter on-line at the DOE Golden Reading Room at http://www.eere.energy.gov/golden/Reading_Room.aspx. The scoping letter described the Proposed Action and requested assistance in identifying potential issues that could be evaluated in the EA. In response to the scoping letters, DOE received comments and questions from individuals, organizations, or agencies regarding the proposed project. Comments received during Public Scoping were addressed, as appropriate, in the EA.

DOE published the Draft EA in the DOE Golden Field Office Public Reading Room for a 30-day review period and sent Notices of Availability (NOA) to interested agencies and individuals indicating that the Draft EA was available on-line for review and comment. DOE received a total of 28 comment letters or e-mail messages regarding the Draft EA. Eleven letters were received from local or regional residents, seven letters were received from local or regional businesses, six letters were received from government organizations or the offices of elected officials, one letter was received from a forestry trade association, one letter was received from an environmental organization, and one letter was received from a tribal health organization. Fourteen of the letters expressed support for the project but did not contain specific questions or comments. Fourteen of the letters contained questions or comments regarding the project. The Final EA summarized the comments and, as appropriate, included specific DOE responses or modifications to Draft EA text.

DETERMINATION: Based on the information presented in the Final EA (DOE/EA-1705), DOE determined that the Proposed Action would not constitute a major Federal action significantly affecting the quality of the human environment within the context of NEPA. Therefore, preparation of an environmental impact statement is not required, and DOE is issuing this FONSI.

Mascoma and Frontier's commitment to obtain and comply with all appropriate Federal, state and local permits required for construction, operation, and other activities related to the Frontier Project,

and to minimize the potential impacts through the implementation of Best Management Practices and various mitigation practices detailed in the EA, shall be incorporated and enforceable through DOE's financial assistance agreement..

The Final EA is available at the DOE Golden Field Office Reading Room Website, http://www.eere.energy.gov/golden/Reading_Room.aspx, and the DOE NEPA Website at http://www.nepa.energy.gov.

For questions about this FONSI, please contact:

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