**Department of Energy**
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

**DOE/EA-1788**

# FINDING OF NO SIGNIFICANT IMPACT

## Sapphire Energy, Inc. Integrated Algal Biorefienry Project in Columbus, New Mexico

**AGENCY:** Department of Energy, Golden Field Office

**ACTION:** Adoption of the United States Department of Agriculture Environmental Assessment and a Department of Energy Finding of No Significant Impact

**SUMMARY**: The United States Department of Energy (DOE) is proposing to provide up to $43 Million in Federal funding to Sapphire Energy, Inc. (Sapphire) for the final design, construction and initial operation of their Integrated Algal Biorefinery (IABR) project near Columbus, New Mexico. The Environmental Assessment (EA) completed by the United States Department of Agriculture (USDA) analyzed the potential environmental impacts associated with the proposed IABR project. The EA was completed by the USDA in response to a loan guarantee application submitted to USDA Rural Development in Albuquerque, New Mexico. All discussion, analysis, and findings related to the potential impacts of construction and operations of the IABR, are contained in the Final EA. Based on the EA, the USDA completed a Finding of No Significant Impact (FONSI), which was published in September 2009. DOE has analyzed USDA's EA, conducted follow-on consultation, and determined the EA to be adequate and satisfactory in describing the proposed project and the potential environmental impacts. Accordingly, DOE adopts the EA and incorporates it by reference into this FONSI.

The scope of the Sapphire IABR project would include the following:

- Construction of a demonstration-scale facility capable of producing 100 barrels per day of refined algal oil.
- Operation of the IABR includes:
  - Propagation and harvesting of algal biomass
  - Extraction of algal oil and conversion to liquid fuels
  - Operation for a three year test period (potentially 2 additional years may be required to obtain required data).
- Decommissioning of the facility includes:
  - Buildings and other permanent structures that can be reused for general industry would be cleaned and left in place
  - Process equipment would be removed and salvaged
  - Other land area would be returned to predevelopment conditions

This FONSI was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality Regulations for Implementing NEPA, as amended, 40 CFR 1500-1508, and Department of Energy NEPA Regulations 10 CFR 1021.322.

Federal Recycling Program Printed on Recycled Paper

This FONSI supports DOE's cost-shared funding of the final design, construction and operation of the Sapphire Energy Inc. IABR project southwest of Columbus, New Mexico.

**ENVIRONMENTAL IMPACTS ANALYSIS:** In compliance with NEPA (42 U.S.C. 4321), USDA's EA examines the potential environmental impacts of a decision to provide a loan guarantee for the proposed project. Under the No Action Alternative, the USDA would not provide a loan guarantee and the project would not be built. The USDA FONSI included mitigation measures that have been met by Sapphire. As part of the adoption process, DOE reviewed USDA's EA for consistency with DOE's NEPA implementing regulations. USDA's environmental impact analyses are summarized as follows and would be entirely consistent with the impacts associated with a DOE decision to provide federal funding to Sapphire.

The proposed IABR project would be constructed on approximately 400 acres of land that was previously used for traditional agriculture and replace it with non-traditional agriculture use. The Natural Resource Conservation Service (NRCS) has verified that no prime farmland, unique, statewide or locally designated cropland is located within the proposed project area, and sufficient agricultural land is available in Luna County for traditional agriculture. Though soil in the area has been classified as highly erodible, activities associated with the project would not increase soil erosion, and best management practices would be employed to minimize ground disturbance.

No floodplains, wetlands, or other waterways of the United States, rivers included in the National Wild and Scenic Rivers Systems, or unique sensitive areas have been identified within the proposed project area. Therefore, no impact to such waters or areas would result from the proposed project.

Discharges to air would not cumulatively result in adverse impacts to air resources. Air emissions from the proposed facility include heat and hydrocarbons from the steam boiler, carbon dioxide (CO2) from the ponds (6,720 metric tons annually), particulates associated with facility construction and truck traffic during operation, and hexane. Air impacts associated with the IABR would be within guidelines included in New Mexico's air quality implementation plan and comply with air quality standards in the region (including the country of Mexico). An air permit is required by the State of New Mexico before construction of the facility, and the determination for a New Source Review or Clean Air Act (CAA) Title V permit would be completed once final designs for the IABR are completed.

Permit requirements ensure minimal impacts to water resources. Approximately 1,900 acre feet of water per year would be used to maintain the ponds (extracted from existing wells); approximately 97 percent would be recaptured during water separation process and the remaining three percent would be retained within the system. The IABR would generate little wastewater; discharges would include water leakage from pond bottoms and line evaporation ponds, storm water, and septic waste from office septic system. No wastewater would be discharged to surface water. Discharge permits would be approved by the New Mexico Environmental Department (NMED). Total dissolved solids (TDS) is the primary constituent of concern associated with the proposed project. It is anticipated that the impact to groundwater would be an addition of 180 mg/L to the existing TDS concentration on the aquifer, which would achieve compliance with New Mexico standards.

The project requires water rights of approximately 3,000 acre feet per year, which would be comprised of a combination of existing water rights and long term leasing rights from adjacent properties. No impacts to water rights of neighbors would result from the IABR project.

No hazardous wastes would be generated by the IABR facility. A small volume of solid waste would be generated from the office, and wastes from the anaerobic digester would be disposed off site in accordance with all applicable regulations.

Transportation impacts include increased vehicle traffic and wear on existing infrastructure during construction and operation of the IABR. During operation, an estimated 30 workers would commute from surrounding communities. Impacts also include those associated with transport of algal oil to the IABR refinery by truck and the existing rail facility in Deming, New Mexico, solid waste collection for the anaerobic digester solid (20-30 round trips per week), CO2 transport, and other related truck trips for supplies. The New Mexico Department of Transportation (NMDOT) was contacted to solicit input on transportation impacts; no comments were received. Trips would be combined, car pooling, and buses would be utilized to reduce impacts. Transportation impacts would be mitigated through implementation of best management practices.

The USDA, with concurrence from the United States Fish and Wildlife Service (USFWS), found no adverse affects to threatened and endangered species associated with the proposed project. However, the USFWS recommends minimizing impacts to birds protected under the Migratory Bird Treaty Act by avoiding construction during bird nesting season or that areas to be constructed during nesting season are surveyed. The USFWS also recommended mitigation measures to reduce potential impacts to burrowing owls.

No significant impact to energy supplies would occur as a result of the proposed project. Sapphire would use conservation best management practices and engineering controls to reduce energy consumption to the greatest extent possible. No impacts to noise, vibration, or aesthetics are anticipated.

No impacts to cultural or historical resources are anticipated in the proposed area and the IABR would not affect any land identified in the Farmland Protection Policy Act.

The proposed area qualifies as an environmental justice population. However, cumulative impacts on socioeconmics would be positive, with the addition of high paying jobs and economic growth through purchase of goods and services from local and regional markets. No negative impacts are anticipated. The project may increase demand on local emergency and security services. Sapphire would secure additional services to overcome the shortfall.

The microorganisms intended for use in this project are not defined as genetically modified microorganisms (GMOs) according to Section 5 under the Toxic Substances Control Act (TSCA). They are also not defined as intergeneric (defined by EPA as "those microorganisms formed by combining genetic material from organisms in different genera" and therefore do not have precommercial notice and permitting requirements under the Section 5 of the Toxic Substances Control Act (TSCA). If, during the DOE project period, Sapphire proposes to use any microorganisms that are defined as GMOs, DOE will conduct a supplemental environmental review of those activities.

**PARTICIPATION IN THE EA PROCESS:** A preliminary notice of the EA was published in August 19, 20, and 21, 2009 by the USDA. No comments were received at the conclusion of the 30-day review period. On June 1, 2010 the DOE sent notice to potentially interested parties providing an additional comment opportunity to potentially interested local, state, and Federal agencies, including the New Mexico Water and Waste Water Division, the New Mexico Energy, Minerals, Forestry, and Resources Conservation Division, the Air Quality Bureau (AQB) of the New Mexico Environment Department, the Bureau of Land Management (BLM) Las Cruces Office, the Environmental Protection Agency Region 6 Office, New Mexico Game and Fish, District 1 of the New Mexico Department of Transportation, the NRCS Farm Service Agency of the USDA, the New Mexico Office of the State Engineer, the New Mexico State Historic Preservation Office (SHPO), the United States Fish and Wildlife Service (USFWS), and the United States Army Corps of Engineers (USACE) Construction Operations Division. DOE received acknowledgement of the notice and no additional comments regarding the proposed project from four state and federal agencies: USFWS, USACE, BLM, and SHPO. AQB acknowledged receipt of the notice and emphasized the importance of obtaining an air quality permit or a Notice of Intent prior to construction of the facility.

**DETERMINATION:** Based on the review of USDA's EA, DOE determines that providing Federal funding to support the final design, construction, and initial operation of the IABR would not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the NEPA.

Therefore, the preparation of an Environmental Impact Statement is not required, and DOE hereby adopts the USDA Environmental Assessment for Sapphire Energy Inc.'s Integrated Algal Biorefinery project and issues this FONSI.

The Final USDA EA is available for review at:
http://www.rurdev.usda.gov/rhs/pss/EnvironmentalDocuments.htm.

For questions about this FONSI please contact:

Kristin Kerwin, NEPA Compliance Officer
DOE Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393
kristin.kerwin@go.doe.gov

For further information on the DOE NEPA Process contact:

Office of NEPA Policy and Compliance
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
(202) 586-4600 or (800)-472-2756

Issued in Golden, Colorado, the 4th Day of August, 2010.

Derek Passarelli
Acting Golden Field Office Manager