FINDING OF NO SIGNIFICANT IMPACT
ADVANCED COAL UTILIZATION BYPRODUCT BENEFICIATION PROCESSING PLANT

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-1498, to analyze the potential environmental consequences of participating in a cooperative agreement with the University of Kentucky Research Foundation (UKRF), Center for Applied Energy Research, on a proposed project is to construct and operate a coal ash beneficiation demonstration plant at the Ghent Power Station in Carroll County, Kentucky. The coal ash beneficiation process, which is based on hydraulic classification and froth flotation, would use coal ash from an existing impoundment to manufacture various concrete additives and construction materials. More specifically, one of the byproducts of this process, pozzolan, when used as an additive to make Portland cement, would result in the production of less carbon dioxide (CO_2) emissions than what would result from Portland cement manufacturing. In addition, using the fly ash from the waste impoundment would decrease the need for additional ash storage capacity, thereby reducing or eliminating the creation of new impoundments.

Based on the analysis in the EA, the DOE has determined that the proposed action is not a major federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969, 42 United States Code 4321 *et seq.* Therefore, preparation of an Environmental Impact Statement is not required, and DOE is issuing this FONSI.

COPIES OF THE EA ARE AVAILABLE FROM:

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BACKGROUND: As part of its mission, the DOE's National Energy Technology Laboratory (NETL) provides science, technology, and policy options for resolving environmental, supply, and reliability issues associated with the use of fossil energy. Consistent with this mission and in partnership with its stakeholders, NETL supports efforts by industry to increase energy efficiency, minimize wastes, reduce environmental impacts, and increase the availability of domestic energy supplies through productivity and operational enhancements.

To facilitate commercial demonstration of technologies that help maintain coal's viability as a stable domestic resource for power generation, DOE/NETL issued a competitive solicitation for projects under a Clean Coal Power Initiative (CCPI) focused on providing opportunities for government to

partner with industry for demonstrating advanced coal-based power generation technologies that foster more efficient clean coal technologies for use in new and existing power plants. Proposals were solicited from the power industry, equipment manufacturing industry, service corporations, R&D firms, software developers, academia, and other interested parties. Candidate technologies were to be demonstrated at commercial-scale facilities to help promote widespread application. The goals of the program were to realize environmental and economic benefits through DOE industry partnerships, and to move promising, yet commercially risky, advanced coal energy systems to market.

DESCRIPTION OF THE PROPOSED ACTION: The proposed action is for DOE to provide, through a cooperative agreement, cost-shared financial support to a CCPI proposal from UKRF for the design, construction, and operation of an advanced coal-ash beneficiation processing plant at the 2,200 MW Ghent Power Station in Carroll County, KY. DOE would provide $4,492,008 (50 percent of the total project cost) under a plan in which the DOE funds would be repaid over a predetermined period if the project is economically successful.

The proposed demonstration facility would process 200,000 tons per year of the fly ash currently stored in the ash impoundment at the Ghent Power Station. As a result of the processing, the plant would annually generate:

- 156,000 tons of pozzolan for concrete;
- 16,000 tons of high-quality block sand;
- 16,000 tons of graded fill sand;
- 1,500 tons of high-quality polymer filler; and
- 8,000 tons of carbon fuel.

Initially, fly ash would be dredged from an inactive waste pond and would undergo hydraulic classification. The ash would be classified by size into a fine (pozzolan) stream and a coarse stream. The pozzolan stream would be treated with a reagent and fine carbon would be separated using froth flotation. The pozzolan stream would then be concentrated, filtered, and dried. A portion of the froth stream would be further processed hydraulically to produce a material with finer particle size (polymer filler), while the tailings of this process (unburned carbon) would be returned to the boiler as fuel. Likewise, the coarse stream produced from the initial classification would be further classified and concentrated into block sand and coarse carbon products.

ENVIRONMENTAL CONSEQUENCES: The Environmental Assessment of the proposed project included consideration of the following resources: Geology and Soils, Cultural Resources, Ecological Resources, Threatened and Endangered Species, Water Resources, Air Quality, Noise, Land Use, Socioeconomic Effects, and Transportation.

Geology and Soils: The proposed facility would be constructed within an inactive ash impoundment using existing access roads. Due to its location, no direct impacts to geological and soil resources would be expected as a result of construction and operation.

Cultural Resources: Based on an EIS prepared by the U.S. EPA for the construction of Units 3 and 4 at the Ghent Station (1978), a cemetery was found to be the only historically significant feature in the area

However, the cemetery was located at the site of the existing coal stock pile and is not in the vicinity of the ash impoundment. Construction and excavation activities would not occur near the coal stock pile, and as a result no cultural resources would be impacted.

Ecological Resources: The proposed project site was previously disturbed in order to create the existing ash impoundment. Construction of the proposed facility would not be expected to impact ecological resources. While the shallow end of the ash impoundment does contain vegetation suitable for wildlife habitat, these areas would not be impacted by the project because the ash in these areas is contaminated with clay and silt and is thus not suitable for processing.

Threatened and Endangered Species: Based on consultation with the U.S. Fish and Wildlife Service, no federally listed or proposed endangered or threatened species exist within the impact area of the project. In addition, according to the Kentucky State Nature Preserves Commission (KSNPC), three federally listed endangered species of mussels exist in the Ohio River near the Ghent Plant, but no construction or excavation would take place near the river. The KSNPC also lists six mussel species, one fish and one amphibian (the Northern Leopard Frog) as "of special concern." Of these, only the Northern Leopard Frog may use parts of the ash impoundment for breeding, but none have been observed during recent spring/summer visits. If any of these "special concern" species are determined to be present, potential impacts would be limited to sedimentation during construction. However, sediment transport is unlikely because runoff must flow through open-water clarifying zones in the eastern end of the impoundment.

Water Resources: Minimal impacts to water resources would be anticipated because the project site is located within the confines of the existing ash impoundment. Limited construction of roofing and concrete pads would mean that impacts to stormwater runoff within the ash impoundment would be negligible. In addition, spill control measures would be implemented to minimize the risks of accidental releases of collecting and frothing agents.

Air Quality: Minor impacts would result from air emissions associated with the proposed project. Fugitive emissions would be expected from construction and excavation activities. These would be controlled based on best management practices already in place for excavation and hauling activities at the Ghent Station. Emissions from the combustion of the collecting and frothing agents that have adhered to the carbon would result in minimal air emissions. Emissions from a pozzolan dryer using natural gas would also be minimal.

Noise: Impacts due to noise related to the proposed project would be minimal. The Ghent Power Station is located in a highly industrialized area and is subject to traffic on U.S. Highway 42, as well as sporadic rail traffic. Primary noise sources within the processing plant would be centrifugal pumps, vibrating screens, and air compressors, with the most significant of these being the compressors. Employees working at the plant would be required to wear hearing protection, and compressors would be enclosed in a sound-proof room. In addition, off-site impacts from noise would be limited due to the lack of receptors (the nearest potential receptor would be located approximately 1,600 feet from the proposed site at the main entrance of the power station). Due to the safety practices in place for on-site receptors and the distance of off-site receptors, impacts from noise would be minimal.

Land Use: Carroll County, Kentucky is a rural area, and regionally the Ohio Valley is primarily agricultural land interspersed with industrial facilities and small communities. No impacts to land use would be expected as a result of construction or operation of the proposed plant. However, if the proposed project is successful, future construction of additional facilities that utilize the proposed technology, as well as growth in industry, could increase industrial land use and limit agricultural land use.

Socioeconomic Effects. Carroll County's economy is based on both agriculture and industry. Farms produce crops such as tobacco, corn, soybeans, garden vegetables, and fruit as well as livestock. Manufacturing employs thirty percent of Carroll County workers. The proposed project would create a limited number of temporary jobs for construction of the plant, and a total of nine permanent positions for operating the plant, including plant operators, a dispatcher, a sale representative, etc. However, creation of these positions would not have significant socioeconomic impacts on the area.

Transportation. The project site is located on U.S. Highway 42, a two-lane road extending from Warsaw, KY, to Carrollton, KY. It accommodates a large amount of commercial traffic from industries located along the route, with approximately 6,000 vehicle-movements per day. During the commercial phase of operations, trucks would use the route to transport products within the local market. Limited truck traffic would be anticipated to transport lightweight aggregate and fill sand. With targeted production of 16,000 tons per year of lightweight aggregate and 16,000 tons per year of graded fill, the estimated amount of products trucked directly to consumers would be 32,000 tons per year, and the anticipated traffic would be 6 to 8 truck movements per day. Indirectly, success of the proposed project could result in the construction of additional facilities that utilize the products produced, and this growth in industry could result in increased truck traffic and/or construction of a barge-loading facility and associated river traffic.

ALTERNATIVE CONSIDERED: In addition to the proposed action, DOE considered the No-Action Alternative, whereby DOE would not provide cost-shared funding for the project. Without DOE participation, fly ash at the Ghent Station would continue to be stock-piled and eventually additional storage impoundments would need to be constructed; however, because this is a previously disturbed site, impacts to geology and soils, cultural and ecological resources, water resources, and threatened and endangered species would be small.

PUBLIC AVAILABILITY: A Draft EA was distributed to federal and state agencies and to the public for review and comment. The Draft EA was also posted on the NETL website. Copies were made available for review at the Carroll County Public Library and the Gallatin County Public Library. No responses were received as a result of the public review.

DETERMINATION: Based on the information and analyses in the EA, DOE has determined that the proposed Federal action, to provide cost-shared financial support for the design, construction, and initial operation of a coal ash beneficiation facility would not constitute a major Federal action that would significantly affect the quality of the human environment, within the meaning of the National Environmental Policy Act. Therefore, an Environmental Impact Statement is not required, and the DOE is issuing this FONSI.

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