FINDING OF NO SIGNIFICANT IMPACT

FOR THE PROPOSED

CALDERON COKEMAKING PROCESS/DEMONSTRATION PROJECT

AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE has prepared an Environmental Assessment (EA) (DOE/EA-1091) for a project proposed by Calderon Energy Company to demonstrate a novel approach for producing metallurgical coke from coal. The Calderon project would involve construction and operation of a commercial-scale coking reactor and auxiliary systems to eliminate emissions of hazardous air pollutants that occur in conventional cokemaking. This completely closed system would collect the sulfur released from the coal during the coking process for sale as a byproduct, significantly reducing emissions of sulfur dioxide to the air. Testing of the coking process would be conducted at Calderon's test site in Alliance, Mahoning County, Ohio, over an 9-month period beginning in March 1996. Based on the analyses in the EA, the DOE has determined that the proposed Federal action is not a major Federal action significantly affecting the quality of the human environment as defined by the National Environmental Policy Act (NEPA) of 1969. 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: The Clean Air Act Amendments of 1990 set new emission standards for hazardous air pollutants from coke ovens. Congress, recognizing that the coke

industry faces technological and financial difficulties in meeting these new, stringent emission standards, required the U.S. Environmental Protection Agency (EPA) and DOE to conduct a joint six-year research and development program to assist the industry in developing and commercializing new technologies and work practices that would significantly reduce hazardous coke oven emissions.

DOE conducted a competitive solicitation for demonstrating innovative cokemaking technology that could effectively control coke oven emissions. From evaluations of the alternative approaches proposed, the best approach for hazardous emission control was therefore selected for support.

DOE's purpose for sponsoring the proposed demonstration project is to provide the coke industry with a new option for the economical production of high quality coke that significantly reduces the quantity of pollutants entering the environment.

DESCRIPTION OF THE PROPOSED PROJECT: The proposed project would establish an 18-month cooperative agreement between the DOE and Calderon Energy Company of Bowling Green, Ohio. Under the agreement, DOE would provide partial funding for the design, fabrication, installation, and operation of a modular coking system capable of producing 48 tons of coke per day.

The purpose of this project is to test a commercial-scale coking reactor and auxiliary systems at Calderon's research site in Alliance, Ohio. At the site, a Process Development Unit (PDU) is available for modification to accommodate the testing. The PDU was constructed by Calderon for tests in an earlier project funded by DOE, the State of Ohio's Coal Development Office, and Calderon, which ceased testing in 1993. Prior to the PDU construction, the site housed a steel foundry that was abandoned in 1955; it was completely razed in 1962. The site was vacant until 1988 when Calderon purchased the property.

The construction activities required to modify the Calderon test unit would involve dismantling portions of the existing PDU, adding a 25-foot by 80-foot extension, and fabricating a 24-foot by 30-foot bay that would be attached to an existing building and serve as an on-site testing laboratory. Modifications to the existing facilities would begin in August 1995, with shakedown and operation beginning in March 1996.

During the testing, sulfur in the process gas would be removed using a hot-gas cleaning system, and the hydrocarbons in the gas would be thermally cracked (broken down) to produce a clean-burning fuel gas. The hot-gas cleaning system would employ an inexpensive limestone sorbent to capture the sulfur. The spent sorbent would be recycled to avoid generating solid waste, and salable elemental sulfur would result.

Testing of coking process would include nine periods of operation (over nine months); each period of operation would last approximately two to three weeks. During the project, 52 million cubic feet of natural gas and 2,615 MWh of electricity would be required to run the test unit. Approximately 18,400 tons of coal would be processed and 37 tons of limestone would be utilized for sulfur removal.

Data collected during the testing would be used for the conceptual design and

cost estimation of a 500,000-ton-per-year commercial facility. The conceptual design for the commercial coking facility is expected to employ an assembly of coking tubes, with each tube being the same size as the one reactor tube proposed for testing at the Alliance facility.

ENVIRONMENTAL IMPACTS: A summary of the major wastes, air emissions, and products to be generated by the proposed project is provided in the table below.

Parameter	Proposed Action
Wastewater	198,750 gallons
Solid Waste	312 cubic yards
Air Emissions	
- **Suspended Particulate**	7,367 pounds
- **SO_2**	16,057 pounds
- **NO_x**	41,041 pounds
- **CO**	9,284 pounds
- **Volatile Organic Compounds**	812 pounds
Products	
- **Coke**	13,248 tons
- **Sulfur**	57.6 tons

AIR QUALITY: The majority of the air emissions would result during testing of the coking process, and would be due to combustion of the clean process gas in the elevated flare on the PDU tower. Flaring of the gas during the intermittent periods of process operations is required due to the nature of the PDU; in a commercial plant, this gas would be used as fuel. The principal emission would be NO_x, which is assumed to be converted to NO_2. The calculated maximum ground level concentration of NO_2 from the flare would be 3.3 microgram/cubic meter, annual average, which is not considered significant compared to the National Ambient Air Quality Standard for NO_2 of 100 microgram/cubic meter, annual average.

TRUCK TRAFFIC: Truck traffic during the 18-month project would result from four activities: (a) delivery of coal and removal of product coke; (b) delivery of limestone; (c) disposal of solid waste; and (d) removal of elemental sulfur. The average daily truck traffic over the 18-month period would be about 2 trucks per day; the average daily truck traffic for the 9-month operational period would be about 4 trucks per day. This volume of traffic is very low compared to the average daily vehicle traffic for Mahoning Avenue (4,200) and State Street (15,400). Assuming that truck traffic would be 10% of total traffic, the additional truck traffic from this project would have a negligible effect on the existing traffic.

NOISE: Construction and operation are not expected to increase the ambient noise

level in the project area. The hydraulic pumps and air compressors for the test unit would be housed in a building away from any residence. The loader transporting coal from the storage pile to the process unit and coke from the unit to the storage pile would be intermittently operated for brief periods of time; the increase in overall noise level is expected to be negligible and short term. Other sources of noise due to plant operation would not be expected to increase the ambient level. Finally, the noise from the trucks delivering coal and limestone and removing coke and sulfur, would be on an intermittent basis and would be confined to the daytime hours (Monday through Friday).

ACCIDENTAL RELEASES: Process upsets or malfunctions that could lead to potential accidental releases from the cokemaking unit would be controlled by rapidly reducing the temperature in the coking reactor. Heating gases for the reactor would be turned off, and as the coking tube cooled the production rate of gases and volatile organic matter generated from the coal would decrease. The sorbent bed used to process the coal gases would be sufficient to handle the gases that would be generated during reactor cooldown. In addition, any malfunction that would result in gas leakage would be automatically or manually controlled by balancing the pressure between the combustion gases and the coal gases. The low pressures in the Calderon process would preclude significant releases of gases if a leak should occur.

SOIL AND GROUNDWATER: Impacts to soil and groundwater are expected to be negligible. While there are no water wells in the immediate area, measurements taken from five EPA monitoring wells on the north edge of the Calderon property determined that groundwater is present at a depth of 23 feet below the surface. The only possible source of contamination under the proposed action would be any runoff (containing particulate matter) from the exposed coal and coke storage pile entering the storm sewer. To prevent this, the coal and coke would be stored north of the PDU tower on level or slightly declined terrain to eliminate any point source discharges to the storm sewer; a low earthen barrier would be constructed to further ensure containment.

SOLID WASTES: Solid wastes would be generated during both the construction and operation phases of the proposed project. Municipal solid waste, after separation of recyclable materials, would be transported by a commercial waste hauler to a permitted landfill. For other solid waste materials generated during construction and operation, each discrete material would be sampled, analyzed, and characterized as hazardous or non-hazardous; and waste profile reports would be developed to establish proper disposal methods.

During the test period, a maximum of 13,248 tons of coke, 552 tons of coke breeze (smaller-size coke particles), and 57.6 tons of sulfur would be produced. Product coke and coke breeze would be characterized at the Calderon site, and coke meeting desired product specifications would be transported to a steel company for quality testing. Coke products outside the specifications would be sold as fuel to a coke reclaimer. Product sulfur would be commercially marketed to a sulfur reclaim facility. If characterization tests on the product sulfur indicate that it is unacceptable, it would be transported to a commercial cokemaking facility and blended with feed coal.

Also, during process operations, fine-size lime particles from the recirculating sorbent stream would be collected in a filter bag. This material would be recycled by blending with the coal feed to the cokemaking operation. Upon

completion of all tests, spent sorbent would be removed from the hot gas cleanup vessel, and characterized to determine if it is hazardous and its proper method of disposal.

HAZARDOUS MATERIALS: To eliminate potential impacts of hazardous materials, the hydraulic fluids in existing equipment would be replaced, and any fluids and oils suspected of containing polychlorinated biphenyls (PCBs) would be sampled and analyzed. Materials determined to contain PCBs would be segregated for disposal in accordance with accepted practices and requirements for their disposal.

Also, Calderon would use two materials with hazardous characteristics, sodium sulfite and sodium hydroxide for boiler water conditioning. The maximum quantity of these materials that would be stored on site is 55 gallons, and storage of these compatible liquids would include provisions for secondary containment. Material Safety Data Sheet information would be communicated to the employees and would be made available to the Ohio Emergency Response Commission, and local emergency response organizations.

LAND USE: Land use impacts are not anticipated as a result of the construction and operation of the Calderon facility. Consultation with the State of Ohio's Office of Historic Preservation under the National Historic Preservation Act has concluded that there would be no effect on cultural resources or historic properties listed in or eligible for listing in the National Register of Historic Places, based on the recent date of construction (1988) for the existing Calderon facilities. In addition, there is little likelihood that any undisturbed archeological remains are present at the existing facilities. The project would not impact Native American tribal or other religious practices or sites.

POLLUTION PREVENTION: Pollution prevention is inherent to the Calderon cokemaking process. With the exception of coal feeding and product recovery, the process would be designed and constructed as an entirely closed operation, with no open transfer points. In addition, materials volatized and gases produced during the tests (e.g., coal tars, benzene, toluene, ammonia, etc.) would be cracked (broken down). The resultant raw gas would be reacted with calcined limestone to produce a clean fuel gas stream containing hydrogen, carbon monoxide, and methane, eliminating the need for either wastewater treatment or byproduct recovery. The spent limestone sorbent would be regenerated to produce a marketable sulfur product and sorbent for recycle.

WATER RESOURCES: Consultation with the U.S. Fish and Wildlife Service under the Fish and Wildlife Coordination Act and the Endangered Species Act confirms that the project would not impound, divert, deepen, control or otherwise modify any stream or other body of water therefore; there would be no impacts to fish and wildlife as a result of the project. In addition, the project site is sufficiently elevated and far enough distanced from the nearest body of water that the site would not be affected by reasonable flood hazards such as the 100-year flood. Finally, in view of the previous land use, the proposed project is not expected to impact any federally regulated wetlands or other waters of the United States.

The project is expected to consume an estimated 4,491,750 gallons of water from the City of Alliance's Municipal Water Department. However, the majority of the water would be utilized to produce steam and fuel gas through the steam and

carbon reactions at various stages of the process. The wastewater (198,750 gallons total or 750 gallons/day) is acceptable in quality for discharge into the municipal sewer system without pretreatment.

HEALTH AND SAFETY: Potential health and safety impacts to on-site workers and the surrounding community resulting from construction and operation of the PDU would be minimized through use of standard industrial practices. Prior to construction, process hazard reviews would be performed to identify potential hazards and incorporate safety engineering design features. In addition, for both construction and operation activities, safety programs would be written and implemented to reduce the risk of accidents. Written hazard communication programs would be established to inform workers of potentially hazardous chemicals. On-going training of personnel would further reduce the risk of accidents and exposure to hazardous substances. Federal regulations would serve as the foundation for the site's health and safety practices.

SOCIOECONOMIC IMPACTS/ENVIRONMENTAL JUSTICE: There would be minimal socioeconomic impacts from the project. The work force in the Alliance, Ohio area is predominantly blue collar; 50% comes from the steel industry and the remainder of the work force is from a variety of diversified companies. Unemployment is at approximately 8%; however, a beneficial impact of the project would be a temporary employment increase for skilled construction workers and operations and maintenance personnel (approximately 20 people).

In addition, no Environmental Justice cases or investigations are active in the Alliance, Ohio area, nor have any reports of concerns been filed. Because the proposed action would take place in an area currently zoned for industrial activity, no disproportionately high or adverse impact on minority or low-income populations is expected.

LONG-TERM/CUMULATIVE IMPACTS: The proposed Department of Energy action would result in testing of the Calderon Cokemaking system for a period of 9 months, after which the experimental facilities would be shut down and purged of feed materials and products. No longer term or subsequent cokemaking operations are planned after completion of the 9-month test program. In addition, no other actions are proposed to be performed at the Calderon site, and there are no other large-scale projects proposed that, in conjunction with the Calderon Cokemaking Project, would create adverse cumulative impacts.

ALTERNATIVES CONSIDERED: In addition to the proposed action, the no-action alternative was considered. Under the no-action alternative, DOE would not provide funding for the development of a cokemaking process capable of reducing the hazardous emissions associated with conventional coke ovens. There are no other practical alternatives to the proposed demonstration project because an existing facility located on an abandoned industrial site would be used. Relocating the existing facility to another site would involve unnecessary monetary expenditures, and would probably produce greater impacts to the natural and human environment.

PUBLIC AVAILABILITY: This FONSI, and the EA on which it is based, will be distributed to all persons and agencies known to be interested in or potentially affected by the proposed action. Additional copies of the FONSI and EA may be obtained from the Pittsburgh Energy Technology Center.

DETERMINATION: The proposed Federal action, to provide cost-shared financial assistance for a demonstration project including the modification of an existing process demonstration unit and operation for producing metallurgical grade coke, does not constitute a major Federal action that would significantly affect the quality of the human environment as defined by NEPA. This conclusion is based on the analyses contained in the EA. Therefore, an Environmental Impact Statement is not required and DOE is issuing this FONSI.

ISSUED IN PITTSBURGH, PA, this 8th day of August, 1995

Sun W. Chun
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