FINDING OF NO SIGNIFICANT IMPACT
FOR
AIR PRODUCTS AND CHEMICALS, INC.
"RECOVERY ACT: DEMONSTRATION OF CO_2 CAPTURE AND SEQUESTRATION OF STEAM METHANE REFORMING PROCESS GAS USED FOR LARGE SCALE HYDROGEN PRODUCTION"
JEFFERSON AND BRAZORIA COUNTIES, TEXAS

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

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE completed a final environmental assessment (EA) for a project under Area 1 of the Industrial Carbon Capture and Sequestration from Industrial Sources and Innovative Concepts for Beneficial CO_2 Use (ICCS). Based on the analyses in this EA (DOE/EA-1846), DOE determined that its proposed action – awarding a grant to Air Products and Chemicals, Inc. (Air Products) to design and demonstrate a state-of-the-art system to concentrate carbon dioxide (CO_2) from two steam methane reformer hydrogen production plants – would result in no significant adverse impacts. In addition, beneficial local socioeconomic impacts would occur from increased employment and spending in nearby communities.

BACKGROUND: Congress appropriated funding for ICCS in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 (Recovery Act), in order to stimulate the economy and reduce unemployment in addition to furthering DOE's ICCS program. DOE solicited applications for this funding by issuing a competitive funding opportunity announcement (DE-FOA-0000015), *Carbon Capture and Sequestration from Industrial Sources and Innovative Concepts for Beneficial CO_2 Use,* on June 8, 2009. The announcement invited applications in two areas of interest: (1) large-scale carbon capture and sequestration projects from industrial sources, and (2) innovative concepts for beneficial CO_2 use.

This project, *Recovery Act: Demonstration of CO_2 Capture and Sequestration of Steam Methane Reforming Process Gas Used for Large Scale Hydrogen Production,* was one of the projects DOE selected for Phase I funding in Area of Interest 1. In Phase I, awardees received funding to complete a Phase II proposal. Phase II projects were then competitively selected from the pool of Phase I awardees. This project was one of nine projects from Areas of Interest 1 and 2 selected for a Phase II award. One part of the Phase II selection process considered potential environmental impacts of all responsive applications pursuant to 10 Code of Federal Regulations (CFR) § 1021.216.

The federal action of providing funding for these ICCS projects requires compliance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. §§ 4321 *et seq.*), the Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508), and DOE's NEPA implementing procedures (10 CFR Part 1021). DOE prepared an EA to evaluate the potential environmental consequences of providing financial assistance to this proposed project under the ICCS program.

PURPOSE AND NEED: The overall purpose for DOE action pursuant to the ICCS program

and the funding opportunity under the Recovery Act is to demonstrate the ability of the Frio formation at the West Hastings Field to accept and retain approximately one million tons per year of CO_2 captured from two existing steam methane reformers (SMR), thus testing large-scale carbon capture and sequestration sooner than might otherwise be possible. The sequestered CO_2 would be used for enhanced oil recovery, resulting in approximately 1.6 to 3.1 million barrels of additional domestic oil production. There is a need for additional research and demonstrations to further our technical understanding of carbon capture and sequestration; to ensure protection of human health and the environment; to reduce costs; to facilitate the full-scale deployment of this technology; and to discover beneficial uses for carbon capture and sequestration.

DESCRIPTION OF THE PROPOSED ACTION: DOE's proposed action is to provide partial funding for an integrated system of CO_2 capture in an industrial setting and geologic sequestration in a sandstone reservoir. The CO_2 that would be sequestered would be separated from the process gas streams of two existing SMR hydrogen production plants, which are located at the Valero Refinery near Port Arthur, Texas; transported via pipeline to the West Hastings Field, an existing oil field in Brazoria County, Texas; and injected into the Frio formation at the West Hastings Field as part of an existing enhanced oil recovery operation. The proposed project would involve construction of two vacuum swing adsorption (VSA) systems to capture the CO_2 from the process gas streams; a compression and dehydration facility; a new cogeneration unit to supply electricity and steam to the VSA systems and SMR plants; and a 12.8 mile long, 8-inch diameter CO_2 pipeline lateral, all of which will be located in Jefferson County, Texas. The proposed project would also involve performance of a research monitoring, verification and accounting (MVA) program to monitor CO_2 injection and sequestration in a portion of the West Hastings Field. DOE would provide approximately $284 million of financial assistance under a cooperative agreement with Air Products to facilitate its proposed project. Air Products' contribution is estimated to be $147 million for a total estimated project cost of $431 million.

ALTERNATIVES CONSIDERED: In addition to the proposed action, DOE considered the no-action alternative as required under NEPA. Under the No-Action Alternative, DOE would not provide funding for Air Products' proposed project. For the purposes of the EA, DOE assumed that the project would not proceed without DOE funding. This assumption established a baseline against which the potential environmental impacts of the proposed project were compared.

ENVIRONMENTAL CONSEQUENCES: DOE evaluated the potential environmental consequences of the proposed project and the no-action alternative. This project would be constructed in two counties. The CO_2 capture units and the CO_2 pipeline lateral would be constructed in Jefferson County. The research MVA program would be conducted in Brazoria County.

DOE considered 14 environmental resource areas in the EA. However, not all areas were evaluated at the same level of detail. DOE focused more detailed analysis on areas that would require new or revised permits, have the potential for significant adverse environmental impacts, or have the potential for controversy. The areas DOE evaluated in more detail included air quality, water resources, geology and soils, floodplains and wetlands, land use, biological resources, historical and cultural resources, environmental justice, transportation, and human health and safety. For these areas, DOE determined there would be minimal potential adverse environmental impacts. Air emissions, underground injection, and construction of the pipeline

lateral may require modifications to existing permits or new permits, but the changes would be minor and not trigger major impacts or controversy.

DOE also evaluated socioeconomics to determine the potential positive benefits of the proposed project on the affected communities. The proposed project is anticipated to result in small increases in local employment and spending, potentially providing a minor beneficial impact to these communities.

The other environmental areas DOE evaluated for potential impacts were noise, utilities and materials, and waste generation. DOE determined that there would be no potential for adverse impacts for these resource areas, or that the impacts would be minimal, temporary, or both. The EA provides more detail on the reasons why DOE did not conduct more detailed evaluations in these areas.

Under the no-action alternative, the project would either be delayed, as Air Products sought other funding sources, or abandoned altogether. The potential environmental consequences of a delayed project would either be the same as the current project, or might change with the project scope. If abandoned, the potential environmental consequences would not occur. Furthermore, the potential beneficial impacts would change or not occur.

PUBLIC AVAILABILITY: DOE issued the Draft EA on May 17, 2011, and advertised its release in *The Port Arthur News* and *The Houston Chronicle* on May 20, 21, and 22, 2011. In addition, DOE sent copies for public review to the Port Arthur Public Library in Port Arthur, Texas and to the Pearland Library in Pearland, Texas. DOE established a 30-day public comment period that began May 17 and ended June 17, 2011. DOE announced it would accept comments by mail, e-mail, and facsimile.

The Draft EA was distributed to various state agencies. DOE also conducted formal consultations by mail with the responsible U.S. Fish and Wildlife Service (USFWS) field office, the U.S. Army Corps of Engineers (USACE), the Texas Historical Commission (the State Historic Preservation Office), the Texas Parks and Wildlife Department, the Texas Commission on Environmental Quality, and Tribal contacts. DOE received correspondence supporting a determination of no potential impacts to threatened or endangered species, and no potential impacts to properties of archeological significance or listed on or eligible for inclusion on the National Register of Historic Places. The June 17, 2011, response from the USFWS requested that Air Products coordinate with the USACE to address post-construction site restoration, requested additional information regarding potential impacts to colonial waterbirds, and made other recommendations regarding operational aspects of the proposed action. The Biological Resources Report in Appendix C of the Final EA was updated to incorporate information from the Texas Parks and Wildlife Department regarding colonial waterbird rookeries in the project area. Based on the information presented in the Final EA, no potential impacts to colonial waterbird rookeries would occur. DOE also met with the Galveston District office of the USACE regarding the potential need for a USACE permit due to the presence of waters of the U.S. (including wetlands) in the project area. A comment from the USACE notified DOE that if USACE Section 10 or 404 permits are required for the project, a request for coordination and/or a permit application must be submitted to the USACE. DOE responded that a preconstruction notification for Nationwide Permit 12 would be prepared by Air Products and submitted to the

USACE. The preconstruction notification was submitted to the USACE on June 15, 2011, and is currently under review.

Copies of the Final EA and this FONSI are available at DOE's National Energy Technology Laboratory web site at http://www.netl.doe.gov/publications/others/nepa/ea.html or by sending a request to:

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DETERMINATION: On the basis of the evaluations in the final EA, DOE determined that its proposed action to provide $284 million in cost-shared funding and Air Products' proposed project to demonstrate the capture and sequestration of CO_2 from steam methane reforming process gas would have no significant impact on the human environment. All potential environmental impacts identified and analyzed in the EA would not be significant. Therefore, preparation of an environmental impact statement is not required, and DOE is issuing this Finding of No Significant Impact.

Issued in Pittsburgh, PA, this 8 day of July 2011.

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