UNIVERSITY
OF WYOMING

School of Energy Resources – Center for Economic Geology Research
Department 3012 • 1000 E. University Ave. • Laramie, WY 82071-2000
(307) 766-6731 • fax (307) 766-6078

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Summary of the CarbonSAFE Project at Dry Fork Station in Gillette, Wyoming

Announced in 2016, the U.S. Department of Energy's (DOE) Carbon Storage Assurance and Facility Enterprise (CarbonSAFE) program is intended to support the development of several large-scale integrated carbon capture and storage (CCS) projects by the 2025 timeframe. Each project must capture and geologically store in one or more saline reservoirs a minimum of 50+ million metric tons (Mt) CO_2 (or approximately 2 million metric tons of CO_2/year over a 25-year project life) with the preferred CO_2 source being a coal-fired power plant. Each project must additionally demonstrate that it is "economically viable," which will require the development of business cases involving utilization of CO_2 such as enhanced oil recovery (CO_2-EOR).

Over the coming decade DOE intends to implement CarbonSAFE through four phases of competitive grant funding, with projects advancing from phase to phase through a down-select process: (1) Phase I (project pre-feasibility); (2) Phase II (storage complex feasibility); (3) Phase III (site characterization); and (4) Phase IV (permitting and construction). DOE is currently implementing Phases I and II. All future phases are dependent upon federal appropriations.

In late 2016, DOE awarded ten research institutions Phase I pre-feasibility awards (for a total of thirteen sites). Led by the University of Wyoming's (UW) Carbon Management Institute (CMI), one of the winning Phase I sites was Dry Fork Station (DFS) in the Powder River Basin (PRB) in Gillette, Wyoming. Teamed with CMI at this site are: Basin Electric Power Cooperative; Energy & Environmental Research Center; Wyoming Infrastructure Authority; UW's Enhanced Oil Recovery Institute; UW's College of Law; UW's College of Business; Advanced Resources International, Inc.; KKR; Carbon GeoCycle, Inc.; Schlumberger; Computer Modeling Group Inc.; and UW's School of Energy Resources. This credentialed team has unparalleled expertise in CO_2 storage projects. The project is separately supported by the Office of the Wyoming Governor; Wyoming Department of Environmental Quality; and the State of Wyoming Legislature's Joint Minerals, Business and Economic Development Interim Committee.

Based in the PRB, the Nation's most prolific coal-producing region, the project benefits from a wealth of existing subsurface data based upon decades of regional mining and oil & gas production activities. The PRB saline storage complex under study is in the immediate vicinity of DFS, existing CO_2 pipeline infrastructure and CO_2-EOR operations that need CO_2. Prior studies estimate 180 million barrels of oil are recoverable via CO_2-EOR in the fields directly adjacent to the PRB storage complex, creating favorable project economics. The project also stands to benefit from synergies created by the DFS-based Wyoming Integrated Test Center (ITC), a new test facility for researchers studying the management and utilization of CO_2 emissions using a slipstream of DFS' flue gas. This summer the ITC will host researchers from the coal-track of the NRG COSIA Carbon XPRIZE, an international competition to incentivize the conversion of CO_2 emissions into valuable products.

Based upon the ongoing Phase I pre-feasibility assessments, the project team has concluded that that the storage complex has the potential to safely, permanently and economically store at least 50+ Mt of CO_2 in secure saline reservoirs. The project's economic model also takes into account potential sources of revenue, such as sales of CO_2 for EOR (approximately $68 million/year). These and related pre-feasibility assessments continue.