PLAINS CO_2 REDUCTION (PCOR) PARTNERSHIP (PHASE III) WILLISTON BASIN TEST SITE GEOCHEMICAL WORK INITIATED – MILESTONE M6

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PROJECT DESCRIPTION

Activities will be conducted in an oil field in the U.S. portion of the Williston Basin to evaluate the potential for geological sequestration of CO_2 in an oil reservoir for the dual purposes of CO_2 sequestration and enhanced oil recovery (EOR). Phase I studies indicated that the Williston Basin oil fields may have over 500 million tons of CO_2 storage capacity associated with potential EOR operations. It is likely that the target injection zone for the project will be located at a depth of between 6000 and 12,000 ft.

BRIEF SUMMARY OF GEOCHEMICAL WORK PLAN

The goal of this activity is to develop laboratory- and field-based data sets and model the interaction between the injected gas, the reservoir fluids, and the rocks to determine 1) the potential amount of CO_2 that may be stored through mineral precipitation; 2) the effects of CO_2-related dissolution and/or mineral precipitation on permeability and injectivity; and 3) the effects of dissolution and/or mineral precipitation on the geomechanical properties of the reservoir and seal rocks. A mineralogical assessment of core samples will be performed to predict the amounts and nature of mineral trapping of the injected gas. Mineral compositions will be obtained using an electron microprobe. Powdered samples will be analyzed by scanning electron microscopy techniques, x-ray diffraction and x-ray fluorescence. The compositional data will be used to perform geochemical modeling to assess the long-term fate of acid gas in the subsurface. Laboratory data and modeling results will be compared with data generated in the field over the course of the demonstration.

MILESTONE

A series of laboratory experiments have been initiated to determine the effects of carbon dioxide on reservoir and seal rocks from potential injection zones that are being considered to host the Williston Basin demonstration site. It is anticipated that these experimental activities will result in the generation of currently unavailable data regarding geochemical reaction rates. A detailed evaluation of several geochemical modeling packages (including PHREEQC and TOUGHREACT) has also been initiated. Ultimately, the laboratory data will be incorporated into the geochemical modeling activities, the results of which will be compared to data collected in the field not only from the Williston Basin site, but from other CO_2 storage projects in similar geological settings.