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whereby 400 tons of supercritical CO2 was injected into a well over a 2-day period and allowed to “soak” as one of the key commercial applications of geological storage that will provide valuable insight into large-scale projects aimed at reducing CO2 emissions to the atmosphere. The Plains CO2 Reduction Partnership, one of the seven U.S. Department of Energy National Energy Technology Laboratory Regional Carbon Sequestration Partnerships, was established in 2004 to evaluate the technical and economic viability of long-term storage of CO2 in geologic formations. The partnership is located in the Williston Basin of North Dakota and encompasses portions of North and South Dakota, Montana, and Wyoming.

ABSTRACT

Injection of carbon dioxide (CO2) for the purpose of enhanced oil recovery (EOR) is widely regarded as a viable method to offset CO2 emissions from the oil and gas industry. This study presents an overview of the experimental setup and results of a pilot project conducted at the Northwest McGregor Oil Field for CO2 Storage and Enhanced Oil Recovery (EOR) in northeast North Dakota. The purpose of this paper is to outline the approach and current observations for the numerical modeling of CO2 injection processes in reservoirs with similar characteristics to the Northwest McGregor Oil Field. The experimental setup consisted of a pilot injection well located in the Three Forks Formation, which was subjected to chromatography, and its composition was measured before and after stimulation. The live water pH measurement service offered by Oilphase, a specialized service provider, was performed to determine the effects CO2 will have on the productivity of the reservoir, wellbore integrity, and productivity. A semiquantitative technique, and it is unable to identify phases below 1 to 5 weight percent, and if solid solutions are present in the system, they will be denoted.

CONCLUSIONS

The experimental setup described in this paper is intended to provide valuable insight into future commercial-scale CO2 injection projects. The pilot injection at the Northwest McGregor Oil Field in northeast North Dakota provided valuable data on the effects of CO2 injection on the reservoir rocks, wellbore integrity, and productivity. The results of this study can be used to support the development of numerical models for predicting the behavior of CO2 injection projects and to design more efficient injection strategies. In addition, the results of this study can be used to design more efficient injection strategies for future CO2 injection projects.

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References