CO2 Sequestration Potential of Texas Low-Rank Coals

Quarterly Technical Progress Report

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DISCLAIMER

ABSTRACT

The objectives of this project are to evaluate the feasibility of carbon dioxide (CO_2) sequestration in Texas low-rank coals and to determine the potential for enhanced coalbed methane (CBM) recovery as an added benefit of sequestration.

The main objectives for this reporting period were to work on Tasks 1 and 2, which consisted of the following subtasks: review literature on CO_2 sequestration and the effect of CO_2 injection on methane production from coalbeds; acquire information on power plant flue gas emissions; acquire data on Texas coal occurrences and properties and formation water quality; construct a digital base map; and select geographic areas and geologic formations for study.

Flue gas information, including volumes and compositions, were obtained for major Texas power plants and other industrial sources, such as cement plants. We evaluated and obtained computer mapping software and began building a digital base map that will be used to depict industrial emissions, coal occurrence, and water quality information. Digital data sets allow us to superpose data for visualization and for assessment of CO_2 sequestration issues.

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INTRODUCTION

The main objective of this project is to investigate the feasibility of CO_2 sequestration in Texas low-rank coals. For this reporting period, our objectives consisted of locating the major point sources of CO_2 emissions, obtaining coal property (quality) information for Texas low-rank coals, and acquiring information on ground water properties. Protected aquifers and their limits must be known in order to ensure that they are not selected for CO_2 injection. The locations of greenhouse gas emissions, as well as volumes and composition, are necessary to rank industrial sources and to assess their proximity to low-rank coals that may be used for sequestration.

EXPERIMENTAL

None.

RESULTS AND DISCUSSION

Large amounts of CO_2 are produced by many industrial sources, primarily power plants, throughout Texas. We identified these major point sources of CO_2 and began constructing a digital map. We obtained data such as the flue gas composition and the amounts of CO_2 emitted on a yearly basis for each major source. We then compiled a table with source type, emission volumes, flue gas composition, and contact information for each major CO_2 source.

Locations of freshwater aquifers and their limits are important considerations. Water salinity values must be known in order to inject at depths where the water is not protected. This information will be used to identify areas and depths where CO_2 sequestration would be permitted for the Wilcox, Yegua, and Jackson low-rank coals. Once we have completed gathering information on CO_2 emissions, coal properties, and hydrology, three sites will be chosen for a detailed investigation.

Mapping software packages were compared to see which would be the most effective. We selected the software and obtained the coordinates for county lines and major rivers that will be included in the maps.

We are compiling an annotated bibliography of technical papers and reports used in our investigation. Also, literature concerning other forms of CO_2 sequestration was reviewed to assess the advantages and disadvantages and the technical issues common among the methods. Literature on gas sorption in coal, factors affecting gas-content distribution in coalbeds, and compositional variability and origins of coal gases was also reviewed.

CONCLUSION

None at this time.

REFERENCES

None.