

Southwest Regional Partnership on Carbon Sequestration

Quarterly Progress Report

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Reid Grigg, PI, Brian McPherson, PI, and Robert Lee, Project Manager

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Recipient: New Mexico Institute of Mining and Technology
801 Leroy Place
Socorro, New Mexico 87801

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Executive Summary

Tasks addressed in this quarter were Tasks 2, 4, 6, and 8.

In Task 2–Public Outreach and Education, the SWP version of simulation and management platform Velo, was launched and SWP held its first STOMP and Velo training workshop in June.

In Task 4–Site Characterization and Modeling, a variety of objectives was accomplished. Researchers evaluated FWU core and well-log availability; all gathered FWU data were implemented appropriately into SWP’s GIS database for FWU. Analysis of induced seismicity potential at FWU began, with the objective of reservoir simulation analysis. A review of FWU core at the CGG Core Repository was planned and a technical memo on oil-based muds for drilling and core retrieval, related to concerns about Morrow shale sensitivity and related drilling and coring problems, was submitted to project administrators. Revisions and updates of the FWU model grid and development of relative permeability formulations continued. Researchers began developing algorithms to convert TOUGHREACT, ECLIPSE, and STOMP grids to model grids for each of the other simulators. Researchers also conducted a simulation sensitivity analysis focused on the effects of grid (cell) size to optimize the FWU reservoir design simulator. Researchers developed a detailed workflow for inverse analysis of pressure fields to evaluate anomalies (leakage pathways or high permeability zones) in the monitored pressure field. A pressure management strategy for different injection/production patterns for the FWU CO₂-EOR operation, based on an existing model, was developed and a draft report written. Researchers developed a preliminary framework for understanding CO₂ storage potential within an EOR-sequestration environment. SWP personnel focused much effort on the SWP Work Plans and initial drafts of all four work plans were completed.

In Task 6–Operational Monitoring and Modeling, work progressed on a number of fronts. Researchers continued to work on design and development of a methane surface flux chamber and an eddy covariance flux tower. Oil and water samples from the Farnsworth Unit were taken and analyzed. SWP researchers studied the seismicity near the Farnsworth field, meeting at the beginning of the quarter to review the seismic inversion process and continued with processing of recorded seismic data. Researchers also continued to work on the development of STOMP-EOR, with the SWP-Velo framework currently operational.

In Task 8–Project Management, a Contract Modification with site approval was received by NMT on April 10, 2013. SWP held the FWU Site Kickoff Meeting in Oklahoma City on April 9–10, 2013, and participated in the 12th Annual CCUS in Pittsburgh with the other regional partnerships. Considerable progress was made towards finalizing the Site Contract with CELLC. Liability and indemnity were major issues, as trying to put together the unique and appropriate level of coverage proved to be a challenge. NMT lawyers worked with insurance companies to determine a reasonable level of insurance, which, though not a game stopper, slowed progress on the contract considerably. In addition, discussion of termination and litigation clauses created a slowdown on the contract during this quarter.

TASK 2 Public Outreach and Education

Researchers launched the SWP version of Velo, PNNL’s simulation and management platform, for the SWP. Key activities included file organization and implementation of user accounts. Additionally, the SWP held its first STOMP and Velo training workshop during June 2013, on the University of Utah

Task 4 Site Characterization and Modeling

Subtask 4.1 Existing Data Gathering and Interpretation

A Coring and Core Analysis Plan for the Farnsworth Unit was developed by SWP researchers, whose main contribution was to recommend coring intervals for new wells that are scheduled. Chaparral needed this information to plan drilling and coring activities. The coring plan for the first to-be-cored new well (13-10A) targets the reservoir or Morrow Buckhaults (or simply “B”) sandstone and the immediate overlying Morrow shale and the Thirteen Finger Limestone. The goal is to core reservoir sandstone and immediate overlying seals, with a total core length of 240 ft. The Coring and Core Analysis report includes additional details on core field handling and delivery to the core-analysis company, and safety-related issues.

In May, a technical memo on oil-based muds for drilling and core retrieval was submitted to project administrators, meant to help the SWP and Chaparral make decisions on the use of oil-based muds. Chaparral had concerns about Morrow shale sensitivity and related drilling and coring problems. The memo contained information from conversations researchers had with Core Labs and TerraTek.