Plains CO_2 Reduction (PCOR) Partnership Monthly Update
September 1–30, 2010

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued efforts planning the annual meeting workshop, including participation in a logistics meeting held on September 7 and a full-day run-through meeting held at the Energy & Environmental Research Center (EERC) on September 8.
- Generated maps of the Bell Creek oil field area showing the distribution of the small communities within a 50-mile radius.
- Completed efforts to compile information on the regional characterization of the large stationary sources for inclusion in Deliverable (D)1 entitled "Review of Source Attributes Update 1."
- Recalculated regional coal capacity information and transmitted the data to NATional CARBon Sequestration Database and Geographic Information System (NATCARB) personnel for inclusion in the soon-to-be-released U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) atlas.
- Targeted the Rival oil field in north-central North Dakota for detailed characterization with respect to enhanced oil recovery (EOR)-based CO_2 storage. Continued performance of characterization modeling utilizing the Petrel software package, including the following:
  - Created Rival log suite in Excel containing 240 wells in four fields.
  - Identified 38 well logs that had not been previously digitized.
  - Imported the oil field boundary definitions into the Petrel project.
  - Imported LAS (Log Ascii Standard format) logs into the Petrel project.
  - Imported tops from previous Rival projects into the new Rival Petrel project.
- Continued efforts preparing new images and figures for inclusion in PowerPoint presentations, posters, fact sheets, etc.
- Efforts conducted as part of the continuing work at the Zama, Alberta, Canada, field site included the following:
  - Participated in a project meeting with Apache Canada Ltd. (Apache), in Calgary, Alberta, on August 30. The following action items were determined:
    - The EERC will acquire new seismic data over the "F Pool," tracer injection, and fluid sampling.
    - Apache will conduct a brief evaluation of seismic techniques.

    - ♦ The EERC will generate a list of data needs for the creation of a static geological model of the pinnacle.
  - Continued efforts to perform laboratory studies on the cement types utilized in the Zama wells to determine the likelihood of potential reactions and the implications to integrity of the system.
  - Developed a preliminary static model of the Zama "F Pool" based on data sets collected over the past four project years. Continued planning efforts to improve the model, including collection of the following data:
    - ♦ Geologic framework, degrees of heterogeneity, and reservoir properties
    - ♦ Injection target and sealing formation data from Apache
    - ♦ Seismic information acquired after the winter drilling season
    - ♦ Cement integrity studies (with planned kickoff in November)

Task 2 – Public Outreach and Education (Daniel J. Daly)

Highlights

- Continued efforts planning the annual meeting workshop using the Implications Wheel®, including the following:
  - Participated in a run-through exercise on September 8 and conducted follow-up interviews with participants.
  - Held conference calls and/or meetings on September 23 and September 30 to discuss workshop content and logistics.
- Traveled to Amsterdam, The Netherlands, to participate in the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-10), including the following:
  - Presented a poster on behalf of the Regional Carbon Sequestration Partnerships (RCSP) Outreach Working Group (OWG) on September 22.
  - Participated on September 22 on a panel in a side meeting held by the Bellona Foundation, an international environmental nongovernmental organization based in Norway.
  - Participated in a meeting of the International Energy Association's Social Science Network on September 23.
- In cooperation with Prairie Public Broadcasting (PPB), granted permission to the U.S. Environmental Protection Agency (EPA) to use PCOR Partnership documentary video clips in the development of an EPA climate change Web site.
- On September 16, participated in the OWG monthly conference call.
- Continued efforts on the modification and creation of new fact sheets for distribution at upcoming events.
- Prepared a poster on behalf of the OWG highlighting the Aquistore (Canada) project's and RCSPs' use of outreach best practices for presentation at the RCSP Annual Review Meeting scheduled for October 5–7, in Pittsburgh, Pennsylvania.
- Completed efforts for the finalization of the fifth documentary entitled "Global Energy and Carbon: Tracking our Footprint," including the following:
  - Presented the documentary for final EERC review on September 2.
  - Produced a draft of the final fact-check document.
  - Finalized graphics and narration revisions based on the fact-check activities.
  - Scheduled the broadcast date with PPB for October 18.

  - Scheduled the review of the final broadcast-ready copy for October 1.
- Continued outreach tracking activities and held an in-house discussion on September 28 to determine the best formats and usage of the data.
- Continued in-house discussions regarding outreach efforts to community libraries and development of an image archive with PPB.
- Participated in development of an exhibit booth for the North Dakota Library Association (NDLA) 2010 Annual Conference scheduled for September 29 – October 2, 2010, in Grand Forks (www.ndla.info/Conference/10conf.htm) as the next step in the efforts to encourage area libraries to stock the PCOR Partnership atlas and documentaries to help reach the general public and school-age children.
- Received notification on September 22 that the Government Documents Roundtable of NDLA had nominated "Managing Carbon Dioxide: the Geologic Solution" (DVD) for its 2010 Notable Document Award; the Roundtable then distributed the PCOR Partnership link for the online streaming version of the documentary to all NDLA members.

Task 3 – Permitting and NEPA (National Environmental Policy Act) Compliance (Lisa S. Botnen)

Highlights

- Participated in an in-house Fort Nelson Carbon Capture and Storage (CCS) Feasibility Project meeting on September 1 with personnel from Spectra Energy.
- Reviewed a 96-page report entitled "The Legal and Regulatory Treatment of Carbon Capture and Storage (CCS) in Canada and the United States" prepared by Nigel Bankes for Natural Resources Canada.
- Initiated development of a "regulatory roundup" to be distributed at the annual meeting in October.
- At a partner's request, provided a brief overview of CCS long-term stewardship options under consideration in the United States and Canada.
- Attended the North Dakota Petroleum Council annual meeting in Minot, North Dakota.
- Distributed to meeting participants (via e-mail) the summary of the Deadwood regulatory meeting held in July. The summary will be uploaded to the partners-only Decision Support System (DSS, © 2007–2010 EERC Foundation).

Task 4 – Site Characterization and Modeling (James A. Sorensen)

Highlights

- Participated in a meeting in Grand Forks, North Dakota, on September 1, with Spectra Energy to review preliminary modeling results.
- Attended GHGT-10 in Amsterdam and presented several posters on September 22, including the following:
  - "The Fort Nelson Carbon Capture and Storage Feasibility Project – A Program for Large-Scale Geologic Storage of CO_2 from a Natural Gas-Processing Plant in British Columbia, Canada"
  - "Northwest McGregor Field CO_2 Huff 'n' Puff: A Case Study of the Application of Field Monitoring and Modeling Techniques for CO_2 Prediction and Accounting"
  - "Modeling CO_2–H_2S–Water–Rock Interactions at Williston Basin Reservoir Conditions"

  - "Investigation of Geochemical Interactions of Carbon Dioxide and Carbonate Formation in the Northwest McGregor Oil Field after Enhanced Oil Recovery and CO_2 Storage"
- Participated in a monthly conference call on September 28 with Spectra Energy regarding action items and upcoming issues for the Fort Nelson CCS Feasibility Project.
- Prepared a draft version of the geomechanical work plan (D87) for the Bell Creek CCS project.

Task 5 – Well Drilling and Completion (Steven A. Smith)

Highlights
- Nothing to note at this time.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights
- Attended the 2010 CO_2 Capture Technology Meeting held September 13–17, 2010, in Pittsburgh, Pennsylvania (www.netl.doe.gov/events/10conferences/co2capture/index.html).
- Continued editing process on the draft capture technology value-added report.
- Completed this year's update and quality assurance/quality control check of the CO_2 emission sources database.
- Addressed a question from a PCOR Partnership partner regarding the production of methane from brine formations as a result of the injection of CO_2.
- At the request of a PCOR Partnership partner, the Integrated Environmental Control Model was used to estimate the composition of flue gas generated by combustion of Powder River Basin subbituminous coal at an "average" subcritical power plant.

Task 7 – CO_2 Procurement (John A. Harju)

Highlights
- Continued discussions with potential CO_2 suppliers. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations (Steven A. Smith)

Highlights
- Nothing to note at this time.

Task 9 – Operational Monitoring and Modeling (Charles D. Gorecki)

Highlights
- Initiated research and construction of a geologic model of the Bell Creek field in Montana.
- Continued lab testing of outcrop samples of rocks similar to the reservoir and cap rock found in the Bell Creek field (including porosity and permeability measurements and, eventually, relative permeability).
- Continued working on the June 2010 Fort Nelson Geologic Model – the base case geologic model is completed, and upscaling and model validation have been initiated.

- Participated in a conference call discussion regarding the RPS Energy Canada (subcontractor) scope of work, in particular:
  - Modeling the CO_2 heat loss down the prospective wellbore to determine what temperature it will be when it reaches the reservoir.
  - Performing some near wellbore modeling to determine the potential for thermal fracturing as a result of the injection of comparatively cold CO_2 and hot formation and formation fluids.
  - Managing the Hycal lab work for the Fort Nelson core samples, including the following tests:
    - Basic core tests
    - Relative permeability tests
    - Cap rock integrity tests
    - Geomechanical testing
    - CO_2 and H_2S solubility testing
- Began preparation of an abstract for AAPG's 2011 Annual Conference & Exhibition (www.aapg.org/houston2011) on characterization and modeling of the Rival oil field for potential CO_2 EOR.
- Organized a training opportunity in Houston, Texas, for research staff to learn Techlog Petrophysics, a new Schlumberger petrophysical software package.
- Participated in the September 28 conference call with Spectra Energy.
- Completed testing of the high-performance computing cluster and initiated the purchasing process.
- Attended GHGT-10 and copresented a poster entitled "An Overview of the IEA Greenhouse Gas R&D Programme Regional Geologic Storage Capacity Studies" on September 22.
- Risk management activities continued, including the following:
  - Updated the risk management portion of the project management plan (PMP).
  - Organized an in-house meeting on September 10 to discuss the path forward for the next round of Fort Nelson risk assessment.
  - Distributed an action item list to Fort Nelson project team members.
  - At GHGT-10, the poster entitled "A New Risk Management Methodology for Large-Scale CO_2 Storage: Application to the Fort Nelson Carbon Capture and Storage Feasibility Project" was presented by EERC staff in attendance.

Task 10 – Site Closure (to be announced [TBA])

- This task is anticipated to be initiated in Quarter 1 – Budget Period (BP)5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling (TBA)

- This task is anticipated to be initiated in Quarter 1 – BP5, Year 9 (October 2015).

Task 12 – Project Assessment (Katherine K. Anagnost)

Highlights

- Nothing to note at this time. The next project assessment report is due December 31, 2010.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- Continued to review various methodologies for the development of a PCOR Partnership programmatic risk assessment.
- Continued efforts on the update to the PMP.
- Hosted Spectra Energy's Fort Nelson project team at the EERC on September 1.
- Participated in a conference call on September 2 with Environment Canada about a potential collaboration on a project.
- Provided expenditure information in response to a request received from Spectra Energy.
- Continued planning the upcoming annual meeting and workshop.
- Presented a PCOR Partnership Program overview at the EERC Hydrogen Action Summit on September 13.
- Program staff reviewed Chapter 6 from the draft Terrestrial Best Practices Manual (BPM) and provided comments on September 9.
- John Harju participated in the 4th Annual American Conference Institute's Carbon Capture and Sequestration Summit on September 29–30, 2010, in Washington, D.C. (www.carboncapturesummit.com/agenda.html)
- Attended GHGT-10 in Amsterdam and presented an overview of the PCOR Partnership Program on September 23.
- Forwarded the FE Techline regarding the Zama project (posted September 23) to the partnership along with the link to the Zama Regional Technology Implementation Plan on the partners-only Web site.
- Continued planning the annual meeting and workshop, including sending out a hotel deadline reminder to the partnership on September 21, compiling information for the product CD, and contacting presenters and sponsors.
- Participated in a conference call with the Fort Nelson CCS Feasibility Project's project manager on September 27 and in a monthly conference call, including all of the key Spectra Energy and EERC staff working on the Fort Nelson project, on September 28.
- Deliverables and milestones for September:
  - August monthly update
  - Task 1: D1: review of source attributes update 1
  - Task 4: M9: Bell Creek test site geological model development initiated
  - Task 9: D52: Fort Nelson test site – site characterization, modeling, and monitoring plan

Task 14 – RCSP Water Working Group Coordination (Charles D. Gorecki)

Highlights

- The September monthly conference call was waived because of extensive RCSP travel.
- Continued work on the road-mapping document.
- Initiated preliminary planning to expand task objectives to include a matchup of quality and quantity of produced water with potential end users, along with an economic analysis to test the viability of producing water along with CCS.

Travel/Meetings

- August 29 – September 1, 2010: Traveled to Calgary, Alberta, Canada, for meetings with Spectra Energy and traveled to Edmonton, Alberta, Canada, for meetings with Natural Resources Canada.
- September 1, 17, and 21, 2010: Traveled for edit sessions to PPB's offices in Fargo, North Dakota.
- September 9–10, 2010: Attended Computer Modelling Group Training entitled "Chemical and Thermal EOR Modelling with STARS" in Houston, Texas.
- September 13–17, 2010: Attended Schlumberger training courses entitled Techlog Basic and Techlog Fundamentals in Houston, Texas.
- September 13–17, 2010: Attended the DOE/NETL 2010 CO_2 Capture Technology Meeting in Pittsburgh, Pennsylvania.
- September 19–23, 2010: Participated in GHGT-10 in Amsterdam, The Netherlands.
- September 22–23, 2010: Attended the North Dakota Petroleum Council Annual Meeting in Minot, North Dakota.
- September 28–30, 2010: Attended the Second International Acid Gas Injection Symposium and Acid Gas Injection Workshop in Calgary, Alberta, Canada.
- September 28, 2010: Presented at the Water-Energy Sustainability Symposium 2010 in Pittsburgh, Pennsylvania.
- September 29–30, 2010: Presented at the American Conference Institute's 4th Annual Carbon Capture and Sequestration Summit in Washington, D.C.