

## **Plains CO<sub>2</sub> Reduction (PCOR) Partnership Monthly Update March 1–31, 2009**

### **PHASE II ACTIVITIES**

#### **Task 1 – Project Management and Reporting (Edward N. Steadman/John A. Harju)**

##### **Highlights**

- Preparations have begun for the 2009 PCOR Partnership Annual Meeting. Plans are to have the meeting in St. Louis, Missouri, in December. Details will be released to members shortly.
- The PCOR Partnership participated in the North-Central Section, Geological Society of America 42nd Annual Meeting (April 2–3, 2009, Rockford, Illinois).
- The PCOR Partnership is participating in the Fish and Wildlife Service Meeting (April 15–16, 2009, Bozeman, Montana).
- The PCOR Partnership is leading the North American Energy Working Group – CO<sub>2</sub> Storage Capacity Estimation Subcommittee
  - A conference call to kick off the group was conducted on March 27, 2009.
- No Phase II Deliverables/Milestones were due in March.
- Upcoming Phase II Deliverables/Milestones for April
  - D3: Task 1 – Quarterly Report
  - D47/M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols
- Upcoming Phase II Deliverables/Milestones for May
  - D46: Task 8 – Documentary: Geologic Sequestration
  - D48: Task 8 – Best Practices Manual: Outreach

#### **Task 2 – Field Validation Test at a Williston Basin Oil Field, North Dakota (James A. Sorensen)**

##### **Highlights**

- **Northwest McGregor Field Demonstration**
  - CO<sub>2</sub> huff 'n' puff planning and scheduling completed, including:
    - ♦ Field operations
    - ♦ Praxair retained for CO<sub>2</sub> injection
    - ♦ Schlumberger retained for logging and reservoir fluid sampling
    - ♦ Z-Seis retained for vertical seismic profile logging
  - Work at the demonstration site conducted includes:
    - ♦ Removal of production equipment
    - ♦ Downhole inspection of casing
    - ♦ Tubing and packer emplaced in wellbore
    - ♦ Installation of surface injection equipment
    - ♦ Installation of surface-mounted in-line fluid and gas sampling ports

- Well logging completed to date (Schlumberger)
  - ◆ UltraSonic Imager casing inspection log
  - ◆ Reservoir saturation tool log

### **Task 3 – Field Validation Test at Zama, Alberta, Canada (Steven A. Smith)**

#### Highlights

- First draft of the Zama Regional Technology Implementation Plan is under review.
- Geochemical evaluation is completed. The final report is scheduled for delivery at any time.
- Injection and production continue at the site.
- Poster presentation was on display March 23–25, 2009, at the Air & Waste Management Association's First International Greenhouse Gas (GHG) Measurement Symposium.
- Oral presentation on the PCOR Partnership Phase II and III activities was given at the same conference.

### **Task 4 – Field Validation Test of Lignite Coal in North Dakota (Lisa S. Botnen)**

#### Highlights

- Injection began on March 10, 2009. Various injection pressures and temperatures were tried and various rates were recorded. Injection was extended 6 days beyond the original 10-day plan in order to collect more data and to look for trends among the various injection scenarios.
- Form 6, Completion Report, was submitted to the North Dakota Industrial Commission (NDIC) upon the completion of the first day of injection at the lignite field validation test site.
- Postinjection activities continue. As soon as immediate postinjection activities are complete, staff will begin to download all data collected during injection and postinjection to begin the evaluation and analysis of the injectivity and sequestration ability of the lignite seam.
- The injector and monitoring wells continue to be instrumented to record pressure and temperature readings postinjection.
- Numerous meetings and conference calls continue to be conducted with various partners and field service providers to discuss the analysis of CO<sub>2</sub> injection and monitoring, mitigation, and verification (MMV) data.

### **Task 5 – Terrestrial Validation Test (Barry W. Botnen)**

#### Highlights

- Progress continues on the regional technology implementation plan for terrestrial sequestration.
- Data entry of field-collected gas samples and site measurements is completed, and quality assurance/quality control (QA/QC) is in progress. Laboratory analysis and data from the University of Wisconsin – Stevens Point were completed in February.
- SAS<sup>®</sup> databases are being constructed as data progresses through the QA/QC process. Analyses of combined field and lab data started in February.
- An analysis of the economic impact of easement payments is ongoing (North Dakota State University).

- Grassland sampling has been completed in Montana, north-central and northeastern North Dakota, and north-central Iowa. The samples are being analyzed.
- A topical report titled “Technical, Regulatory, and Economic Feasibility of Wetlands as a GHG Mitigation Strategy” is in final review at the Energy & Environmental Research Center (EERC).
- PCOR Partnership Partners have obtained Climate Community and Biodiversity Standards certification for grassland carbon credits.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on GHG emissions is complete.
- Other state and regional GHG or cap-and-trade program rules and policies and U.S. Department of Energy (DOE) Guidelines for Aggregators and Terrestrial Offset Providers are being evaluated.
- The Ducks Unlimited, Inc.–PCOR Partnership terrestrial project Web site is being updated.
- Characterization inputs and the terrestrial portion of the Decision Support System (DSS, © 2007 EERC Foundation) are being worked on.

#### **Task 6 – Continued Characterization of Regional Sequestration Opportunities (Wesley D. Peck)**

##### Highlights

- Participated in a conference call with the regional partnership’s geographic information system (GIS) working group. There was significant discussion of partnership region overlap issues regarding the inventory and assessment of CO<sub>2</sub> sources. It was reiterated again and again that the PCOR Partnership and BigSky went over the overlap issue in a very detailed manner over a year ago. The new representative from BigSky has no record of that effort. This issue will be addressed again before the May meeting in Pittsburgh and then again at that meeting.
- Preparations of materials for the non-GIS portion of the DSS continue.
- Great progress on the new GIS interface for the DSS continues. There will be several new functions to make the site more versatile.
- Participated in three viewings of the draft version of the geological sequestration documentary currently in production. Several map-based images to be used in the documentary were created.
- Currently working on transferring data generated in Petrel to appropriate GIS files that can be integrated into the DSS.

#### **Task 7 – Research, Safety, Regulatory, and Permitting Issues (Lisa S. Botnen)**

##### Highlights

- Various state, provincial, and regional GHG reduction and carbon capture and storage (CCS) initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.
- Form 6, Completion Report, was submitted to the NDIC upon the completion of the first day of injection at the lignite field validation test site.

- Actions occurring in Congress and the new administration continue to be followed and reviewed for any implications relating to CCS.
- Recent publications relating to regulating CO<sub>2</sub> sequestration and MMV issues continue to be reviewed.

## **Task 8 – Public Outreach and Education (Daniel J. Daly)**

### Highlights

- Deliverable D35: Documentary on Reducing Carbon Footprint
  - The concept for the Cameroon shoot was finalized, a conference call with Prairie Public Broadcasting (PPB) regarding logistics for the Cameroon shoot was held, and a draft itinerary of the Cameroon shoot was prepared based on the call.
  - Background articles from *National Geographic* and other sources were acquired that will aid in filming and script development.
  - One pager was sent to PPB, which will send them to the U.S. embassies in Cameroon and India informing them of our activities and requesting their assistance
  - A set of photos to support the video shoot in Des Moines, Iowa, was created.
  - Travel dates were blocked out for the domestic and international trips required for the filming.
  - A meeting was scheduled for early July with PPB as a midterm status review of time line and project direction.
- Deliverable D46: Documentary on Geologic Sequestration
  - The backbone (narration and interviews) was reduced to broadcast length and reviewed internally.
  - A follow-up meeting and an edit trip to PPB was conducted on March 9, 2009.
    - ♦ Reviewed the current draft and met with PPB's animator.
    - ♦ Revisions were noted, and PPB prepared a draft that was reviewed on March 13, 2009.
    - ♦ Because of the level of revisions and to accommodate an interview of an EERC employee, an extension was requested and approved by DOE.
  - PPB is making changes based on the revised script
  - Coordination with PPB and the animator is ongoing.
- D22: Public Web Site Update was submitted to DOE for review on February 23, 2009; we are currently waiting for comments from DOE.
- Requested a proposal from A Goodman's (a public relations group based in Oakland, California) regarding an assessment of the materials and outreach strategies of the PCOR Partnership.
- Best practices manual
  - Met internally and laid out a revised time line and discussed writing assignments.
  - Currently reviewing the spring 2008 manual developed by the National Energy Technology Laboratory (NETL) for sequestration projects.
- Weyburn–Midale Project (WMP) Outreach Advisory Group
  - Empressa Communications informed the group that the WMP Outreach Strategy draft had been accepted by WMP Senior Management.
- Outreach Working Group
  - Participated in a conference call on March 19, 2009.

- An American Electric Power representative discussed testing at the West Virginia site.
- Outreach updates were given by participants.

### **Task 9 – Identification of Commercially Available Sequestration Techniques Ready for Large-Scale Deployment (Melanie D. Jensen/Michael L. Jones)**

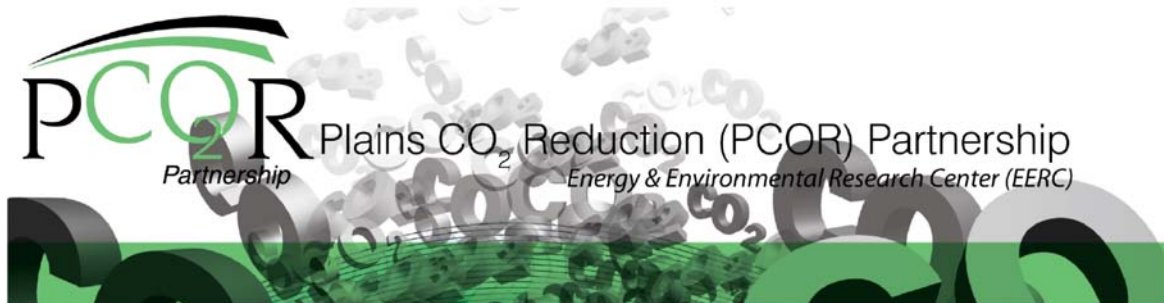
#### Highlights

- Verification of the location of gas-processing facilities in Canada was completed.
- Attended the 2009 CO<sub>2</sub> Capture Technology Conference in Pittsburgh, Pennsylvania. Highlights from 34 technologies or capture technology programs were described during the presentations.
- A noncontractual value-added topical report entitled “CO<sub>2</sub> Emissions in the PCOR Partnership Region: Characterization and Calculation Methodologies” is being reviewed internally.

### **Task 10 – Regional Partnership Program Integration (Edward N. Steadman)**

#### Highlights

- The PCOR Partnership also continued participation in working group conference calls, including the following:
  - GIS
  - Capture and transportation
  - Geologic
  - Outreach
  - Simulation and risk assessment



## **PHASE III ACTIVITIES**

### **Task 1 – Regional Characterization (Wesley D. Peck)**

#### **Highlights**

- Spoke with Nebraska Public Power District regarding potential contacts for initiating a subcontract agreement for work to assess geologic sequestration characterization and opportunities in Nebraska. The next step is to contact the University of Nebraska-Lincoln.
- Participated in a meeting with TAQA; a brief overview of the DSS was given.
- Well location data were processed.

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

#### **Highlights**

- PPB obtained footage of injection activities at the lignite site; we are currently waiting for the FTP (file transfer protocol) material of the video shot.
- WMP Outreach Advisory Group
  - Richard Fink from Empressa Communications informed the group that the WMP outreach strategy draft had been accepted by WMP senior management.
- A proposal was requested from A Goodman's (a public relations group based in Oakland, California) regarding an assessment of the PCOR Partnership's outreach materials and outreach strategies.
- Deliverable D24: the PCOR Partnership Region Sequestration General Poster was submitted and approved by DOE on March 31, 2009.
- School outreach
  - Consulting services are being arranged with a Watford City High School teacher with respect to reviewing PCOR Partnership outreach materials for use by educators.
  - Attempted to meet with a Red River High School teacher to discuss a review of the same materials.
- Presentation to teachers
  - Presented on sequestration to the North Dakota Science Teachers Association 2009 Spring Meeting in Bismarck, North Dakota.
  - Obtained feedback on the presentations and materials.
  - Requested and received a tape of a presentation to the Minnesota State University in Crookston, Minnesota; the tape will be transcribed and be used as a basis for an annotated PowerPoint for the Web.

- EERC video capability
  - Video was shot of oil percolating through sediment as a basis for the preparation of an animation to be used in the geology video and for the Web.
  - Obtained b-roll for use in PPB documentaries and the Web.
- Keystone Climate Status Investigation Workshop for educators
  - Made preliminary contact with University of Nebraska in Omaha regarding classroom space to accommodate 35 teachers and dormitory space during the workshop and passed this information on to Keystone to complete the arrangements.
- Outreach information system (OIS)
  - Received an update on the status of the OIS activities.
  - A binder of materials and a summary of available materials is being compiled and will be completed by May 1, 2009.

### **Task 3 – Permitting and NEPA Modeling (Lisa S. Botnen)**

#### Highlights

- Various state, provincial, and regional GHG reduction and CCS initiatives are being tracked and analyzed.
- An update to the regulatory section of the DSS is under development.
- Reviewed the approval from the British Columbia Oil and Gas Commission for the drilling of the exploration well for the Fort Nelson CCS project.
- Actions occurring in Congress and the new administration continue to be followed and reviewed for any implications relating to carbon capture and storage.
- Recent publications relating to regulating CO<sub>2</sub> sequestration and MMV issues continue to be reviewed.
- Analysis of carbon market strategies continues.
- Frequent updates are provided to task leaders with regard to federal, state, and provincial actions.

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

#### Highlights

- Fort Nelson demonstration
  - Final permit granted to drill exploratory well.
  - Site preparations were completed in advance of drilling activities, including roads, ice bridge, drilling location, site camp, and staging area.
  - Four water wells were drilled at the site for the purpose of potable site water, exploratory well drilling water, and shallow groundwater monitoring.
  - Purging and sampling of wells were conducted to determine baseline water conditions.
  - Risk assessment activities have continued.

### **Task 5 – Well Drilling and Completion (Steve Smith)**

- This task has not begun (Quarter 1 – Budget Period 3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 6 – Infrastructure Development (Melanie D. Jensen)**

### Highlights

- Prepared and submitted a document for a PCOR Partnership partner about the cost, equipment, and permitting requirements for truck-loading CO<sub>2</sub>.
- A separate document providing information about the cost, equipment, and permitting requirements for capturing, compressing, and truck-loading CO<sub>2</sub> from ethanol plants was prepared for research internally.
- The GREET model was downloaded and an evaluation begun of its ability to estimate the CO<sub>2</sub> footprint of the entire process associated with ethanol production from biomass. The GREET model evaluates the energy and emission impacts of advanced vehicle technologies and new transportation fuels.
- An updated carbon capture technologies overview was initiated. This noncontractual value-added report will incorporate information gathered over the past 8 months. The 34 technologies that were discussed during at the CO<sub>2</sub> Capture Technologies conference will be incorporated into the updated carbon capture technologies overview that is in currently being prepared.
- Evaluation of a gas treatment model continued. A determination will be made as to its applicability to CO<sub>2</sub> capture in the PCOR Partnership region.

## **Task 7 – CO<sub>2</sub> Procurement (John A. Harju)**

### Highlights

- Numerous discussions with potential CO<sub>2</sub> suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

## **Task 8 – Transportation and Injection Operations (TBA)**

- This task has not begun (Quarter 1 – Budget Period 4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 9 – Operational Monitoring and Modeling (TBA)**

- This task has not begun (Quarter 1 – Budget Period 4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 10 – Site Closure (TBA)**

- This task has not begun (Quarter 1 – Budget Period 5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 11 – Postinjection Monitoring and Modeling (TBA)**

- This task has not begun (Quarter 1 – Budget Period 5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.



## **Task 12 – Project Assessment (Stephanie L. Wolfe)**

- Assessment was conducted for all 13 Phase III tasks for October 1, 2007 – September 30, 2008, and was illustrated the Project Assessment Annual Report (Deliverable 57). The report was submitted on December 31, 2008.

## **Task 13 – Project Management (Edward N. Steadman)**

### Highlights

- Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.
- Preparations have begun for the 2009 PCOR Partnership Annual Meeting. Details will be released to members shortly.
- A risk management fact sheet and presentation was compiled for Spectra Energy for the Fort Nelson field demonstration test.
  - Spectra Energy is planning a meeting with the British Columbia government for drilling approval on April 8, 2009, in British Columbia. The PCOR Partnership will attend this meeting.
- DOE's stimulus details/solicitations
  - DOE sent solicitations out March 4, 2009:
    - ◆ Geologic Sequestration Training and Research
    - ◆ CCS from Industrial Sources
    - ◆ Site Characterization of Promising Geologic Formations for CO<sub>2</sub> Storage
    - ◆ Amendment to Reopen the FOA "Clean Coal Power Initiative – Round 3"
  - An e-mail was sent to PCOR Partnership partners on March 11, 2009, explaining the initial details.
  - DOE has temporarily taken the Web site down. Once the Web site is functioning, PCOR Partnership partners will be informed.
- A workshop on CO<sub>2</sub> sequestration technologies and environmental impacts is being assembled by PCOR Partnership members for the Air Quality VII Conference (Arlington, Virginia, October 25–29, 2009).
- Deliverable D24: the PCOR Partnership Region Sequestration General Poster was submitted and approved by DOE on March 31, 2009.
- Upcoming Phase III Deliverables/Milestones for April
  - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
- Upcoming Phase II Deliverables/Milestones for May
  - D2: Task 1 – First Target Area Completed
  - D16: Task 2 – Fort Nelson Test Site Fact Sheet

## **Task 14 – Regional Carbon Sequestration Partnership (RCSP) Water Working Group Coordination (Charles D. Gorecki)**

### Highlights

- Milestone M21 – Outline of White Paper on Nexus of CCS and Water was completed and turned in for comments and submitted to the Water Working Group (WWG) participants.

- The date for the WWG annual meeting will be May 7, 2009, from 12:30 to 5:00 p.m. EST in Pittsburgh, Pennsylvania, at the Sheraton Square Hotel in the Waterfront Room.
- Many of the Partnerships and DOE participants to the WWG have been identified. As of March 31, 2009, there are representatives from the following partnerships: PCOR Partnership, Southeast Regional Carbon Sequestration Partnership, Southwest Regional Carbon Sequestration Partnership, West Coast Regional Carbon Sequestration Partnership, and Midwest Regional Carbon Sequestration Partnership. There are also representatives from Sandia National Laboratory, Lawrence Berkeley National Laboratory, Texas Bureau of Economic Geology, Los Alamos National Laboratory, Southern Company, DOE NETL, and DOE NETL Existing Plants Program.

### **Travel/Meetings for Phase II and III**

- March 2, 2009: Documentary edit sessions with PPB in Fargo, North Dakota.
- March 2, 2009: Presented to the North Dakota Science Teachers Association in Bismarck, North Dakota.
- March 9, 2009: Documentary edit sessions with PPB in Fargo, North Dakota.
- March 23–26, 2009: Attended the 2009 CO<sub>2</sub> Capture Technology Conference in Pittsburgh, Pennsylvania.
- May 4–7, 2009: Attend the Eighth Annual Conference on CCS in Pittsburgh, Pennsylvania.