

**Plains CO<sub>2</sub> Reduction (PCOR) Partnership Monthly Update  
February 1–28, 2009**

**PHASE II ACTIVITIES**

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

**Highlights**

- As of February 28, 2009, the PCOR Partnership has 80 (Phase II and III) partners. Please note that Phase II members in good standing are automatically enrolled in Phase III for the first budget period that overlaps with the last 2 years of Phase II (October 1, 2007 – September 30, 2009).
- The PCOR Partnership presented at the Hydrogen Works Training Course (San Diego, California, February 17–19, 2009).
- The PCOR Partnership attended the Oil and Gas Research Council Meeting February 4, 2009, in Bismarck, North Dakota. Discussion was held on the Washburn study, lignite test, and Williston Basin Phases II and III.
- The PCOR Partnership is participating in the North-Central Section, Geologic Society of America 42nd Annual Meeting (April 2–3, 2009, Rockford, Illinois).
- The following Phase II Deliverables/Milestones were completed in February:
  - M12/D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan
  - D22: Task 8 – Web Site Update
- Upcoming Phase II Deliverables/Milestones for March:
  - D46: Task 8 – Documentary: Geologic Sequestration
- Upcoming Phase II Deliverables/Milestones for April:
  - D3: Task 1 – Quarterly Report
  - D47/M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols

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

**Highlights**

- The E. Goetz 1 well in the Northwest McGregor oil field, Williams County, North Dakota, was visited.
- Sundry notice was submitted to the North Dakota Industrial Commission (NDIC) Department of Mineral Resources – Oil and Gas Division to inject 400 to 800 tons of CO<sub>2</sub> into the Mission Canyon Formation. Injection has been tentatively set for April 6, 2009.
- M12/D45: Williston Basin Field Validation Test Outreach Action Plan was submitted to the U.S. Department of Energy (DOE) for review on February 27, 2009; we are currently waiting for comments from the DOE.

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

#### Highlights

- Injection of acid gas continues at a rate of approximately 1 million cubic feet per day.
- Geomechanical testing and reporting is in the final stages and should be completed by mid-April.
- Geochemistry analytical work and reporting is being finalized. This activity is scheduled for completion by March 15, 2009.
- A draft Deliverable D52: Zama Field Validation Test Regional Technology Implementation Plan is currently prepared and in the initial stages of review.

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

#### Highlights

- Discussions are ongoing with Pinnacle and Schlumberger to coordinate monitoring, mitigation, and verification (MMV) activities.
- Development continues on the subsurface geologic model. This model will be used to estimate reservoir capacity with respect to CO<sub>2</sub> storage or sequestration ability.
- Monitoring wells are prepped for injection.
- Site preparations continue in order to get ready for CO<sub>2</sub> injection.
- Wellhead design and installation are complete.
- Numerous meetings and conference calls continue to be conducted with various partners and field service providers to discuss the logistics of CO<sub>2</sub> injection and MMV activities.
- Gyro surveys were run on all five wells. All wells appear to be fairly straight.
- RST logs were run on all five wells. The same logs will be run immediately following injection to determine CO<sub>2</sub> saturation at the wellbore.

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

#### Highlights

- Progress continues on the Deliverable D54 Regional Technology Implementation Plan for terrestrial sequestration.
- Data entry of field-collected gas samples and site measurements is completed, and quality assurance and quality control (QA/QC) is in progress. Laboratory analysis and data collection 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 northeast North Dakota, and north-central Iowa. The samples are being analyzed.
- Fact sheets on the Climate Change Policy and comparisons of soil carbon models are being reviewed by the Energy & Environmental Research Center (EERC).

- A topical report entitled “Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas (GHG) Mitigation Strategy” is in final review at Ducks Unlimited, Inc. (DU)/EERC.
- The PCOR Partnership partners continue to work toward obtaining Climate Community and Biodiversity Standards verification for grassland carbon credits.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on GHG emissions continues. Results are being finalized.
- Evaluation continues on other state and regional GHG or cap-and-trade program rules and policies and DOE Guidelines for Aggregators and Terrestrial Offset Providers.
- The DU–PCOR Partnership terrestrial project Web site continues to be updated.
- Work continues on characterization inputs and the terrestrial portion of the Decision Support System (DSS, © 2007 EERC Foundation).

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

### Highlights

- Discussions continue on material for the carbon markets portion of the DSS.
- The news ticker for the new DSS home page is currently being worked on.
- An internal meeting was held regarding the progress and planned work on the redesigned version of the DSS.
- After internal discussions, it was decided that only the oil fields of northeastern British Columbia will be incorporated in the DSS database.
- Text for the Zama Field validation test was prepared for the Partnership’s Decision Support System Web page.
- A conference call with geographic information system (GIS) technical staff from the other regional partnership programs took place. Source location overlaps from the Big Sky Carbon Sequestration Partnership need to be reevaluated for accuracy.
- A draft version of an executive summary for Task 6 of Phase II was submitted. This document will be used as a guide for the final months of Phase II and the development of final reports.
- Cross-section information for the lignite site was obtained. This information is being used to create a graphic depicting the site for the next regional atlas.
- The EERC Graphics Department is working with us on new images for the PCOR Partnership Atlas and Web pages.
- A base map for the Madison Formation evaluation in North Dakota, Saskatchewan, and Manitoba was created with our assistance. All of the GIS-based files for the area from the Williston Basin Targeted Geoscience Initiative study were also obtained.
- Preparation of materials for the non-GIS portion of the DSS continues.
- Work on the new GIS interface for the DSS continues. The learning curve associated with the Geocortex GIS software is turning out less steep than expected.
- Work on data management regarding oil fields in the Powder River Basin portion of Wyoming continues. The latest data set obtained from the Wyoming Geological Survey has numerous differences from the existing data being used in the PCOR Partnership database.
- The latest sources data set should be ready in early March.

## **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.
- EERC staff testified at a North Dakota House Committee hearing regarding the merits of a proposed carbon sequestration bill.
- 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.

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

### Highlights

- D22: Public Web Site Update was submitted to DOE for review on February 23, 2009; we are currently waiting for comments from DOE.
- Deliverable D46: Documentary on Geologic Sequestration (due to DOE March 2009)
  - The following interviews were conducted: Fischer Oil and Gas, Inc., North Dakota Geological Survey, and NDIC, and scanning electron microscope screens were filmed at the EERC.
  - At the request of the EERC, North Dakota representatives of Hess Corporation requested permission from their Houston Office to give an interview, but the Houston declined the offer.
  - A 50-minute narrative backbone was completed based on the initial script; the script was revised and edits were done at Prairie Public Broadcasting (PPB) during the weeks of February 16 and February 23.
  - NDIC's interview from February 13, 2009, was transcribed.
  - The interviews of Fischer Oil and Gas, Inc., and North Dakota Geological Survey were internally reviewed.
  - The revised 5-week production schedule was prepared and reviewed with EERC and PPB representatives.
  - A list of B-roll was submitted to PPB for use in the video and work continued with the animator.
- A response to an inquiry from Pure in Calgary regarding obtaining footage of geologic sequestration for use by Korean documentary filmmakers is currently being prepared.
- Deliverable D35: Documentary on Reducing Carbon Footprint
  - A one pager was finalized for use by PPB in arranging film locations and interviews.
  - Film locations under consideration are Des Moines, Iowa, USA (industrialized nation example); Dehli, India (industrializing nation example); and Cameroon (developing nation example).
  - A background write-up for Des Moines, Iowa, was prepared.
- Deliverable D17: PowerPoint Presentation: General Audience CO<sub>2</sub> Sequestration Outreach
  - Slides on carbon cycle and atmospheric issues are currently being updated.

- The PCOR Partnership participated in an Outreach Working Group conference call on February 19, 2009.
- Weyburn–Midale Project Outreach Advisory Group
  - The EERC was provided with written and verbal comments for a draft final Outreach Strategy document.

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

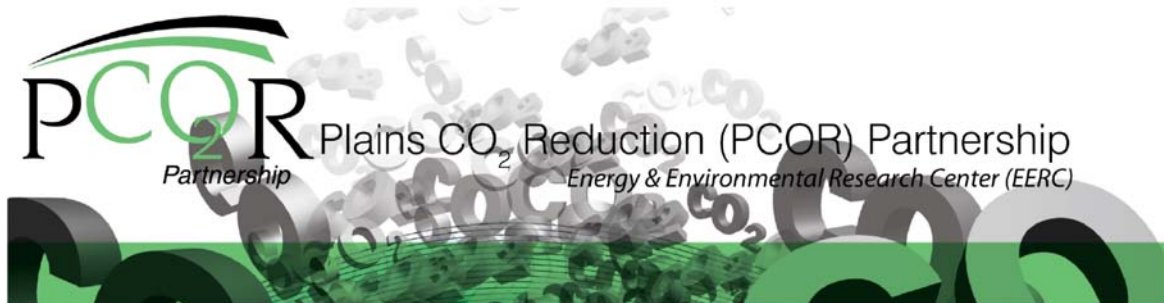
#### Highlights

- New summary statistics for all of the types of stationary CO<sub>2</sub> emission sources were generated. Updated illustrative charts were prepared. The draft emission estimation methodologies report was updated with the new statistics, tables, charts, and Web links. The entire draft was reworded to make all of the additions clear to the reader. The draft document is in final preparation and formatting.

### **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
  - A Water Working Group (WWG) has been established as part of the PCOR Partnership activities.



## **PHASE III ACTIVITIES**

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

#### **Highlights**

- Paperwork was completed to renew the license agreement with the Pennwell Company for use of the pipeline data.
- Work on materials for the next version of the PCOR Partnership regional atlas continues.
- Perez Graphics, a graphic design company catering to the petroleum industry, was contacted to inquire on the creation of custom cross-section graphics; it was decided to let the EERC Graphics personnel have a try at creating similar products.
- Melzer Consulting was contacted regarding their potential participation with our Missouri Department of Natural Resources (DNR) partners as they oversee the bid process for injection well construction. Melzer Consulting indicated that they would be happy to speak with the Missouri DNR.
- The Kansas Geological Survey's white paper was reviewed, and we participated in a conference call regarding the North America Carbon Atlas Partnership.

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

#### **Highlights**

- The outreach team participated in an Outreach Working Group conference call on February 19, 2009.
- A 1-hour presentation on sequestration and the PCOR Partnership program was given to 150 faculty and students at the Minnesota State University Crookston student union on Thursday, February 19.
- School outreach was continued in the following areas:
  - Work continues to contact teachers in the region to develop an advisory group for activities.
  - A PCOR Partnership presentation was accepted at the North Dakota State Science Teachers Meeting in Bismarck, North Dakota, for March 5–7, 2009.
- Deliverable D24: PCOR Partnership Region Sequestration General Poster (due to DOE March 31, 2009)
  - The outreach team continues to develop poster concepts based on initial drafts.
- Deliverable D12: Demonstration Web Pages on the Public Site
  - Draft final Web pages were completed in anticipation of a review by EERC project managers.
- Video clips including animation (we are currently awaiting comments from DOE)

- We are currently responding to internal requests for Web page examples that feature the video clips for use in the EERC review process.
- Examples are being prepared for both the public PCOR Partnership Web site and a sample of a YouTube page.
- Preparations were made to have PPB film the injection at the lignite test site on March 9 for use in a video clip.
- Weyburn–Midale Project Outreach Advisory Group
  - The EERC was provided with written and verbal comments for a draft final Outreach Strategy document.
- EERC video capability
  - A draft PowerPoint to use in training others in June on editing with the PCOR Partnership PC-based video software was provided internally; comments were provided.

### **Task 3 – Permitting and National Environmental Policy Act 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.
- EERC staff testified at a North Dakota House Committee hearing regarding the merits of a proposed carbon sequestration bill.
- 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.
- 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

- Drilling plans, performance risk assessment, plans for shallow groundwater monitoring wells, and the overall MMV program were discussed with Spectra Energy in Calgary.
- Draft risk assessment in PowerPoint format is due for completion and presentation to the British Columbia Oil and Gas Commission in early April.
- Exploration well drilling is tentatively set to begin no later than June 2009. Four shallow groundwater monitoring wells are scheduled to be drilled in March 2009.

### **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

- The additives used in the Econamine FG CO<sub>2</sub> capture process were researched.
- The use of potassium carbonate in CO<sub>2</sub> capture was researched.
- In response to a request from a PCOR Partnership partner, information about the cost, equipment, and permitting requirements for truck-loading CO<sub>2</sub> was gathered and summarized.
- A PowerPoint presentation was prepared on the topic of carbon capture during H<sub>2</sub> production for the PCOR Partnership Project Manager to present at a hydrogen production conference.

## **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 – Post Injection 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 in 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.
- A risk management fact sheet and presentation were 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.
- The PCOR Partnership attended the Oil and Gas Research Council Meeting February 4, 2009, in Bismarck, North Dakota. Discussion was held on the Washburn study, lignite test, and Williston Basin Phases II and III.
- Spectra Energy hosted a meeting in Calgary, Alberta, Canada, to discuss the Fort Nelson demonstration project. The project is still on track to have the well drilled in March 2009.
- 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, for October 25–29, 2009).
- No Phase III Deliverables/Milestones were due for February.
- Upcoming Phase III Deliverables/Milestones for March
  - D2: Task 1 – First Target Area Completed
  - M4: Task 4 – Williston Basin Test Site Selected
  - M5: Task 4 – Data Collection Initiated for Williston Basin Test Site
  - D24: Task 2 – PCOR Partnership Region Sequestration General Poster
  - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site
- Upcoming Phase III Deliverables/Milestones for April
  - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report

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

#### Highlights

- Funding for Task 14 was finalized.
- Milestone M21 – Outline of White Paper on Nexus of CO<sub>2</sub> CCS was submitted to DOE for review on February 27, 2009; we are currently waiting for comments from DOE. This also will be submitted to the WWG participants in early March 2009.

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

- January 30 – February 5, 2009: SPE Reservoir Simulation Symposium in The Woodlands, Texas
- February 1–5, 2009: EUEC Conference in Phoenix, Arizona
- February 2–4, 2009: Carbon and Climate Change Conference in Austin, Texas
- February 3, 2009: North Dakota Petroleum Council Board Room Meeting & Legislative Reception in Bismarck, North Dakota
- February 4, 2009: Oil and Gas Research Council Meeting in Bismarck, North Dakota
- February 7–13, 2009: CO<sub>2</sub> Geological Storage Modeling Workshop in Orleans, France

- February 8–11, 2009: Attended CMG’s Introduction to WinProp advanced simulation technologies training course in Calgary, Alberta
- February 10, 2009: Attended meeting with Cargill in Minneapolis, Minnesota
- February 11, 2009: Attended meeting with DOE in Pittsburgh, Pennsylvania
- February 17–19, 2009: Hydrogen Works: The Premier Professionals Training Course in San Diego, California
- February 18, 2009: Met with PPB for geologic documentary in Fargo, North Dakota
- February 19, 2009: Presented to faculty and students at the University of Minnesota in Crookston, Minnesota
- February 21–24, 2009: AIChE/Society of Petroleum Engineers Workshop in Sonoma, California
- February 23–26, 2009: CO<sub>2</sub> & Capture Storage Conference in Calgary, Alberta
- February 23–27, 2009: Met with Spectra Energy in Calgary, Alberta
- February 25–28, 2009: Rock Works Geological Modeling Conference in Denver, Colorado
- March 2–3, 2009: Pinnacle Hydrofracturing Workshop in Denver, Colorado
- March 7–11, 2009: Meet with the Colorado School of Mines in Denver, Colorado
- March 23–26, 2009: 2009 CO<sub>2</sub> Capture Technology Conference in Pittsburgh, Pennsylvania
- May 4–7, 2009: The Eighth Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania