

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

**PHASE II ACTIVITIES**

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

**Highlights**

- Coordinated and participated in the 2009 PCOR Partnership annual meeting and workshops on December 1–3, 2009, in St. Louis, Missouri, where a wrap-up of Phase II activities was presented, including the following:
  - “PCOR Partnership Phase II: Program Management Overview/Conclusions”
  - “Zama Acid Gas Enhanced Oil Recovery (EOR), CO<sub>2</sub> Storage, and Monitoring Project”
  - “Zama Field Validation Test: A Partner Perspective”
  - “Carbon Storage in Lignite Coal”
  - “Lignite Coal Evaluation”
  - “Phase II Williston Basin Northwest McGregor Oil Field Huff ‘n’ Puff Test”
  - “PCOR Partnership Outreach and Education”
  - “Regional Characterization and Decision Support System”
  - “Terrestrial Field Validation Test – Display Booths Featured”
- Uploaded the annual meeting presentations to the partners-only decision support system (DSS, © 2007–2009 EERC Foundation) and sent an e-mail to all partners notifying them of the presentations’ availability on December 10, 2009.
- Contacted on December 22, 2009, the partners who did not attend the annual meeting to determine if something could have been done differently to facilitate their participation.
- Uploaded a topical report on the final results for Phase II to the U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI) site on December 29, 2009.
- Uploaded the topical report on the final results to the partners-only DSS site and sent an e-mail to all partners notifying them of the report’s availability on December 29, 2009.
- Submitted a final report to the North Dakota Industrial Commission, along with the required project summary, pursuant to Contract Nos. G005-014 and FY06-LV-143, on December 30, 2009 (1 day before the due date).
- Phase II deliverables submitted for December:
  - D55: Task 2 – Williston Basin Field Validation Test regional technology implementation plan
  - D51: Task 8 – documentary: Carbon Footprint – One Size Does Not Fit All
  - D56: Task 1 – Phase II final report
  - November monthly update
- Upcoming Phase II deliverables for January:
  - December monthly update

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

### Highlights

- Presented huff ‘n’ puff project results on December 2, 2009, at the PCOR Partnership annual meeting.
- Finalized and submitted the regional technology implementation plan for the project on December 29, 2009.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Presented project results on December 2, 2009, at the PCOR Partnership annual meeting.
- Prepared and submitted the December 2009 project status report for the Zama Acid Gas EOR, CO<sub>2</sub> Sequestration, and Monitoring Project to the Carbon Sequestration Leadership Forum (CSLF) Secretariat on December 15, 2009.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Presented project results on December 2, 2009, at the PCOR Partnership annual meeting.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Prepared and manned display exhibits at the PCOR Partnership annual meeting.
- Prepared final results for inclusion in the Phase II final report.
- Drafted updated information for inclusion in a noncontractual, value-added report.

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

### Highlights

- Presented characterization results and an update on the DSS site on December 3, 2009, at the PCOR Partnership annual meeting.
- Prepared an exhibit booth, including demonstration of the DSS site, at the annual meeting.
- Presented the First Annual DSS User of the Year award to Lyle Burke of RPS Energy at the annual meeting.
- Distributed the PCOR Partnership Atlas, 3rd Edition, to each annual meeting attendee.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 1–3, 2009.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Presented an overview of outreach activities and results during both the annual meeting and a premeeting workshop.
- Distributed the fourth documentary entitled “Managing Carbon Dioxide: The Geologic Solution” to each annual meeting attendee and showcased a continuous loop of the video in the PCOR Partnership’s exhibit booth at the meeting.
- Prepared and sent letters of appreciation to the participants/interviewees in the geologic documentary.
- Planned the distribution of the geologic DVD to the partnership, as well as planned to encourage the partners to contact their local public broadcasting station to request broadcast in their region.
- Efforts toward the fifth documentary, tentatively entitled “Carbon Footprint: One Size Does Not Fit All” included:
  - Held a second review session for the program managers on December 4, 2009.
  - Held multiple editing sessions and animation meetings at Prairie Public Broadcasting’s (PPB’s) headquarters in Fargo, North Dakota.
  - Held a third internal review session on December 15, 2009.
  - Prepared and submitted a revised script and cut new narration.
  - Submitted a draft version of the documentary on December 29, 2009.
- Prepared final results for inclusion in the Phase II final report.

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

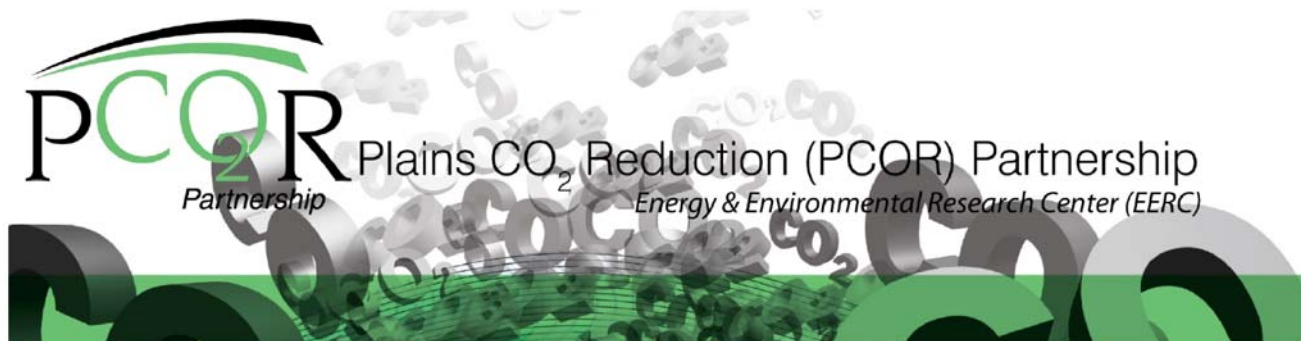
### Highlights

- Continued updating/revising the draft Best Practices Manual: Regional Sequestration Opportunities (D44) report summarizing the cost and effort required for the initial capture, compression, and transportation of CO<sub>2</sub> within the PCOR Partnership region. The new version of the report incorporates gas-processing facilities that were added to the CO<sub>2</sub> emission database during the last year as well as updates the overview of regional CO<sub>2</sub> point sources and emissions by the ethanol plants. The hypothetical pipeline routes were also updated to reflect the changes made in the sources being considered for capture.
- Presented information on deployable CO<sub>2</sub> capture technologies at the PCOR Partnership pre-annual meeting workshop.
- Prepared final results for inclusion in the Phase II final report.

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

### Highlights

- Program Manager continued his efforts as the chairman of the North American Energy Working Group (NAEWG) North American Carbon Atlas Partnership (NACAP) Methodology Subcommittee, including the following:
  - Continued work determining the “level of detail/granularity in publically accessible GIS” as assigned to the Methodology Working Group and Information Technology Working Group. This work must be completed by next NACAP meeting.
  - Continued discussions with NACAP committee members on additional work assigned.
- Provided comments on December 10, 2009, on the document entitled “Site Screening, Selection, and Characterization for Storage of CO<sub>2</sub> in Deep Geologic Formations” as part of the Geological/Capacity Working Group.
- Agreed to participate in the 2010 ASME DOE Carbon Sequestration Peer Review in February 2010.
- Participated in conference calls for other various working groups, including Geologic and Modeling, Capture and Transportation, Simulation and Risk Assessment, GIS, and the Water Working Group (WWG).



## **PHASE III ACTIVITIES**

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

#### **Highlights**

- Presented an update on characterization activities and the DSS remodel on December 3, 2009, at the PCOR Partnership annual meeting.
- Prepared an exhibit booth, including demonstration of the DSS site, at the annual meeting.
- At the request of a partner, assembled data related to EOR potential for Wyoming oil fields in the Powder River Basin.
- Initiated the selection, processing, and cataloging of images to be used in the DSS image gallery.
- Continued efforts to develop a preliminary report on the Cedar Hills Formation in western Nebraska—the geologic horizon is a promising saline formation target for CO<sub>2</sub> storage.

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

#### **Highlights**

- Continued efforts toward an update to the public Web site (D13), including a meeting with the Program Manager on December 17, 2009.
- Presented an update on outreach and education activities at the PCOR Partnership annual meeting.
- Coordinated efforts with the RCSP Outreach Working Group to finalize and submit an abstract for a presentation at the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-10) in Amsterdam in September 2010.
- Provided review comments for a confidential draft communications plan under development by the Petroleum Technology Research Centre for a sequestration project in Saskatchewan, Canada.

### **Task 3 – Permitting and National Environmental Protection Agency (NEPA) Modeling (Lisa S. Botnen)**

#### **Highlights**

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 1–3, 2009.
- Continued to follow committee hearings and actions on the Boxer–Kerry Climate Change bill.

- Participated in a conference call of the Interstate Oil and Gas Compact Commission's Pipeline Transportation Task Force.
- Continued review of Environmental Protection Agency (EPA) findings document entitled "Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act" signed by the EPA Administrator on December 7, 2009.
- Continued following the activities of the climate talks in Copenhagen (COP 15).
- Worked with British Columbia regulators on the development of a comprehensive review of acid gas and potential carbon capture and storage (CCS) regulations.

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

##### Highlights

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 1–3, 2009.
- In coordination with Spectra Energy, submitted on December 15, 2009, the December 2009 project status report for the Fort Nelson CCS project to the CSLF Secretariat.
- Continued iterative modifications to the static geological model of the Fort Nelson CCS project area of review.
- Initiated the development of dynamic injection simulations for the Fort Nelson CCS project using specific potential injection well locations recently provided by Spectra Energy.
- Initiated efforts on a general CCS risk management document for the partners-only DSS Web site.
- Continued modification of the first-round risk assessment report for the Fort Nelson CCS project based on comments provided by Spectra Energy.
- Prepared and submitted two abstracts for presentation at GHGT-10. One abstract presents a general overview of the Fort Nelson CCS project, and the second presents an overview of the approach used to conduct a first-round risk assessment for the Fort Nelson CCS project.
- Continued efforts to develop a draft "value-added" fact sheet on the PCOR Partnership's approach to risk management of CCS projects.
- Provided a statement of work objectives for January 2010 to December 2010 to Spectra Energy. Quarterly meetings are planned, with the first meeting scheduled for January 27, 2010, in Calgary. Monthly teleconferences have also been scheduled with the first call planned for January 8, 2010.
- Initiated work to develop and design a laboratory experimental program for petrological, geochemical, and geomechanical analysis of core samples from the Bell Creek area.

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

##### Highlights

- Nothing to note at this time.

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

### Highlights

- Presented “CO<sub>2</sub> Pipeline Basics” at the PCOR Partnership annual meeting on December 2, 2009.
- Taking the place of a last-minute ill presenter, presented an update on work performed by Ramgen Power Systems on December 2, 2009, at the annual meeting.
- Participated in a conference call on December 10, 2009, with BNSF concerning rail transport of CO<sub>2</sub> for CCS demonstrations.
- At the request of a partner, CO<sub>2</sub> emissions on a lb CO<sub>2</sub>/MWh basis were calculated on December 15, 2009, for Minnesota and North Dakota’s electricity-generating facilities.
- Prepared for a partner on December 17, 2009, a short text version including references of the “CO<sub>2</sub> Pipeline Basics” presentation given at the annual meeting.
- Located Web references for CO<sub>2</sub> emissions from the various ethanol plants, taconite plants, and refineries for inclusion in the “References” section of the PCOR Partnership CO<sub>2</sub> emission sources master spreadsheet.
- Responded to several information requests stemming from the annual meeting.

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

### Highlights

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 1–3, 2009.
- Continued discussions with potential CO<sub>2</sub> 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)**

- This task is anticipated to be initiated Quarter 3 – BP4, Year 4.

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

### Highlights

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 2–3, 2009.
- Continued working on Fort Nelson simulations, i.e., added new well locations and began rerunning the simulations to determine the long-term fate of the sour CO<sub>2</sub> with the new well locations. Recently, Spectra Energy acquired some seismic surveys in the area of interest which revealed that there may be a fault that is inhibiting flow between different portions of the study area. This has also been added to the model, and different fault transmissibility values are being applied to the fault in the model to determine the potential implications.
- Continued talks with Spectra Energy about paying for special core analysis on the first test well, as well as a geomechanical, geochemical, and a cap rock testing program for the core from the first well drilled last winter at the Fort Nelson site.
- The new data from the special core analysis will be added to Version 3 of the model.

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

- This task is anticipated to be initiated in Quarter 1 – BP 5; Year 9.

### **Task 11 – Post Injection Monitoring and Modeling (TBA)**

- This task is anticipated to be initiated in Quarter 1 – BP 5; Year 9.

### **Task 12 – Project Assessment (Katherine Anagnost)**

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 1–3, 2009.
- Prepared and submitted on December 31, 2009, the second annual project assessment report for the reporting period of October 1, 2008 – September 30, 2009.

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

#### Highlights

- Coordinated and participated in the 2009 PCOR Partnership annual meeting and workshops on December 1–3, 2009, in St. Louis, Missouri, where a discussion of current and proposed Phase III activities was presented, including the following:
  - “Risk Management of CCS Projects: How to Ensure a Sustainable Storage Performance”
  - “International Perspectives on CO<sub>2</sub> Capture and Storage”
  - “CO<sub>2</sub> Pipeline Basics”
  - “Ramgen Project”
  - “PCOR Partnership: Phase III Overview”
  - “Phase III Fort Nelson Demonstration Project Update”
  - Panel Discussion: “Elements of Sound CCS Policy”
- Uploaded the annual meeting presentations to the partners-only DSS and sent an e-mail to all partners notifying them of the presentations’ availability on December 10, 2009.
- Attended the 7th Annual EOR Carbon Management Workshop in Houston, Texas, and the 15th Annual CO<sub>2</sub> Flooding Conference in Midland, Texas ([http://melzerconsulting.com/CO2\\_Week\\_Brochure.pdf](http://melzerconsulting.com/CO2_Week_Brochure.pdf)).
- Discussed on December 16, 2009, participation in a partner’s deep saline CO<sub>2</sub> injection program in Canada.
- Sent an e-mail of appreciation to the annual meeting presenters on December 21, 2009.
- Contacted on December 22, 2009, the partners who did not attend the annual meeting to determine if something could have been done differently to facilitate their participation.
- Submitted several abstracts for GHGT-10 for consideration on or before December 22, 2009 ([www.ghgt.info/GHGT10.html](http://www.ghgt.info/GHGT10.html)).
- Phase III deliverables/milestones for December:
  - M23: Task 14 – monthly WWG conference call held – waived by DOE
  - D57: Task 12 – project assessment annual report
  - November monthly update
- Upcoming Phase III deliverables for January:
  - December monthly update



- D13: Task 2 – public site updates
- M23: Task 14 – monthly WWG conference call held
- D58/D59: Task 13 – quarterly progress report/milestone quarterly report
- D15: Task 2 – Williston Basin test site fact sheet
- D28: Task 3 – environmental questionnaire – Williston Basin test site
- D31: Task 4 – Williston Basin test site – geological characterization experimental design package

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

### **Highlights**

- Attended and participated in the PCOR Partnership Annual Meeting in St. Louis, Missouri, December 2–3, 2009.
- Distributed WWG minutes on December 21, 2009, from the conference call held November 16, 2009.
- Continued efforts between the WWG and RCSP Public Outreach Group on a fact sheet based loosely on the White Paper on the Nexus of CCS and Water.
- DOE waived the December 2009 monthly conference call and also eliminated the water resource estimation methodology documents. Alternative reports are under consideration.

### **Phase II – Travel/Meetings**

- November 30 – December 3, 2009: participated in the PCOR Partnership annual meeting and workshops in St. Louis, Missouri.
- December 3, 8, 11, 13–14, 18, 21 and 28, 2009: traveled for documentary edit sessions to PPB offices in Fargo, North Dakota.

### **Phase III – Travel/Meetings**

- November 30 – December 3, 2009: participated in the PCOR Partnership annual meeting and workshops in St. Louis, Missouri.
- December 7–8, 2009: attended the 7th Annual EOR Carbon Management Workshop in Houston, Texas.
- December 9–11, 2009: attended the 15th Annual CO<sub>2</sub> Flooding Conference in Midland, Texas.
- December 15–18, 2009: presented at the 2009 AGU Fall Meeting Union Session U02: Geophysical Monitoring, Verification, and Accounting for Geologic Carbon Sequestration in San Francisco, California.