

**Plains CO₂ Reduction (PCOR) Partnership Monthly Update
May 1–31, 2008**

PHASE II ACTIVITIES

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

Highlights

- PCOR Partnership members received a DVD copy of the documentary “Reducing Our Carbon Footprint – The Role of Markets.”
- Work is currently being done on a revision to the 2nd edition of the PCOR Partnership Regional Atlas. Distribution will be ready in approximately 6–8 weeks.
- *Energy Biz Magazine* would like to cover the PCOR Partnership in an upcoming article. We have submitted information for the story.
- As of May 29, 2008, Phase II of the PCOR Partnership has 76 partners. The following partners joined in May:
 - Abengoa Bioenergy New Technologies
 - Marathon Oil Company
 - TGS Geological Products and Services
- Preparations for the 2008 PCOR Partnership Annual Meeting continue. The dates will be September 16–18, 2008, in Minneapolis, Minnesota.
 - On May 8, 2008, an e-mail went out to partners with initial details on the meeting.
 - Web site registration will be available soon.

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

Highlights

- Continued evaluation of oil fields in Williston Basin that may be suitable candidates to host the injection and monitoring, mitigation, and verification (MMV) activities. Efforts are focused on developing baseline characterization data for fields in the Cedar Creek Anticline area, the Billings Anticline-Dickinson area, and along the Nesson Anticline. Specifically, new well log data have been obtained for wells in the Cedar Creek Anticline area. This well log data will be used to support the development of a petrophysical model of the Cedar Creek Anticline area.
- Laboratory tests were continued to examine the effects that CO₂ under deep reservoir pressure and temperature injection conditions can have on cores of limestone. Limestone cores were examined before and after injection using a Positron Emission Tomography technique to identify changes in porosity, and possibly permeability, caused by the injection. Results of the initial experiments qualitatively suggested an increase in porosity, and likely permeability, as a result of the injection of supercritical CO₂. It is anticipated that a

series of these tests, using a variety of injection conditions and rock types, will be conducted over the spring and summer of 2008.

- Submitted the draft write-up for D41/M11: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document (write-up only; final draft due on August 29, 2008) on May 30, 2008.

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

Highlights

- Pressure analysis and modeling are ongoing and scheduled to be completed shortly. This activity will be used to identify whether pressure spikes (should they occur) in the monitoring well can be attributed to leakage from the reservoir.
- Framework for Zama Best Practices Manual initiated.
- Presented poster on the geomechanical work completed to date at the Canadian Society of Petroleum Geology Annual Meeting held May 12, 2008.

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

Highlights

- Well development was started on North Dakota State Well 36-15. A sonic hammer tool was run with subsequent swabbing in order to obtain a formation fluid sample and to verify that perforations are open. A small amount of formation fluid was present. Samples were taken and submitted to a certified lab for analysis. Results are expected any time.
- Well development was started on North Dakota State Well 36-16. A sonic hammer tool was run with subsequent swabbing to verify that perforations are open. There was not a lot of fluid entry; therefore, an acid job was completed. This treatment seemed to be more effective as more formation fluid appears to be present. Swabbing continues on this well.
- Electricity has been run to the site.
- The work plan for well stimulation continues to be developed and revised based on information that is gathered from each well.
- A hearing was held before the North Dakota Industrial Commission (NDIC) to review the underground injection control (UIC) permit application package.
- Measurements of water levels and pressure in the wells continue to be taken on a regular basis.
- Additional gas samples from the wells have been obtained and analyzed.

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

Highlights

- Field activities for the 2008 wetland catchment sampling season continue.
- Preparations continue for the third grassland sampling season; field activities will begin in early June.
- The carbon tracking system (Oracle-based database) is complete and is currently being tested.
- PCOR Partnership partners continue to work toward obtaining ISO 14064-2 verification for grassland carbon credits.

- Ducks Unlimited, Inc. (DU), continues to make progress with respect to its carbon credit program. It has currently secured over 14,000 acres of private grasslands, with an initial goal set at 30,000 acres. Future projects are in process.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on greenhouse gas (GHG) emissions continues.
- The draft topical report entitled “Market Development for Terrestrial Sequestration on Private Lands” is in final review (EERC).
- We are evaluating other state and regional GHG or cap-and-trade program rules and policies and the Department of Energy’s (DOE) Guidelines for Aggregators and Terrestrial Offset Providers.
- The DU–PCOR Partnership terrestrial project Web site is being updated.
- The Decision Support System (DSS, © 2007 EERC Foundation) is undergoing characterization inputs and work on its terrestrial portion.

Task 6 – Continued Characterization of Regional Sequestration Opportunities (Erin M. O’Leary)

Highlights

- Worked on the Gas Analysis Web site; performed system work on the live and test servers.
- Worked to set up the GIS test and live servers. Also worked to research and develop a method to secure PCOR Partnership related geographic information system (GIS) data from unauthorized access over the Web. A security issue with Environmental Systems Research Institute leaves GIS layers open to public access.
- Attended the 7th Annual Carbon Capture and Sequestration meeting in Pittsburgh. During that meeting, discussions were held with the Kansas Geological Survey regarding some mapping strategies for the national carbon sequestration atlas.
- Finalized materials to be sent to Natcarb for creating national maps for the DOE atlas.
- Reviewed oil and gas update activities.
- A representative from Latitude Geographics provided a Web-based demonstration of its unique Geocortex tool designed to optimize the development of Web-based GIS applications. The product is quite impressive, and we are now pursuing purchase of the software.
- Text and graphics materials for the PCOR Partnership portion of the next DOE national carbon sequestration atlas have been uploaded to the DOE SharePoint site.
- The following maintenance activities were performed on the database servers used by the PCOR Partnership: service pack updates and the migration of data to a newer server.

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

Highlights

- Development of deliverable D40, the National Environmental Policy Act (NEPA) document for the Williston Basin Validation Test, is ongoing.
- A hearing was held before the NDIC on May 1, 2008, to review the UIC permit applications. The file is still open pending Environmental Protection Agency approval of the aquifer exemption and in order to accommodate public comment.

- Development of a regulatory group meeting to be held in conjunction with the PCOR Annual meeting has begun.
- Developments regarding various state and regional initiatives continue to be followed.
- Analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed.
- Review of recent publications relating to regulating CO₂ sequestration and MMV issues continues.

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

Highlights

- Reducing Our Carbon Footprint: The Role of Markets documentary
 - Received 900 copies of the documentary on Wednesday, May 14, 2008, and the documentary was distributed to partners.
 - All production tasks are completed, and the next step is national marketing by Prairie Public Broadcasting.
- The terrestrial documentary (M10/D39) was submitted to DOE for review on April 30, 2008, currently waiting for comments.
- Geologic documentary (D46) is due September 30, 2008.
 - Script was updated.
 - Draft letters were sent to Hess to obtain permission for site visits and interviews in Texas for the enhanced oil recovery site and in New Mexico for geologic CO₂ at Bravo Dome.
 - Filming in New Mexico and Texas is scheduled for the week of June 15.
- The public Web site update (D22)
 - Finalized latest update to the public site in the wake of the National Energy Technology Laboratory's approval received in mid-April.
 - Site will go live by mid-June when streaming video has been upgraded for quality and text changes have been completed.
- Outreach Working Group (OWG)
 - Attended outreach presentation and OWG breakfast session at the Pittsburgh meeting.
 - Provided feedback on the OWG video script for video intended for Greenhouse Gas Technology Conference (GHGT-9).
 - Provided feedback for GHGT-9 video script.
 - Attended the OWG conference call on May 15:
 - ♦ Provided images for the video.
 - ♦ Discussed Greenpeace report.
- D17: PowerPoint entitled “General Phase II Information PowerPoint Presentation” was completed on schedule and submitted to DOE for review on May 30, 2008.

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

Highlights

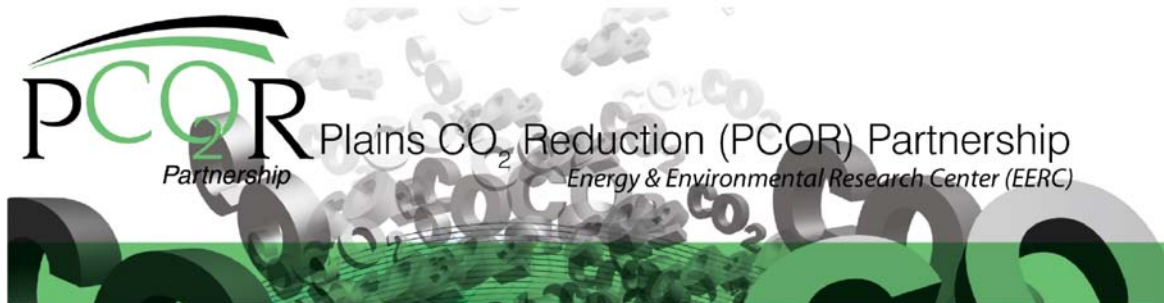
- Efforts continue to determine the amount of replacement power that will be needed to apply capture technology to the various types of regional sources for varying capture levels.

- Work continues on determining the most applicable, currently available capture technology for each of the various regional source types.
- Prepared a survey and a cover e-mail requesting input from the PCOR Partnership members regarding the topics that they would like to see covered during the capture workshop be held during the PCOR Annual Meeting in September.

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

Highlights

- On May 29, 2008, the PCOR Partnership responded to the International Energy Agency (IEA) GHG Programme peer review's comment document.
- The draft of the World Resources Institute's Sequestration Guidelines was received May 13 from Sarah Forbes for review. Comments are due back on June 15, 2008.
- The PCOR Partnership also continued participation in working group conference calls, including the following:
 - GIS
 - Capture and transportation
 - Geologic
 - Outreach



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Erin M. O’Leary)

Highlights

- Updated several reports, monthly updates, and demo site updates.
- Working on the new DSS
- Working on enhancements to DSS and the help video.
- Participated in a conference call with Minnesota State Geologist to discuss characterization-related activities that his team could provide for the PCOR Partnership.
- Missouri has completed the scanning of its well logs into raster format (tif). Missouri will send a DVD of the logs to the EERC.
- British Columbia has sent information on how to obtain data on wells and pools. Over the next week, the data will be retrieved and reviewed for its usefulness and subsequent assimilation into the DSS.

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

Highlights

- The Outreach Action Plan, deliverable D11, was submitted to DOE on March 31, 2008, currently waiting for comments.
- Received 500 DVDs of the Nature in the Balance documentary on May 30, 2008, from Prairie Public Broadcasting.
- OWG
 - Attended outreach presentation and OWG breakfast session at the Pittsburgh meeting.
 - Provided feedback on the script being prepared by the OWG for the video to be shown at the DOE booth at the GHGT-9 meeting.
- Attended the OWG conference call on May 15, 2008:
 - Provided images for the video.
 - Discussed Greenpeace report.
- A draft General Fact Sheet, deliverable D14, was sent to DOE for review on April 30, 2008, currently waiting for comments.
- Initiated work on upcoming fact sheets for the Canadian and Williston Basin demonstrations for the Web page for the public Web site.
- Continue to acquire information and data for the Outreach Information System.
- Deliverable D17 entitled “General Phase III Information PowerPoint Presentation” was completed on schedule and submitted to DOE for review on May 30, 2008.

- Preparing a list of videoclips to be inserted on the Web site.
- School outreach
 - Continued development of materials for the Teacher Seminar in Bismarck, North Dakota, on June 11.
 - Completed facilitator portion of the PowerPoint and questions for teachers related to the Nature in the Balance DVD and the Atlas
 - Working on an annotated PowerPoint for teachers and creating an activity for teachers that reflects Williston Basin conditions.
- Preparations continue on an Outreach Source Book as a consistent, single source to support outreach activities.
- Provided feedback on the outreach portion of the Best Practices Manual for the Regional Carbon Sequestration Partnership Program.

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

Highlights

- The developments of various state and regional initiatives are being tracked and analyzed.
- An update to the regulatory section of the DSS is under development.
- Work continues on the NEPA questionnaire for the Williston Basin Test.
- Development of a regulatory group meeting to be held in conjunction with the PCOR Partnership's Annual Meeting has begun.
- The analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to carbon capture and storage.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.

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

Highlights

- Spectra Energy and the British Columbia Ministry of Energy, Mines and Petroleum Resources formally announced on May 19 their plans to conduct a large-scale carbon capture and storage project at Fort Nelson, British Columbia.
- Development of an MMV plan for the Fort Nelson demonstration continued. Specifically, discussions were held with Pinnacle Technologies, Apogee Scientific, and Schlumberger Carbon Services with respect to potential technologies and costs for MMV work at Fort Nelson.
- Development of Baseline Characterization Experimental Design Package for the Williston Basin site continued.
- Group regional characterization activities
 - Development of a petrophysical model of the Mission Canyon Formation in the Washburn Study Area continued.
 - Development of a petrophysical model of the Rival acid gas injection field in North Dakota continued.

Task 5 – Well Drilling and Completion (TBA)

- 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

- Efforts continue to determine the amount of replacement power that will be needed to apply capture technology to the various types of regional sources for varying capture levels.
- Work continues on determining the most applicable, currently available capture technology for each of the various regional source types.
- Developed an objective plan for determining potential regional CO₂ pipeline routes.
- Began tracking down the information required to perform material, energy, and thermodynamic balances for the ECO₂ process that Basin Electric has chosen for installation at the Antelope Valley power station.
- Verification of the location coordinates for the PCOR Partnership CO₂ sources using Google Earth continue.

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- Numerous discussions with potential CO₂ 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)

- 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 and annual progress reports.
- Future activities include the Project Assessment Annual Report due December 31, 2008, and the Risk Assessment Plan due within Budget Period 3. An initial draft has been started for the Risk Assessment Plan.
 - A draft risk management plan outline and organization chart was included in the submission of the IEA peer review's comment document on May 29, 2008.
 - The risk management database research has also begun; initial contact has been made with consulting services.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- Preparations for the 2008 PCOR Partnership Annual Meeting continue. The dates will be September 16–18, 2008 in Minneapolis, Minnesota.
 - On May 8, 2008, an e-mail went out to partners with initial details on the meeting.
 - Web site registration will be available soon.
- The PCOR Partnership took part in the 7th Annual Carbon Capture & Sequestration Conference in Pittsburgh, Pennsylvania.
 - The PCOR Partnership submitted two abstracts.
 - A booth (Phase II and III) was on exhibit.

Travel/Meetings for Phases II and III

- May 5–8, 2008: 7th Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania
- May 6–8, 2008: 2008 Electric Power Conference in Baltimore, Maryland
- June 1–5, 2008: The 33rd International Technical Conference on Coal Utilization & Fuel Systems in Clearwater, Florida
- June 9–12, 2008: Teachers Seminar in Bismarck, North Dakota
- June 15–20, 2008: Filming in New Mexico and Texas
- June 18–19, 2008: 9th Annual Western Canadian Sedimentary Basin Working Group Meeting in Winnipeg
- June 29 – July 2, 2008: 4th International Symposium on Energy, Informatics and Cybernetics: EIC '08 in Orlando, Florida
- July 7–11, 2008: Meet with PCOR Partnership Partners in Calgary, Alberta
- August 13–15, 2008: Coal-Gen in Louisville, Kentucky
- September 29 – October 2, 2008: Pittsburgh Coal Conference in Pittsburgh, Pennsylvania
- November 16–20, 2008: GHGT-9 Conference in Washington, D.C.