

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

### **PHASE II ACTIVITIES**

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

##### **Highlights**

- The PCOR Partnership task leaders met internally on July 27, 2009. Topics discussed included Phase II Year 4 budget status; progress on the Regional Technology Implementation Plans (RTIPs); upcoming deliverables, milestones and travel; preparation for the Phase II final report; the status of the U.S. Department of Energy (DOE) Fossil Energy Techlines; the PCOR Partnership Annual Meeting; and an update on the McGregor Huff ‘n’ Puff as well as other task leader activities.
- Participated in the Geologic Working Group meeting held on July 13, 2009, at the Energy & Environmental Research Center (EERC).
- Reviewed and returned to DOE on July 23, 2009, a Fossil Energy Techline entitled “Regional Carbon Sequestration Partnership Collaborates with Excelsior Energy Inc.’s Mesaba Energy Project to Determine the Best Strategies for Capture and Storage of CO<sub>2</sub>.” This techline discussed the carbon management plan that the PCOR Partnership helped to prepare, including use of the Decision Support System (DSS, © 2007 EERC Foundation) as a tool in its preparation.
- Prepared a poster entitled “Carbon Capture and Storage (CCS) Opportunities for Marathon and an Approach to Identify and Manage Potential Project Risks” for Marathon Oil Company for its use at an internal poster session.
- Upcoming Phase II deliverables for August:
  - D22: Task 8 – Web Site Update
  - D52: Task 3 – Zama Field Validation Test RTIP
  - D53: Task 4 – Lignite Field Validation Test RTIP
  - D49: Task 6 – Regional Atlas
  - Monthly Update

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

##### **Highlights**

- Started production on July 6, 2009, at the E. Goetz #1 well head after a 2-week “CO<sub>2</sub> soak” period.
- Continued production in mid-July with average oil cut 2.6 times greater than the baseline cut, where the maximum oil cut was 12.3% and the baseline 2.8%. The maximum oil production

rate is approximately 5.0 times greater. Production rates are averaging 3–5 barrels of oil a day, which is a significant increase over baseline production values (1.5 bbl/day).

- Continued production in late July at an average rate of 3–5 bbl/day, with data appearing to indicate successful incremental oil production.
- Initiated static modeling of the northern portion (encompassing the injection site) of the Northwest McGregor field.
- Continued analysis using advanced neural network methods.

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

#### Highlights

- Continued preparation of the RTIP.
- Continued injection and production at the site.
- Doug Nimchuk of Apache Canada Ltd.
- Pat McLellan of Advanced Geotechnology

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

#### Highlights

- Received Z-Seis final report on July 7, 2009.
- Participated in numerous meetings and conference calls with various partners and field service providers to discuss and finalize monitoring, verification, and accounting (MVA) data for inclusion in the RTIP.
- Drafted the RTIP and submitted it for internal review.

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

#### Highlights

- On June 30, 2009, submitted the RTIP for terrestrial sequestration to DOE for review.
- Drafted and submitted for internal review a value-added Topical Report entitled “Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas Mitigation Strategy.”
- The U.S. Geological Survey (USGS) continued its analysis of wetland catchment gas sampling and reporting on this data.
- North Dakota State University (NDSU) continued its analysis of the economic impact of easement payments.
- Initiated final reporting activities now that the RTIP is complete.
- For information on related projects in the area, please visit:
  - Ducks Unlimited Carbon Credit Program  
[www.ducks.org/Conservation/EcoAssets/1306/CarbonSequestration.html](http://www.ducks.org/Conservation/EcoAssets/1306/CarbonSequestration.html)
  - National Farmers Union Carbon Credit Program  
[www.carboncredit.ndfu.org/](http://www.carboncredit.ndfu.org/)
  - Iowa Farm Bureau  
[www.agragate.com/](http://www.agragate.com/)

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

### Highlights

- Continued the compilation and formatting of the next edition of the PCOR Partnership Atlas (Deliverable D49). This third edition will contain individual page spreads for each of the Phase II validation sites as well as a page spread for Phase III activities.
- Continued preparation of the new geographic information system (GIS) interface for the DSS. An internal review is planned to identify any illogical or inefficient steps.
- Continued to create and provide new material to the Web programmers for their effort to update the DSS site.

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

### Highlights

- Tracked and analyzed various state, provincial, and regional greenhouse gas (GHG) reduction and CCS initiatives.
- Continued analysis of carbon market strategies.
- Reviewed recent publications relating to the regulation of CO<sub>2</sub> sequestration and MVA issues.
- Continued to follow and review actions occurring in Congress for any actions relating to CCS. Provided updates of these activities to task leaders.
- Provided input on the regulatory/policy sections of the PCOR Partnership Atlas.

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

### Highlights

- Attended the Regional Carbon Sequestration Partnership (RCSP) Public Outreach Working Group Outreach Best Practices Manual Development Workshop in Washington, D.C.
- Continued work on the finalization of video clips and sequestration project summaries for inclusion in the public Web site update (Deliverable D22) due August 31, 2009.
- Reviewed the status of the Geologic Sequestration and Carbon Footprint documentaries with Prairie Public Broadcasting, and prepared a work plan to aid in the scheduling of activities essential to both the video broadcast and DVD production.

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

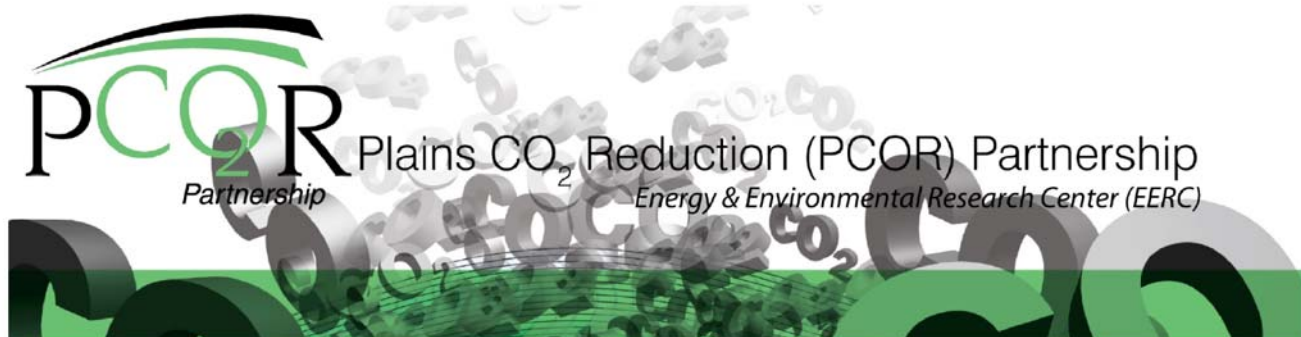
### Highlights

- Continued efforts to update 2008 report summarizing the cost and effort required for the initial capture, compression, and transportation of CO<sub>2</sub> within the PCOR Partnership region.

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

### Highlights

- Attended and participated in a round-table discussion in Washington, D.C., on potential joint CCS projects under the United States–Canada Clean Energy Dialogue.
- Participated in conference calls for the various working groups, including Outreach, Geologic, and Modeling; Capture and Transportation; Simulation and Risk Assessment; and GIS.
- 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:
  - On July 1, 2009, sent a confidential draft final report to subcommittee members for review.
  - On July 14, 2009, held a conference call to discuss the draft final report entitled “Development of Storage Coefficients for Carbon Dioxide Storage in Deep Saline Formations.”
  - On July 21, 2009, distributed minutes from the conference call to subcommittee members.
  - On July 22–23, 2009, presented subcommittee efforts at the NAEWG-NACAP meeting in Pittsburgh, Pennsylvania.



## **PHASE III ACTIVITIES**

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

#### **Highlights**

- Attended a workshop in Morgantown, West Virginia, on July 20–21, 2009, for geotechnical and GIS/information technology (IT) personnel from RCSP/NatCarb and related personnel (e.g., USGS, International Energy Agency [IEA]) involved in NACAP. The Morgantown workshop focused on geotechnical and GIS/IT technical aspects to improve exchange and quality of CCS data for RCSPs, NatCarb, and our potential North American colleagues and previewed the needs for the upcoming release of the DOE national carbon management atlas.
- Initiated efforts to collect and comprehend the readily available data on the subsurface of western Nebraska in response to projected needs of the Nebraska Public Power District to understand Nebraska geology as it relates to CCS.

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

#### **Highlights**

- Completed a draft final of the PowerPoint for the Fort Nelson Test Site (Deliverable D19) in collaboration with Spectra Energy and submitted it to DOE for review on July 31, 2009.
- Attended and participated in the “Keystone Center for Education: Climate Status Investigations” for the PCOR Partnership region at the Omaha Regional CSI Middle/High School Institute in Omaha, Nebraska, on July 29–30, 2009. This conference aimed to broaden the scope and quality of national science education with a balanced, nonbiased, comprehensive, and interdisciplinary approach to the study of global climate change. This professional development program helped teachers gain the confidence to introduce the topic of global climate change to middle and high school students. The Outreach Team presented information on the RCSP program to 13 teachers attending the 2-day workshop and distributed the regional atlas and documentaries. The Outreach Team also filmed the workshop for subsequent video clip preparation for the PCOR Partnership public Web site.

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

#### **Highlights**

- Tracked and analyzed various state, provincial, and regional GHG reduction and CCS initiatives, and provided frequent updates to task leaders and pertinent partners.
- Continued ongoing efforts to develop an update to the regulatory section of the DSS.
- Followed and reviewed actions occurring in Congress for any implications relating to CCS, and provided updates of these activities to task leaders.

- Continued ongoing review of recent publications relating to regulating CO<sub>2</sub> sequestration and MVA issues.
- Continued analyses of carbon market strategies.
- Provided input on the regulatory/policy sections of the PCOR Partnership Atlas.
- Participated in an Interstate Oil and Gas Compact Commission Pipeline Transportation Task Force conference call.
- Distributed minutes to the PCOR Partnership Regulatory Workshop – Brainstorming Session participants for their review and approval prior to distribution to the membership-at-large.
- Planned Travel: Carbon Capture & Sequestration – Policy, Economics, Regulation, and Risk, September 14–15, 2009, Washington, D.C. ([www.platts.com/Events/2009/pc919/](http://www.platts.com/Events/2009/pc919/)).

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

##### Highlights

- Participated in a workshop on July 29, 2009, at Spectra Energy in Calgary, Alberta, Canada, to identify potential risks associated with the Fort Nelson demonstration project, and assembled technical team members to provide input prior to quantification of the identified risks.
- Completed Version 1 of the static geological model.
- Continued the interpretation of the depositional system and facies distribution, and created new maps. This information will be used in the creation of the static model Version 2.
- Conducted initial dynamic modeling as an iterative process to determine the most representative injection scenarios and optimal injection schemes for long-term movement of CO<sub>2</sub>.
- Continued group regional characterization activities, including an update of the Bakken Model, and requested additional well logs from TGS and digitization by the Neuraloggers of well logs in the Bailey Field Area within the Williston Basin.
- Continued negotiations with Basin Electric Power Cooperative (a potential provider of CO<sub>2</sub> for the Williston Basin project) and the oil companies. No deals have been completed, and therefore, no site has been formally accepted or schedule of activities set.
- Presented at a meeting with EERC staff, NETL Project Manager, and Spectra Energy on July 7, 2009, at the EERC in Grand Forks, North Dakota.
- Participated in a meeting on July 8, 2009, at the EERC with EERC staff, Spectra Energy, and Oxand representatives on deliverables related to the risk management policy and process for the Fort Nelson project.
- Completed the first two reservoir simulations with hypothetical wells for the regional characterization of the Fort Nelson injection site.
- Participated in a conference call with Oxand on the initial findings of the Fort Nelson models.

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

- This task is anticipated to be initiated Quarter 1 – Budget Period (BP) 4, Year 3.

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

### Highlights

- Continued efforts at the request of Excelsior Energy to prepare text, figures, and tables to show potential pipeline infrastructure needed to move CO<sub>2</sub> from the planned Mesaba Integrated Gasification Combined Cycle plant to various geological sequestration opportunities in the PCOR Partnership region.
- Continued an evaluation of the proposed preliminary regional pipeline network developed under Phase II in July 2008. The preliminary network will be adapted to include the Phase III demonstration test activities.
- Continued an internal review of the overview of updated capture technologies.
- Completed preliminary calculations to investigate potential CO<sub>2</sub> compressors for use in the Williston Basin demonstration, and contacted Trimeric for assistance with a ballpark cost estimate for the purchase and installation of the necessary compression equipment. Trimeric indicated that purchase and installation of the compression and dehydration equipment will likely run between approximately \$13 million to \$16.25 million.

## **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 (Steve Smith)**

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

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

- This task is anticipated to be initiated Quarter 1 – BP4, Year 3.

## **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)**

- Nothing to note at this time. The next Project Assessment Annual Report is scheduled to be submitted on December 31, 2009.

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

#### Highlights

- The PCOR Partnership's project manager serves as chairman for the NAEWG-NACAP Methodology Subcommittee (on CO<sub>2</sub> Storage Capacity Estimation). This subcommittee discusses geologic storage capacity coefficients and the methodology for estimations. The data sharing of this group will lead to a solid foundation in the area of CO<sub>2</sub> capture and sequestration mapping and estimations in North America. This subcommittee will coordinate its activities closely with NAEWG-NACAP. The Kickoff Session was held March 27, 2009, and conference calls were held May 4 and July 14, 2009. The subcommittee's recommendations were then presented to NAEWG-NACAP at a meeting July 22–23, 2009, in Pittsburgh, Pennsylvania.
- Continued work on a risk management plan outline scheduled to be completed September 30, 2009.
- Submitted the Project Management Plan as an Appendix to the Continuation Application (EERC Proposal 2009-0271).
- Continued planning for the upcoming 2009 PCOR Partnership Annual Meeting scheduled for December 1–3, 2009, in St. Louis, Missouri, including ongoing efforts to post the registration information on the Internet and plan evening activities for attendees.
- Continued preparation of materials for a workshop on CO<sub>2</sub> sequestration, addressing advancements in development of direct and indirect sequestration technologies, environmental impacts, and value-added options, i.e., enhanced oil recovery operations, for October 25, 2009, in conjunction with the EERC's Air Quality VII conference in Arlington, Virginia.
- Continued preparation of materials for October 26, 2009, as Session Coordinator for the Carbon Management session in conjunction with the EERC's Air Quality VII conference, including preparation of a presentation to be used during the session.
- Hosted a task leader meeting at the EERC on July 27, 2009, where topics discussed included the Phase III – BP4: Continuation Application; the Regulatory Meeting – Brainstorming Session; DOE Techlines; the 2009 PCOR Partnership Annual Meeting; the Phase III Williston Basin Site Selection Update, and a Fort Nelson Update, as well as other task leader activities.
- Prepared a response to a July 31, 2009, letter to the Editor of the *Grand Forks Herald*. The response appeared on August 5, 2009.
- Continued efforts to streamline the process for existing Phase II members to continue their membership into Phase III, BPs 4 and 5, i.e., the next 8 years.
- Submitted an abstract entitled "The Plains CO<sub>2</sub> Reduction (PCOR) Partnership: Carbon Management Options for the Central Interior of North America" for consideration at the upcoming Electric Utilities Environmental Conference 2010: 13th Annual Energy & Environmental Conference and Expo scheduled for February 1–4, 2010, in Phoenix, Arizona.
- Hosted visits from NETL Program Manager on July 7, 2009; Spectra Energy on July 7–8, 2009; and Oxand on July 8, 2009.
- Upcoming Phase III deliverables for August:
  - M22: Task 14 – Draft White Paper – Nexus of CCS and Water Available for Comments
  - M23: Task 14 – Monthly Water Working Group (WWG) Conference Call Held
  - Monthly Update

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

### **Highlights**

- Continued preparation of Draft White Paper on the Nexus of CCS and Water due to be transmitted to DOE and the WWG on August 17, 2009, with comments due September 8 and the final document due September 30.
- Completed review and transmitted comments to the Expert Panel on the USGS' report entitled "Development of a Probabilistic Assessment Methodology for Evaluation of Carbon Dioxide Storage."
- Completed final changes and corrections to the Final Report entitled "Development of Storage Coefficients for Carbon Dioxide Storage in Deep Saline Formations" for the DOE and IEA Greenhouse Gas R&D Programme.

### **Phase II – Travel/Meetings**

- June 29–30, 2009: Attended the International Climate Stewardship Solutions Conference, "Learning from Overseas Experience with Policies and Strategies that Create Economic Opportunity and Reduce Carbon," in Bismarck, North Dakota.

### **Phase III – Travel/Meetings**

- June 29 – July 1, 2009: Participated in a Fort Nelson Risk Management meeting at Spectra Energy in Calgary, Alberta, Canada.
- July 14–15, 2009: Attended the RCSP Public Outreach Working Group meeting in Washington, D.C.
- July 14–17, 2009: Participated in a Fort Nelson Risk Management meeting at Spectra Energy in Calgary, Alberta, Canada.
- July 15–17, 2009: Presented at the Infocast 3rd Annual Carbon Capture Status & Outlook Conference, in Washington, D.C.
- July 20–21, 2009: Attended the North America Carbon Atlas Partnership Meetings in Morgantown, West Virginia.
- July 22–23, 2009: Presented at the North America Energy Working Group–North American Carbon Atlas Partnership meeting in Pittsburgh, Pennsylvania.
- July 27–30, 2009: Participated in a Fort Nelson Risk Management meeting at Spectra Energy in Calgary, Alberta, Canada.
- July 28–29, 2009: Met with Nebraska Public Power District in Denver, Colorado.
- July 29–30, 2009: Presented at the Keystone Center for Education: Climate Status Investigations Teacher Workshop in Omaha, Nebraska.