July 31, 2009

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
State Capitol, 14th Floor
Bismarck, ND 58505-0840

Dear Ms. Fine:

Subject: EERC Plains CO_2 Reduction Partnership (PCOR) Phase II Deliverable D3 Quarterly Technical Progress Report for the Period April 1 – June 30, 2009
Contract No. FY06-LV-143; EERC Funds 9249, 9607, 9661, 9707–9708; and
Contract No. G005-014; EERC Funds 9250 and 9709

Enclosed is a hard copy of the Quarterly Technical Progress Report for the PCOR Partnership Program for Phase II. Also enclosed is a CD containing the Quarterly Technical Progress Report. A PDF of the report will also be sent via e-mail.

If you have any questions, please contact me by phone at (701) 777-5279 or by e-mail at esteadman@undeerc.org.

Sincerely,

Edward N. Steadman
PCOR Partnership Manager
EERC Senior Research Advisor

ENS/sah

Enclosures

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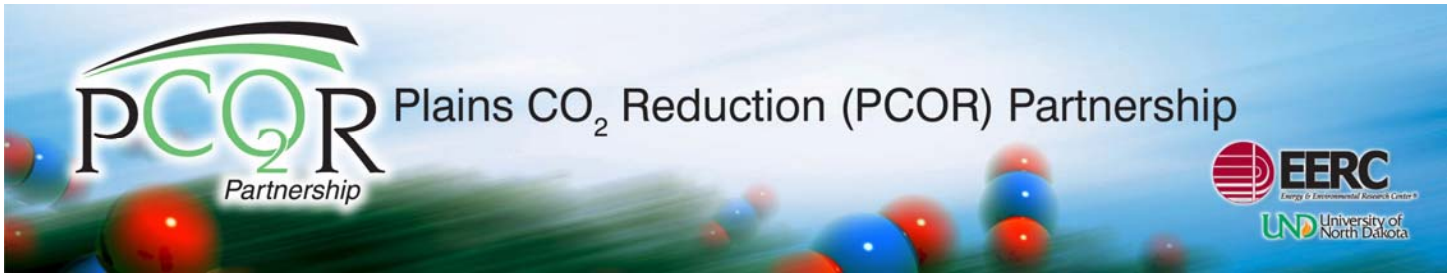
Rich Baker, NDIC Department of Mineral Resources, Oil and Gas Division
Lynn Helms, NDIC Department of Mineral Resources, Oil and Gas Division

c: Corey Irion, EERC



PLAINS CO_2 REDUCTION PARTNERSHIP PHASE II

Quarterly Technical Progress Report

(for the period April 1 – June 30, 2009)

Prepared for:

Karlene Fine
North Dakota Industrial Commission
600 East Boulevard Avenue
State Capitol, 14th Floor
Bismarck, ND 58505-0840

Contract Nos. FY06-LV-143 and G005-014
EERC Funds 9249, 9607, 9661, 9707–9708 and 9250, 9709

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July 2009

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PLAINS CO_2 REDUCTION PARTNERSHIP PHASES II
Quarterly Technical Progress Report
April 1 – June 30, 2009

INTRODUCTION

The Plains CO_2 Reduction (PCOR) Partnership is one of seven regional partnerships operating under the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP) Program. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota. The PCOR Partnership region includes all or part of nine states (Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming) and four Canadian provinces (Alberta, British Columbia, Manitoba, and Saskatchewan).

Phase II is a 4-year project, divided into two budget periods (BPs), running from October 1, 2005, to September 30, 2009. This progress report summarizes the activities for the above-referenced reporting period (April 1 – June 30, 2009) for Phases II.

The activities for Phase II of the PCOR Partnership include four validation tests (Figure 1) along with regional characterization, regulatory and permitting activities, and outreach. Ten tasks have been developed; see Table 1 for the responsibility matrix.

SUMMARY OF SIGNIFICANT PHASE II ACCOMPLISHMENTS

Task 1 – Project Management and Reporting

Phase II of the PCOR Partnership currently has 83 partners. The latest additions to the program are Baker Hughes Oilfield Operations, Inc., which joined the PCOR Partnership on April 23, 2009, and the Petroleum Technology Research Centre, which joined on May 4, 2009.

Table 1. Phase II Responsibility Matrix

Phase II Task Description	Responsible Party
Task 1 – Project Management and Reporting	Ed Steadman
Task 2 – Field Validation Test in a Williston Basin Oil Field, North Dakota	Jim Sorensen
Task 3 – Field Validation Test at Zama, Alberta	Steve Smith
Task 4 – Field Validation Test of North Dakota Lignite	Lisa Botnen
Task 5 – Terrestrial Validation Test	Barry Botnen
Task 6 – Characterization of Regional Sequestration Opportunities	Wes Peck
Task 7 – Research Safety, Regulatory, and Permitting Issues	Lisa Botnen
Task 8 – Public Outreach and Education	Dan Daly
Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment	Melanie Jensen
Task 10 – Regional Partnership Program Integration	Ed Steadman

Figure 1. PCOR Partnership Phase II validation test sites.

Phase II members in good standing are automatically enrolled in Phase III for overlapping years (October 1, 2007 – September 30, 2009). The membership, as of June 30, 2009, is listed in Table 2. Significant accomplishments for project management and reporting for the period included the following:

- A DOE Fossil Energy Techline, "Regional Carbon Sequestration Partnership Huff 'n' Puff Test Is under Way: Evaluating the Feasibility of Simultaneous CO_2 Sequestration and Enhanced Oil Recovery" describing the "puff" phase of the Williston Basin CO_2 Huff 'n' Puff (H&P) Field Validation Test (in the Northwest McGregor oil field), is under development.

Table 2. PCOR Partnership Membership, Phase II/Phase III

U.S. Department of Energy National Energy Technology Laboratory	Fischer Oil and Gas, Inc.	North Dakota Industrial Commission Lignite Research, Development and Marketing Program
UND EERC	Great Northern Power Development, LP	North Dakota Industrial Commission Oil and Gas Research Council
Abengoa Bioenergy New Technologies	Great River Energy	North Dakota Natural Resources Trust
Air Products and Chemicals	Hess Corporation	North Dakota Petroleum Council
Alberta Department of Energy	Huntsman Corporation	North Dakota State University
ALLETE	Interstate Oil and Gas Compact Commission	Otter Tail Power Company
Ameren Corporation	Iowa Department of Natural Resources	Petroleum Technology Research Centre
American Coalition for Clean Coal Electricity	Lignite Energy Council	Petroleum Technology Transfer Council
American Lignite Energy (ALE)	Manitoba Geological Survey	Prairie Public Broadcasting
Apache Canada Ltd.	Marathon Oil Company	Pratt & Whitney Rocketdyne, Inc.
Baker Hughes Oilfield Operations, Inc.	MEG Energy Corporation	Ramgen Power Systems, Inc.
Basin Electric Power Cooperative	Melzer Consulting	RPS Energy Canada Ltd. – APA Petroleum Engineering Inc.
Biorecro AB	Minnesota Power	Saskatchewan Industry and Resources
Blue Source, LLC	Minnkota Power Cooperative, Inc.	SaskPower
BNI Coal, Ltd.	Missouri Department of Natural Resources	Schlumberger
British Columbia Ministry of Energy, Mines, and Petroleum Resources	Missouri River Energy Services	Shell Canada Energy
Carbozyme, Inc.	Montana–Dakota Utilities Co.	Spectra Energy
Computer Modelling Group, Inc.	Montana Department of Environmental Quality	Strategic West Energy Ltd.
Dakota Gasification Company	National Commission on Energy Policy	Suncor Energy Inc.
Ducks Unlimited Canada	Natural Resources Canada	TAQA NORTH, Ltd.
Ducks Unlimited, Inc.	Nebraska Public Power District	TGS Geological Products and Services
Eagle Operating, Inc.	Nexant, Inc.	University of Alberta
Eastern Iowa Community College District	North American Coal Corporation	U.S. Geological Survey Northern Prairie Wildlife Research Center
Enbridge Inc.	North Dakota Department of Commerce Division of Community Services	Weatherford Advanced Geotechnology
Encore Acquisition Company	North Dakota Department of Health	Western Governors' Association
Energy Resources Conservation Board/ Alberta Geological Survey	North Dakota Geological Survey	Westmoreland Coal Company
Environment Canada	North Dakota Industrial Commission Department of Mineral Resources, Oil and Gas Division	Wisconsin Department of Agriculture, Trade and Consumer Protection
Excelsior Energy Inc.		Xcel Energy

- Prairie Public Broadcasting (PPB) and the PCOR Partnership documentary "Out of the Air: Into the Soil: Land Practices That Reduce Atmospheric Carbon Levels" won the 2007–2008 Gold Aurora Award in the category of entertainment documentary for nature/environment, as well as a 15th Annual Communicator Award of Excellence in the Environmental Documentary Category.
- PPB and the PCOR Partnership documentary "Reducing Our Carbon Footprint: The Role of Markets" also won a 15th Annual Communicator Award of Excellence. The Communicator Awards were announced on June 9, 2009.
- A DOE Fossil Energy Techline, "Example Benefits of a Regional Carbon Sequestration Partnership's Decision Support System Displayed in the Development of a Carbon Management Plan" is under development to describe the collaborative efforts of the EERC and Excelsior Energy to create a carbon management plan for its Mesaba Project. The Techline explains how useful the PCOR Partnership Decision Support System (DSS, © 2007 EERC Foundation) was in designing a carbon management plan.
- Work continues on the Phase II Final Report (Deliverable [D] 56). At this time, the field validation tests are drawing to a close, and summaries on the results are being developed. The final report is due on December 29, 2009.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

Task 2 continues to focus on evaluating the effectiveness of carbon dioxide (CO_2) storage in conjunction with enhanced oil recovery (EOR) operations in a deep carbonate reservoir in the Williston Basin. Specifically, the EERC is collaborating with Eagle Operating Company and the members of the PCOR Partnership to conduct a CO_2-based Huff 'n' Puff (H&P) operation into a single oil-producing well. In mid-June, a total of 440 tons of CO_2 was injected into the E. Goetz #1 well in the Northwest McGregor oil field in Williams County, North Dakota.

Task 3 – Field Validation Test at Zama, Alberta

Injection of gas has continued during this reporting period. A cumulative total of over 800 million cubic feet (approximately 40,000 tons) of gas has been injected, with an average composition of 80% CO_2 and 20% hydrogen sulfide (H_2S). This equates to approximately 28,000 tons of CO_2 stored throughout the operational period. Injection rates throughout this reporting period have remained relatively stable at approximately 1 million cubic feet per day but have generally increased over the past year to meet voidage replacement demands. Oil is currently being produced at an average rate of 100 barrels per day (Figure 2). As of June 30, 2009, 22,000 barrels of oil have been produced from this pinnacle.

Task 4 – Field Validation Test of North Dakota Lignite

Postinjection monitoring at the Lignite for CO_2 Sequestration and Enhanced Coalbed Methane Field Validation Test site was complete at the end of June 2009. Preliminary analyses of the various data sources indicate concurrence with regard to plume direction and containment.

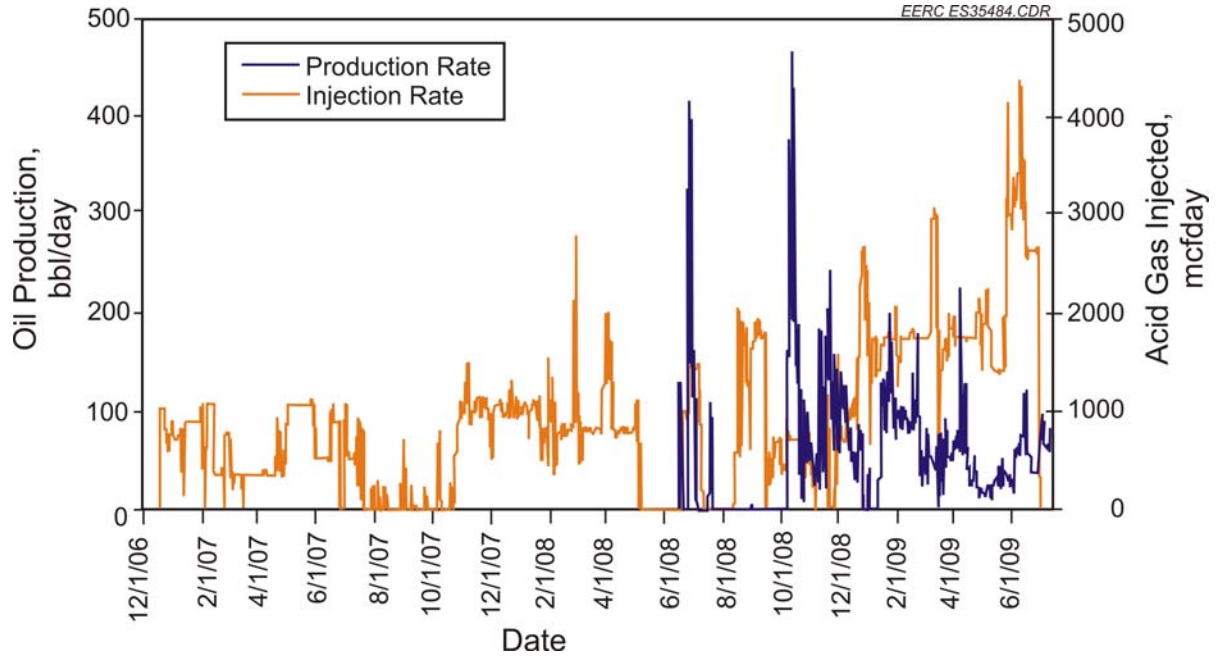

Figure 2. Zama acid gas injection profile.

Task 5 – Terrestrial Validation Test

Significant accomplishments for the reporting period included the following:

- The draft Regional Technology Implementation Plan (RTIP), was prepared during this quarter. Work continues towards the final report. The RTIP provides a "user's manual" with instructive information on how to implement terrestrial offset projects in the PCOR Partnership region based on the work completed during Phase II. The final report will present the specific tasks and results completed by the partners participating in this test.
- The database workflow procedures using ArcSDE geodatabase versioning and replication for updating the carbon unit polygon feature class have been successfully deployed and are operational. This process allows carbon unit polygon features to be updated at near real time by distributed users. A user guide documenting details of the Ducks Unlimited, Inc. (DU), CONSERV Enterprise Geodatabase is currently under production.
- Analyses of grassland samples collected in North Dakota and Iowa are complete. Approximately 90 deep cores were collected for soil characterization. The processing of these cores has also been completed. Statistical analysis is ongoing on all the data collected over the course of the sampling years and will be fully reported in the final report.
- DU's Avoided Grassland Conversion Project in the Prairie Pothole Region was officially certified on March 27, 2009, by the Scientific Certification Systems Greenhouse Gas Verification Program that it meets the Gold Level quality standard defined by the Climate, Community, and Biodiversity Alliance. In doing so, the project became the first project to be approved for North America. A copy of the project description document and other details are available at www.climate-standards.org/ projects/index.html
- A fact sheet for distribution to policy- and lawmakers during the lead-up to the passage of the American Clean Energy and Security (ACES) Act was prepared. This fact sheet highlighted the need for, and benefits of, including soil-based sequestration methods, such as grassland restoration and protection, in the Act. During the drafting and lead-up to the passage of the bill, DU staff in both regional and Washington, D.C., offices provided science-based recommendations for offsets, including providing language favorable to grassland and the PCOR Partnership region's terrestrial sequestration carbon credits. In H.R. 2454, the U.S. House approved both grassland and wetlands as identified eligible offset project types for initial consideration.
- DU submitted a Project Concept form to the Climate Action Reserve for the development of an Avoided Grassland Conversion protocol. The Climate Action Reserve, formerly part of the California Climate Action Registry, is a prominent registry with early indications that offsets verified against its protocols will be recognized in a national program. A decision on adopting the Avoided Grassland Conversion protocol is expected during the fall of 2009.

Task 6 – Characterization of Regional Sequestration Opportunities

A significant accomplishment for the reporting period includes the continuation of a major remodel of the PCOR Partnership DSS. The anticipated updates will include a new and improved geographic information system (GIS) interface, as well as expanded content with regard to the ongoing field validation projects. Geocortex®, a product from Latitude Geographics, is being used to facilitate the development of the GIS interface. Figures 3 and 4 show the proposed new interface for the GIS portion of the DSS.

Also in this reporting period, text and graphics materials for the next release of the PCOR Partnership Atlas (D49) have been assembled. At this time, it is estimated that ten new pages of information will be added to the Atlas. This deliverable is due August 31, 2009, and plans are under way to distribute it at the upcoming Annual Meeting.

Task 7 – Research Safety, Regulatory, and Permitting Issues

The regulatory Road Map Document (D50) was submitted for review on June 30, 2009. Additionally, regulatory requirements for the lignite field validation test were met.

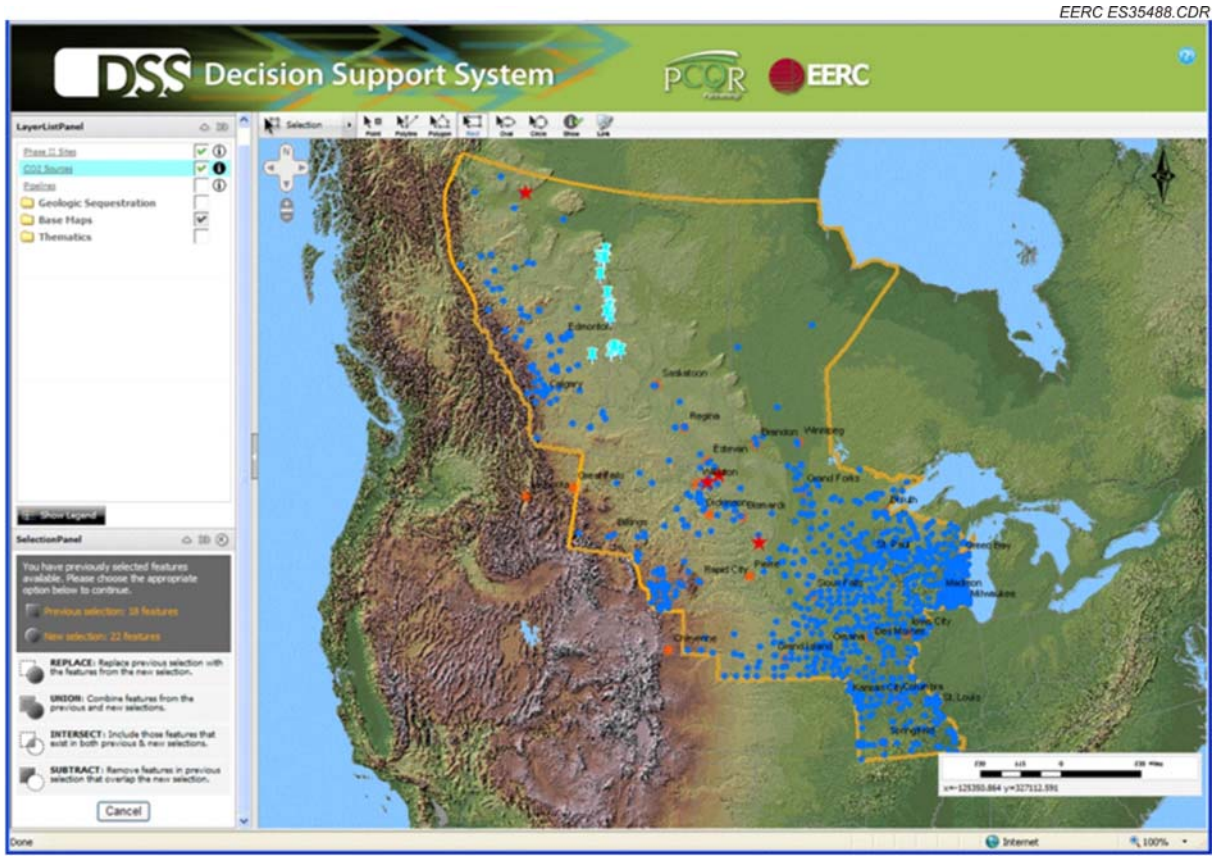

Figure 3. New interface for the GIS portion of the DSS. The new selection menu is featured on the lower left side of screen and the blue push pins represent the sources selected.

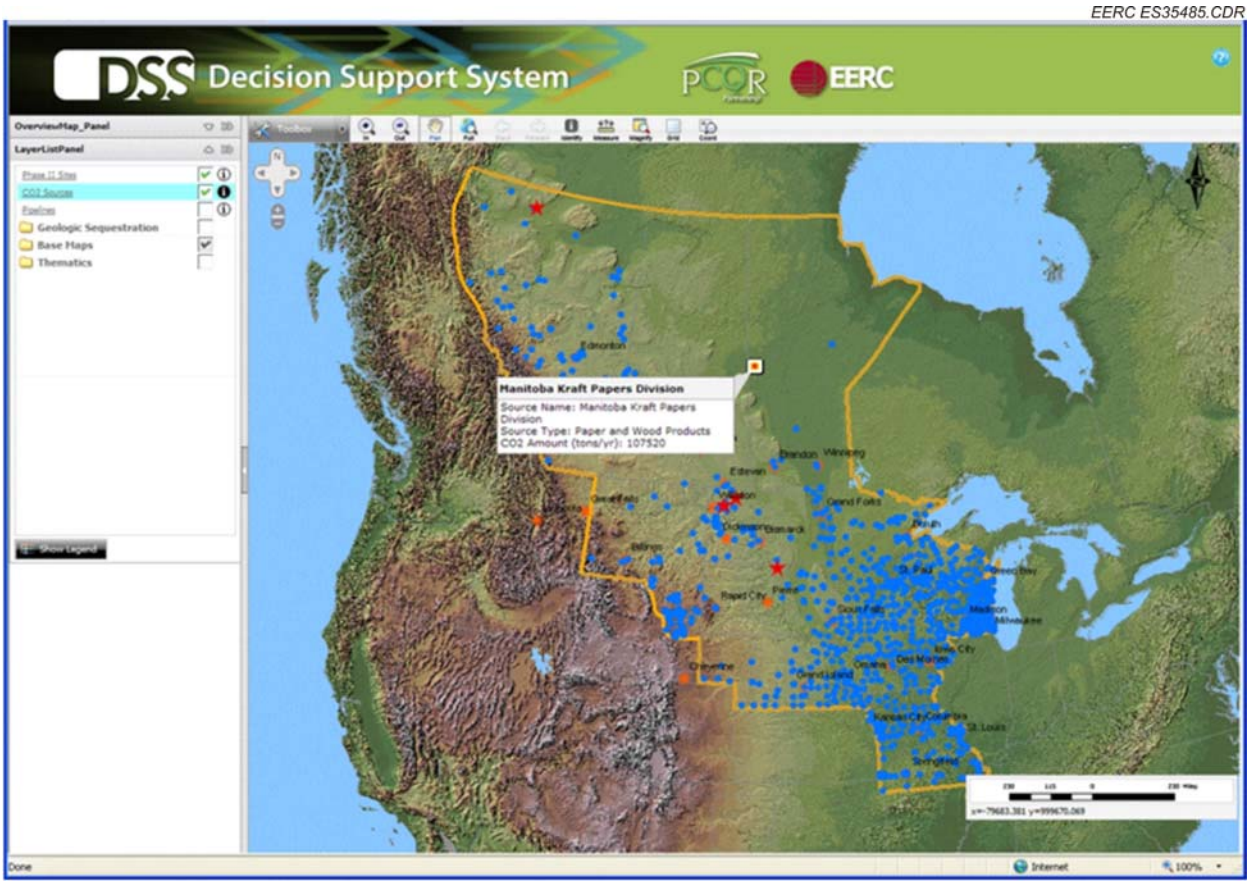

Figure 4. Interface for the GIS portion of the DSS illustrating the new map tips function to show basic information without selecting the feature.

Task 8 – Public Outreach and Education

A significant accomplishment during this reporting period is the completion of principal filming (over 50 hours of video footage) in collaboration with PPB for the CO_2 Sequestration and Global Warming – Overview of Phase II Results for Regional Partnership documentary (D51) on location in Minnesota; Delhi, India; and multiple locations in the Republic of Cameroon, in west-central Africa.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

Significant accomplishments during this reporting period include:

- A quality assurance/quality control (QA/QC) check of the entire PCOR Partnership CO_2 sources database was completed, and identified errors were corrected.
- The task leader responded to a query about the method that the PCOR Partnership uses to estimate CO_2 emissions from combustion of different types of coal.

- Additional text and figures were prepared as part of the effort to update the draft Best Practices Manual: Regional Sequestration Opportunities (D44) submitted for review in July 2008.

Task 10 – Regional Partnership Program Integration

Participation in conference calls for the Outreach, Geologic, and Modeling; Capture and Transportation; Simulation and Risk Assessment; and GIS Working Groups continued during this reporting period.

A workshop on potential joint carbon capture and storage (CCS) projects with Canada under the Clean Energy Dialogue is under development. Both the United States and Canada have expressed an interest to continue discussions on CCS. These discussions are occurring under the U.S.–Canada Clean Energy Dialogue. The program manager attended and participated in a round-table discussion on June 29–30, 2009.

PHASE II PROGRESS OF WORK

Task 1 – Project Management and Reporting

Task 1 includes all project management and reporting activities. This reporting period focused on the following activities: 1) managing overall project activities, 2) informing stakeholders about DOE's RCSP Program and the PCOR Partnership, 3) enlisting new partners in the PCOR Partnership, and 4) discussing existing and potential demonstration activities with prospective Phase II participants. Efforts undertaken in Task 1 also included the following:

- Work continues on planning the PCOR Partnership Annual Meeting to be held in St. Louis, Missouri on December 2–3, 2009. Two half-day premeeting workshops, one on Effective CCS Outreach Strategies and another on Carbon Management, will be run concurrently on the afternoon of December 1, 2009. A fee will be charged to non-PCOR Partnership members. Efforts are under way to promote attendance at the workshops and encourage participation in the PCOR Partnership and/or other RCSP programs. A Web site is currently under development.
- On June 9–10, 2009, the PCOR Partnership hosted an independent consultant to assist through September 30, 2009, in developing reports and outreach materials related to the assessment of carbon separation, capture, and storage opportunities and also provide technical support for the development and review of program deliverables.
- As the PCOR Partnership is in the final year of its Phase II efforts, work has begun on the Phase II Final Report (D56). At this time, the field validation tests are drawing to a close, and summaries on the results are under development.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

The goal of Task 2 is to conduct a field validation test in the Williston Basin oil field in northwestern North Dakota to evaluate the potential for geological sequestration of CO_2 in a deep carbonate reservoir for the dual purpose of CO_2 storage and EOR.

During this quarter, a total of 440 tons of CO_2 was injected into the E. Goetz #1 well in the Northwest McGregor oil field in Williams County, North Dakota. The injection zone is in a limestone interval of the Mission Canyon Formation at a depth of approximately 8050 ft below ground surface. Injection occurred over a period of 2 days. The well was shut-in immediately upon the completion of the injection. The work plan for the Northwest McGregor H&P operation is to allow the injected CO_2 to soak in the formation for several weeks, after which time the well will be brought back onto production. Monitoring through the period, collection and analysis of fluid and gas samples, as well as postproduction period reservoir saturation tool (RST) and vertical seismic profiling (VSP) logging runs will be conducted throughout the summer of 2009.

Task 3 – Field Validation Test at Zama, Alberta

The goal of the field validation test in the Zama Field of Alberta, Canada, is to evaluate the potential for geological sequestration of CO_2 as part of a gas stream that also includes high concentrations of H_2S acid gas injected for the concurrent purposes of CO_2 sequestration, H_2S disposal, and EOR. The following activities have been undertaken during this reporting period:

- Final reporting for the Zama project is being conducted. The framework and text elements for the RTIP are in the review stages and should be completed in the next quarter.

Task 4 – Field Validation Test of North Dakota Lignite

In Task 4, the effectiveness of lignite seams to act as sinks for CO_2 during simultaneous CO_2 storage and enhanced coalbed methane (ECBM) production will be evaluated in the Williston Basin. The list below describes ongoing activities and progress for the reporting period:

- Postinjection logging and surveys are complete. Results and reports from Schlumberger, Z-Seis, Praxair, and Pinnacle have been received. A meeting was held with Schlumberger in Grand Forks to present and discuss its data as well as Z-Seis data.
- Shallow groundwater wells near the project site were sampled following injection.
- Postinjection monitoring at the field test site was complete the end of June 2009. Staff has downloaded all postinjection data to continue evaluation and analysis of the injectivity and sequestration ability of the lignite seam.
- Work continues on the RTIP. A preliminary draft report has been completed. The final report will be completed next quarter.
- Final Form 4, Sundry Notices, was submitted to the North Dakota Industrial Commission (NDIC) for the monitoring wells.

- A 1-year extension of the site easement was granted by the North Dakota state land department in order to continue monitoring at the test site location. The original end date of the easement was June 1, 2009.
- Numerous meetings and conference calls continue to be conducted with various partners and field service providers to discuss data analysis of CO_2 injection and monitoring, verification, and accounting (MVA) data.

Task 5 – Terrestrial Validation Test

The objective of Task 5 is to develop the technical capacity to systematically identify, develop, and apply alternate land use management practices to the prairie pothole ecosystem (at both local and regional scale) that will result in greenhouse gas (GHG) reductions. Ongoing activities and accomplishments for the period are listed below:

- Economic analysis of landowner acceptance and opportunity in the PCOR Partnership region continues to be performed by Dr. Ben Rashford at the University of Wyoming. Model results were summarized in the RTIP report and will be presented in the final report.
- A database has been developed and successfully deployed this quarter for tracking tabular information for conservation easements. A Web application is also available for general users to query easements and for administrators to maintain the database. Each carbon project/unit is protected by a related conservation easement that protects the carbon stocks and conservation values of the property in perpetuity. This is an important characteristic of "permanence" for biological offsets and an integral part of tracking carbon projects. An ArcGIS server Web application with online digitization is under development for tracking carbon units and easements spatially.
- A mapping tool for property and land cover types under option contracts for its carbon offsets was developed.
- Database work on developing reports for the carbon module took place this quarter. Reports will include providing summary information for each transaction/sale, inventory of grassland offsets available for sale, general development of templates, and user-defined customized reports.
- Meetings took place with several investors this quarter interested in developing biological carbon offset portfolios. Separate meetings were held with the Carbon Fund, The Conservation Fund, and Ecosystem Investment Partners.
- PCOR Partnership partners participated in a U.S. House Agricultural Committee questionnaire on climate policy for terrestrial sequestration, farming practices, and carbon trading. Comments can be viewed at http://agriculture.house.gov/inside/publications.html
- Analyses of GHG flux samples collected from South Dakota wetlands are ongoing. Reports of research findings are being drafted.

Task 6 – Characterization of Regional Sequestration Opportunities

The goal of Task 6 is to characterize the PCOR Partnership region with respect to regional sequestration opportunities and to provide this information to our partners through our Web-based DSS. Progress within the reporting period included the following:

- Work is progressing on modifications to the current PCOR Partnership Atlas. At this time, it is estimated that ten new pages of information will be added to the product.
- The requested new server has arrived and is in operation. EERC staff and management have been utilizing a Microsoft Sharepoint application for housing pertinent project management documents, spreadsheets, and images related to the project. Diagnoses of recent server problems have identified a serious conflict of the Sharepoint services with other traditional Web site services. Without a new dedicated server, the existing PCOR Partnership data management system would have needed to be abandoned. The purchase of this new machine will ensure that the management efforts of the past several years will not be lost.
- A major remodel of the PCOR Partnership DSS continues. The anticipated updates will include a new and improved GIS interface as well as expanded content with regard to the ongoing field validation projects. Several new functions will make the site more versatile.
- A secure socket layer (SSL) certificate from Verisign has been purchased and installed on the www2.undeerc.org server. This software will ensure that our partners will log-in through a secure mechanism. Without this setup, it would be possible to intercept passwords and hack into the DSS.

Task 7 – Research Safety, Regulatory, and Permitting Issues

The goal of Task 7 is to identify and track new and existing regulations with respect to the relevant regulatory agencies within each of the PCOR Partnership states and provinces and the relevant federal regulatory agencies of the United States and Canada. Activities in Task 7 included the following:

- Various state, provincial, and regional GHG reduction and CCS initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to CCS.
- Recent publications relating to regulating CO_2 sequestration and MVA issues continue to be reviewed.
- A review of the U.S. Environmental Protection Agency (EPA) positive "endangerment finding" that GHGs endanger public health continues.
- A review of the Waxman/Markey bill is ongoing.
- EERC staff attended the Interstate Oil and Gas Compact Commission (IOGCC) meeting in Anchorage, Alaska. In addition, EERC staff also participated in the IOGCC Pipeline Transportation Task Force meeting.

- Final Form 4, Sundry Notices, was submitted for the monitoring wells for the lignite field validation test.
- Road map document (D50) was submitted for review on June 30, 2009.

Task 8 – Public Outreach and Education

The goals of the PCOR Partnership's Public Outreach and Education task are to provide 1) outreach and education mechanisms that raise the awareness of CCS opportunities in the region and 2) outreach to interested stakeholders with information about existing and future CCS efforts in the region.

The draft final documentary entitled "Geologic CO_2 Sequestration" (D46) was submitted for review on May 29. The draft final report "Best Practices Manual: Outreach" was completed and submitted to NETL for review on May 29.

Principal filming for the final Phase II documentary (D51) was completed, including both domestic and overseas locations. In early May, over 10 hours of video was shot of a family in Howard Lake, Minnesota, just east of Minneapolis. In late May, over 20 hours of video was shot with two families in the New Delhi area of India. In late June, over 20 hours of video was shot with two families in two towns (Muyuka and Ikata) in the Buea area of southwestern Cameroon on the west coast of Africa. The documentary will contrast and compare energy use and lifestyle and the implications of reducing carbon emissions for families in the United States, a developing nation, and an underdeveloped nation.

In addition, members of the outreach team took part in the monthly conference calls and related activities of the Outreach Working Group; completed initial arrangements for a Keystone teacher seminar in Omaha, Nebraska, in July 2009; and presented at the North Dakota Petroleum Council Teacher Education Seminar on June 10, 2009, and at the Lignite Energy Council's "2009 Lignite Education Seminar: Energy, Economics and Environment" on June 17, both in Bismarck, North Dakota.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

The goal of Task 9 is to identify sequestration technologies and approaches that are suitable and available for large-scale deployment in the PCOR Partnership region and to estimate their economic viability. Maintaining a current emission database; enhancing the ability to identify good matches between CO_2 emission sources, capture/separation technologies, and appropriate geologic sinks; and accurately estimating the costs of capture, compression, and transportation are crucial aspects to meeting this goal.

The update and review of the PCOR Partnership's CO_2 emission database were completed. To the extent possible, all of the location coordinates were verified using Google Earth. The majority of power plant emissions were updated based on current EPA databases, and gas processing facilities were added. All of the information underwent a QA/QC evaluation.

Additional text and figures were prepared as part of the effort to update the draft Best Practices Manual: Regional Sequestration Opportunities (D44) submitted in July 2008. The revised document will include updated CO_2 emission information as well as the inclusion of more than 200 additional natural gas-processing or transportation facilities. Potential pipeline routes are being adjusted to incorporate the gas-processing facilities.

Task 10 – Regional Partnership Program Integration

Task 10 consists of the PCOR Partnership's active participation in and leadership to technical working groups to identify, discuss, and resolve common issues related to the deployment of sequestration technologies. The PCOR Partnership continued participation in working group conference calls, including the following:

- GIS and Database
- Capture and Transportation
- Geologic and Infrastructure
- Public Outreach
- Simulation and Risk Assessment
- North American Energy Working Group
  - North American Carbon Atlas Partnership Methodology Subcommittee: efforts are under way to transmit the confidential draft report entitled "Development of Storage Coefficients for Carbon Dioxide Storage in Deep Saline Formations" to the Subcommittee for its review prior to the conference call scheduled for mid-July, and the Working Group meeting scheduled for July 22–23.
- Regulatory
- Water

PHASE II COST STATUS

The approved budget for Phase II, along with actual costs incurred and in-kind cost share reported, is shown in Table 3.

Table 3. Phase II Budget and Actual Costs Incurred

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	$15,913,178	$14,267,792
Nonfederal Share – Cash	$2,321,410	$2,037,587
Nonfederal Share – In-Kind	$7,825,301	$10,165,483
Total	$26,059,889	$26,470,862

PHASE II SCHEDULE STATUS

Table 4 contains a listing of all deliverables and milestones by quarter, with completion dates, for the duration of Phase II. Table 5 contains project milestones and deliverables (Gantt chart) for the duration of Phase II.

ACTUAL OR ANTICIPATED PHASE II PROBLEMS OR DELAYS

Task 1 – Project Management and Reporting

Nothing to note at this time.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

Unavoidable weather-related delays at the site resulted in actual injection on June 16–17, 2009. Unfortunately, no specific time frame can be applied with accuracy for the exact timing of the cessation of field activities. We plan to puff 4–6 weeks after the huff, but if the well does not respond the way we predicted, we may allow it to "soak" a bit longer. No two reservoirs are alike, and the reservoir behavior with respect to the CO_2 is the main focus of the task. Because the length of time necessary to complete the process is uncertain, there is a strong possibility that additional time beyond the end of BP3 may be needed to finish up activities at the site.

Task 3 – Field Validation Test at Zama, Alberta

Nothing to note at this time.

Task 4 – Field Validation Test of North Dakota Lignite

Nothing to note at this time.

Task 5 – Terrestrial Validation Test

Nothing to note at this time.

Task 6 – Characterization of Regional Sequestration Opportunities

Nothing to note at this time.

Task 7 – Research Safety, Regulatory, and Permitting Issues

Nothing to note at this time.

Table 4. Phase II Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2005)		
M1: Task 1 – Project Management Plan Completed	12/31/05	12/30/05
D1: Task 1 – Project Management Plan	12/31/05	12/30/05
D2: Task 8 – Regional CO_2 Sequestration Potential – Field Validation Tests (Fact Sheet 6)	12/31/05	12/29/05
D5: Task 3 – Zama Field Validation Test NEPA Compliance Document	2/28/06	12/21/05
Year 1 – Quarter 2 (January–March 2006)		
D3: Task 1 – Quarterly and Earned Value Management (EVM) Report	1/31/06	1/30/06
M3: Task 3 – Zama Field Validation Test Experimental Design Package Completed	2/28/06	2/28/06
M2: Task 6 – First Regional Characterization Data Gap Assessment Completed	2/28/06	2/28/06
D4: Task 3 – Zama Field Validation Test Experimental Design Package	2/28/06	2/28/06
D6: Task 5 – Terrestrial Field Validation Test Experimental Design Package	2/28/06	2/28/06
D7: Task 5 – Terrestrial Field Validation Test NEPA Compliance Document	2/28/06	2/14/06
D8: Task 6 – First Regional Characterization Data Gap Assessment	2/28/06	2/28/06
D9: Task 8 – Outreach Action Plan – Carbon Sequestration	2/28/06	2/28/06
D10: Task 3 – Zama Field Validation Test Site Health and Safety Plan	3/31/06	3/31/06
D11: Task 3 – Zama Field Validation Test Regulatory Permitting Action Plan	3/31/06	3/28/06
D12: Task 5 – Terrestrial Field Validation Test Site Health and Safety Plan	3/31/06	2/2/06
D13: Task 5 – Terrestrial Field Validation Test Regulatory Permitting Action Plan	3/31/06	3/27/06
Year 1 – Quarter 3 (April–June 2006)		
D3: Task 1 – Quarterly and EVM Report	4/30/06	4/28/06
D14: Task 1 – Semiannual Report	4/30/06	4/28/06
D15: Task 3 – Zama Field Validation Test Outreach Action Plan	4/30/06	4/28/06
D16: Task 5 – Terrestrial Field Validation Test Outreach Action Plan	4/30/06	4/28/06
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	5/31/06	5/31/06
D18: Task 3 – Zama Field Validation Test Sampling Protocols	6/30/06	6/29/06
D19: Task 5 – Terrestrial Field Validation Test Sampling Protocols	6/30/06	6/21/06
M4: Task 5 – Terrestrial Field Validation Test Sampling Protocols Completed	6/30/06	6/21/06
Year 1 – Quarter 4 (July–September 2006)		
D3: Task 1 – Quarterly and EVM Report	7/31/06	7/26/06
D20: Task 8 – Zama Acid Gas Project (Fact Sheet 7)	7/31/06	7/28/06
D21: Task 10 – Regional Partnership Integration Plan	7/31/06	7/18/06
D22: Task 8 – Web Site Update	8/31/06	8/31/06

Continued…

Table 4. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 1 (October–December 2006)		
D3: Task 1 – Quarterly and EVM Report	10/31/06	10/31/06
D14: Task 1 – Semiannual Report	10/31/06	10/31/06
D23: Task 9 – Best Practices Manual: Using Wind Power to Offset the Energy Requirements of CO_2 Compression for Sequestration	10/31/06	10/31/06
D24: Task 4 – Lignite Field Validation Test NEPA Compliance Document	10/31/06	10/13/06
D25: Task 8 – CO_2 Sequestration Through Habitat Restoration – Defining Best Terrestrial Sequestration Practices for Landowners (Fact Sheet 8)	12/31/06	12/29/06
Year 2 – Quarter 2 (January–March 2007)		
D3: Task 1 – Quarterly and EVM Report	1/31/07	1/31/07
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	2/28/07	2/28/07
D26: Task 4 – Lignite Field Validation Test Experimental Design Package	2/28/07	2/28/07
D27: Task 4 – Lignite Field Validation Test Site Health and Safety Plan	3/30/07	3/29/07
D28: Task 4 – Lignite Field Validation Test Regulatory Permitting Action Plan	3/30/07	3/30/07
M5: Task 4 –Specific Well Location at the Lignite Field Validation Test Identified	2/28/07	2/28/07
M6: Task 4 – Finalized Drilling Prognosis for the Five-Spot Research Wells for the Lignite Field Validation Test	3/30/07	3/30/07
Year 2 – Quarter 3 (April–June 2007)		
D3: Task 1 – Quarterly and EVM Report	4/31/07	4/25/07
D14: Task 1 – Semiannual Report	4/30/07	4/30/07
D29: Task 4 – Lignite Field Validation Test Outreach Action Plan	4/30/07	4/27/07
D30: Task 8 – Outreach Booth	4/30/07	4/30/07
D31: Task 8 – CO_2 Sequestration Validation Test in a Deep, Unminable Lignite Seam in Western North Dakota (Fact Sheet 10)	5/31/07	5/31/07
D32: Task 4 – Lignite Field Validation Test Sampling Protocols	6/29/07	6/29/07
D33: Task 6 – Denver–Julesberg Basin EOR Potential Report	6/29/07	4/30/07
Year 2 – Quarter 4 (July–September 2007)		
D3: Task 1 – Quarterly and EVM Report	7/31/07	7/25/07
D34: Task 1 – Phase II Continuation Application/Progress Report	7/31/07	7/31/07
M7: Task 4 – White Paper on CO_2 Flood Design for Simultaneous Evaluation of Carbon Sequestration and ECBM Recovery – Lignite Field Validation Test Site Completed	7/31/07	7/16/07
D22: Task 8 – Web Site Update	8/31/07	8/31/07

Continued…

Table 4. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 4 (July–September 2007), continued		
M8: Task 5 – Best Management Practices for Terrestrial Carbon Sequestration on Private Lands in the Prairie Pothole Region (Fact Sheet 11) Completed	9/30/07	9/28/07
D35: Task 8 – Documentary: Carbon Trading	9/30/07	9/28/07
Year 3 – Quarter 1 (October–December 2007)		
D3: Task 1 – Quarterly Report	10/31/07	10/31/07
D14: Task 1 – Semiannual Report	10/31/07	10/31/07
D36: Task 6 – Regional Characterization Data Gap Assessment Update	10/31/07	10/31/07
D37: Task 8 – CO_2 Sequestration Validation Test in a Deep Oil Field in the Williston Basin (Fact Sheet 12)	10/31/07	10/30/07
D38: Task 9 – Best Practices Manual: Excelsior Energy	11/30/07	11/30/07
M9: Task 3 – Progress of Geomechanical Evaluation Reported	12/31/07	12/28/07
Year 3 – Quarter 2 (January–March 2008)		
D3: Task 1 – Quarterly Report	1/31/08	1/31/08
D22: Task 8 – Web Site Update	3/31/08	3/31/08
Year 3 – Quarter 3 (April–June 2008)		
D3: Task 1 – Quarterly Report	4/30/08	4/30/08
D39: Task 8 – Documentary: Terrestrial CO_2 Sequestration	4/30/08	4/30/08
M10: Task 8 – Documentary: Terrestrial CO_2 Sequestration Reported	4/30/08	4/30/08
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	5/30/08	5/30/08
Year 3 – Quarter 4 (July–September 2008)		
D3: Task 1 – Quarterly Report	7/31/08	7/31/08
D44: Task 9 – Best Practices Manual: Regional Sequestration Opportunities	7/31/08	7/31/08
Year 4 – Quarter 1 (October–December 2008)		
D3: Task 1 – Quarterly Report	10/31/08	10/31/08
D40: Task 2 – Williston Basin Field Validation Test Regulatory Permitting Action Plan	11/28/08	12/11/08
D41: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	11/28/08	12/03/08
M11: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	11/28/08	12/03/08
D42: Task 2 – Williston Basin Field Validation Test Experimental Design Package	12/31/08	12/31/08
D43: Task 2 – Williston Basin Field Validation Test Site Health and Safety Plan	12/31/08	12/23/08
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	12/31/08	12/31/08

Continued…

Table 4. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 2 (January–March 2009)		
D3: Task 1 – Quarterly Report	1/31/09	1/30/09
M12: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	2/27/09	2/27/09
D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	2/27/09	2/27/09
D22: Task 8 – Web Site Update	2/27/09	2/23/09
Year 4 – Quarter 3 (April–June 2009)		
D3: Task 1 – Quarterly Report	4/30/09	4/30/09
D47: Task 2 – Williston Basin Field Validation Test Sampling Protocols	4/30/09	4/30/09
M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols Completed	4/30/09	4/30/09
D46: Task 8 – Documentary: Geologic Sequestration	5/29/09	5/29/09
D48: Task 8 – Best Practices Manual: Outreach	5/29/09	5/29/09
D50: Task 7 – Road Map Document	6/30/09	6/30/09
Year 4 – Quarter 4 (July–September 2009)		
D3: Task 1 – Quarterly Report	7/31/09	
D54: Task 5 – Terrestrial Field Validation Test Regional Technology Implementation Plan	7/31/09	
D22: Task 8 – Web Site Update	8/31/09	
D52: Task 3 – Zama Field Validation Test Regional Technology Implementation Plan	8/31/09	
D53: Task 4 – Lignite Field Validation Test Regional Technology Implementation Plan	8/31/09	
D49: Task 6 – Regional Atlas	8/31/09	
Year 5 – Quarter 1 (October – December 2009)		
D3: Task 1 – Quarterly Report	10/31/09	
D55: Task 2 – Williston Basin Field Validation Test Regional Tech. Implementation Plan	11/30/09	
D56: Task 1 – Phase II Final Report	12/29/09	
D51: Task 8 – Documentary: CO_2 Sequestration and Global Warming – Overview of Phase II Results for Regional Partnership	12/31/09	

Table 5. PCOR Partnership Phase II Gantt Chart

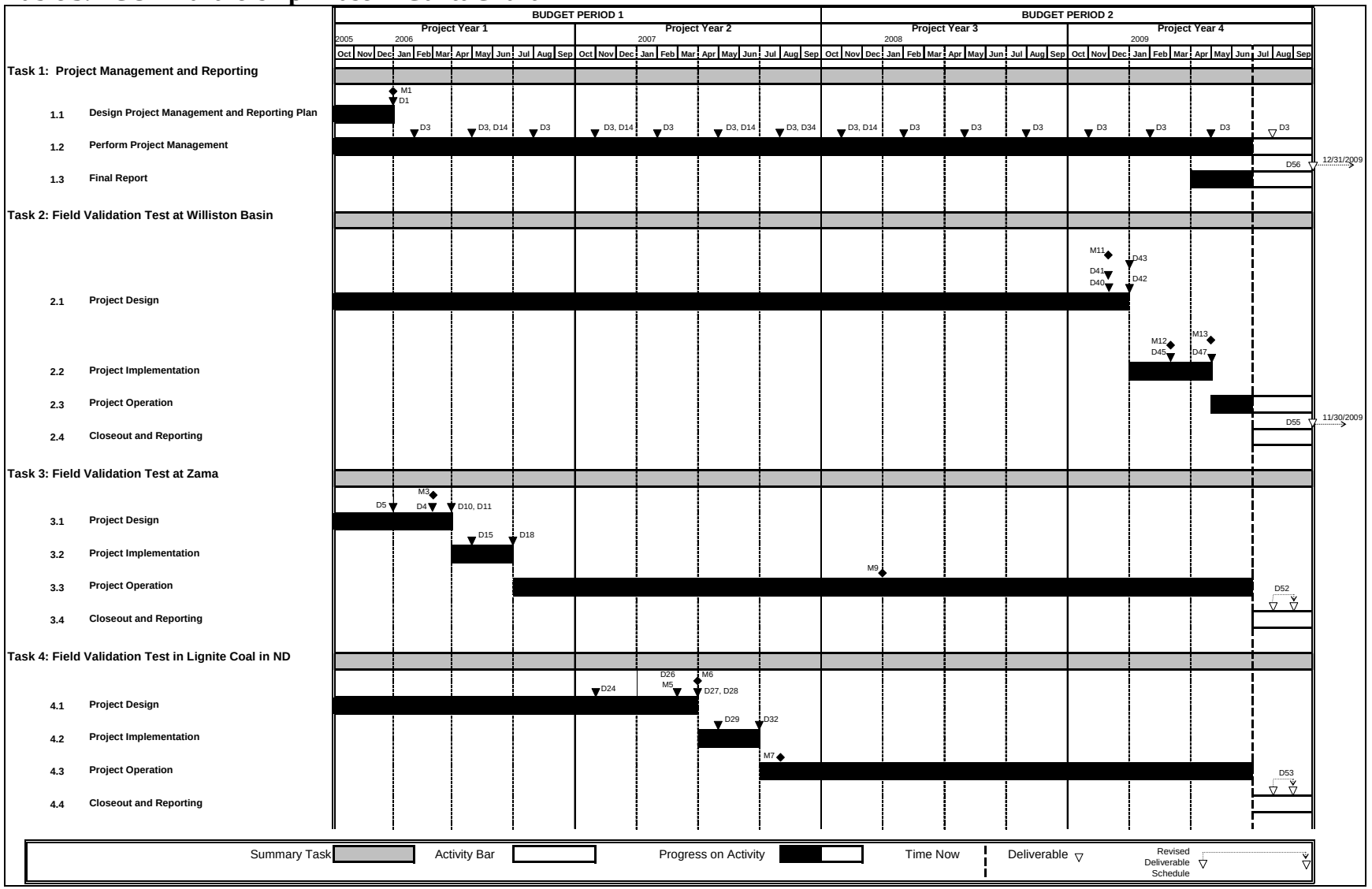

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Table 5. PCOR Partnership Phase II Gantt Chart (continued)

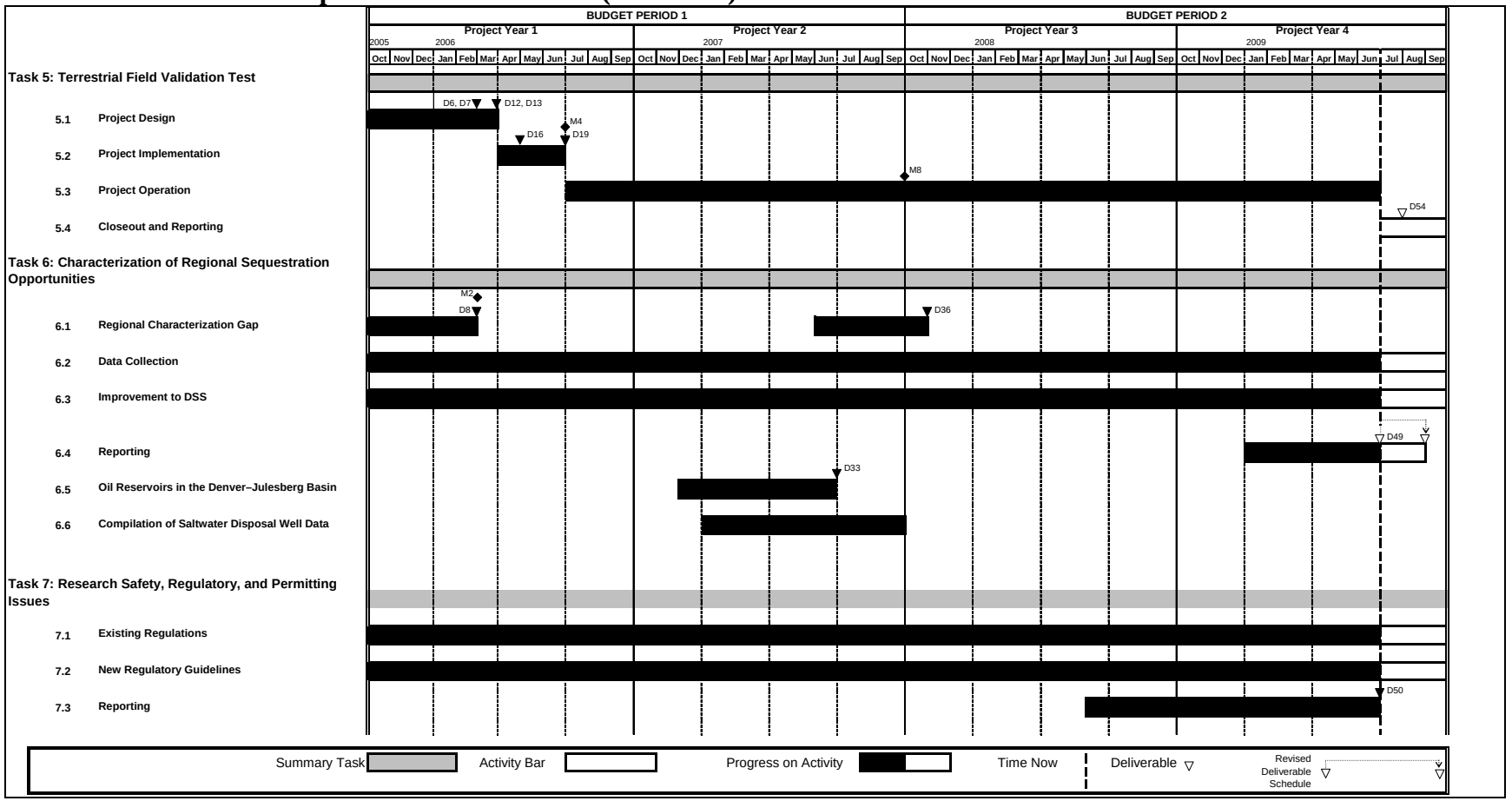

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Table 5. PCOR Partnership Phase II Gantt Chart (continued)

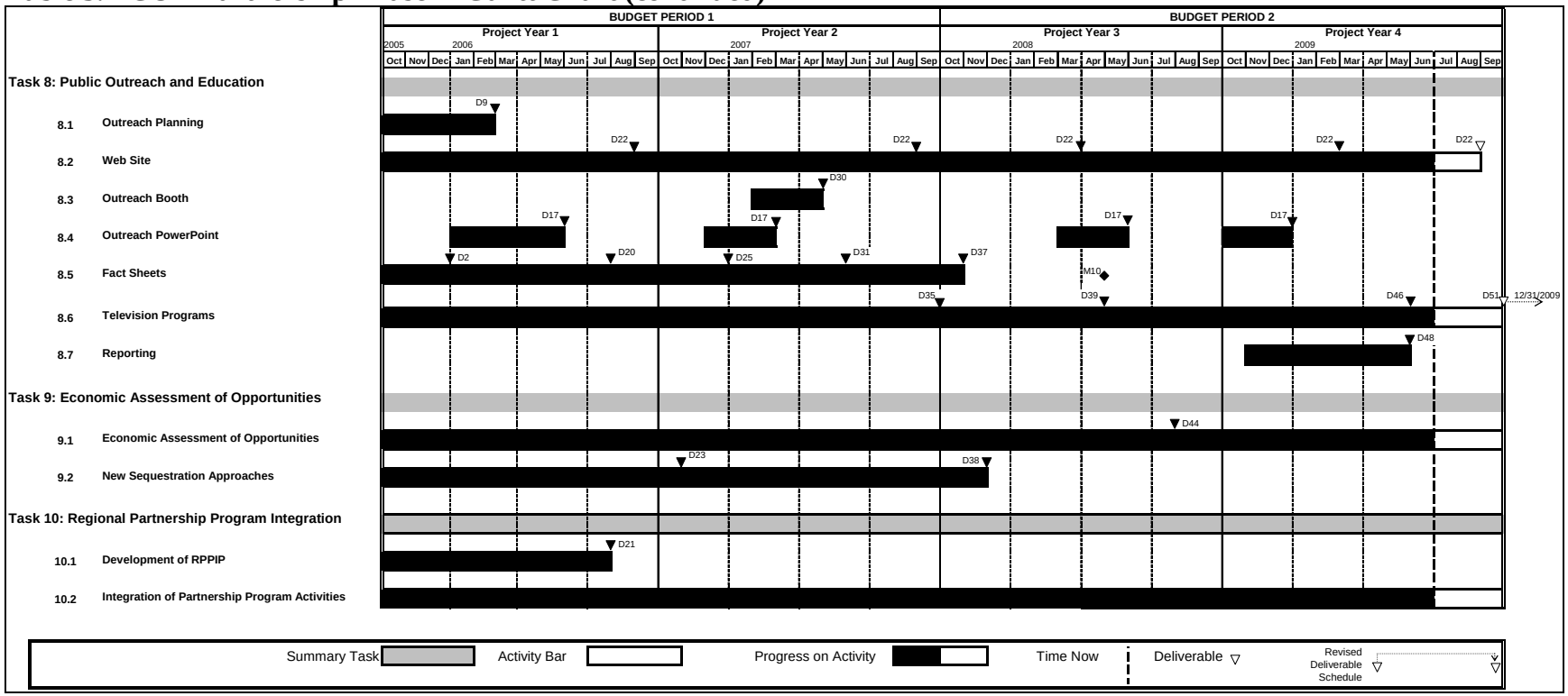

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Table 5. PCOR Partnership Phase II Gantt Chart (continued)

Key for Phase II Deliverables ▼

D1 Project Management Plan
D2 Fact Sheet 6 – Regional CO_2 Sequestration Potential – Field Validation Tests
D3 Quarterly Progress Reports
D4 Zama Field Validation Test Site – Experimental Design Package
D5 Zama Field Validation Test Site – NEPA Compliance Document
D6 Terrestrial Field Validation Test Site – Experimental Design Package
D7 Terrestrial Field Validation Test Site – NEPA Compliance Document
D8 Regional Characterization Data Gap Assessment
D9 Outreach Action Plan – Carbon Sequestration
D10 Zama Field Validation Test Site – Site Health & Safety Plan
D11 Zama Field Validation Test Site – Regulatory Permitting Action Plan
D12 Terrestrial Field Validation Test Site – Site Health & Safety Plan
D13 Terrestrial Field Validation Test Site – Regulatory Permitting Action Plan
D14 Semiannual Progress Report
D15 Zama Field Validation Test Site – Outreach Action Plan
D16 Terrestrial Field Validation Test Site – Outreach Action Plan
D17 PowerPoint Presentation: General Audience CO_2 Sequestration Outreach
D18 Zama Field Validation Test Site – Sampling Protocols
D19 Terrestrial Field Validation Test Site – Sampling Protocols
D20 Fact Sheet 7– Zama Acid Gas Project
D21 Regional Partnership Program Integration Plan
D22 Web Site Update
D23 Best Practices Manual – Using Wind Power to Offset the Energy Requirements of CO_2 Compression for Sequestration
D24 Lignite Field Validation Test Site – NEPA Compliance Document
D25 Fact Sheet 8 – CO_2 Sequestration through Habitat Restoration
D26 Lignite Field Validation Test Site – Experimental Design Package
D27 Lignite Field Validation Test Site – Site Health & Safety Plan
D28 Lignite Field Validation Test Site – Regulatory Permitting Action Plan
D29 Lignite Field Validation Test Site – Outreach Action Plan
D30 Outreach Booth
D31 Fact Sheet 10 – CO_2 Sequestration Validation Test in a Deep, Unminable Lignite Seam in Western North Dakota
D32 Lignite Field Validation Test Site – Sampling Protocols
D33 Denver–Julesberg Basin EOR Potential Report
D34 Continuation Application
D35 Video 1– Carbon Trading
D36 Regional Characterization Data Gap Assessment Update
D37 Fact Sheet 12 – CO_2 Sequestration Validation Test in a Deep Oil Field in the Williston Basin
D38 Best Practices Manual – Excelsior Energy
D39 Video 2 – Terrestrial CO_2 Sequestration
D40 Williston Basin Field Validation Test Site – Regulatory Permitting Action Plan
D41 Williston Basin Field Validation Test Site – NEPA Compliance Document
D42 Williston Basin Field Validation Test Site – Experimental Design Package
D43 Williston Basin Field Validation Test Site – Site Health & Safety Plan
D44 Best Practices Manual – Regional Sequestration Opportunities
D45 Williston Basin Field Validation Test Site – Outreach Action Plan
D46 Video 3 – Geologic Sequestration
D47 Williston Basin Field Validation Test Site – Sampling Protocols
D48 Best Practices Manual – Outreach and Education
D49 Regional Atlas
D50 Road Map Document
D51 Video 4 – CO_2 Sequestration and Global Warming
D52 Zama Field Validation Test Site – Regional Technology Implementation Plan
D53 Lignite Field Validation Test Site – Regional Technology Implementation Plan
D54 Terrestrial Field Validation Test Site – Regional Technology Implementation Plan
D55 Williston Basin Field Validation Test Site – Regional Technology Implementation Plan
D56 Final Report

Key for Phase II Milestones ◆

M1 Project Management Plan Completed
M2 Regional Characterization Data Gap Assessment Completed
M3 Zama Field Validation Test Site – Experimental Design Package Completed
M4 Terrestrial Field Validation Test Site – Sampling Protocol Completed
M5 Identification of Specific Well Location at the Lignite Field Validation Test
M6 Finalized Drilling Prognosis for the Five-spot Research Wells for the Lignite Field Validation Test
M7 White Paper on CO_2 Flood Design for CO_2 Sequestration and ECBM Recovery Completed
M8 Fact Sheet 11 – Best Management Practices for Terrestrial Carbon Sequestration on Private Lands in the Prairie Pothole Region
M9 Progress of Geomechanical Evaluation Reported
M10 Video 2 Completed – Terrestrial CO_2 Sequestration
M11 Williston Basin Field Validation Test Site – NEPA Compliance Document Completed
M12 Williston Basin Field Validation Test Site – Outreach Action Plan Completed
M13 Williston Basin Field Validation Test Site – Sampling Protocol Completed

Task 8 – Public Outreach and Education

Because of the volume of video obtained on location and the timing of the trips for location filming, the submittal of the draft final copy of the documentary "CO_2 Sequestration and Global Warming – Overview of Phase II Results for Regional Partnership" (D51) to DOE, originally scheduled for August 31, 2009, will likely be delayed.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

Nothing to note at this time.

Task 10 – Regional Partnership Program Integration

Nothing to note at this time.

PHASE II PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

Task 1 – Project Management and Reporting

The Quarterly Progress Report/Milestone Quarterly Report (D3) was submitted to DOE for approval on April 30, 2009.

A number of publications, papers, and public releases were submitted during this reporting period. The meetings/travel section contains a complete listing of presentations given to research stakeholders and technology users. Further information on activities and progress on these can be found in their respective sections within this report.

The PCOR Partnership also took part in the 8th Annual Carbon Capture & Sequestration Conference held May 4–7, 2009, in Pittsburgh, Pennsylvania. The PCOR Partnership delivered four presentations, as well as two poster presentations. A booth was on exhibit and staffed during the conference.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

A presentation entitled "The Plains CO_2 Reduction (PCOR) Partnership: Activities and Results in the Williston Basin" was presented on April 28, 2009, at the 17th Annual Williston Basin Petroleum Conference in Regina, Saskatchewan, Canada. A copy of the presentation can be found at www.wbpc.ca/assets/File/Presentation/15_Sorensen_PCOR.pdf

Task 3 – Field Validation Test at Zama, Alberta

A poster presentation entitled "Zama Acid Gas EOR, CO_2 Sequestration, and Monitoring Project" was given June 9, 2009, at the American Association of Petroleum Geologists (AAPG) Annual Convention and Expo in Denver, Colorado.

Task 4 – Field Validation Test of North Dakota Lignite

A presentation on the lignite project was given on April 28, 2009, at the 17th Annual Williston Basin Petroleum Conference held in Regina, Saskatchewan, Canada. A copy of the presentation can be found at www.wbpc.ca/assets/File/Presentation/15_Sorensen_PCOR.pdf

Task 5 – Terrestrial Validation Test

The PCOR Partnership task leader:

- Attended "Navigating the American Carbon World" in San Diego, California, April 1–3, 2009. Partners met with representatives from major registries, regulatory agencies, and investors distributing investment and educational material about grassland sequestration opportunities in the PCOR Partnership region.
- Presented on grassland sequestration at the "Ecosystem Markets: Making Them Work" conference held June 18–19, 2009, in Portland, Oregon. A copy of the presentation can be found at www.nebc.org/documents/ecosys09/6B-Kempka.pdf

The PCOR Partnership continues to market carbon offsets to potential investors and will develop a communications and marketing strategy related to a new campaign, "Rescue the Duck Factory," which will include promoting the PCOR Partnership region's grassland carbon offset opportunities to corporations and business partners.

Task 6 – Characterization of Regional Sequestration Opportunities

EERC staff traveled to British Columbia at the end of April to attend the Latitude Geographics annual meeting. Latitude Geographics developed the software currently used to assist in the development of the new GIS interface on the DSS. The general meeting was scheduled for 2 days with two programming specialists staying an additional day to attend training sessions.

Task 7 – Research Safety, Regulatory, and Permitting Issues

EERC staff attended the IOGCC meeting in Anchorage, Alaska. In addition, EERC staff also participated in the IOGCC Pipeline Transportation Task Force meeting.

Task 8 – Public Outreach and Education

The draft final "Geologic Sequestration" documentary (D46) and the draft final "Best Practices Manual: Outreach" (D48) were submitted to DOE on May 29, 2009.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

The Task 9 lead attended the Eighth Annual Carbon Capture and Sequestration Conference held in Pittsburgh, Pennsylvania, May 4–7, 2009, to learn more about various emerging CO_2 capture technologies.

Task 10 – Regional Partnership Program Integration

The PCOR Partnership program manager (PM) attended the Energy Council's "2009 State and Provincial Trends in Energy and the Environment Conference" in Saskatoon, Saskatchewan, Canada, on June 18–20, 2009, presenting "Key Issues in Carbon Capture and Storage," while serving with the Honorable Warren Chisum, Chairman, Carbon Management Caucus, Texas House of Representatives, on a Saturday morning Breakfast Panel: Working Together on Carbon Issues.

The PM also attended the U.S.–Canada Clean Energy Dialogue Round-Table on carbon capture and storage in Washington, D.C., on June 29–30, 2009.

MEETINGS/TRAVEL

Representatives from the PCOR Partnership participated in and/or presented at the following meetings and conferences in this reporting period:

- April 1–3, 2009: Presented at the 43rd Annual Meeting for Geological Society of America (GSA) and 2009 North-Central GSA Section Meeting in Rockford, Illinois.
- April 3, 2009: Participated in the Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon in Rockford, Illinois.
- April 2, 9, 14, 21, 24, and 28, 2009: Participated in a geologic sequestration (D46) documentary edit session at PPB studios in Fargo, North Dakota.
- April 15–17, 2009: Presented at the U.S. Department of Interior, Fish and Wildlife Service, Bozeman Fish Technology Center in Bozeman, Montana.
- April 26–29, 2009: Attended the 17th Annual Williston Basin Petroleum Conference in Regina, Saskatchewan, Canada.

- April 26–May 1, 2009: Attended the Latitude Geographics GeoCortex User Conference in Victoria, British Columbia, Canada.
- April 30, 2009: Attended the National Rural Electric Cooperative Association Cooperative Research Network CO_2 Capture & Utilization Symposium in Arlington, Virginia.
- May 2–8, 2009: Filming for the Carbon Footprint Documentary (D51) in Minneapolis, Minnesota.
- May 2, 7, 12, 17, 20, 23, and 28, 2009: Participated in a geologic sequestration (D46) documentary edit session at PPB studios in Fargo, North Dakota.

- May 4–7, 2009: Attended and participated in the 8th Annual Conference on Carbon Capture & Sequestration in Pittsburgh, Pennsylvania.
- May 19, 2009: Presented general PCOR Partnership information at the Moorhead Rotary Club in Moorhead, Minnesota.
- May 22 – June 2, 2009: Filming for the Carbon Footprint Documentary (D51) in Delhi, India.
- June 8–12, 2009: Attended meetings with Ducks Unlimited and the U.S. Geological Survey in Bismarck, North Dakota.
- June 12–23, 2009: Filming for the Carbon Footprint Documentary (D51) in Ikata, Muyuka, Buea, Yaounde, Kribi, and Douala, in the Republic of Cameroon, West Africa.
- June 23, 2009: Met with NETL personnel to design collaborative experiments on CO_2 sequestration under geological conditions in Pittsburgh, Pennsylvania.
- June 29–30, 2009: Attended and participated in U.S.–Canada Clean Energy Dialogue Round-Table on Carbon Capture and Storage in Washington, D.C.
- June 29–30, 2009: Attended the International Climate Stewardship Solutions Conference in Bismarck, North Dakota.

Materials presented at these meetings will be available to partners on the PCOR Partnership DSS Web site (http://gis.undeerc.org/website/pcorp/).

REFERENCES

None.