



PLAINS CO₂ REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report

(for the period January 1 – March 31, 2010)

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EXECUTIVE SUMMARY

The Plains CO₂ Reduction (PCOR) Partnership is one of seven Regional Carbon Sequestration Partnerships (RCSPs) competitively awarded by the U.S. Department of Energy National Energy Technology Laboratory in 2003 as part of a national plan to mitigate greenhouse gas emissions. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota and continues to include stakeholders from the public and private sector in Phase III. The PCOR Partnership region includes all or part of nine U.S. states and four Canadian provinces.

Phase III, the development phase, a 10-year effort (2007–2017), is an extension of the characterization (Phase I) and validation (Phase II) phases. The Phase III efforts of the PCOR Partnership include two large-volume demonstration tests—one in Canada and one in the United States—that focus on injecting CO₂ into deep geologic formations for CO₂ storage.

Budget Period 4 (Years 3–8 of Phase III) began October 1, 2009. Activities leading to the initiation of CO₂ injection in both demonstration sites continued. The PCOR Partnership continued working with its partner and site-owner, Spectra Energy, on the Fort Nelson demonstration project in British Columbia, Canada. In January, Spectra Energy hit a total depth for the “slant drill” operation being conducted off the well it drilled last year. This has created a new borehole, and a variety of tests were initiated on the well. Predictive simulations also continued to be run on the Fort Nelson site. Unfortunately, because of delays related to the merger acquisition of our commercial partner for the U.S. test site, initiation of these efforts was delayed.

Efforts continued to expand, populate, and increase user-friendliness of the partners-only Decision Support System (DSS, © 2007–2010 EERC Foundation). Service on multiple RCSP Working Groups, including participation in monthly conference calls, also continued. Plans for a new documentary produced in conjunction with Prairie Public Broadcasting stayed on course for delivery at the 2010 annual meeting. Multiple meetings are in the planning stages, including the annual meeting tentatively scheduled for October 19–21, 2010, in Minneapolis, Minnesota; a second regulatory meeting is being planned for this summer in Deadwood, South Dakota; and the second annual RCSP Water Working Group annual meeting will be held May 13, 2010, in Pittsburgh, Pennsylvania. In February, PCOR Partnership staff submitted (and subsequently received acceptance for) a total of 16 abstracts for the 9th Annual Conference on Carbon Capture

and Sequestration scheduled for May 10–13, 2010, in Pittsburgh. In addition, all required deliverables and milestones were submitted and met on schedule.

This progress report presents an update of Phase III PCOR Partnership activities from January 1, 2010, through March 31, 2010.



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INTRODUCTION

The Plains CO₂ 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, and includes stakeholders from the public and private sector. The membership as of March 31, 2010, is listed in Table 1. 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).

The RCSP Program is part of NETL's Carbon Sequestration Program and is a government–industry effort tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture and storage (CCS) on the North American continent.

The RCSP Program initiative is being implemented in three phases:

- Phase I – Characterization Phase (2003–2005): characterized opportunities for carbon sequestration
- Phase II – Validation Phase (2005–2009): conducted small-scale field validation tests
- Phase III – Development Phase (2007–2017): involves large-volume carbon storage demonstration tests

Phase III is divided into three budget periods (BPs), running from October 1, 2007, to September 30, 2017:

BP3: October 1, 2007 – September 30, 2009

BP4: October 1, 2009 – September 30, 2015

BP5: October 1, 2015 – September 30, 2017

Note: BP1 and BP2 were effective in Phase II.

Table 1. PCOR Partnership Membership Phase III

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

The overall mission of the Phase III program is to 1) build upon Phase I and II assessments of regional sequestration data to verify the ability of target formations to store CO₂, 2) facilitate the development of the infrastructure required to transport CO₂ from the source to the injection site, 3) monitor and facilitate development of the rapidly evolving North American regulatory and permitting framework for CO₂ storage, 4) develop opportunities for PCOR Partnership partners to capture and store CO₂, 5) establish a means by which carbon markets can facilitate CCS/EOR (enhanced oil recovery) project development in the region, 6) develop the technical expertise that will allow carbon credits to be monetized for CO₂ sequestered in geologic formations, 7) continue collaboration with the other RCSP Program partnerships, and 8) provide outreach and education for CO₂ sequestration stakeholders and the general public.

In Phase III, the PCOR Partnership is building on the information generated in its characterization (Phase I) and validation (Phase II) phases. A programmatic RCSP Phase III goal is the injection of approximately 1 million tons of CO₂ a year into at least one regionally significant geologic formation. Each of the RCSP's large-volume injection tests is designed to demonstrate that CO₂ storage sites have the potential to store regional CO₂ emissions safely, permanently, and economically for hundreds of years.

The PCOR Partnership is working toward the establishment of two demonstration sites. The sites are located in 1) the Bell Creek oil field in Powder River County in southeastern Montana and 2) near Spectra Energy's Fort Nelson gas-processing facility, situated near Fort Nelson, British Columbia, Canada (Figure 1).

The PCOR Partnership's objectives for the demonstration projects are as follows: 1) conduct a successful field demonstration to verify that the region's large number of oil fields have the potential to store significant quantities of CO₂ in a safe, economical, and environmentally responsible manner and 2) conduct a successful demonstration at the Fort Nelson site to verify the economic feasibility of using the region's carbonate saline formations for safe, long-term CO₂ storage. During Phase III, the PCOR Partnership will continue to refine storage resource estimates and evaluate other factors relevant to regional storage goals.

The PCOR Partnership plans to achieve its Phase III mission through a series of 14 tasks: 1) Regional Characterization, 2) Public Outreach and Education, 3) Permitting and National Environmental Policy Act (NEPA) Compliance, 4) Site Characterization and Modeling, 5) Well Drilling and Completion, 6) Infrastructure Development, 7) CO₂ Procurement, 8) Transportation and Injection Operations, 9) Operational Monitoring and Modeling, 10) Site

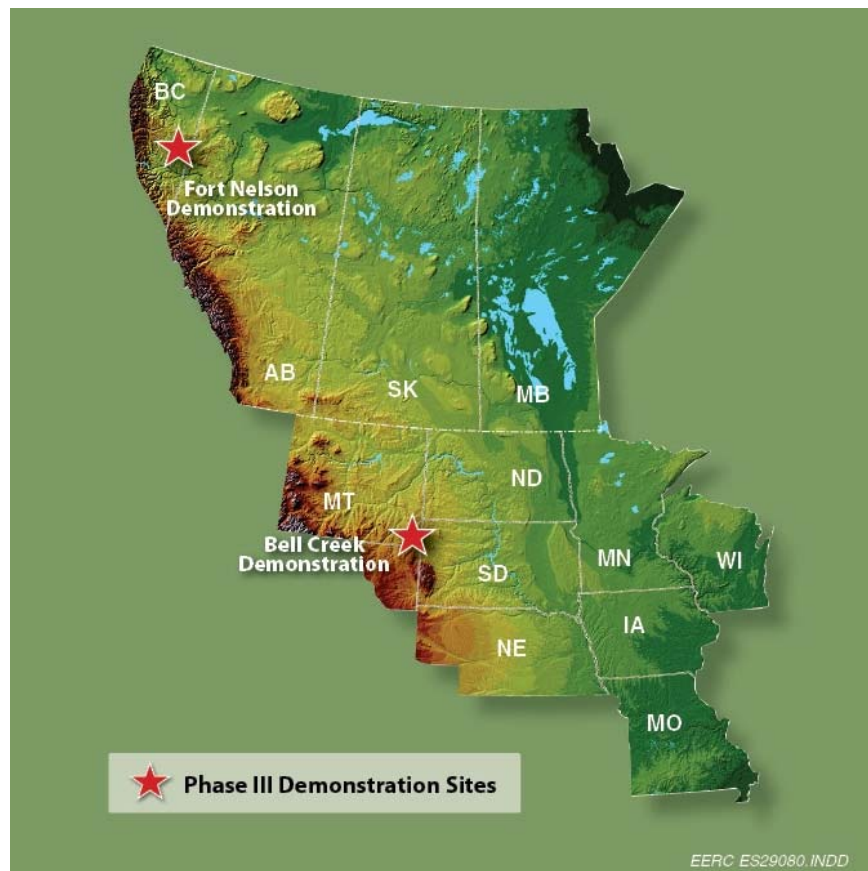


Figure 1. PCOR Partnership Phase III demonstration sites.

Closure, 11) Postinjection Monitoring and Modeling, 12) Project Assessment, 13) Project Management, and 14) RCSP Water Working Group Coordination. See Table 2 for the responsibility matrix of these fourteen tasks.

It should be noted that Tasks 10 and 11 will not be initiated until BP5.

PROGRESS OF WORK

Task 1 – Regional Characterization

Significant accomplishments for Task 1 for the reporting period included the following:

- Traveled to Lincoln, Nebraska, January 11–12, 2010, to meet with representatives from the Nebraska Public Power District with regard to carbon management planning. Also participated in discussions regarding potential CO₂ needs for EOR in western Nebraska and adjacent Kansas.
- Continued work on reviewing the geology of western Nebraska with respect to CO₂ storage in saline formations. Expanded the investigation to explore faulting that may affect storage security and volume.
- Examined literature pertaining to earthquakes and active faults in Nebraska.
- Compiled metadata for the saline aquifer raster data and provided the raster data sets to the Sandia Staffing Alliance (SSA) on January 15, 2010. SSA is working with DOE NETL on aspects of saline sequestration as related to water supply for power plants.
- Continued review and upgrade of the Decision Support System (DSS, © 2007–2010 EERC Foundation). The following efforts have been undertaken:
 - The new risk management section for the DSS was completed and sent to programming, and review began January 15, 2010.
 - The PCOR Partnership database structure that supports the DSS was received.
 - Several of the database tables are no longer needed, and the data review and cleanup will make management of the system easier and more intuitive.
 - Worked on a prototype for a new introduction page for the interactive map portion of the DSS. This new page will offer options intended to streamline the use of the geographic information systems (GIS) component of the DSS.
 - Initiated a design for a new section of the DSS that will cover carbon markets.
 - Held a meeting to discuss new material for the regulations section of the DSS.
 - Made significant progress in developing the media gallery portion of the DSS. This specifically includes the development of a Flash-based navigation interface for browsing for photos, maps, and illustrations.
 - Updated the general “CO₂ in the Region” and “Geologic Sinks” information for inclusion on March 9.
 - Adjusted the products database default search sort order to “by date” at the request of users.
 - Continued efforts toward detailing the 200+ images selected as initial entries into the new image gallery. The details include a title, description, and category.

- Overcame issues with the Geocortex software and made progress on the GIS interface.
- Created updated imagery and maps for upcoming PowerPoint presentations.
- Continued efforts to assist on a presentation to be given at the North American Carbon Atlas Partnership (NACAP) meeting held in Mexico in March. The presentation included a review of the methodologies section of the recent national RCSP atlas.
- Helped update regional statistical data for the DOE NETL revised fact sheet for Phase II.
- Participated in a GIS Working Group conference call on February 1 with representatives from the other regional sequestration partnerships along with Tim Carr and his group.
- Aggregated characterized saline aquifer data for submission to NATCARB (a distributed NATIONAL CARBOn Sequestration Database and Geographic Information System).
- Continued rectifying saline storage calculations with the Iowa Geological Survey.
- Mailed a PCOR Partnership Atlas, 3rd Edition, to each partner contact who did not already receive a copy at the 2009 Annual Meeting.
- Discussed wrap-up of work under the Missouri Department of Natural Resources subcontract which ended March 31, 2010.
- On March 5, 2010, responded to a request for information from Argonne National Laboratory on potential target formations for geological sequestration within the PCOR Partnership region.
- Discussed potential regional characterization efforts, e.g., fact sheets, posters, and atlas, that could easily be tailored to meet the needs of the Indian Land Tenure Foundation.

Table 2. Phase III Responsibility Matrix

Phase III Task Description	Task Leader
Task 1 – Regional Characterization	Wesley D. Peck
Task 2 – Public Outreach and Education	Daniel J. Daly
Task 3 – Permitting and NEPA Compliance	Lisa S. Botnen
Task 4 – Site Characterization and Modeling	James A. Sorensen
Task 5 – Well Drilling and Completion	Steven A. Smith
Task 6 – Infrastructure Development	Melanie D. Jensen
Task 7 – CO ₂ Procurement	John A. Harju
Task 8 – Transportation and Injection Operations	Steven A. Smith
Task 9 – Operational Monitoring and Modeling	Charles D. Gorecki
Task 10 – Site Closure	TBA
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Katherine K. Anagnost
Task 13 – Project Management	Edward N. Steadman
Task 14 – RCSP Water Working Group Coordination	Charles D. Gorecki

Task 2 – Public Outreach and Education

Significant accomplishments for Task 2 for the reporting period included the following:

- Held a third internal meeting on January 8, 2010, with PCOR Partnership management to review the draft documentary “Carbon Footprint: One Size Does Not Fit All” (a draft had been sent to DOE NETL on December 29, 2009, and the draft final was due on March 31, 2010).
- Prepared a revised script for the carbon footprint documentary based on feedback from in-house focus groups, PCOR Partnership managers, and DOE NETL.
- The fourth documentary, “Managing Carbon Dioxide: The Geologic Solution,” was mailed out January 8, 2010, to all partners who had not received a copy at the annual meeting.
- Held an internal meeting with management on January 14, 2010, to review proposed updates to the public Web site.
- Submitted the “Public Web Site Update” report on January 15, 2010 (Deliverable D13).
- Reviewed the draft video of presentations and classroom activities from last summer’s (July 29–30, 2010) Keystone CSI: Climate Status Investigations education workshop in Omaha, Nebraska (the workshop was held with the collaboration of the PCOR Partnership) and an internal work plan was developed to finalize the video segments.
- Prepared several abstracts for consideration for the 9th Annual Conference on Carbon Capture and Sequestration to be held in Pittsburgh, Pennsylvania, May 10–13, 2010. “Covering the Bases – Regional and Project Level Outreach for Sequestration” was subsequently accepted for presentation.
- Also submitted an abstract in collaboration with the RCSP Outreach Working Group and the Petroleum Technology Research Center in Regina, Saskatchewan, for presentation on the collaborative role of developing site communication plans. The PCOR Partnership will represent the Outreach Working Group with this presentation, as well as discuss the RCSP Best Practices Manual.
- Prepared a draft final update for the Outreach Action Plan (Deliverable D11) and submitted the update on March 31, 2010.
- Discussed methods for the expanded tracking of outreach activities to support the outreach information system.
- Prepared a draft description of the on-location filming and interview needs as a first step in the production of the 30-minute Fort Nelson Carbon Capture and Storage (CCS) Project documentary.
- Met with EERC library staff on February 19 and again March 22 to discuss an improved method for archiving and managing video images in collaboration with Prairie Public Broadcasting (PPB) and to discuss next steps in developing a plan for outreach activities involving regional libraries.
- Met with PPB staff on February 19 to discuss the scope and scheduling for future activities, and prepared and distributed a draft plan based on discussions.
- Continued participation in the Weyburn–Midale Outreach Advisory Panel including a conference call on February 25 to review public and partners-only Web pages and outreach budgets.

- Initiated efforts to prepare sample outreach materials for the Indian Land Tenure Foundation.
- Met on four occasions with senior PCOR Partnership management to review new ideas for the public Web site as well as video clips excerpted from the documentary entitled “Managing Carbon Dioxide: The Geologic Solution.”
- Participated in the RCSP Outreach Working Group conference calls on January 18, February 18, and March 18, 2010.
- Prepared a summary of past, current, and planned activities with PPB that was circulated to senior managers in-house.
- Continued participation with the Aquistore Project Communications Advisory Group.

Task 3 – Permitting and NEPA Compliance

Significant accomplishments for Task 3 for the reporting period included the following:

- Participated in conference calls of the Interstate Oil and Gas Compact Commission’s (IOGCC’s) Pipeline Transportation Task Force (PTTF). The PTTF was formed in May 2009 to undertake a scoping on behalf of states on the issue of CO₂ pipeline transportation. The main outcome of the task force will be to produce a report to help states begin to understand the issues that will need to be addressed in siting and regulating new CO₂ pipelines.
- Reviewed and commented on PTTF draft interim regulatory framework report on CO₂ pipeline infrastructure issues.
- Completed an IOGCC survey on PCOR Partnership Phase II field validation site permitting issues to be used at the IOGCC RCSP “Lessons Learned” exercise and participated in that meeting in Santa Fe, New Mexico, January 20–22, 2010.
- Worked with British Columbia regulators on the development of a comprehensive review of acid gas disposal and potential CCS regulations.
- Reviewed Senate Bill 2889 named the “Surface Transportation Board Reauthorization Act of 2009” to identify potential implications for CO₂ pipelines.
- Conducted internal meetings to facilitate the update of the “Regulations” page on the DSS (<http://www2.undeerc.org/website/pcorp/Regulations/Default.aspx>).
- Continued review of the implications of U.S. Environmental Protection Agency (EPA) findings document entitled “Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act” signed by the EPA Administrator on December 7, 2009.
- Forwarded timely CCS information to internal project leaders, e.g., an article called “SEC to Issue Climate Change Disclosure Guidance,” etc.
- Attended the 2010 Carbon and Climate Change Conference in Austin, Texas. Met with various PCOR Partnership partners, potential partners, and service providers at this conference.
- Continued efforts toward planning the upcoming regulatory meeting in Deadwood, South Dakota, July 21–22, 2010, including these activities:
 - Finalized accommodations for the meeting.

- E-mailed letters of invitation to pipeline regulators on March 9, with general information (i.e., atlas, video, fact sheets, and products listing) on the PCOR Partnership Program subsequently mailed.
- Continued development of a draft agenda.
- Continued to contact potential invitees.
- Began review of EPA’s proposed new greenhouse gas (GHG) emission-reporting requirements.
- Continued ongoing review of recent publications relating to regulating CO₂ sequestration and monitoring, verification, and accounting (MVA) issues.
- Continued analyses of carbon market strategies.

Task 4 – Site Characterization and Modeling

Significant accomplishments for Task 4 for the reporting period included the following:

- Submitted second draft of the first-round risk assessment report for the Fort Nelson CCS Project to Spectra Energy on January 7, 2010. The updated report appendices were sent on January 22, 2010.
- Held monthly conference call between Spectra and the EERC on January 8, 2010. Topics discussed included drilling update, time line/communication pathways plan, water sampling and analysis, geology update, risk assessment, project time line, the proposed Fort Nelson zone on the DSS site and the upcoming January 27, 2010, meeting in Calgary.
- Continued running predictive simulations on the Fort Nelson CCS Project.
- On January 9, 2010, Spectra hit total depth for the “slant drill” operation being conducted off the well they drilled last year. This has created a new borehole in the target reservoir and lower part of the cap rock that is approximately 80 meters away from the old borehole. The new borehole spans an interval from a depth of 2054 m at the top to 2283 m at the bottom. A variety of tests (well logging, leak-off tests, etc.) were initiated on the well over the course of the week and will continue over the winter.
- A conference call was held between Spectra, Weatherford Laboratories, and the EERC on January 12, 2010. Topics discussed included logistics for collecting and analyzing shallow groundwater and formation fluid samples, analytical tests on previously collected core, and the upcoming meeting in Calgary.
- Continued work on geochemical reaction modeling: all standard samples and representative samples of the cap rock and reservoir rocks from the site were submitted to the laboratory.
- Researched the British Columbia Oil and Gas Commission’s permitting and reporting requirements, including the following:
 - Acid gas permitting requirements
 - Nonspecial waste permitting requirements
 - Hydrocarbon storage permitting requirements
 - Storage well monthly reporting requirements
- A quarterly progress meeting was held at Spectra’s headquarters in Calgary on January 27, 2010.

- Prepared several abstracts for the upcoming CCS Conference in Pittsburgh, Pennsylvania.
- Continued laboratory experiments on rock-cutting samples from the Fort Nelson CCS Project exploratory well on selected portions of the core as part of an ongoing series of geomechanical and geochemistry experimental activities. These activities include the use of x-ray diffraction and scanning electron microscope techniques.
- Participated in meetings with Spectra Energy in Calgary on February 22 and 23. Meetings focused on presentations and discussions with upper management at Spectra's Calgary offices regarding the key technical elements and issues associated with the Fort Nelson CCS Project.
- Met with key subcontractors in Calgary to examine core samples from the Fort Nelson CCS Project exploration well, and discussed analytical plans for those samples.
- Worked with key subcontractors in Calgary to finalize plans for analyzing core samples from Fort Nelson exploration well.
- Regarding the Bell Creek MVA project:
 - Participated in a conference call with Encore Acquisition Company regarding desired data sets and transfer protocol for the proposed demonstration site.
 - Continued to conduct laboratory analyses of rock samples from outcrops of the Newcastle Formation in Wyoming, which are analogous to the reservoir rocks of the Bell Creek oil field, to evaluate their mineralogy and petrologic properties. These activities include the use of x-ray diffraction and scanning electron microprobe techniques.
 - Continued work to develop and design a laboratory experimental program for petrological, geochemical, and geomechanical analysis of core samples from the Bell Creek area.

Actual or anticipated problems or delays during the reporting period included the following:

- Because of the merger acquisition of our commercial partner at the Bell Creek demonstration site, negotiations have been delayed and the demonstration schedule remains uncertain.

Task 5 – Well Drilling and Completion

This task was anticipated to be initiated in October 2009. Because of delays related to the merger acquisition of our commercial partner for the Bell Creek test site, initiation of efforts will be delayed.

Task 6 – Infrastructure Development

Significant accomplishments for Task 6 for the reporting period included the following:

- Submitted the value-added report entitled “Regional Emissions and Capture Opportunities Assessment – Plains CO₂ Reduction (PCOR) Partnership” on January 4,

2010. This report replaces Phase II Deliverable D44 as it updates the original document and expands on it with information gathered during Phase III activities.

- Dr. Robert Cowan began work on January 4, 2010, as a Research Engineer to assist on the Phase III Infrastructure Development task. Dr. Cowan's areas of expertise are carbon capture and water treatment.
- Prepared statistics regarding the PCOR Partnership region's power plants for outreach activities.
- Received acceptance notification for an abstract entitled "Estimating the Cost to Capture, Compress, and Transport CO₂ from Stationary Sources in the PCOR Partnership Region" for the 9th Annual Carbon Capture and Sequestration Conference in Pittsburgh, Pennsylvania.
- Completed a first draft of a summary of the compression process during CCS on January 22, 2010. Plans are under way to submit the final product as a value-added report in the future.
- Web-based information about capture technologies is being reviewed on a weekly basis. This information will be included in a draft matrix of capture technologies and combustion platforms that was developed for use as the basis for an updated overview of capture technologies. Plans are under way to submit the final product as a value-added report in the future.
- Conducted an informal survey of projects at the EERC that deal with both CO₂ capture and water use/reuse/minimization to prevent duplication of effort. Summarized and updated information about water usage during CCS activities and organized an internal meeting of EERC personnel to review and discuss activities and future projects.
- Checked the status of the activities of the RCSP Pipeline Atlas Working Group on January 15, 2010. No action has been taken or scheduled since the last conference call held November 12, 2009.
- Participated in the RCSP Water Working Group (WWG) conference calls on February 25 and March 23.
- At a partner's request, researched solubility information of CO₂ and H₂S in NMP (N-methylpyrrolidone).
- Reviewed the Carbon Sequestration Leadership Forum's draft definition for the concept of "capture- and storage-ready" and provided comment on March 3, 2010.
- In response to a question from a partner for information about the "average" energy cost during CO₂ compression, initiated the collection of specific operating data for various CO₂ compression technologies. Calculations for various compressor types were performed and summarized.
- On March 26, 2010, participated in a Webinar entitled "Gaps and Barriers to Carbon Management Technologies: Outcomes of the Founder Societies Technologies for Carbon Management Workshop." The Webinar was put on by the American Institute of Chemical Engineers; the American Institute of Mining, Metallurgical and Petroleum Engineers; the American Society of Civil Engineers; the American Society of Mechanical Engineers; and the Institute of Electrical and Electronics Engineers.
- Data vintage was added to the CO₂ sources spreadsheet. A few discrepancies were noted, and a thorough review and update of these additions were completed.
- Some discrepancies were noted between 26 of the PCOR Partnership-determined CO₂ source locations and the locations on record on the Environment Canada Web site. A

review of the locations was initiated to determine if changes to the PCOR Partnership database are warranted.

Actual or anticipated problems or delays during the reporting period included the following:

- Some of the work on this task has been delayed while the plans for CO₂ capture and geologic sequestration for the demonstration projects are finalized.

Task 7 – CO₂ Procurement

Significant accomplishments for Task 7 for the reporting period included the following:

- Discussions continued with potential CO₂ suppliers. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Actual or anticipated problems or delays during the reporting period included the following:

- Because of delays related to the merger acquisition of our commercial partner for the Bell Creek test site, initiation of efforts will be delayed.

Task 8 – Transportation and Injection Operations

This task is anticipated to be initiated Quarter 3 – BP4, Year 4 (October 2010).

Task 9 – Operational Monitoring and Modeling

Significant accomplishments for Task 9 for the reporting period included the following:

- Attended a participatory workshop hosted by the Global Climate and Energy Project and the U.S. Geological Survey on seals and cap rocks in geologic carbon sequestration at the Asilomar Conference Grounds in Pacific Grove, California, January 12–15, 2010.
- Continued running predictive simulations on the Fort Nelson site with the new well locations, injection schemes, and fault transmissibilities.
- Discussed subcontracts for MVA activities at the Fort Nelson site and the mechanisms by which we can help facilitate these activities with other task leaders.
- Submitted an abstract (subsequently accepted) to the 9th Annual Conference on Carbon Capture and Sequestration on the Fort Nelson modeling and MVA work.
- Began researching and requesting new tools to aid in more accurately modeling the Fort Nelson project.
- Continued working on predictive simulations with CO₂ injection to identify uncertainties and analyze sensitivities.
- Worked on numerical tuning optimization in CMOST for application to future simulation studies.

- Continued working on simulations for the Fort Nelson CCS Project and the development of history-matching techniques with CMOST.
- Staff traveled to Houston, Texas, for training on Computer Modeling Group's (CMG's) CMOST and GEM. This training will help the EERC reduce model uncertainties with some new modeling software and techniques.
- Continued discussions with Oxand Risk & Project Management Solutions and RPS Energy Canada about performing a wellbore study for Spectra Energy.
- Assisted Spectra Energy in the development of PowerPoint slides for a meeting on February 23 in Calgary on Fort Nelson CCS project modeling and simulation results.
- Attended the IEA Greenhouse Gas R&D Programme's CO₂ Geological Storage Modeling Meeting on February 16–17, 2010, in Salt Lake City, Utah.
- Discussed modeling outputs with Spectra Energy.
- Discussed plans for an upcoming quarterly meeting with Spectra Energy, including date options and potential agenda items.
- Discussed deliverables/milestones with other task leaders.
- Activities for the Bell Creek test site are not scheduled to begin until October 2010.

Task 10 – Site Closure

This task is anticipated to be initiated Quarter 1 – BP5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling

This task is anticipated to be initiated Quarter 1 – BP5, Year 9 (October 2015).

Task 12 – Project Assessment

The third annual project assessment report (D57) is due December 31, 2010, for the reporting period of October 1, 2009 – September 30, 2010.

Task 13 – Project Management

Significant accomplishments for Task 13 for the reporting period included the following:

- Held internal meetings to discuss preliminary plans for the upcoming annual meeting and tentatively selected the dates October 19–21, 2010, in Minneapolis/St. Paul, Minnesota.
- Participated in internal planning sessions for the next PCOR Partnership regulatory workshop scheduled for July 21–22, 2010, in Deadwood, South Dakota.
- Provided project baseline accounts for PCOR Partnership demonstration project information to the NETL Project Manager on January 7, 2010, to be compiled for an Underground Injection Control (UIC) Program Class VI Rule Economic Analysis Project Forecast.
- Led a task leader meeting on January 19, 2010. Topics discussed included an annual meeting recap, the Bell Creek test site update, upcoming PCOR Partnership group

meeting, new reporting format for the quarterly progress reports, and various task leader updates.

- Presented a review of Phase II activities and an update on Phase III activities before the North Dakota Oil and Gas Research Council on January 20, 2010, in Bismarck, North Dakota.
- Led an internal budget review meeting on January 29, 2010.
- Reviewed potential abstracts to be submitted before February 22, 2010, for the upcoming 9th Annual Carbon Capture and Sequestration Conference in Pittsburgh, Pennsylvania.
- Upon request, submitted an abstract on January 14, 2010, for the Carbon Sequestration: Research, Deployment, and Commercialization session at the Joint North-Central and South-Central Geological Society of America (GSA) meeting in Branson, Missouri, April 11–13, 2010.
- Continued efforts as chair of the NACAP Methodology Subcommittee including participation in several conference calls with DOE/NETL and NACAP committee personnel and copresentation of a discussion on the appendix on methodology on March 9–10, 2010, in Cuernavaca, Mexico.
- Participated in the Fort Nelson CCS Project monthly conference call on January 8, 2010.
- Responded to an inquiry on CCS in the PCOR Partnership region from a representative of the science team of the British Consulate in Boston, Massachusetts.
- Provided comments on January 25, 2010, to the RCSP Coordinator on the site screening, selection and characterization process diagrams to be included in an upcoming draft version of the Best Practices Manual.
- On January 25, 2010, agreed to present at the Institute for Energy and Environment at Ohio State University's Geologic Carbon Sequestration Site Integrity: Characterization and Monitoring Workshop on June 7–8, 2010.
- Attended and presented at the EUEC 2010: Energy & Environment Conference held February 1–3, 2010, in Phoenix, Arizona.
- Established a password-protected ftp site for the exchange of data for the upcoming Bell Creek project.
- Met with several partners at the EERC including PPB, Lignite Energy Council, and North American Coal Corporation and updated them on program activities.
- Held a PCOR Partnership group meeting on February 18 comprising EERC personnel participating fully or peripherally in the program. These meetings are anticipated on a quarterly basis for informational and educational purposes.
- Traveled to Calgary, Alberta, Canada, February 22–24, to present an update on the PCOR Partnership activities on the Fort Nelson CCS Project before Spectra Energy executive management.
- Responding to a request from DOE, submitted an abstract on the U.S.–Canada Collaboration to the 9th Annual CCS Conference.
- Accepted an invitation to attend the first Bilateral National Conference on CCS under the U.S.–Canada Clean Energy Dialogue on May 10, 2010.
- On March 5, provided information on current projects, i.e., Fort Nelson, Bell Creek, and Zama, to WorleyParsons (WP). WP and Schlumberger have been engaged by the

Global CCS Institute to undertake an update to a comprehensive survey of all CCS projects globally.

- Task leaders and staff worked diligently on proposed modifications to the statement of project objectives in regard to the Bell Creek MVA project and Zama add-on work.
- An add-on proposal (EERC Proposal No. 2010-0208) for the ongoing work at Zama was sent on March 19, 2010.
- Efforts have been initiated on a nontechnical risk register to assist with the overall PCOR Partnership Program risk management.
- Traveled to Washington, D.C., to present an overview of program activities before the Assistant Secretary of Fossil Energy on March 23, 2010.
- A task leader meeting was held on March 25, 2010.
- Welcomed the NETL project manager, Andrea McNemar, for a day of meetings at the EERC on March 30, 2010.
- Deliverables for January:
 - December monthly update
 - D13: Task 2 – public site updates
 - M23: Task 14 – monthly WWG conference call held
 - D58/D59: Task 13 – quarterly progress report/milestone quarterly report
- Deliverables for February:
 - January monthly update
 - M23: Task 14 – monthly WWG conference call held
- Deliverables for March:
 - February monthly update
 - M23: Task 14 – monthly WWG conference call held
 - D11: Task 2 – update to outreach action plan

Actual or anticipated problems or delays during the reporting period included the following:

- Because negotiations for commercial sponsorship are ongoing for the Bell Creek demonstration site, attendant deliverables and milestones were approved for extension by DOE NETL on January 27, 2010.

Task 14 – RCSP Water Working Group (WWG) Coordination

Significant accomplishments for Task 14 for the reporting period included the following:

- Attended the Groundwater Protection Council 2010 UIC Conference held in Austin, Texas, on January 25–27, 2010. Served on an RCSP panel and provided an update on the PCOR Partnership on January 27, 2010.
- In lieu of the water resource estimation methodology document originally due in February 2010, a 1-page fact sheet (front and back) providing an overview of issues and opportunities associated with the nexus of water and CCS will be due April 30, 2010.
- The WWG held its monthly conference call on January 6, 2010, and the minutes from the call were distributed on January 29, 2010.
- Continued updating WWG future research goals.

- Drafted an abstract on WWG activities for the 9th Annual Carbon Capture and Sequestration Conference in Pittsburgh, Pennsylvania.
- The WWG held its monthly conference call on February 25, including a discussion of upcoming conferences where WWG presentations could be given.
- Scheduled a date and location for the second WWG annual meeting on May 13 in Pittsburgh, following the conclusion of the 9th Annual Carbon Capture and Sequestration Conference.
- Received comments from the WWG on March 26, 2010, on the draft 1-page fact sheet providing an overview of issues and opportunities associated with the nexus of water and CCS.
- Held the monthly conference call on March 23, 2010.

Actual or anticipated problems or delays during the reporting period included the following:

- On December 15, DOE waived the water resource estimation methodology documents due February 2010 and May 2011. An alternative report to replace the latter is still under consideration.

PHASE III COST STATUS

The approved BP4 (Modification No. 16) budget along with actual costs incurred and in-kind cost share reported is shown in Table 3. A spending plan for BP4 and actual incurred cost by quarter of cash funds for BP4 are provided in Figure 2 and Table 4.

PHASE III SCHEDULE STATUS

Table 5 lists all deliverables and milestones by quarter, with completion dates, through the end of the reporting period (see Table 6 for the Gantt chart for BP4, Year 3).

Table 3. Phase III Budget – BP4

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	\$52,318,380	\$2,009,057
Nonfederal Share – Cash	\$2,368,750	\$336,808
Nonfederal Share – In-Kind	\$50,238,457	\$17,786
Total	\$104,925,587	\$2,363,651

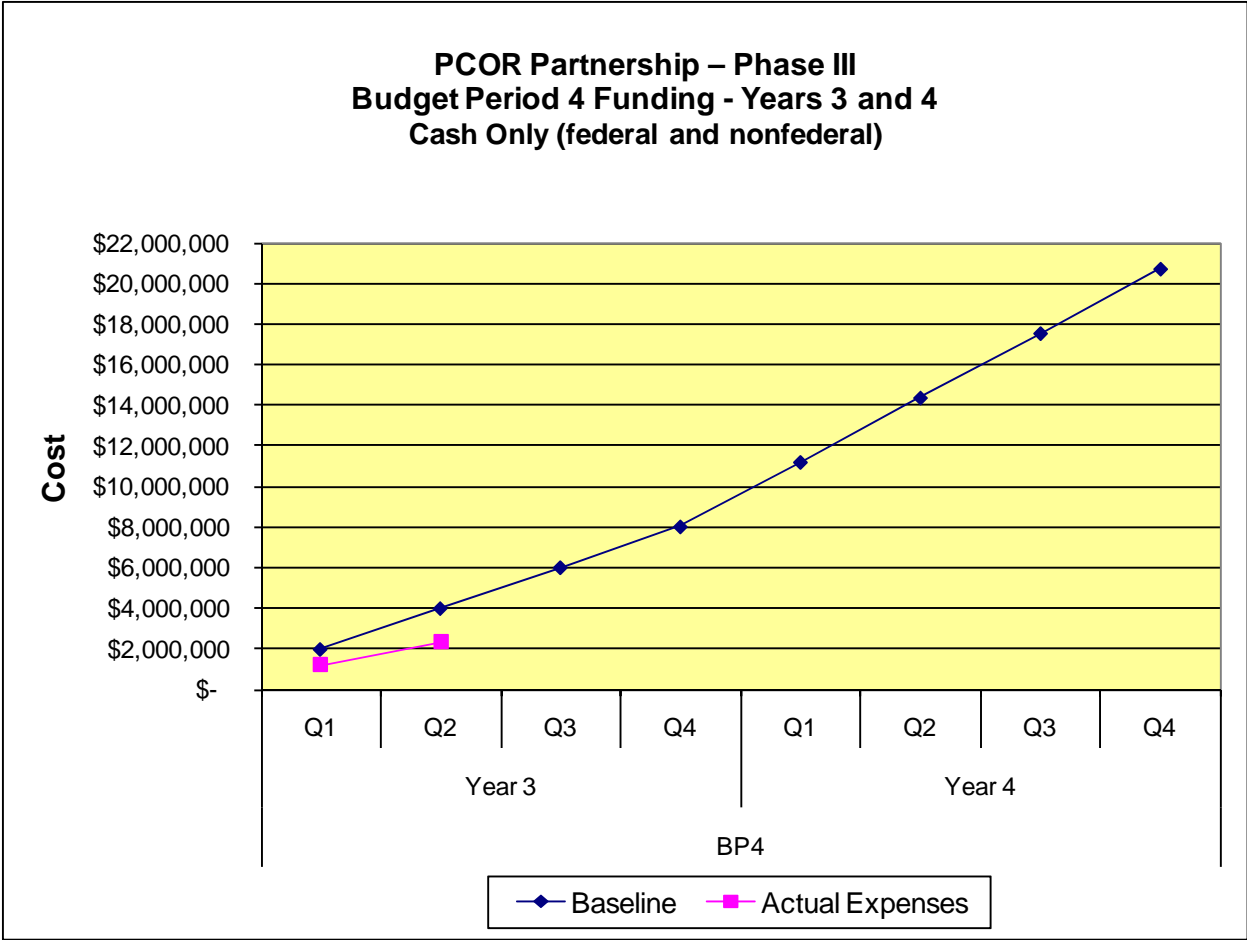


Figure 2. PCOR Partnership Phase III, BP4 – Years 3 and 4, funding (cash only).

Table 4. BP4 – Years 3 and 4 Spending Plan

Baseline Reporting Quarter	Year 3								Year 4							
	Q1		Q2		Q3		Q4		Q1		Q2		Q3		Q4	
	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total
Baseline Cost Plan																
Federal Share	\$ 1,889,558	\$ 1,889,558	\$ 1,889,558	\$ 3,779,115	\$ 1,889,558	\$ 5,668,673	\$ 1,889,558	\$ 7,558,230	\$ 2,984,500	\$ 10,542,730	\$ 2,984,500	\$ 13,527,230	\$ 2,984,500	\$ 16,511,730	\$ 2,984,500	\$ 19,496,230
Nonfederal Share	\$ 117,188	\$ 117,188	\$ 117,188	\$ 234,375	\$ 117,188	\$ 351,563	\$ 117,188	\$ 468,750	\$ 180,000	\$ 648,750	\$ 180,000	\$ 828,750	\$ 180,000	\$ 1,008,750	\$ 180,000	\$ 1,188,750
Total Planned	\$ 2,006,745	\$ 2,006,745	\$ 2,006,745	\$ 4,013,490	\$ 2,006,745	\$ 6,020,235	\$ 2,006,745	\$ 8,026,980	\$ 3,164,500	\$ 11,191,480	\$ 3,164,500	\$ 14,355,980	\$ 3,164,500	\$ 17,520,480	\$ 3,164,500	\$ 20,684,980
Actual Incurred Cost																
Federal Share	\$ 1,025,953	\$ 1,025,953	\$ 983,104	\$ 2,009,057												
Nonfederal Share	\$ 171,873	\$ 171,873	\$ 164,935	\$ 336,808												
Total Incurred Cost	\$ 1,197,826	\$ 1,197,826	\$ 1,148,039	\$ 2,345,865												
Variance																
Federal Share	\$ 863,605	\$ 863,605	\$ 906,454	\$ 1,770,058												
Nonfederal Share	\$ (54,686)	\$ (54,686)	\$ (47,748)	\$ (102,433)												
Total Variance	\$ 808,919	\$ 808,919	\$ 858,706	\$ 1,667,625												

Table 5. Phase III – Through BP4, Year 3: Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2007)		
M17: Task 4 – Fort Nelson Test Site Selected	12/31/07	12/28/07
D37: Task 4 – Fort Nelson Test Site – Site Geological Characterization Experimental Design Package	12/31/07	12/28/07
D63: Task 13 – Project Management Plan	12/31/07	12/28/07
Year 1 – Quarter 2 (January–March 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/08	1/31/08
D38: Task 4 – Fort Nelson Test Site – Geomechanical Experimental Design Package	1/31/08	1/31/08
M1: Task 1 – Three Target Areas Selected for Detailed Characterization	3/31/08	3/20/08
M18: Task 4 – Fort Nelson Test Site Geochemical Work Initiated	3/31/08	3/19/08
D11: Task 2 – Outreach Plan	3/31/08	3/31/08
D30: Task 4 – U.S. Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/02/08
Year 1 – Quarter 3 (April–June 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/08	4/30/08
D14: Task 2 – General Phase III Fact Sheet	4/30/08	4/30/08
D17: Task 2 – General Phase III Information PowerPoint Presentation	5/30/08	5/30/08
M3: Task 3 – Start Environmental Questionnaire for U.S. Test Site	6/30/08	6/27/08
M6: Task 4 – U.S. Test Site Geochemical Work Initiated	6/30/08	6/30/08
M7: Task 4 – U.S. Test Site Geological Characterization Data Collection Initiated	6/30/08	6/30/08
Year 1 – Quarter 4 (July–September 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/08	7/31/08
D12: Task 2 – Demonstration Web Pages on the Public Site	7/31/08	7/31/08
M2: Task 1 – Demonstration Project Reporting System (DPRS) Prototype Completed	9/30/08	9/26/08
D1: Task 1 – Review of Source Attributes	9/30/08	9/26/08
Year 2 – Quarter 1 (October–December 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/08	10/31/08
D20: Task 2 – Documentary Support to PowerPoint and Web Site	12/31/08	12/31/08
D57: Task 12 – Project Assessment Annual Report	12/31/08	12/31/08

Continued...

Table 5. Phase III – Through BP4, Year 3: Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 2 (January–March 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/09	1/30/09
M21: Task 14 – Outline of White Paper on Nexus of CO ₂ Capture and Sequestration (CCS) and Water, Part Subtask 14.2 – White Paper on Nexus of CCS and Water	2/27/09	2/27/09
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/09	3/31/09
Year 2 – Quarter 3 (April–June 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/09	4/30/09
M23: Task 14 – Monthly WWG Conference Call Held	4/30/09	4/30/09
D2: Task 1 – First Target Area Completed	5/29/09	5/29/09
M23: Task 14 – Monthly WWG Conference Call Held	5/29/09	5/29/09
M24: Task 14 – WWG Annual Meeting Held	5/29/09	5/07/09
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	5/29/09
M23: Task 14 – Monthly WWG Conference Call Held	6/30/09	6/25/09
Year 2 – Quarter 4 (July–September 2009)		
M23: Task 14 – Monthly WWG Conference Call Held	N/A	Waived by DOE
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/09	7/31/09
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	7/31/09
M22: Task 14 – Draft White Paper – Nexus of CCS and Water Available for Comments	8/17/09	8/18/09
M23: Task 14 – Monthly WWG Conference Call Held	8/31/09	8/25/09
M4: Task 4 – U.S. Test Site Selected	9/30/09	9/30/09
M5: Task 4 – Data Collection Initiated for U.S. Test Site	9/30/09	9/30/09
M23: Task 14 – Monthly WWG Conference Call Held	9/30/09	9/22/09
D1: Task 1 – Review of Source Attributes	9/30/09	9/25/09
D3: Task 1 – Permitting Review – One State and One Province	9/30/09	9/30/09
D9: Task 1 – Updated DSS	9/30/09	9/29/09
D47: Task 6 – Topical Report on the Preliminary Design of Advanced Compression Technology	9/30/09	9/30/09
D77: Task 13 – Risk Management Plan Outline	9/30/09	9/18/09

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Table 5. Phase III – Through BP4, Year 3: Milestones and Deliverables (continued)

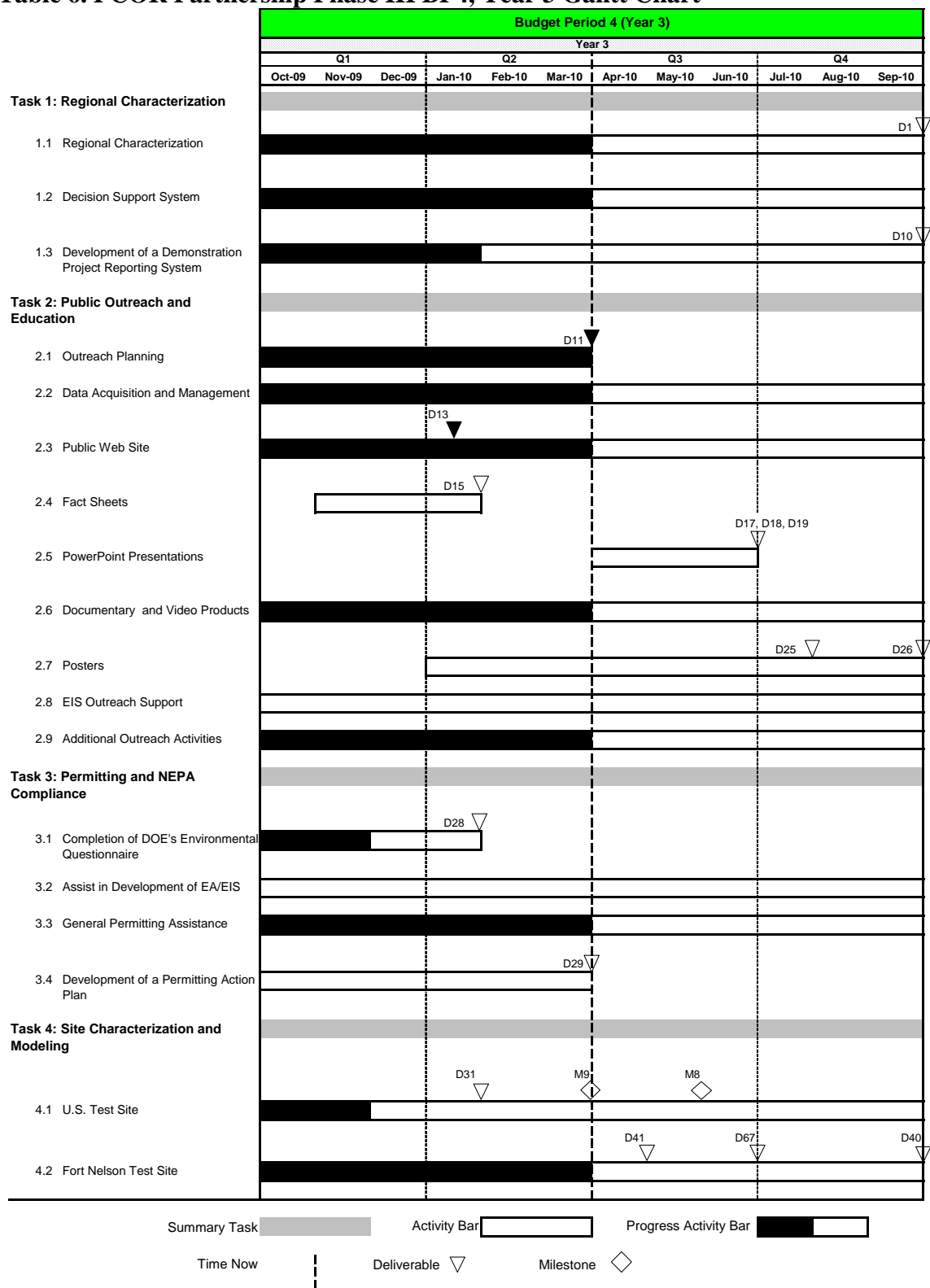
Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 1 (October–December 2009)		
M23: Task 14 – Monthly WWG Conference Call Held	10/30/09	10/26/09
D78: Task 14 – Final White Paper on the Nexus of CCS and Water	10/30/09	10/28/09
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/30/09	11/02/09
M23: Task 14 – Monthly WWG Conference Call Held	11/30/09	11/16/09
M23: Task 14 – Monthly WWG Conference Call Held	12/31/09	Waived by DOE
D57: Task 12 – Project Assessment Annual Report	12/31/09	12/31/09
Year 3 – Quarter 2 (January–March 2010)		
D13: Task 2 – Public Site Updates	1/15/10	1/15/10
M23: Task 14 – Monthly WWG Conference Call Held	1/31/10	1/06/10
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	1/29/10
M23: Task 14 – Monthly WWG Conference Call Held	2/28/10	2/25/10
D79: Task 14 – Water Resource Estimation Methodology Document	2/28/10	Waived by DOE
D11: Task 2 – Outreach Plan	3/31/10	3/31/10
M23: Task 14 – Monthly WWG Conference Call Held	3/31/10	3/23/10
Year 3 – Quarter 3 (April–June 2010)		
D41: Task 4 – Fort Nelson Test Site – Geochemical Final Report	4/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	4/30/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	5/31/10	
D67: Task 4 – Fort Nelson Test Site – Simulation Report	6/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/10	
M24: Task 14 – WWG Annual Meeting Held	6/30/10	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/10	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/10	

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Table 5. Phase III – Through BP4, Year 3: Milestones and Deliverables (continued)

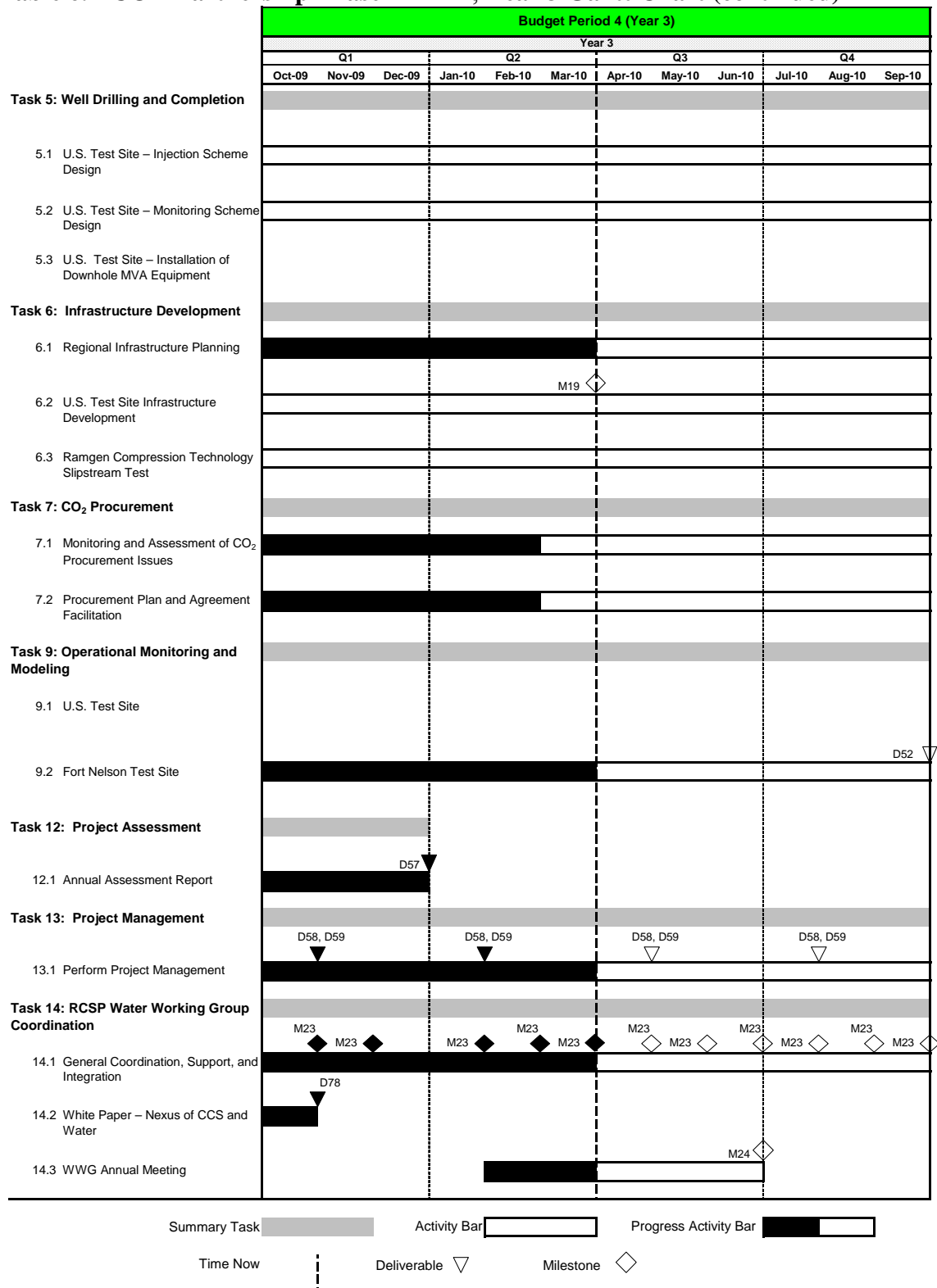
Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 4 (July–September 2010)		
M23: Task 14 – Monthly WWG Conference Call Held	7/31/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	
D15: Task 2 – U.S. Test Site Fact Sheet	7/31/10	
D28: Task 3 – Environmental Questionnaire – U.S. Test Site	7/31/10	
D31: Task 4 – U.S. Test Site – Geological Characterization Experimental Design Package	7/31/10	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/10	
D1: Task 1 – Review of Source Attributes	9/30/10	
D10: Task 1 – Demonstration Project Reporting System Update	9/30/10	
D26: Task 2 – Fort Nelson Test Site Poster	9/30/10	
D29: Task 3 – Permitting Action Plan	9/30/10	
D40: Task 4 – Fort Nelson Test Site – Geomechanical Final Report	9/30/10	
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
M19: Task 6 – Capture, Dehydration, and Compression Technology Selected	9/30/10	
M9: Task 4 – U.S. Test Site Geological Model Development Initiated	9/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/10	

Table 6. PCOR Partnership Phase III BP4, Year 3 Gantt Chart



Continued...

Table 6. PCOR Partnership Phase III BP4, Year 3 Gantt Chart (continued)



Continued...

Table 6. PCOR Partnership Phase III BP4, Year 3 Gantt Chart (continued)

Key for Deliverables ▼	Key for Milestones ◆
D1 Review of Source Attributes (Update) D10 DPRS Update D11 Outreach Plan (Update) D13 Public Site Updates D15 U.S. Test Site Fact Sheet D17 General Phase III Information PowerPoint Presentation (Update) D18 U.S. Test Site PowerPoint Presentation D19 Fort Nelson Test Site PowerPoint Presentation (Update) D25 U.S. Test Site Poster D26 FN Test Site Poster D28 U.S. Test Site – Environmental Questionnaire D29 Permitting Action Plan D31 U.S. Test Site – Site Geological Characterization Experimental Design Package D40 FN Test Site – Geomechanical Final Report D41 FN Test Site – Geochemical Final Report D52 FN Test Site – Site Characterization, Modeling, and Monitoring Plan D57 Project Assessment Annual Report D58 Quarterly Progress Report D59 Milestone Quarterly Report D67 FN Test Site – Simulation Report D78 Final White Paper on the Nexus of CCS and Water	M8 U.S. Test Site Wellbore Leakage Data Collection Initiated M9 U.S. Test Site Geological Model Development Initiated M19 Capture, Dehydration, and Compression Technology Selected M23 Monthly WWG Conference Call Held M24 WWG Annual Meeting Held

PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

Abstracts

Abstracts – Accepted for Presentation

Ayash, S.C., Giry, E., Frenette, R., Meyer, V., Moffatt, D., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2010, A new risk management methodology for large-scale CO₂ storage—application to Spectra Energy’s proposed Fort Nelson carbon capture and storage project [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Daly, D.D., Crocker, C.R., Hanson, S.K., Steadman, E.N., and Harju, J.A., 2010, Covering the bases – regional and project-level outreach for sequestration [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Daly, D.D., and Sacuta, N., 2010, Cross-border collaboration in applying outreach best practices to Aquistore project [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Gorecki, C.D., Klapperich, R.J., Bremer, J.M., Holubnyak, Y.I., and McNemar, A., 2010, Regional carbon sequestration partnership—water working group [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Gorecki, C.D., Sorensen, J.A., Knudsen, D.J., Bremer, J.M., Steadman, E.N., Harju, J.A., and Wildgust, N., 2010, Developing resource estimates for CO₂ storage in regional deep saline formations [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

- Holubnyak, Y.I., Hawthorne, S.B., Mibeck, B.A., Miller, D.J., Bremer, J.M., Smith, S.A., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2010, Laboratory and numerical modeling of CO₂-H₂S-water-rock interactions at Williston Basin reservoir conditions [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Holubnyak, Y.I., Knudsen, D.J., Mibeck, B.A., Bremer, J.M., Smith, S.A., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2010, Geochemical modeling of enhanced oil recovery and CO₂ storage at the Northwest McGregor oil field [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Holubnyak, Y.I., Smith, S.A., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2010, Introducing new statistical methods in geochemical kinetics modeling for better estimations of CO₂-water-rock interactions [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Jensen, M.D., Pavlish, B.M., Pei, P., Leroux, K.M.B., Steadman, E.N., and Harju, J.A., 2010, Estimating the cost to capture, compress, and transport CO₂ from stationary sources in the PCOR Partnership region [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Knudsen, D.J., Liu, G., Gorecki, C.D., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2010, History matching a CO₂ huff ‘n’ puff EOR project with CMG’s GEM and CMOST [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Schmidt, D.D., Steadman, E.N., and Harju, J.A., 2010, CO₂ storage pilot study for lignite coal [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Smith, S.A., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2010, Zama acid gas EOR, CO₂ sequestration, and monitoring project [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Sorensen, J.A., Knudsen, D.J., Pluemer, B., Smith, S.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2010, Northwest McGregor field CO₂ huff ‘n’ puff—a case study of the application of selected geophysical techniques for CO₂ monitoring in a deep carbonate reservoir [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.
- Sorensen, J.A., Schmidt, D.D., Knudsen, D.J., Smith, S.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2010, Results of the Plains CO₂ Reduction Partnership’s Phase II demonstration in the Northwest McGregor oil field, North Dakota [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Steadman, E.N., Harju, J.A., Anagnost, K.K., Daly, D.J., Gorecki, C.D., Jensen, M.D., Peck, W.D., Smith, S.A., and Sorensen, J.A., 2010, The Plains CO₂ Reduction (PCOR) Partnership—carbon capture and storage demonstration activities [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Steadman, E.N., Harju, J.A., Daly, D.J., Gorecki, C.D., Jensen, M.D., Peck, W.D., Smith, S.A., and Sorensen, J.A., 2010, The Plains CO₂ Reduction (PCOR) Partnership—carbon capture and storage demonstration activities [abs.]: American Association of Petroleum Geologists – Rocky Mountain Section Meeting, Durango, Colorado, June 13–16, 2010.

Steadman, E.N., Harju, J.A., Daly, D.J., Gorecki, C.D., Jensen, M.D., Peck, W.D., Smith, S.A., and Sorensen, J.A., 2010, The Plains CO₂ Reduction (PCOR) Partnership—developing carbon management options for the central interior of North America [abs.]: Geological Society of America North-Central Section (44th Annual) and South-Central Section (44th Annual) Joint Meeting, Branson, Missouri, April 11–13, 2010.

Steadman, E.N., Harju, J.A., Sorensen, J.A., Smith, S.A., Ayash, S.C., Gorecki, C.D., Daly, D.J., Jensen, M.D., and Peck, W.D., 2010, The Plains CO₂ Reduction (PCOR) Partnership—collaborative U.S.–Canada carbon capture and storage demonstration activities [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Abstracts – Submitted but Not Accepted for Presentation

Daly, D.J., Hanson, S.K., Peck, W.D., Steadman, E.N., and Harju, J.A., 2010, Outreach planning and tracking [abs.]: 9th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, Pennsylvania, May 10–13, 2010.

Abstracts – Accepted but Author(s) Declined Invitation

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MEETINGS/TRAVEL

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

- January 11–12, 2010: met with representatives of Nebraska Public Power District in Lincoln, Nebraska.
- January 12–15, 2010: presented at the Seals and Caprocks in Geologic Carbon Sequestration Workshop in Pacific Grove, California.
- January 19–20, 2010: presented before the North Dakota Oil and Gas Research Council in Bismarck, North Dakota.
- January 20–22, 2010: participated in the IOGCC RCSP “Lessons Learned” exercise in Santa Fe, New Mexico.
- January 25–27, 2010: participated in the Groundwater Protection Council 2010 UIC Conference held in Austin, Texas.
- January 26–28, 2010: met with representatives of Spectra Energy in Calgary, Alberta, Canada.
- January 31 – February 3, 2010: traveled for a presentation on February 1, 2010, at the 2010 EUEC Energy and Environment Conference in Phoenix, Arizona.
- February 15–18, 2010: attended the IEA Greenhouse Gas R&D Programme’s CO₂ Geological Storage Modelling Meeting on February 16–17, 2010, in Salt Lake City, Utah.
- February 16–18, 2010: presented as an invited speaker at the Texas Carbon Capture and Storage Association CO₂ Storage Policy seminar and attended the 2010 Carbon and Climate Change Conference in Austin, Texas.
- February 21–24, 2010: attended project meetings with Spectra Energy, Weatherford Laboratories, and RPS Energy Canada in Calgary, Alberta, Canada.
- February 22–27, 2010: attended CMG’s courses CMOST and CO₂ Sequestration with GEM February 23–26, 2010, in Houston, Texas.
- February 25, 2010: attended a meeting with Denbury Resources in Bismarck, North Dakota.
- March 4, 16, 18, 22, 24, 30 and 31, 2010: participated in editing sessions at Prairie Public Broadcasting in Fargo, North Dakota.
- March 7–13, 2010: attended meetings with Alberta Innovates – Technology Futures and participated in CMG training courses entitled “Geochemistry for GEM” and CO₂ Sequestration with GEM” in Calgary, British Columbia, Canada.
- March 8–11, 2010: participated in the third NACAP Working Group Meeting held March 9–10, in Cuernavaca, Mexico.
- March 22–24, 2010: presented a PCOR Partnership overview before the Assistant Secretary for Fossil Energy and associated staff on March 23 in Washington, D.C.
- March 27 – April 4, 2010: attended the 6th IMA Conference on Modelling Permeable Rocks, held March 29 – April 1, in Edinburgh, Scotland.

Materials presented at these meetings are available to partners on the PCOR Partnership DSS Web site (<http://www2.undeerc.org/website/pcorp/>).

REFERENCES

None.