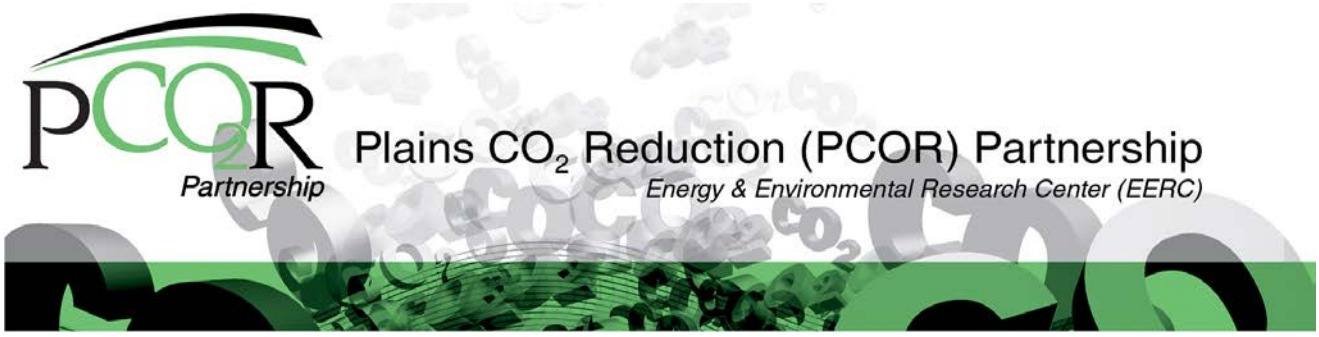

PLAINS CO_2 REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report
Task 13 – Deliverable D58/D59

(for the period January 1 – March 31, 2016)

Prepared for:

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EXECUTIVE SUMMARY

The Plains CO_2 Reduction (PCOR) Partnership is one of seven Regional Carbon Sequestration Partnerships competitively awarded by the U.S. Department of Energy (DOE) 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 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.

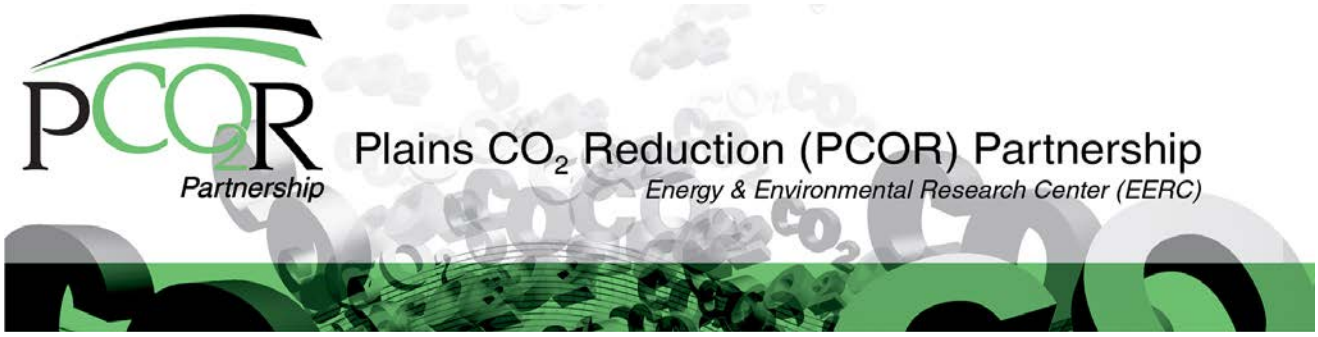
Phase III, the multiyear (2007–2017) development phase, is an extension of the characterization (Phase I) and validation (Phase II) phases and is intended to confirm that commercial-scale CO_2 capture, transportation, and storage can be achieved safely, permanently, and economically over extended periods in the PCOR Partnership region. Budget Period (BP) 4 began October 1, 2009.

This progress report presents an update of Phase III PCOR Partnership activities from January 1, 2016, through March 31, 2016.

The 6-month extension to BP4 continued through March 31, 2016, and focused on extended and enhanced work, specifically in the Bell Creek activities. As of December 31, 2015, the most recent month of record, 2.807 million tonnes of total gas (composition of approximately 98% CO_2) has been purchased by Denbury Resources Inc. (Denbury) for injection into the Bell Creek Field since May 2013, equating to an estimated 2.753 million tonnes of CO_2 stored. Initial processing of historic InSAR data was completed. Results of the fall 2015 enhanced pulsed-neutron logging program were provided, and interpretation began. Models were developed for generic life cycle analyses featuring conventional oil production and natural gas processing.

The BP5 continuation application was submitted and approved. CO_2 breakthrough at the Aquistore site observation well was confirmed in pulsed-neutron log data provided to the PCOR Partnership. PCOR Partnership modeling and simulation activities were performed in support of the Aquistore and Bell Creek projects, and laboratory efforts focused on the Williston Basin.

Nine tasks continued. In addition to the foregoing, an article related to the PCOR Partnership's minimum miscibility pressure work was submitted to the journal *Energy & Fuels*, collaboration continued on DOE best practices manuals, the PCOR Partnership Atlas update continued, scenarios regarding CO_2 emission and energy production in North Dakota were evaluated, compilation of the regulatory permitting document continued, and review of articles for the Special Issue of the *International Journal of Greenhouse Gas Control* continued. Ten deliverables and milestones were completed, ten abstracts were submitted for presentation, and three presentations were given.



PLAINS CO_2 REDUCTION PARTNERSHIP PHASE III
Quarterly Technical Progress Report
January 1 – March 31, 2016

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 Partnerships (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 sectors. The membership, as of March 31, 2016, 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 Storage Program (Figure 1) 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 PCOR Partnership Program 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 – March 31, 2016
- BP5: April 1, 2016 – September 30, 2017

BP1 and BP2 were effective in Phase II.

Table 1. PCOR Partnership Membership Phase III (October 1, 2007 – present, inclusive)

DOE NETL
UND EERC
Abengoa Bioenergy New Technologies
Air Products and Chemicals, Inc.
Alberta Department of Energy
Alberta Department of Environment
Alberta Innovates – Technology Futures
ALLETE
Ameren Corporation
American Coalition for Clean Coal Electricity
American Lignite Energy
Apache Canada Ltd.
Aquistore
Baker Hughes Incorporated
Basin Electric Power Cooperative
BillyJack Consulting Inc.
Biorecro AB
Blue Source, LLC
BNI Coal, Ltd.
British Columbia Ministry of Energy, Mines, and Petroleum Resources
British Columbia Oil and Gas Commission
C12 Energy, Inc.
The CETER Group, Ltd.
Computer Modelling Group Ltd.
Continental Resources, Inc.
Dakota Gasification Company
Denbury Resources Inc.
Eagle Operating, Inc.
Eastern Iowa Community College District
Enbridge Inc.
Encore Acquisition Company
Energy Resources Conservation Board/ Alberta Geological Survey
Environment Canada
Excelsior Energy Inc.
Great Northern Project Development, LP
Great River Energy
Halliburton
Hess Corporation
Huntsman Corporation
Husky Energy Inc.
Indian Land Tenure Foundation
Interstate Oil and Gas Compact Commission
Iowa Department of Natural Resources
Lignite Energy Council
Manitoba Geological Survey
Marathon Oil Company
MBI Energy Services
MEG Energy Corporation
Melzer Consulting
Minnesota Power
Minnkota Power Cooperative, Inc.
Missouri Department of Natural Resources
Missouri River Energy Services
Montana–Dakota Utilities Co.
Montana Department of Environmental Quality
National Commission on Energy Policy
Natural Resources Canada
Nebraska Public Power District
North American Coal Corporation
North Dakota Department of Commerce Division of Community Services
North Dakota Department of Health
North Dakota Geological Survey
North Dakota Industrial Commission Department of Mineral Resources, Oil and Gas Division
North Dakota Industrial Commission Lignite Research, Development and Marketing Program
North Dakota Industrial Commission Oil and Gas Research Council
North Dakota Natural Resources Trust
North Dakota Petroleum Council
North Dakota Pipeline Authority
Omaha Public Power District
Otter Tail Power Company
Outsource Petrophysics, Inc.
Oxand Risk & Project Management Solutions
Peabody Energy
Petroleum Technology Research Centre
Petroleum Technology Transfer Council
Pinnacle, a Halliburton Service
Prairie Public Broadcasting
Pratt & Whitney Rocketdyne, Inc.
Praxair, Inc.
Ramgen Power Systems, Inc.
RPS Energy Canada Ltd.
Saskatchewan Ministry of Industry and Resources
SaskPower
Schlumberger
Sejong University
Shell Canada Limited
Spectra Energy
Suncor Energy Inc.
TAQA North, Ltd.
TGS Geological Products and Services
University of Alberta
University of Regina
WBI Energy, Inc.
Weatherford Advanced Geotechnology
Western Governors' Association
Westmoreland Coal Company
Wisconsin Department of Agriculture, Trade and Consumer Protection
Wyoming Office of State Lands and Investments
Xcel Energy

The overall mission of the Phase III program is to 1) gather characterization data to verify the ability of the target formations to store carbon dioxide (CO_2), 2) facilitate the development of the infrastructure required to transport CO_2 from sources to the injection sites, 3) facilitate sensible development of the rapidly evolving North American regulatory and permitting framework, 4) develop opportunities for PCOR Partnership partners to capture and store CO_2, 5) facilitate the establishment of a technical framework by which carbon credits can be monetized for CO_2 stored in geologic formations, 6) continue collaboration with other RCSPs, and 7) provide outreach and education for CO_2 capture and storage 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. The PCOR Partnership plans to fully utilize the infrastructure of its region to maximize CO_2 injection volumes. A programmatic

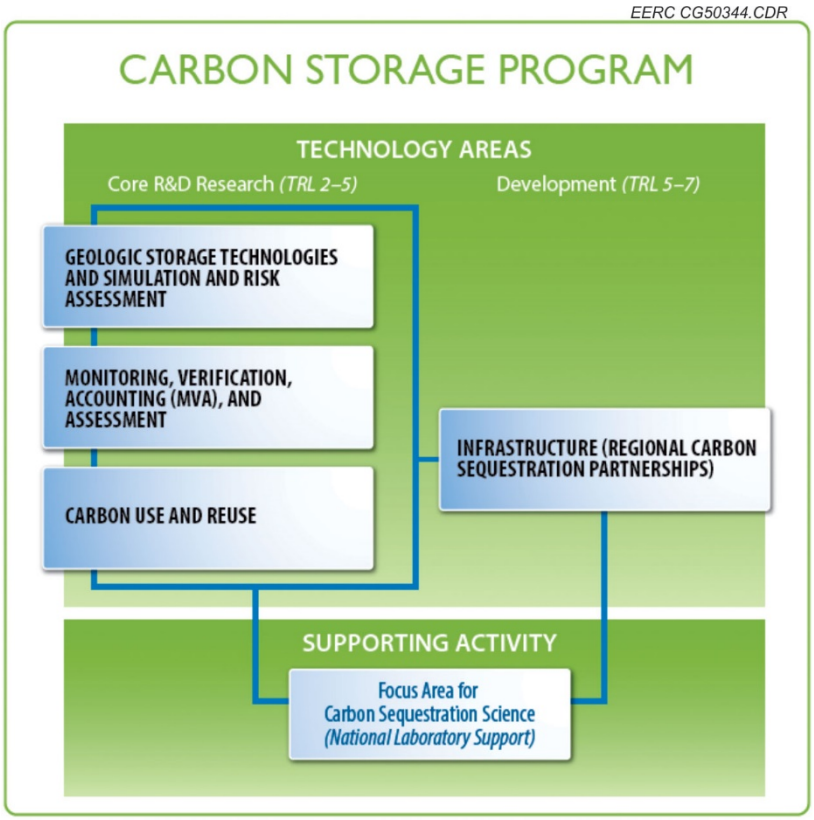


Figure 1. DOE Carbon Storage Program technology areas featuring regional partnerships (courtesy of Andrea Dunn, DOE NETL; "TRL" stands for technology readiness level).

development phase (Phase III) goal is implementation of large-scale field testing involving at least 1 million metric tons of CO_2 a project. Each of the RCSP large-volume injection tests is designed to demonstrate that the CO_2 storage sites have the potential to store regional CO_2 emissions safely, permanently, and economically for hundreds of years.

The PCOR Partnership is working with Denbury Resources Inc. (Denbury) in the Denbury-operated Bell Creek oil field in Powder River County in southeastern Montana. The PCOR Partnership has also conducted a feasibility study for Spectra Energy Transmission's (Spectra's) Fort Nelson gas-processing facility, situated near Fort Nelson, British Columbia, Canada. In addition, the PCOR Partnership is collaborating with the Petroleum Technology Research Centre (PTRC) on site characterization, risk assessment, and monitoring, verification, and accounting (MVA) activities associated with the Aquistore Project near Estevan, Saskatchewan, Canada. The PCOR Partnership's work has concluded with Apache Canada Ltd. to further characterize the Zama Acid Gas Enhanced Oil Recovery (EOR), CO_2 Storage, and Monitoring Project in Alberta, Canada, as well as its work on a multiyear, binational characterization effort of the basal Cambrian system (Figure 2).

Figure 2. Location of large-scale sites in PCOR Partnership Phase III.

The PCOR Partnership's objectives for the demonstration projects are as follows: 1) conduct a successful Bell Creek demonstration to verify that the region's large number of oil fields have the potential to store significant quantities of CO_2 in a safe, economical, and environmentally responsible manner and 2) support Spectra's feasibility study of a Fort Nelson demonstration to verify the economic feasibility of using the region's carbonate saline formations for safe, long-term CO_2 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 16 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 (completed); 6) Infrastructure Development; 7) CO_2 Procurement (completed); 8) Transportation and Injection Operations (completed); 9) Operational Monitoring and Modeling; 10) Site Closure; 11) Postinjection Monitoring and Modeling; 12) Project Assessment; 13) Project Management; 14) RCSP Water Working Group (WWG) Coordination; 15) Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project (completed); and 16) Characterization of the Basal Cambrian System (completed). Table 2 lists the responsibility matrix for these 16 tasks.

It should be noted that Tasks 10 and 11 will not be initiated until BP5 (April 2016).

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	Charles D. Gorecki
Task 4 – Site Characterization and Modeling	James A. Sorensen
Task 5 – Well Drilling and Completion (completed)	John A. Hamling
Task 6 – Infrastructure Development	Melanie D. Jensen
Task 7 – CO_2 Procurement (completed)	John A. Harju
Task 8 – Transportation and Injection Operations (completed)	Melanie D. Jensen
Task 9 – Operational Monitoring and Modeling	John A. Hamling and Lawrence J. Pekot
Task 10 – Site Closure (starting BP5)	John A. Hamling
Task 11 – Postinjection Monitoring and Modeling (starting BP5)	John A. Hamling and Lawrence J. Pekot
Task 12 – Project Assessment	Loreal V. Heebink
Task 13 – Project Management	Charles D. Gorecki
Task 14 – RCSP WWG Coordination	Ryan J. Klapperich
Task 15 – Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project (completed)	Charles D. Gorecki
Task 16 – Characterization of the Basal Cambrian System (completed)	Wesley D. Peck

PROGRESS OF WORK

Task 1 – Regional Characterization

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

- Prepared one of the two presentations to be given at the North America Energy Ministers Trilateral (NAEMT) Meeting in Mexico City and Villahermosa, Mexico, which will be held April 11–15, 2016.
- Participated in a January 6, 2016, conference call to discuss the ongoing development of the U.S. DOE Site Characterization best practices manual (BPM). The outline of a new chapter was discussed and next steps planned. Provided comments on the latest version of the BPM in March 2016.
- Continued efforts to update Deliverable (D) 81, Regional Carbon Sequestration Atlas (update), including the following:
  - Adding new pages: two pages will extend Bell Creek information, one page will describe the Basal Cambrian work, one will be dedicated to the Aquistore project, and one or two will be related to "green oil" or CO_2 EOR and CCS.
  - Worked on graphics, maps, and figures, and updated text in the preface through Chapter 2.
- Continued activities to update the content and function of the partners-only **Decision Support System (DSS)**, including the following:

  - A new server was brought online to address potential failure risks in the older equipment.
- Continued activities to update the content of the **PCOR Partnership general database**, including the following:
  - Updated North Dakota and Montana Petra projects with the latest general well information from each state's online resource as follows: added 245 new North Dakota wells and five new Montana wells.
  - Updated North Dakota production and injection data.
  - Updated South Dakota, Nebraska, Wyoming, British Columbia, and Saskatchewan projects.
  - Scanned the over 100,000 well logs, and began downloading well logs from the Wyoming Oil and Gas Conservation Commission Web site. These will be formatted, downloaded, and imported into the Petra database and filtered to account for those wells in the PCOR Partnership region within Wyoming.
- Continued efforts on assessing data from the PCOR Partnership DSS on large point sources and potential sinks:
  - Used the Carnegie Mellon Integrated Environmental Control Model (IECM) to estimate the change in CO_2 emissions and net power output from the existing baseload coal-fired power generation facilities in North Dakota. Discrepancies between the predicted and actual CO_2 emissions for the state's coal-fired power plants were rectified.
  - The IECM model runs were guided by various capture scenarios that had been identified as potential approaches to reduce North Dakota's CO_2 emissions by 45%, as required by the U.S. Environmental Protection Agency (EPA) Clean Power Plan. The predicted values (based on various levels of capture) were applied to different scenarios that incorporated various combinations of retrofitted full capture, retrofitted partial capture, conversion to natural gas firing, retiring small and/or old units, supplementing with wind power to reach current power outputs, and construction of new-build plants with capture. Energy load growth for the year 2030 was taken into account in the CO_2 emission and energy production estimates for one of the scenarios.
  - The information regarding CO_2 emission and energy production for each of the scenarios (as well as assumptions that were made) was summarized in a very brief internal report, which will be expanded into a full draft report.
- With regard to the **Aquistore** project:
  - Held monthly internal Aquistore update meetings to discuss the progress of activities and abstract/presentation topics for upcoming conferences.
  - Submitted D93 – Geological Modeling and Simulation Report for the Aquistore Project – on February 29, 2016.
  - The SaskPower capture plant was down for routine maintenance during the week of February 8–12, 2016. The plant was returned to service, and injection at the Aquistore well resumed.
  - An EERC Senior Geophysicist traveled to Estevan, Saskatchewan, Canada, to observe the collection of 3-D vertical seismic profile (VSP) in the injection well at the Aquistore site on February 19–20, 2016.

  - Held a conference call with the PTRC Aquistore project manager. The February site work program at the Aquistore site has been completed, which included surface seismic at the site with the permanent receiver system, pulsed-neutron logs (PNLs) in both wells, and spinner survey testing in the injection well.
  - Received processed PNL of observation well from a PTRC representative. CO_2 breakthrough at the observation well was confirmed. Will receive other results when available.
  - Participated in a Science and Engineering Research Committee (SERC) conference call on March 16, 2016.
  - As of March 22, 2016, 49,000 metric tons of CO_2 has been injected.
  - With regard to static **modeling** and dynamic predictive **simulation** activities:
    - Continued to process provided daily injection and pressure data. Rewrote the code to better filter noisy data and generate the simulation history match file simultaneously, which will be used for the simulation model.
    - History-matching was performed in an attempt to correct the injection rate to account for variable temperature effect on fluid density and volume, but the impact to the history match was considered minor.
    - Modified the model using a different relative permeability setting.
    - Compared older versions of the geologic model with the current version to search for possible simulation improvements. Over the area of simulation, the current constant property layer model was considered to be more than adequate, as the variable layer properties of earlier geologic models were very minor.
    - Reran simulation with improved well performance since the injection restart in November 2015. The simulation pressure is getting closer to field data.
- With regard to the **Williston Basin** CO_2 Storage Sink Relative Permeability laboratory characterization effort:
  - Continued work on the value-added laboratory report.
  - Worked on laboratory characterization efforts:
    - Completed thin-section petrographic analyses of all samples.
    - Completed 3-D scanning for bulk volume on the Broom Creek samples.
    - Completed porosity testing on all samples.
    - Received mercury injection capillary pressure (MICP) data. It was turned into a series of charts for use in reporting.
    - Completed x-ray diffraction (XRD) analyses.
    - Completed permeability-to-air testing on all samples. Continued quality checking steady-state gas permeability results.
    - Modified the length of core samples that will be utilized for relative permeability testing. Performed 3-D scanning for bulk volume and porosity testing on the modified samples.
    - Continued preparing brine solutions for relative permeability testing.
    - Performed relative permeability testing including brine permeability, CO_2 permeability, and CO_2/brine conditions on samples from the following formations:
      - Inyan Kara Formation
      - Deadwood Formation

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

- Continued troubleshooting of the relative permeability system delayed the relative permeability testing in the Williston Basin CO_2 Storage Sink Relative Permeability laboratory characterization effort until January 2016.

Task 2 – Public Outreach and Education

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

- Submitted the updated Phase III fact sheet (D14) on February 26, 2016.
- Submitted D11 entitled "Outreach Action Plan (Update 2)" on March 28, 2016.
- Submitted an abstract on outreach to the Greenhouse Gas Control Technologies (GHGT)-13 Conference, in collaboration with PTRC entitled "Communicating about the Geological Storage of Carbon Dioxide – Comparing Public Outreach for CO_2 EOR and Saline Storage Projects." Authors include Norman Sacuta, Kyle Worth, and Aleana Young of PTRC and Daniel Daly and Barry Botnen of the EERC.
- Continued to apply changes based on final internal EERC review of the value-added update of the Phase II Lignite and Northwest McGregor fact sheets.
- Continued the value-added update of the Phase II Zama fact sheet. Reviewed text on pages 1 and 4 and began development of pages 2 and 3. Worked on updating text and images.
- Continued the update of the Fort Nelson Feasibility Study fact sheet (D16).
- Initiated efforts to update the Bell Creek Fact Sheet (D15) with a discussion of the format, preliminary time line, and work assignments.
- Informed the Dakota Science Center of Grand Forks, North Dakota, that the EERC and the PCOR Partnership Task 2 team would be available to host teachers taking part in the the North Dakota Science Teachers Association 2016 Spring Collaborative Conference Preconference STEM (Science, Technology, Engineering, and Mathematics) Networking Sessions on the afternoon of April 21, 2016.
- Worked to develop a new set of maps showing outreach coverage, outreach sectors, and areas with storage potential in the region for use in the Outreach Action Plan and to demonstrate the status of outreach activities in the upcoming Technical Advisory Board (TAB) meeting.
- During the quarter, the PCOR Partnership was represented by EERC personnel at seven meetings and one conference. Specifically, the PCOR Partnership outreach activities included three oral presentations. The following quantities of PCOR Partnership outreach materials were distributed:
  - PCOR Partnership documentary entitled "Nature in the Balance: CO_2 Sequestration" – 8
  - PCOR Partnership documentary entitled "Reducing Our Carbon Footprint: The Role of Carbon Markets" – 6
  - PCOR Partnership documentary entitled "Out of the Air – Into the Soil" – 7
  - PCOR Partnership documentary entitled "Managing Carbon Dioxide: The Geologic Solution" – 8

  - PCOR Partnership documentary entitled "Global Energy and Carbon: Tracking Our Footprint" – 7
  - PCOR Partnership video training guide entitled "Installing a Casing-Conveyed Permanent Downhole Monitoring System" – 6
  - "Plains CO_2 Reduction Partnership Atlas, 4th Edition, Revised" – 7
- Participated in a number of **conference calls** this quarter, including the following:
  - Participated in the monthly Aquistore outreach advisory group phone call on February 29, 2016, and sent out an e-mail summary.
  - Participated in the monthly Aquistore outreach advisory group conference call on March 30, 2016.
  - With regard to the monthly RCSP Program Outreach Working Group (OWG) conference calls, the focus continued to be discussion of ongoing review and update of the RCSP outreach and education BPM draft:
    - Continued review and revision of the DOE outreach BPM for the RCSP Program OWG based on the OWG conference call held December 17, 2015. A set of text comments were e-mailed to the BPM lead on January 13, 2016.
    - In lieu of participation in the OWG call on January 21, 2016, the Task 2 team provided comments by e-mail and followed up by e-mail with the OWG lead.
    - Reviewed and provided written comments to DOE on behalf of the PCOR Partnership for the draft outreach BPM authored by the RCSP Program OWG.
    - Participated in the OWG monthly conference call on March 17, 2016. Discussion focused on the status of the outreach BPM and its upcoming review.
- Continued efforts to update the **public Web site** (www.undeerc.org/pcor), including the following:
  - Submitted the new "Technical Posters" section on the public PCOR Partnership Web site for review on February 19, 2016. The new section was approved and went live on February 23, 2016.
  - Prepared updated versions of several PDF documents to include new URLs.
  - Worked on updating the PCOR Partnership Web site disclaimer.
  - Worked on the Options to Reduce CO_2 page.
  - The Grand Forks, North Dakota, city government sent out notification of the North Dakota Department of Commerce Division of Community Services (DCS)-funded household energy and carbon footprint pages on the PCOR Partnership Web site with January's electric bills.
  - Reviewed and provided comments on a draft article intended for the EERC Solutions blog regarding the DCS-funded household energy and carbon footprint pages on the PCOR Partnership Web site.
  - Added a link for the upcoming Lignite Energy Council (LEC) Education Seminar to the Educators page. Task 2 personnel will present and distribute outreach materials at the seminar to be held June 14, 2016, in Bismarck, North Dakota.
  - Continued ongoing identification and repair of broken links.
- Continued collaborative efforts with **Prairie Public Broadcasting (PPB)**, including the following:
  - Met with PPB on March 23, 2016, to review progress on documentaries D21 (the Bell Creek Story) and D22 (Coal and the Modern Age).

  - With regard to the Bell Creek 30-minute documentary (D21):
    - Traveled to Denbury offices in Plano, Texas, on February 18–19, 2016, to interview Phil Rykhoek, President and Chief Executive Officer, and Matt Dahan, Vice President of the North Region.
  - With regard to D22, the Coal in the Modern Age 60-minute documentary:
    - Reviewed the first third of the initial script draft (draft script 1.0).
    - Reviewed sources and initiated script updates for the remaining two-thirds of the D22 script.
    - Continued script development for the D22 coal documentary, including obtaining interview transcripts, reviewing transcripts, and incorporating interview materials into the evolving narrative backbone.
    - Scheduled a meeting for April 8, 2016, to review D22 script updates.
- Information regarding the **site sessions/visits** to the PCOR Partnership public Web site included the following:
  - There were 7721 sessions/visits to the public Web site (www.undeerc.org/pcor). Traffic decreased approximately 6% from last quarter (8191 sessions/visits). 1159 of these sessions/visits interacted with more than one page. Approximately 24% of visitors came to the site using a mobile device or tablet.
  - There were 6611 unique visitors to the public Web site, representing a 5% decrease from last quarter (6966 visitors). In particular, 85% of these visitors were new to the Web site (visitors whose visit was marked as a first-time visit in this quarter).
  - Of the 7721 sessions/visits, 42% of the Web traffic was domestic, and 58% was international. Table 3 lists the top ten countries for visits to the PCOR Partnership Web site: the United States, India, United Kingdom, Canada, Australia, Philippines, Kenya, Malaysia, Pakistan, and Indonesia. There was traffic from 135 countries overall (Figure 3).
  - There were 657 sessions/visits originating from within the PCOR Partnership region (Figure 4). Approximately 69% of the regional visits originated from the United States, and 31% came from Canada. Visits from within the PCOR Partnership region comprised over 8% of the overall traffic to the public Web site (it should be noted that the totals are exaggerated to some degree because the visit location data were aggregated at the state and province levels, even though the PCOR Partnership region formally includes only portions of British Columbia, Montana, and Wyoming).
- During this reporting period, a breakdown of how visitors came to the PCOR Partnership Web site, also referred to as **traffic sources** (Figure 5), was determined and is provided below:
  - Search traffic refers to the use of search engines such as Google, Bing, and Yahoo. Search traffic accounted for 86% of the overall traffic that came to the public Web site. Google Analytics provides keywords that visitors used to find the public Web site. The top three search phrases were "carbon sequestration," "what is CO_2," and "CO_2 sequestration."
  - Direct traffic consists of those visitors who bookmark or type in the URL (www.undeerc.org/pcor). It is likely that most of the direct traffic (over 11%) is from persons familiar with the PCOR Partnership.

Table 3. Sessions/Visit Activity from the Top Ten Countries and the PCOR Partnership Region

	Country	Sessions/ Visits*	PCOR Partnership State/Province	Visits*
1	United States	3255		
			North Dakota	228
			Minnesota	85
			Wisconsin	40
			Iowa	28
			Missouri	27
			Wyoming	15
			Nebraska	11
			Montana	9
			South Dakota	9
2	India	870		
3	United Kingdom	614		
4	Canada	472		
			Alberta	93
			British Columbia	63
			Saskatchewan	39
			Manitoba	10
5	Australia	413		
6	Philippines	195		
7	Kenya	106		
8	Malaysia	99		
9	Pakistan	94		
10	Indonesia	88		
	Other 125 countries	1515		
Total Sessions/Visits		**7721**	**Total PCOR Partnership Visits**	**657**

*Arranged by the number of visits to the site.

  - Referral site traffic (about 3%) corresponds to the traffic directed to the PCOR Partnership Web page from other sites via links. The top three referring Web sites were ask.com, anthapedia.in, and globalccsinstitute.com.
  - Less than 1% of site traffic resulted from teacher campaigns and social interactions, such as e-mail or social media sources (e.g., Facebook and YouTube).
- During this reporting period, the **nature of the sessions** to the PCOR Partnership public Web site included 10,939 page views (a 5% decrease from last quarter); the top five pages viewed are listed in Table 4. These five pages make up about 73% of total page views.

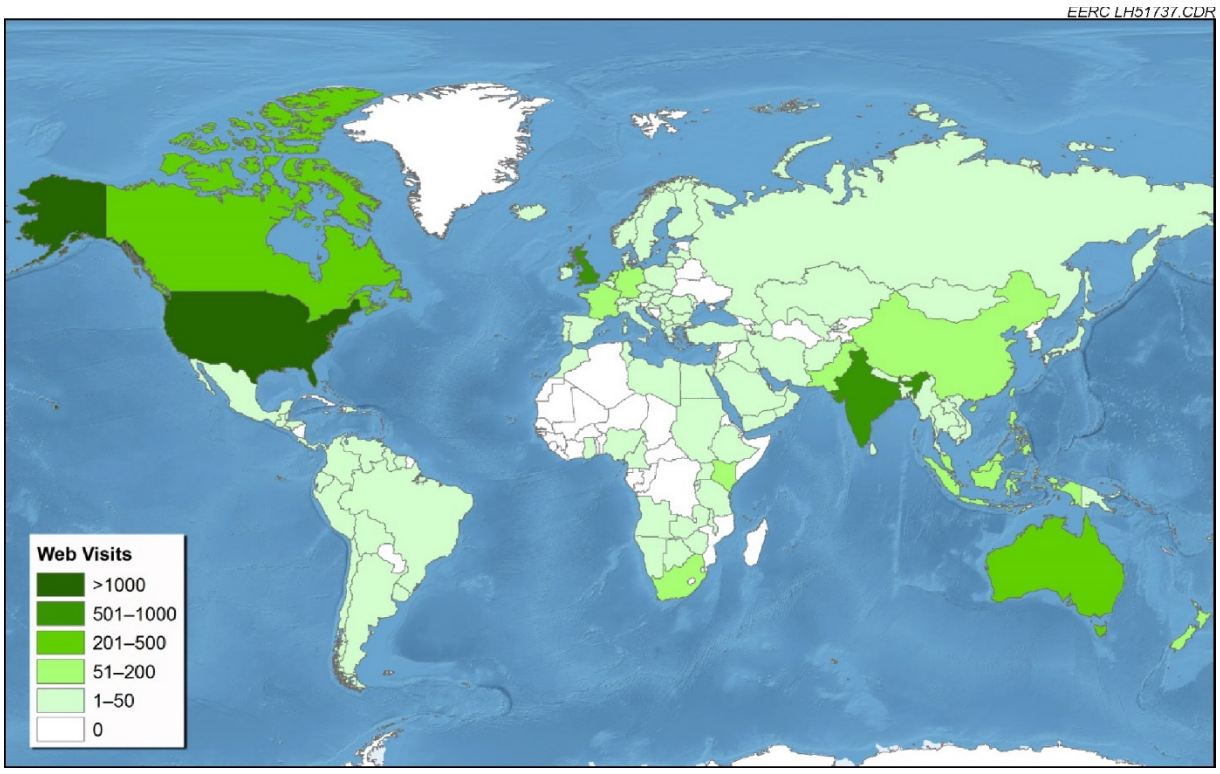


Figure 3. Map of PCOR Partnership Web site global traffic for this reporting period.

- All five documentaries and 50 video clips taken from the documentaries have been uploaded to the EERC's YouTube channel. The top five accessed YouTube videos are listed in Table 5. Because of the volume of material, the videos were organized into seven playlists. Each video description includes one or more links to the PCOR Partnership public Web site. Two PCOR Partnership full-length documentaries are also on the PPB YouTube Channel. These are listed in Table 6. These videos can also be streamed on the PCOR Partnership public Web site.
- During this reporting period, the PCOR Partnership received **public television exposure** from documentaries broadcast in the PPB region in four states and one Canadian province. A total of two broadcasts aired, with "Managing Carbon Dioxide: The Geologic Solution" and "Global Energy and Carbon: Tracking Our Footprint" each airing once.
- In addition to YouTube and the public Web site, PCOR Partnership documentaries and video clips are available on PBS Learning Media. This free, online media service was developed for Pre-K–12 educators to enhance learning through images, videos, etc., and provides teachers with the ability to create custom lesson plans based on this content. Table 7 lists the top five video clips viewed during this quarter on PBS Learning Media.
- Most recently, PCOR Partnership documentaries and video clips have been made available on the North Dakota Studies Web site at ndstudies.org. This Web site promotes the teaching of North Dakota history, geography, culture, and other subjects by providing lesson plans, videos, curriculum, and images for use by teachers, students, and the general public. Table 8 lists the top five video clips viewed during this quarter on ndstudies.org.

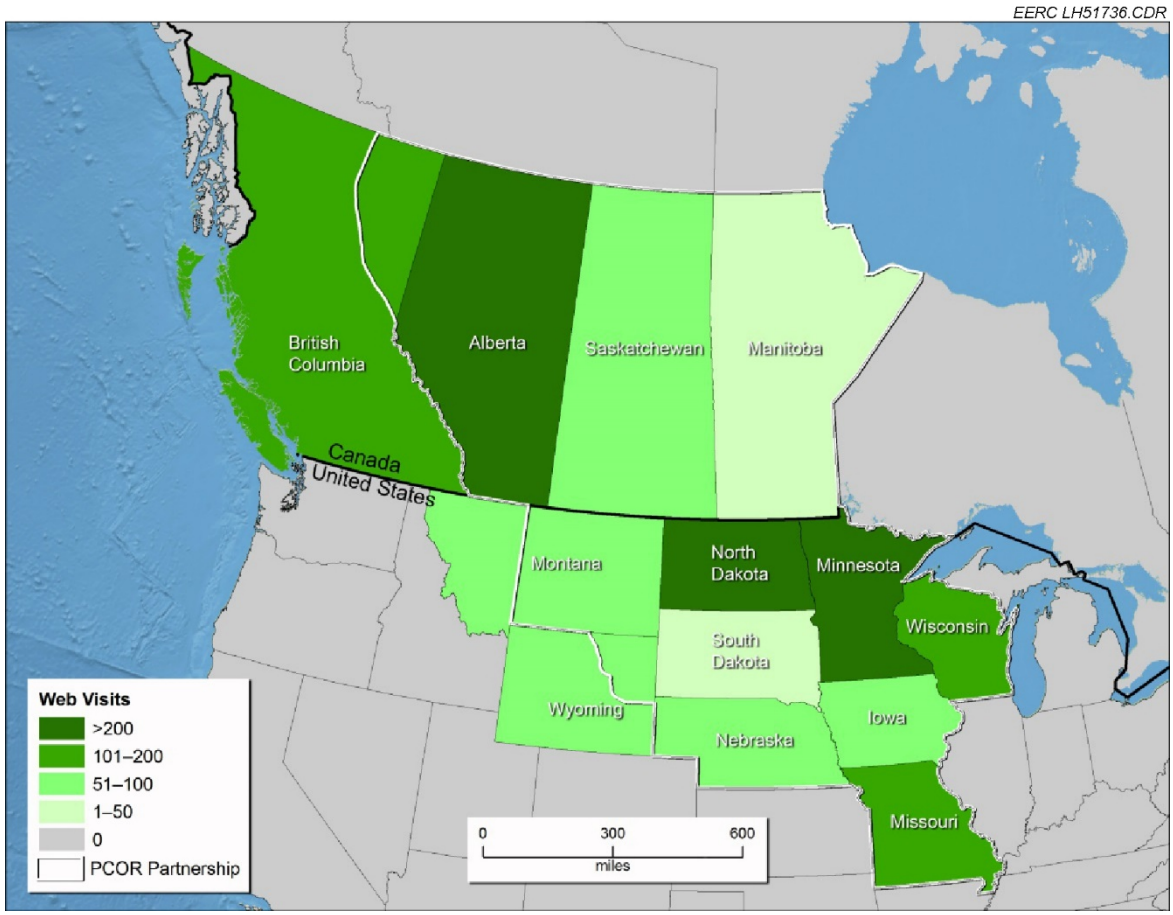


Figure 4. Map of PCOR Partnership Web site regional visits for this reporting period.

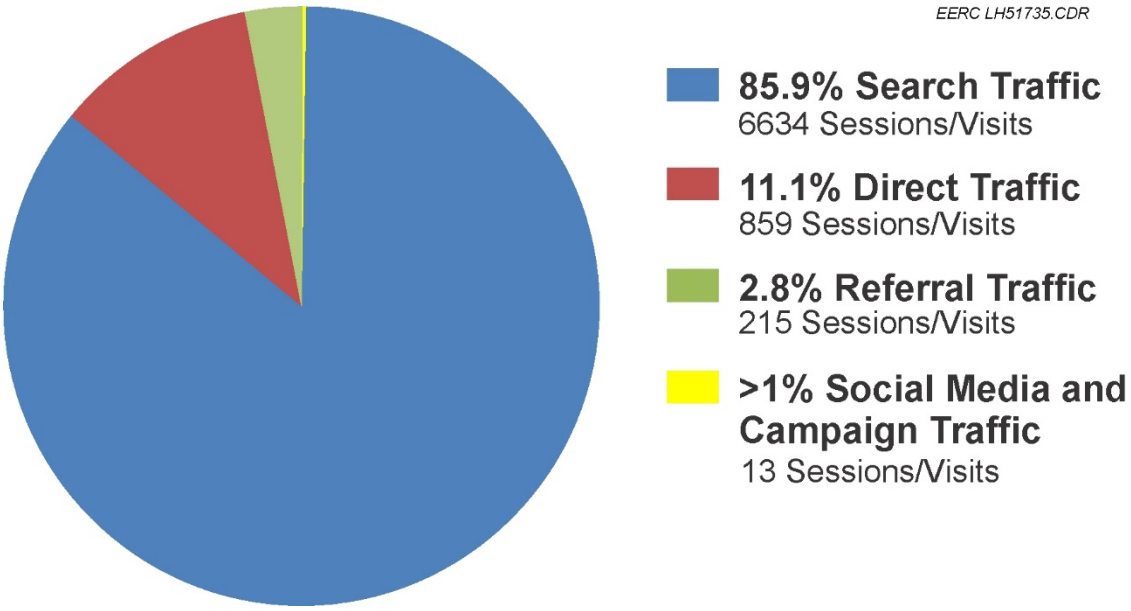


Figure 5. PCOR Partnership public Web site traffic sources for this reporting period.

Table 4. Top "Page Views" on the PCOR Partnership Public Web Site

Page Title	Page Views	% Page Views	Page
What Is CO_2 Sequestration?	5691	52.0	www.undeerc.org/pcor/sequestration/whatissequestration.aspx
What Is CO_2?	1314	12.0	www.undeerc.org/pcor/sequestration/whatisco2.aspx
CO_2 Sequestration Projects	352	3.0	www.undeerc.org/pcor/co2sequestrationprojects/default.aspx
Home Page	326	3.0	www.undeerc.org/pcor/default.aspx
Carbon and CO_2 on Earth	297	2.7	www.undeerc.org/pcor/sequestration/co2onearth.aspx

Table 5. Top EERC PCOR Partnership-Related YouTube Channel Videos Accessed

Video	Video Length	Views	Est. Minutes Watched	Avg. View Duration
Reducing Our Carbon Footprint: The Role of Markets Documentary	26:49	948	4164	4:23
Reforestation in Brazil	4:41	724	1470	2:01
The Phases of Oil Recovery – So Far	2:40	412	702	1:42
Household Energy Around the World	5:34	142	351	2:28
Reservoir Geology 101: Fluid in the Rocks	1:52	139	173	1:52

Table 6. PCOR Partnership Documentaries on PPB YouTube Channel Accessed

Video	Video Length	Views	Est. Minutes Watched	Avg. View Duration
Global Energy and Carbon: Tracking Our Footprint	32:36	1492	12,502	8:38
Managing Carbon Dioxide: The Geologic Solution	31:40	269	3660	13:60

Table 7. Top Ten EERC PCOR Partnership-Related Videos Viewed on PBS Learning Media

Video	Video Length	Views
Household Electricity and Carbon Footprint	4:22	35
More Fuel Less Carbon	3:11	27
No-Till Farming and Carbon Storage	3:32	19
Carbon-Based Fuels and Our Quality of Life	2:34	13
A Postindustrial Economy: Household Energy in the U.S.	4:11	12

Table 8. Top Ten EERC PCOR Partnership-Related Videos Viewed on North Dakota Studies

Video	Video Length	Views
Carbon and Energy	3:16	6
Introduction to Energy Use and Environmental Challenges	2:32	6
Electricity	3:50	5
Geological Sequestration	9:34	5
Carbon Use Reduction – Household and Societal Actions	7:32	4

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

- Travel to China and interviews with U.S. DOE officials have proven difficult to arrange. Final planning with respect to interviewees and travel arrangements for documentary D22 (Coal and the Modern World; due July 31, 2016) are being reconsidered.

Task 3 – Permitting and NEPA Compliance

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

- Attended the Groundwater Protection Council 2016 Underground Injection Control Conference held February 23–25, 2016, in Denver, Colorado.
- Continued working on the regulatory permitting document for the PCOR Partnership region (D76 – Regional Regulatory Perspective). The goal of this document is to help PCOR Partnership states and provinces through the permitting process. Continued compiling rules, regulations, and statutes crosswalks and flowcharts for various scenarios of CCS geologic storage including CO_2 EOR for each of the PCOR Partnership states and provinces.
  - Prepared the Nebraska, Montana, Iowa, North Dakota, Minnesota, Wisconsin, Manitoba, and Saskatchewan injection well and underground injection control (UIC) permitting rules/regulations/statutes flowcharts and drilling regulatory crosswalks. Continued refinement and consolidation.
  - Contacted a North Dakota Industrial Commission (NDIC) representative to discuss permitting questions. Completed the first draft of the North Dakota crosswalk spreadsheet. Discussed the 2016 NDIC proposed rule language and possible changes to the North Dakota crosswalk spreadsheet.
  - Researched CCS rules for British Columbia.
  - Worked on the Missouri crosswalk spreadsheet.

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

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 4 – Site Characterization and Modeling

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

- Submitted the final report for D64 entitled "Bell Creek Test Site – Site Characterization Report" on February 22, 2016, upon completion of Denbury's review, which required no changes. D64 was initially submitted to DOE on August 29, 2013, and approved February 10, 2014.
- Submitted the final report for D32 entitled "Bell Creek Test Site – Geomechanical Final Report" on February 24, 2016, upon completion of Denbury's review, which required no changes. D32 was initially submitted to DOE on January 31, 2013.
- Submitted D36 entitled "Bell Creek Wellbore Integrity Study" on March 30, 2016, upon completion of Denbury's review. No changes were requested by Denbury. D36 was initially submitted to DOE on May 19, 2014.
- Continued work on the PCOR Partnership Site Characterization BPM (D35), primarily modifying the outline.
- Completed a PowerPoint presentation regarding the quality control of the PNL data collected from the fall 2015 campaign.
- **Bell Creek** test site activities included the following:
  - With regard to **modeling** efforts, the following activities occurred:
    - Resumed work on the Bell Creek near-surface model and continue to make progress. Efforts are being concentrated on increasing the understanding of hydraulic head in the shallow subsurface of the field, shallow water chemistry, temperature and pressure conditions, etc. This model will be used to help understand the effect of CO_2 storage on the near-surface environment.
    - Worked on identifying which cells contain perforations in the Bell Creek Version 2 (Phases 3–7) model. This will assist with setting up the predictive simulation.
    - Continued work on improving properties in the geomechanical models, both the 1-D and 3-D mechanical earth models (MEMs). Reviewed available data to calibrate properties in the MEMs, including checking processed PNLs. Worked on preparing for the simulations.
    - Constructed a series of well cross sections within Phase 4 of the Bell Creek Field. These can be used for assessments of the field and assisting in planning field work.
    - Worked on updating the PNL data from the fall 2015 campaign in the static model. Some of the PNL logs are being reprocessed using updated water salinity values to ensure accuracy.
    - Updated temperature data in the 3-D model using the most current data collected by the distributed temperature system (DTS) in 05-06 OW (observation well).
    - Worked on the reservoir model, including a quality check of the Bell Creek well tops.

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

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 5 – Well Drilling and Completion

This task ended in Quarter 3 – BP4, Year 7 (June 2014).

- Submitted D44 entitled "Bell Creek Test Site – Drilling and Completion Activities Report" on March 30, 2016, upon completion of Denbury's review. No changes were requested by Denbury. D44 was initially submitted to DOE on May 30, 2014.

Task 6 – Infrastructure Development

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

- Submitted D45 entitled "Bell Creek Test Site – Infrastructure Development Report" on March 31, 2016.
- Continued work on an updated version of the 2011 CO_2 capture technologies overview value-added document:
  - Of technologies included in the original document, 25 absorption technologies, 11 cryogenic/mineralization/reduction technologies, and the hydrogen membrane reactor technology were updated.
  - One membrane and seven adsorption technologies were found to require significant updating. Updates are under way.
  - Six of the technologies presented at the 2014 and 2015 DOE NETL capture technology meetings were readied for inclusion in the report.
  - One chemical absorption and one adsorption technology were found during Internet searches and are being readied for inclusion in the report.
- E-mailed the director of business development for Dresser-Rand asking permission to pass on his contact information to a group that may be interested in demonstrating the DATUM S supercompressor (previously known as the Ramgen Rampressor). This is part of a continuing effort to assist in finding a demonstration site for the compressor because once it is demonstrated in a field setting, it could be a boon to future CCS projects in the PCOR Partnership region.
- Assisted a partner with questions about the CO2ncrete capture technology. The partner's primary question was if it was a real technology, and secondly, if it would be of use at a coal-fired power plant. The task lead sent information regarding similar mineralization technologies: Calera, C-Quest, SkyMine, New Sky Energy, and Cemtrex. A link was provided for Solidia's home page. The primary difference between CO2ncrete and the other known mineralization technologies is that CO2ncrete plans to make use of 3-D printers to fabricate the building material.

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

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 7 – CO_2 Procurement

This task ended Quarter 4, BP4, Year 6 (September 2013).

Task 8 – Transportation and Injection Operations

This task ended Quarter 4, BP4, Year 8 (September 2015).

Task 9 – Operational Monitoring and Modeling

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

- Completed and submitted the DOE CO_2 Storage Memo through December 2015. An estimated 2.753 million metric tons of CO_2 has been stored at Bell Creek.
- Submitted Milestone (M) 54 entitled "Bell Creek Test Site – Initial Processing and Analysis of Historic InSAR Data Completed." Received approval January 26, 2016.
- Submitted M58 entitled "Bell Creek Test Site – Completion of 2.75M Metric Tons of CO_2 Stored" on March 22, 2016. Received approval March 22, 2016.
- Submitted M56 entitled "Life Cycle Analysis for Primary and Secondary Recovery Oil Completed" on March 31, 2016. A life cycle analysis (LCA) of oil production is being conducted using two tools: spreadsheet models that use emission factors from U.S. DOE NETL publications and customized programming of the Argonne National Laboratory GREET model. This milestone concentrated on developing models for generic LCAs featuring conventional oil production and natural gas processing. Future efforts will focus specifically on the Bell Creek project in which CO_2 from natural gas processing is used for EOR.
- A Webinar was held with NETL on January 28, 2016, to present the LCA work that has been conducted under the PCOR Partnership by a consultant with The CETER Group (CETER). Several NETL personnel were in attendance, as well as a representative of the Bureau of Economic Geology (BEG).
- Submitted a draft article entitled "Rapid and Simple Capillary-Rise/Vanishing Interfacial Tension Method to Determine Crude Oil Minimum Miscibility Pressure: Pure and Mixed CO_2 Methane and Ethane" for DOE review on March 23, 2016. Received approval from DOE on March 31, 2016. The article was submitted to the journal *Energy & Fuels*.
- Drafted an abstract on a simulation study of CO_2 flooding in the Bell Creek oil field for the Computer Modelling Group (CMG) 2016 Technical Conference to be held June 13–14, 2016, in Calgary, Alberta, Canada.
- In response to comments from Denbury on D66 reports (Bell Creek Test Site – Simulation Report [update]), revised technical content and figures in Update 4.
- With regard to DOE BPMs:
  - DOE BPM for MVA:
    - Received the revised draft back from the group lead for review. Updated a figure. Continued preparation of a Bell Creek MVA overview call-out box at DOE's request.
    - Sent comments on March 4, 2016. Upon request, provided a near-surface monitoring stratigraphic column and related text for the DOE MVA BPM.

  - DOE Operating Carbon Storage Projects BPM:
    - Received feedback from the BPM team lead for review. Submitted review comments to the BPM lead on February 26, 2016.
    - Participated in a DOE Operating Carbon Storage Projects BPM conference call on March 4, 2016. Provided an updated image for a landowner relations call-out box for use in the BPM. Reviewed the final draft.
- Continued work on D51, the PCOR Partnership MVA BPM (Monitoring for CO_2 Storage and CO_2 EOR):
  - Modified and expanded the detail of the outline.
  - Compiled a list of "lessons learned," which will serve as the basis for developing the BPM.
  - Received input on the incremental value of additional sample collection and other topics related to sampling frequencies from a consultant from CETER for inclusion in the BPM.
  - Participated in several conference call meetings with a consultant from CETER discussing Bell Creek MVA measurements, risk assessment categories, etc., for inclusion in the BPM.
- Downloaded and evaluated the National Risk Assessment Partnership (NRAP) DREAM (Designs for Risk Evaluation and Monitoring) tool to determine its use with PCOR Partnership MVA data. The DREAM tool will not fit the objectives the PCOR Partnership is trying to accomplish.
- Continued **Bell Creek** site activities, including the following:
  - Held meetings with Denbury in Plano, Texas, on January 7, 2016. Agenda items included Bell Creek D21 documentary planning and scheduling of interviews, Bell Creek LCA, PNL planning, seismic processing and interpretation update (Denbury and EERC presentations) and planning a path forward, update on initial InSAR processing, and revised time line and path forward for outstanding PCOR Partnership products under Denbury review.
  - Held a Webinar with representatives from Denbury and Schlumberger on February 26, 2016, to review PNL processing results for 18 wells, which were acquired as part of the fall 2015 PNL campaign. Based on the results discussed during the call, the PNL logs will be reprocessed using a lower value for formation water sigma to improve oil versus water saturation interpretations.
  - Used the most recent publicly available data to determine that cumulative total CO_2 gas injection is 4,489,133 metric tons through January 31, 2016. This value represents the total gas volume injected, which includes purchase and recycle streams and is NOT corrected for a gas composition of approximately 98% CO_2 (Table 9).
  - As of December 31, 2015, the most recent month of record, 2.807 million tonnes of total gas (composition of approximately 98% CO_2) has been purchased for injection into the Bell Creek Field, equating to an estimated 2.753 million tonnes of CO_2 stored (Table 10), with the difference comprising other trace gases in the purchase gas stream. A separate methodology from that used to calculate total gas injected was used to calculate a cumulative associated CO_2 storage volume estimate by correcting the gas purchase volume (approximately 98% CO_2) obtained from Denbury's custody transfer meter with gas compositional data.

Table 9. Bell Creek CO_2 Gas Injection Totals for January 2016 (cumulative totals May 2013 to January 2016)*

	January 2016 Injection
Total, Mscf	4,129,816
Total, U.S. tons†	236,219
Total, metric tons†	214,502
Cumulative Total, Mscf ‡	86,429,286
Cumulative Total, U.S. tons†‡	4,943,619
Cumulative Total, metric tons†‡	4,489,133

Source: Montana Board of Oil and Gas (MBOG) database.

* There has been a lag in posting of injection/production volumes to the MBOG database. Total gas injection volumes are ***NOT CORRECTED*** for gas composition and include the combined purchased and recycled gas streams.

† This was calculated utilizing a conversion of 17.483 Mscf/U.S. ton and 19.253 Mscf/metric ton.

‡ Cumulative totals are for the period from May 2013 to the month listed.

Table 10. Cumulative Total Gas Purchased and Estimated Associated CO_2 Storage Volumes for the Bell Creek Field[1]

	December 2015 Gas Volume
Monthly Total Gas Purchased, MMscf[2]	1717
Monthly Total Gas Purchased, million tons[2]	0.098
Monthly Total Gas Purchased, million tonnes[2]	0.089
Cumulative Total Gas Purchased, MMscf[2,3]	54,034
Cumulative Total Gas Purchased, million tons[2,3]	3.091
Cumulative Total Gas Purchased, million tonnes[2,3]	2.807
Cumulative Total CO_2 Stored, MMscf[3,4]	53,003
Cumulative Total CO_2 Stored, million tons[3,4]	3.032
Cumulative Total CO_2 Stored, million tonnes[3,4]	2.753

[1] Conversion factors of 17.483 Mscf/ton and 19.253 Mscf/tonne were used to calculate volumes.

[2] Total gas purchased volumes are ***NOT CORRECTED*** for gas composition.

[3] Cumulative totals are for the period from May 2013 to the month listed.

[4] Total gas CO_2 stored volumes are ***CORRECTED*** for gas composition.

- Completed production/injection GeoPDF map update for the most recent Denbury data available.
- Received InSAR dataset from TRE Canada; continued processing the Phase 1 data.
- Worked with historical InSAR data for the Bell Creek Field prior to CO_2 injection (2007–2012), and compared results with historical production/injection data over the same time period. Began statistical analyses of "noise" in the available InSAR data to determine the baseline for comparison with potential future InSAR surveys.
- With regard to **modeling** and dynamic reservoir pressure and multiphase fluid flow **simulation** efforts:
  - ♦ Consistent progress since April 2011.

- ♦ Worked on injection gas optimization for field operation prediction, including the impact of impurities such as methane on the CO_2 minimum miscibility pressure (MMP). Investigated the sensitivity of EOR performance to these impurities.
- ♦ Worked on building simple gas injection models for heterogeneous reservoirs to investigate the gas sweep efficiency by visualizing the gas flow behavior; the current regional scale model is too large to analyze the fluid displacement behavior between wells.
- ♦ Analyzed Bell Creek Phase 3 water-flooding stage and boundary conditions for use in simulation activities.
- ♦ Updated the simulation database for Phase 3 with production/injection data.

– With regard to **injection-phase seismic** efforts:
- ♦ Continued passive seismic monitoring of 04-03 OW using the borehole seismic array:
  - ▪ Near-continuous operation since May 22, 2013.
  - ▪ Sent a two-person crew to Bell Creek Field to repair network setting at the borehole array to restore ability to log in remotely. The array had gone idle about December 25, 2015. Tested remote connection and restarted array.
  - ▪ Swapped recording to the new empty drive (Drive 3 was full) on the borehole array.
  - ▪ Continued work on the 3-D seismic data interpretation and inversion process in Petrel and HR9.
  - ▪ Completed 3-D VSP horizon picks, allowing the first look at the differencing and cross-equalization measures.
  - ▪ Worked on putting culture files in Montana State Plane coordinates into the Hampson–Russell seismic software in order to improve our 4-D image. Culture files are phase boundaries, section and township lines, etc.
  - ▪ Continued 4-D analysis of the 4-D VSP data. Horizon picking is in progress and difficult given the structural discontinuities.
  - ▪ Continued looking into time-lapse interpretation of the 4-D seismic difference attribute maps.
  - ▪ Continued 4-D VSP analysis, including well logs data loading and analysis and calibration with 3-D VSP.

– With regard to **injection-phase PNL** activities:
- ♦ Received processed PNL data collected during the fall 2015 enhanced PNL campaign from Schlumberger. Continued importing PNL logs from the fall 2015 campaign into Petrel.
- ♦ Completed a PowerPoint presentation regarding the quality control of the PNL data collected from the fall 2015 campaign.

– With regard to **injection-phase sampling** activities:
- ♦ Travel for Bell Creek activities:
  - ▪ Traveled to Gillette, Wyoming, for purchase and recycle gas sample collection activities at the Bell Creek test site January 25–29, 2016.
- ♦ Continued reservoir pressure and distributed temperature monitoring of 05-06 OW from the permanent downhole monitoring (PDM) system using the casing-conveyed pressure–temperature gauges (PTGs) and fiber-optic DTS:
  - ▪ Near-continuous operation since April 2012.

- Received a quote for the repair of the fiber-optic DTS unit. This device measures the downhole pressure and temperature using the fiber-optic cable in the monitoring well. A short occurred on the motherboard of the DTS unit on November 4, 2015, resulting in it being removed and sent in for repair.
- The repaired fiber-optic DTS unit arrived at the EERC the week of March 7, 2016. It was installed on March 23, 2016.

♦ Completed landowner packages for all groundwater-monitoring activities that occurred after August 2015. Denbury approved the packages on February 24, 2016. The packages have a different format, consisting of field measurements and select laboratory analyses for 18 groundwater locations.

♦ Developed talking points for discussions with Bell Creek landowners to provide guidance and information on how future outreach and engagement may be improved.

♦ Completed laboratory gas chromatography (GC) confirmatory analysis data for the August 2015 (31 samples) and November 2015 (17 samples) soil gas sampling events. Completed laboratory analyses of purchase and recycle gas stream samples collected on January 25, 2016. A summary of all oil and CO_2 gas stream samples collected for analyses to date is provided in Table 11.

♦ Continued working with a Denbury representative to start collecting ten additional oil samples from the Bell Creek Field. This is slated to begin in BP5 (April 2016). Samples will be collected every 2 months for 1.5 years and analyzed at the EERC.

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

- As stated previously, during maintenance of the Qorex system, a fault was identified in the interrogator system that appears to have been caused by an electrical short resulting in the system becoming nonoperational on November 4, 2015. The fiber-optic DTS unit was repaired and returned to the EERC. The repaired unit was installed on March 23, 2016.

Table 11. Oil and CO_2 Gas Stream Sampling and Analyses

Stream(s)	Dates Sampled
Production: Oil[1]	Jan 2014, March 2014,[2] May 2014, June 2014, July 2014, Sept 2014, Oct 2014,[2] Jan 2015,[2,3] May 2015,[3,4] June 2015,[3] Nov 2015[3,5]
Production: CO_2 Gas[1]	Sept 2014,[2] Nov/Dec 2014, Jan 2015,[6] March 2015, July 2015
Purchase/Recycle: CO_2 Gas[7]	May 2014,[8] June 2014, July 2014, Sept 2014, Oct 2014, April 2015, July 2015, Sept 2015, Jan 2016

[1] Wells 56-14R, 32-02, and 05-06 unless otherwise noted.
[2] Wells 56-14R and 32-02 only.
[3] Samples collected but not analyzed.
[4] Wells 32-02 and 05-06 only.
[5] Wells 56-14R and 05-06 only.
[6] Well 05-06 only.
[7] Both purchase and recycle streams unless otherwise noted.
[8] Purchase stream only.

- The Bell Creek Field borehole array that had gone idle about December 25, 2015, was repaired during the January 7–8, 2016, field trip. The network setting at the array was repaired to restore the ability to log in remotely. The remote connection was tested and the array was restarted. The communications with the system were down, not the actual system. Communications downtimes are generally less than 8 hours.
- Following the elimination of D53 "Fort Nelson Test Site – Best Practices Manual – Monitoring for CO_2 Storage in a Brine Formation" from the scope of work, it was proposed to use D100 "Fort Nelson Test Site – Best Practices Manual – Feasibility Study" as satisfaction for the completion of International Energy Agency Greenhouse Gas R&D Programme (IEAGHG) 2011 PCOR Partnership Peer Review Milestone R4, due March 31, 2016. Additionally, it was proposed to use the publication of the RCSP BPMs as satisfaction for the completion of IEAGHG 2011 PCOR Partnership Peer Review Milestone R6, due September 2017. Final word has not been received from DOE.
- A Bell Creek field trip was planned March 28 – April 1, 2016, to distribute landowner packages and a release document for the Fox Hills monitoring. This trip was postponed to April 4–8, 2016, because of inclement weather in the field.

Task 10 – Site Closure

This task is anticipated to be initiated in Project Year 9, Quarter 3, BP5 Year 1 (April 2016).

Task 11 – Postinjection Monitoring and Modeling

This task is anticipated to be initiated in Project Year 9, Quarter 3, BP5 Year 1 (April 2016).

Task 12 – Project Assessment

Significant accomplishments for Task 12 for the reporting period included the following:

- No activity this quarter.

Task 13 – Project Management

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

- Prepared the PCOR Partnership BP5 continuation application, including providing BP4 accomplishments from Program Year 3 to present; proposing BP5 task activities and budget; revising the Gantt chart with deliverables, milestones, and time line; and revising the statement of project objectives (SOPO). Submitted the application to DOE on January 22, 2016. Received approval on March 31, 2016.
- A list of deliverables with due dates in Year 9 Quarter 2 (January–March 2016) that were revised in the BP5 continuation application was submitted for approval. Approval was received January 26, 2016. The deliverables with the revised due dates include:
  - D22: Task 2 – Energy from Coal 60-minute Documentary (July 31, 2016)
  - D55: Task 11 – Bell Creek Test Site – Cost-Effective Long-Term Monitoring Strategies Report (September 30, 2016)

  - D69: Task 9 – Bell Creek Test Site – Best Practices Manual – Simulation Report (May 31, 2017)
- Attended and presented at the North Dakota Carbon Management Industrial Working Group Meeting held March 9–10, 2016, in Bismarck, North Dakota.
- Submitted M36 entitled "Technical Advisory Board Meeting Scheduled" on March 31, 2016. Received approval March 31, 2016.
- Submitted an abstract entitled "The Plains CO_2 Reduction Partnership: Developing Technologies for CCS Deployment in Central North America" for the 35th International Geological Congress to be held August 27 – September 4, 2016, in Cape Town, South Africa.
- Submitted nine PCOR Partnership abstracts on February 10, 2016, for the GHGT-13 Conference to be held November 14–18, 2016. Abstracts were sent to DOE for review in an e-mail on February 11, 2016. Author notification is scheduled for June 1, 2016. The abstract titles are as follows:
  - 4-D Seismic Monitoring of Injected CO_2 Enhances Geological Interpretation, Reservoir Simulation, and Production Operations
  - Effects of Reservoir Temperature and Percent Levels of Methane and Ethane on CO_2/Oil MMP Values as Determined Using Vanishing Interfacial Tension/Capillary Rise
  - Engaging Teachers to Facilitate Learning – PCOR Partnership Outreach in Action
  - How Green Is My Oil? A Detailed Look at Carbon Accounting for CO_2 Enhanced Oil Recovery Sites (CO_2 EOR)
  - Impact of CO_2 Impurity on MMP and Oil Recovery Performance of Bell Creek Oil Field
  - Monitoring 2.5 Million Tonnes of CO_2 at the Bell Creek Oil Field
  - Numerical Modeling of the Aquistore CO_2 Storage Project
  - Regionwide and Project-Level Outreach – The PCOR Partnership Approach
  - Relative Permeability of Williston Basin CO_2 Storage Targets
- Continued revising the project management plan accordingly for the BP4 extension and BP5 continuation.
- Participated in a BPM Synergy WebEx led by DOE on February 26, 2016. The overall estimated time line for the completion of the BPMs was discussed.
- Participated in a DOE BPM Synergy conference call and WebEx on March 17, 2016. The status of all of the DOE BPMs and a schedule for completing the documents for NETL management review were discussed.
- Reviewed and commented on the DOE Simulation and Risk Assessment BPM. Submitted comments to the BPM lead on February 25, 2016.
- Upon request, updated the Bell Creek project PowerPoint slide for DOE's RCSP slides.
- Held a task leader meeting February 2, 2016. Topics discussed included the BP5 continuation application, abstracts for the upcoming CCUS (carbon capture, utilization, and storage) and GHGT-13 conferences, Bell Creek and Aquistore project updates, other upcoming conferences and meetings, and task leader updates.
- Held a task leader meeting March 1, 2016. Topics discussed included upcoming conferences, including CCUS and GHGT-13, for which abstracts were submitted; Bell Creek and Aquistore project updates; upcoming meetings; and task leader updates.

- Continued planning the 2016 PCOR Partnership Annual Membership Meeting. The workshop will be held September 13, 2016, and the annual meeting will be held September 14–15, 2016, in Grand Forks, North Dakota. Additional planning activities included the following:
  - Sent "Save the Date" postcards and an e-mail blast announcing the PCOR Partnership annual meeting and workshop.
  - Made room block arrangements.
  - Chose the evening event venue.
  - Discussed topics for the workshop.
- Continued planning for the spring 2016 TAB meeting to be held in New Orleans, Louisiana, on April 5–6. Contacted the TAB member from LEC regarding hotel arrangements. Contacted several TAB members regarding the meeting. Finalized the agenda, presentation, and meeting/hotel logistics.
- Met to discuss PCOR Partnership Web site and DSS server hardware needs.
- CMG software licenses were renewed. CMG software is being used to conduct the dynamic modeling activities for the PCOR Partnership.
- Deliverables and milestones completed in January:
  - December monthly update
  - Task 9: M54 – Initial Processing and Analysis of Historic InSAR Data Completed
  - Task 13: D58/D59 – Quarterly Progress Report/Milestone Quarterly Report
- Deliverables and milestones completed in February:
  - January monthly update
  - Task 1: D93 – Geologic Modeling and Simulation Report for the Aquistore Project
  - Task 2: D14 – General Phase III Fact Sheet (update)
- Deliverables and milestones completed in March:
  - February monthly update
  - Task 2: D11 – Outreach Action Plan (Update 2)
  - Task 6: D45 – Bell Creek Test Site – Infrastructure Development Report
  - Task 9: M56 – Life Cycle Analysis for Primary and Secondary Recovery Oil Completed
  - Task 9: M58 – Bell Creek Test Site – Completion of 2.75M Metric Tons of CO_2 Stored
  - Task 13: M36 – Technical Advisory Board Meeting Scheduled

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

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 14 – RCSP WWG Coordination

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

- With regard to the Special Issue of the *International Journal of Greenhouse Gas Control* (IJGGC) on the "Nexus of Water and Carbon Capture and Storage":

  - The IJGGC special issue articles are under review or have been reviewed. These will be returned to their authors soon.
  - Contacted reviewers of IJGGC Special Issue papers.
  - Contacted IJGGC representative to discuss schedule.
  - An update of the IJGGC special issue was provided to the managers of the journal.
  - Completed author review of submissions.
  - Initiated editorial review to combine reviewer comments.
  - Readjusted editorial assignments.
  - Returned two articles to the authors for minor revisions.
  - Discussed progress of the IJGGC Special Issue, the path forward, and the status of remaining papers with PCOR Partnership management and a consultant from CETER.
  - A review team is being assigned to the remaining papers.
- With regard to conference calls (M23):
  - Held the January WWG monthly conference call on January 27, 2016, to discuss progress of the IJGGC Special Issue and the DOE BPM sidebars, as well as the frequency of future conference calls and potential topics.
  - Formally waived the February and March conference calls based on limited work required by the WWG at this time.
- Distributed notes from the January conference call.
- Provided a review of the WWG portion of the Task 2 PCOR Partnership Phase III fact sheet (D14).
- With regard to WWG topics for DOE BPMs:
  - Comments relevant to WWG work were provided to the BPM author teams.

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

- Future WWG conference calls are likely to be less frequent, not on a monthly basis. Quarterly conference calls were proposed in the BP5 continuation application.
- The publication schedule for the IJGGC Special Issue has been revised because of delays with submissions and completing reviews. Elsevier has suggested that existing submissions be processed for regular publication and then be included with other prior submissions to create a "virtual jounal" focused on water issues. A few submitted articles will be rejected as part of this process for either poor quality or poor fit. Three papers still require a decision to proceed. We began reviewing the papers in light of the alternate publication plan proposed by Elsevier and will make a decision in April.

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project

This task ended Quarter 2, BP4, Year 7 (February 2014).

Task 16 – Characterization of the Basal Cambrian System

This task ended Quarter 2, BP4, Year 7 (March 2014).

PHASE III COST STATUS

The approved BP4 (Modification No. 33) budget along with actual costs incurred and in-kind cost share reported is shown in Table 12. A spending plan for BP4 and actual incurred cost by quarter of cash funds for BP4 are provided in Figure 6 and Table 13.

Table 12. Phase III Budget – BP4

Organization	Approved Budget,* $	Actual Costs Incurred, $
DOE Share – Cash	65,123,437	60,477,018
Nonfederal Share – Cash	2,411,971	3,002,296
Nonfederal Share – In-Kind	35,766,276	36,100,731
Total	103,301,684	99,580,045

*As of Modification No. 33.

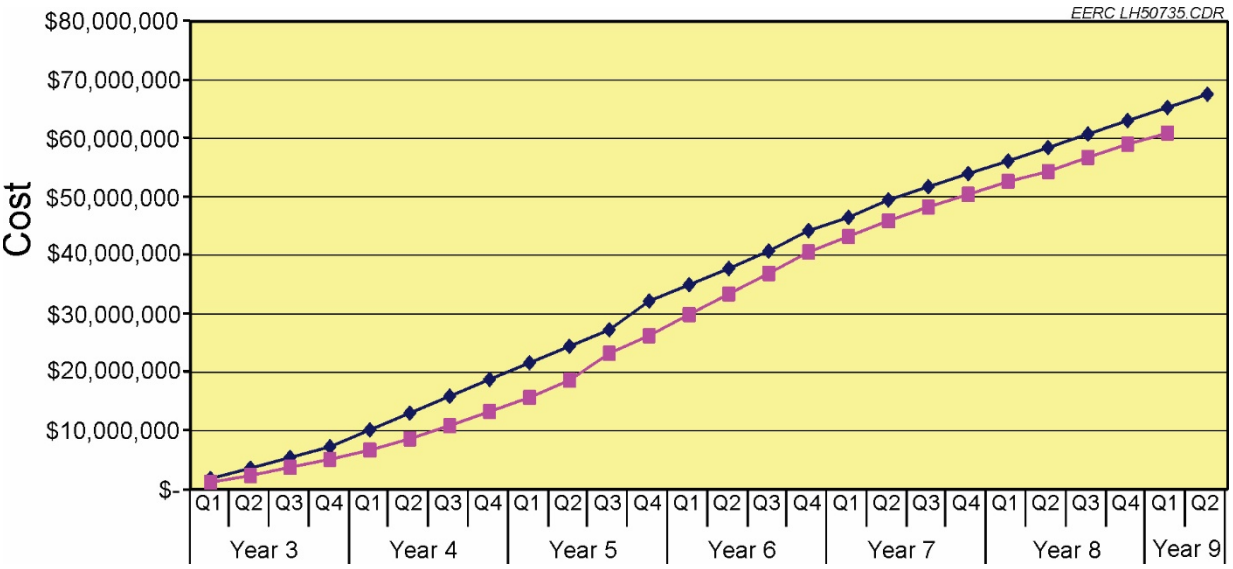


Figure 6. PCOR Partnership Phase III, BP4, Years 3–9 funding (cash only).

PHASE III SCHEDULE STATUS

Table 14 lists all deliverables and milestones by quarter, with completion dates, through the end of the reporting period (see Table 15 for the Gantt chart for BP4, Years 7–9).

Table 13. Phase III, BP4, Years 3–10 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	$1,692,969	$ 1,692,969	$ 1,692,969	$ 3,385,938	$ 1,692,969	$ 5,078,906	$1,692,969	$ 6,771,875	$2,707,624	$ 9,479,499	$ 2,707,624	$12,187,123	$2,707,624	$14,894,747	$2,707,624	$17,602,371
Nonfederal Share	$ 127,735	$ 127,735	$ 127,735	$ 255,470	$ 127,735	$ 383,204	$ 127,735	$ 510,939	$ 177,644	$ 688,583	$ 177,644	$ 866,227	$ 177,644	$ 1,043,871	$ 177,644	$ 1,221,515
Total Planned	$1,820,704	$ 1,820,704	$ 1,820,704	$ 3,641,407	$ 1,820,704	$ 5,462,111	$1,820,704	$ 7,282,814	$2,885,268	$10,168,082	$ 2,885,268	$13,053,350	$2,885,268	$15,938,618	$2,885,268	$18,823,886
Actual Incurred Cost																
Federal Share	$1,025,953	$ 1,025,953	$ 983,104	$ 2,009,057	$ 1,352,281	$ 3,361,338	$1,347,660	$ 4,708,998	$1,531,401	$ 6,240,399	$ 1,864,304	$ 8,104,703	$1,982,465	$10,087,168	$2,163,678	$12,250,846
Nonfederal Share	$ 171,873	$ 171,873	$ 164,935	$ 336,808	$ 74,929	$ 411,737	$ 4,563	$ 416,300	$ 80,246	$ 496,546	$ 56,614	$ 553,160	$ 257,142	$ 810,302	$ 251,531	$ 1,061,833
Total Incurred Cost	$1,197,826	$ 1,197,826	$ 1,148,039	$ 2,345,865	$ 1,427,210	$ 3,773,075	$1,352,223	$ 5,125,298	$1,611,647	$ 6,736,945	$ 1,920,918	$ 8,657,863	$2,239,607	$10,897,470	$2,415,209	$13,312,679
Variance																
Federal Share	$ 667,016	$ 667,016	$ 709,865	$ 1,376,881	$ 340,688	$ 1,717,568	$ 345,309	$ 2,062,877	$1,176,223	$ 3,239,100	$ 843,320	$ 4,082,420	$ 725,159	$ 4,807,579	$ 543,946	$ 5,351,525
Nonfederal Share	$ (44,138)	$ (44,138)	$ (37,200)	$ (81,339)	$ 52,806	$ (28,533)	$ 123,172	$ 94,639	$ 97,398	$ 192,037	$ 121,030	$ 313,067	$ (79,498)	$ 233,569	$ (73,887)	$ 159,682
Total Variance	$ 622,878	$ 622,878	$ 672,665	$ 1,295,542	$ 393,494	$ 1,689,036	$ 468,481	$ 2,157,516	$1,273,621	$ 3,431,137	$ 964,350	$ 4,395,487	$ 645,661	$ 5,041,148	$ 470,059	$ 5,511,207

Baseline Reporting Quarter	Year 5								Year 6							
	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	$2,671,493	$20,273,864	$ 2,671,493	$22,945,356	$ 2,671,493	$25,616,849	$4,771,676	$30,388,524	$2,612,701	$33,001,225	$ 2,612,701	$35,613,925	$2,862,592	$38,476,517	$3,362,375	$41,838,891
Nonfederal Share	$ 152,429	$ 1,373,944	$ 152,429	$ 1,526,373	$ 152,429	$ 1,678,802	$ 152,429	$ 1,831,231	$ 145,185	$ 1,976,416	$ 145,185	$ 2,121,601	$ 145,185	$ 2,266,786	$ 145,185	$ 2,411,971
Total Planned	$2,823,922	$21,647,808	$ 2,823,922	$24,471,729	$ 2,823,922	$27,295,651	$4,924,105	$32,219,755	$2,757,886	$34,977,641	$ 2,757,886	$37,735,526	$3,007,777	$40,743,303	$3,507,560	$44,250,862
Actual Incurred Cost																
Federal Share	$2,255,269	$14,506,115	$ 2,762,335	$17,268,450	$ 4,349,081	$21,617,531	$2,768,852	$24,386,383	$3,463,510	$27,849,893	$ 3,244,138	$31,094,031	$3,271,990	$34,366,021	$3,542,974	$37,908,995
Nonfederal Share	$ 160,751	$ 1,222,584	$ 134,138	$ 1,356,722	$ 264,409	$ 1,621,131	$ 296,942	$ 1,918,073	$ 156,655	$ 2,074,728	$ 244,345	$ 2,319,073	$ 209,528	$ 2,528,601	$ 156,775	$ 2,685,376
Total Incurred Cost	$2,416,020	$15,728,699	$ 2,896,473	$18,625,172	$ 4,613,490	$23,238,662	$3,065,794	$26,304,456	$3,620,165	$29,924,621	$ 3,488,483	$33,413,104	$3,481,518	$36,894,622	$3,699,749	$40,594,371
Variance																
Federal Share	$ 416,224	$ 5,767,749	$ (90,843)	$ 5,676,906	$(1,677,589)	$ 3,999,318	$2,002,824	$ 6,002,141	$ (850,810)	$ 5,151,332	$ (631,438)	$ 4,519,894	$ (409,399)	$ 4,110,496	$ (180,600)	$ 3,929,896
Nonfederal Share	$ (8,322)	$ 151,360	$ 18,291	$ 169,651	$ (111,980)	$ 57,671	$ (144,513)	$ (86,842)	$ (11,470)	$ (98,312)	$ (99,160)	$ (197,472)	$ (64,343)	$ (261,815)	$ (11,590)	$ (273,405)
Total Variance	$ 407,902	$ 5,919,109	$ (72,552)	$ 5,846,557	$(1,789,569)	$ 4,056,989	$1,858,311	$ 5,915,299	$ (862,280)	$ 5,053,020	$ (730,598)	$ 4,322,422	$ (473,742)	$ 3,848,681	$ (192,190)	$ 3,656,491

Baseline Reporting Quarter	Year 7								Year 8							
	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	$2,253,496	$44,092,387	$ 2,977,355	$47,069,742	$ 2,253,496	$49,323,237	$2,253,496	$51,576,733	$2,136,847	$53,713,580	$ 2,303,285	$56,016,865	$2,303,286	$58,320,151	$2,303,286	$60,623,437
Nonfederal Share	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971
Total Planned	$2,253,496	$46,504,358	$ 2,977,355	$49,481,713	$ 2,253,496	$51,735,208	$2,253,496	$53,988,704	$2,136,847	$56,125,551	$ 2,303,285	$58,428,836	$2,303,286	$60,732,122	$2,303,286	$63,035,408
Actual Incurred Cost																
Federal Share	$2,579,307	$40,488,302	$ 2,644,052	$43,132,354	$ 2,349,302	$45,481,656	$2,087,549	$47,569,205	$2,171,628	$49,740,833	$ 1,707,622	$51,448,455	$2,350,008	$53,798,463	$2,206,301	$56,004,764
Nonfederal Share	$ 62,881	$ 2,748,257	$ 14,980	$ 2,763,237	$ 15,096	$ 2,778,333	$ 90,494	$ 2,868,827	$ 2,587	$ 2,871,414	$ 44,275	$ 2,915,689	$ 16,621	$ 2,932,310	$ 63,441	$ 2,995,751
Total Incurred Cost	$2,642,188	$43,236,559	$ 2,659,032	$45,895,591	$ 2,364,398	$48,259,989	$2,178,043	$50,438,032	$2,174,215	$52,612,247	$ 1,751,897	$54,364,144	$2,366,629	$56,730,773	$2,269,742	$59,000,515
Variance																
Federal Share	$ (325,811)	$ 3,604,085	$ 333,303	$ 3,937,388	$ (95,806)	$ 3,841,581	$ 165,947	$ 4,007,528	$ (34,781)	$ 3,972,747	$ 595,663	$ 4,568,410	$ (46,722)	$ 4,521,688	$ 96,985	$ 4,618,673
Nonfederal Share	$ (62,881)	$ (336,286)	$ (14,980)	$ (351,266)	$ (15,096)	$ (366,362)	$ (90,494)	$ (456,856)	$ (2,587)	$ (459,443)	$ (44,275)	$ (503,718)	$ (16,621)	$ (520,339)	$ (63,441)	$ (583,780)
Total Variance	$ (388,692)	$ 3,267,799	$ 318,323	$ 3,586,122	$ (110,902)	$ 3,475,219	$ 75,453	$ 3,550,672	$ (37,368)	$ 3,513,304	$ 551,388	$ 4,064,692	$ (63,343)	$ 4,001,349	$ 33,544	$ 4,034,893

Continued . . .

Table 13. Phase III, BP4, Years 3–10 Spending Plan (continued)

Baseline Reporting Quarter	Year 9								Year 10							
	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	$2,250,000	$62,873,437	$ 2,250,000	$65,123,437	$ 1,611,384	$66,734,821	$1,611,384	$68,346,205	$1,611,384	$69,957,589	$ 1,611,385	$71,568,974	$1,611,385	$73,180,359	$1,611,385	$74,791,744
Nonfederal Share	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971	$ -	$ 2,411,971
Total Planned	$2,250,000	$65,285,408	$ 2,250,000	$67,535,408	$ 1,611,384	$69,146,792	$1,611,384	$70,758,176	$1,611,384	$72,369,560	$ 1,611,385	$73,980,945	$1,611,385	$75,592,330	$1,611,385	$77,203,715
Actual Incurred Cost																
Federal Share	$1,909,898	$57,914,662	$ 2,562,356	$60,477,018												
Nonfederal Share	$ (4,110)	$ 2,991,641	$ 10,655	$ 3,002,296												
Total Incurred Cost	$1,905,788	$60,906,303	$ 2,573,011	$63,479,314												
Variance																
Federal Share	$ 340,102	$ 4,958,775	$ (312,356)	$ 4,646,419												
Nonfederal Share	$ 4,110	$ (579,670)	$ (10,655)	$ (590,325)												
Total Variance	$ 344,212	$ 4,379,105	$ (323,011)	$ 4,056,094												

Table 14. Phase III Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2007)		
D37: Task 4 – Fort Nelson Test Site – Geological Characterization Experimental Design Package	12/31/07	12/28/07
D63: Task 13 – Project Management Plan	12/31/07	12/28/07
M17: Task 4 – Fort Nelson Test Site Selected	12/31/07	12/28/07
Year 1 – Quarter 2 (January–March 2008)		
D38: Task 4 – Fort Nelson Test Site – Geomechanical Experimental Design Package	1/31/08	1/31/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/08	1/31/08
D11: Task 2 – Outreach Plan	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/02/08
D30: Task 4 – Williston Basin Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
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
Year 1 – Quarter 3 (April–June 2008)		
D14: Task 2 – General Phase III Fact Sheet	4/30/08	4/30/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	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 Williston Basin Test Site	6/30/08	6/27/08
M6: Task 4 – Williston Basin Test Site Geochemical Work Initiated	6/30/08	6/30/08
M7: Task 4 – Williston Basin Test Site Geological Characterization Data Collection Initiated	6/30/08	6/30/08
Year 1 – Quarter 4 (July–September 2008)		
D12: Task 2 – Demonstration Web Pages on the Public Site	7/31/08	7/31/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/08	7/31/08
D1: Task 1 – Review of Source Attributes	9/30/08	9/26/08
M2: Task 1 – Demonstration Project Reporting System (DPRS) Prototype Completed	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 14. Phase III 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 CCS and Water, Part Subtask 14.2 – White Paper on Nexus of CCS and Water	2/28/09	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	4/15/09
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
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	5/29/09
M24: Task 14 – WWG Annual Meeting Held	5/31/09	5/07/09
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	Not applicable	Not required
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	7/31/09
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	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 (DOE) 8/21/09 (WWG)
M23: Task 14 – Monthly WWG Conference Call Held	8/31/09	8/25/09
D1: Task 1 – Review of Source Attributes	9/30/09	9/25/09
D3: Task 3 – 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 – 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
M4: Task 4 – Bell Creek Test Site Selected	9/30/09	9/30/09
M5: Task 4 – Bell Creek Test Site – Data Collection Initiated	9/30/09	9/30/09
M23: Task 14 – Monthly WWG Conference Call Held	9/30/09	9/22/09

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 1 (October–December 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/30/09	11/02/09
D78: Task 14 – Final White Paper on the Nexus of CCS and Water	10/30/09	10/28/09
M23: Task 14 – Monthly WWG Conference Call Held	10/31/09	10/26/09
M23: Task 14 – Monthly WWG Conference Call Held	11/30/09	11/16/09
D57: Task 12 – Project Assessment Annual Report	12/31/09	12/31/09
M23: Task 14 – Monthly WWG Conference Call Held	12/31/09	Waived by DOE
Year 3 – Quarter 2 (January–March 2010)		
D13: Task 2 – Public Site Updates	1/15/10	1/15/10
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	1/29/10
M23: Task 14 – Monthly WWG Conference Call Held	1/31/10	1/6/10
D79: Task 14 – Water Resource Estimation Methodology Document	2/28/10	Waived by DOE
M23: Task 14 – Monthly WWG Conference Call Held	2/28/10	2/25/10
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)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	4/30/10
M23: Task 14 – Monthly WWG Conference Call Held	4/30/10	4/28/10
M23: Task 14 – Monthly WWG Conference Call Held	5/31/10	5/13/10
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	6/30/10	6/30/10
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (update)	6/30/10	6/29/10
M23: Task 14 – Monthly WWG Conference Call Held	6/30/10	6/23/10
M24: Task 14 – WWG Annual Meeting Held	6/30/10	5/13/10
Year 3 – Quarter 4 (July–September 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	7/29/10
M23: Task 14 – Monthly WWG Conference Call Held	7/31/10	7/28/10
M23: Task 14 – Monthly WWG Conference Call Held	8/31/10	8/31/10
D1: Task 1 – Review of Source Attributes	9/30/10	9/20/10
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	9/30/10
M9: Task 4 – Bell Creek Test Site Geological Model Development Initiated	9/30/10	9/30/10
M23: Task 14 – Monthly WWG Conference Call Held	9/30/10	Waived by DOE

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 1 (October–December 2010)		
D87: Task 4 – Bell Creek Test Site – Geomechanical Experimental Design Package	10/30/10	10/29/10
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/10	10/29/10
M23: Task 14 – Monthly WWG Conference Call Held	10/31/10	10/26/10
M23: Task 14 – Monthly WWG Conference Call Held	11/30/10	Waived by DOE
D57: Task 12 – Project Assessment Annual Report	12/31/10	12/23/10
M23: Task 14 – Monthly WWG Conference Call Held	12/31/10	12/13/10
Year 4 – Quarter 2 (January–March 2011)		
M8: Task 4 – Bell Creek Test Site Wellbore Leakage Data Collection Initiated	1/15/11	1/14/11
D31: Task 4 – Bell Creek Test Site – Geological Characterization Experimental Design Package	1/31/11	1/27/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/11	1/31/11
M23: Task 14 – Monthly WWG Conference Call Held	1/31/11	1/19/11
M28: Task 4 – Bell Creek Geological Experimental Design Package Completed	1/31/11	1/27/11
D15: Task 2 – Bell Creek Test Site Fact Sheet	2/28/11	2/28/11
M23: Task 14 – Monthly WWG Conference Call Held	2/28/11	Waived by DOE
D10: Task 1 – Demonstration Project Reporting System Update	3/31/11	3/25/11
D18: Task 2 – Bell Creek Test Site PowerPoint Presentation (update)	3/31/11	3/31/11
D26: Task 2 – Fort Nelson Test Site Poster	3/31/11	3/31/11
D28: Task 3 – Environmental Questionnaire – Bell Creek Test Site	3/31/11	3/30/11
D85: Task 6 – Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCS Activities	3/31/11	3/31/11
M23: Task 14 – Monthly WWG Conference Call Held	3/31/11	3/22/11
Year 4 – Quarter 3 (April–June 2011)		
M30: Task 5 – Bell Creek Test Site Baseline MVA Initiated	4/01/11	3/24/11
M23: Task 14 – Monthly WWG Conference Call Held	4/30/11	4/21/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/11	4/29/11
D88: Task 13 – Programmatic Risk Management Plan	4/30/11	4/29/11
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/11	5/31/11
D34: Task 4 – Bell Creek Test Site – Baseline Hydrogeological Final Report	5/31/11	5/31/11

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 3 (April–June 2011) (continued)		
M23: Task 14 – Monthly WWG Conference Call Held	5/31/11	5/5/11
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (update)	6/30/11	6/30/11
M23: Task 14 – Monthly WWG Conference Call Held	6/30/11	6/23/11
M24: Task 14 – WWG Annual Meeting Held	6/30/11	5/5/11
Year 4 – Quarter 4 (July–September 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/11	7/28/11
M23: Task 14 – Monthly WWG Conference Call Held	7/31/11	7/26/11
D29: Task 3 – Permitting Action Plan	8/31/11	8/31/11
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/11	8/31/11
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/11	8/31/11
M23: Task 14 – Monthly WWG Conference Call Held	8/31/11	8/24/11
D1: Task 1 – Review of Source Attributes	9/30/11	9/21/11
D4: Task 1 – Permitting Review – Basic EPA Requirements[+]	9/30/11	9/30/11
D9: Task 1 – Updated DSS	9/30/11	9/23/11
D25: Task 2 – Bell Creek Test Site Poster	9/30/11	9/30/11
D50: Task 9 – Bell Creek Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/11	9/30/11
M23: Task 14 – Monthly WWG Conference Call Held	9/30/11	Waived by DOE
M31: Task 9 – Bell Creek Test Site – Site Characterization, Modeling, and Monitoring Plan Completed	9/30/11	9/30/11
M33: Task 16 – Basal Cambrian Baseline Geological Characterization Completed	9/30/11	9/29/11
Year 5 – Quarter 1 (October–December 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/11	10/31/11
M23: Task 14 – Monthly WWG Conference Call Held	10/31/11	10/26/11
M23: Task 14 – Monthly WWG Conference Call Held	11/30/11	11/30/11
D57: Task 12 – Project Assessment Annual Report	12/31/11	12/30/11
M23: Task 14 – Monthly WWG Conference Call Held	12/31/11	Waived by DOE
M34: Task 16 – Basal Cambrian Static Geological Model Completed	12/31/11	12/21/11

[+] Name change requested September 28, 2011, and approved October 3, 2011.

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 5 – Quarter 2 (January–March 2012)		
M16: Task 4 – Bell Creek Test Site – Initiation of Production and Injection Simulation	1/13/12	12/29/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/12	1/31/12
D65: Task 4 – Fort Nelson Test Site – Site Characterization Report	1/31/12	1/31/12
D81: Task 1 – Regional Carbon Sequestration Atlas (update)	1/31/12	1/31/12
M23: Task 14 – Monthly WWG Conference Call Held	1/31/12	1/19/12
M29: Task 4 – Fort Nelson Site Characterization Report Completed	1/31/12	1/31/12
D91: Task 16 – Report – Geological Characterization of the Basal Cambrian System in the Williston Basin	2/29/12	2/29/12
M23: Task 14 – Monthly WWG Conference Call Held	2/29/12	2/28/12
D5: Task 1 – Second Target Area Completed	3/31/12	3/30/12
D18: Task 2 – Bell Creek Test Site PowerPoint Presentation (update)	3/31/12	3/30/12
M10: Task 4 – Bell Creek Test Site Wellbore Leakage Data Collection Completed	3/31/12	3/12/12
M36: Task 13 – Annual Advisory Board Scheduled	3/31/12	3/28/12
M23: Task 14 – Monthly WWG Conference Call Held	3/31/12	3/27/12
Year 5 – Quarter 3 (April–June 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/12	4/30/12
M23: Task 14 – Monthly WWG Conference Call Held	4/30/12	Waived by DOE
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/12	5/31/12
M23: Task 14 – Monthly WWG Conference Call Held	5/31/12	5/31/12
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (update)	6/30/12	6/29/12
D41: Task 4 – Fort Nelson Test Site – Geochemical Report	6/30/12	6/29/12
D84: Task 6 – Report – A Phased Approach to Building Pipeline Network for CO_2 Transportation During CCS	6/30/12	6/29/12
M23: Task 14 – Monthly WWG Conference Call Held	6/30/12	6/28/12
M24: Task 14 – WWG Annual Meeting Held	6/30/12	5/3/12
M32: Task 4 – Fort Nelson Geochemical Report Completed	6/30/12	6/29/12

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 5 – Quarter 4 (July–September 2012)		
D13: Task 2 – Public Site Updates	7/31/12	7/31/12
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/12	7/31/12
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/12	7/31/12
M23: Task 14 – Monthly WWG Conference Call Held	7/31/12	7/24/12
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/12	8/31/12
M23: Task 14 – Monthly WWG Conference Call Held	8/31/12	8/30/12
D1: Task 1 – Review of Source Attributes	9/30/12	9/28/12
D10: Task 1 – DPRS Update	9/30/12	9/28/12
M23: Task 14 – Monthly WWG Conference Call Held	9/30/12	9/27/12
Year 6 – Quarter 1 (October–December 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/12	10/31/12
M23: Task 14 – Monthly WWG Conference Call Held	10/31/12	10/25/12
M23: Task 14 – Monthly WWG Conference Call Held	11/30/12	11/28/12
D57: Task 12 – Project Assessment Annual Report	12/31/12	12/28/12
M23: Task 14 – Monthly WWG Conference Call Held	12/31/12	Waived by DOE
Year 6 – Quarter 2 (January–March 2013)		
D32: Task 4 – Bell Creek Test Site – Geomechanical Final Report	1/31/13	1/31/13
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/13	1/31/13
M23: Task 14 – Monthly WWG Conference Call Held	1/31/13	1/16/13
D14: Task 2 – General Phase III Fact Sheet (update)	2/28/13	2/28/13
M23: Task 14 – Monthly WWG Conference Call Held	2/28/13	2/28/13
D85: Task 6 – Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCS Activities	3/31/13	Waived by DOE (journal article)
D89: Task 16 – Report – Geochemical Evaluation of the Basal Cambrian System	3/31/13	3/28/13
D99: Task 14 – Water/CCS Nexus-Related Fact Sheet	3/31/13	3/22/13
M23: Task 14 – Monthly WWG Conference Call Held	3/31/13	3/28/13
M36: Task 13 – Annual Advisory Board Meeting Scheduled	3/31/13	3/27/13

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 3 (April–June 2013)		
D15: Task 2 – Bell Creek Test Site Fact Sheet (update)	4/15/13	3/25/13
D16: Task 2 – Fort Nelson Test Site Fact Sheet (update)	4/30/13	Waived by DOE
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/13	4/30/13
M14: Task 4 – Bell Creek Test Site Geological Characterization Data Collection Completed	4/30/13	4/30/13
M23: Task 14 – Monthly WWG Conference Call Held	4/30/13	4/25/13
M35: Task 16 – Basal Cambrian Dynamic Capacity Estimation Completed	4/30/13	4/30/13
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/13	5/31/13
D43: Task 5 – Bell Creek Test Site – Monitoring Experimental Design Package	5/31/13	5/31/13
M23: Task 14 – Monthly WWG Conference Call Held	5/31/13	5/30/13
M27: Task 5 – Bell Creek Test Site – MVA Equipment Installation and Baseline MVA Activities Completed	5/31/13	5/31/13
M23: Task 14 – Monthly WWG Conference Call Held	6/30/13	6/27/13
M26: Task 9 – Bell Creek Test Site – CO_2 Injection Initiated	6/30/13	May 2013 – sent 6/25/13
M37: Task 3 – IOGCC Task Force Subgroup Meeting 2 Held	5/9/13	5/29/13
M42: Task 3 – Findings and Recommendations of the Operational and Postoperational Subgroups Presented to the Carbon Geologic Storage (CGS) Task Force	6/30/13	6/20/13 – sent 6/28/13
Year 6 – Quarter 4 (July–September 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/13	7/31/13
D33: Task 4 – Bell Creek Test Site – Geochemical Final Report	7/31/13	7/31/13
M12: Task 4 – Bell Creek Test Site Geochemical Work Completed	7/31/13	7/31/13
M23: Task 14 – Monthly WWG Conference Call Held	7/31/13	7/25/13
D64: Task 4 – Bell Creek Test Site – Site Characterization Report	8/31/13	8/29/13
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/13	8/30/13
D81: Task 1 – Regional Carbon Sequestration Atlas (update)	8/31/13	5/1/13
M23: Task 14 – Monthly WWG Conference Call Held	8/31/13	Waived by DOE

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 4 (July–September 2013) (continued)		
D1: Task 1 – Review of Source Attributes	9/30/13	9/5/13
D6: Task 3 – Permitting Review – Update 1	9/30/13	9/24/13
D48: Task 7 – Bell Creek Test Site – Procurement Plan and Agreement Report	9/30/13	9/24/13
D90: Task 16 – Report – Wellbore Evaluation of the Basal Cambrian System	9/30/13	9/5/13
D94:Task 2 – Aquistore Project Fact Sheet	9/30/13	9/30/13
D95: Task 2 – Aquistore Project Poster	9/30/13	9/30/13
D98: Task 3 – Report – Findings, Recommendations, and Guidance of CGS Task Force	9/30/13	8/30/13
M23: Task 14 – Monthly WWG Conference Call Held	9/30/13	9/30/13
M38: Task 3 – IOGCC Task Force Wrap-Up Meeting Held	9/30/13	8/16/13 – sent 9/5/13
M39: Task 3 – IOGCC Task Force Editing Subgroup Meeting Held	9/30/13	6/3/13 – sent 9/5/13
M40: Task 15 – Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project Completed	9/30/13	9/24/13
Year 7 – Quarter 1 (October–December 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/13	10/31/13
D42: Task 5 – Bell Creek Test Site – Injection Experimental Design Package	10/31/13	10/30/13
D99: Task 14 – Water–CCS Nexus-Related Fact Sheet	10/31/13	10/31/13
M23: Task 14 – Monthly WWG Conference Call Held	10/31/13	10/31/13
M23: Task 14 – Monthly WWG Conference Call Held	11/30/13	11/21/13
M23: Task 14 – Monthly WWG Conference Call Held	12/31/13	Waived by DOE
M24: Task 14 – WWG Annual Meeting Held	12/31/13	8/19/13
M43: Task 9 – Bell Creek Test Site – First Full-Repeat Sampling of the Groundwater-Soil Gas-Monitoring Program Completed	12/31/13	11/15/13 – sent 12/13/13
Year 7 – Quarter 2 (January–March 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/14	1/31/14
D57: Task 12 – Project Assessment Annual Report	1/31/14	1/31/14
M23: Task 14 – Monthly WWG Conference Call Held	1/31/14	1/28/14
M41: Task 6 – Decision to Incorporate Ramgen Compression Technology into Bell Creek Project	1/31/14	1/29/14

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 7 – Quarter 2 (January–March 2014) (continued)		
D86: Task 15 – Updated Regional Implementation Plan for Zama	2/28/14	2/28/14
M23: Task 14 – Monthly WWG Conference Call Held	2/28/14	2/27/14
D24: Task 2 – PCOR Partnership Region Sequestration General Poster (update)	3/31/14	3/27/14
D36: Task 4 – Bell Creek Test Site – Wellbore Leakage Final Report	3/31/14	3/19/14
D92: Task 16 – Report – Storage Capacity and Regional Implications for Large-Scale Storage in the Basal Cambrian System	3/31/14	3/27/14
D93: Task 1 – Geological Modeling and Simulation Report for the Aquistore Project	3/31/14	3/25/14
D96: Task 4 – Bell Creek Test Site – 3-D Seismic and Characterization Report	3/31/14	3/27/14
M23: Task 14 – Monthly WWG Conference Call Held	3/31/14	3/25/14
M36: Task 13 – Annual Advisory Board Meeting Scheduled	3/31/14	3/4/14 – sent 3/25/14
M44: Task 9 – Bell Creek Test Site – First 3-D VSP Repeat Surveys Completed	3/31/14	3/1/14 – sent 3/25/14
Year 7 – Quarter 3 (April–June 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/14	4/30/14
M23: Task 14 – Monthly WWG Conference Call Held	4/30/14	4/24/14
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/14	5/30/14
D101: Task14 – WWG Web Site Content Update	5/31/14	5/30/14
M23: Task 14 – Monthly WWG Conference Call Held	5/31/14	5/21/14
D44: Task 5 – Bell Creek Test Site – Drilling and Completion Activities Report	6/30/14	5/30/14
M23: Task 14 – Monthly WWG Conference Call Held	6/30/14	6/26/14
M45: Task 9 – Bell Creek Test Site – First Full-Repeat of Pulsed Neutron Logging Campaign Completed	6/30/14	6/9/14
M46: Task 9 – Bell Creek Test Site – 1 Year of Injection Completed	6/30/14	6/26/14

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Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 7 – Quarter 4 (July–September 2014)		
D13: Task 2 – Public Site Updates	7/31/14	7/29/14
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/14	7/31/14
M23: Task 14 – Monthly WWG Conference Call Held	7/31/14	7/17/14 WebEx
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/14	8/27/14 Exec. Sum.
M23: Task 14 – Monthly WWG Conference Call Held	8/31/14	Waived by DOE
D1: Task 1 – Review of Source Attributes	9/30/14	9/24/14
D7: Task 1 – Third Target Area Completed	9/30/14	9/26/14
D93: Task 1 – Geological Modeling and Simulation Report for the Aquistore Project	9/30/14	9/30/14
D100: Task 9 – Fort Nelson Test Site – Best Practices Manual – Feasibility Study	9/30/14	9/30/14
M23: Task 14 – Monthly WWG Conference Call Held	9/30/14	9/30/14
Year 8 – Quarter 1 (October–December 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/14	10/31/14
D99: Task 14 – Water/CCS Nexus-Related Fact Sheet	10/31/14	10/31/14
M23: Task 14 – Monthly WWG Conference Call Held	10/31/14	10/28/14
M48: Task 9 – Bell Creek Test Site – 1 Million Metric Tons of CO_2 Injected	10/31/14	10/29/14
M23: Task 14 – Monthly WWG Conference Call Held	11/30/14	11/25/14
D57: Task 12 – Project Assessment Annual Report	12/31/14	12/30/14
M24: Task 14 – WWG Annual Meeting Held	12/31/14	8/11/14
Year 8 – Quarter 2 (January–March 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/15	1/30/15
D32: Task 4 – Bell Creek Test Site – Geomechanical Report (Update 1)	1/31/15	1/28/15
M23: Task 14 – Monthly WWG Conference Call Held	1/31/15	1/27/15
M23: Task 14 – Monthly WWG Conference Call Held	2/28/15	2/26/15
D25: Task 2 – Bell Creek Test Site Poster (update)	3/31/15	2/5/15
M23: Task 14 – Monthly WWG Conference Call Held	3/31/15	3/25/15
M36: Task 13 – Annual Advisory Board Meeting Scheduled	3/31/15	3/31/15

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 8 – Quarter 3 (April–June 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/15	4/29/15
M23: Task 14 – Monthly WWG Conference Call Held	4/30/15	4/28/15
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/15	6/1/15
M23: Task 14 – Monthly WWG Conference Call Held	5/30/15	5/28/15
D85: Task 6 – Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCUS (carbon capture, utilization, and storage) Activities (update)	5/31/15	5/29/15
M23: Task 14 – Monthly WWG Conference Call Held	6/30/15	6/23/15
M49: Task 9 – Bell Creek Test Site – 1.5 Million Metric Tons of CO_2 Injected	6/30/15	6/30/15
Year 8 – Quarter 4 (July–September 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/15	7/31/15
M23: Task 14 – Monthly WWG Conference Call Held	7/31/15	Waived by DOE
M50: Task 9 – Bell Creek Test Site – 2 Years of Near-Surface Assurance Monitoring Completed	7/31/15	7/21/15
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/15	8/27/15 Exec. Sum.
M23: Task 14 – Monthly WWG Conference Call Held	8/31/15	Waived by DOE
M51: Task 9 – Bell Creek Test Site – Initial Analysis for First Large-Scale Repeat Pulsed-Neutron Logging Campaign Post-Significant CO_2 Injection Completed	8/31/15	8/31/15
D1: Task 1 – Review of Source Attributes (update)	9/30/15	9/23/15
D8: Task 3 – Permitting Review – Update 2	9/30/15	9/30/15
D49: Task 8 – Bell Creek Test Site – Transportation and Injection Operations Report	7/31/15	9/29/15
M23: Task 14 – Monthly WWG Conference Call Held	9/30/15	9/30/15
Year 9 – Quarter 1 (October–December 2015)		
D59/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/15	10/31/15
M23: Task 14 – Monthly WWG Conference Call Held	10/31/15	10/29/15
M23: Task 14 – Monthly WWG Conference Call Held	11/30/15	Waived by DOE
D57: Task 12 – Project Annual Assessment Report	12/31/15	12/31/15
M24: Task 14 – WWG Annual Meeting Held	12/31/15	8/20/15
M53: Task 9 – Expanded Baseline and Time-Lapse 3-D Surface Seismic Survey Completed	12/31/15	12/17/15

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 9 – Quarter 2 (January–March 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/16	1/31/16
M23: Task 14 – Monthly WWG Conference Call Held	1/31/16	1/27/16
M54: Task 9 – Initial Processing and Analysis of Historic InSAR Data Completed	1/31/16	1/26/16
D14: Task 2 – General Phase III Fact Sheet (update)	2/29/16	2/26/16
D93: Task 1 – Geological Modeling and Simulation Report for the Aquistore Project (Update 2)	2/29/16	2/29/16
M23: Task 14 – Monthly WWG Conference Call Held	2/29/16	Waived by DOE
D11: Task 2 – Outreach Plan (update)	3/31/16	3/28/16
D45: Task 6 – Bell Creek Test Site – Infrastructure Development Report	3/31/16	3/31/16
M23: Task 14 – Monthly WWG Conference Call Held	3/31/16	Waived by DOE
M36: Task 13 – Annual Advisory Board Meeting Scheduled	3/31/16	3/31/16
M56: Task 9 – Life Cycle Analysis for Primary and Secondary Recovery Oil Completed	3/31/16	3/31/16
M58: Task 9 – Bell Creek Test Site – Completion of 2.75 Million Metric Tons of CO_2 Stored	3/31/16	3/22/16
Year 9 – Quarter 3 (April–June 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/16	
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/16	
D101: Task 14 – WWG Web Site Content Update 1	5/31/16	
M57: Task 9 – Life Cycle Analysis for EOR (enhanced oil recovery) at the Bell Creek Field Completed	5/31/16	
D105: Task 9 – Comparison of Non-EOR and EOR Life Cycle Assessments	6/30/16	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/16	
Year 9 – Quarter 4 (July–September 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/16	
D13: Task 2 – Public Site Updates	7/31/16	
D22: Task 2 – Energy from Coal 60-minute Documentary	7/31/16	
D16: Task 2 – Fort Nelson Test Site Fact Sheet (Update)	8/31/16	
D66: Task 9 – Bell Creek Test Site – Simulation Report (update)	8/31/16	
D81: Task 1 – Regional Carbon Sequestration Atlas (update)	8/31/16	
D102: Task 13 – Best Practices Manual – Adaptive Management Approach	8/31/16	
M59: Task 9 – Completed the PCOR Partnership Adaptive Management Approach Best Practices Manual	8/31/16	

Continued . . .

Table 14. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 9 – Quarter 4 (July–September 2016) (Continued)		
D1: Task 1 – Review of Source Attributes (update)	9/30/16	
D8: Task 3 – Permitting Review – Update 3	9/30/16	
D55: Task 11 – Bell Creek Test Site – Cost-Effective Long-Term Monitoring Strategies Report	9/30/16	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/16	
Year 10 – Quarter 1 (October–December 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/16	
D21: Task 2 – Bell Creek Test Site 30-minute Documentary	10/31/16	
D76: Task 3 – Regional Regulatory Perspective	10/31/16	
D15: Task 2 – Bell Creek Test Site Fact Sheet (Update)	11/30/16	
M52: Task 9 – Initial Analysis of Extended Pulsed-Neutron Logging Campaign Data Completed	11/30/16	
D57: Task 12 – Project Assessment Annual Report	12/31/16	
D106: Task 14 – Special Issue of IJGGC – Nexus of Water and Carbon Capture and Storage	12/31/16	
M23: Task 14 – Monthly WWG Conference Call Held	12/30/16	
M24: Task 14 – WWG Annual Meeting Held	12/31/16	
M36: Task 13 – Annual Advisory Board Meeting Scheduled	12/31/16	
M55: Task 9 – Initial Tracer Analysis Completed	12/31/16	

Table 15. Phase III, BP4, Years 7–9 Gantt Chart

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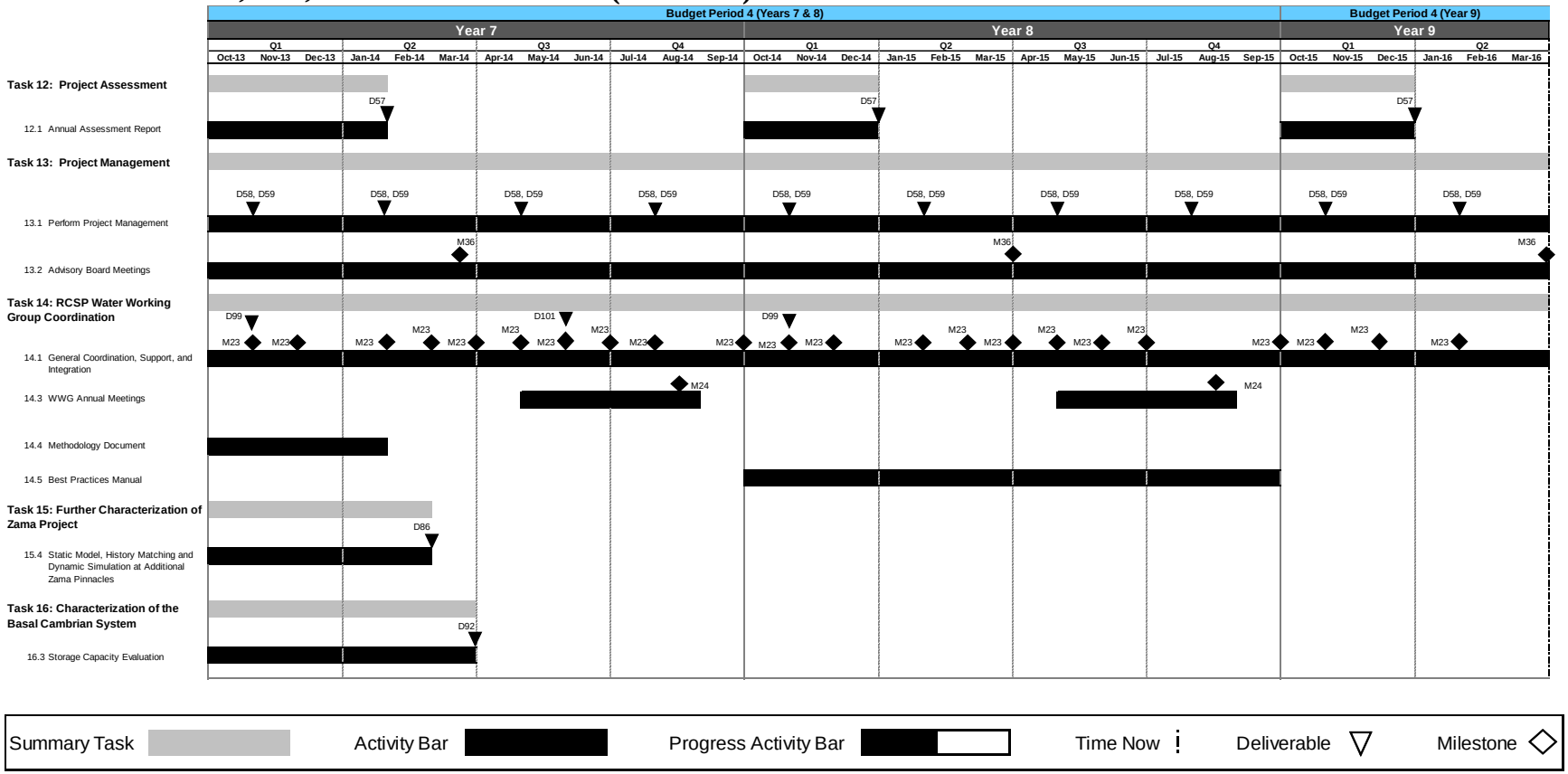
Table 15. Phase III, BP4, Years 7–9 Gantt Chart (continued)

Continued . . .

Table 15. Phase III, BP4, Years 7–9 Gantt Chart (continued)



Continued . . .

Table 15. Phase III BP4, Years 7–9 Gantt Chart (continued)

Key for Deliverables ▼				Key for Milestones ◆	
D1	Review of Source Attributes	D57	Project Assessment Annual Report	M23	Monthly WWG Conference Call Held
D7	Third Target Area Completed	D58	Quarterly Progress Report	M24	WWG Annual Meeting Held
D8	Permitting Review – Update 2	D59	Milestone Quarterly Report	M36	Annual Advisory Board Meeting Scheduled
D11	Outreach Plan	D66	BC Test Site – Simulation Report	M41	Decision to Incorporate Ramgen Compression Technology into BC Project
D13	Public Site Updates	D85	Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCUS Activities	M43	BC Test Site – First Full-Repeat Sampling of the Groundwater- and Soil Gas- Monitoring Program Completed
D14	General Phase III Fact Sheet			M44	BC Test Site – First 3-D VSP Repeat Surveys Completed
D17	General Phase III Information PowerPoint Presentation	D86	Updated Regional Technology Implementation Plan for Zama	M45	BC Test Site – First Full-Repeat of Pulsed-Neutron Logging Campaign Completed
D24	PCOR Partnership Region CO_2 Storage General Poster	D92	Report – Storage Capacity and Regional Implications for Large-Scale Storage in the Basal Cambrian System	M46	BC Test Site – 1 Year of Injection Completed
D25	BC Test Site Poster (Update)			M48	BC Test Site – 1 Million Metric Tons of CO_2 Injected
D32	BC Test Site – Geomechanical Report	D93	Report – Geological Modeling and Simulation for the Aquistore Project	M49	BC Test Site – 1.5 Million Metric Tons of CO_2 Injected
D36	BC Test Site – Wellbore Leakage Final Report	D96	BC Test Site – 3-D Seismic Acquisition and Characterization Report	M50	BC Test Site – 2 Years of Near-Surface Assurance Monitoring Completed
D42	BC Test Site – Injection Experimental Design Package	D99	Nexus of Water and CCS Fact Sheet	M51	BC Test Site – Initial Analysis for First Large-Scale Repeat Pulsed-Neutron Logging Campaign Post-Significant CO_2 Injection
D44	BC Test Site – Drilling and Completion Activities Report	D100	FN Test Site – Best Practices Manual– Feasibility Study	M53	BC Test Site – Expanded Baseline and Time-Lapse 3-D Surface Seismic Survey Completed
D45	Report – Infrastructure Development	D101	WWG Web Site Content Update	M54	BC Test Site – Initial Processing and Analysis of Historic InSAR Data Completed
D49	BC Test Site – Transportation and Injection Operations Report			M56	BC Test Site – Life Cycle Analysis for Primary and Secondary Recovery Oil Completed
				M58	BC Test Site – nIjection of 2.75 Million Metric Tons of CO_2 Completed

January 2016

PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

During the reporting period, eight abstracts were submitted for presentation, two were accepted, and three oral presentations were given at four different meetings and conferences. In addition, a quarterly progress report and eight deliverables/milestones (eight draft and six approved) were completed. In addition to the products cited below, staff also undertook four project management site trips. For more detail, see the Meetings/Travel section.

Abstracts

Submitted

Daly, D.J., Crocker, C.R., Crossland, J.L., Gorecki, C.D., and Steadman, E.N., 2016, Engaging teachers to facilitate learning—PCOR Partnership outreach in action [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Daly, D.J., Crossland, J.L., Crocker, C.R., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2016, Regionwide and project-level outreach—the PCOR Partnership approach [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Gorecki, C.D., Ayash, S.C., Peck, W.D., Hamling, J.A., Sorensen, J.A., Daly, D.J., Jensen, M.D., Klapperich, R.J., Heebink, L.V., Pekot, L.J., Steadman, E.N., and Harju, J.A., 2016, The Plains CO_2 Reduction Partnership—developing technologies for CCS deployment in central North America [abs.]: 35th International Geological Congress, Cape Town, South Africa, August 27 – September 4, 2016.

Hamling, J.A., Klapperich, R.J., Kalenze, N.S., Bosshart, N.W., Stepan, D.J., Burnison, S.A., Leroux, K.M., Glazewski, K.A., Gorecki, C.D., and Richards, T.L., 2016, Monitoring 2.5 million tonnes of CO_2 at the Bell Creek oil field [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Hamling, J.A., Azzolina, N.A., Peck, W.D., Gorecki, C.D., Melzer, L.S., and Nakles, D.V., 2016, How green is my oil? a detailed look at carbon accounting for CO_2 enhanced oil recovery sites (CO_2 EOR) [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Hawthorne, S.B., Miller, D.J., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2016, Effects of reservoir temperature and percent levels of methane and ethane on CO_2/oil MMP values as determined using vanishing interfacial tension/capillary rise [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Jiang, T., Pekot, L.J., Jin, L., Peck, W.D., Gorecki, C.D., and Worth, K., 2016, Numerical modeling of the Aquistore CO_2 storage project [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Jin, L., Pekot, L.J., Hawthorne, S.B., Gobran, B., Greeves, A., Bosshart, N.W., Jiang, T., Hamling, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2016, Impact of CO_2 impurity on MMP and oil recovery performance of Bell Creek oil field [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Salako, O., Burnison, S.A., Hamling, J.A., Reed, S., and Gorecki, C.D., 2016, 4-D seismic monitoring of injected CO_2 enhances geological interpretation, reservoir simulation, and production operations [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Smith, S.A., Beddoe, C.J., Zacher, E.J., Heebink, L.V., Kurz, B.A., Peck, W.D., and Gorecki, C.D., 2016, Relative permeability of Williston Basin CO_2 storage targets [abs.]: 13th International Conference on Greenhouse Gas Control Technologies (GHGT-13), Lausanne, Switzerland, November 14–18, 2016.

Accepted for Presentation

Gorecki, C.D., Ayash, S.C., Peck, W.D., Hamling, J.A., Sorensen, J.A., Daly, D.J., Jensen, M.D., Klapperich, R.J., Heebink, L.V., Pekot, L.J., Steadman, E.N., and Harju, J.A., 2015, The Plains CO_2 Reduction Partnership—guiding CCS deployment in central North America [abs.]: Carbon Capture, Utilization & Storage Conference, Tyson, Virginia, June 14–16, 2015.

Azzolina, N.A., Peck, W.D., Hamling, J.A., Gorecki, C.D., Melzer, L.S., and Nakles, D.V., 2015, How green is my oil? a detailed look at carbon accounting for CO_2 enhanced oil recovery sites (CO_2 EOR) [abs.]: Carbon Capture, Utilization & Storage Conference, Tyson, Virginia, June 14–16, 2015.

Presentations

Azzolina, N.A., Peck, W.D., Hamling, J.A., Gorecki, C.D., Ayash, S.C., Doll, T.E., Nakles, D.V., and Melzer, L.S., 2016, How green is my oil? a detailed look at GHG accounting for CO_2 EOR sites: Plains CO_2 Reduction (PCOR) Partnership WebEx presentation to U.S. Department of Energy National Energy Technology Laboratory personnel, January 28, 2016.

Burnison, S., 2016, Geophysics at the EERC—overview of projects, status, and plans: Presented to Denbury Resources Inc. personnel, Plano, Texas, January 7, 2016.

Jensen, M.D., and Azzolina, N., 2016, Life cycle analysis (LCA) of oil produced by CO_2 EOR: Presented to Denbury Resources Inc. personnel, Plano, Texas, January 7, 2016.

Deliverables/Milestones

Draft Submitted

Daly, D.J., Crossland, J.L., Crocker, C.R., and Gorecki, C.D., 2016, Outreach action plan: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 2 Deliverable D11 (update 2) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No.

DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Jensen, M.D., and Gorecki, C.D., 2016, Bell Creek test site – infrastructure development report: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Subtask 6.2 Deliverable D45 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Jensen, M.D., Schlasner, S.A., Hamling, J.A., Gorecki, C.D., and Azzolina, N.A., 2016, Life cycle analysis for primary and secondary recovery oil completed: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 9 Milestone M56 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Jiang, T., Pekot, L.J., Jin, L., Peck, W.D., and Gorecki, C.D., 2016, Geologic modeling and simulation report for the Aquistore project: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 1 Deliverable D93 (update 2) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, February.

Draft Submitted and Approved

Daly, D.J., Crocker, C.R., Crossland, J.L., Peck, W.D., Hamling, J.A., and Gorecki, C.D., 2016, PCOR Partnership—demonstrating CO_2 storage in the northern Great Plains: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 2 Deliverable D14 (update) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Glazewski, K.A., Hamling, J.A., and Gorecki, C.D., 2016, Bell Creek test site—initial processing and analysis of historic InSAR data completed: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 9 Milestone M54 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2016-EERC-01-11, Grand Forks, North Dakota, Energy & Environmental Research Center, January.

Gorecki, C.D., Kalenze, N.S., and Hamling, J.A., 2016, Bell Creek test site—completion of 2.75M metric tons of CO_2 stored: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 9 Milestone M58 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2016-EERC-03-12, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Heebink, L.V., Ayash, S.C., and Gorecki, C.D., 2016, Technical Advisory Board meeting scheduled: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 13 Milestone M36 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Approved

Ge, J., Klenner, R.C.L., Liu, G., Braunberger, J.R., Ayash, S.C., Pu, H., Gao, T., Bailey, T.P., Hamling, J.A., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Bell Creek Field test site—geomechanical modeling report: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 9 Deliverable D32 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2016-EERC-02-18, Grand Forks, North Dakota, Energy & Environmental Research Center, January.

Kalenze, N.S., Hamling, J.A., Klapperich, R.J., Braunberger, J.R., Burnison, S.A., Glazewski, K.A., Stepan, D.J., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Bell Creek test site—site characterization report: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 4 Deliverable D64 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2016-EERC-02-15, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

Progress Reports

Monthlies

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Pekot, L.J., Harju, J.A., Heebink, L.V., and Klapperich, R.J., 2016, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (December 1–31, 2015) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, February 2016.

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Hamling, J.A., Jensen, M.D., Pekot, L.J., Harju, J.A., Heebink, L.V., and Klapperich, R.J., 2016, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (January 1–31, 2016) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, February 2016.

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Hamling, J.A., Jensen, M.D., Pekot, L.J., Harju, J.A., Heebink, L.V., and Klapperich, R.J., 2016, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (February 1–29, 2016) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March 2016.

Quarterlies

Gorecki, C.D., Harju, J.A., Steadman, E.N., Romuld, L., Sorensen, J.A., Daly, D.J., Hamling, J.A., Jensen, M.D., Peck, W.D., Klapperich, R.J., Heebink, L.V., Votava, T.J., Pekot, L.J., and Ensrud, J., 2016, Plains CO_2 Reduction Partnership Phase III Task 13 Deliverable D58/59 quarterly technical progress report (October 1 – December 31, 2015) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-

05NT42592 and North Dakota Industrial Commission Contract Nos. FY08-LX111-162 and G-015-030, Grand Forks, North Dakota, Energy & Environmental Research Center, January.

Meeting Minutes

Klapperich, R.J., 2016, Minutes—Regional Carbon Sequestration Partnerships Water Working Group conference call: January 27, 2016.

The February and March Water Working Group conference calls have been waived. Beginning in April 2016, the calls will be quarterly.

MEETINGS/TRAVEL

Representatives from the PCOR Partnership incurred travel costs for their participation in the following four meetings/conferences and four project management site trips in this reporting period:

- January 6–8, 2016: traveled to Plano, Texas, for project meetings with Denbury personnel.
- January 7–8, 2016: traveled to Gillette, Wyoming, for repairs to the borehole array network at the Bell Creek test site.
- January 25–29, 2016: Off-site staff member traveled to the EERC offices in Grand Forks, North Dakota, for meetings and work on state and provincial regulation flowcharts and crosswalk documents.
- January 25–29, 2016: traveled to Gillette, Wyoming, for purchase and recycle gas sample collection activities at the Bell Creek test site.
- February 17–19, 2016: Traveled to Fargo, North Dakota, for meetings with PPB and to Plano, Texas, to conduct interviews at Denbury.
- February 22–26, 2016: Traveled to Denver, Colorado, to attend the Ground Water Protection Council Underground Injection Control Meeting.
- March 9–10, 2016: Traveled to Bismarck, North Dakota, to attend the North Dakota Carbon Management Industrial Working Group meeting.
- March 22–24, 2016: Traveled to Glendive, Montana, for site work at the Bell Creek site.

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