



Plains CO<sub>2</sub> Reduction (PCOR) Partnership  
Energy & Environmental Research Center (EERC)

## PLAINS CO<sub>2</sub> REDUCTION PARTNERSHIP PHASE III

### Quarterly Technical Progress Report Task 13 – Deliverable D58/D59

*(for the period July 1 – September 30, 2013)*

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**PLAINS CO<sub>2</sub> REDUCTION PARTNERSHIP PHASE III**  
**Quarterly Technical Progress Report**  
**July 1 – September 30, 2013**

**EXECUTIVE SUMMARY**

The Plains CO<sub>2</sub> Reduction (PCOR) Partnership is one of seven Regional Carbon Sequestration Partnerships (RCSPs) competitively awarded by the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) in 2003 as part of a national plan to mitigate greenhouse gas emissions. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota and continues to include stakeholders from the public and private sector in Phase III. The PCOR Partnership region includes all or part of nine U.S. states and four Canadian provinces.

Phase III, the development phase, a 10-year effort (2007–2017), is an extension of the characterization (Phase I) and validation (Phase II) phases. The Phase III efforts of the PCOR Partnership include two large-volume demonstration tests—one in Canada and one in the United States—that focus on injecting carbon dioxide (CO<sub>2</sub>) into deep geologic formations for CO<sub>2</sub> storage. Budget Period 4 (Years 3–8 of Phase III) began October 1, 2009.

This progress report presents an update of Phase III PCOR Partnership activities from July 1, 2013, through September 30, 2013.

Denbury Resources Inc. (Denbury) hosted Montana Governor Steve Bullock; Bruce Brown, Carbon Storage Program Infrastructure Coordinator; and other dignitaries at the Bell Creek Site Commissioning Ceremony on August 16, 2013, at the Bell Creek oil field in southeastern Montana. Additional efforts at the Bell Creek site during this reporting period included near monthly soil gas- and water-sampling events in July, August, and September as well as the start of the full-field annual sampling trip at the end of September. In August, a field trip excursion to an outcrop of the Muddy Formation near Hulett, Wyoming, was held for EERC and Denbury technical personnel. In September, the valued-added videographic best practices manual entitled “Installing a Casing-Conveyed Permanent Downhole Monitoring System,” using footage collected at the Bell Creek site, premiered at the PCOR Partnership Annual Membership Meeting in September.

The annual membership meeting ([www.undeerc.org/pcor13](http://www.undeerc.org/pcor13)) was held September 25 and 26, in Minneapolis, Minnesota, and attracted 88 attendees representing 46 organizations from 15 states, the District of Columbia, and three Canadian provinces. Over 15 posters, prepared and presented since the last annual meeting, were displayed in addition to three exhibit booths that distributed outreach materials. Also this reporting period, the EERC hosted the fifth annual Regulatory Roundup in Deadwood, South Dakota, attracting regional regulatory personnel, and regional characterization, modeling and simulation, and outreach and education efforts continued.





Plains CO<sub>2</sub> Reduction (PCOR) Partnership  
Energy & Environmental Research Center (EERC)

## **PLAINS CO<sub>2</sub> REDUCTION PARTNERSHIP PHASE III**

### **Quarterly Technical Progress Report**

**July 1 – September 30, 2013**

## **INTRODUCTION**

The Plains CO<sub>2</sub> Reduction (PCOR) Partnership is one of seven regional partnerships operating under the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP) Program. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota, and includes stakeholders from the public and private sectors. The membership, as of September 30, 2013, is listed in Table 1. The PCOR Partnership region includes all or part of nine states (Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming) and four Canadian provinces (Alberta, British Columbia, Manitoba, and Saskatchewan).

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

The 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 (Figure 1)

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

- BP3: October 1, 2007 – September 30, 2009
- BP4: October 1, 2009 – September 30, 2015
- BP5: October 1, 2015 – September 30, 2017

Note: BP1 and BP2 were effective in Phase II.

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

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

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<sub>2</sub>), 2) facilitate the development of the infrastructure required to transport CO<sub>2</sub> 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<sub>2</sub>, 5) facilitate establishment of a technical framework by which carbon credits can be monetized for CO<sub>2</sub> stored in geologic formations, 6) continue collaboration with other RCSPs, and 7) provide outreach and education for CO<sub>2</sub> 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<sub>2</sub> injection volumes. A programmatic development phase (Phase III) goal is implementation of large-scale field testing involving at

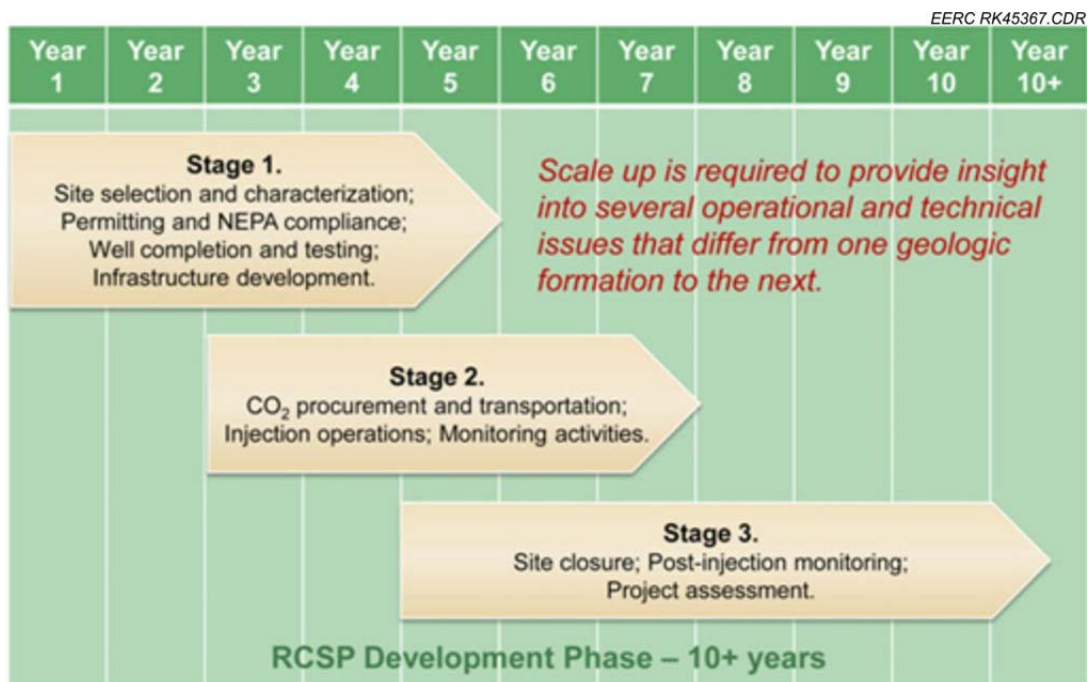


Figure 1. RCSP development phase: scaling up toward commercialization (source: [www.netl.doe.gov/technologies/carbon\\_seq/infrastructure/rcspiii.html](http://www.netl.doe.gov/technologies/carbon_seq/infrastructure/rcspiii.html) [accessed July 2013]).

least 1 million tons (Mt) of CO<sub>2</sub> a project. Each of the RCSP's large-volume injection tests is designed to demonstrate that the CO<sub>2</sub> storage sites have the potential to store regional CO<sub>2</sub> emissions safely, permanently, and economically for hundreds of years.

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

The PCOR Partnership's objectives for the demonstration projects are as follows: 1) conduct a successful field demonstration to verify that the region's large number of oil fields has the potential to store significant quantities of CO<sub>2</sub> in a safe, economical, and environmentally responsible manner and 2) conduct a successful demonstration to verify the economic feasibility of using the region's carbonate saline formations for safe, long-term CO<sub>2</sub> 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; 6) Infrastructure Development; 7) CO<sub>2</sub> Procurement; 8) Transportation

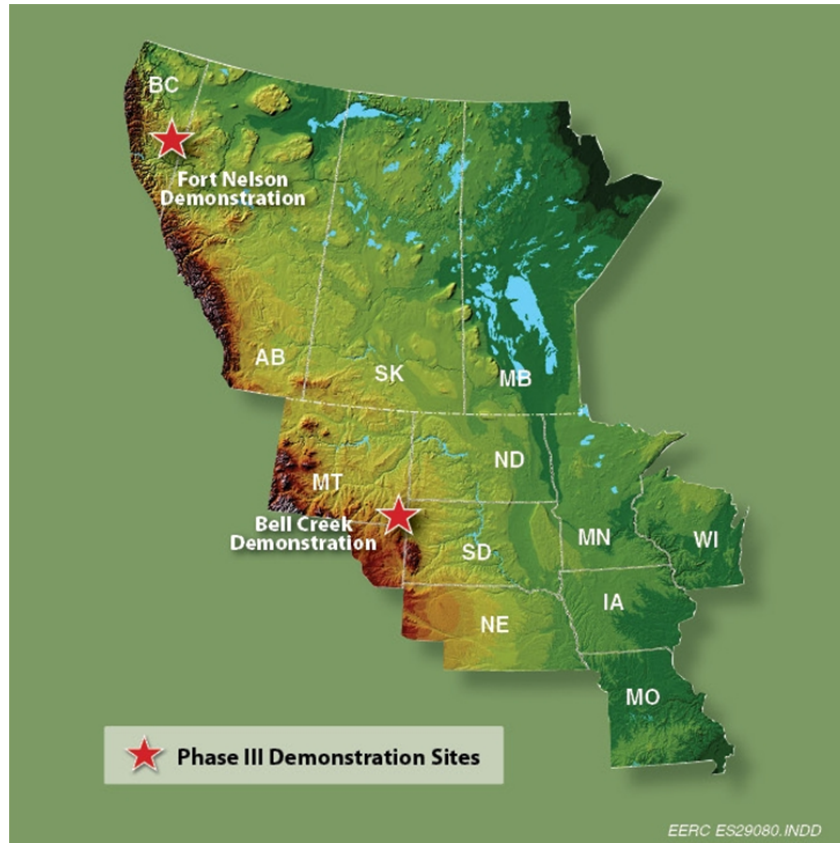


Figure 2. PCOR Partnership Phase III large-scale sites.

and Injection Operations; 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 Enhanced Oil Recovery (EOR), CO<sub>2</sub> Storage, and Monitoring Project; and 16) Characterization of the Basal Cambrian System. 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.

## PROGRESS OF WORK

### Task 1 – Regional Characterization

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

- Attended the North Dakota Petroleum Council (NDPC) Annual Meeting on September 16–18, 2013, in Grand Forks, North Dakota.

**Table 2. Phase III Responsibility Matrix**

Phase III Task Description	Task Leader
Task 1 – Regional Characterization	Wesley D. Peck
Task 2 – Public Outreach and Education	Daniel J. Daly
Task 3 – Permitting and NEPA Compliance	Lisa S. Botnen
Task 4 – Site Characterization and Modeling	James A. Sorensen
Task 5 – Well Drilling and Completion	John A. Hamling
Task 6 – Infrastructure Development	Melanie D. Jensen
Task 7 – CO <sub>2</sub> Procurement	John A. Harju
Task 8 – Transportation and Injection Operations	Melanie D. Jensen
Task 9 – Operational Monitoring and Modeling	Charles D. Gorecki
Task 10 – Site Closure	TBA*
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Katherine K. Anagnost
Task 13 – Project Management	Charles D. Gorecki
Task 14 – RCSP WWG Coordination	Ryan J. Klapperich
Task 15 – Further Characterization of the Zama Acid Gas EOR, CO <sub>2</sub> Storage, and Monitoring Project	Charles D. Gorecki
Task 16 – Characterization of the Basal Cambrian System	Wesley D. Peck

\* To be announced.

- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- Began in-house review of the draft value-added report on the geologic characterization and CO<sub>2</sub> storage potential in Nebraska.
- Completed work on the **annual review** and update of the attribute data for the CO<sub>2</sub> sources database (Deliverable [D]1), including the following:
  - Completed updating the Canadian sources.
  - Completed additional estimates of CO<sub>2</sub> emissions from ethanol plants that were needed in order to finalize the CO<sub>2</sub> emissions database update.
  - Submitted for NETL review the draft “Review of Source Attributes” on September 5, 2013.
- Continued efforts to characterize six saline formations for CO<sub>2</sub> storage (Broom Creek, Inyan Kara, Leduc, Minnelusa, Mission Canyon, and Winnipegosis Formations [Fms]), including the following:
  - Continued data collection for characterization of the Inyan Kara and Broom Creek Fms.
  - Continued revision of the Broom Creek Fm outline, including the integration of the following:
    - ◆ CO<sub>2</sub> mass storage capacity
    - ◆ Average effective porosity
    - ◆ Average permeability
    - ◆ Formation temperature
    - ◆ Formation pressure
    - ◆ Formation thickness

- Searched through saltwater disposal wells that inject into the Broom Creek Fm and compared relevant data to the current models.
- Worked on the development of a new formation outline for the Leduc Fm of Alberta.
- Submitted an abstract entitled “Using Multiple-Point Statistics in the Modeling of a Winnipegosis Formation Pinnacle Reef for Enhanced Oil Recovery and CO<sub>2</sub> Storage Applications” for the American Association of Petroleum Geologists (AAPG) Annual Convention and Exhibition scheduled for April 2014 in Houston, Texas.
- Calculated CO<sub>2</sub> storage for the Minnelusa Fm in Wyoming
- Began a draft report for evaluation of the Minnelusa Fm.
- Continued updates and maintenance of the partners-only **Decision Support System (DSS)**, including the following:
  - Continued efforts to check and correct the OOIP (original oil in place) values for the oil pools table for eventual upload.
  - Continued review of entire Web site for accuracy and relevance, and saved revisions to a “test” site for review.
  - Began updating the following Web pages:
    - ◆ “Bell Creek Demonstration”
    - ◆ “Keep Me Informed”
    - ◆ “EERC Contacts”
    - ◆ “About the PCOR Partnership”
    - ◆ “Glossary of Terms”
  - Continued to add descriptions to the atlas images for upload to the “Image Gallery.”
  - Began revisions to the carbon cycle text and image located on the “CO<sub>2</sub> Sources” page.
- Continued improving **data management** and data access using Petra software, including:
  - Completed updates on all North Dakota, Montana, and South Dakota Petra projects.
  - Joined “new” Montana abandoned oil field data with existing oil field data.
  - Incorporated CO<sub>2</sub> calculations into the oil pool database.
  - Downloaded LAS (log ASCII standard) files, fixed where appropriate, and imported for Bowman, Dunn, Golden Valley, Hettinger, McKenzie, Mountrail, and Slope (North Dakota) and Billings (Montana) Counties.
  - Added data from the North Dakota Industrial Commission (NDIC) regarding oil field production for June and July 2013.
  - Added well files, oil field production data, spreadsheets, case files, and publications to the pool data table.
- Continued data collection and organization for NATCARB (National Carbon Sequestration Database and Geographic Information System [GIS]) in preparation for the next version of the DOE NETL atlas, including the following:
  - Collected the data related to the saline storage modeling outputs, including Broom Creek, Inyan Kara, Minnelusa, and Mission Canyon.
  - Compiled the Basal Cambrian system data.

- Summarized oil pool/reservoir information on an oil field-based level (the NATCARB format).
- Updated the CO<sub>2</sub> source data based on information found in D1.
- Began preliminary investigation into the CO<sub>2</sub> EOR potential of the Bakken Fm.
- With regard to the **Aquistore** project static modeling and dynamic predictive simulations effort:
  - Reviewed the NDIC and Saskatchewan Oil and Gas databases for additional wells in vicinity of the Petroleum Technology Research Centre (PTRC) wells penetrating the Precambrian Fm.
  - Created surfaces for Red River, Icebox, Black Island, Deadwood, and Precambrian Fms.
  - Received the Schlumberger Carbon Services (Schlumberger) model and imported seismic horizon points.
  - Continued review of differences between the EERC model and the Schlumberger model, more specifically the project area, well database, marker tops, structure interpretations, and isopach maps.
  - Log analysis
    - ◆ Loaded log curves from five wells in the project area.
    - ◆ Created normalized gamma ray logs.
    - ◆ Loaded formation tops in the project area.
    - ◆ Continued review of the observation well and injection well suites of data, e.g., logs, sidewall core analyses, drilling reports.
    - ◆ Completed quality assurance/quality control (QA/QC) of log analysis.
  - Populated the static geologic model (expanded project area) with:
    - ◆ Measured depth.
    - ◆ Formation salinity.
    - ◆ Formation temperature.
    - ◆ Formation pressure.
    - ◆ Finished correlations of subzones.
    - ◆ Constructed isopach maps of superior zones.
    - ◆ Reviewed EERC-proposed depths for scanning electron microscopy (SEM) analysis of injector well core.
    - ◆ Data from the Basal Cambrian project to expand the area for structure/thickness control.
  - Ran correlation and log analysis of all recently added data.
  - EERC personnel participated in a PTRC SERC (Science and Engineering Research Council) and Risk Assessment Meeting and in the Aquistore Annual Sponsors' Meeting, held July 9–12, 2013, in Regina, Saskatchewan.

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

- With regard to the Aquistore Project, the capture facility is complete, but turbine installation is delayed. CO<sub>2</sub> injection is now delayed until spring 2014.



## Task 2 – Public Outreach and Education

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

- Submitted for NETL review the draft Aquistore Project fact sheet and poster (D94 and D95, respectively) on September 30, 2013.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- Previewed the “Installing a Casing-Conveyed Permanent Downhole Monitoring System” value-added videographic best practices manual at the PCOR Partnership Annual Membership Meeting (Figure 3).
- Began planning for an update to the CO<sub>2</sub> general storage poster (D24, due March 2014).
- Continued assessing results from a survey of partner-related Web sites in order to determine how partners are sharing CCS-related information.
- Provided information for use in the PCOR Partnership presentation for the IEA Greenhouse Gas (GHG) R&D Programme 2013 expert review of the RCSP Initiative.
- Continued gathering “site-specific” community outreach information for the Bell Creek project area and began developing a protocol to capture, manage, and display the information.
- Began work to assess feedback from 70 librarians representing four types of libraries in the PCOR Partnership region (i.e., public, K–12, university, and government).



Figure 3. Cover art for the videographic best practices manual of a permanent downhole monitoring (PDM) system using footage captured at the Bell Creek site.



- Received and assessed quarterly tracking data from the Lignite Energy Council, Prairie Public Broadcasting (PPB), and the EERC.
- Participated in an in-house meeting on July 8, 2013, to discuss the use of Google Analytics as a research tool for analyzing Web use.
- Continued Web research efforts using Google Analytics for the PCOR Partnership Web site ([www.undeerc.org/pcor](http://www.undeerc.org/pcor)).
- Responded to a request from the Lignite Energy Council (partner) and Minnkota Power Cooperative (partner) for information on percentages of natural CO<sub>2</sub> emissions.
- Continued discussions regarding upcoming documentary products:
  - On July 19 and September 5, 2013, discussed the upcoming Bell Creek documentary (D21, due April 2016), including story line and interview candidates.
  - Prepared a proposed story line for the Bell Creek documentary in PowerPoint and presented to in-house personnel.
  - On September 13, 2013, met with PCOR Partnership management to discuss topics and logistics for the “Domestic Energy and Carbon” documentary (D22, due May 2015) and the “Storage in Carbon Management” documentary (D23, due April 2017).
- Continued collaborative efforts with PPB, including the following:
  - Traveled with a PPB film crew to the Bell Creek Field for the Bell Creek Commissioning Ceremony hosted by Denbury on August 16, 2013.
  - Met with PPB at the EERC on August 26, 2013, to discuss budgets and scopes of work.
  - Continued to work on the four segments of the educator presentation video series to be used at teacher training seminars and on the Web, including a meeting in Fargo on August 14, 2013.
  - Finalized editing the PDM value-added video.
  - Created a DVD of the PDM video to play at the annual meeting.
  - Coordinated scheduling for upcoming filming of location footage and interviews with SaskPower at its Boundary Dam power plant.
  - Continued to coordinate with PPB on scheduling film trips for upcoming documentary projects.
- Completed the final revisions to the forms and programming for the outreach-tracking database.
- Continued efforts to review and improve the public Web site, including the following:
  - Worked on updated technical content for the “Global Carbon Cycle” page ([www.undeerc.org/PCOR/Sequestration/Cycle.aspx](http://www.undeerc.org/PCOR/Sequestration/Cycle.aspx)).
  - Completed updates to the “Video Clip Library” ([www.undeerc.org/PCOR/Video-Clip-Library](http://www.undeerc.org/PCOR/Video-Clip-Library)), including installation of an upgraded video clip player (Adobe Media Service).
- Performed the following in preparation for the upcoming DOE Carbon Storage R&D Project Review Meeting (DOE Review Meeting):
  - Submitted an abstract for a poster entitled “PCOR Partnership Outreach – A Decade of Achievement” on July 3, 2013.
  - Received an acceptance notification for the poster on July 19, 2013.
  - Prepared a poster “teaser” slide.

- Presented the poster on August 20, 2013.
- Participated in an RCSP Outreach Working Group (OWG) activities, including the following:
  - Attended a meeting held on August 19, 2013, in conjunction with the DOE Review Meeting.
  - Participated in a conference call on September 19, 2013.
  - On September 25, 2013, participated in a conference call to discuss a paper on social media related to RCSP activities for the upcoming 12th International Conference on Greenhouse Gas Control Technologies (GHGT-12).
- Provided information to PTRC for use in its monthly Aquistore Outreach Advisory Panel conference call on July 22, 2013, and participated in an Aquistore Outreach Advisory Panel conference call on August 26, 2013.
- During this reporting period, information regarding the **site visits** to the PCOR Partnership public Web site included the following:
  - There were 1155 visits to the public Web site ([www.undeerc.org/pcor](http://www.undeerc.org/pcor)), above average but a decrease of nearly 40% from the 1616 visits last quarter. See Figure 4 for the quarterly visits from April 2010 – September 2013.
  - There were 912 new visitors (visitors whose visit was marked as a first-time visit) and 77 returning visitors for a total of 989 visitors, representing over a 31% decrease from the 1298 visitors last quarter.

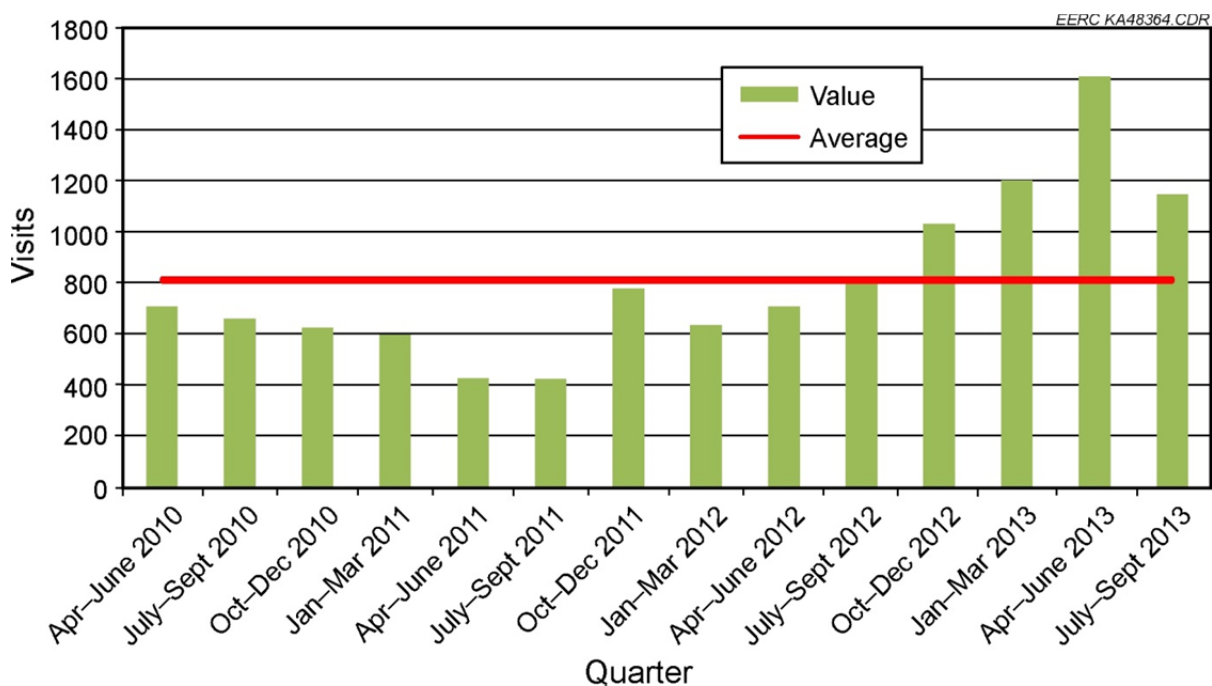


Figure 4. Quarterly visits to PCOR Partnership public Web site.

- ◆ New visitors made up 79% of the traffic to the Web site.
- ◆ Returning visitors comprised 21% of the total visits (note: these results are based on the Google Analytics definition of new versus returning visitors, <https://support.google.com/analytics/>).
- Of the 1155 visits, 60% of the Web traffic was domestic, and 40% was international. Table 3 lists the top ten countries with the highest number of visits to the PCOR Partnership Web site. There was traffic from 59 countries overall (Figure 5).  
There were 219 visits originating from within the PCOR Partnership Region (Figure 6), representing a decrease of 32% from the 322 visits from last quarter. Approximately 74% of the regional visits originated from the United States, and 26% came from Canada. Visits from within the PCOR Partnership region comprised 19% of the overall traffic to the public Web site (note: the totals are skewed 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).

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

Country	PCOR Partnership State/Province	Visits
1. United States		691
	North Dakota	76
	Minnesota	45
	Montana	12
	Missouri	10
	Nebraska	8
	Wisconsin	5
	South Dakota	2
	Wyoming	2
	Iowa	1
2. Canada		79
	Alberta	32
	Saskatchewan	21
	British Columbia	4
	Manitoba	1
3. India		45
4. United Kingdom		36
5. Philippines		36
6. Australia		32
7. Germany		16
8. Japan		14
9. Brazil		12
10. France		11
Other 49 Countries		183
<b>Total Visits</b>		<b>1155</b>

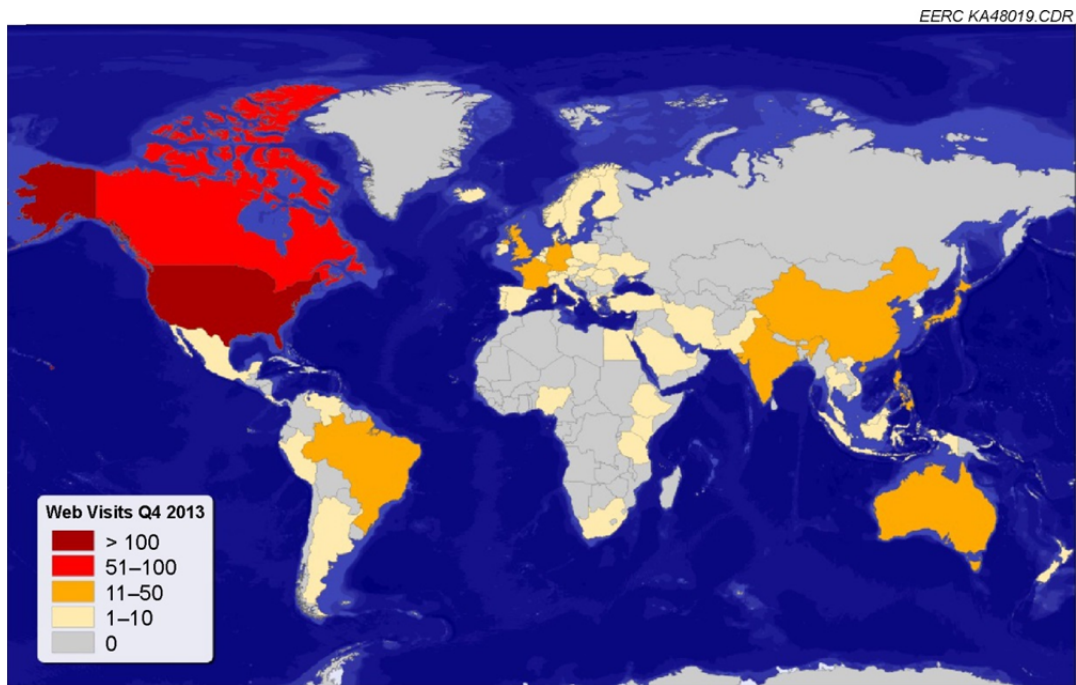


Figure 5. Map of PCOR Partnership Web site global traffic (source: Google Analytics).

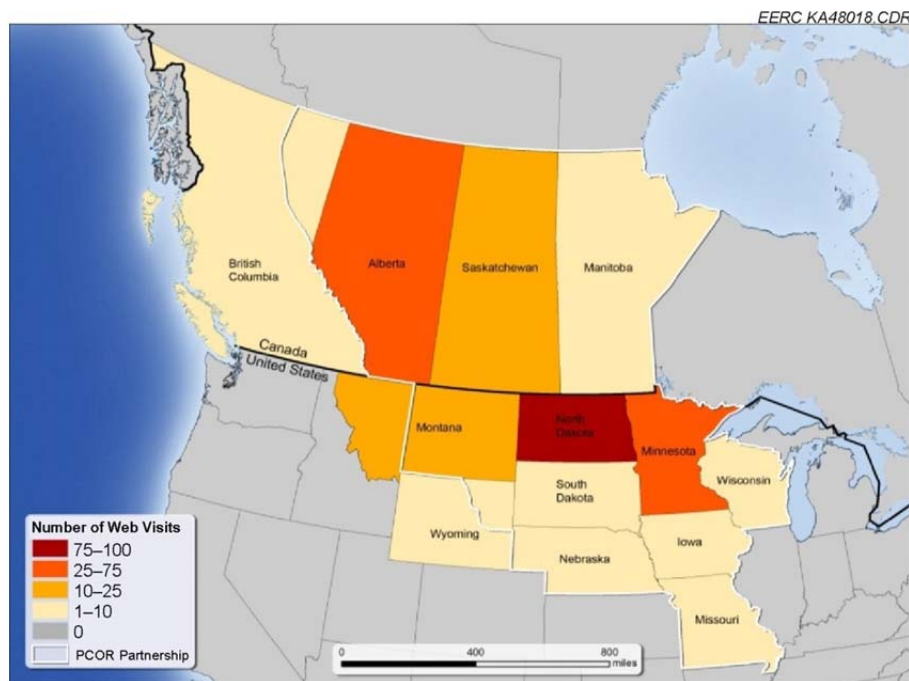


Figure 6. Map of PCOR Partnership Web site regional visits (source: Google Analytics).

- During this reporting period, a breakdown of how visitors came to the PCOR Partnership Web site, also referred to as traffic sources (Figure 7), is provided below.
  - Direct traffic consists of those visitors who bookmark or type in the URL ([www.undeerc.org/pcor](http://www.undeerc.org/pcor)). It is likely that most of the direct traffic (13%) is from persons familiar with the PCOR Partnership (Kaushik, 2010).
  - Search engine traffic refers to the use of keywords and accounted for nearly 72% of the traffic. Google Analytics provides the keywords visitors used. The top three keywords used include “CO<sub>2</sub> Sequestration,” “PCOR,” and “What Is CO<sub>2</sub>?”.
- Referral site traffic (13%) corresponds to the traffic directed to the PCOR Partnership Web page from other sites via links. The top two referring Web sites were DOE-based, specifically the main DOE Web site (20 referrals) and the NETL Web site (19 referrals). Other top referral Web sites belong to the Southeast Regional Carbon Sequestration Partnership (SECARB) and Apache Corporation.
- Last quarter, during two education workshops, a flash drive campaign (flash drives were distributed that included a link to the PCOR Partnership Web site) was implemented in an attempt to increase Web traffic. The links included on the flash drives were utilized by 24 individuals: 17 from North Dakota and seven from Minnesota.
- During this reporting period, the nature of the visits to the PCOR Partnership public Web site included 2464 page views; the top five pages viewed are listed in Table 4.
- During this reporting period, coverage on the PCOR Partnership was generated by primarily two articles. An article titled “CO<sub>2</sub>-Sequestration Project Adding Value” in the “Journal of Petroleum Technology” had a circulation of over 1 million readers. The

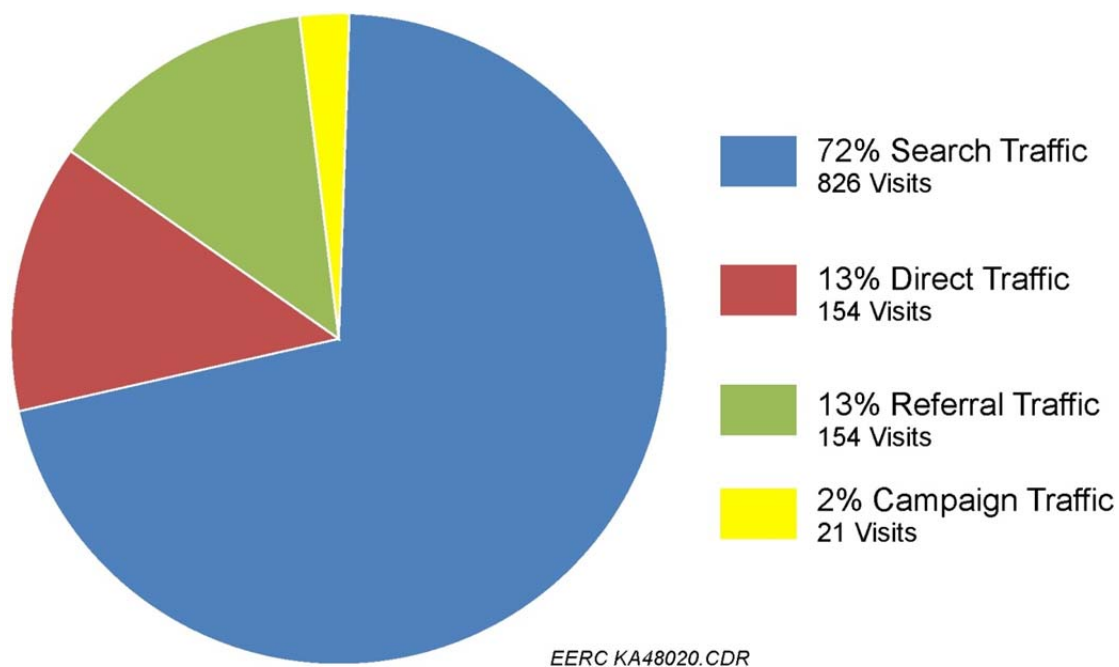


Figure 7. PCOR Partnership public Web site traffic sources (source: Google Analytics).

**Table 4. Top Pages for “Page Views” on the PCOR Partnership Public Web Site**

Page Title	Page Views	% Page Views	Page
Home Page	641	26%	<a href="http://www.undeerc.org/pcor/default.aspx">www.undeerc.org/pcor/default.aspx</a>
What Is CO <sub>2</sub> Sequestration	262	11%	<a href="http://www.undeerc.org/pcor/sequestration/whatissequestration.aspxwhatissequestration.aspx">www.undeerc.org/pcor/sequestration/whatissequestration.aspxwhatissequestration.aspx</a>
CO <sub>2</sub> Sequestration Projects	168	6.8%	<a href="http://www.undeerc.org/pcor/co2seqprojects/default.aspx">www.undeerc.org/pcor/co2seqprojects/default.aspx</a>
About the Partnership	153	6.3%	<a href="http://www.undeerc.org/pcor/about/default.aspx">www.undeerc.org/pcor/about/default.aspx</a>
Documentaries	70	2.8%	<a href="http://www.undeerc.org/pcor/documentary/">www.undeerc.org/pcor/documentary/</a>

key news feature for the majority of the media coverage was titled “IOGCC Task Force Continues Work to Pave Way for CO<sub>2</sub> Storage.” This news story appeared in 61 different online newspaper articles, 57 additional online articles, nine television networks, and three radio stations. See Appendix A for the full list.

- During this reporting period, “Global Energy and Carbon: Tracking Our Footprint” was broadcast a total of 12 times in six states: Alaska (1), California (1), Georgia (3), Michigan (1), North Carolina (3), and South Carolina (3). There were no broadcasts within the partnership region.
- During this reporting period, the PCOR Partnership was represented by EERC personnel at 21 conferences/meetings and two workshops. Specifically, the PCOR Partnership outreach activities included 11 oral presentations, nine poster presentations, and two exhibit booths. The following quantities of PCOR Partnership outreach materials were distributed:
  - PCOR Partnership documentary entitled “Nature in the Balance: CO<sub>2</sub> 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” – 6
  - PCOR Partnership documentary entitled “Managing Carbon Dioxide: The Geologic Solution” – 33
  - PCOR Partnership documentary entitled “Global Energy and Carbon: Tracking Our Footprint” – 28
  - “PCOR Partnership Atlas, 4th Edition” – 2
  - “PCOR Partnership Atlas, 4th Edition, Revised” – 92

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

- Received notification on July 22, 2013, that filming scheduled for July 23, 2013, at SaskPower’s Boundary Dam power plant had been canceled. The trip was rescheduled for October 23, 2013.

### **Task 3 – Permitting and NEPA Compliance**

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

- Submitted for NETL review the draft “Permitting Review – Update 1” (D6) on September 24, 2013.
- Submitted for NETL review the draft “Report – Findings, Recommendations, and Guidance of the Carbon Geologic Storage (CGS) Task Force on Operational and Postoperational Liability” (D98) on August 30, 2013.
- Submitted a milestone report “IOGCC (Interstate Oil and Gas Compact Commission) Task Force Wrap-Up Meeting Held” (M38) on September 5, 2013. The meeting was held via conference call on August 16, 2013, and the following persons participated:
  - Scott Anderson, Environmental Defense Fund
  - Rob Finley, Advanced Energy Technology Initiative, Illinois State Geological Survey
  - Kevin Connors, NDIC (representing Lynn Helms)
  - Lawrence Bengal, Arkansas Oil and Gas Commission
  - Kevin Frederick, Wyoming Department of Environmental Quality
  - Kevin Bliss, Bliss Consulting
  - Gerry Baker, IOGCC
  - Fred Eames, Hunton & Williams LLP
  - Laura Ladd, Hewitt Ladd, Inc., Wyoming
  - Lisa Botnen, EERC
- Submitted a milestone report “IOGCC Task Force Editing Subgroup Meeting Held” (M39) on September 5, 2013. The meeting was held in Washington, D.C., on June 3–5, 2013. Subgroup members that participated included the following:
  - Kevin Bliss, Bliss Consulting
  - Kevin Connors, NDIC
  - Lawrence Bengal, Arkansas Oil and Gas Commission
- Hosted the 5th Annual Regulatory Roundup on July 30–31, 2013, in Deadwood, South Dakota (Figure 8). Representatives from the following entities were present:
  - Alberta Energy
  - IOGCC
  - North Dakota Pipeline Authority
  - NDIC Oil and Gas Division
  - Saskatchewan Geological Survey
  - South Dakota Geological Survey
  - Bliss Consulting
  - Melzer Consulting
  - Premier Oil Recovery, LLC
  - The CETER Group
  - EERC
- Worked on a meeting summary for the Regulatory Roundup.





Figure 8. Attendees at the 5th Annual Regulatory Meeting held in Deadwood, South Dakota.

- Participated in a conference call with North America 2050: A Partnership for Progress (NA2050) Sequestration Working Group to discuss needed areas of education and outreach (Note: NA2050 facilitates state and provincial efforts to design, promote, and implement cost-effective policies that reduce greenhouse gas emissions and create economic opportunities, <http://na2050.org/sequestration>).
- Attended the NDPC Annual Meeting on September 16–18, 2013, in Grand Forks, North Dakota.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- Provided a tour of EERC facilities and reviewed EERC CO<sub>2</sub> capabilities with an NDIC representative.
- Additional activities with regard to the IOGCC CGS Task Force included:
  - Discussed with IOGCC personnel the development of an outreach strategy for the final report (D98).
  - Discussed a communication plan with IOGCC personnel.
- With regard to the Lignite Field Validation Test site (Phase II) closure:
  - Continued efforts to monitor the site during the reclamation phase, including site visits on July 23, August 8, and September 24, 2013 (Figure 9).
  - Continued to modify a draft value-added report on closure activities.





Figure 9. Results of reclamation efforts at the Lignite Field Validation Test site  
(top: September 2011, bottom: July 2013).

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:

- EERC staff participated in full-day training called “Fundamentals of Geostatistics,” provided by Dr. Clayton Deutsch on August 5–8, 2013, at the EERC.
- EERC staff participated in five half-day in-house Petrel software training sessions and a 1-hour training session led by Schlumberger.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- **Bell Creek** test site activities included the following:
  - Submitted for NETL review the draft “Preinjection Geochemical Report” (D33/M12) on July 31, 2013.
  - Submitted for NETL review the draft “Site Characterization Report” (D64) on August 29, 2013.
  - Continued work on the wellbore leakage report (D36, due March 2014) and initiated identification of wells scoring highest for deep leakage potential.
  - Conducted a literature review for wellbore integrity with a focus on case studies in EOR applications.
  - Continued to work on the value-added mitigation plan.
  - Modeling staff attended and presented at the North Dakota GIS Users Conference held September 10–12, 2013, in Grand Forks, North Dakota.
  - Discussed ideas for an AAPG abstract (due September 19, 2013) on further interpretation of outcrop and subsurface core.
  - Continued preparation of an “AAPG Bulletin” journal article.
  - Reviewed the raw log data and seismic data, and conducted a literature review on the interpretation methods.
  - Continued work on the Version 3 static geologic model, including importing the following:
    - ◆ Data from all previous models
    - ◆ PNL logs
    - ◆ Redrill well logs
    - ◆ Core analysis data
  - Continued work on the **geomechanical** modeling activities, including the following:
    - ◆ Continued revisions to D32, Geomechanical Report (submitted January 31, 2013), based on Denbury’s comments.
    - ◆ Worked on evaluating methods to derive rock mechanical properties from seismic data.
    - ◆ Continued literature review for the mechanical earth model (MEM).
    - ◆ Continued work on the 3-D MEM and geomechanical modeling and simulations.
  - Conducted a literature review for **SCAL** (special core analysis) work on capillary pressure tests.
  - Reviewed the SCAL work update from Core Laboratories, Inc.
  - With regard to the 56-14R sidewall core (21 samples):

- ◆ Determined that one sample will be tested for porosity and another for SEM mineral mapping (using the thin section).
- ◆ Completed initial evaluation of the thin sections.
- Discussed the 60 feet of full-diameter core collected from 33-14R, and continued awaiting receipt of samples from Core Laboratories.
- Continued review and modification of the petrophysical assessment (including 21 well packages) of 81 intervals of core from the U.S. Geological Survey Denver Core Research Center.
- Continued work on the in-house **relative permeability** system.
- Conducted literature review on relative permeability for cap rock
- **Fort Nelson** test site activities included the following:
  - Continued to work on revisions to the Fort Nelson Test Site – Site Characterization Report (received from Spectra on February 1, 2013).
  - Continued to work on revisions to the Fort Nelson Test Site – Geochemical Report (received from Spectra on February 7, 2013).
  - 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**

Significant accomplishments for Task 5 for the reporting period included the following:

- Prepared and presented a poster entitled “Baseline Monitoring, Verification, and Accounting (MVA) at the Bell Creek Combined CO<sub>2</sub> EOR and CO<sub>2</sub> Storage Project” at the Combined IEAGHG Monitoring and Environmental Research Network Meeting held August 26–30, 2013, in Canberra, Australia.
- Sampling staff attended the 58th Annual Midwest Ground Water Conference on September 23–25, 2013, in Bismarck, North Dakota.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- Worked on poster entitled “Baseline Soil Gas Monitoring at the Bell Creek Combined CO<sub>2</sub> EOR and CO<sub>2</sub> Storage Project” to be presented at the Carbon Management Technology Conference (CMTC) scheduled for October 21–23, 2013, in Arlington, Virginia.
- Began work on the Injection Experimental Design Package (D42, due October 2013).
- Continued revisions to the value-added baseline MVA report.
- Led a guided field trip to an outcrop near Hulett, Wyoming, for Denbury staff on August 10–15, 2013 (Figure 10), and prepared a companion field guide.
- Performed site maintenance at the Bell Creek site in preparation for the commissioning ceremony.
- Prepared posters (recycling process flow and an overview map) for use at the commissioning ceremony.



Figure 10. Denbury and EERC personnel visit an outcrop of the Muddy Formation near Hulett, Wyoming (August 2013).

- Finalized the April 2013 sampling results for area landowners, and sent the packages to Denbury on July 18, 2013, for review.
- Continued **Fox Hills Fm CO<sub>2</sub> exposure testing** to evaluate the potential impact of CO<sub>2</sub> (as recommended by the PCOR Partnership Technical Advisory Board [TAB]), as follows:
  - Participated in weekly update meetings.
  - In addition to the 13 central composite test matrix samples, prepared and tested two additional samples: one with no CO<sub>2</sub> (100% N<sub>2</sub>) and one with 70% CO<sub>2</sub>.
  - Removed final CO<sub>2</sub>-rock exposure sample from the incubator on August 28, 2013, and initiated analyses of the water from that sample.
  - Collected fresh samples (1 liter each) of groundwater from Fox Hills monitoring wells 05-04 and 33-12.
  - Wrote first draft of experimental approach, results, discussion, and conclusions for statistical analysis and modeling results.
  - Discussed incorporation of the exposure test results into the mitigation plan.

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 6 – Infrastructure Development**

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

- Attended the 2013 CO<sub>2</sub> Capture Technology Meeting held July 8–11, 2013, in Pittsburgh, Pennsylvania.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.
- Provided task update information for inclusion in the Annual Membership Meeting overview presentation.
- Began efforts toward the decision point regarding potential incorporation of Ramgen compression technology into the Bell Creek project (M41, due January 2014), including:
  - Discussed Rampressor with and provided information to representatives of Ramgen.
  - Introduced Ramgen personnel to Denbury personnel in attendance at the annual meeting to begin discussions.
- Continued preparations for a trade or peer-reviewed journal article on pipeline sizing for sources that produce variable amounts of CO<sub>2</sub>, including the following:
  - Modified, shortened, and edited the draft document.
  - Revised the executive summary.
  - Identified a short list of appropriate peer-reviewed journals, the most likely is “Energy & Environmental Science.”
  - Further refined the draft document, formatting it specifically for “Energy & Environmental Science.”
- Continued information searches needed to update the capture technologies overview document (value-added report, 2011) and, after the updated report is complete, its companion interactive DSS Web page.
- Discussed Program Year 7 activities in-house.
- Participated in the PCOR Partnership programmatic risk assessment by scoring the probability and impact of various risks for inclusion in the risk register.

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<sub>2</sub> Procurement**

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

- Participated in ongoing project discussions with Denbury.
- Attended the PCOR Partnership Annual Membership Meeting on September 25 and 26, 2013, in Minneapolis, Minnesota.

- Submitted to NETL the draft “Bell Creek Test Site – Procurement Plan and Agreement Report” (D48) on September 24, 2013.

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

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

## **Task 8 – Transportation and Injection Operations**

Significant accomplishments for Task 8 for the reporting period included the following:

- Attended the in-house Bell Creek project update meeting on July 24, 2013.
- Prepared a draft budget for a report on measurement of CO<sub>2</sub> fugitive emissions from surface facilities at EOR injection sites.
- Met in-house on September 19, 2013, to discuss the status of the fugitive emissions report.

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 9 – Operational Monitoring and Modeling**

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

- Modeling staff attended a Society of Petroleum Engineers (SPE) training course entitled “Modern Production Data Analysis for Unconventional Reservoirs” on September 28 and 29, 2013, in New Orleans, Louisiana.
- Modeling staff attended SPE ATCE (Annual Technical Conference and Exhibition) September 30 – October 2, 2013, in New Orleans, Louisiana.
- Worked on writing an abstract for the 2014 Improved Oil Recovery conference scheduled for April 12–16, 2014, in Tulsa, Oklahoma (not submitted).
- Discussed maintenance of the high-performance computing cluster.
- Continued **Bell Creek** site activities, including the following:
  - Injected cumulatively (May–August 2013) 262,390 tons of CO<sub>2</sub> (Table 5)
  - Submitted for NETL review the executive summary of the updated “Simulation Report” on August 30, 2013. Denbury is currently reviewing the full report.
  - Began work on summarizing the first full-repeat sampling of the groundwater- and soil gas-monitoring program (M43, due December 2013).
  - Upon request, provided slides with geophone array information included to NETL Infrastructure Coordinator on August 8, 2013.
  - Continued work on predictive simulation of the clipped, larger Phase 1 model.

**Table 5. Bell Creek CO<sub>2</sub> Injection Totals May–August 2013**

	May 2013 Injection (Mcf)	June 2013 Injection (Mcf)	July 2013 Injection (Mcf)	August 2013 Injection (Mcf)
TOTAL (Mscf)	187,073	932,103	590,030	648,220
TOTAL (U.S. tons)*	10,700	53,315	33,749	37,077
Cumulative Total (Mscf)	187,073	1,119,176	1,709,206	2,357,426
Cumulative Total (U.S. tons)*	10,700	64,015	97,764	134,841

(taken from Montana Oil & Gas Database)

\* There is an approximately 2–3 month lag in posting of injection/production volumes to the MBOG database. This was calculated utilizing a conversion of 17.483 Mscf/U.S.ton

- Worked on predictive simulation, including troubleshooting problems.
- Conducted literature review on simulation approaches for CO<sub>2</sub> storage.
- Prepared slides of predictive simulation results.
- With regard to **injection-phase seismic** efforts:
  - ◆ Discussed seismic inversion work performed by Denbury.
  - ◆ Discussed coordination of a repeat seismic survey contiguously with Denbury's planned 4-D seismic survey scheduled for January 2014.
  - ◆ Gathered data regarding Muddy Fm zone intervals for all wells in Bell Creek Field Phases 1, 2, 3, 4, and 8 for use in passive-seismic monitoring exercises.
  - ◆ EERC staff traveled July 1–3, 2013, to the Hastings oil field near Pearland, Texas, to observe Denbury's 4-D seismic shoot and tour facilities.
  - ◆ Held a conference call on September 12, 2013, to discuss Bell Creek passive seismic monitoring. Planned a check shot survey in 05-06 OW well to help improve the velocity model (to aid processing the passive-seismic monitoring).
  - ◆ On September 4, 2013, discussed the following with Denbury:
    - Receiving the entire 3-D surface seismic dataset
    - Status of 3-D VSP (vertical seismic profiling) dataset that Apex is currently processing
    - Plans for a 4-D seismic shoot at the Bell Creek Field
- Continued analysis of **pressure gauge response** from the 05-06 OW well, including:
  - ◆ Processed and summarized PDM data from 05-06 OW and production data from the field.
  - ◆ Archived most recent PDM data for 05-06 OW for the period June 11 – August 7, 2013.
  - ◆ Collected data downloads on August 6–8, 2013.
  - ◆ Prepared the new PDM data, including updating the model for analysis.
  - ◆ Continued automation of Bell Creek pressure and temperature data processing using Microsoft Excel.
- With regard to **injection-phase PNL** (pulsed-neutron log) activities:



- ◆ Hosted PNL review meeting (held in conjunction with the PCOR Partnership Annual Membership Meeting) with Schlumberger, Denbury, and EERC personnel on September 24, 2013, in Minneapolis, Minnesota.
- ◆ Loaded additional PNLs into the designated Petrel project.
- ◆ Worked on a presentation entitled “Characterization and Time-Lapse Monitoring of a Combined CO<sub>2</sub> EOR and CO<sub>2</sub> Storage Project at the Bell Creek Oil Field Utilizing Pulsed-Neutron Well Logging” for CMTC scheduled for October 21–23, 2013, in Alexandria, Virginia.
- ◆ Read several PNL papers that deal with processing, interpretation, and application to CO<sub>2</sub> flooding.
- ◆ Attended a meeting to discuss the current status QA/QC PNL data.
- ◆ Worked on picking new tops from PNL wells from reservoir to surface.
- Discussed plans to track monthly CO<sub>2</sub> volumes for Bell Creek.
- Worked on retrieving injection and production data from Denbury using oil field manager (OFM) software.
- Held Bell Creek project update meetings on July 24 and September 13, 2013. Topics discussed included upcoming activities and key dates, surface and near-surface MVA update, seismic update, outcrop field trip, PNL, documentary update, and upcoming deliverables.
- Continued efforts on the **Fox Hills groundwater-monitoring wells** (05-04 and 33-12), including the following:
  - ◆ Archived most recent Fox Hills field data as well as compiled all analytical Fox Hills monitoring well data for June 2013.
  - ◆ Reviewed water well logs received from WW Drilling, LLC, and Denbury.
  - ◆ Reviewed results from the June 2013 sampling of the two groundwater monitoring wells (Energy Labs). The results look “normal.”
  - ◆ Groundwaters in both wells (05-04 and 33-12) are showing consistency in quality with time.
  - ◆ Groundwater temperatures in both wells are consistent.
  - ◆ Detected no dissolved CO<sub>2</sub> in groundwater from either well (since onset of monitoring in April 2013).
- With regard to **site sampling** activities:
  - ◆ Compiled analysis of the most recent (June 2013) soil gas-sampling data from the handheld field meters as well as the field and laboratory gas chromatograph analyses.
  - ◆ Traveled to the Bell Creek Field on September 10–13, 2013, and collected replicate soil gas samples at 56-09 which showed anomalous readings (repeat analysis indicated anomalies were from natural processes occurring in the vadose zone and not related to fluids injected as part of EOR).
  - ◆ Discussed water-sampling results with landowners.
  - ◆ Made plans to collect additional landowner water samples in October 2013.
  - ◆ Completed the July 2013 sampling of the soil gas profile stations/interspaced wells on July 31, 2013.
  - ◆ Completed the August 2013 sampling of the profile stations/interspaced locations and all of Phase 1 on August 29, 2013.



- ◆ Completed on September 4, 2013, an outreach time line for all landowner contacts since the inception of the Bell Creek project.
  - ◆ Began preparations for the 2013 annual soil gas- and water-sampling event scheduled to begin September 30, 2013.
- With regard to the **quarterly summary of monitoring operations** during the injection phase at the Bell Creek site:
  - Continuous downhole injection monitoring since May 22, 2013, including:
    - ◆ Pressure in two lobes of the Bell Creek sands.
    - ◆ Pressure in overlying zone.
    - ◆ Continuous distributed temperature.
    - ◆ Download of PDM data from 05-06 OW well on September 25–27, 2013.
    - ◆ Continued analysis of data.
  - PNL
    - ◆ Acquisition of first repeat PNL log in 05-06 OW on August 27, 2013.
    - ◆ Tentatively planning acquisition of three PNL logs in the 05-05, 05-07, and 05-01 injection wells and a spinner production log in 05-01 by October 20, 2013.
    - ◆ Held PNL review and operational planning meeting with Schlumberger, Denbury, and EERC personnel on September 24, 2013.
  - Conducted monthly soil gas sampling at select well locations, soil gas profile stations, and water samples at Fox Hills monitoring wells, including:
    - ◆ 96 soil gas samples (July 31, 2013) and two Fox Hills groundwater-monitoring well samples.
    - ◆ 125 soil gas samples (August 27–28, 2013) and two Fox Hills groundwater monitoring well samples (August 27, 2013).
    - ◆ Analysis under way.
  - Collected annual first full-repeat near-surface operational monitoring survey for soil gas and water samples. This effort was coordinated concurrently with the monthly September event for sampling soil gas at selected well locations, soil gas profile stations, and water at the Fox Hills groundwater monitoring wells (September 29 – October 6, 2013), including:
    - ◆ Approximately 300 soil gas samples.
    - ◆ 22 water samples.
    - ◆ Analysis under way.
  - Continued passive seismic monitoring since May 22, 2013, from 04-03 OW permanent geophone array.
- Continued **Fort Nelson** site activities, including the following:
  - Continued review of Spectra’s comments on the Fort Nelson Test Site – Simulation Report (D67, originally submitted September 2011). Comments were received February 4–7, 2013, and revisions are under way.
  - Developed a draft comprehensive report that summarizes all of the technical activities that have been conducted as part of the PCOR Partnership Program through 2012. This report includes summary discussions of the project, geologic characterization and geomodeling, risk assessment, and MVA.
  - Discussed the comprehensive summary report with the CETER Group, Inc. (CETER Group) at the EERC on July 15 and 16, 2013.

- Initiated development of a comprehensive MVA planning document. The document will include surface, shallow subsurface, and deep subsurface monitoring plans for both potential injection scenarios that have been the subject of previous modeling and risk assessment efforts. This document is also being developed in such a way so that it is compliant with the Canadian Standards Association (CSA) Standards for the Geological Storage of Carbon Dioxide.

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

- The first Bell Creek full-field operational monitoring soil gas- and water-sampling trip was interrupted because of a severe winter storm (70% complete). Remaining samples will be collected in early November (tentatively week of November 11) to complete the remaining 30% of the first full-field operational monitoring soil gas and water sampling.
- One zone (~50 feet) of the repeat Bell Creek carbon/oxygen ratio PNL log on the 05-06 OW well must be relogged because of issues during the acquisition of the log. This zone will be relogged by the service provider at no cost.

#### **Task 10 – Site Closure**

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

#### **Task 11 – Postinjection Monitoring and Modeling**

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

#### **Task 12 – Project Assessment**

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

- Submitted D57, the annual assessment report, on December 28, 2012.

#### **Task 13 – Project Management**

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

- Submitted for NETL review the draft June monthly update on July 16, 2013.
- Submitted for NETL review the draft July monthly update on August 15, 2013.
- Submitted the April–June quarterly progress report on July 31, 2013.
- Followed up on June 24, 2013, with NETL on a draft Fossil Energy Techline announcing injection at the Bell Creek Field.
- Attended Denbury’s Bell Creek Site Commissioning Ceremony on August 16, 2013 (Figure 11).
- Attended the 5th Annual Regulatory Roundup in Deadwood, South Dakota, and presented an overview of the PCOR Partnership Program on July 30, 2013.

- Provided photos and captions to NETL from 2003 to present for use in an RCSP timeline to be presented at the DOE Review Meeting.
- Participated in several meetings (prior to the **DOE Review Meeting**) on August 19, 2013, including:
  - Presented at the Joint U.S.–Norway Workshop on “CO<sub>2</sub> Storage Demonstration Projects: The Value of Monitoring Technology.”
  - Participated in a meeting with NETL personnel to review the PDM video and discuss PCOR Partnership objectives.
  - Attended the RCSP WWG Open House.
  - Participated in the RCSP WWG annual meeting.
- Attended the DOE Review Meeting on August 20–22, 2013, and participated in several plenary RCSP panel sessions, including:
  - “Onshore Monitoring, Verification, Accounting, and Assessment Lessons Learned.”
  - “Overall Key Lessons Learned during the Last 10 years and Looking to the Future of CCS.”
  - “Partnering with Industry for Large- and Small-Scale CCS Projects.”
- Hosted an exhibit booth and distributed PCOR Partnership outreach materials during the DOE Review Meeting held August 20–22, 2013.



Figure 11. Steve Bullock, Montana Governor, and Phil Rykhoek, Denbury CEO, with the ceremonial scissors at the Bell Creek Commissioning Ceremony on August 16, 2013 (photo courtesy of Denbury Resources, Inc.).

- Participated in conference calls with **BillyJack Consulting** on July 25, August 22, and September 19, 2013, and discussed plans for TAB activities and Canadian partner activities.
- Attended the **NDPC Annual Meeting** on September 16–18, 2013, in Grand Forks, North Dakota.
- Met with PTRC management on September 24, 2013, and discussed the Aquistore Project and related activities.
- Hosted a TAB meeting on September 24, 2013, and discussed a potential WebEx to review the presentation prepared for the expert review (excluding any TAB members that may be expert review panelists).
- With regard to the PCOR Partnership 2013 **Annual Membership Meeting** held September 25 and 26, in Minneapolis, Minnesota ([www.undeerc.org/Events/2011-2015/pcor13/](http://www.undeerc.org/Events/2011-2015/pcor13/)), the following activities were performed this reporting period:
  - The meeting attracted 88 attendees (Figure 12) representing 46 organizations from 15 states, the District of Columbia, and three Canadian provinces.
  - Presented “PCOR Partnership Program: Accomplishments and Path Forward.”
  - Displayed 16 posters (presented since the 2012 annual meeting) and three exhibit booths, where outreach materials and products were distributed.
  - Sent registered attendees an “everything you need to know” e-mail on September 18, 2013.
  - Prepared a hotel welcome letter with pertinent information.
  - Prepared the annual meeting program, including the agenda, speaker biographies, and special event sponsors.
  - Sent an e-mail on August 26, 2013, alerting PCOR Partnership members that the meeting hotel room block would end soon.
  - Sent an e-mail on August 19, 2013, alerting the PCOR partnership members that the preliminary agenda was updated and noting the featured speaker, i.e., FERC (Federal Energy Regulatory Commission) Commissioner Tony Clark.
  - Contacted speakers and partners regarding participation in the meeting.



Figure 12. Attendees at the PCOR Partnership 2013 Annual Membership Meeting held September 25 and 26, 2013, in Minneapolis, Minnesota.

- Prepared for the IEAGHG 2013 **Expert Review** of the RCSP's Initiative, including the following:
  - Submitted the draft project information form (PIF) for the Bell Creek field test to NETL on September 13, 2013.
  - Submitted the draft presentation to NETL on September 27, 2013.
  - Arranged travel for personnel to represent the PCOR Partnership Program on November 14, 2013, in Washington, D.C.
- Participated in a NETL technology managers' conference call on July 11, 2013, regarding upcoming meetings and new methodologies.
- Participated on August 2 and September 17, 2013, in conference calls with NETL and PCOR Partnership personnel regarding storage capacity estimates in depleted oil and gas reservoirs and shale formations.
- Discussed additional references for a depleted oil and gas reservoir production-based methodology.
- Sent a letter to NETL, dated August 23, 2013, regarding the permanent geophone installation and baseline VSP acquisition cost overrun request for additional funding.
- Discussed several items with the NETL Project Manager, including the following: 1) IEAGHG expert review meeting; 2) EERC press release regarding Bell Creek injection initiation; 3) exhibit booth at the DOE Review Meeting; 4) the NETL-led conference call held July 11, 2013, regarding the DOE Review Meeting; and 5) status of the Fort Nelson project and potential associated SOPO (statement of project objectives) changes.
- Established new **milestones** in relation to project progress at the Bell Creek Field. The new milestones are listed in Table 6.
- Prepared Bell Creek-related slides on September 20, 2013, for inclusion into a presentation to be given by the NETL Sequestration Division Manager to the Assistant Secretary of Fossil Energy.
- Reviewed task budgets for the upcoming federal fiscal year.
- Discussed cost-share contributions and reporting in relation to the Bell Creek project.
- With regard to an update to the **programmatic risk management plan**:
  - Met with CETER Group consultants at the EERC on July 15 and 16, 2013, to discuss an update to the programmatic risk assessment.
  - Participated in programmatic risk assessment (the evaluation of the risk register) on September 5, 2013.
  - Discussed with CETER Group consultants on September 11, 2013, the programmatic risk assessment update and inclusion of information into the PIF.
- Conducted monthly **task leader meetings** on July 2, August 12, and September 3, 2013. Topics discussed included updates on the Bell Creek, Fort Nelson, Aquistore, and Basal Cambrian projects; upcoming TAB meetings; review of upcoming conferences and deliverables; and updates from each task leader present.
- Deliverables and milestones completed in July:
  - June monthly update
  - Task 4: D33 – Bell Creek Test Site – Preinjection Geochemical Report
  - Task 13: D58/D59: Quarterly Progress Report/Milestone Quarterly Report
  - Task 4: M12 – Bell Creek Test Site – Preinjection Geochemical Work Completed

**Table 6. Additional Bell Creek Project Milestones Added**

M No.	Task No.	Title	Due Date
M43	5.3	Bell Creek Test Site – First full-repeat sampling of the groundwater- and soil gas-monitoring program completed	December 31, 2013
M44	9	Bell Creek Test Site – First 3-D VSP repeat surveys completed	March 31, 2014
M45	9	Bell Creek Test Site – First full-repeat of PNL campaign completed	June 30, 2014
M46	9.1	Bell Creek Test Site – 1 year of injection completed	June 30, 2014
M47	2.6	Bell Creek Test Site 30-minute video broadcast	December 31, 2016

- Task 14: M23 – Monthly WWG conference call held
- Deliverables and milestones completed in August:
  - July monthly update
  - Task 4: D64 – Bell Creek Test Site – Site Characterization Report
  - Task 9: D66 – Bell Creek Test Site – Simulation Report (executive summary only)
- Deliverables and milestones completed in September:
  - Task 1: D1 – Review of Source Attributes
  - Task 2: D94 – Aquistore Project Fact Sheet
  - Task 2: D95 – Aquistore Project Poster
  - Task 3: D98 – Report – Findings, Recommendations, and Guidance of the CGS Task Force on Operational and Postoperational Liability
  - Task 7: D48 – Bell Creek Test Site – Procurement Plan and Agreement Report
  - Task 16: D90 – Report – Wellbore Evaluation of the Basal Cambrian System
  - Task 3: M38 – IOGCC Task Force Wrap-Up Meeting Held
  - Task 3: M39 – IOGCC Task Force Editing Subgroup Meeting Held
  - Task 14: M23 – Monthly WWG conference call held
  - Task 14: M24 – WWG Annual Meeting held
  - Task 15: M40 – Further Characterization of the Zama Acid Gas EOR, CO<sub>2</sub> Storage, and Monitoring Project Completed

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

- Continued discussions with Spectra regarding a path forward for the Fort Nelson project now that CO<sub>2</sub> injection will be significantly delayed.

#### **Task 14 – RCSP WWG Coordination**

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

- Continued efforts on the next water–CCS nexus-related fact sheet (D99-2, due October 31, 2013) focused on water-monitoring technologies.
- Held the monthly conference call on September 30, 2013.
- Provided draft fact sheet for WWG review on September 17, 2013.

- Distributed the July conference call notes on September 16, 2013.
- Continued a literature review in support of the methodologies document.
- Attended the Groundwater Protection Council Annual Forum held September 22–25, 2013, in St. Louis, Missouri, including topic sessions focused on water quality issues associated with oil and gas development, including the utility of preproduction baseline sampling, water use and risks associated with hydraulic fracturing, life cycle analysis of water used for hydrocarbon production, and risks associated with injection-derived induced seismicity. All of these activities share commonalities with concerns and issues associated with large-scale CCS operations.
- Hosted the WWG annual meeting on August 19, 2013, in Pittsburgh, Pennsylvania. Nine persons attended, and the following partnerships were represented: the Midwest Regional Carbon Sequestration Partnership (MRCSP), the Midwest Geologic Sequestration Consortium (MGSC), the Big Sky Carbon Sequestration Partnership, and the PCOR Partnership. The following items were discussed: the WWG mission statement, future products, fact sheet review, upcoming meetings, and upcoming calls.
- Hosted the WWG Open House on August 19, 2013, featuring a poster session by WWG members sharing individual and RCSP-sponsored research related to the nexus of CCS and water. Participants were asked to fill out a WWG outreach survey. A common concern identified from the surveys was the relationship between groundwater impacts, CCS, and Class VI permitting.
- NETL waived the requirement for an August conference call.
- Distributed the June conference call notes on July 29, 2013.
- Held the monthly conference call on July 25, 2013. Nine persons participated and reviewed plans for the WWG Open House and PCOR Partnership Annual Membership Meeting. Also discussed progress on the monitoring technologies fact sheet and shared regional partnership updates on water-related activities.
- With regard to the DOE Review Meeting, the following activities were performed:
  - Submitted an abstract for a poster entitled “Regional Carbon Sequestration Partnership Water Working Group” on July 3, 2013.
  - Received an acceptance notification for the poster on July 19, 2013.
  - Prepared a poster “teaser” slide.
  - Presented the poster on August 20, 2013 (Figure 13).

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 15 – Further Characterization of the Zama Acid Gas EOR, CO<sub>2</sub> Storage, and Monitoring Project**

Significant accomplishments for Task 15 for the reporting period included the following:

- Continued activities with regard to the Muskeg L pool, including the following:
  - Worked on structural modeling.



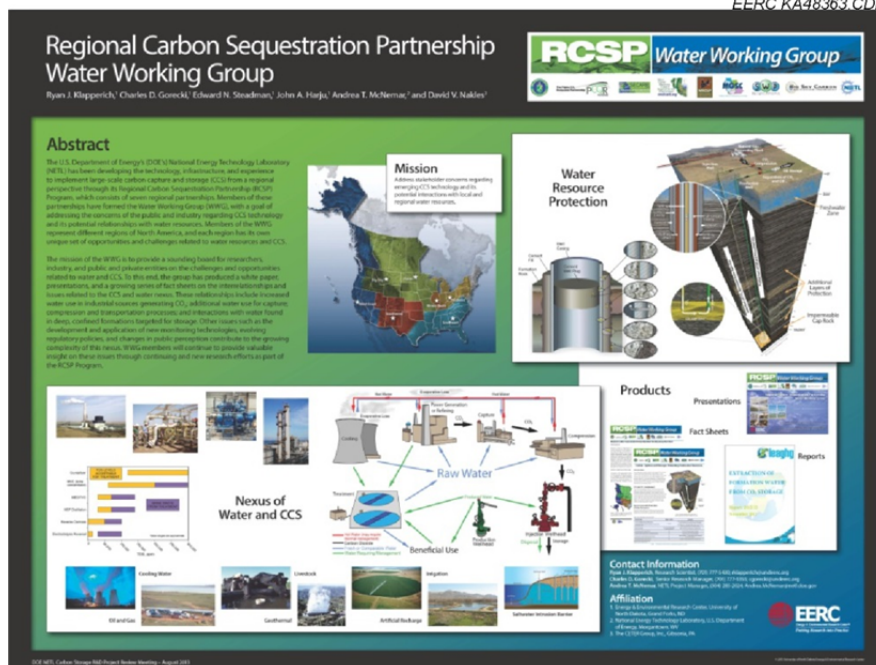


Figure 13. RCSP WWG poster presented at the WWG Open House and DOE Review Meeting (August 2013).

- Worked on history matching.
- Recomputed pressure and temperature properties.
- Worked on case design and analysis.
- Worked on case design and analysis for the G2G pool.
- Continued work on the Updated Regional Technology Implementation Plan for Zama (D86).
- Submitted for NETL review the milestone “Further Characterization of the Zama Acid Gas EOR, CO<sub>2</sub> Storage, and Monitoring Project Completed” (M40) on September 24, 2013.
- With regard to the DOE Review Meeting, the following activities were performed:
  - Submitted an abstract for a poster entitled “Acid Gas Injection for Enhanced Oil Recovery and Long-Term Storage in Zama Pinnacle Reefs” on July 3, 2013.
  - Received an acceptance notification for the poster on July 19, 2013.
  - Prepared a poster “teaser” slide.
  - Presented the poster on August 20, 2013.

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

- Requested an extension for D86 from September 30, 2013, to February 28, 2014. NETL approved the request on September 16, 2013.



## Task 16 – Characterization of the Basal Cambrian System

Significant accomplishments for Task 16 for the reporting period included the following:

- Submitted for NETL review a draft report entitled “Wellbore Evaluation of the Basal Cambrian System” (D90) on September 5, 2013.
- Presented a Basal Cambrian Project update via WebEx to the TAB members on August 23, 2013.
- Worked on a presentation entitled “Carbon Sequestration Case Study: Large-Scale Exploration in a Basal Saline System in Canada and the United States” for CMTC scheduled for October 21–23, 2013, in Alexandria, Virginia.
- Participated in conference call with Berkeley and Princeton Universities to discuss the path forward on 2-D and 3-D modeling.
- Prepared slides to send to Berkeley and Princeton based on EERC simulation activities.
- With regard to the DOE Review Meeting, the following activities were performed:
  - Submitted an abstract for a poster entitled “Large-Scale CO<sub>2</sub> Storage Exploration in a Basal Saline System in Canada and the United States” on July 3, 2013.
  - Received an acceptance notification for the poster on July 19, 2013.
  - Prepared a poster “teaser” slide.
  - Presented the poster on August 21, 2013.
- Began preparation of a presentation to be given at the North American Wellbore Integrity Workshop on October 16, 2013, in Denver, Colorado.
- Continued and completed work on eight additional injection scenarios by varying the rock compressibility and injection strategies to maximum CO<sub>2</sub> injection based on the 25 selected locations.
- Performed QA/QC on the freshwater boundary for all injection scenarios to account for any discrepancies or issues on results.
- Continued efforts on documenting all activities regarding the modeling and simulation work for inclusion in the final report (D92, due March 2014).
- With regard to the **Aquistore** project (20 core samples) mineralogical characterization:
  - Completed thin-section analyses.
  - Placed samples in the humidity chamber, prepped for grain density and porosity measurements.
  - Completed porosity measurements.
  - Prepped core plugs for permeability and geomechanical testing.
  - Performed petrophysical analyses as follows:
    - ♦ Selected 11 samples (of the original 20 core plugs), including thin sections, for initial SEM morphological characterization.
    - ♦ Performed x-ray diffraction (XRD) on three of the 11 samples to verify findings.
    - ♦ Added an additional sample for XRD analysis based on modeler request.
    - ♦ Began assembly of mineralogical results and interpretations.
    - ♦ Held an in-house meeting to discuss results of petrophysical testing.
      - Marginal evidence of cementation based on close grain contact with little mineral component in between.
      - Expected that dolomite is the cementing phase, when present.

- Performed gas permeability testing:
  - ◆ Initiated testing on 11 of the 20 samples.
  - ◆ Expanded gas permeability testing to all 20 samples (instead of originally selected 11 samples) for use in modeling efforts.
- Provided all porosity and gas permeability data to EERC modelers and PTRC personnel.
- Performed water permeability testing:
  - ◆ Completed water permeability testing on nine of the originally selected 11 samples (two cores were reserved for relative permeability testing).
  - ◆ Expanded water permeability testing to include remaining nine sample plugs.
  - ◆ Performed QA/QC on water permeability results through comparison with outside lab results.
- Determined pore pressure measurement and Klinkenberg correlation factor on all samples, where possible.
- Prepared an updated progress report including water permeability testing and provided to PTRC.
- Planned for relative permeability testing:
  - ◆ Planned initiation date of testing is October 2013.
  - ◆ Selected two samples (based on gas permeability results) for testing.
- Continued preparation of data sheets for the samples and updating the report as additional data is collected and interpreted.

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.

### PHASE III COST STATUS

The approved BP4 (Modification No. 26) budget along with actual costs incurred and in-kind cost share reported is shown in Table 7. A spending plan for BP4 and actual incurred cost by quarter of cash funds for BP4 are provided in Figure 14 and Table 8.

**Table 7. Phase III Budget – BP4**

Organization	Approved Budget, \$	Actual Costs Incurred, \$
DOE Share – Cash	59,400,262	37,908,995
Nonfederal Share – Cash	2,411,971	2,685,376
Nonfederal Share – In-Kind	30,279,844	24,986,073
Total	92,092,077	65,580,444

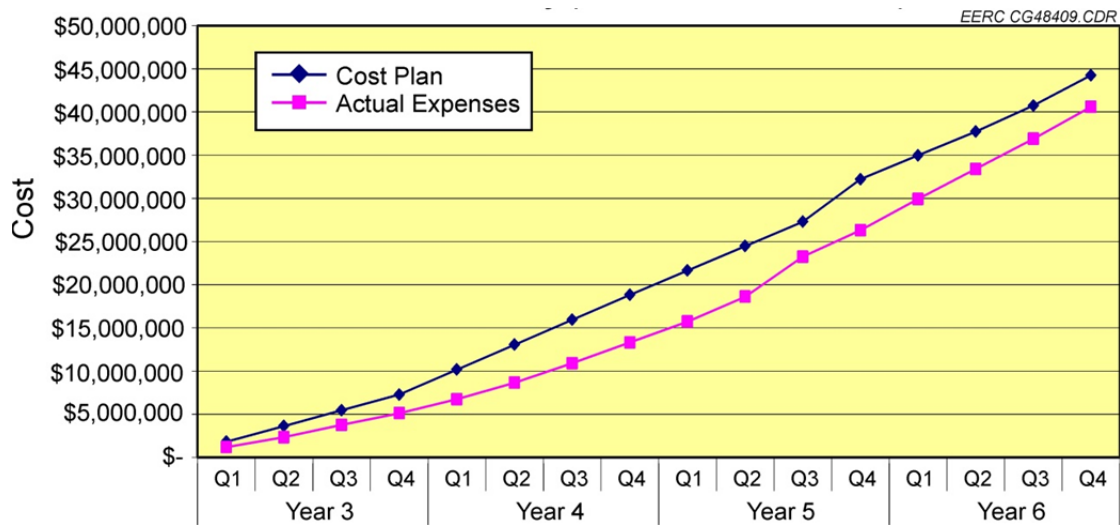


Figure 14. PCOR Partnership Phase III, BP4, Years 3–6 funding (cash only).

### PHASE III SCHEDULE STATUS

Table 9 lists all deliverables and milestones by quarter, with completion dates, through the end of the reporting period (see Table 10 for the Gantt chart for BP4, Years 5 and 6).

**Table 8. BP4 – Years 3–6 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
<b>Baseline Cost Plan</b>																
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
<b>Actual Incurred Cost</b>																
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
<b>Variance</b>																
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
<b>Baseline Cost Plan</b>																
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
<b>Actual Incurred Cost</b>																
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
<b>Variance</b>																
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

**Table 9. Phase III Milestones and Deliverables**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 1 – Quarter 1 (October–December 2007)</b>		
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
<b>Year 1 – Quarter 2 (January–March 2008)</b>		
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
<b>Year 1 – Quarter 3 (April–June 2008)</b>		
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
<b>Year 1 – Quarter 4 (July–September 2008)</b>		
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
<b>Year 2 – Quarter 1 (October–December 2008)</b>		
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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 2 – Quarter 2 (January–March 2009)</b>		
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 <sub>2</sub> 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
<b>Year 2 – Quarter 3 (April–June 2009)</b>		
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
<b>Year 2 – Quarter 4 (July–September 2009)</b>		
M23: Task 14 – Monthly WWG Conference Call Held	N/A	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 1 – Permitting Review – One State and One Province	9/30/09	9/30/09
D9: Task 1 – Updated DSS	9/30/09	9/29/09
D47: Task 6 – 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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 3 – Quarter 1 (October–December 2009)</b>		
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
<b>Year 3 – Quarter 2 (January–March 2010)</b>		
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
<b>Year 3 – Quarter 3 (April–June 2010)</b>		
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
<b>Year 3 – Quarter 4 (July–September 2010)</b>		
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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 4 – Quarter 1 (October–December 2010)</b>		
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
<b>Year 4 – Quarter 2 (January–March 2011)</b>		
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 <sub>2</sub> 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
<b>Year 4 – Quarter 3 (April–June 2011)</b>		
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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 4 – Quarter 3 (April–June 2011) (continued)</b>		
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
<b>Year 4 – Quarter 4 (July–September 2011)</b>		
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 <sup>+</sup>	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
<b>Year 5 – Quarter 1 (October–December 2011)</b>		
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

<sup>+</sup> Name change requested September 28, 2011, and approved October 3, 2011.

Continued . . .

**Table 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 5 – Quarter 2 (January–March 2012)</b>		
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
<b>Year 5 – Quarter 3 (April–June 2012)</b>		
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 <sub>2</sub> 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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 5 – Quarter 4 (July–September 2012)</b>		
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
<b>Year 6 – Quarter 1 (October–December 2012)</b>		
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
M37: Task 3 – IOGCC Task Force Subgroup Meeting 1 Held	12/31/12	12/21/12
<b>Year 6 – Quarter 2 (January–March 2013)</b>		
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 <sub>2</sub> 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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 6 – Quarter 3 (April–June 2013)</b>		
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 8 – Bell Creek Test Site – CO <sub>2</sub> 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 CGS Task Force	6/30/13	6/20/13 – sent 6/28/13
<b>Year 6 – Quarter 4 (July–September 2013)</b>		
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 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 6 – Quarter 4 (July–September 2013) (continued)</b>		
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 <sub>2</sub> Storage, and Monitoring Project Completed	9/30/13	9/24/13
<b>Year 7 – Quarter 1 (October–December 2013)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/13	
D42: Task 5 – Bell Creek Test Site – Injection Experimental Design Package	10/31/13	
D99: Task 14 – Water/CCS Nexus-Related Fact Sheet	10/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	10/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	11/30/13	
D41: Fort Nelson Test Site – Geochemical Report (Update 1)	12/15/13	
D57: Task 12 – Project Assessment Annual Report	12/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	12/31/13	
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	
<b>Year 7 – Quarter 2 (January–March 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/14	
M23: Task 14 – Monthly WWG Conference Call Held	1/31/14	
M41: Task 6 – Decision to Incorporate Ramgen Compression Technology into Bell Creek Project	1/31/14	

Continued . . .

**Table 9. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 7 – Quarter 2 (January–March 2014) (continued)</b>		
D86: Task 15 – Updated Regional Implementation Plan for Zama	2/28/14	
M23: Task 14 – Monthly WWG Conference Call Held	2/28/14	
D24: Task 2 – PCOR Partnership Region Sequestration General Poster (update)	3/31/14	
D36: Task 4 – Bell Creek Test Site – Wellbore Leakage Final Report	3/31/14	
D92: Task 16 – Report – Storage Capacity and Regional Implications for Large-Scale Storage in the Basal Cambrian System	3/31/14	
D93: Task 1 – Geological Modeling and Simulation Report for the Aquistore Project	6/30/13	
D96: Task 4 – Bell Creek Test Site – 3-D Seismic and Characterization Report	6/30/13	
M23: Task 14 – Monthly WWG Conference Call Held	3/31/14	
M36: Task 13 – Annual Advisory Board Meeting Scheduled	3/31/14	
M44: Task 9 – Bell Creek Test Site – First 3-D VSP Repeat Surveys Completed	3/31/14	
<b>Year 7 – Quarter 3 (April–June 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/14	
M23: Task 14 – Monthly WWG Conference Call Held	4/30/14	
M25: Task 9 – Fort Nelson Test Site – CO <sub>2</sub> Injection Initiated	4/30/14	
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	5/31/14	
D79: Task 14 – Water Resource Estimation Methodology Document (update)	5/31/14	
M23: Task 14 – Monthly WWG Conference Call Held	5/31/14	
D44: Task 5 – Bell Creek Test Site – Drilling and Completion Activities Report	6/30/14	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/14	
M45: Task 9 – Bell Creek Test Site – First Full-Repeat of Pulsed Neutron Logging Campaign Completed	6/30/14	
M46: Task 9 – Bell Creek Test Site – 1 Year of Injection Completed	6/30/14	

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**Table 9. Phase III Milestones and Deliverables (continued)**

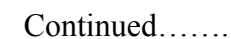
<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 7 – Quarter 4 (July–September 2014)</b>		
D68: Task 4 – Fort Nelson Test Site – Best Practices Manual – Site Characterization	7/15/14	
D13: Task 2 – Public Site Updates	7/31/14	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/14	
M23: Task 14 – Monthly WWG Conference Call Held	7/31/14	
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/14	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/14	
D1: Task 1 – Review of Source Attributes	9/30/14	
D7: Task 1 – Third Target Area Completed	9/30/14	
D35: Task 4 – Bell Creek Test Site – Best Practices Manual – Site Characterization	9/30/14	
D83: Task 6 – Report – Integration of Advanced Compression Technology with CO <sub>2</sub> Storage	9/30/14	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/14	

Table 10. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart

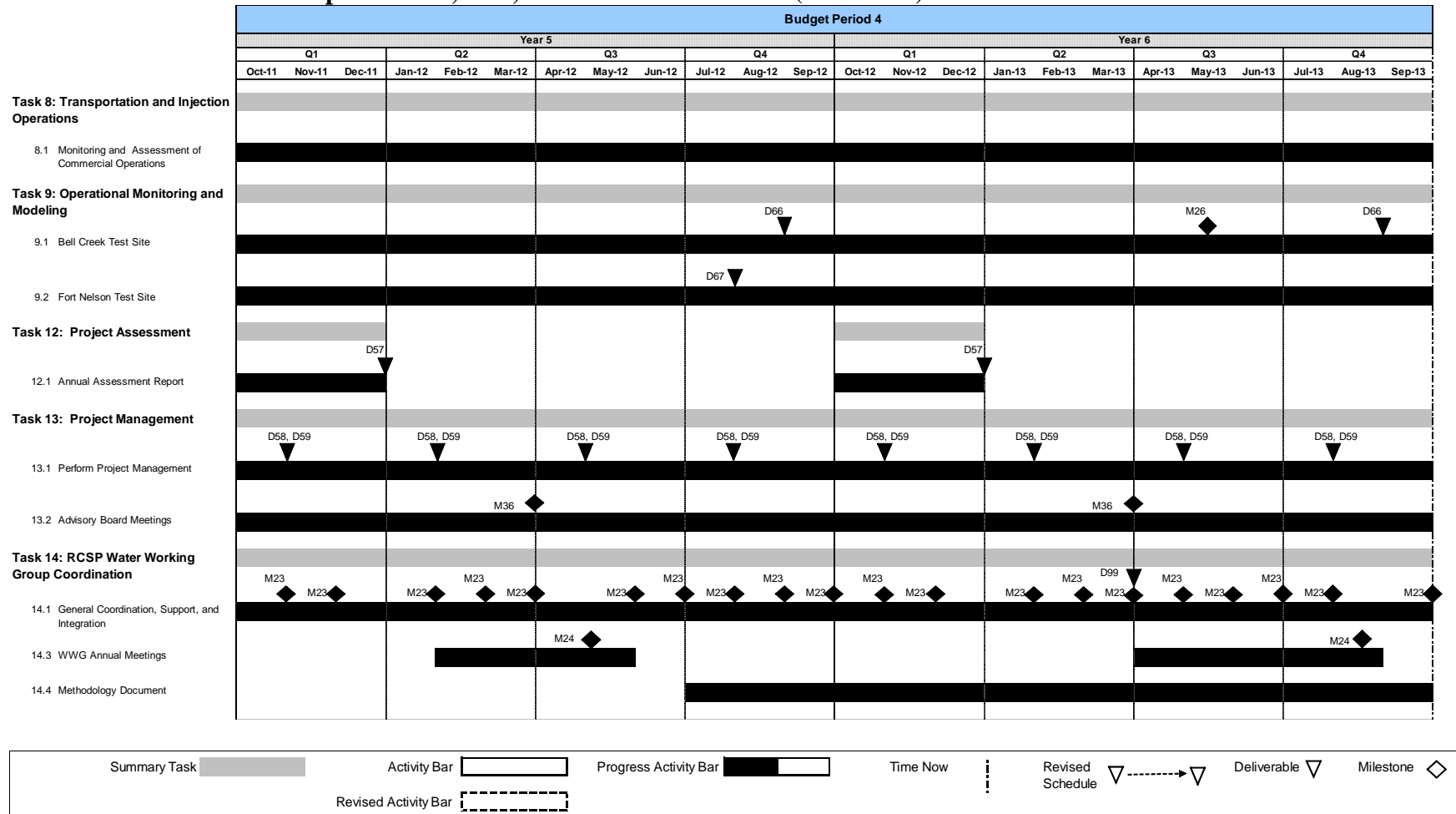


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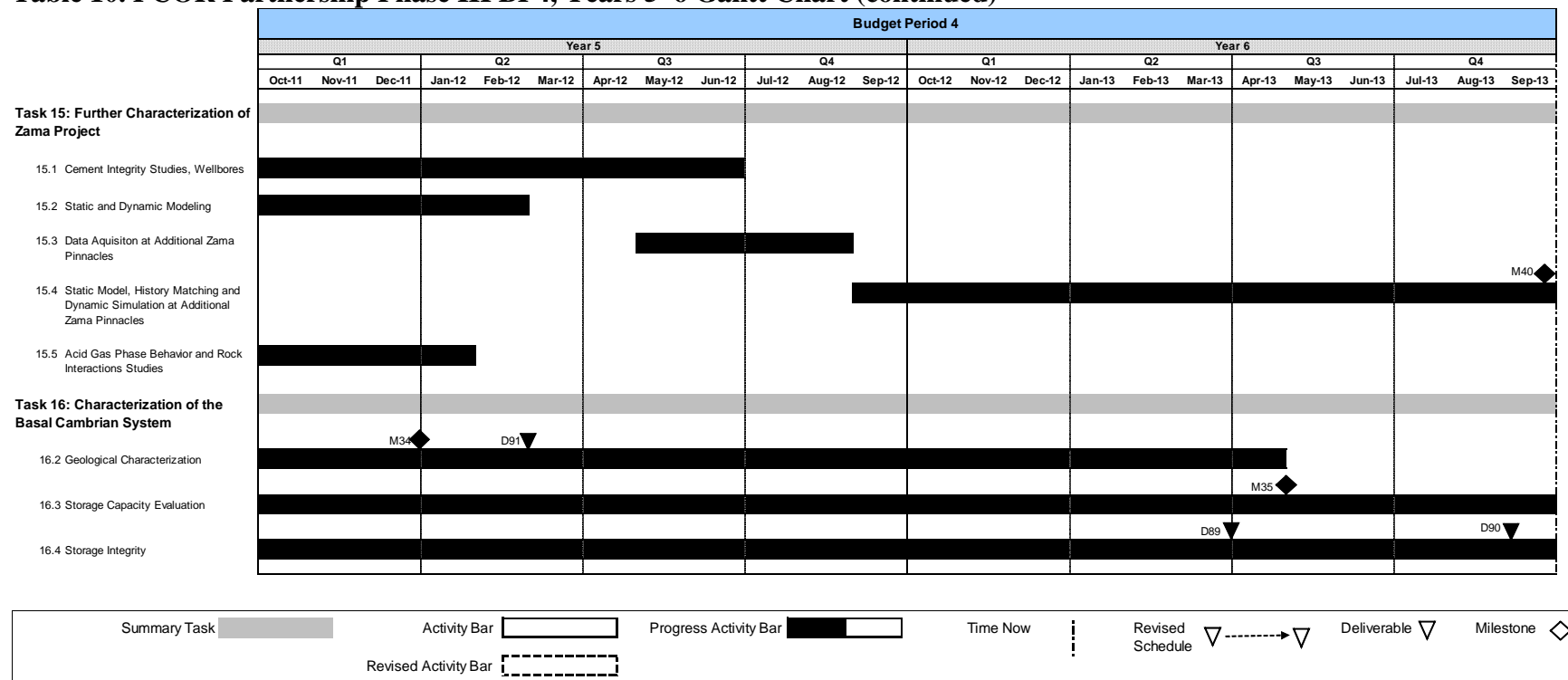




**Table 10. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart (continued)**



**Table 10. PCOR Partnership Phase III BP4, Years 5–6 Gantt Chart (continued)**



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**Table 10. PCOR Partnership Phase III BP4, Years 5–6 Gantt Chart (continued)**

Key for Deliverables (D) ▼		Key for Milestones (M) ◆
D1 Review of Source Attributes	D66 BC Test Site – Simulation Report	M10 BC Test Site – Wellbore Leakage Data Collection Completed
D5 Second Target Area Completed	D67 FN Test Site – Simulation Report	M12 BC Test Site – Preinjection Geochemical Work Completed
D6 Permitting Review – Update 1	D81 Regional Carbon Sequestration Atlas	M14 BC Test Site – Geological Characterization Data Collection Completed
D10 DPRS Update	D84 Report – A Phased Approach to Building Pipeline Network for CO <sub>2</sub> Transportation During CCS	M16 BC Test Site – Initiation of Production and Injection Simulations
D13 Public Site Updates	D89 Report – Geochemical Evaluation of the Basal Cambrian System	M23 Monthly WWG Conference Call Held
D14 General Phase III Fact Sheet	D90 Report – Wellbore Evaluation of the Basal Cambrian System	M24 WWG Annual Meeting Held
D15 BC Test Site Fact Sheet	D91 Report – Geological Characterization of the Basal Cambrian System in the Williston Basin	M26 BC Test Site – CO <sub>2</sub> Injection Initiated
D17 General Phase III Information PowerPoint Presentation	D93 Report – Geological Modeling and Simulation for the Aquistore Project	M27 BC Test Site – MVA Equipment Installation and Baseline MVA Activities Completed
D18 BC Test Site PowerPoint Presentation	D94 Aquistore Project Fact Sheet	M29 FN Test Site – Site Characterization Report Completed
D19 FN Test Site PowerPoint Presentation	D95 Aquistore Project Poster	M32 FN Test Site – Geochemical Report Completed
D32 BC Test Site – Geomechanical Report	D98 Report – Findings, Recommendations and Guidance of the GCS Task Force on Operational and Postoperational Liability	M34 Basal Cambrian Static Geological Model Completed
D33 BC Test Site – Preinjection Geochemical Report	D99 Water/CCS Nexus Related Fact Sheet	M35 Basal Cambrian Dynamic Capacity Estimation Completed
D41 FN Test Site – Geochemical Report		M36 Annual Advisory Board Meeting Scheduled
D43 BC Test Site – Monitoring Experimental Design Package		M37 Subgroup Meetings Held
D48 BC Test Site – Procurement Plan and Agreement Report		M38 Task Force Wrap-Up Meeting Held
D57 Project Assessment Annual Report		M39 Editing Subgroup Meeting Held
D58 Quarterly Progress Report		M40 Further Characterization of the Zama Acid Gas EOR, CO <sub>2</sub> Storage, and Monitoring Project Completed
D59 Milestone Quarterly Report		M42 Findings and Recommendations of the Operational and Postoperational Liability Subgroups Presented to the GCS Task Force
D64 BC Test Site – Site Characterization Report		
D65 FN Test Site – Site Characterization Report		

## PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

During the reporting period, six abstracts were accepted for oral presentation; five abstracts were accepted for poster presentation; and 20 presentations (11 oral and nine poster) were given at 23 different meetings/conferences. In addition, a quarterly progress report, 11 deliverables (ten draft and one approved), and ten milestones (four draft and six approved) were completed.

### Abstracts

#### *Submitted*

Bosshart, N.W., Braunberger, J.D., Gorecki, C.D., and Steadman, E.N., 2013, Using multiple-point statistics in the modeling of a Winnipegosis Formation pinnacle reef for enhanced oil recovery and CO<sub>2</sub> storage applications [abs.]: American Association of Petroleum Geologists Annual Convention and Exhibition 2014, Houston, Texas, April 6–9, 2014.

#### *Submitted and Accepted for Oral Presentation*

Burnison, S.A., Ditty, P., Gorecki, C.D., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2013, Integrated geophysical monitoring program to study flood performance and incidental CO<sub>2</sub> storage associated with a CO<sub>2</sub> EOR project in the Bell Creek Oil Field [abs.]: American Geophysical Union Fall Meeting, San Francisco, California, December 9–13, 2013.

Dotzenrod, N.W., Braunberger, J.R., and Gorecki, C.D., 2013, Geospatial workflow optimization using ModelBuilder for visualizing subsurface CO<sub>2</sub> plume footprint predictions derived from numerical simulation cases [abs.]: North Dakota GIS Users Conference, Grand Forks, North Dakota, September 10–12, 2013.

#### *Submitted and Accepted for Poster Presentation*

Daly, D.J., Crocker, C.R., Crossland, J.L., Gorecki, C.D., and Steadman, E.N., 2013, PCOR Partnership outreach—a decade of achievement [abs.]: Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Gao, P., Gorecki, C.D., Braunberger, J.R., Shah, J., Klenner, R.C.L., Steadman, E.N., and Harju, J.A., 2013, Acid gas injection for enhanced oil recovery and long-term storage in Zama pinnacle reefs [abs.]: Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Klapperich, R.J., Gorecki, C.D., Steadman, E.N., Harju, J.A., McNemar, A.N., and Nakles, D.V., 2013, Regional Carbon Sequestration Partnership Water Working Group [abs.]: Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Liu, G., Peck, W.D., Braunberger, J.R., Klenner, R.C.L., Gorecki, C.D., and Steadman, E.N., 2013, Large-scale CO<sub>2</sub> storage exploration in a basal saline system in Canada and the United

States [abs.]: Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

***Accepted for Oral Presentation***

Hamling, J.A., and Gorecki, C.D., 2013, Characterization and time-lapse monitoring of a combined CO<sub>2</sub> EOR and CO<sub>2</sub> storage project at the Bell Creek oil field utilizing pulsed neutron well logging [abs.]: Carbon Management Technology Conference, Alexandria, Virginia, October 21–23, 2013.

Liu, G., Peck, W.D., Braunberger, J.R., Klenner, R.C.L., Gorecki, C.D., and Steadman, E.N., 2013, Carbon sequestration case study—large-scale exploration in a basal saline system in Canada and the United States [abs.]: Carbon Management Technology Conference, Alexandria, Virginia, October 21–23, 2013.

Klapperich, R.J., Gorecki, C.D., Sorensen, J.A., Steadman, E.N., Harju, J.A., McNemar, A.T., and Nakles, D.V., 2013, Regional Carbon Sequestration Partnership Water Working Group white paper on the nexus of water and carbon capture and storage [abs.]: Carbon Management Technology Conference, Alexandria, Virginia, October 21–23, 2013.

Peck, W.D., Steadman, E.N., Harju, J.A., Gorecki, C.D., Botnen, L.S., Daly, D.J., Jensen, M.D., Sorensen, J.A., Smith, S.A., Hamling, J.A., Klapperich, R.J., and Anagnost, K.K., 2013, The Plains CO<sub>2</sub> Reduction (PCOR) Partnership—a Regional Carbon Sequestration Partnership in the interior plains of North America [abs.]: EUEC 2014: Energy, Utility & Environment Conference, Phoenix, Arizona, February 3–5, 2014.

***Accepted for Poster Presentation***

Hamling, J.A.; Stepan, D.J., Kalenze, N.S., and Klapperich, R.J., 2013, Baseline soil gas monitoring at the Bell Creek combined CO<sub>2</sub> EOR and CO<sub>2</sub> storage project [abs.]: Carbon Management Technology Conference, Alexandria, Virginia, October 21–23, 2013.

***Rejected for Presentation***

Gao, P., Gorecki, C.D., Braunberger, J.R., Shah, J., Steadman, E.N., and Harju, J.A., 2013, Acid gas injection for enhanced oil recovery and long-term storage in Devonian-aged pinnacle reefs [abs.]: International Petroleum Technology Conference (IPTC), Doha, Qatar, January 20–22, 2014.

**Presentations**

Dotzenrod, N.W., Braunberger, J.R., and Gorecki, C.D., 2013, Geospatial workflow optimization using ModelBuilder for visualizing subsurface CO<sub>2</sub> plume footprint predictions derived from numerical simulation cases: Presented at the North Dakota GIS Users Conference, Grand Forks, North Dakota, September 10–12, 2013.

Gorecki, C.D., 2013, Overview of the PCOR Partnership Program: Presented at the Plains CO<sub>2</sub> Reduction (PCOR) Partnership Regulatory Meeting, Deadwood, South Dakota, July 30, 2013.

Gorecki, C.D., 2013, PCOR Partnership Program—accomplishments and path forward: Presented at the PCOR Partnership Annual Membership Meeting, Minneapolis, Minnesota, September 25–26, 2013.

Gorecki, C.D., 2013, PCOR Partnership’s approach to MVA for CO<sub>2</sub> EOR and storage projects in remote locations: Presented at the Joint U.S.–Norway Workshop on CO<sub>2</sub> Storage Demonstration Projects: The Value of Monitoring Technology, Pittsburgh, Pennsylvania, August 19, 2013.

Gorecki, C.D., 2013, PCOR Partnership’s approach to MVA for CO<sub>2</sub> EOR projects: Presentation and panel discussion for Onshore Monitoring, Verification, Accounting, and Assessment: Lessons Learned at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Gorecki, C.D., 2013, PCOR Partnership Technical Advisory Board (TAB) side meeting: Presented at the Plains CO<sub>2</sub> Reduction (PCOR) Partnership Technical Advisory Board (TAB) Meeting, Minneapolis, Minnesota, Sept 24, 2013.

Gorecki, C.D., and Harju, J.A., 2013, PCOR Partnership – partnering with industry: Presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Klapperich, R.J., 2013, RCSP Water Working Group meeting: Presented at the Regional Carbon Sequestration Partnership Water Working Group annual meeting, Pittsburgh, Pennsylvania, August 19, 2013.

Peck, W.D., 2013, Basal Cambrian project update: Presented via WebEx to the PCOR Partnership Technical Advisory Board, Grand Forks, ND, August 23, 2013.

Sorensen, J.A., Peck, W.D., Smith, S.A., Gorecki, C.D., and Steadman, E.N., 2013, The role of the Plains CO<sub>2</sub> Reduction (PCOR) Partnership in the Aquistore Project: Presented at the Aquistore Annual Sponsors’ Meeting, Regina, Saskatchewan, July 12, 2013.

Steadman, E.N., 2013, Lessons learned through RCSP activities – Plains CO<sub>2</sub> Reduction (PCOR) Partnership: Presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

### **Poster Presentations**

Daly, D.J., Crocker, C.R., Crossland, J.L., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, PCOR Partnership outreach—a decade of achievement: Poster presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Gao, P., Gorecki, C.D., Braunberger, J.R., Shah, J., Klenner, R.C.L., Steadman, E.N., and Harju, J.A., 2013, Acid gas injection for enhanced oil recovery and long-term storage in Zama pinnacle reefs: Poster presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Grove, M.M., 2013, Bell Creek CO<sub>2</sub> Enhanced Oil Recovery Project: Poster presented at the Bell Creek CO<sub>2</sub> Enhanced Oil Recovery Project Commissioning Event, Bell Creek, Montana, August 16, 2013.

Hamling, J.A., 2013, Baseline MVA at the Bell Creek CO<sub>2</sub> enhanced oil recovery project: Poster presented at the IEAGHG Combined Monitoring and Environmental Research Network Meeting, Canberra, Australia, August 27–30, 2013.

Klapperich, R.J., Gorecki, C.D., Steadman, E.N., Harju, J.A., McNemar, A.T., and Nakles, D.V., 2013, Regional Carbon Sequestration Partnership Water Working Group: Poster presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Liu, G., Peck, W.D., Braunberger, J.R., Klenner, R.C.L., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Large-scale CO<sub>2</sub> storage exploration in a basal saline system in Canada and the United States: Poster presented at the Carbon Storage R&D Project Review Meeting, Pittsburgh, Pennsylvania, August 20–22, 2013.

Peck, W.D., 2013, Bell Creek unit CO<sub>2</sub> EOR process flow diagram: Poster presented at the Bell Creek CO<sub>2</sub> Enhanced Oil Recovery Project Commissioning Event, Bell Creek, Montana, August 16, 2013.

### **Deliverables/Milestones**

#### ***Draft***

Anagnost, K.K., Harju, J.A., and Steadman, E.N., 2013, Bell Creek test site—carbon dioxide (CO<sub>2</sub>) procurement efforts for a large-scale CO<sub>2</sub> storage and CO<sub>2</sub> enhanced oil recovery project: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 7 Deliverable D48 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Bengal, L.E., Bliss, K., and Connors, K., 2013, Guidance for states and provinces on operational and post-operational liability: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 3 Deliverable D98 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

Botnen, L.S., Gorecki, C.D., and Steadman, E.N., 2013, Permitting review—update 1: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 3 Deliverable D6 for U.S.



Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Botnen, L.S., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, IOGCC Task Force editing subgroup meeting held: Plains CO<sub>2</sub> Reduction (PCOR) Partnership draft Phase III Task 3 Milestone M39 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Botnen, L.S., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, IOGCC Task Force wrap-up meeting held: Plains CO<sub>2</sub> Reduction (PCOR) Partnership draft Phase III Task 3 Milestone M38 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Braunberger, J.R., Pu, H., Gorecki, C.D., Bailey, T.P., Bremer, J.M., Peck, W.D., Gao, P., Ayash, S.C., Liu, S.C., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2013, Bell Creek test site—simulation report: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 9 Deliverable D66 executive summary for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

Daly, D.J., Crocker, C.R., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Aquistore—demonstrating carbon storage: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 2 Deliverable D95 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Daly, D.J., Crocker, C.R., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, PCOR Partnership Role in the Aquistore Project: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 2 Deliverable D94 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Gao, P., Ayash, S.C., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Further characterization of Zama acid gas EOR, CO<sub>2</sub> storage, and monitoring project completed: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 15 Milestone M40 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Glazewski, K.A., Hamling, J.A., Peck, W.D., Doll, T.E., Laumb, J.D., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Wellbore evaluation of the basal Cambrian system: Plains CO<sub>2</sub> Reduction (PCOR) Partnership draft Phase III Task 16 Deliverable D90 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-

05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

Jensen, M.D., Haley, J.D., Peck, W.D., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Review of source attributes: Plains CO<sub>2</sub> Reduction (PCOR) Partnership draft Phase III Task 1 Deliverable D1 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, September.

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<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 4 Deliverable D64 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

Kurz, B.A., Heebink, L.V., Eylands, K.E., Smith, S.A., Hamling, J.A., Klapperich, R.J., Thompson, J.S., Stepan, D.J., Botnen, B.W., Pu, H., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Bell Creek test site—preinjection geochemical report: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III draft Task 4 Deliverable D33 Milestone M12 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, July.

### *Approved*

Ayash, S.C., Gorecki, C.D., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2013, Bell Creek test site—geological characterization data collection completed: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 4 Milestone M14 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-07, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

Ayash, S.C., Gorecki, C.D., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2013, Technical Advisory Board meeting scheduled: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 13 Milestone M36 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-09, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Botnen, L.S., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Findings and recommendations of the operational and postoperational subgroups presented to the CGS Task Force: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 3 Milestone M42 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-04, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Botnen, L.S., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, IOGCC Task Force subgroup Meeting 2 held: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 3 Milestone M37 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-06, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Daly, D.J., Crocker, C.R., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Plains CO<sub>2</sub> Reduction (PCOR) Partnership general audience CO<sub>2</sub> sequestration outreach PowerPoint: Phase III Task 2 Deliverable D17 (update 4) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, May.

Hamling, J.A., Kalenze, N.S., Klapperich, R.J., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Bell Creek test site—MVA equipment installation and baseline MVA activities completed: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 5 Milestone M27 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-03, Grand Forks, North Dakota, Energy & Environmental Research Center, May.

Liu, G., Peck, W.D., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2013, Basal Cambrian dynamic capacity estimation completed: Plains CO<sub>2</sub> Reduction (PCOR) Partnership Phase III Task 16 Milestone M35 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2013-EERC-07-05, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

## **Progress Reports**

### ***Monthlies***

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Botnen, L.S., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Harju, J.A., Anagnost, K.K., and Klapperich, R.J., 2013, Plains CO<sub>2</sub> Reduction (PCOR) Partnership: Phase III monthly report (June 1–30, 2013) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, July.

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Botnen, L.S., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Harju, J.A., Anagnost, K.K., and Klapperich, R.J., 2013, Plains CO<sub>2</sub> Reduction (PCOR) Partnership: Phase III monthly report (July 1–31, 2013) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

### *Quarterlies*

Gorecki, C.D., Harju, J.A., Steadman, E.N., Romuld, L., Sorensen, J.A., Botnen, L.S., Daly, D.J., Hamling, J.A., Jensen, M.D., Peck, W.D., Klapperich, R.J., Anagnost, K.K., and Votava, T.J., 2013, Plains CO<sub>2</sub> Reduction Partnership Phase III: Task 13 Deliverable D58/59 quarterly technical progress report (April 1 – June 30, 2013) 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, July.

### **Meeting Minutes**

Klapperich, R.J., 2013, Minutes—Regional Carbon Sequestration Partnership Water Working Group conference call: June 27, 2013.

Klapperich, R.J., 2013, Minutes—Regional Carbon Sequestration Partnership Water Working Group conference call: July 25, 2013.

### **MEETINGS/TRAVEL**

Representatives from the PCOR Partnership attended and/or participated in the following 23 meetings/conferences and twelve project management site trips in this reporting period:

- July 1–3, 2013: Toured the Hastings oil field and met with Denbury personnel near Pearland, Texas.
- July 7–11, 2013: Participated in the 2013 CO<sub>2</sub> Capture Technology Meeting in Pittsburgh, Pennsylvania.
- July 9–12, 2013: Attended the 7th Annual Wyoming CO<sub>2</sub> Conference in Casper, Wyoming.
- July 9–12, 2013: Participated in the Aquistore Risk Assessment Workshop and SERC meeting in Regina, Saskatchewan, Canada.
- July 16, 2013: Attended the WBI Energy Customer Meeting in Bismarck, North Dakota.
- July 23, 2013: Inspected the Phase II Lignite Field Validation Test site near Kenmare, North Dakota.
- July 29 – August 1, 2013: Performed oil and gas sampling at the Bell Creek oil field in southeastern Montana.
- July 30–31, 2013: Hosted and participated in the 5th annual PCOR Partnership Regulatory Meeting in Deadwood, South Dakota.
- July 31 – August 1, 2013: Toured the Bell Creek oil field in southeastern Montana.
- August 6–8, 2013: Traveled to the Bell Creek oil field in southeastern Montana for site maintenance.
- August 6–8, 2013: Downloaded monitoring data at the Bell Creek site in southeastern Montana.

- August 8, 2013: Attended the SPE Williston Basin Section open meeting in Minot, North Dakota.
- August 9, 2013: Reviewed education video Parts 1 and 2 at PPB offices in Fargo, North Dakota.
- August 10–16, 2013: Hosted an outcrop field trip for Denbury personnel near Hulett, Wyoming.
- August 14, 2013: Traveled to PPB offices for project discussions in Fargo, North Dakota.
- August 16, 2013: Attended the Bell Creek CO<sub>2</sub> Enhanced Oil Recovery Project Commissioning Event (Ribbon Cutting) at the Bell Creek site in southeastern Montana.
- August 19, 2013: Participated in the WWG Open House in Pittsburgh, Pennsylvania.
- August 19, 2013: Hosted and participated in the WWG Annual Meeting in Pittsburgh, Pennsylvania.
- August 20–23, 2013: Presented at and participated in the Carbon Storage Project R&D Project Review Meeting in Pittsburgh, Pennsylvania.
- August 23 – September 1, 2013: Presented at the IEAGHG Combined Monitoring and Environmental Research Network meeting in Canberra, Australia.
- August 25–28, 2013: Observed the repeat logging activities at the Bell Creek oil field in southeastern Montana.
- August 26–29, 2013: Performed sampling activities at the Bell Creek oil field in southeastern Montana.
- September 9–14, 2013: Met with landowners in or near the Bell Creek oil field in southeastern Montana.
- September 10–12, 2013: Attended the North Dakota GIS Users Conference in Grand Forks, North Dakota.
- September 10–12, 2013: Attended a meeting with partner, Suncor, in Calgary, Alberta, Canada.
- September 16–18, 2013: Attended and distributed PCOR Partnership outreach materials at the NDPC Annual Meeting in Grand Forks, North Dakota.
- September 22–25, 2013: Attended the Groundwater Protection Council Annual Meeting in St. Louis, Missouri.
- September 23–25, 2013: Attended the 58th Annual Midwest Groundwater Conference in Bismarck, North Dakota.
- September 23–26, 2013: Hosted and presented at the 2013 PCOR Partnership Annual Membership Meeting in Minneapolis, Minnesota.
- September 24, 2013: Inspected the Phase II Lignite Field Validation Test site near Kenmare, North Dakota.
- September 24, 2013: Hosted and participated in the Bell Creek Baseline PNL Review Meeting in Minneapolis, Minnesota.
- September 24, 2013: Hosted and participated in the PCOR Partnership TAB Meeting in Minneapolis, Minnesota.
- September 27 – October 3, 2013: Attended the SPC ATCE and short course in New Orleans, Louisiana.
- September 29 – October 6, 2013: Performed sampling at the Bell Creek site.

- September 30 – October 6, 2013: Met with landowners in and near the Bell Creek oil field.

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

## **REFERENCES**

Kaushik, A., 2010, Web Analytics 2.0—the art of online accountability and science of customer centricity: Indianapolis, Indiana, John Wiley, 86 p.

# **APPENDIX A**

## **MEDIA COVERAGE**

**Table A-1. Media Coverage**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
7/1/2013	CO <sub>2</sub> -Sequestration Project Adding Value	Journal of Petroleum Technology	131,132,133	Richardson	Texas	Trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	1st Discount Brokerage (1DBDirect.com)	n/a	West Palm Beach	Florida	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	A.M. Best Company	55,845	Olwick	New Jersey	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Alerus Retirement Solutions	6581	St. Paul	Minnesota	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Alliance Review, The	7340	Alliance	Ohio	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Alliance Warburg Capital Management	n/a	Atlanta	Georgia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Anchorage Daily News (ADN.com)	250,458	Anchorage	Alaska	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Arizona Republic (azcentral.com)	1,698,825	Phoenix	Arizona	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Ashland Times-Gazette, The (Times-Gazette.com)	11,669	Ashland	Ohio	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	AskBrianPeart.com	n/a	Snellville	Georgia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Belleville News-Democrat (BND.com)	115,759	Belleville	Illinois	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Bellingham Herald, The	112,175	Bellingham	Washington	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Beyond the Dow	37,462	Austin	Texas	Other online article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	BioSpace	118,002	San Francisco	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Boston Globe (boston.com)	4,203,142	Boston	Massachusetts	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Bradenton Herald (Bradenton.com)	134,724	Bradenton	Florida	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	BuffaloNews.com	318,963	Buffalo	New York	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Business Insurance	11,510	Chicago	Illinois	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Cabling Installation & Maintenance	1882	Nashua	New Hampshire	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Carlsbad Current-Argus	15,744	Carlsbad	New Mexico	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Centre Daily Times (centredaily.com)	49,908	State College	Pennsylvania	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Cincinnati Enquirer	714,039	Cincinnati	Ohio	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Concord Monitor	224,530	Concord	New Hampshire	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Contra Costa Times	274,867	Walnut Creek	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Daily News Los Angeles	380,079	Woodland Hills	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Daily Record	64,930	Parsippany	New Jersey	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Daily-Jeff.com	10,342	Cambridge	Ohio	Online newspaper article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	DealBreaker.com	28,115	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Deming Headlight, The	10,470	Deming	New Mexico	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Dental Economics	1018	Tulsa	Oklahoma	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Denver Post	1,866,620	Denver	Colorado	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Digital Journal	n/a	Toronto, Ontario	Canada	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Digital Media Wire	3198	West Hollywood	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Duluth News-Tribune	193,680	Duluth	Minnesota	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	el Nuevo Herald Miami	3525	Miami	Florida	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	El Paso Times	215,575	El Paso	Texas	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	ElectroIQ (Solid State Technology)	80,582	Ann Arbor	Michigan	Online Trade Media Article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Farmington Daily Times	34,728	Farmington	New Mexico	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Fat Pitch Financials	2335	Richmond	Virginia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Fayetteville Observer-Times (fayobserver.com)	108,172	Fayetteville	North Carolina	Online newspaper article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Fort Worth Star-Telegram (Star-Telegram)	697,733	Fort Worth	Texas	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Good Day Sacramento	16,775	Sacramento	California	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Great American Insurance Company	n/a	Cincinnati	Ohio	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Greater Baton Rouge Business Report	30,354	Baton Rouge	Louisiana	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	HeraldNet	1,152,477	Everett	Washington	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	HPC Wire	10,000	San Diego	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	IC Places	1000	Winter Park	Florida	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Idaho State Journal	25,000	Pocatello	Idaho	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Illinois Daily Herald (dailyherald.com)	396,300	Arlington Heights	Illinois	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Indiana Statesman	13,401	Terre Haute	Indiana	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Indianapolis Business Journal (IBJ.com)	23,965	Indianapolis	Indiana	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Industrial Info Financials	372	Sugar Land	Texas	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	InfoStor	6051	Nashua	New Hampshire	Other online article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Inland Valley Daily Bulletin	198,873	Ontario	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Inside Bay Area	143,959	Oakland	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	InsideMetals	n/a	Reno	Nevada	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	IntelligentValue	1000	Boulder	Colorado	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	International Business Times	3,013,743	New York	New York	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	InvestorPlace	469,279	Lancaster	Pennsylvania	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	InvestTalk	n/a	Dana Point	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Island Packet	84,872	Bluffton	South Carolina	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Kansas City Star, The (KansasCity.com)	1,039,993	Kansas City	Missouri	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	KARN NewsRadio 102.9 FM/920 AM	6357	Austin	Texas	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	KEYE-TV Channel 42	101,664	Austin	Texas	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	KUTV-TV Channel 2	66,000	Salt Lake City	Utah	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	KVOR 740 AM	348	Colorado Springs	Colorado	Radio – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Las Cruces Sun-News	84,446	Las Cruces	New Mexico	Online newspaper article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Lexington Herald-Leader (Kentucky.com)	340,340	Lexington	Kentucky	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Long Beach Press-Telegram	140,019	Long Beach	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Macon Telegraph (macon.com)	164,346	Macon	Georgia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Market Intelligence Center	23,757	Charlottesville	Virginia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Market Pulse	4000	Atlanta	Georgia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Maxim Group	5378	Woodbury	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Miami Herald, The	1,947,469	Miami	Florida	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Minneapolis Star Tribune (StarTribune.com)	1,656,780	Minneapolis	Minnesota	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Minnesota Public Radio	288,164	St. Paul	Minnesota	Radio – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Minyanville	290,484	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	MoneyShow.com	24,167	Sarasota	Florida	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	MyCentralOregon.com	n/a	Bend	Oregon	Radio – broadcast media

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	myMotherLode.com	25,706	Sonora	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Myrtle Beach Sun News (MyrtleBeachOnline.com)	5622	Myrtle Beach	South Carolina	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Nation's Restaurant News	70,509	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Network Journal, The	45,398	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Newsday – Queens Edition (newsday.com)	1,569,004	Melville	New York	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Oak Ridger	54,901	Oak Ridge	Tennessee	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Oil & Gas Journal	38,847	Houston	Texas	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Oil and Gas Online	1000	Houston	Texas	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Oklahoman (NewsOK.com)	715,508	Oklahoma City	Oklahoma	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Olympian, The (theolympian.com)	88,732	Olympia	Washington	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Online Investor, The	18,652	Palo Alto	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	PaidContent.org	124,762	Santa Monica	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Pasadena Star-News	66,248	Pasadena	California	Online newspaper article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Pettinga Financial	n/a	Evansville	Indiana	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	PRWeb	1,467,145	Ferndale	Washington	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Raleigh News & Observer (newsobserver.com)	652,984	Raleigh	North Carolina	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Record–Courier (recordpub.com)	15,290	Ravenna	Ohio	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Redlands Daily Facts	18,379	Redlands	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Renewable Energy World	33,417	Peterborough	New Hampshire	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Riverside Press-Enterprise (The Press-Enterprise; PE.com)	260,333	Riverside	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Rockford Register Star (rrstar.com)	306,686	Rockford	Illinois	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Ruidoso News	18,608	Ruidoso	New Mexico	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Sacramento Bee, The (sacbee.com)	1,095,779	Sacramento	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Salt Lake Tribune	707,649	Salt Lake City	Utah	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Bernardino County Sun, The (sbsun.com)	78,889	San Bernardino	California	Online newspaper article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Diego Union Tribune (UTSanDiego.com)	709,440	San Diego	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Gabriel Valley Tribune (sgvtribune.com)	50,140	Covina	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Jose Mercury News (MercuryNews.com)	1,777,959	San Jose	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Luis Obispo Telegram–Tribune (SanLuisObispo.com)	79,512	San Luis Obispo	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	San Mateo Daily Journal	17,359	San Mateo	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Securities Industry and Financial Markets Association	2332	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Securities Technology Monitor	2000	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	SiliconValley.com	6734	San Jose	California	Online trade media article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	StreetInsider.com	72,993	Birmingham	Michigan	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	StreetIQ.com	3652	Foster City	California	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Sun Herald (SunHerald.com)	150,386	Gulfport	Mississippi	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	The Street Sweeper (thestreetsweeper.org)	2451	Hewlett	New York	Other online article

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**Table A-1. Media Coverage (continued)**

<b>Date</b>	<b>Headline</b>	<b>Media Organization/ Publication</b>	<b>Circulation/ DMA</b>	<b>City</b>	<b>State or Country</b>	<b>Type</b>
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Torrance Daily Breeze (dailybreeze.com)	189,198	Torrance	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Townhall.com	1,244,502	Washington	District of Columbia	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	TVNewsCheck	58,602	Chatham	New Jersey	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Vision Monday	3217	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Wall Street Select	373	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	WHBF-TV Channel 4	18,733	Rock Island	Illinois	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Whittier Daily News	80,762	Whittier	California	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Wichita Eagle, The (Kansas.com)	253,079	Wichita	Kansas	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	WJRT-TV Channel 12	107,095	Flint	Michigan	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Worcester Telegram & Gazette	379,131	Worcester	Massachusetts	Online newspaper article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Worth	21,491	New York	New York	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	WR Hambrecht & Co.	342	Berwyn	Pennsylvania	Other online article
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	WRAL-TV Channel 5 (wral.com)	1,088,918	Raleigh	North Carolina	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	WVNS-TV Channel 59	124,062	Lewisburg	West Virginia	Television – broadcast media
8/14/2013	IOGCC Task Force Continues Work to Pave Way for CO <sub>2</sub> Storage	Zantrio	1000	Melbourne	Florida	Other online article

