



Plains CO₂ Reduction (PCOR) Partnership Energy & Environmental Research Center (EERC)

Plains CO₂ Reduction (PCOR) Partnership Monthly Update December 1–31, 2012

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued review of updates and corrections to the latest edition of PCOR Partnership Atlas (Deliverable [D] 81, update due August 2013).
- Continued efforts to characterize the third target area (D7, due September 2013), including the following:
 - Created a large-scale map of the Pine oil field (east-central Montana) and Cedar Creek Anticline.
 - Continued to move historical water injection and oil production data for the Pine and Pennel oil fields from files collected at the Montana Board of Oil and Gas offices to spreadsheets for incorporation into a new database.
- Continued compiling Nebraska geologic data with regard to saline storage opportunities.
- Received well tops data for the Minnelusa Formation in the Wyoming portion of the Powder River Basin to explore saline storage opportunities.
- Continued updating the databases that ultimately feed the Decision Support System (DSS, © 2007–2013 Energy & Environmental Research Center [EERC] Foundation®) with new oil fields, wells, and gas plants.

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

Highlights

- Continued efforts to populate, test, and refine the outreach tracking database.
- Continued efforts to review and improve the public Web site, including identification and prioritization of areas for update, actions to increase Web traffic, and actions to improve tracking and reporting.
- Continued preparation of a value-added video short, including a script revision and film edit, focused on permanent downhole monitoring (PDM) for carbon capture, utilization, and storage (CCUS) reservoir monitoring.
- Met with the Prairie Public Broadcasting (PPB) education group in Fargo, North Dakota, to discuss future collaboration on educational activities.
- Contacted Lignite Energy Council (LEC) personnel to discuss potential CCUS classroom activities at its upcoming teacher seminar in June 2013.
- Initiated arrangements for filming the installation of geophones at the Bell Creek site.

- Participated in the monthly Regional Carbon Sequestration Partnership (RCSP) Outreach Working Group (OWG) conference call. Topics discussed included the message mapping presentation given at the Eleventh International Conference on Greenhouse Gas Technologies (GHGT-11) in Kyoto in November 2012 and new message maps on distinguishing CCUS from hydraulic fracturing and CCUS and drinking water.
- Participated in a telephone discussion on December 5 regarding the potential for collaboration on education with the Global Carbon Capture and Storage (CCS) Institute in Australia.
- Continued efforts to update the Phase III general fact sheet (D14, due February 2013), including discussions with program management held on December 6, 2012.
- Continued the update to and revision of the Lignite Field Validation Test fact sheet (value-added).

Task 3 – Permitting and NEPA (National Environmental Policy Act) Compliance (Lisa S. Botnen)

Highlights

- Provided information about the Phase II Lignite Field Validation Test upon request from CO2CRC (the Cooperative Research Center for Greenhouse Gas Technologies).
- Continued activities associated with the Interstate Oil and Gas Compact Commission (IOGCC) Carbon Geologic Storage (CGS) Task Force, including the following:
 - Participated in the working group conference call on December 6 to discuss findings since the last call (held November 8).
 - Began planning for the next subgroup workgroup meeting (possibly February 2013).
 - Continued to discuss the report outline and writing assignments.
- Submitted milestone (M) M37, entitled “IOGCC Task Force Subgroup Meeting 1 Held,” on December 21, 2012.
- With regard to the Lignite Field Validation Test site (Phase II) closure:
 - Continued efforts to monitor the site during the reclamation phase.
 - Continued to modify a draft value-added report on closure activities.

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

Highlights

- Fort Nelson test site activities included the following:
 - Submitted a required update to Deliverable D41 (Fort Nelson Test Site – Geochemical Observations) on December 14, 2012.
- Bell Creek test site activities included the following:
 - Continued work on the geomechanical modeling report (D32, due January 2013).
 - Continued analysis of pressure gauge response from 0506 OW well, including construction of a leakage model (including pressure and temperature models) and a simplified geomechanical model.
 - Continued building a facies object model.
 - Continued work on the 3-D mechanical earth model.
 - Continued work on the fieldwide model.

- Participated in in-house meetings to discuss the draft (value-added) mineralogical report on December 7 and 8, 2012.
- Completed pulsed-neutron baseline logging activities on 14 of 54 wells.
- Participated in a pulsed-neutron log review meeting in Plano on December 4, 2012, with Schlumberger and Denbury.
- Continued to discuss special core analysis (SCAL) work with Core Labs, including the following:
 - ◆ Participated in a short meeting on December 5, 2012 (during a flight layover) in Houston, Texas.
 - ◆ Participated in a conference call on December 19, 2012, to discuss CT scan results of core plug samples.
 - ◆ Collected a 25-gallon produced-oil sample from well 05-11 for use in SCAL testing.
- Continued sensitivity analysis in Petrel.
- Participated in a reservoir saturation tool (RST) log review meeting December 3–4, 2012, at Denbury headquarters in Plano, Texas.
- Completed a draft of a Bell Creek outcrop/core facies poster for the American Association of Petroleum Geologists (AAPG) Annual Conference & Exhibition to be held May 19–22, 2013, in Pittsburgh, Pennsylvania.

Task 5 – Well Drilling and Completion (John A. Hamling)

Highlights

- Reviewed the draft PDM video.
- Received approval for and scheduled installation of two groundwater monitoring wells on the 05-04 and 33-12 well pads (estimated drilling spud date is January 4, 2013).
- EERC staff traveled to the Bell Creek site to site the location of two groundwater monitoring wells and received a signed landowner agreement.
- Began work on a sampling and analysis plan (SAP) for the two groundwater monitoring wells.
- Participated in an in-house update meeting on December 14, 2012. Topics discussed included upcoming activities; surface and near-surface monitoring, verification, and accounting (MVA) activities; pulsed-neutron logging; seismic activities; modeling updates; and upcoming deliverables.
- Continued evaluation of well integrity throughout the Bell Creek Field.
- Continued analysis and data integration of final baseline and soil gas-sampling (Event 5) data.
- Completed lab analysis from the November 2012 sampling event.
- Continued preparation of a technical presentation about the Bell Creek surface and near-surface MVA program to be given to the PCOR Partnership Technical Advisory Board (TAB) on January 3, 2013.
- Continued work on the baseline MVA report.
- Continued preparation of a mitigation plan under probable scenarios of vertical CO₂ migration.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- On December 10, 2012, submitted for peer review the paper on the methodology of design for a hypothetical phased pipeline network to the journal entitled *Energy & Fuels*.
- Continued collecting information for and began writing the report entitled “Opportunities and Challenges Associated with CO₂ Compression and Transport During CCUS Activities.” This is an update of D85, which the Statement of Project Objectives (SOPO) requires to occur biennially. The first version was submitted in March 2011.
- Continued in-house review for improving the capture technology tree.
- Updated visitors from Nebraska Public Power District (NPPD) on PCOR Partnership activities on December 21, 2012.

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- Participated in ongoing project discussions with Denbury.

Task 8 – Transportation and Injection Operations (Melanie D. Jensen)

Highlights

- Participated in the Bell Creek project update meeting on December 14, 2012.

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

Highlights

- Continued Bell Creek site activities, including the following:
 - Prepared, reviewed, and revised abstracts for the 2013 Society of Petroleum Engineers (SPE) Annual Technical Conference & Exhibition, to be held September 30 – October 2, 2013, in New Orleans, and for the 2013 SPE Eastern Regional Meeting to be held August 20–22, 2013, in Houston, Texas.
 - Worked on upscaling of the geologic model.
 - Continued PVTsim software learning.
 - Checked the production history of several wells to estimate the drainage radius.
 - Discussed new PVT (pressure–volume–temperature) test data and minimum miscibility pressure (MMP) results.
 - Continued work on the International Petroleum Technology Conference (IPTC) e-poster presentation and revised the IPTC paper on Bell Creek subnormal pressure mechanism.

Task 10 – Site Closure (to be announced [TBA])

- This task is anticipated to be initiated in Quarter 1 – Budget Period (BP) 5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling (TBA)

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

Task 12 – Project Assessment (Katherine K. Anagnost)

Highlights

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

Task 13 – Project Management (Charles D. Gorecki)

Highlights

- Attended and presented on December 11, 2012, on the Bell Creek project at the Electric Power Research Institute stakeholder meeting in Mobile, Alabama.
- Continued work on the updated project management plan.
- Held a discussion with the Petroleum Technology Research Centre (PTRC) regarding Aquistore, including the upcoming SERC (scientific and engineering research committee) meeting in February, an upcoming project participant meeting, the scope of work, and the core description.
- Held the task leader meeting on December 7. Topics discussed included: recap of GHGT-11, updates on the Fort Nelson and Bell Creek projects, update on Aquistore, upcoming TAB meeting dates, overview of CO₂ Conference Week (Midland, Texas), upcoming deliverables and milestones, and updates from each task leader present.
- Continued planning for a WebEx for the TAB to be held January 3, 2013.
- Continued preparation of a draft agenda for the March 5 and 6, 2013, TAB meeting in Orlando, Florida.
- Staff traveled to Midland, Texas, to participate in the CO₂ Conference Week workshops held December 3–5, 2012.
- Deliverables and milestones completed in December:
 - November monthly update
 - Task 12: D57 – Project Assessment Annual Report
 - Task 14: M23 – Monthly Water Working Group (WWG) conference call held
 - Task 3: M37 – IOGCC Task Force Subgroup Meeting 1 Held

Task 14 – RCSP Water Working Group (WWG) Coordination (Ryan J. Klapperich)

Highlights

- Discussed current revisions to the fact sheet and reviewed short- and long-term goals of the WWG task with The CETER Group, Inc., during their visit on December 12–13, 2012.
- Began addressing comments from the WWG review of the water–CCS nexus-related fact sheet (D99).
- Continued preparation of and compilation of graphics for the new water resource protection fact sheet with assistance from the OWG.
- Continued preparations for the January WWG conference call.
- The requirement for a December WWG conference call was waived.

- Continued reviewing the WWG white paper in preparation for journal article submission.
- Participated in the December OWG call (December 13) to provide comments on water-related “Message Maps.”

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO₂ Storage, and Monitoring Project (Dayanand Saini)

Highlights

- Checked the well log data inventory for all 13 wells with reference to TGS online well log collection, purchased the missing interval of well ACL (02) HZ ZAMA 8-33-115-6, and imported it into the Petrel project. Also purchased a GR log for the 80-m interval.
- Georeferenced Z3Z, G2G, RRR, NNN, and Muskeg L pinnacles in ArcGIS for static geologic modeling.
- Continued building static and dynamic geologic models.
- Worked on MMP modeling and collected relevant stimulation data for Zama G2G pinnacle.
- Prepared a tentative time line for the project (Gantt chart and staff time).
- Held in-house Zama project update meetings to discuss project progress with team members December 17 and 27.
- Continued review of relevant published literature and internal technical reports/presentations on the geologic and reservoir characteristics of the Zama subbasin.
- Reviewed a published report on geochemical modeling of Zama acid gas injection.

Task 16 – Characterization of the Basal Cambrian System (Wesley D. Peck)

Highlights

- Exported the 3-D model and provided it to project collaborators at Lawrence Berkeley National Laboratory.
- Continued working toward integrating the completed 3-D model into the simulation software.
- Continued literature review for the geochemical report (D89, due March 2013) to ensure that data generated are valid.
- Continued drafting the geochemical evaluation report (D89).
- Rough draft of the well integrity report undergoing in-house review.
- Continued work on the report describing the wellbore integrity issues (D90, due September 2013) for wells in the Cambro–Ordovician saline system in the United States.

Travel/Meetings

- December 2–5, 2012: Attended the Enhanced Oil Recovery Carbon Management Workshop held in conjunction with CO₂ Conference Week in Midland, Texas.
- December 3–4, 2012: Participated in an RST log review meeting at Denbury headquarters in Plano, Texas.
- December 3–6, 2012: Attended the National Groundwater Expo and Annual Meeting in Las Vegas, Nevada.
- December 5–7, 2012: Attended the CO₂ Conference Week activities in Midland, Texas.

- December 9–22, 2012: Traveled to the Bell Creek oil field for site activities in southeastern Montana.
- December 10–11, 2012: Presented at the EPRI Annual Meeting in Mobile, Alabama.
- December 10–15, 2012: Met with landowners in the Bell Creek oil field and surrounding area.
- December 11, 2012: Participated in a meeting to discuss education materials at PPB headquarters in Fargo, North Dakota.
- December 13 and 27, 2012: Traveled to the Lignite field validation site near Kenmare, North Dakota, to inspect the site.
- December 17–21, 2012: Participated in Schlumberger NExT (Network of Excellence in Training) Techlog Fundamentals software training in Houston, Texas.

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