



Plains CO₂ Reduction (PCOR) Partnership Monthly Update August 1–31, 2011

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued efforts on the revised atlas (4th edition).
- Continued programming activities to upgrade the online geographic information system (GIS) and Decision Support System (DSS, © 2007–2011 EERC Foundation) capabilities.
- Research staff participated in an Aquistore Project risk assessment meeting in Regina, Saskatchewan, Canada.
- Continued efforts on the Rival Field characterization, including the following:
 - Completed the Rival geologic model update report.
 - Continued work on a full report including simulation on the model.
 - Completed the porosity and permeability work.
 - Initiated petrophysical modeling.
 - Completed x-ray diffraction (XRD) analysis of the core plug, and prepared a report outline.
 - Participated in several conference calls with TAQA North Ltd. (TAQA).

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

Highlights

- Prepared a draft of a Bell Creek documentary (Deliverable [D] 21) plan, including concept, shot list, schedule, and FAQ, as a first step in the process of seeking site owner permission so filming can begin.
- Began preparation of a Fort Nelson documentary (D22) plan, including concept, shot list, schedule, and FAQ, as a first step in the process of seeking owner permission so filming can begin.
- Reviewed and commented on the Regional Carbon Sequestration Partnership (RCSP) Carbon Capture Utilization and Storage video and fact cards for use at the Beijing Carbon Sequestration Leadership Forum (CSLF) meeting in September.
- Continued discussions and prepared budget estimates to explore the potential for Web-based games as a communication tool for carbon capture and storage (CCS).
- Continued efforts to prepare the Bell Creek test site general outreach poster (D25, due September 30, 2011).

- Continued development of activities to obtain feedback on clarity of messages and individual outreach and education task products including the following:
 - For planning purposes, divided the PCOR Partnership region into 1) the northern Williston Basin, 2) the southern Williston Basin, and 3) the eastern urban region.
 - Proposed a series of triad groups, comprising three members of the general public and a discussion lead coupled with larger, more formal focus groups.
 - Prepared work plans and preliminary budgets.
- Continued discussions with The Ammerman Experience regarding its upcoming media communications presentation at the PCOR Partnership Annual Meeting on September 13 in Denver.
- Met with Energy & Environmental Research Center (EERC) Applied Geology Lab personnel regarding development of video-based outreach.
- Continued preparing video shorts excerpted from the documentary entitled “Global Energy and Carbon: Tracking Our Footprint.”
- Delivered a 3-hour presentation on sequestration at the Prairie Public Broadcasting (PPB) “master” teacher training session held on Saturday, August 27, in Fargo, North Dakota. These master teachers will, in turn, facilitate sessions at PPB’s Teacher Training Institute in November.
- Continued planning efforts for an update to the public Web site (D13, due June 2012).
- Continued efforts to develop an outreach-tracking database.
- Continued to track state-by-state CCS regulations for development of future outreach materials.

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

Highlights

- Continued development of the revised/updated Regulatory Roundup document.
- Prepared a meeting summary of the third PCOR Partnership Regulatory Meeting (June 29 and 30).
- Prepared and submitted a draft permitting action plan (D29) for the Bell Creek test site for review and approval on August 31.
- Completed the review of the U.S. Environmental Protection Agency’s proposal to exempt CO₂ streams for geologic storage from the Resource Conservation and Recovery Act regulations.
- Activities related to the Lignite Phase II validation site closure included the following:
 - Obtained approval to proceed from the appropriate regulatory agencies.
 - Prepared and submitted subcontracts for plugging and abandoning the wells and for site reclamation.
 - Established the start date as September 6.
 - Acquired necessary information and established appropriate procedures for the removal of the bridge plug from Well 36-15.

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

Highlights

- Bell Creek test site activities included the following:
 - Performed fracture pressure calculations for sand and shale intervals.
 - Held in-house project update meetings on August 8 and 22.
 - Received lidar data, and began correction of surface locations and elevation data of all wells for both surface monitoring and geologic characterization modeling activities.
 - Traveled to the Bell Creek Field on August 4 and 5 for a site visit.
 - Discussed the creation of a mechanical earth model for the Bell Creek Field to assist in understanding the geomechanical behavior during CO₂ injection.
 - Continued development of the geological model.
 - Continued drafting a geologic core evaluation program.
 - Reviewed price quotes for work under the core analysis program.
- Fort Nelson test site activities included the following:
 - Continued work on the geomechanical model.
 - Continued review of the geomechanical testing and modeling program.
 - Continued data collection for the geomechanical simulation, including the lab data, equivalent formation data, and expected data.
 - Reviewed new prediction simulations and suggested a few more scenarios.
 - Continued preparation of draft report presenting the results of geochemical experiments conducted over the course of 2009–2011.
 - Reviewed the final report on results of the core analytical work conducted by Weatherford Laboratories in Calgary.
 - Began reconciliation of the various data packages associated with the 2009 wellbore characterization and core analyses to ensure the quality and accuracy of data relative to the specific rock formation intervals under evaluation.
 - Updated the action items list following the management meeting held in Vancouver, British Columbia, Canada, on July 20 and 21.
 - Continued work on the 2011 static geologic model.
 - Held in-house project update meetings on August 1, 15, and 29.
 - Finalized and delivered a report detailing the petrophysical characterization of cap rock samples obtained from the C-61-E wellbore, including detailed mineralogical characteristics, bulk volume, and skeletal density of three samples.

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

Highlights

- Continued efforts to gain landowner permissions for the surface soil gas and groundwater sampling program.
- Continued updating the joint Denbury–EERC monitoring, verification, and accounting (MVA) plan as a “living document.”
- Continued work related to the evaluation of wells within the Phase 1 area.
- Continued work evaluating wells within a 1-mile buffer around the Phase 1 area.
- Continued incorporating database well information into a GIS format for spatial risk and/or monitoring assessments.

- Initiated work on wells in the Phase 3 and Phase 7 areas for potential reentry for deployment of additional monitoring technologies and additional data collection.
- Continued work on a site and operations safety plan for field sampling and monitoring well drilling and completion activities.
- Began preparation of field sampling equipment for a baseline monitoring trip.
- Continued work to select a well-logging provider for the monitoring well.
- Ordered compliant PPE (personal protective equipment) for site activities for all EERC personnel participating in field activities.
- Prepared a Bell Creek project overview and update for presentation at the PCOR Partnership Annual Meeting on September 14.
- Received Bureau of Land Management surface access permission for the soil gas and water baseline monitoring programs.
- Continued investigation pricing and operational logistics related to drilling, completions, and MVA technologies to be deployed at the Bell Creek Phase 1 monitoring well.
- Continued efforts to establish phone and Internet connection with Denbury and Range Communications.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- Adapted the capture technologies table (included as an appendix in the value-added capture technologies overview report submitted in March 2011) for the DSS in a format requested by the programmers. Following editing and internal review, the information will be given to the programmers for incorporation into the DSS site.
- Research staff attended and presented at the Electric Power Research Institute (EPRI)-sponsored Health and Environmental Toxicity of Amines for Post-Combustion Capture Conference in Palo Alto, California, on August 16 and 17.
- Completed the annual update and quality assurance/quality control of the CO₂ emission sources master data spreadsheet.
- Attended the National Energy Technology Laboratory (NETL) CO₂ Capture Technology Meeting held August 22–26 in Pittsburgh, Pennsylvania (www.netl.doe.gov/events/11conferences/co2capture).
- Began preparation of a trip summary for the Capture Technology Meeting.
- Continued revision of a draft CO₂ Pipelines technical brief.

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

- Continued collecting information about CO₂ stream generation and infrastructure needs for the Bell Creek demonstration, including the design and operation of the Lost Cabin gas-processing plant.

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

Highlights

- Tested a new computer node within the computer cluster.
- Participated in the RCSP Sim/Risk Working Group monthly conference call on August 23, including delineation of the following goals:
 - Discussion of Sim-SEQ progress.
 - Assignment of a modeling progress report from one partnership per month.
- Continued Bell Creek site activities, including the following:
 - Submitted the executive summary for D66 – Simulation Report on August 31, 2011.
 - Worked on the reservoir simulation of the Phase 1 area.
 - Held an in-house modeler meeting on August 30, including an update on the Bell Creek modeling activities.
 - Began interpretation of the coring program in the Mowry Formation.
 - Worked on the numerical tuning for the reservoir simulation of the Phase 1 area.
 - Continued preparation of the site characterization, modeling, and monitoring plan (D50) due September 30, 2011.
 - Continued working on history-matching historic production and injection in the Bell Creek Field.
 - Modeling personnel attended an Applied Petroleum Technology Academy training course on CO₂ flooding in Casper, Wyoming.
- Continued Fort Nelson site activities, including the following:
 - Submitted the executive summary for D67 – Simulation Report on August 31, 2011.
 - Sent a draft of D67, Fort Nelson Simulation Report, to Spectra Energy for review and comment.
 - Reviewed a draft report prepared by RPS Energy presenting the results of an engineering evaluation of the drilling and completion of the exploratory well drilled in 2009 (Well C-61-E).
 - Worked on finalizing the subnormal pressure report, including the implications of subnormal pressure and repressurization to recharge and leaking potential.
 - Continued work on prediction simulation (CO₂ plume size and bottomhole pressure).
 - Drafted an MVA plan for shallow groundwater and surface water monitoring.
 - Worked on developing scope-of-work documents and a schedule for key technical activities to be conducted over the next 12 months, including modeling and risk assessment.

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)

- The project assessment report (D57) for the period October 1, 2010 – September 30, 2011, will be submitted by December 31, 2011. The report for the previous program year is available on the partners-only Web site (www2.undeerc.org/website/pcorp/Products/DB/pdfs/ENS_D57_Task12_Dec10.pdf).

Task 13 – Project Management (Charles D. Gorecki)

Highlights

- Continued efforts toward populating and updating the partners' database, which was programmed in-house.
- Continued planning the PCOR Partnership Annual Meeting and Foundations of CCS Geology Workshop to be held September 12–14 in Denver, Colorado, including the following:
 - Updated the online agenda and sent an accompanying e-mail blast on August 9.
 - Sent an e-mail blast on August 17 regarding the hotel block deadline of August 21.
- Provided requested information on August 5 regarding both the Fort Nelson and Zama projects to the CSLF Technical Group for its gaps analysis that will be used for the update of the CSLF Technology Roadmap of 2010. The update is planned to take place in spring 2012.
- On August 2, received a copy of the U.S. Carbon Sequestration Council's paper entitled "Global Status of Geologic CO₂ Storage Technology Development."
- On August 12, submitted revised responses to the IEA Greenhouse Gas R&D Programme Expert Review Panel's comments and recommendations.
- Deliverables and milestones completed in August:
 - July monthly update
 - Task 3: D29 – Permitting Action Plan
 - Task 9: D66 – Bell Creek Test Site – Simulation Report
 - Task 9: D67 – Fort Nelson Test Site – Simulation Report
 - Task 14: M23 – Monthly Water Working Group (WWG) Conference Call Held
 - Held an in-house meeting to discuss the status of the North Dakota Lignite Research Council funding.

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

Highlights

- Distributed minutes from the July conference call.

- Held the monthly conference call on August 24.
- Continued brainstorming survey questions and identifying key database items and potential ranges of values for the NATCARB database request forum.
- Charlie Gorecki accepted an invitation to present on the nexus of CCS and water in a session chaired by John Litynski at the Carbon Management Technology Conference scheduled for February 2012 (www.carbonmgmt.org).
- Continued to develop potential outreach survey questions.
- Formalized survey development and the associated distribution plan.
- Contacted West Virginia University to discuss the WWG's feedback to NATCARB.

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO₂ Storage, and Monitoring Project (James A. Sorensen)

Highlights

- Worked on initial petrophysical analysis for the “F” Pool.
- Worked on populating the Computer Modelling Group (CMG) simulation model with reservoir properties.
- Revised the WinProp pressure–volume–temperature (PVT) model for improved predictions of minimum miscibility pressure.
- Initiated preparation of an abstract (due September 26) for the 18th Society of Petroleum Engineers (SPE) Improved Oil Recovery Symposium scheduled for April 14–18, 2012, in Tulsa, Oklahoma (www.speior.org/call_for_papers.asp).
- Completed the construction of the dynamic model using a single static realization, and started to run initial simulations.
- Prepared rock samples for XRD following removal from the batch reactor after a 14-day exposure period.
- Analyzed fluids from this reaction series to better understand its mass balance.
- Analyzed steel coupons, previously reacted, using XRD to determine the chemistry of the scale precipitated during the exposure period.
- Performed initial simulations for model validation and history match, and worked on the modification of different reservoir parameters for improving the predictions.

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

Highlights

- Continued acquisition of digital well logs.
- Continued work on the deterministic model for the aquifer system.
- Held an in-house working group meeting on August 8.
- Held an in-house project update meeting on August 22.
- Continued planning for the September 14 meeting of the technical and steering committee members in Denver following the PCOR Partnership Annual Meeting.
- Continued work on a draft poster for discussion at the September 14 meeting.
- Initiated preparation of a poster abstract for submittal by September 9 for the DOE Carbon Storage Program Infrastructure Meeting scheduled for November.

- Updated a draft summary report that describes the CO₂ emission sources and their stream compositions.

Travel/Meetings

- August 1–5, 2011: Traveled to the Bell Creek Field and surrounding area in southeastern Montana to contact landowners regarding project activities.
- August 4–5, 2011: Traveled to the Bell Creek Field for a site visit.
- August 9–11, 2011: Participated in a risk assessment meeting for the Aquistore Project in Regina, Saskatchewan, Canada.
- August 14–20, 2011: Participated in the Eventbrite CO₂ Flooding School training and field trip in Casper, Wyoming.
- August 15–18, 2011: Presented at the EPRI Health and Environmental Toxicity of Amines for Post-Combustion Capture Conference in Palo Alto, California.
- August 16–19, 2011: Attended Esri Building Geodatabases training course in Broomfield, Colorado.
- August 21–26, 2011: Attended the 2011 CO₂ Capture Technology Meeting in Pittsburgh, Pennsylvania.
- August 27, 2011: Presented at the PPB master teacher training session in Fargo, North Dakota.

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