

Enhanced Oil Recovery Commission



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July 25, 2013 7:30 AM
BP Collaboration Center, University of Wyoming
Energy Innovation Center
Laramie, Wyoming

Commission Members Present:

Bruce Williams, Chairman
Tom Fitzsimmons
Tom Drean
John MacPherson
Aaron Otteman
Rob Hurless (Governor Mead)
Jimmy Goolsby
Eric Easton – Senior Assistant Attorney General
Senator Eli Bebout—via Phone

Enhanced Oil Recovery Institute Staff Present:

David Mohrbacher
Glen Murrell
Pepper McClenahan
Laura Dalles
Allen Tanner
Sheena Xie
Curtis Chopping
Tashi Herzmark
Rituraj Borgohain
Haifeng Jiang
Taylor Garman
Hannah Peterson

I. Call to Order

Chairman Williams called the meeting to order at 7:53am. A quorum was established.

II. Approval of Minutes

Minutes from the May 15, 2013 meeting were reviewed. Chairman Williams moved to approve the minutes from the May 15, 2013 meeting, seconded by Commissioner Jimmy Goolsby. No further discussion. All in favor, none opposed. **Motion Passed.**

Senior Assistant Attorney General Eric Easton asked for clarification on the motion and whether the executive session minutes were being approved as well. The executive session minutes were emailed to the board members. Vice Chairman Tom Fitzsimmons moved to approve the executive session minutes from the

May 15, 2013 meeting. Motion was seconded by Commissioner Tom Drean. No further discussion. All in favor, none opposed. **Motion Passed.**

Senior Assistant Attorney General Eric Easton stated that the executive minutes should be kept in Director Mohrbacher's office. Director Mohrbacher stated the minutes are kept in a locking file cabinet in his office.

III. Commission Open Discussion

Chairman Williams thanked Vice Chairman Tom Fitzsimmons for leading the May meeting in his absence. Chairman Williams asked Commissioner Aaron Otteman who was in attendance at the Technical Advisory Board (TAB) meeting the day before, how he felt it went. Commissioner Aaron Otteman expressed how this was the first TAB meeting he was able to attend and how he thought it went very well. Commissioner Aaron Otteman expressed that he thought all of the projects seem to be moving along quite nicely; some of them seem to be moving along exceptionally well, in particular the West Gibbs Project.

There were no further open discussion items.

IV. Director's Overview

Director Mohrbacher presented a PowerPoint updating the Commission on EORI activities since the last meeting.

- Director Mohrbacher described the successful TAB meeting that took place the prior day. A critique of this meeting will be provided within the next few weeks. The TAB indicated EORI's work was of extremely high quality and fairly normal discussions were held after the meeting. Director Mohrbacher and TAB member Charlie Carlisle specifically discussed the modeling capabilities of EORI and how the Institute has become much more reservoir-focused. TAB member Carlisle noted that EORI is not doing much in the way of fluids. Director Mohrbacher discussed how he would like strategic feedback as to how EORI can better accomplish work in the way of fluids.
- Director Mohrbacher described the work completed on the 2015-2016 biennium budget request. The request looks similar to the 2013-2014 biennium budget.
- Director Mohrbacher reported EORI is almost fully staffed. He demonstrated the healthy growth in staff that the EORI experienced from 2010 to 2013 as well as the turnover experienced during the same timeframe.
- Vice Chairman Tom Fitzsimmons asked how long it takes for a new technical person to become up-to-speed and effective. Senior Research Scientist Sheena Xie answered it takes 2-3 months for the new hires to become effective. Associate Director Glen Murrell stated that it depends on the position, and it can be as long as 6-12 months before an individual becomes effective. Director Mohrbacher stated that replacing capability developed over years requires a multi-year investment. Director Mohrbacher states that, "turnover has a much greater cost than hiring a new staff person. Lost opportunity is huge within EORI's program when a key staff person like Reza Barati moves to another organization." Vice Chairman Tom Fitzsimmons expressed the importance of getting new staff up to speed quickly, noting that lengthy replacement times put projects behind schedule. Director Mohrbacher asked the Commission what is the normal or reasonable turnover for an organization? Commissioner Tom Drean stated that turnover is unpredictable, and stated it is helpful to have multiple people trained in various areas so that work is not disrupted by turnover.
- Director Mohrbacher highlighted a few staff members and their accomplishments and contributions to EORI: Laboratory Group Leader, Sheena Xie; Research Scientist, Asst. Aboozar Hesami; Business Manager, Pepper McClenahan; and Outreach Coordinator, Laura Dalles. Director Mohrbacher introduced two new staff members hired during late May; Tashi Herzmark and Rituraj Borgohain. Director Mohrbacher explained the focus for the lab group is training new and existing staff on laboratory equipment. The group has developed a business plan for the new laboratory. Director Mohrbacher also commented on the continually growing intern program at EORI which currently is staffed at seven student interns.

- Director Mohrbacher discussed three retirees that expressed interested in working with EORI and with the University, with special attention to Tom Doll, in hopes that they could help take the program to the next level.
- Director Mohrbacher provided an updated timeline of EORI's transition into the Energy Innovation Center. The timeline for commissioning key instruments in the EORI Laboratory was outlined, including the 6 month delay in moving into the lab, GC installation and initial commissioning in June 2013, PVT equipment installation initiated during mid-June 2013 and how lab capability will be gradually ramped up over the next 18 months (June 2013—December 2014).
- Director Mohrbacher concluded his presentation to the Commission stating Wyoming oil production is increasing for the first time since the early 1980's. The increase is a result of additional production coming from unconventional oil development, NGLs from gas production and application of enhanced oil recovery. CO₂ EOR in Wyoming has contributed 95.8 million barrels of incremental production since 1986. Including 7.15 million barrels in 2012 which was equal to 12% of total Wyoming production for the year. A huge opportunity exists to improve EOR and IOR operations. Director Mohrbacher discussed moving forward with coal conversion projects but indicated the difficulty of doing so until natural gas prices go up.
- At the last meeting, discussion was held about the transfer of knowledge from consultants to EORI staff to ensure EORI becomes the go-to institute for EOR. Commissioner Tom Drea inquired if this had been given any more thought. Director Mohrbacher responded with specific examples of training attended by staff which will develop skillsets internally, noting that the process will take time. Director Mohrbacher also discussed work being performed under an Agreement for Services with Steve Fryberger. Steve works closely and integrally with the EORI staff and also still completes field work for Shell. Director Mohrbacher indicated that a similar arrangement is in progress with Tom Doll. Associate Director Glen Murrell explained that prior to the last meeting Steve Fryberger was functioning in an advisory capacity. EORI has incorporated Commissioner Drea's suggestions to focus on work products and adjusted Fryberger's work plan accordingly. Mr. Fryberger will now produce work products that can be kept in house to educate the staff and transfer his knowledge.

V. 9:00–9:45 - Possible Changes to SER/EORI Organization

Director Mohrbacher introduced the Director of the School of Energy Resources, Mark Northam. After introductions, Director Northam began his presentation noting that October 2009 was the last time he spoke with the Enhanced Oil Recovery Commission.

Director Northam presented a PowerPoint on the School of Energy Resources (SER) to the Commission:

- Director Northam began by giving a brief summary of his background, education and experience. Director Mohrbacher and Northam have been working together from the beginning of Director Mohrbacher's start with the EORI.
- Director Northam gave an overview of the SER and how it fits into the organization of the University. Director Northam reports to the Provost, like most department heads, and sits alongside the deans of other Colleges. Director Northam discussed how some reporting relationships may change due to the new University President. President Robert Sternberg has said "the era of being dependent on state funding is over... We need to build stronger and more meaningful partnerships with the private sectors..." Director Northam expressed belief that EORI and SER will become more relevant than they have been in the last six years.
- Director Northam continued his presentation with the introduction of the Energy Resource Council (ERC). The ERC has seven private sector representatives appointed by the Governor. He proceeded to introduce all current members and recent changes within the members of the ERC. He proceeded to explain SER's objectives that lie in three main areas; academics, research and outreach. Director Northam gave a brief description of each area and how SER functions in each area.
- Director Northam continued to describe the different undergrad and graduate degrees that the School of Energy Resources has to offer. This included information pertaining to SER's MBA program with energy management concentration as well as another master degree that awards a separate degree for energy management, which is not offered anywhere else in academia at this moment. Commissioner

Tom Drean asked if the five graduates of the program in December were able to find jobs. Director Northam said yes, this new degree program currently has a 100% placement rate.

- Director Northam continued with briefly discussing the budget of SER, funding opportunities, and the ability to bring in individuals or find new projects. He also discussed where funds have been added including highlighting coal research technologies, and state funding to build the high-bay research facility. Director Northam further described how there are 35 million dollars in private contributions and endowments; more than any college on campus. This opens a big door to partnering with private sector. Several companies contributed \$2 million donations or more to the EIC. Those large donations have been invested in construction of the Energy Innovation Center. The new building provides for housing research equipment, offices, and meeting rooms. Smaller contributions have gone to feed the technology enterprise, equipment that students will likely see and use if they go to a larger firm. Director Northam continued in giving examples the EIC building's capabilities, such as the BP collaboration center's technology that allows researchers or partners in different locations to share data, 3-D images and research.
- Director Northam discussed two primary objectives within SER. 1) the creation of a tier one engineering school that will work on improving in the digital rock and physics area. 2) Work on improved oil recovery, coordinated with EORI, including the fundamentals of fluid, rock and the impact of the technologies we use on the reservoirs. The results will provide a fundamental base to optimize EORI's project work. There will be a strong link between this program and EORI, especially when moved to the high-bay facility (hopefully this will expand capabilities of EORI).
- Director Northam continued in discussing how SER wants to change the context in which fundamentals are taught; for instance they do not want to teach well construction like it was being taught 10-15 years ago. SER is also looking to build internships for students to provide hands-on experience and a real understanding of how recent graduates are put to work. Director Northam summarized with saying that SER is creating true partnerships with a wide range of energy companies on campus, and is transforming focus from an individual, publication focus, to a program oriented, research, and team-driven focus. Publication is becoming less of the end point and a better understanding of fundamentals is becoming more of the focus.

Director Mohrbacher called Associate Director Glen Murrell to the front of the room for a special presentation. Associate Director Glen Murrell had just completed a project management professional certification through the Project Management Institute (PMI), a sought after certification. Associate Director Glen Murrell was congratulated by the Commission and attending staff.

**** A motion to go into executive session by Chairman Williams, 9:55am****

****A motion to come out of executive session by Chairman Williams, 10:50am****

*****Vice Chairman Fitzsimmons left the meeting, 11:00am*****

*****Senator Eli Bebout joined the meeting via telephone, 11:00am*****

VI. Unfinished Business

Review Outstanding Action Items

Chairman Williams proceeded with the agenda by addressing outstanding action items.

- The action for having a staff person from Legacy Reserves work with an EORI intern to provide information regarding new regulations and regulatory requirements for CO2 injection has been cancelled. Director Mohrbacher explained that Lynne Boomgaarden gave an extremely effective presentation at the CO2 Conference concerning regulation. Director Mohrbacher asked if there were any questions. None were posed.

- Letter to Minerals Committee re: EORI's mission - A draft letter was provided to Commissioners at the meeting. Chairman Williams asked if any Commission members have a problem with the letter as it stands to please let him know as soon as possible.
- Letter to Governor - Chairman Williams stated that there is no longer a need for a letter to Governor Mead now that Benjamin Cook's model is scheduled to go public. Chairman Williams advised that this action item can be taken off the list.
- Core storage - Director Mohrbacher informed the Commission that the Enhanced Oil Recovery Institute (EORI) now has their own core storage on the loading dock, this issue is resolved for EORI.
- The action items pertaining to the May meeting were all discussed.

Staffing solutions were covered in Director Mohrbacher's presentation, a copy of Lynne Boomgaarden's presentation was given in place of a liaison to the EPA policy committee, and a copy of Brian Jefferies presentation was provided to update the Commission on the Wyoming Pipeline Authority.

Senator Eli Bebout mentioned that a new draft of the Big Horn Basin Resource Management Plan (RMP) was released yesterday. The Senator suggested it may be wise to sort through the new release for issues relating to EOR. Senator Eli Bebout recommended that the Enhanced Oil Recovery Commission re-evaluate the RMP and get involved at the appropriate time since the Institute took a position earlier. The evaluation should compare the comments made in the earlier release to the supplemental document.

Chairman Williams asked Director Mohrbacher who would be available and best fit to help with this job. Director Mohrbacher informed the Commission of Business Manager Pepper McClenahan's experience with legal documents. Director Mohrbacher suggested that these be action items captured now. Senator Eli Bebout offered a way to prevent repetitive work when reviewing the RMP to narrow down the applicable information, and then send it to EORC for review.

Senator Eli Bebout moved to perform an analysis on EOR on the Bighorn Basin RMP, seconded by Commissioner Jimmy Goolsby. No further discussion. All in favor none opposed. **Motion carried.**

- Chairman Williams continued with outstanding action items. Business Manager Pepper McClenahan informed the Commission that the head of the Pipeline Authority had been sent an invite to attend the next Commission and Technical Advisory Board meetings. Director Mohrbacher had sent a calendar with the next four meeting dates asking if he could attend one or two of the following meetings.
- The WOGCC has been contacted per Associate Director Glen Murrell concerning an effort to centralize data. At this moment there has been no response.

UW Econ Model Available to Public

Associate Director Glen Murrell reported that public release of the UW Econ model is proceeding according to schedule. This schedule includes a publication date at the end of August. There will be two forms of the model available; a publically free version available to anyone who pays severance and/or ad valorem taxes to the state of Wyoming and a fee-based access version for anyone else that does not pay Wyoming taxes related to oil production. The fee based version will be administered by the Economics Department at the University of Wyoming. The payment system has been built. Ben Cook and his group have been doing research and talking to legal about copyrights, which are progressing well and almost

secured. There is a plan to roll out a small beta – test version to an audience in the next few weeks. Chairman Williams asked who will be giving the press release. Associate Director Glen Murrell and Outreach Coordinator Laura Dalles have a very rough draft prepared of the press release that will be ready in the next few weeks. EORI will utilize the University's media blitz system to report the results of the work.

Update EORI spending

Business Manager Pepper McClenahan gave a brief update of the Enhanced Oil Recovery Institute's (EORI) spending. EORI is underspent through the fiscal year in May due to the delay of moving into the new building and hiring of staff. A plan is in place to address the underspent areas. Some of the underspent monies have been reallocated from labor to budget categories. The faculty budget is mostly on track and most of these budgets have been spent. Commissioner Tom Drean asked if EORI has a pay on performance or delivery system with the faculty members. Director Mohrbacher answered explaining that faculty members get a budget and manage it. They do present once a year at the Technical Advisory Board meeting. Commissioner Tom Drean asked if there was opportunity to change this. Director Mohrbacher said yes.

Chairman Williams asked for Director Mohrbacher to give an evaluation of each of the faculty contracts, what they have done, and whether they are responsive, at the next Commission meeting. It was concluded that Director Mohrbacher will deliver the requested evaluations at the January meeting.

VII. New Business

Updated Accounting System

Accounting interns Hannah Peterson and Taylor Garman gave a brief presentation updating the Commission on the progress of the new accounting system for EORI.

Review Current 2015/2016 Biennium Budget

Business Manager Pepper McClenahan presented the drafted 2015/2016 Biennium Budget to the Commission with knowledge that updated figures had been received the previous day.

Chairman Williams entertained a motion to approve the budget proposal subject to updated figures received from the University for retirement and insurance rates and with the same exception request proposed by the University for compensation increases. Commissioner Drean asked questions pertaining to the detail presented in the budget. Business Manager Pepper McClenahan described how she worked with the budget office for guidance in the design of the biennium budget.

Commissioner Tom Drean amended the previous motion to include language the draft be reviewed by EORI for zero based requirements and additional justification be provided as necessary. Motion seconded by Commissioner Aaron Otteman, no further discussion. All in favor none opposed. **Motion passed.**

Review EORI Recommendations for Reallocation of Budget

Associate Director Glen Murrell presented a reallocation request to pay two summer months' salary support, associated fringe costs, and software for Ben Cook's work to develop the Economic Mode. After further clarification that this work was outside of the original scope of work with the Enhanced Oil Recovery Institute (EORI), it was moved by Commissioner John MacPherson and seconded by Commissioner Jimmy Goolsby to reallocate the funds for the proposal. No further discussion. All in favor none opposed. **Motion passed.**

Update Plans for Off-Site EORI Staff Training/ Review Results of the 2013 EORI CO2 Conference

Outreach Coordinator Laura Dalles gave a presentation updating the Commission on Outreach efforts since the May meeting.

- Recap of the Tensleep III Workshop July 8-9
 - There were 47 attendees which was just shy of the projected attendance of 50.
 - There were a broad variety of topics and speakers in attendance.
 - Evaluations of Tensleep were positive with good feedback.
 - Potential for Outreach to repeat the Tensleep series.
- CO₂ Conference Recap
 - Held July 10-11 at the Casper Event Center.
 - 285 attendees, an extremely good turnout.
 - Multiple marketing strategies which included different forms of media coverage.
 - The past seven CO₂ Conferences showed a steady increase in revenue and in total attendance.
 - Survey results mainly positive results
 - Good feedback
 - The planning process is already under development for the 2014 CO₂ Conference.
- IOR/EOR Conference, September 9th and 10th
 - A list of confirmed speakers was shared with the Commission.
 - Estimate 100 attendees.
 - Pre-event activity such as golf or fly-fishing is under development.
- Wyoming Football Tailgate Reception, Saturday, Sept. 7th
 - Wyoming vs. Idaho game
 - This day is labeled “Energy Day”.
 - There will be a pre-game hospitality tent that will host 50 people.
 - This is a \$5000 investment.
 - It is hoped to acknowledge and celebrate partnerships.
- Staff Training
 - Flat Top Anticline Field Trip was June 14th
 - Geological tour of exposed oil field
 - Positive feedback from the staff
 - Staff Development – Staff Training
 - In development
 - 2 days off site, \$10,000 budget
 - Professional Facilitator
 - Topics will include verbal and nonverbal communication development and emotional intelligence in the workplace.
- Other Outreach Activities
 - Forums
 - Will begin fall 2013.
 - Will utilize the new technology of the Energy Innovation Center.
 - Potential to collaborate with Trihydro and other partners.
 - Distinguished Speaker Series
 - Underway, so far this year Sallie Greenberg and Monty Hoffman have spoken to EORI staff.
 - It is hoped that this will grow to one-two speakers every 6 weeks.
 - Minnelusa II
 - There is potential to repeat Minnelusa I.
 - Minnelusa II will be scheduled for the late fall.
 - Tensleep III
 - Potential for a repeat of the Tensleep series.

- Purpose of repeat would be to engage a different audience, an audience less experience in the industry.

***Senator Eli Bebout left the meeting, 12:30pm**

Review Business Plan for the EORI Laboratory

Research Scientist Curtis Chopping gave a PowerPoint presentation to the Commission on Enhanced Oil Recovery Institute's (EORI) Laboratory Business Plan.

- Curtis Chopping began with a brief summary of his background, education and how long he has been with EORI.
- EORI Lab Objectives
 - Establish EORI laboratory capability to screen and validate EOR methods for Wyoming fields
 - Serve Wyoming Operators' needs for lab measurements
 - Develop new EOR methods to improve oil recovery for Wyoming fields
 - Implement collaborative projects with the faculty at SER and Chem. & Petr. Engineering; work with faculty and students to promote energy education.
- Quick Summary of Lab Group
 - Geochemist/petrologist, petroleum engineers, chemists
 - Lab Management team: technical leader, safety officer, budget officer, project leaders
- Lab Equipment Procurement & Capability
 - Three Core Flood Apparatus
 - Phase Behavior Apparatus
 - GOR Apparatus
 - Slim Tube Apparatus
 - Agilent GCs
 - Visual Cell
 - HPHT Tensiometer/Operating System
 - Cambridge Viscometer
 - Anton Paar Stabinger
 - Automatic High Sensitivity Wide Range Cryoscope
 - Rocker & HPHT Cylinders
- Lab Business Plan
 - Project Oriented
 - Wyoming field projects will have priority
 - Short term goals (Current date through October 2013)
 - Discussed a variety of short term goals held by the Enhanced Oil Recovery Institute Laboratory Group.
 - Long term goals (FY 2014)
 - Discussed a variety of long term goals held by the Enhanced Oil Recovery Institute Laboratory Group.

Update Project Status

Director Mohrbacher directed the Commission's attention to project updates that were included as handouts at the meeting.

Update Prospects

Associate Director Glen Murrell updated the Commission on the list of prospects under development by the Enhanced Oil Recovery Institute (EORI).

VIII. Review EORI Calendar


Chairman Williams asked if the schedule for the Commission and Technical Advisory Board (TAB) meeting in July of 2014 needs to be rescheduled to a month with fewer competing events. It was discussed that keeping the TAB and Commission meetings next to each other creates an invaluable opportunity for Commission members to attend the TAB meeting and to hear any feedback that the TAB may have for EORI.

IX. Review action items

Business Manager Pepper McClenahan reviewed all action items that had developed from the meeting.

- Director Mohrbacher to maintain the executive session minutes in his office, in a locked file cabinet or secure location.
- Review of supplemental RMP for the Big Horn Basin; take a look at the changes and see what EORI can do to support EOR in this effort.
- David to address performance based deliverables for the faculty members.
- Agenda for January, Director Mohrbacher to give the EORC an evaluation of contracts, and what faculty members have completed.
- Finalized budget will be sent out after the necessary changes and suggestions are addressed.
- Review the letter to the Minerals Committee and get feedback to Chairman Williams within the next week.

The meeting was adjourned at 1:45pm.



Bruce Williams, Chairman