Meetings, Conferences and Workshops

7th International Greenhouse Gas Control Technology Conference: Weyburn Project Highlighted By Randy Burke

The greenhouse gas conference was attended by more than 660 delegates from around the globe. I was involved in two presentations: one about regional mapping and the other about the potential of CO_2 leakage resulting from salt dissolution (see new publication section). More than 200 papers were presented and about an equal number of posters.

A special series of sessions was allocated to presenting results from the first phase of the Weyburn CO_2 Monitoring and Storage Project in which NDGS geologists played a role in helping to characterize the regional geology in North Dakota. A hardcover 273 page book titled *IEA GHG Weyburn CO_2 Monitoring & Storage Project Summary Report 2000-2004* (Wilson and Monea, 2004) was published in time to hand out to participants at the meeting. The book is becoming recognized as one of the most comprehensive works on geologic CO_2 sequestration and a standard in the science.

In recognition of the expertise demonstrated by the results of the project presented at the meeting, the University of Regina signed four agreements with organizations in Australia, Europe and the United States. The partnerships illustrate the growing international network of scientific centers studying carbon dioxide storage and that scientists in our region are recognized as global leaders in this field.

Several speakers at the meeting spoke about the need for more geologists to study the details of sedimentary basins. It became apparent to them during their work that the detailed geologic characterization of sedimentary basins in general is so poor that assessments of storage potential are not accurate. Numerous geologic storage options are under consideration including coal beds, brine aquifers, and oil reservoirs. Data on the fluids, porosity, permeability, stratigraphy, structure and mineralogy of these geologic features are currently insufficient to make accurate assessments of their potential use. One need only look at the North Dakota portion of the Williston Basin and see that there are fewer than 200 hundred holes that reach basement rocks. That amounts to one potential data point every 350 square miles, and little of the data needed was collected at those localities. With so much unknown geology in the State, one can easily see how new oil discoveries are being made.

Although many opportunities remain for new oil and gas discoveries in North Dakota, less then 60 to 75% of the oil that already has been discovered has been produced. The opportunity to test new technologies in the Williston Basin that might allow recovery of some of that 60-70% stranded oil, and to find a market for CO_2 being emitted from North Dakota power plants encouraged the NDGS to participate in the Weyburn Project. Dakota Gasification Company in Beulah is selling thousands of tons of CO_2 for use in the Weyburn project. In the process they built a 200 mile (320 km) long pipeline that provided numerous jobs and involved over 100 million dollars in capital investment. The 30% increase in oil production from the use of CO_2 in Weyburn Field demonstrates the potential economic feasibility of this technology to this region. Many North Dakota reservoirs are geologically as good, and some better, than those at Weyburn (Nelms and Burke, 2004, Burke, 2004, Smith, and others, 2004) and several of the best candidates lie along the route of the pipeline. When economics allow, aspects of this technology will be applied in North Dakota.

Discussions at the Plains CO_2 Reduction Partnership meeting in Billings illustrated the wide range of potential reservoirs in the State from biological to geological. It seems likely that a combination of storage and utilization approaches will be used if CO_2 reduction is to occur and that such projects will bring together the agriculture, wildlife, and energy industries.

As the conference in Vancouver progressed to completion, it became very apparent that few places around the globe were better suited to act on greenhouse gas issues than North Dakota. North Dakota geologists were involved in the seminal studies on storage and monitoring and thus have the knowledge; while the State has the sources, the sinks, and a populace willing to take up the challenge.

References

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Nelms, R.L. and Burke, R.B., 2004. Evaluation of Oil Reservoir Characteristics to Assess North Dakota Carbon Dioxide Miscible Floooding Potential: 12th Williston Basin Horizontal Well and Petroleum Conference Proceedings, p. G-2 – G-5.

Smith, S.A., Burke, R.B., Helms, L.D., Fischer, D.W., Sorenson, J.A., Peck, W.D., Steadman, E.N. and Harju, J.A., 2004. Sequestration potential of petroleum reservoirs in the Williston Basin: 1st phase final report, Plains CO_2 Reduction Partnership, U.S. Department of Energy, 17 pp.

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Midwest Geosciences Group

The Midwest Geosciences Group (MGG) is a self-supporting organization that promotes continuing education in the geosciences through workshops, short courses and field trips. On October 8, 2004 Lorraine Manz and Fred Anderson attended an MGG short course entitled: "*Improving Hydrogeologic Investigations: Advances in Characterizing Ground Water Movement through Glacial Successions*", which was held in Waverly, MN. Waverly is a small town located approximately 30 miles west of the Twin Cities in an area dominated by glacial landforms and deposits produced by Late Wisconsinan Des Moines lobe ice.

The course was attended by about 80 individuals representing most of the upper Midwestern states and a diversity of backgrounds. A morning classroom session covered topics including an overview of the regional glacial geology and history and various discussions of techniques designed to encourage the use of standardized descriptive methods to characterize depositional environments and stratigraphy. In the afternoon, a field session included several practice exercises and demonstrations of site characterization methods such as rotosonic drilling and cone penetrometry.

Middle Bakken Formation Studies

On September 24, 2004, Julie LeFever presented a day-long core workshop in Denver. The event was sponsored by the Petroleum Technology Transfer Council. The workshop was originally planned for one half-day with a maximum enrollment of 30 participants. However, it was expanded to two, half-day sessions when more than 70 people registered for the class. The participants represented all of the major players in the middle Bakken play in eastern Montana looking to move over into western North Dakota. Julie will present another Bakken core workshop in Billings, Montana in February, 2005.

Six Bakken papers and posters were placed on the North Dakota Geological Survey website at http://www.state.nd.us/ndgs/Bakken/bakken.htm for viewing and downloading. This was done to make it easier for oil companies to access the information. These files have been downloaded more than **6,500** times within the last three months.

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Geological Society of America Annual Meeting and Exposition

The Geological Society of America's 2004 Annual Meeting and Exposition was held at the Colorado Convention Center in Denver from November 7-10. The meeting was attended by Fred Anderson, Randy Burke, John Hoganson, and Ed Murphy. Included in the meeting's Abstracts with Programs was a short article by John and Ed entitled *Observations of burning coal veins and recognition of the origin of clinker by members of the Lewis and Clark Expedition in North Dakota*. (Refer to this issue's New Publications listings on page 38 for the full reference.)

Geological fieldwork is a hunt for meaning. Rocks, minerals, fossils and structures are just intermediate steps, missing links that must be identified before ignorance gives way to understanding.
J.W. Harrington, *Dance of the Continents*