

Status Report on Oil and Gas Research Program Ongoing Projects
November 20, 2006

Digital Thin Section and Core Photo Project

This is a project submitted by the Oil and Gas Division and the North Dakota Geological Survey. The total cost of this project is \$39,966 with \$10,000 provided by the Oil and Gas Research Program. The purpose of this project is designed to produce high quality digital photomicrographs of representative thin sections and photographs of the corresponding core section to be posted on the North Dakota Oil and Gas Division website. The duration of the project is expected to be two years.

July 7, 2005

The purchase of the microscope has been made and \$10,000 has been expended from the Oil and Gas Research Fund. The first status report is due August 1, 2005. This project is well underway and digital thin sections and core photos of the Middle Bakken are already available on the Oil and Gas Division's website. Additional temporary staffing has been hired to accelerate the photographing and it is anticipated the work on the Middle Bakken, Birdbear and Ratcliffe plays will be completed ahead of schedule.

November 15, 2005

The August 1, 2005 status report has been received and posted on the Oil and Gas Research Council's website. As of that status report, 5,520 feet of core has been photographed resulting in 8,057 photographs. The photographs have been posted on the Oil and Gas Division's subscription website. Essentially the entire Bakken core has been photographed and the work, as of August 1, 2005, was focused on Birdbear and Ratcliffe cores.

March 1, 2006

The Birdbear and Ratcliffe cores have been completed and the final report will be submitted no later than July 1, 2006—ahead of schedule.

November 20, 2006

Final report received. As of August, 2006, 15,433 feet of core had been photographed resulting in 25,901 photographs. (This is approximately 5% of the cores in the core library.) A total of 57,852 photomicrographs have been taken of 7,546 thin sections. (This is approximately 50% of the thin sections in the State's collection.) The photos are posted on the Oil and Gas Division's subscription website. Essentially all of the core and thin sections from the three major oil plays currently ongoing in the Williston Basin (Bakken, Birdbear and Ratcliffe) have been photographed. The Department of Mineral Resources has received numerous positive comments throughout the oil and gas industry on the addition of these photographs to the Oil and Gas Division's subscription site. The core photographs and photomicrographs are being used internally by companies to sell CEO's on drilling projects as well as being used in presentations at national meetings.

North Dakota Petroleum Council and Oil and Gas Education Program

This is a program submitted by the North Dakota Petroleum Council. Total cost of the program is \$210,000 with the Oil and Gas Research Council providing \$100,000. The purpose of this program is two fold—providing funding for the Teacher Education Seminar and a school-based program called the Energy Career Awareness Partnership which is a year-round program that puts someone in the classrooms across the State on a daily basis to make presentations, conduct seminars and trade-shows and hold training sessions about the energy industry. The expected result of this program is to provide an on-going education effort in North Dakota schools that will eventually expose virtually every North Dakota student to the energy industry. The duration of this project is two years.

OGRP Summary
November 20, 2006

November 15, 2005
Contract being drafted.

March 1, 2006

Contract signed and first report received. The three-day Teacher Seminar was held last year and continues to educate teachers about the oil and gas industry. Plans are being made for the 2006 seminars with teachers being recruited at this time. The Energy Career Awareness Partnership (ECAP) continues its work in providing information about the oil and gas industry to students and adults. An effort is being made to reach out to parents to inform them of the great career opportunities in North Dakota's energy industry. The ECAP is also assisting with the rewriting of the Bismarck Public School's Career Education classes to include a focus on the oil and gas industry. This is scheduled to be available to 9th grade students in the Bismarck Public School District in the 2006-2007 school year.

November 20, 2006

Second status report received. The 2005/2006 academic year resulted in direct contact with 5,431 individuals for grades four through adult. ECAP is returning annually to classrooms across the state, career, energy and job fair events. ECAP continues to try to engage parents in knowing that there are opportunities in the North Dakota energy industry.

Industrial Safety Training Program

This is a program submitted by the Northwest North Dakota Workforce Training Division of Williston State College. Total cost of the program is \$281,601 with the Oil and Gas Research Council providing \$65,540 for the first year of this two year project. The funding provided by the Oil and Gas Research Council will be utilized to hire a Safety Trainer for the Industrial Safety Training Program. The purpose of this program is to train individuals into a highly skilled workforce for careers in the energy industry.

November 15, 2005
Contract being drafted.

March 1, 2006

Contract signed and first report received. A full-time safety trainer has been hired. Training equipment has been purchased. Matching dollars totaling \$42,286.46 have been received. A hands-on training site continues to be developed with the purchase of land and the donation of equipment to be provided this spring.

November 20, 2006

Final report received. Total number of participants enrolled in oilfield safety classes were 2,113; 201 safety courses offered with 11,752 contact hours provided; of those courses, 64 were for new-hire training with 248 participants and 2,044 contact hours provided. In January Williston State College partnered with Halliburton and the Center for Transportation Safety to provide truck driver training. There were 37 participants in the CDL program. In April a new oilfield fire training course was developed with the Hess Corporation donating all of the fire equipment. There were 9 fire safety courses offered with 76 participants. Because of the success during the first year, Williston State College is confident that the Industrial Safety Training Program will continue to grow and provide training opportunities for area companies.

Contribution of the Petroleum Industry to the North Dakota Economy

This is a project submitted by the North Dakota Petroleum Council and Dr. Larry Leistriz of NDSU to estimate the contribution of the petroleum industry to the North Dakota economy, measured by indicators such as employment, income, additional gross receipts in various sectors of the state, and

revenues from selected state taxes. In addition the Petroleum Council will develop a communications plan to determine the best use and distribution of the results to a targeted audience of North Dakota policy makers and/or the general public. The total cost of this project is \$40,000 with \$20,000 provided from the Oil and Gas Research Fund

March 1, 2006

Contract has been signed with the contingency that the Petroleum Council seeks involvement from the North Dakota Association of Oil and Gas Producing Counties and the Northern Alliance of Independent Producers. Input has been received from these two entities. Draft Oil Contribution Analysis is due October 1, 2006.

November 20, 2006

North Dakota State University is in the final stages of gathering data from the North Dakota oil industry for the Oil Contribution Analysis. The report based on the Analysis will be done by February 1. Once that report has been completed the next phase of the project regarding the communications plan will begin.

Remediation of Salt and Hydrocarbon Impacted North Dakota Soils

This is a project submitted by BioRem Environmental Consultants, Amerada Hess Corporation and the Department of Mineral Resources Oil and Gas Division. Total project cost is \$40,000 with \$20,000 provided from the Oil and Gas Research Fund. The purpose of this project is to develop a user-friendly, low-cost and environmentally appropriate soil remediation process. The proposed project will organize, document and publish a practical soil remediation procedure. The technology has been developed and successfully used for the remediation of North Dakota soils impacted with brine and/or hydrocarbons. With proper organization and presentation, the technology can be applied by field personnel. The technology will be made available to all North Dakota oil and gas producers.

March 1, 2006

Contract submitted to the applicant and revisions were proposed. A revised contract has been sent to the applicant this week.

November 20, 2006

The final report has been received. A Guide for Remediation of Salt/Hydrocarbon Impacted Soil has been written. The guide documents a step-by-step approach to remediation beginning with the impacts of salt/hydrocarbon spills on soils and proceeding through the site evaluation process, field sampling and analytical tests, selection and application of soil amendments and monitoring and site closure requirements. The North Dakota Industrial Commission has published the guide and it is available to all North Dakota operators and the general public. In addition a one-day workshop was held on May 7, 2006 at the Williston Basin Petroleum Conference held in Minot, N.D.

North American Prospect Expo

This is a project submitted by the Department of Mineral Resources North Dakota Geological Survey and the North Dakota State Land Department. Total cost of the project is \$6,725 with \$1,445 provided from the Oil and Gas Research Fund. The purpose of this project is to provide information on current North Dakota oil and gas plays and studies to petroleum geologists, operators and venture capitalists attending the 2006 North American Prospect Expo. Providing this information will encourage investment in North Dakota oil and gas prospects, ultimately resulting in increased drilling for oil and gas in the State.

OGRP Summary
November 20, 2006

March 1, 2006

Contract signed. The Expo has been held with North Dakota having a booth at the event. First report is due May 31, 2006

November 20, 2006

Final report received. The North Dakota Geological Survey, Oil and Gas Division, State Land Department and North Dakota Petroleum Council participated in the North American Prospect Expo held in Houston on February 2-3, 2006. Activity in the North Dakota booth was continuous throughout the entire expo. Questions related to the oil play in the Bakken and pipeline capacity dominated the inquiries. Mineral lease activity, the Birdbear play, the Oil and Gas Division's subscription website and the 2006 Williston Basin Petroleum Conference and Expo were also topics of interest. It appears likely that most of the Williston Basin players (geologist, engineers and financial officers) that were present at the expo stopped by the North Dakota exhibit. Monthly downloads of Bakken, Ratcliffe and Birdbear articles, posters and maps from the North Dakota Geological Survey website peaked around and after the NAPE meeting.

Education of Oilfield Fire Safety

This is a project submitted by the North Dakota Association of Oil and Gas Producing Counties. Total cost of the project is \$216,500 with \$15,000 being provided from the Oil and Gas Research Fund. The purpose of this project is to provide education to 3,000 volunteer and staff firefighters in western and central North Dakota and encourage them to learn more about oilfield fire safety by attending training at the Dickinson-based Williston Basin Oilfield Fire Training Facility that is currently being constructed. In addition this will include providing information to state officials and policy makers about oilfield fire safety and the importance of providing this training.

March 1, 2006

Contract signed. First report is due March 31, 2006

November 20, 2006

Two status reports have been received. Three newsletters of the four authorized in the funding have been distributed to 1,100 western oilfield fire volunteers. Information was also provided in early May at the Williston Basin Petroleum Conference in Minot. **The North Dakota Association of Oil and Gas Producing Counties is requesting a no-cost extension to publish additional quarterly newsletters with the funds that remain. (See attached letter.)**

Plains CO₂ Reduction Partnership Program – Phase II

This is a project submitted by the Energy and Environmental Research Center. Total value of the project is \$21,487,892 with \$500,000 provided from the Oil and Gas Research Fund. Phase II of the CO₂ Plains Reduction Partnership will include, among other tasks, field-based demonstration projects that focus on injecting CO₂ into geologic formations for the dual purpose of CO₂ sequestration and enhanced hydrocarbon production. The primary objectives of these activities are twofold: 1) to develop data sets that verify the ability of the target formations to store CO₂ and produce hydrocarbons and 2) to develop a mechanism by which carbon credits can be monetized for CO₂ sequestered in geologic formations.

March 1, 2006

Contract signed. A report for the work done through December 31, 2005 has been received. Development of the NEPA document for the Beaver Lodge Field validation test has been initiated. Literature search for documents and data specifically related to the Beaver Lodge Field and development of an experimental design

package for the Beaver Lodge Field validation test have been initiated. In regards to the Zama Demonstration Field Validation Test, the draft Experimental Design Package has been completed and is in review. Subcontractors have been obtained and contract negotiations are under way. Baseline fluid samples are being collected for initial characterization work and injection of acid gas is scheduled for February or March.

November 20, 2006

Two quarterly reports have been received for the work completed from January 1, 2006 through September 30, 2006. Work continued on the NEPA documents for the Beaver Lodge Field validation test. Meetings were held with Amerada Hess to resolve details on preliminary information needed for the NEPA documentation. Additional work was done developing a detailed geologic characterization of an area in central North Dakota for the purpose of geologic sequestration of CO₂ from coal-fired power plants in the area. In regards to the Zama Demonstration Field Validation Test, work has focused on meeting preinjection deliverables. The project team has focused their attention on characterization activities related to the injection zone. That has included incorporating data sets from existing sources and creating data where available. The primary focus has been the creation of maps to better describe the geological environment. Testing of core and fluids has begun in order to determine properties that will indicate the reactivity of the system when acid gas is introduced.

Research and Survey of Public Perception Program

This is a program submitted by the Northern Alliance of Independent Producers. Total value of the project is \$210,000 with \$20,000 provided from the Oil and Gas Research Fund. The purpose of this project is to launch a public education program through print and electronic media regarding the oil and gas industry—to educate the public regarding America's current energy situation; assist consumers in making informed choices; help consumers have realistic expectations regarding energy; assist the public in supporting sound public policy choices; and complement current employment training, and education programs. The funding provided from the Oil and Gas Research Fund is to be focused on the research and survey aspects of this program.

March 1, 2006

Draft contract just forwarded to applicant this week.

November 20, 2006

Contract has been signed. The launch of the survey was postponed until after the November elections. Field research is now being done and is scheduled for completion by the end of November. Anticipate a report being made to the Council in December, 2006.

Cretaceous Gas/Shale-Gas Expansion

This is a project submitted by Continental Resources. Total cost of the project is \$630,120 with \$186,120 provided from the Oil and Gas Research Fund. The purpose of this project is to provide information on how the use of newer well logging technologies could expand current North Dakota shallow gas production and generate interest in Cretaceous gas prospects statewide. The intent of the project is to develop a well logging template to be utilized throughout the state to help in identifying shallow Cretaceous gas reservoirs. The duration of this project is 12 months.

November 20, 2006

The contract has been signed. The first status report was received. Four wells have been drilled through the Eagle Formation. (Only two wells were anticipated under the grant.) Two wells were drilled in the southern portion and two were drilled in the northern portion of the Cedar Hills North

Unit. As of the end of August, 2006, two of the wells were completed. Portions of the core is being analyzed to determine gas desorption isotherms. Analysis is also being done on the logs to be incorporated with the core data as it becomes available. All the data has been obtained and is now waiting for analysis. Anticipate next report before the end of the year.

Polymer Gel Treatment: A Remediation for Produced Waters

This is a project submitted by Aeon Energy Corp. Total cost of the project is \$101,000 with \$50,500 provided from the Oil and Gas Research Fund. The purpose of this project is to test the viability of a chemical polymer gel treatment to reduce the volume of produced water from marginally economic wells. Aeon Energy had requested funding to test two wells. The Council authorized funding for testing on one well. The duration of the project is 4 months.

November 20, 2006

The polymer treatment by Aeon Energy began 11/1/06 and was completed 11/4/06. Production prior to the treatment was measured at 1 BOPD with 600 BWPD. A total of 2,412 barrels of polymer were pumped. Although the results of the project are yet to be determined through production, there were some indications that the procedure may have some effect based on 'bled off' tests conducted during the process. The well is currently shut-in prior to the beginning of production testing. .

Crude Oil Transportation Capacity Study

This is a project submitted by the Northern Alliance of Independent Producers. Total cost of the project is \$16,000 with \$8,000 to be provided from the Oil and Gas Research Fund. The purpose of this project is to conduct research regarding transportation and infrastructure capacity for Williston Basin crude oil and to identify factors that have influenced or limited the movement of North Dakota product to market so appropriate (regulatory, public policy or otherwise) changes can be implemented. The engineering firm engaged to conduct this study will provide recommendations of possible responses.

November 20, 2006

This contract is yet unsigned as the applicant is seeking a revision to their application—**NAIP is requesting that ALL Consulting be engaged to conduct this study rather than Purvin & Gertz. (See attached letter.)**