DOE selects proposals for oilfield demonstration projects

In June, candidate proposals for oilfield demonstration projects were submitted to the Department of Energy for federal cost sharing; the DOE selected 9 out of 31 submitted. Among the proposals selected were those from Parker and Parsley Development Co., Midland, TX, and Strata Production Co. of Roswell, NM. The proposals were for DOE’s Class III Oil Recovery Field Demonstration Program.

As a team member in the Parker and Parsley project, the PRRC will be responsible for petrophysical work, laboratory testing of CO₂ gravity drainage, and technology transfer of the results.

Also, as team members for the Strata project, the PRRC will assist in interpreting the results from the project, assist in preparing reports, and participate in technology transfer efforts.

The Class III Oil Recovery Field Demonstration Program was created to ensure the continued flow of crude oil from some of the nation’s most threatened reservoirs.

PRRC teams with Parker and Parsley

The PRRC has teamed with Parker and Parsley Development Co., Midland, TX, to test the feasibility of CO₂ gas injection in the naturally fractured Spraberry Trend. The total project cost is estimated to be $13 million; The DOE will provide $5.2 million (40%) and Parker and Parsley will provide the remaining $7.8 million.

The PRRC will be responsible for petrophysical work, laboratory testing of CO₂ gravity drainage, and technology transfer of the results. Prior to initiation of a pilot CO₂ flood, advanced reservoir characterization techniques will be applied. The objectives are to characterize the fracture system, investigate the interaction of the rock matrix with the fracture network, re-evaluate the cause of the poor waterflood performance, and understand flow paths that injected CO₂ will follow.

The Spraberry Trend Area Field has an estimated OOIP between six and ten billion barrels. The field covers an area greater than 2,500 square miles, making it the largest area reservoir in the world.

The marginal economics of producing from the Spraberry are well known and documented in a large body of published literature. Primary solution gas drive and waterflooding have recovered less than 12% of the OOIP.

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reservoir characterization followed by a Spraberry CO₂ pilot have been proposed.

The results of this project will test the economic feasibility of CO₂ flooding the Spraberry Trend reservoirs, which contain large volumes of unrecovered oil. In addition, the reservoir characterization methodology, laboratory experimental results, and enhanced oil recovery operations developed will be applicable to all naturally fractured reservoirs, regardless of geological class. Plans include drilling sixteen wells, including six water and four CO₂ injection wells, three production, and two logging observation wells. In addition, a dual lateral horizontal core well will be drilled in the pilot area to characterize the local fracture network.

Parker and Parsley, a mid-sized independent and proposer of the project operates 2,400 Spraberry wells; in 1993 they drilled 249 Spraberry wells. The Spraberry Project Team (SPT) has been organized and the following is a list of key team members and their responsibility:

- Parker and Parsley is the proposer of the project responsible for administration, field operations, coordination of the SPT. Paul McDonald, Senior Reservoir Engineer, is the Project Manager and Tom Sheffield, Geologist, is on the Project Committee.

- New Mexico Tech’s Petroleum Recovery Research Center will provide laboratory facilities for research and work jointly with the Petroleum Industry Alliance on Technology Transfer. David Schechter, Senior Scientist at the PRRC, will coordinate New Mexico Tech’s activities and is a member of the Project Committee.

- Epic Consulting (Calgary, Alberta, Canada) will develop the reservoir simulation and design various tests for the pilot wells. Richard Baker, President of Epic Consulting, is also on the Project Committee.

- New Mexico Tech’s Department of Petroleum and Natural Gas Engineering Department will lead the fracture characterization program. Dr. Lawrence Teufel, Langdon Taylor Endowed Chair of the department, will supervise fracture characterization.

- Lincoln Elkins, consulting Petroleum Engineer, will provide reservoir engineering consultation and will act as critical reviewer of the project. Elkins published the original reservoir analysis paper on the Spraberry Trend in 1953. Elkins’ experience with the Spraberry covers 30 years.

- The Petroleum Industry Alliance, Midland, TX, will work jointly with New Mexico Tech on technology transfer, with focus in the Permian Basin. Steve Melzer, Director of the University of Texas Permian Basin’s Center for Energy and Economic Diversification will lead the Midland Basin technology transfer effort.

Strata to work in Nash Draw
Bushy Canyon Pool

The DOE selected a proposal from Strata Production Co. to conduct an advanced reservoir characterization and advanced reservoir management project in the Nash Draw Bushy Canyon Pool at an average depth of 6,800 feet in the Delaware/Permian Basin in Eddy County, New Mexico.

The five-year project will involve advanced reservoir characterization using three-dimensional seismic, vertical seismic profile, geostatistics, and log and core analyses and reservoir simulation to design a reservoir management program aimed at early implementation of pressure maintenance. Strata will compare the performance of the demonstration effort with the nearby East Loving Pool, which was developed without advanced reservoir characterization or pressure maintenance.

In the first budget period, 400 feet of conventional core will be collected from two wells drilled at the owner’s expense, along with modern well logs and pressure data from eight wells drilled at the owner’s expense, and a two-pattern pilot project that will include the conversion of two wells to water injectors. If this phase is successful, the project will move to its second budget period, which will include the drilling of ten new wells, three of which will be deviated to exploit portions of the reservoir under a playa lake and a potash mine, and conversion of wells to water injectors.

Total project cost estimation is $18.4 million with the DOE providing 43% of the costs and the remaining from Strata and partners.

The PPRC, along with other team members, will assist in interpreting the results from the project, assist in preparing the required reports to the DOE, and participate in project evaluation and technology transfer.
PTTC activities

In our 1993 summer newsletter, we reported on the newly created Petroleum Technology Transfer Council (PTTC), a national umbrella organization established by the Independent Petroleum Association of America (IPAA). The purpose, and the necessity, for creating the PTTC is to promote the effective transfer of exploration and production technology from the research and development community and intermediary providers of technology to domestic petroleum producers and operators in all producing regions. In our 1993-1994 winter newsletter, we reported that the PRRC/New Mexico Tech was selected by an industrial advisory group convened by the Independent Petroleum Association of New Mexico as one of ten PTTC regional lead organizations across the nation.

For several months, the PTTC studied an approach for implementing a technology transfer program. Their recommendations for a five-year plan were submitted to the Department of Energy in May of 1993. Federal support was obtained for PTTC’s recommendations, and on November 1, 1994, the PTTC received operating funds for the first year of the program.

The DOE’s Bartlesville managing contractor, BDM, oversees the activities of the PTTC. BDM’s responsibility includes the inspection of all of the participating regional offices. On November 2, E. Lance Cole of BDM-Oklahoma and Deborah Rowell, executive director of the PTTC, visited Tech to tour the facilities of the PRRC, the Department of Petroleum and Natural Gas Engineering Department, and the Bureau of Mines and Mineral Resources.

With the completion of phase one—analyzing, planning, and establishing a national office and overall management (completed October 1, 1994)—the PTTC is entering into phase two in which the resource centers become operational. The centers will conduct problem-identification workshops specific to the areas of each one. The PRRC has already conducted three problem-identifying workshops and plans on conducting several technology workshops soon. The ultimate goal of the regional centers is to disseminate all upstream technology that is available from the government, national labs, universities, research organizations, service industry, and other sources.

Ms. Rowell stressed the importance of meeting with producers to show that the PTTC is industry-driven and not another government program. "Independent producers have been skeptical about the government, but if independent producers are going to survive into the 21st century something needs to be done to make them more competitive."

The Electronic Information System Update on the Petroleum Onramp to the Information Superhighway

The Gas and Oil Technology Exchange and Communication Highway (GO-TECH) is a computer-based networking system that was developed by the New Mexico Petroleum Recovery Research Center, with system support from Los Alamos National Laboratory.

GO-TECH, described in our Summer 1994 Newsletter, has been fully operational since May 1994, with selected major sub-systems coming on-line earlier in February. Following evaluation of the system by several in-state test sites, software for accessing GO-TECH was distributed, starting in late August 1994.

In addition to users who access the system directly via Internet, there are currently more than 175 active GO-TECH accounts with approximately 80% representing independent oil and gas producers in New Mexico. The pattern of usage indicates that the system is being used primarily in the workplace, with 80% of requests coming during normal working hours and 88% during the work week. Peak requests per day have exceeded 700, the average is over 400 per day.

The response seen during the initial phase of GO-TECH has been much more promising than originally anticipated. A large portion of this success is due to the very active roles played by the two regional trade associations in New Mexico. Another large contributing factor is the ready acceptance of digital communication technology in the petroleum workplace.

Dave Martin, PRRC Director, delivered presentations on GO-TECH at the Annual Meeting of the Independent Petroleum Association of New Mexico (IPANM) at Albuquerque in September 1994 and at a PTTC workshop in November 1994. The GO-TECH system was demonstrated by Bob Blaylock and Bob Emery at the IPANM Annual Meeting and the Annual Meeting of the New Mexico Oil and Gas Association at Santa Fe (continued on page 4).
Information system . . .

(continued from page 2)

in October 1994. Martin and Blaylock also displayed the GO-TECH system as part of the PTTC exhibit at the 65th Annual IPAA Meeting at Phoenix in November as well as at the 1994 Annual Meeting of the Interstate Oil and Gas Compact Commission at Long Beach, CA, in December 1994.

In November 1994, the GO-TECH system was approved as a prototype electronic information system that will be used by the Petroleum Technology Transfer Council (PTTC), a non-profit organization formed to address the technology needs of oil and gas producers in the U.S. The PTTC system will connect users to the resources of the national organization as well as to all ten of the PTTC regional centers.

Jenny Pecore, Information Technologist, is GO-TECH's troubleshooter at the PRRC. Jenny may be called at 505/835-5812 to report problems in the system.

Improved techniques for fluid diversion in oil recovery

On November 10, 21 people from 11 outside organizations met in Socorro to review progress for the PRRC research project, Improved Techniques for Fluid Diversion in Oil Recovery. This 1.6-million-dollar project receives financial support from the U.S. Department of Energy, the State of New Mexico, and ten major oil companies. These companies include Arco Exploration and Production Technology Co., British Petroleum Company, Chevron Petroleum Technology Co., Conoco Inc., Exxon Production Research Company, Marathon Oil Co., Mobil Research and Development Corp., Phillips Petroleum Co., Texaco Inc., and Unocal. Randy Seright, Senior Engineer at the PRRC, is principal investigator for the project. The project began in September of 1992 and is scheduled for completion in October of 1995.

This project is directed at reducing water production and increasing oil recovery efficiency. In the United States, more than 20 billion barrels of water are produced each year during oilfield operations. An average of 7 barrels of water are produced for each barrel of oil. Today, the cost of water disposal is typically between $0.25 and $0.50/bbl for pipeline transport, and $1.50/bbl for trucked water. Therefore, there is a tremendous economic incentive to reduce water production if that can be accomplished without sacrificing hydrocarbon production. Environmental considerations also provide a significant incentive to reduce water production during oilfield operations.

This three-year project has two general objectives. The first objective is to compare the effectiveness of gels in fluid diversion (water shut-off) with those of other types of processes. Several different types of fluid-diversion processes are being compared, including those using gels, foams, emulsions, and particulates. The ultimate goals of these comparisons are to (1) establish which of these processes are most effective in a given application, and (2) determine whether aspects of one process can be combined with those of other processes to improve performance. Analyses and experiments are being performed to verify which materials are the most effective in entering and blocking high-permeability zones.

Another objective of the project is to identify the mechanisms by which materials (particularly gels) selectively reduce permeability to water more than to oil. A capacity to reduce water permeability much more than oil or gas permeability is critical to the success of gel treatments in production wells if zones cannot be isolated during gel placement.

Topics at the November 10 project review included gel properties in fractured systems; the ability of gels to reduce water permeability more than oil permeability; use of aluminum-citrate-polyacrylamide gels; field applications of gels; gel placement in anisotropic flow systems; and use of foams, emulsions, and particulates as blocking agents.

CO₂ Huff-n-Puff project progressing

The Central Vacuum Unit (CVU) CO₂ Huff-n-Puff project is progressing on the first task as defined in the project statement of work, "Reservoir Analysis and Characterization." One of the deliverables for this task is the determination of the original oil in place (OOIP) for the project area; critical to that is the establishment of a true oil-water contact (OWC), initial water saturation, and porosity. In addition to the work involved in establishing the reservoir formation characteristics, significant progress has been made in developing an equation of state (EOS) that accurately describes the multiple phases of the CO₂-oil fluid system that can exist in the reservoir.

The first step in determining the reservoir characteristics is the establishment of the formation

(continued on page 5)
Huff-n-Puff Project
(continued from page 4)

porosity across the project area. The normalized porosity and permeability data from 455 wells in the project area were available for this review. By using geostatistical techniques, a distribution of the wellbore data to interwell locations provides the reservoir simulation software with data for the areas between the wells. These techniques may prove a more realistic distribution of the data than the typical algorithm used in mapping software. The initial screening of the data from the project wells resulted in a reduced well count of 322 to be used for variogram and gridding evaluation.

The preliminary three-dimensional (3-D) porosity grids have been created using Texaco's kriging algorithm. Initially two sets of each grid will be developed: one with fine grid meshes for near wellbore simulation and a second with coarser meshes for interwell flow simulation. The coarser meshes will be made directly from the well data variograms, rather than averaged versions of the fine mesh grids. The grid size optimization is proceeding with input from the compositional simulation experts, so the end product will better support the simulation process.

The normal method for establishing a relationship between formation porosity and permeability has been to apply linear regression analysis to a scattering of core-determined porosity and permeability data. This previous work did not account for numerous parameters that can have an effect on this relationship. A new method uses artificial intelligence to determine the porosity-permeability relationships and then derives valid values of permeability for all wells in the study. Artificial intelligence is a name applied to several types of computer programs that attempt to simulate the learning processes of the human brain. The particular type of artificial intelligence applied to develop the porosity/permeability relationship for this project is called a neural network. This method, used to derive permeability from wellbore measurements in this project, is a process patented by Texaco.

The general methodology used for neural networks consists of four steps: data to train the network is assembled and put in the proper format. The network is then "trained" using the selected data. Then it is applied to a test data set held in reserve. Finally, the results are evaluated to determine the effectiveness of the network. A data set of slightly over 4,000 data points was used to train the network. During the "learning" phase, the network operates such that data supplied are acted upon by the network to generate a value, which is compared to the known value. The amount of error is determined and the value of a weighting function adjusted to yield a better result and the process is repeated. More than 50 repetitions of the above process were completed before a network was finalized. The final network achieved a mean absolute deviation (error) of 7.28 millidarcies vs. 10.96 millidarcies for the standard linear regression analyses. In this case, the application of standard linear regression analysis would have resulted in data 50 percent less accurate than that obtained from the neural network.

Once the porosity and permeability variations have been addressed, a detailed evaluation of fluid saturations was undertaken using capillary pressure data, corrected for reservoir conditions, to define the initial fluid saturations above-an-OWC or the elevation of zero capillary pressure level (Sw = 100.0 %). A study of the available electric logs defined the OWC to be at -1,000' from sea level datum. The average Sw of the main pay zone was then established at 20.0% using the capillary pressure data. The recent development of deeper reservoirs have provided a significant density of wireline data within the San Andres transition zone. The effect of the previous waterflooding efforts in this formation was evident on the new wireline logs. However, due to compartmentalization and discontinuities within the reservoir, a "ghost" or "shadow" of the original saturation profile can be identified, especially in the non-waterflooded transition zone that verifies the OWC to be approximately -1,000' from sea level.

Since compositional simulators are limited to two-phase equations of state, approximations were required to deal with the three-phase behavior observed in the laboratory experimentation. A series of constant composition expansion experiments were run on samples of CVU crude oil with increasing concentrations of CO2. The objective of this task is to adjust the parameters in the three parameter Peng-Robinson equation of state to match this data and provide proper CO2-oil phase behavior descriptions for use in a compositional simulation model. An equation of state has been determined that accurately represents the reservoir fluid characteristics.

Subsequent efforts will be directed toward an improvement of the current match, reservoir gridding refinements including fine gridding in near wellbore areas, and slultime experiments will be simulated to assist in development of a reasonable fit of the live oil-CO2 phase behavior data, especially considering the complexity of dealing with the three-phase system. The permeability gridding of the reservoir using the neural network to determine interwell permeabilities directly from the geostatistical determined porosity grid may be evaluated as an alternative gridding approach.
Establishing links to researchers in China

On her recent trip to China, Jill Buckley, head of the Petrophysics and Surface Chemistry Group, met with the researchers in several Chinese organizations with research interests and problems related to those studied at the PPRC. An invitation from the Petroleum Engineering Department of the University of Petroleum (UPC), located in Dongying City, Shandong Province, made the trip possible.

The lectures on wettability, how it is influenced by crude oils, and its effects on oil recovery, were attended by students and faculty from the department, as well as by representatives of the nearby Shengli oil field and its associated Research Institute. There was lively discussion on topics that ranged from different views of mixed wettability to practical reservoir applications of the results of laboratory studies. Communication was facilitated by Yu Liu, a research associate with the P&SC group, who interpreted and discussed her own research contributions.

The trip also included stops at the research institute of the China National Petroleum Corporation (RIPE) in Beijing and at the graduate branch of the University of Petroleum in Changping. Special thanks for arranging this exchange are due to Drs. Jienian Yan and Yueming Chen of UPC and to Jia Dao, a visiting scholar in Socorro from 1987-91, now with the China Oilfield Chemistry Company. In the future, UPC plans to send representatives to visit and work in Socorro, extending the cooperation that began with this visit.

Three students receive McMinn Scholarships

Three New Mexico Tech students have received the Roswell Section of the Society of Petroleum Engineers Jack McMinn scholarships. The winners are Timothy Gorham, Brandon Pembles, and Daniel Ochs (a 1993 recipient).

Timothy came from Cincinnati, Ohio, to New Mexico Tech in pursuit of a petroleum engineering degree. He is a senior expecting to earn a bachelors degree in May 1995. During the past summer, Tim worked as a co-op student at Sandia Laboratories. While attending classes at Tech this fall, he continues to work on the Sandia project of sealing wells, rams, and shafts at the Yucca Mountain high-level nuclear waste repository. After graduation, he plans to attend Rogaland University in Stavanger, Norway for his masters in petroleum Engineering. Tim is currently the 1994-95 vice-president of the SPE New Mexico Tech Chapter, and he served as Secretary of the AAPG New Mexico Tech Chapter.

Brandon, a native New Mexican from Milan, has worked on campus since the spring of 1992. He is currently working as an engineering student assistant to Bill Weiss, the Petroleum Recovery Research Center field engineer. Brandon gathers and compiles data for use in the oilfield simulator, and he produces three-dimensional views of producing oil fields. He is proficient in several sophisticated computer software programs such as AutoCad, Quattro Pro, and Paraadox. He taught an AutoCad class at New Mexico Tech's Community College last year. Brandon, a senior, is expecting to earn a bachelors degree in engineering mechanics in May 1996.

Dan is the current president of the SPE New Mexico Tech Chapter, and he served as treasurer for the 1993-94 term. He is from Simi Valley in California, and during 1991, while still in high school, he attended Moorpark College (CA) where he maintained a 4.0 grade point average. Dan was a 1991 National Merit Scholar upon graduating from high school. For the past three summers, while attending Tech, he worked for UNOCAL, both in Louisiana and California. Dan's major area of interest is in reservoir simulation. He is a senior and anticipates graduating in May 1996 with dual majors in petroleum engineering and mathematics.
Director Emeritus of PRRC honored by SPE

Dr. Joseph J. Taber, Director Emeritus of the Petroleum Recovery Research Center was among the SPE members recognized for exceptional professional and technical contributions at the Annual Technical Conference and Exhibition in New Orleans last September. Taber was recognized in the Society of Petroleum Engineers' "Distinguished Member" classification, which was created in 1982 to honor members who achieve prominence in the petroleum industry or academia. Taber's significant contributions in petroleum engineering have been in the areas of alcohol flooding, surfactant flooding, horizontal well injection, coalbed methane, EOR research and development, and EOR economics and environmental issues.


Taber has received tributes from SPE in the past: he was the recipient of the EOR Pioneer Award (awarded by both the SPE and the Department of Energy) in Tulsa, Oklahoma, in 1990, and he was an SPE Distinguished Lecturer, 1989-1990, presenting his paper entitled "The Outlook for EOR in Changing Economic Conditions" at fifteen SPE sections in the United States.

Taber, supposedly "retired" from the PRRC, continues to be active in the EOR field, especially CO2 flooding. Last year he presented a paper entitled "The Use of Supercritical CO2 for Enhanced Oil Recovery" at the International Conference on Carbon Dioxide Utilisation at the University of Bari in Bari, Italy. The paper was presented as the Plenary Lecture for the section on the utilization of supercritical CO2. Taber pointed out that EOR consumed far more CO2 than all other uses combined. 4

Profile: Executive Director of PTTC, Deborah Rowell

Over lunch at a local restaurant on the day Deborah Rowell visited the PRRC, a member of the lunch group mentioned she had lived in Memphis for 17 years. Ms. Rowell declared, with the hint of a soft Mississippi accent, "Now I know why I liked you right off." But then, Deborah, a native of Laurel, Mississippi, seems to like everyone "right off," whether they're from the deep south or not. This amiable manner will serve her well as the head information liaison between the research community and oil and gas producers.

The personable Ms. Rowell is the executive director of the newly formed Petroleum Technology Transfer Council (PTTC). She heads a Washington, D.C., staff to establish and implement the PTTC program throughout the country. During the organizing phase of the PTTC over the past three years, she has traveled extensively, speaking to industry groups about the program. Ms. Rowell is an economist who wants to help independent oil and gas producers gain access to valuable technology. Her primary goal is to narrow the information gap between the major producers and many independent producers who don't have access to new exploration and production technology.

Prior to joining the PTTC, Deborah had been on the senior staff of the Independent Petroleum Association of America (IPAA) since 1983. She wrote the monthly column "Facts and Forecasts" for Petroleum Independent Magazine and served as editor of the annual statistical book, The Oil & Natural Gas Producing Industry In Your State. She has been asked to serve on the Advisory Board of the National Technology Transfer Center. She serves as a liaison on the Steering Committee for the American Geological Institute's efforts to form a National Geoscience Data Repository. In the past, she has served as a member of several subcommittees and currently serves on several others for the National Petroleum Council. She is also a member of the Society of Petroleum Engineers, the American Association of Petroleum Geologists, and the Society of Exploration Geophysicists.

Deborah's career move into the oil and gas industry wasn't by accident: her father was an independent producer in Laurel, where she grew up and learned the business early in her life. When she graduated from high school, she left home to attend Louisiana State University where she earned a BS in International Trade and Finance. She then attended Virginia Polytechnic Institute and earned her MA in Economics. Upon her father's retirement, Deborah and her brother took over the family business. In the early 1980's, however, Deborah and her family were hit hard by the oil bust and sold the company. Fortunately, by that time, Deborah's life, education, and career were firmly entrenched in the industry. She moved to the Washington, D.C., area and joined the IPAA as a staff economist in 1983. It was a perfect match: "The members of IPAA are the people I grew up with," she said. 4
Further interest in downhole sampling

A presentation based on the thesis work of Ashish Banik (MS Petroleum and Natural Gas Engineering, 1993) was made on November 15 at the Second Tracer Workshop in Austin, Texas. The meeting, which featured a wide variety of papers from technologists in both oil industry and Hydrology, was attended by John Heller, who described Banik’s work. That research consisted of theoretical and experimental examination of a method for obtaining samples from specific levels, so that tracer experiments could give much more detailed information about the reservoir. A copy of that presentation, PRRC 94-59, is available.

PRRC Newsbriefs

Paper Deliveries

Two papers were presented at the 3rd International Symposium on Wettability and Its Effect on Oil Recovery in Laramie, WY, Sept. 21-12: Y. Liu and J. S. Buckley, "Wetting Alteration by Adsorption from Crude Oil" and J. S. Buckley, "Chemistry of the Crude Oil/Brine Interface."


A. Ouenes et al., "A New Approach Combining Neural Networks and Simulated Annealing for Solving Petroleum Inverse Problems" and N. Saad, C. Kalkomey, and A.


Personnel: Gains and Losses

In December, two members of the PRRC team left the fold: Assistant Director for Administrative Services William (Bill) R. Christy and Executive Secretary Karen Bohlender.

Bill Christy, who is retiring, came to Tech in January 1982 and started out his nearly 13 years on campus in the business office. In October 1986, Bill transferred to the PRRC where he soon became an invaluable and trusted co-worker and friend to all. Bill’s immediate plans are to do some traveling; he promised his wife a trip to Orlando, and then they’re going up through the Carolinas for some sight-seeing. Bill, a CPA, may be leaving the PRRC but will be “in business” developing software for use in commercial applications.

Karen Bohlender left December 2 to join her husband in Colorado Springs where he’s been working since his transfer from the Stallion Site on the White Sands Missile Range. Karen started at the PRRC as a Technical Secretary in October of 1988, was promoted to the position of Graphics Specialist, and then to Executive Secretary, where she’s been for the past two years.

Replacing Bill Christy as Assistant Director for Administrative Services is Alan A. Reisinger, a nine-year Tech veteran who comes to the PRRC from the EMRTC Group. Alan has had extensive experience in planning, directing, and coordinating administrative and financial activities.

Also new at the PRRC is Jenny Pecore in the newly created position of Information Technologist. Recently married, Jenny and her husband Doug, both practicing petroleum engineers in Texas, came to Socorro to enable Doug to further his education at Tech. Jenny maintains the information on GO-TECH and is involved in PTTC activities.

Another newly created position has brought Nouraddine Benallil back to the PRRC after a two-year absence. Nouraddine’s title is Computer Support Specialist. Nouraddine is a graduate of Tech and worked at the PRRC as a student.

Happy New Year
To All Our Readers
PRRC researchers awarded patent

The Miniporopermeameter, which was described in the Winter 1993 issue, has been granted a U.S. patent, number 5,373,272. This apparatus is built upon the well-known miniporometer, a device with which the permeability of reservoir rock may be measured with a probe held against the flat surface of the sample. The miniporopermeameter (MPP) adds to this capability, giving the porosity as well. Porosity is measured by calculation from the rate of decay of air pressure in the cavity over the rock surface. The inventors are Jim McLemore, John Heller and Zhongming Chen (who received his MS at Tech in Petroleum Engineering last year).

Recent Tech graduate working in Senator Bingaman’s D.C. office

Mark Valenzuela, a native of New Mexico and a recent graduate from Tech with a BS degree in technical communication, has joined the legislative staff of U.S. Sen. Jeff Bingaman (D-NM) in Washington.

For three years Mark worked in the Information/Publications Office of the PRRC as a student assistant, and for one semester during that time, he served an internship, a prerequisite to earning his degree.

Mark is a legislative correspondent in Bingaman’s office assigned to handle constituent correspondence on natural resources, environment, and energy issues.

New Mexico Tech student awarded Phillips Petroleum Fellowship

Hugo Harstad, a graduate student in the Petroleum and Natural Gas Engineering Department at New Mexico Tech has received a $12,000 fellowship from the Phillips Petroleum Company Foundation. Dr. Douglas Rhett of Phillips Petroleum (on the right in photo below) presented the fellowship to Mr. Harstad on December 7 in Socorro. The fellowships are awarded each year to a select number of outstanding students who are doing graduate studies in the United States. Mr. Harstad is from Kristiansand, Norway. He began his graduate studies at Tech in August 1993 after receiving his BS degree in petroleum engineering from Rogaland University Center in Stavanger, Norway. His PhD research studies will be in petroleum-related rock mechanics.

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PETROLEUM RECOVERY RESEARCH CENTER

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New Mexico Oil Price History

Posted oil prices courtesy of Navajo Refining Co.; oil stocks courtesy of the *Oil & Gas Journal*; spot oil prices taken from various sources.

New Mexico
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