



COALBED METHANE EXTRA

A publication of the Coalbed Methane Outreach Program (CMOP)

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Technology

Jim Walter Resources Employs Innovative CMM Technologies

Jim Walter Resources (www.jimwalterresources.com) recently installed a cryogenic gas processing unit to upgrade medium-quality gob gas. The cryogenic unit was developed and built by BCCK Engineering of Midland, Texas (www.bcck.com) and processes a 7 MMcfd gas stream of roughly 70% methane into 4 MMcfd of pipeline quality gas.

The BCCK cryogenic facility was installed at the Blue Creek #4, #5, and #7 mines in January 2000. A dedicated gathering system from the gob wells delivers the gas to the unit. The unit then processes oxygen, CO₂, water vapor, and nitrogen sequentially from the gob gas feed stream, leaving

enriched pipeline-quality gas. JWR and BCCK are looking for ways to improve the efficiency of the project as well as expand it. For example, JWR has ordered an additional compressor that will increase throughput by 20%, or 1.5 MMcfd.

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BCCK's Cryogenic Unit at Jim Walter Resources Blue Creek Mines (courtesy of Jim Walter Resources).

CBM/CMM Production Benefits Domestic Energy Supply

In less than a decade, CMM/CBM production in the United States rose six-fold, from about 200 Bcf in 1990 to 1.2 Tcf in 1999 (EIA Annual Reserve Report, www.eia.doe.gov), representing about 6% of the nation's annual gas supply. CMM constitutes about 47 Bcf, or 4% of the current 1.2 Tcf of CBM produced. According to a study entitled "Natural Gas: Meeting the Challenges of the Nation's Growing Gas Demand" by the National Petroleum Council (NPC), without this CBM/CMM production and its associated 400 Tcf resource base, gas prices would be significantly higher. The NPC study estimates that for every 250 Tcf decrease in the gas resource base, gas prices would be \$0.75/Mcf to \$1.00/Mcf higher. With gas demand projected to increase by 50% over the next decade, CMM/CBM projects can play an important role in meeting marginal energy demand. (Continued on Page 4)



International

ADB Completes Evaluation of Yangquan CMM Project, China

Technical consultants ICF Consulting, Advanced Resources International, Inc., REI Drilling, and EDL recently completed a technical and economic evaluation of a coal mine methane (CMM) utilization project at the Yangquan coal mine, Shanxi Province, China. The study was commissioned by the Asian Development Bank (ADB) (www.adb.org), which is evaluating funding coalbed methane development projects in China.

The Yangquan mine complex currently vents a relatively concentrated methane-air stream (40% CH₄) that contains about 202,000 m³/day (5.7 MMcfd). This vented stream is forecast to increase to about 290,000 m³/day (10.2 MMcfd) by 2005. The consultants found that improvements in mining technologies, such as steerable horizontal boreholes, and deployment of those technologies could further improve the quality and quantity of CMM at Yangquan.

The study determined that an array of up to 51 small (1-MW) reciprocating engines, generating about 50 MW of power, is the most effective utilization option for Yangquan. This type of engine is able to handle the variations in gas quality and gas quantity which often

characterize CMM gas production streams.

The study also evaluated CBM production from virgin coal seams in the Shouyang area, about 40 km west of Yangquan. CBM reserves have not yet been proven at Shouyang and the project is too high risk for bank loan financing. However, the Shouyang area remains attractive for exploration by diversified petroleum exploration and production companies.

Ecolinks Awards CMM Project in Ukraine

EcoLinks, an initiative of the U.S. Agency for International Development (www.usaid.gov), recently announced a cost-sharing grant to the Stakhanova Mine, Ukraine and Resource Enterprises (www.reidrilling.com) of the U.S. The objective of the proposed project is to determine the feasibility of forming an independent directional drilling and gas utilization company that would provide modern

CMM drainage technology to the Stakhanova and other mines of the Donetsk Basin. REI will be providing technical and financial support while the mine will provide data and logistics.

The Stakhanova Mine liberates nearly 2 BCF of methane per year, equivalent to just over 800,000 tons of CO₂. A methane drainage and recovery system is expected to improve mine safety, mining productivity, and environmental quality. The project is scheduled to begin in the second quarter of 2001.

EcoLinks Challenge Grants (www.ecolinks.org/grants.html) are competitively awarded, cost-sharing grants supporting one-year environmental partnership projects. These projects address urban and industrial problems in CEE (Central and Eastern Europe) and NIS (Newly Independent States). Partners from the CEE/NIS region and the US will jointly manage selected projects.



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International

Tender Offer Let for India's CBM/CMM Development Program

The United Nations Industrial Development Organization (UNIDO) www.unido.org, acting on behalf of the Government of India and the Global Environmental Facility (GEF) www.gefweb.org, recently issued terms of reference for the supply of equipment and services for the extraction and utilization of CMM/CBM at the Moonidih and Sudamdih Coal Mines in the State of Jharkand, located in the Damodar Valley coalfields of eastern India. These two mines are relatively gassy and hold good potential for commercial CMM projects. The goal of the capacity building project is to introduce advanced techniques for gas resource assessment, recovery, and utilization methods relative to Indian mining conditions.

Bids were solicited for four equipment packages: 1) Underground drilling and completion; 2) Underground gas collection system; 3) Surface drilling and completion, and; 4) Laboratory equipment. Bidders can bid on single or multiple packages. In addition to the equipment procurement, the successful bidder will also provide training for the operation and maintenance of the equipment during the performance demonstration period. The closing

date for the bids was May 18th, although depending on the responses received it may be reopened. For more information, please contact M. Latrech at UNIDO (mlatrech@unido.org).

The Global Environment Facility was established to support international cooperation and finance actions to address four critical threats to the global environment: biodiversity loss, climate change, degradation of international waters, and ozone depletion. The GEF has funded similar CMM projects in China and is considering additional CMM projects in other countries.

Marketing Workshop Held in China

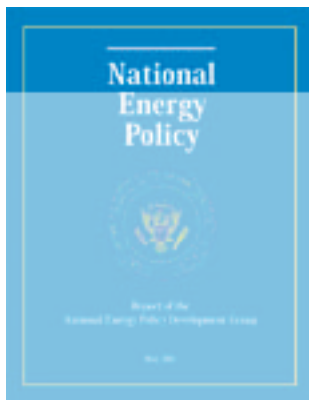
The China Coalbed Methane Clearinghouse and the U.S. EPA convened a workshop in Xiamen, China on April 24 and 25, as part of an ongoing project to market CMM projects at eight of the gassiest coal mining administrations in China. Raven Ridge Resources, Incorporated and China Venture Advisors, LLC conducted the workshop, the purpose of which was to assist companies and organizations within China to develop the skills that will allow them to effectively market CMM projects. There were 30 attendees, including members of six of the gassiest coal mining administrations and the

China National Petroleum Corporation. Ray Pilcher from Raven Ridge Resources and Jay Rothstein from China Venture Advisors presented material at the workshop including methods to effectively target and interface with potential investors or partners. The projects will be presented by mine officials at the International CMM/CBM Investment Exposition/Symposium in Shanghai, China on November 7 - 8, 2001. For more information on the upcoming Exposition, please refer to the CBM Extra's "Upcoming Events" section).

Now Available "Coalbed Methane Notes"

a short weekly e-mail from the Coalbed Methane Outreach Program providing updates on industry and program activities, is now available. CBM Notes is only being disseminated to those who email a subscription request to energystar@optimuscorp.com.

If interested, simply send a message with the word "SUBSCRIBE" in the subject box. We are interested in feedback on this service and welcome ideas for upcoming Notes. EPA is also planning on posting all Notes on the website at www.epa.gov/coalbed.



New Energy Policy Will Encourage CMM Recovery and Usage

The National Energy Policy Development Group, established by the Bush administration to provide recommendations on energy policy, recently released its findings and key recommendations in a report entitled "Reliable, Affordable, and Environmentally Sound Energy for America's Future" (www.energy.gov/HQPress/releases01/maypr/energy_policy.htm). While CMM is not specifically addressed in the report, several of the recommendations may encourage CMM development.

CBM/CMM Production Benefits

(Continued from Page 1)

Coal companies are uniquely positioned to benefit from the surging interest in CMM/CBM development. For example, Consol Energy (www.consolenergy.com) is projected to earn over \$170 million in 2001 from sales of about 30 Bcf of CMM/CBM, according to company press releases. Consol produces and sells a combination of CMM from their in-mine horizontal wells and gob wells as well as from wells drilled into virgin coal seams. Other coal companies are looking at CMM/CBM as a way of improving their bottom line. According to a recent press release, Peabody Coal announced it is evaluating the potential for developing CMM/CBM from the company's coal reserves (Coal Outlook, 2/16/01). Peabody recently purchased the CBM assets near their Caballo Mine in Wyoming. Jim Walter Resources (JWR) (www.jimwalterresources.com) has operated an extensive degasification program at their deep, longwall mines in Alabama for about 20 years. Similar to Consol, these operations produce gas from in-mine, gob, and vertical degasification wells. JWR is also a leader in exploring innovative technologies to utilize medium- to low-quality gas. For example, JWR is employing a BCCK Engineering (www.BCCK.com)

cryogenic plant to process approximately 7 MMscf per day of medium quality gas into approximately 4 MMscf of pipeline quality gas (see article on Page 1). Those companies pursuing CMM projects may also benefit from the sale of greenhouse gas credits their projects generate.

The future for CMM/CBM development looks bright given the projected price of natural gas as well as solid fundamentals and good earnings outlooks for the coal industry itself. The combination of the above factors, coupled with increased awareness of the potential profitability of CMM/CBM projects, means that new mines should seriously consider degasification efforts as an integral part of their overall mine development plan.



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Grants Available For CMM Projects

The U.S. Department of Energy Office of Industrial Technologies' NICE3 grant program (National Industrial Competitiveness through Energy, Environmental and Economics)



provides cost sharing for the scale-up and first commercial demonstration of energy-efficient and clean production manufacturing and industrial technologies. Mining is one of the program categories and projects utilizing CMM for on-site power generation and industrial applications (e.g., process heat, coal drying, etc.) will be considered. A maximum of \$525,000 can be made available to successful state and industrial partnerships to cover up to 50 percent of the scale-up/demonstration cost. The solicitation closes August 11, 2001. Visit the program's web site (www.oit.doe.gov/nice3) for more information.

West Elk Mine Initiates Degas Program

According to Coal Outlook (4/24/01), Arch Coal (www.archcoal.com) has initiated an aggressive degasification program at their West Elk Mine in Colorado to address higher than expected levels of methane in the workings. The longwall mine has experienced "a substantial curtailment of planned shipments" in the first quarter of 2001 due to production problems associated with the high methane levels according to the article. The West Elk longwall mine is slated to produce between four and six million tons of coal this year.

The mine is currently drilling in-mine degasification holes and plans to drill surface gob holes as well, although the rugged topography over the mine will likely make surface drilling more difficult. In the article, Arch President/CEO Steven Leer is optimistic that the degasification drilling combined with a revised ventilation plan will allow the mine to "... return to reasonably strong levels of production in the second half of the year."

Jim Walter Resources

(Continued from Page 1)

In addition to the cryogenic facility, JWR is working with Ramgen Power Systems (www.ramgen.com) to find uses for very low quality gob gas and ventilation air methane. This project will not only help further reduce methane emissions from the mine complex, but may also supply power to the mining operations.

These efforts are consistent with JWR's philosophy of maximizing every potential revenue source, or, as Chuck Dixon, Vice President, Engineering at Jim Walter Resources, says with a little dose of Southern humor, "getting the squeal out of the pig."

JWR is a pioneer and industry leader in CMM production and utilization. EPA's Coalbed Methane Outreach Program has worked closely with JWR to help identify and implement cost-effective CMM recovery and use options.



International Emerging Markets for Coal Mine Methane Projects, EPA-Sponsored Workshop

An EPA sponsored workshop was held on May 17, 2001 in Tuscaloosa in conjunction with the International Coalbed Methane Symposium. Approximately 50 people attended representing numerous countries. The objective of the workshop was to identify barriers that have constrained development of CMM and CBM in developing countries and countries with economies in transition (e.g., former Soviet republics). Both speakers and audience members noted that governments in several of the countries discussed are aware of, and in some cases have implemented legislation, to mitigate some of these barriers. EPA will evaluate recommendations made at the workshop and continue its efforts to facilitate development of CBM and CMM in these countries.

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Please notify us if your contact information (address, e-mail, or phone/fax number) changes.

Upcoming Events

Seventh International Mine Ventilation Congress
Krakow, Poland
June 17-22, 2001

This conference, sponsored by the Mining Committee of the Polish Academy of Sciences, will bring mining engineers, scientists, and researchers together to discuss current and emerging mine ventilation issues. In addition to technical presentations, equipment and product exhibitors will be present, and there will be site visit opportunities. For more information, contact Waclaw Trutwin, Strata Mechanics

Research Institute, Polish Academy of Sciences, 30-059 Krakow, ul. Reymonta 27, Poland (e-mail: trutwin@img-pan.krakow.pl), or visit the conference website at www.emag.katowice.pl/IMVC.

Coalbed and Coal Mine Methane Conference - Eastern Region
Annapolis, MD
July 19-20, 2001

Attend the Eastern U.S. version of the leading non-association Coalbed Methane Event. Speakers will present information on a variety of subject areas where coalbed methane is concerned.

Expert panelists will cover the geology, technology, regulation, and financing of coalbed and coal mine methane projects.

This event will be held at the Sheraton Barcelo Hotel Annapolis. For more information, please contact the Strategic Research Institute at (212) 967-0095 or visit their web site at www.srinstitute.com/cr203.

Upcoming Events continued on Page 7.



Upcoming Events

Coalbed Methane in the Ukraine Dnipropetrovsk, Ukraine September 19-21, 2001

This event will cover such topics as (1) legal and law items of the exploration, production and utilization of coalbed methane (CBM), (2) reserves of CBM, methods of their calculation, (3) organization of geological prospecting and mining and geological conditions of CBM production, (4) technique and technology of well-boring and CBM production, (5) technique and technology of CBM utilization, and (6) ecological and marketing aspects of CBM production and utilization. For more information, please contact Pymonenko Lyudmila Ivanivna at nanu@igtm.dp.ua.

2001 International CMM/CBM Investment Exposition/ Symposium Shanghai, China November 7-8, 2001

This symposium, co-sponsored by the China State Administration of Coal Mine Safety Supervision, the China Coal Industry Association, the the U.S. EPA, will provide investors and companies with information on coal mine methane (CMM) and coalbed methane (CBM) development and China, and new investment opportunities

for CMM/CBM projects. Topics to be discussed include (1) opportunities for investment in specific CMM/CBM projects, (2) exploration and development technology, (3) pipeline transport and use technologies, and (4) financing, policy and regulatory issues.

The symposium, organized by the China Coalbed Methane Clearinghouse, will be held at the Holiday Inn Pudong Shanghai. One of the most attractive destinations in Asia for travelers, Shanghai is the trade and financial capital of China. Parties interested in presenting papers and posters are invited to submit a 400-word abstract by June 20, 2001. Pre-registration for attending the conference is required by October 10, 2001. For a pre-registration form and more information regarding the symposium, please contact Mr. Huang Shengchu or Mr. Zhu Chao at cbmc@public.bta.net.cn or Ms. Sally Hill at shill@ravenridge.com.

Symposium of Utilization of Greenhouse Gases Orlando, FL April 2002

The deadline for abstract submission is October 15, 2001. Visit the American Chemical Society web site at www.acs.org/meetings.

North American 9th U.S. Mine Ventilation Symposium Ontario, Canada June 9-12, 2002

The North American 9th U.S. Mine Ventilation Symposium will be held at Queen's University, Kingston, Ontario, Canada. Abstract submission deadline is July 27, 2001. For more information on trade show registration, proposals for specialty workshops and sponsorship, please contact Euler De Souza, Department of Mining Engineering, Queen's University, phone (613) 533-2199 or by fax (613) 533-6597.