

THE ENERGY MINERALS GEOLOGIST

Newsletter of the Energy Minerals Division
of the American Association of Petroleum Geologists

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PRESIDENT'S MESSAGE

Current and Upcoming Events:

A number of events aimed at keeping the Division relevant for the members are coming to fruition. The "coal book," which has been an effort of my own for the past three years, finally is finished and available to the coal industry. The book was put together with the intent that it could be used as a methods reference by geologists and to introduce non-geologist coal industry managers to the varied ways that geology impacts and can help their operations. With the funds gained from sales of this book, we hope to be able to sponsor other publications and events of interest to EMD members.



The computer bulletin board (BBS), which began as a concept during Don Towse's term as President and was given the go-ahead during Sam Friedman's term, is operational. Scott McColloch deserves a round of applause from the members for suggesting the BBS and for assembling and maintaining the system. We hope to keep the BBS full of useful information and software for members to take advantage of and use. With your input to Scott on the use and needs of the BBS, we will keep it useful to you!

With some amount of last-minute scrambling by EMD officers and committee chairs, and especially with the guidance of Ned Gilbert, we have assembled what we hope will be an especially useful set of courses, field trips, and technical sessions at the 1992 Calgary AAPG-CSPG meeting in June. Mike Fein is leading the charge for the 1993 New Orleans annual meeting, and he already has lined up the Luncheon speaker. Mike has begun organizing technical sessions through his local EMD convention committee. Of course, EMD representatives continue working with Section convention committees to include EMD programs in regional meetings.

We are working on keeping EMD current with respect to the distribution of EMD and AAPG members. The fastest growing segment of AAPG membership is in the international portion of its members. This has spurred AAPG to begin holding more technical meetings outside the U.S., and they will be held on an annual basis. The special Caracas, Venezuela meeting in 1993 will include a session on coal. I am working to see that appropriate EMD subjects also are included in the AAPG meetings in The Hague, The Netherlands in 1993 and in Kuala Lumpur, Malaysia in 1994. Joint technical sessions and courses with the DPA and soon-to-be Environmental Geosciences Division are being pursued to cover topics of interest to EMD members and the other divisions.

I cannot claim direct credit for all these events or for the future outcome of things that will have started during my term. Running the EMD is truly a matter of management of people and events rather than single-handed effort, because many things, such as the annual meetings, are started by earlier administrations and only the final fruits of those labors, often 2-4 years later, are evident to the general membership. Nonetheless, we (the officers and committee chairs in office at a given time) maintain the Division

and make what impacts we can for the betterment of the Division and its members.

Do you have topics or ideas for things that should be addressed by EMD and/or pursued to improve the Division or its members? We want to hear from you, especially if you are able to get personally involved in such efforts! The best way for EMD to stay current with and relevant to its members is through the involvement of those members!

On Geological Employment:

I came across an article in the February issue of *Money* magazine which caught my eye, perhaps yours as well. The article was entitled "Money's Best Jobs in America" (p. 66-72) and covered the ranking of 100 job classifications as they determined them through a poll of *Money* subscribers. Guess what the #2 ranked job was? Geologist! Number 1 was "Biologist" and number 3 was "Physician." Our job was rated the second highest on the basis of factors such as "annual earnings" (average = \$70,560), "security" (rated as "average"), "prestige" (rated as "good"), job "satisfaction" (rated as "excellent"), as well as other factors not separately listed in their table such as the median number of years people have been in a profession, ease of entry (i.e., education level required), and job stress.



On top of the #2 rating we received, the job category was rated as one of the five-best for growth during 1992 (i.e., 6% or more growth) and one of only nine that had an "excellent" job satisfaction rating. Growth in geological jobs over the next 14 years was projected to be 22%!

No doubt, given the many layoffs of geologists in the petroleum and minerals industries over the past 10 years or so, many of you are wondering about some of these ratings and projections. Although the article states that the 1992 outlook for jobs in geology is "excellent" because of "the never-ending search for petroleum and natural gas," I suspect that the short-term outlook for geology is better in the environmental area than petroleum on the basis of continued layoffs (albeit less extensive than in the late 1980s) and retrenchment in the industry in the U.S. To those who have been laid off and have searched for geological employment with little success, and especially to those who have gotten out of the profession altogether because of a lack of employment opportunities, this article likely has a hollow ring to it on many counts.

However, let's face it: the article bears out in at least some respects the reasons we got into the field in the first place. Most of us would not have become geologists if we didn't enjoy the learning, activities, and challenges involved in the jobs we do. Those who have managed to stay employed find the search for oil or minerals, or the investigation of hazards at a building site, or

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the cleanup or prevention of pollution, etc. to be very rewarding pursuits, at least on an intellectual and personal level if not always financially. Ergo, the high job-satisfaction rating.

What good does the article do for those who are unemployed or underemployed? Well, for one, it holds out some hope that, if you have stayed in the profession, things are finally looking up and you should keep looking and working for fuller employment. The output of new graduates in our field has dropped dramatically since the mid-1980s and won't pick up until 3-4 years after there is a clear increase in employment opportunities for new graduates.

The magazine didn't get into analysis of subfields of geology, so there isn't much help there. For those who are searching for employment, whether after a layoff or soon to be getting out of college, you may have to be a little broader in your thinking when it comes to accepting what jobs are available. Consider whether or not your training is broad or specific enough to make a change possible between subfields. Get that training on your own if you have to in order to make yourself saleable.

EMD, and AAPG in general, will help you where we can. Consider the EMD as a resource for job information. We expect to maintain a consultants' list (with information on specialties and experience) of EMD members on the BBS. A *resumé* and *jobs-available* section also will be maintained to allow connections between job seekers and employers. We will continue to put on short courses, technical sessions, and field trips to help members and non-members maintain their geological expertise or broaden that expertise. As you have heard many times, jobs often are advertised and filled through word of mouth. Call around to EMD members and officers to see if they have heard of jobs. Being an EMD and AAPG member helps to give you a point of common interest to work from when contacting such people or potential employers who also are members. If there were no advantage to the networking and infrastructure provided or made possible by professional societies, many wouldn't exist in the first place.

Along with the current events noted before, these are some of the ways EMD stays relevant to its members, employed and unemployed. Employment of members and technical quality of our programs are of ongoing concern to EMD and AAPG. The officials and staffs of EMD and AAPG are working to maintain our usefulness and relevancy to our members. With your input on the results of our efforts, we will maintain the vitality of our society and improve its services to you!

Doug Peters

COAL BOOK DELAYED

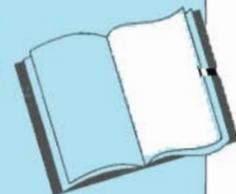
The availability of the "Geology in Coal Resource Utilization" book was delayed from the original projected mid-December due date. The pre-holiday crunch of printing and vacations by staff at the printer have held up the book.

The book now is available from the publisher for \$95, plus \$2.50 for postage and handling.

The original estimate on reduction from manuscript to 800-page printed form was too large. The actual length of the book is now 581 pages, and the original two volumes have been combined into a single-volume book.

Please contact the publisher at (800) 767-1518 if you missed ordering a book during the prepublication sale and would like to order one now.

Doug Peters



MEMBERSHIP

As of December 31, 1991, there were 1,906 members in EMD, an increase of 135 members since December 31, 1990 (7.6%). This is the highest membership total since early 1985 when membership was 1,914.

If you know of someone who would like to join EMD and is an AAPG member, please contact the Membership Department at AAPG headquarters (918-584-2555) for application forms and EMD informational brochures, or check off the EMD box on their dues renewal form and include the applicable fee for EMD membership.

EMD COMPUTER BULLETIN BOARD IS NOW ON LINE

After a period of "burning in," to guarantee that the disk drive problem reported in the last *Energy Minerals Geologist* has been corrected, and of more software development by me, the EMD bulletin board is on line and ready for use by members. The telephone number is (304) 594-3547.

When you first log on, you will be granted "non-live" status. This will allow you to browse through the system and become familiar with it. We then will check your membership status against a database of current members from

AAPG (available to members in the file library) and elevate you to "live" status with full privileges as quickly as possible.

The bulletin board should be available 24 hrs per day, with the



exception of a brief period when the system shuts itself down for daily housekeeping. This currently is set to occur at 3:00 AM EST. If there are any questions, please call me at (304) 594-2331 or, better yet, log on and send questions by BBS mail to SYSOP.

"Scott" McColloch
(a.k.a. "SYSOP")

1993 AAPG ANNUAL MEETING (NEW ORLEANS) PLANNING UPDATE

Recent layoffs and movement of industry people out of the New Orleans area is causing trouble for my local EMD meeting committee and the general planning process. Nonetheless, planning for a joint session with the future Environmental Geosciences Division dealing with energy minerals, the environment, and economics is coming together well.

A combination short course/lecture and field trip on coal depositional processes and deposits also is in the works. The tentative plan is for the pre-meeting, approximately half-day course to be followed immediately by the two-day field trip, with a repeat of the course following the trip so that those who could not make the course the first day still can participate in it (and as a refresher for those who wish to go through it again).

I have received a positive response from Dr. Dixie Lee Ray, former Governor of the State of Washington, regarding her being the EMD luncheon speaker. As far as I know, her attendance is definite barring any unforeseen problems before the meeting.

Mike Fein

EMD EVENTS AT THE 1992 AAPG/CSPG ANNUAL MEETING



Ned Gilbert and his local EMD planning committee, with help from Gretchen Hoffman, Chair of the EMD Education

Committee, have put together a great set of EMD events for the upcoming Calgary meeting. Below is a list of EMD technical sessions, trips, and short courses. Your attendance at EMD-sponsored events is encouraged and appreciated. Please send in your registration as soon as possible, especially for the very-limited-attendance McMurry Formation field trip and remote sensing short course. The McMurry Formation field trip is the first we know of in AAPG to use a helicopter as transportation for participants.

EMD Pre-Meeting Short Course #12, June 20, 8:00 am-5:00 pm, US\$60.00
"Detection of Subtle Basement Structures and Related Hydrocarbon Plays"

- course focuses on remote sensing and geophysical techniques to detect basement structures and their impact on traps and reservoirs
- taught by Zeev Berger (Esso Resources Canada Ltd.)

EMD Pre-Meeting Short Course #13, June 20, 8:00 am-5:00 pm, US\$175
"Coal Bed Methane: Depositional, Hydrologic, and Petrologic Controls on Reservoir Characteristics of Coal Beds"

- course covers coal depositional systems, organic geochemistry and coal petrography, and hydrogeology as they affect the evaluation of source rock and reservoir characteristics of coal beds
- taught by Walter B. Ayers, Jr. (Taurus Exploration, Inc.), William R. Kaiser (Texas Bureau of Economic Geology), and Jeffrey R. Levine (University of Alabama)

EMD Pre-Meeting Field Trip #18, June 19, 7:30 am, through June 21, 5:00 pm, US\$375.00

"Coal, Oil, and Gas Deposits of West Central Alberta"

- trip examines the properties of

west-central Alberta coal in relation to mining and coal-bed methane extraction and will cover the geology of oil and gas fields encountered along the route

- led by Wolfgang Kalkreuth (Geological Survey of Canada) and Willem Langenberg (Alberta Geological Survey)

Monday Morning, June 22, 8:30 am-12:00 noon

EMD Oil Shales/Sandstones (Poster Session), 7 papers

- chaired by W.H. Tisdale

Monday Afternoon, June 22, 1:30-5:00 pm

EMD Remote Sensing in Basin Analysis (Poster Session), 9 papers

- chaired by Paul Fuenning

Tuesday Morning, June 23, 8:30 am-12:00 noon

EMD Hydrocarbons from Coal (Oral Session), 10 papers

- chaired by Ben E. Law and Dudley D. Rice

Wednesday, June 24, 11:30 am-1:30 pm, EMD Luncheon Westin Hotel, US\$22.00

"Energy Minerals Reserves and Resources in a Changing World"

- speaker: Mr. Dennis J. Nikols, Alberta Geological Survey

EMD Post-Meeting Field Trip #19, June 25, 6:00 pm, through June 28, 7:00 pm, US\$900.00

"The McMurry Formation: Reservoir Heterogeneities Exposed in Outcrop"

- trip visits largest oil sand mine in the world, the AOSTRA Underground Test Facility, and classic outcrops and sections of the McMurry Formation (the host of the oil sands deposits), including helicopter travel to and from the outcrop
- led by Daryl M. Wightman (Alberta Geological Survey) and S. George Pemberton (University of Alberta)

GEOTECH '92 CALL FOR PAPERS

The 9th Denver GeoTech geocomputing conference will be held on August 29-September 1, 1992 at the Sheraton Denver Tech Center. The emphasis will be placed on the state-of-the-art and anticipated future trends in computer-oriented geoscience. Abstracts are requested for oral and poster presentations suitable for the broad range of technical fields (minerals, petroleum, environment, engineering, etc.) which will be represented among anticipated participants.

Topical areas included in this computer-oriented meeting will be

- 1) Mapping
- 2) Petroleum Exploration
- 3) Graphics
- 4) Environmental Site Characterization and Remediation
- 5) Geostatistics
- 6) Geographic Information System Applications
- 7) Database Design and Use
- 8) Workstation Applications
- 9) Expert Systems/Artificial Intelligence
- 10) Data Capture and Handling
- 11) Geophysics
- 12) Well Log Data Analysis
- 13) Ground Water
- 14) Mining and Mineral Exploration
- 15) Image Processing
- 16) Reservoir/Deposit Modeling

Abstracts must include a paper title and the name(s), address(es), affiliation(s), and telephone/fax numbers of the author(s). Send your typed, double-spaced abstract of no more than 250 words for consideration to
 GeoTech '92
 c/o ExpoMasters
 Contract Station 19
 P.O. Box 207
 Aurora, CO 80231
 Telephone: (303) 752-4951, Fax: (303) 752-4979

SUBMITTAL DEADLINE for abstracts is April 1, 1992. Please specify whether you want your abstract considered for only oral, only poster, or either oral or poster presentation. Authors will be notified of acceptance/rejection by May 10, 1992. Camera-ready extended abstracts and short papers (no longer than 9 pages, including figures) for the Proceedings volume will be required for accepted abstracts by July 1, 1992.

Oral presentations will be 25 minutes long, followed by a 5-minute long question-and-answer period. Poster presentations will be one-half day in length, although the authors will be required to attend their poster for only a portion of that time.

GUEST ARTICLE: EASTERN COAL AND THE CLEAN AIR ACT AMENDMENTS OF 1990

William A. Bruno
Vice-President, Corporate Planning
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Pittsburgh, PA 15241

The Clean Air Act Amendments of 1990 (CAAA), specifically the acid rain provisions, will have far-reaching impacts on the coal industry in the eastern U.S. A two-phased reduction in sulfur dioxide (SO₂) emissions is mandated. Phase I, beginning in 1995, requires SO₂ reductions at 110 plants based on what each plant would emit at a rate of 2.5 lb (1.1 kg) SO₂ per million Btu. Phase II will begin in 2000, and it will affect virtually all coal-fired plants in the U.S. The SO₂ reductions required in Phase II are based on an emission rate of 1.2 lb (0.54 kg) SO₂ per million Btu.

The CAAA is considered a landmark piece of environmental legislation because of the way the mandated SO₂ reductions will be achieved. Each affected unit will be issued an initial allocation of allowances, entitling the owner to emit 1 ton (0.9 tonne) of SO₂ per allowance. The reduction in SO₂ will occur because the plants will be issued fewer allowances than the amount of SO₂ they currently emit.

The key to the system, and what makes it so unique, is that the allowances can be shifted among a utility's units and even bought and sold between utilities or anyone else who wishes to own an SO₂ allowance. As a result, a utility can decide if it wants to make deep SO₂ reductions at one plant, with a scrubber for example, and continue to burn its existing coal at another plant by shifting SO₂ allowances.

The ability to "protect" high-sulfur coal burn at one plant by scrubbing another plant is an extremely important concept. It is critical to the eastern coal industry that a few key plants install scrubbers by 1995.

In Phase II, a total of 8,900,000 allowances will be issued. This total represents a cap on annual SO₂ emissions by U.S. utilities. The cap cannot be exceeded, even if new coal-fired plants are built. Thus, new plants will have to obtain allowances from existing plants in order to operate, and SO₂ rates will get increasingly tighter. Sulfur dioxide emission rates will become so restrictive that many plants will be forced to install scrubbers after the year 2000.

In looking at how utilities will comply with the legislation, there are really only two fundamental choices: utilities can scrub plants or they can fuel-switch—generally to lower-sulfur coal but possibly to natural gas.

Scrubbers offer the potential for low

coal costs, and they protect utilities from price premiums associated with lower-sulfur coal and natural gas. They do not cause the dislocations in local economies caused by fuel switching. However, they do require substantial capital. Utilities that want to scrub—because it is the least-cost compliance strategy—are nevertheless concerned with getting approval for rate increases from their Public Utility Commissions (PUCs). Scrubbers are the most economic solution for large units with good access to high-sulfur coal—units like the Harrison Station in West Virginia, the Conemaugh Station in Pennsylvania, and the Gavin Station in Ohio.

Fuel switching, on the other hand, offers a less capital-intensive alternative to scrubbing. However, fuel switching can result in much higher fuel costs. Utilities must forecast and account for uncertainty associated with lower-sulfur coal price premiums and natural gas availability and price. Also, fuel switching to lower-sulfur coal could have a severe impact on local economies where higher-sulfur coal is produced.

Although many utilities have announced compliance plans, certain of the largest coal burning utilities in the East have not. When these utilities make final compliance decisions, the ultimate effect on the eastern coal industry—and the local economies that depend on the industry—will be much clearer.

When the final compliance strategies are in place, they will have two effects. The first will be on coal markets—shifts in production, changing prices, and transportation changes. This is the direct effect on the eastern coal industry.

The second effect will be on local communities that support and depend on the coal industry. These socio-economic effects often are overlooked, but they should be viewed as a critical fallout of utility compliance choices. Legislatures and state PUCs in particular must be aware of the socio-economic costs involved with fuel switching, particularly at the larger utilities. The reason is that there is a multiplier effect to a scrubber decision that determines how many total jobs are at stake as well how much coal will be affected.

For example, Allegheny Power System (APS) has announced that scrubbing their Harrison plant is the most economic compliance strategy available to them. Harrison currently burns about 4,700,000 tons/yr (4,270,000 tonnes/yr) of high-sulfur coal. However, because APS will have the ability to trade SO₂ allowances between plants, scrubbing Harrison will allow them to continue to burn 7,200,000

tons (6,550,000 tonnes) of higher-sulfur coal at four other plants. This is because a scrubbed Harrison plant would not require all of the allowances it is going to receive—so APS can take their allowances and use them at the other plants. Thus, we have a coal market multiplier effect that in this case is over 2 to 1.

Similarly, APS has estimated that about 2,200 direct mining jobs would be lost if 12,000,000 tons (10,900,000 tonnes) of high-sulfur coal capacity were shut down. However, there are many other jobs in local communities that are indirectly associated with the coal industry. APS has estimated that in addition to the direct mining jobs, about 5,500 jobs are indirectly supported by the 12,000,000 tons (10,900,000 tonnes) of high-sulfur coal.

The point is this: scrubbers at a few plants such as the Harrison plant and the Gavin plant could have dramatic effects on the eastern coal industry and the communities involved in that industry.

Looking ahead, we believe 25 to 30 utility units, about 15-18 GW of utility capacity, will be scrubbed to meet Phase I SO₂ reductions requirements. By Phase II, an additional 20 to 40 GW of capacity will be scrubbed.

Therefore, we expect a significant market for eastern high-sulfur coal to continue after 1995. In fact, after 2000 we think high-sulfur coal demand will actually strengthen because of the large number of scrubbers that will be in operation at that point. However, it is important to keep in mind that high-sulfur coal mines that are shut down in 1995 because of fuel switching will be very costly to reopen in 2000. Mining conditions deteriorate very quickly in shut-down mines. When compliance decisions are made for Phase I, this consideration must be taken into account.

The new acid rain law ultimately will hurt all coal production because sulfur will have a definite and measurable cost associated with it. There is, however, no question that demand for eastern low-sulfur coal will increase significantly in the next decade. This is due to market growth as well as fuel switching.

As the coal industry responds to the demands of the CAAA, geologists become increasingly important in answering questions such as "how much eastern low-sulfur coal exists and at what cost?" Coal companies will need to develop new reserves—and the mining risk will become greater. As a result, the ability to separate the "stars" from the "dogs" for new low-sulfur coal properties

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COALBED METHANE ACTIVITY IN THE UNITED STATES, 1990-1991 (Report of the Coalbed Methane Committee)

Summary

During 1990, approximately 200 bcf of coalbed methane was produced in the United States from nearly 2,500 wells. To date, More than 330 bcf of coalbed gas has been produced in this country, most of it in just the past few years. Some 200 bcf on this total (>60%) has come from the San Juan Basin of Colorado and New Mexico. Most of the balance (about 122 bcf) was produced in the Black Warrior Basin in northwestern Alabama.

During 1990, the San Juan Basin produced an average of approximately 500 mmcf of coalbed gas from nearly 1,000 wells. Total production for 1991 is estimated at 170 bcf; in 1985, only about 2.1 bcf was produced in the basin from 64 wells. Daily production during 1991 is expected to exceed 700 mmcf (although recent curtailments and low wellhead gas prices may reduce that figure) from more than 1,000 Fruitland Formation coalbed methane (CBM) wells. Some of the CBM wells in the San Juan Basin produce from 1 mmcf to more than 20 mmcf at a depth of around 3,000 ft. Those are the most prolific CBM wells developed to date in the world. The Black Warrior Basin during 1990 produced an estimated 35 bcf from some 1,400 wells, with an average daily production rate of nearly 100 mmcf.

The production of non-associated gas from "unconventional" reservoirs, primarily coal beds and low-permeability ("tight") sandstones, provides the largest share of net gas reserves growth in the

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will be a key attribute of the successful coal company over the next decade.

Quality control also will become more important, and geologists will play an increasingly important role in predicting sulfur content. The costs of being wrong will be easily quantified because SO₂ allowances will be priced.

Markets for high-sulfur coal will be hurt, but a significant core of opportunity will continue in the next century. Key decisions by utilities and approvals by PUCs are to be made over the next few months on major utility strategies. These decisions and final approvals will have a lasting impact on eastern coal mining.

(Editors' Note: This article is the condensed version of a presentation given at the EMD Luncheon during the 1991 Eastern Section-AAPG Annual Meeting in Pittsburgh, Pennsylvania.)

U.S. In 1990, approximately one-third of all gas wells drilled in the U.S. were designed to exploit coal beds and/or "tight" sandstones.

Section 29 (IRS) Tax Credit

Passed by the U.S. Congress several years ago, and extended last Fall, this tax credit, which only can be captured by companies operating at a profit (to put it simply), is creating quite a dilemma for the U.S. natural gas industry. Proponents of this credit claim that it is both stimulating the development of new technology to enable commercial production from such "unconventional" and poorly understood reservoirs as coal beds and tight sandstones, and encouraging development of significant new reserves of gas. Opponents, on the other hand, strongly believe that it makes little sense to subsidize an "otherwise uneconomic" gas resource at the same time that producers are shutting in "conventional" gas production in the present severely depressed market.

Well Statistics

From January through July of 1991, operators completed 992 CBM wells in all of the U.S. versus 1,821 during 1990. At year end 1990, 1,435 CBM wells were producing in the Black Warrior Basin and 994 wells in the San Juan Basin. During the period October 1990-September 1991, the national trend for both CBM well permits and well completions decidedly was downward. In October 1990, 402 permits were issued in the U.S., and only 56 in September 1991, with a low of 31 in May. In terms of CBM well completions, 230 were recorded in October 1990 and only four in September 1991. The high in 1991 was 216 wells in March.

In the Rocky Mountain region, from November 1990 through October 1991, the following statistics were reported:

Well Permits:

Year-to-date (October 1991): 232,
mostly in San Juan, Piceance, and Wyoming basins)

Year-to-date (October 1990): 1,742

Well Completions:

Year-to-date (October 1991): 495
(footage drilled = 1,450,000 ft)

Year-to-date (October 1990): 530

1991 Completions (January-October):

N. New Mexico (San Juan Basin): 365
(74% of total)

W. Colorado (San Juan + Piceance): 93
(19%)

Wyoming: 30 (6%)

E. Colorado (Raton): 7 (1%)

Reserves

According to the U.S. Department of Energy, CBM accounted for 75% of U.S. net gas reserves growth, with 5.087 tcf of booked reserves, which is 3% of all economically recoverable U.S. gas. Of this amount, 1.411 tcf of reserves was booked in 1990. By 1993, it is estimated by some experts that approximately 12 tcf of CBM reserves will have been booked, and that more than 9,000 CBM wells will be producing nearly 3,000 mmcf, which would amount to about 4% of the total gas deliverability in the U.S.

Resources

In its latest published estimates (December 31, 1990) the Potential Gas Committee (PGC) states that the estimated most-likely recoverable supply of CBM in the U.S., including Alaska, is approximately 145 tcf. The PGC cautions that this estimate should be considered as being very preliminary because important information concerning coal volumes, in-place gas contents, recovery factors, etc. is available only in a few of the coal-bearing areas. The 32 coal basins so far evaluated contain a total estimated in-place CBM resource of 275-649 tcf, depending on assumed average in situ gas contents and other variables. The latest PGC biennial report divides its estimates of recoverable gas supply (CBM and conventional) into three resource categories (probable, possible, and speculative) which depend on the degree of certainty. For each category, the minimum, most likely, and maximum values are listed.

Exploration & Development Activity

Each issue of the *Quarterly Review of methane from Coal Seams Technology*, published at the Colorado School of Mines with funding from the Gas Research Institute (free subscriptions), gives a review by basin of CBM drilling and production highlights, together with summaries of GRI-sponsored CBM research and other features. Each month, Petroleum Information publishes details of CBM drilling activity and production data by well for both the Rockies and the eastern U.S. Dwights Energydata and Ammonite Resources also are useful sources of CBM activity information and economic analyses.

D. Keith Murray

REMOTE SENSING MEETING OF INTEREST

The First Thematic Conference on Remote Sensing for Marine and Coastal Environments: Needs and Solutions for Pollution Monitoring, Control, and Abatement will be held in New Orleans, Louisiana on June 15-17, 1992. The Environmental Research Institute of Michigan is sponsoring the meeting. Technical sessions at the meeting will cover 1) detection, identification, and monitoring, 2) operational support, 3) marine policy formulation and implementation, 4) phenomenology of marine pollution and its effects, and 5)

remote sensing technology, techniques, and validation. Peer-reviewed papers from the meeting will appear in a later special issue of *Photogrammetric Engineering & Remote Sensing*.

For more information on the technical program of the conference, contact Dr. Robert H. Rogers, and for registration information, contact Nancy J. Wallman at (313) 994-1200, ext. 3234, fax (313) 994-5123, telex 4940991 ERIMARB. Both can be reached at ERIM/Marine Environment Conference, P.O. Box 134001, Ann Arbor, MI 48113-4001.

EMD COUNCIL CANDIDATES' BIOGRAPHIES AND STATEMENTS

For Vice-President/President Elect, 1992-94

JOHN W. GABELMAN

Position: Consulting Geologist and Geological Services, John W. Gabelman and Associates, Danville, CA.

Experience: Utah International; Amer. Smelting & Refining; Colorado Fuel & Iron; New Jersey Zinc; Anglo Saxon Mining, Silver Spruce Mines; U.S. Atomic Energy Commission.

Education: B. Geol. Engineering, M. Geol. Engineering, Dr. Sci, Colorado School of Mines.

Professional Organizations: AAPG, EMD, AIPG, GSA, SEG, AGU, Society for Mining, Met, & Explor., Society of Explor. Geochemists, Amer. Mineralogical Society. EMD Founder, Publications Comm. Chairman, Nuclear Minerals Comm. Chairman; 1990 EMD Annual Meeting Best Paper Awards Committee Chairman.

Publications: Uranium geology, mineralogy, and exploration; oil, coal, and geothermal energy. AAPG Studies in Geology No. 3, "Migration of Uranium and Thorium — Exploration Significance." Annual Developments in Nuclear Minerals (AAPG Bulletin).

As a founding EMD member, I am familiar with its progress and problems. I will continue to promote a healthy role for energy minerals in national economies. Most needed is improvement of the images of energy minerals to the environment-conscious public, which presently believes the dangers or unpleasant effects of using uranium, coal, and even geothermal fluids, exceed their benefits. Great discrepancies exist between the actual histories of beneficial and essential industrial roles of energy minerals and the average public concept of those roles. No energy mineral, including coal, has escaped public disparagement. For example, Americans continue to regard Three Mile Island as a terrible accident, which it was not, while the French are comfortable with the generation of 80% of their power from nuclear sources. The need for improved

industry images long has been recognized and much effort and money have been devoted to that cause. However, that effort has been dominated by industry and government/national laboratories. It led the average public to conclude their reports were biased and thus untrustworthy. Mineral need/use images might be improved more effectively through less-biased respected professional societies, such as AAPG/EMD, by publication of educational facts and safe-use histories.

H. ROBERT HOPKINS

Position: Senior Research Associate, Exxon Production Research Company, Houston, Tx.

Specialty: geologic image interpretation for structural mapping, and oil and coal prospect delineation and evaluation.

Experience: Exxon, Humble, Virginia Geological Survey

Education: B.A., M.S. Geology, University of Virginia; Ph.D. Geology, Cornell University.

Professional Organizations: AAPG, EMD; EMD Remote Sensing Committee Chairman and Technical Program Chairman; 1991 Annual Convention EMD Poster Session Chairman; AAPG Bulletin associate editor for Remote Sensing; ERIM Thematic Conf. for Geologic Remote Sensing, conference chairman; NASA Advisory Committee on Space Applications (1985-88).

Publication: Co-Editor of special issue of the Journal of the Amer. Soc. for Photogrammetry and Remote Sensing.

It is a great honor to be nominated as a candidate for Vice President/President-Elect of Energy Minerals Division of AAPG. I accept the nomination with-enthusiasm. The big question is "what policies and direction would I pursue to improve the responsiveness of EMD to its constituents?" EMD must be more flexible to respond to the members in the present economic situation. We need to achieve closer ties between members in each of the energy commodities and in remote sensing through the commodity chairmen and regional councillors. We are a diverse group and

most of us are interested in one commodity. I would, therefore, propose to strengthen the coal, oil shale, tar sands, geothermal, coalbed methane, nuclear minerals and remote sensing committees so that they may address the important issues for their areas. To aid in communication we must encourage and expand use of the EMD computer bulletin board system developed at the West Virginia Geological & Economic Survey. This will allow us to be well informed so that EMD and AAPG can act and react in what the consensus feels is the best interests of the members of EMD.

For Councillor, Eastern Section, 1992-94

THOMAS R. JAKE

Position: U.S. Government Imagery Analyst and Coordinator.

Experience: West Virginia Geological Survey Geologist III; Supervisory Geologist, Branch Chief.

Education: B.S. Geology, Bowling Green State Univ., M.S. Geology, West Virginia Univ.

Professional Organizations: AAPG EMD; Amer. Soc. Photogrammetry and Remote Sensing; Geol. Soc. Wash. D.C.; AAPG Eastern Section Secretary 1990-91, Vice President 1991-92.

Publications: Coal resources, sedimentology, stratigraphy, field trip guidebook, coalbed maps.

I am honored to be a candidate for the position of Energy Minerals Division Councillor for the Eastern Section. The EMD consists of members with diverse interests: coal, tar sands, oil shale, nuclear minerals, remote sensing and coalbed methane. The EMD Councillor, therefore, is elected to serve the membership by supporting research initiatives and presentations on these "unconventional" topics. This nomination is an opportunity 1) to represent the Eastern Section EMD membership and advance our common goals within AAPG; 2) to support research in EMD topics and plan for technical presentations at our national and regional meetings, and 3) to advance

the concept that the Energy Minerals Division is a strong group of scientists with a common goal, namely to maintain and improve the high standard of geologic investigation and technical reporting within AAPG.

GAYLE H. (SCOTT) MCCOLLOCH, JR.
Position: Assistant Head Coal Section, West Virginia Geological and Economic Survey.

Experience: Coal Geologist/Statistician, West Virginia Geological and Economic Survey.

Education: M.S. Geology, West Virginia Univ.

Professional Organizations: AAPG EMD; EMD Founder, Electronic Bulletin Board Committee Chairman; 1988 AAPG Eastern Section Annual Meeting program chairman and field trip leader for EMD; Amer. Soc. Photogrammetric Engineering and Remote Sensing; International Assoc. Math. Geology; Geol. Soc. Wash. D.C.; Appalach. Geol. Soc., Digital Equipment Users Soc.

EMD has become a forum for a diversity of disciplines that superficially do not appear to have much in common. Furthermore we are often separated by great distances and have little opportunity to reinforce the common ground that brought us together in EMD in the first place. Good communications are an essential factor in maintaining cohesiveness and esprit de corps in any multi-disciplinary venture, and so it is with EMD. Without good communications I fear there is a great potential for divisiveness between the various disciplines within the organization. The need to reinforce this cohesiveness is the main reason I proposed and am in the process of developing the EMD bulletin board. As Eastern Section Councillor I would welcome the opportunity to work with members of all disciplines to foster communication and strengthen EMD.

For Councillor, Mid-Continent Section, 1992-94

DAVID GWYNNE CAMPBELL

Position: President, Earth Hawk Exploration; Division Manager, PetroCorp.

Experience: Leede Exploration, Tenneco, Lone Star Producing.

Education: B.S. Geology, Univ. of Tulsa, M.S. Geology, Univ. of Oklahoma.

Professional Organizations: AAPG EMD, API, AAAS, N.Y. Acad. Sci., Ind. Petrol. A.A., Okla. I.P.A., OCGS, TGS, SPWLA, VAGN, Petrol. Exp. Soc. Great Britain. AAPG Information Committee, 1978 Annual Convention Field Trip Committee Chairman, Executive Committee, National Chairman House of Delegates, Astrogeology

Committee, Nominating Committee, Honors and Awards Committee, Advisory Council, Vice President, 1990-91; Advisory Board Membership Committee Mid-Continent Section.

In view of the challenges and opportunities the EMD faces now and in the future, I am honored to be considered for the office of EMD Councillor for the Mid-Continent Section of AAPG. My professional career spans 34 years as a geologist prospecting for oil and gas in the Mid-Continent region. Combined with this career is a background of continuing participation in numerous AAPG activities including several elected offices and various standing committees. With this foundation, I look forward to serving the EMD with emphasis on 1) improving liaison with AAPG, 2) strengthening the symbiotic relationship of energy and environment and 3) advancing the forum of EMD activities in the Mid-Continent.

FREDERICK B. HENDERSON III

Position: President, The Geosat Committee, Inc.

Experience: Geothermal Group, Lawrence Berkeley Laboratory, the University of California; Consulting economic geologist (HENDCO); Kaiser Aluminum and Chemical; St. Joe Minerals.

Education: B.S. and M.S. geology, Stanford University; Ph.D. Harvard University.

Professional Organizations: AAPG EMD; EMD Technical Program Chairman and EMD Vice Chairman 1991 Annual Convention; AAPG Research and Environment Committees; GSA; IAF; AAAS, AIME, ASPRS, SEG, CSRS, Japanese Remote Sensing Society.

Publications: Global environmental change, remote sensing for petroleum exploration, satellite imagery for environmental management, metallic mineral deposits.

If elected to serve EMD as a Councillor, Mid-Continent Section, I shall support strengthening EMD's role within the AAPG through broadening its relations with other pertinent divisions and committees with mutual interests with EMD. Specifically, as a member of the AAPG Research and Environment Committees and with a long standing commitment as President of the Geosat Committee to expand national and international geoscience use of remote sensing and GIS systems, I would hope to serve EMD and the Section better by representing your needs to these other AAPG activities. I will strive to expand direct contact with EMD members within the Mid-Continent Section in order to bring the section members' needs and interests to the attention of the full Energy Minerals Division and elsewhere in the AAPG as appropriate. If elected, I promise to serve with great energy!

For Councillor, Pacific Section, 1992-94

M.C. (MEL) ERSKINE, JR.

Position: Consulting geologist and geophysicist, El Cerrito, California

Experience: Consultant in exploration and exploration research for geothermal and hydrocarbon resources. President and Chief Geologist, Eureka Resource Associates, Chief geologist, Earth Satellite Corp.; Humble Minerals.

Education: Geol. Engr., Colorado School of Mines; M.S. and Ph.D., University of California, Berkeley.

Professional Organizations: AAPG EMD; Technical Program Chairman and EMD Vice Chairman 1990 National Convention; Pacific Section EMD Councillor; EMD Committee on Conventions, Chairman. President, Northern California Geological Society; AAPG Delegate 1989; SEPM; Life member Pacific Section SEG; GSA.

Publications: Tectonics of the western cordillera, economic history of geothermal development, idealized models of geothermal resources, and the tectonic and hydrologic setting of the Coso Geothermal reservoir; frontier basin analysis; tectonics and hydrocarbon potential of the Wyoming Thrust Belt; geophysically controlled balanced cross sections of the Basin Ranges and California basins; minerals exploration approaches for the Brazilian Shield.

I am very pleased to accept the nomination for Energy Minerals Division (EMD) Councillor for the Pacific Section of AAPG. I think that it is very important that EMD have strong representation in the Pacific Section so that we can count on program space in our regional meetings. It is especially important to encourage professional communication in these hard financial times. The geothermal industry, which is a dominant Pacific Section concern, has been particularly hard hit by low oil and gas prices. We have developed a symposium on "Geothermal Development Challenges" for this year's Pacific Section meeting in Sacramento to act as a focal point for discussions of this industry's problems. As a consultant with a broad cross section of industry clients, I think I can be sensitive to the changing concerns of the EMD constituency in the Pacific Section. I am pleased to be able to offer time and effort to AAPG and EMD in a partial exchange for the many years of help that the publications and meetings of AAPG and EMD have provided. Thank you for this opportunity to serve.

For Councillor, Rocky Mountain Section, 1992-94

ELIZABETH BARTOW CAMPEN

Position: Vice President and Exploration Geologist, Campen Consultants, Inc.
Experience: Marinex Petroleum; Infinity Oil; Montana Power; Helton Engineering; Benson Mineral Group.
Education: B.A. Geology, Smith College; Postgraduate, The Albert Schweitzer College.
Professional Organizations: AAPG EMD; AAPG House of Delegates Recording Secretary; President, Rocky Mountain Section, 1990-91; Rocky Mountain Section 1983 Annual Meeting Coordinator and Moderator; RMGS; Montana Geol. Soc. President 1985; Billings Geophysical Soc.; Yellowstone Bighorn Research Assoc. Treasurer.
Publications: Oil and gas fields guidebook, tectonics, coalbed methane resources and guidebooks.

I appreciate the opportunity to run for the office of Rocky Mountain Section Councillor for the Energy Minerals Division (EMD). EMD offers its members a base on which to branch out from the traditional oil and gas concepts of AAPG. The increased opportunities presented by the relatively recent introduction of the efficiency of alternative fuels presents the modern geologist with the same exciting challenges and opportunities available to the oil and gas explorationists of the early part of the 20th Century. My involvement with EMD has been interesting and profitable. It would give me great pleasure to work with the exceptional and creative individuals who comprise the Executive Committee. The geographical area which comprises the Rocky Mountain Section contains a wealth of energy minerals. It would be a challenge and a great honor to be involved in an executive role in the development and subsequent management of this wealth.

WILLIAM L. CHENOWETH

Position: Consulting Geologist, Grand Junction, Colorado
Experience: U.S. Atomic Energy Commission; U.S. Energy Research and Development Administration, U.S. Department of Energy; Research Associate New Mexico Bureau of Mines and Mineral Resources.
Education: B.S., Geology, Wichita State University; M.S., Geology, University of New Mexico
Professional Organizations: AAPG EMD, Founding Member 1977; Chairman Nuclear Minerals Committee 1982-Present; GSA, AIME
Publications: Uranium geology and mining history, road logs Colorado Plateau; Annual Developments in

Nuclear Minerals (AAPG Bulletin).

I am honored to be nominated for the office of Rocky Mountain Section Councillor. I feel that the EMD will play an increasing role in the overall activities of the Association and that I am able to work for that goal. I welcome the chance to share my past involvement with EMD on a larger scale. If I am elected, I will do my best to represent the Rocky Mountain Section, with its abundant energy minerals, in the EMD and the Association.

ARGUMENTS FOR AND AGAINST BYLAWS CHANGES ON THE BALLOT

1) VOTING ON CHANGING THE DIVISION NAME EMD Needs A New Name:

Almost fifteen years ago, before most Division members went to work and joined AAPG, the "Energy Minerals" Division developed from a committee of members working in the "hard" energy resources (coal, oil sands, uranium, oil shale, geothermal) who wanted to share their information and to participate in AAPG meetings and publications. Oil sands and coal are still major interests of our members, but some commodities fade while others grow. Also, the "E" and "M" of EMD now totally fail to recognize the newer major interests in remote sensing and coalbed methane and seem to rule out other areas such as hydrogeology and economics.

Polls and informal discussions with Division members show a wide desire to update the Division name to reflect what it is today and hopes to be tomorrow. Worse still, other AAPG members are confused by a name that doesn't reflect the Division's present mission and its members' interests. A consequence is a reluctance to join the Division and to participate in Division programs. This is no way to grow.

One result of the Division's obsolescent name is, I'm sure, the loss of the opportunity to play a lead role in the environmental and hydrogeology activities now developing as a potential major area in AAPG. Times change and the Division changes and will change. Its name should reflect this.

Don Towse

Why The Division Name Should Be Changed To Applied Sciences Division:

There are many members of EMD, spread throughout the Division, who are not, repeat not, employed in 1) coal, 2)

geothermal, 3) nuclear minerals, 4) oil shale, 5) oil sands, and 6) coalbed methane. Many ask "Why am I a member?" That question remains unanswered for many. Some members have never worked in energy minerals. Some years ago, remote sensing was added to the energy minerals list. However, remote sensing, because it is a tool, does not belong to the six energy source categories.

The name Energy Minerals is restrictive. The name will continue to limit the size of the membership. By changing the name to "Applied Sciences Division," any geologic branch, exclusive of petroleum, including energy minerals, can be categorized under that name, thus making the Division more flexible. Remote sensing will fit well too.

Finally, I am the Southwest Section Councillor, representing the 5th largest EMD section. I am supposed to report on southwest section EMD activities at meetings, but I cannot. Why? There are no energy minerals of commercial importance within the geographic bounds of this section on which to report! So, please vote to change the name to "Applied Sciences Division." It will benefit us all!

Tom Beard

EMD Does Not Need A New Name!

In 1974, the AAPG Mineral Economics Committee evolved into the Energy Minerals Committee, to which I was appointed by President Merrill Haas. After three years of convening successful symposia at annual AAPG meetings, the Energy Minerals Committee became the Energy Minerals Division. Article I of the EMD Bylaws addresses the name of the Division: "This Technical Division of the American Association of Petroleum Geologists...shall be known as the Energy Minerals Division." Thus, I submit to you that EMD already is defined and recognized as a technical division of AAPG. New AAPG divisions also will be technical divisions. Therefore, the word "Technical" in a division name would be redundant, nondistinctive, and inappropriate.

EMD has a coalbed methane councillor and is a forum for coalbed methane papers, but the coal workers sensibly are not calling for a name change to "Energy Minerals and Coalbed Methane Division." EMD also has a remote sensing councillor and is a forum for remote sensing papers. We should realize that it is unnecessary for remote sensing workers to call for a name change to "Energy Minerals and Remote Sensing Division." Adding the names of "coalbed methane," "technical," or "remote sensing" to the name of the Division would be misleading. Our present name

should prevail!

The 200 EMD members in the Southwest Section, presided over by Councillor Beard, may not all *work* with energy minerals. Past-President Platt's questionnaire, sent to all EMD members, nevertheless showed that their *interest* in alternative energy resources still is very high. Thus, the "Applied Sciences" name would not serve the alternative energy purpose of this Division as stated in the EMD Bylaws. EMD is the only AAPG Division that provides a forum for geologic topics exclusively related to alternative energy resources. In addition, all of AAPG is concerned with *applied* science: geology applied to energy resources! Therefore, EMD cannot be an exclusive "Applied Science Division." EMD should keep its present name.

Don Towse laments EMD's "lost opportunity" (because of our name?) to absorb the environmental and hydrogeology activities of AAPG. In reality, over the past few years, an independent movement has been at work within the Association that resulted in a proposal that the 1991-92 House of Delegates consider approval of an Environmental Geosciences Division, a proposal which is expected to be adopted by the House of Delegates on June 21, 1992 in Calgary. The new Division will provide a technical forum for environmental and hydrogeological activities. Therefore, Towse's plea for a name change is outdated and unjustified. We should continue to attract AAPG members to EMD whose *prime interests* are in energy minerals and fluids and in remote sensing applied to exploration and production/monitoring. We should emphasize that EMD shall remain a forum for the alternative energy resources. The name ENERGY MINERALS DIVISION has served AAPG and EMD well for 15 years and serves us with distinction and high recognition at present. Let's keep the name as is!

Sam Friedman

2) VOTING ON SECTION COUNCILLOR ELECTION PROCESS

Let Section Members Elect Section Councillors:

Section Councillors represent their Section's members in management of the Division and provide Division liaison and input into Section activities and programming.

Like King George III, the Division hierarchy now nominates Councillors for the colonies, and members around the world blindly vote for candidates they

probably don't know, or they don't vote at all. As a long time co-conspirator, I have seen several flaws in this process: 1) except by chance personal acquaintance, Division management has a very difficult time identifying the talent available in the Sections; 2) new councillors often come as near strangers to their Section organization and spend most of their term learning the ropes and building bridges. We are fortunate this year in having such outstanding councillor candidates, but we have most assuredly missed good talent that could help the Division in the future.

Nominations from within Sections and votes only by Section members will cure these flaws. In addition it will raise the visibility and stature of the councillors and the Division in each of the Sections and give Section members a more direct voice in their organization.

This year I intend to vote only for the Councillor from my (Pacific) Section and not presume to tell members of the other "colonies" who their representative should be. I hope many of you will do the same.

Don Towse

Section Councillors Are Elected Fairly By Division Members!

Section members contribute substantially to Section Councillors' elections. Members within the sections currently select their representatives and advise the EMD Nominations Committee concerning selection of Councillor candidates. The only flaw in the election process is the failure of 85% of the Section members to vote, and the 15% who vote may not always select the better candidates.

The EMD Bylaws provide for the election of Section Councillors (one from each AAPG Section) thus giving members equal geographic representation on the Council. At present, Councillors who understand their responsibilities and are productive, well represent the members in their Sections and provide them with information and a forum in which to present the results of their work. All the duties of the Councillors are written clearly in the EMD Bylaws Article IV, Section 2: "...they shall be responsible for planning and establishing general policy and long range objectives...." Section Councillors should attend two business meetings per year "for the transaction of Council business."

Article V, Section 6d specifically describes the duties of the Councillors: they "...shall represent Division members in their Sections on the Council and shall see that papers and other programs of interest to the Division members are included in the Section meetings of the

American Association of Petroleum Geologists and in meetings and activities of other societies and groups in the Section."

The complaint that no dynamic EMD programs or other activities occur in three of the AAPG Sections "because there is no interest among the Section members" or "because there are no energy minerals" in those Sections is pure malarkey! Energy minerals employment of EMD members currently may be low in these three Sections, but all the Sections contain energy minerals or fluids, EMD interest is high, and EMD membership is growing. The problem is that some EMD Councillors have not carried out their duties. Unfortunately, Councillors who do not carry out their duties are inadequate leaders. If 20 EMD members in a Section elect a Councillor, or if 220 EMD members in the whole Division elect a Councillor, who does not plan ahead, attend Council meetings, or organize EMD programs, the Section absolutely will not have any EMD activities. Changing the election procedure will not solve this problem, but may compound it. Some EMD Councillors may need changing, but EMD Bylaws governing elections DO NOT require change.

No matter how appealingly it is phrased, VOTE AGAINST the proposal.

Sam Friedman

Consider the Numbers...

My concern with electing Section Councillors by members within each section is with the small number of votes (as few as 10-25) needed to choose the winner. As in the past as Secretary-Treasurer of the EMD, I have counted ballots and tabulated results for several EMD elections.

When sent out as a separate mailer, the number of ballots returned ranges roughly from 400 to 500. When sent out as part of the newsletter, we have had a return of between 200 and 300 ballots (please send us your ballot!). Based on past ballot-return experience, this means that in small EMD sections such as the Mid-Continent and Southwest Sections—each about nine or 10 percent of our membership—perhaps only 20 to 50 members would be voting for the Councillors in each of these sections.

Total votes for the Canadian Section Councillor would be even lower than for the Mid-Continent and Southwest sections. Just over half these votes (between 10 and 25) would be needed by a candidate for election to the EMD Council.

Please consider these numbers when you vote on Proposal #2.

Sandra Feldman

Continued on the next page

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3) VOTING ON PROCESS FOR AMENDING BYLAWS

Presently, Article XI of the EMD Bylaws explicitly only allows for votes on changes to the Bylaws at the Annual Business Meeting, which is held during the AAPG Annual Meeting. This means that only the very small portion of the members who attend this meeting are making decisions affecting all members. Also, even if these decisions are made in the best interest of all members, there is no straightforward way to determine if what has been decided is actually what

the majority of members want. Note that the Bylaws do not prohibit mail balloting of the whole membership, they simply do not explicitly provide for this voting process on controversial matters.

I have proposed, and the EMD Council has agreed, that this issue be placed on the ballot so that the Bylaws can be amended to explicitly allow voting by mail by the entire membership on Bylaws amendments. This is largely a housekeeping measure, but I feel it is important that voting on amendments explicitly be allowed outside of the Annual Business Meeting format. I urge you to vote in favor of this issue!

Doug Peters

HOW TO SUBMIT MATERIAL FOR THE NEWSLETTER

We encourage you, the EMD member and/or reader of the EMD newsletter, to submit short notices and articles for publication in the newsletter. These can include commodity/industry news notes, product announcements in areas of EMD topics, book reviews, employment changes, geological software reviews, and any other items which would be of general interest to EMD members. We prefer to receive such articles on IBM-compatible disk (which will be returned), but letters or legible faxes are okay. Call Sam at (405) 325-3031 or Doug at (303) 236-0772 for more information on submitting material. General comments and suggestions on the newsletter can be addressed to us as well.

Sam Friedman
Doug Peters

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