

**Joint Session with SPE
Lamp Lighter - Delmont
3 May 2007**

Development of First U.S. Offshore Gas Storage Facility

presented by

**Ken Brown and
Dr. Peter Kaufman**
Schlumberger Data & Consulting Services

Abstract

The MoBay Storage Hub is the first offshore storage facility ever proposed for the US. It will involve the conversion of three depleted Miocene gas fields located in the state waters of Alabama. To better understand their potential for storage and to optimize their development, a 3D geologic reservoir model was built from well and seismic data and run through numerical simulation.

Geological, geophysical, and engineering data were used to develop a 3D geological reservoir model, integrating reservoir formation tops, petrophysical interpretations from logs, seismic attributes, and engineering data. The completed geologic model was modified slightly during history matching, then used for forecasting multiple developmental scenarios.

The history-matched reservoir simulation model demonstrated the MoBay Storage Hub is an excellent candidate for high-deliverability, multicycle gas storage services, based on sand continuity, high porosity and permeability, and historical and predicted well deliverability rates. The integration of geologic, geophysical, and engineering data in the context of a 3D reservoir model demonstrated the fields' potential for gas storage, allowed optimization of the number and location of injection/withdrawal wells, and guided recommendations for data collection that will improve field development and operations.

Detailed reservoir characterization using seismic data and numerical simulation is uncommon for gas storage projects. Reservoir characterization in most gas storage projects are subject to older

well data, limited, if any, seismic, and reservoir simulation focused primarily on modifying surface operations, as opposed to major well planning activities. In this project, a typical workflow for primary field development was applied to the characterization of three prospective fields, taking advantage of the rich data set that has been developed through sixteen years of developmental drilling, seismic surveys, and production.

Author Biography

Dr. Peter Kaufman has worked for two years with Schlumberger DCS in Pittsburgh performing geological and geophysical characterization for gas storage fields and gas shale reservoirs. Before joining the DCS office, he worked for seven years in Schlumberger-Doll Research, developing approaches for geologically modeling detailed observations of faults and fractures and bringing their effective properties into reservoir simulation modeling. He started his professional career with Amoco's basin modeling team in Houston in 1995. He holds a Ph.D. from the Massachusetts Institute of Technology.

Mr. Ken Brown received his B.S. Degree in 1981 in Petroleum and Natural Gas Engineering from Pennsylvania State University, and subsequently joined Marathon Oil Company's Gulf Coast Offshore Division in Lafayette, LA as a Completion/Production Engineer. In 1984, he returned to Penn State to pursue his M.S. Degree in Petroleum and Natural Gas Engineering from Pennsylvania State University, which he received in 1986. Since completing his graduate degree, he has worked for Shell Western Exploration and Production Company, Inc. (SWEPI) in Bakersfield, CA as a Reservoir Engineer, as a consultant for several years, for Michigan Consolidated Gas Company (MichCon) in Detroit, MI as a Gas Storage Engineer, and for S. A. Holditch & Associates, Inc. (SAH) in Pittsburgh, PA. In 1998, SAH was purchased by Schlumberger. Now part of Schlumberger Data and Consulting Services, Ken is currently a Principle Consultant in Gas Storage, where his primary interests include surveillance and optimization of gas storage operations, pressure transient test analysis, and production data analysis.

For reservations to this informative and entertaining evening, please complete the attached reservation form.

WHAT IS THE PAPG?

PAPG is a non-profit organization founded in 1984 to provide a forum for Petroleum Geologists in the Pittsburgh Area to meet socially and discuss technical topics relative to the exploration and development of reserves in the Northern and Central Appalachian Basin. PAPG is an affiliated association with AAPG (American Association of Petroleum Geologists) and has representation in the House of Delegates. Educational opportunities are provided via field trips, seminars and AAPG Sectional meetings, sponsored solely by PAPG or in conjunction with the PTTC (Petroleum Technology Transfer Council), PGS (Pittsburgh Geologic Society) and SPE (Society of Petroleum Engineers).

Although PAPG is predominately a geologic organization, numerous industry professionals including geophysicists, engineers, lawyers and landmen are among PAPG's members and find the interaction at meetings and educational opportunities beneficial to their professions. PAPG also encourages student membership and participation.

Meetings are typically held monthly from September through May in locations within 50 miles of downtown Pittsburgh. From time to time, meetings are held in conjunction with SPE and PGS.

NEWS AND EVENTS

Mark your calendar now for these upcoming events:

May 1st & 2nd - Hilton Garden Inn, Pittsburgh/Southpointe

The North American Coalbed Methane Forum, Inc. - Spring Session

- For more information please contact:

Ihor Havryluk - (412)445-5803

or

Dr. Kashi Aminian - (304)293-7682 ext 3406

Spring 2007 Field Trip (Dates to be determined)

PAPG

- More Information to come

2008 AAPG Eastern Regional Meeting

- Scheduled for Pittsburgh

Have information you want to share with the organization?

Please contact the secretary to add the information to the next newsletter.

PAPG 2006-2007 DUES

PAPG dues for the 2006-2007 season are now DUE!

*The membership form is attached to this newsletter. Please fill the form out **completely** so that we can ensure that we have your latest contact information. We are planning to publish a membership directory this year and your updated information is crucial.*

NOTICE OF MAY 2007 MEETING PITTSBURGH ASSOCIATION OF PETROLEUM GEOLOGISTS

DATE: Thursday 3, May 2007

PLACE: Lamplighter - Delmont
6566 Route 22
Delmont, PA 15626
(724) 468-4545

TIME: 5:00 PM – Social Hour (w/ Cash Bar)
6:00 PM – Dinner
7:00 PM – Speaker

TOPIC: “Development of First U.S. Offshore Gas Storage Facility.”

SPEAKER: Ken Brown and Dr. Peter Kaufman

COST: \$25.00
\$10.00 students
(Checks payable to SPE)

DINNER OPTIONS: Broiled NY Strip Steak
or
Baked Stuffed Pork Chops

RESERVATIONS: Call, email, fax, or mail this reservation form to:

Barbara A. Purks
412-787-5403 (phone)
412-787-2906 (fax)
bpurks@pittsburgh.oilfield.slb.com

NAME(S) _____

COMPANY

DINNER CHOICE(S)

CONTACT THE PAPG

PAPG Officers:

- President:** **Pat Imbrogno** -- Wind City Management LLC.
Phone: 412-269-1419
Email: pimbrogno@comcast.net
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- AAPG Delegate:** **Doug Patchen** – Petroleum Technology Transfer Council
Phone: 304-293-2867 ext 5443
Email: doug.patchen@mail.wvu.edu

SPONSORS

PAPG wishes to thank those companies and individuals who have contributed to the PAPG 2006-2007 season:

- ABARTA Oil & Gas Co., Inc. -
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- EOG -
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- Natural Energy Development Corp. -
- Superior Well Services, Ltd. –
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- Vista Resources, Inc. -

Sponsor Information

If you or your company would like to sponsor the PAPG and help support the continuation of our Meetings, Field Trips, and other events, we ask that you send a donation to the PAPG. Any contribution of \$100.00 or more by any group or individual will be recognized in the monthly newsletter, and at scheduled monthly meetings.

We ask that you show your support for the PAPG by a contribution and your continuing attendance at the monthly meetings.

We appreciate your continued support.

Contributions may be sent to:

PAPG
PO BOX 16352
GREENTREE PA 15242-0352

APPLICATION FOR MEMBERSHIP AND MEMBERSHIP RENEWAL

PLEASE INDICATE YOUR MEMBERSHIP STATUS BY CHECKING THE APPROPRIATE BOX:

PROFESSIONAL - RENEWAL

STUDENT - RENEWAL

PROFESSIONAL – NEW MEMBERSHIP

STUDENT - NEW MEMBERSHIP

The **PITTSBURGH ASSOCIATION OF PETROLEUM GEOLOGISTS** membership year runs from JUNE 1 through MAY 31. Monthly meetings are usually held the second Thursday of the month from September through November and January through May.

Professional Dues are \$25.00 per year

Student Dues are \$10.00 per year

NEW APPLICATION: If you have never been a member of PAPG, please fill out the remainder of the form, obtain the signatures of two members to sponsor you, and mail check, payable to PAPG, to the address below.

RENEWAL: Please fill out the mailing address/directory information below if your contact information has changed and submit dues, payable to PAPG, to the address below.

Mail completed form and dues payment (checks only) to:

Dave Boyer
Texas Keystone, Inc.
560 Epsilon Drive
Pittsburgh, PA 15238

MAILING ADDRESS / DIRECTORY INFORMATION – PLEASE COMPLETE ALL INFORMATION

NAME _____ DATE _____

COMPANY / UNIVERSITY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

JOB TITLE: _____

EMAIL: _____ **Please fill this in – help us save those mailing costs!**

PHONE: () _____ - _____

FAX: () _____ - _____

WOULD YOU BE INTERESTED IN PAPG PARTICIPATION?: Officer Speaker

**WOULD YOU LIKE YOUR CONTACT INFORMATION PLACED
IN THE MEMBERSHIP DIRECTORY (available to members only?)** Yes No

TWO SPONSORS REQUIRED for NEW MEMBERS

Name _____ Date _____

Name _____ Date _____