

AAPG Distinguished Lecture

William G. Zempolich, Offshore Kazakhstan International Operating Company NV, The Hague, Netherlands

Monday, January 14, 2002

12:00 noon in Bldg. A, Room A-1036 at ChevronTexaco Park, San Ramon. (Directions: 925-736-6039)

Sponsored by Chevron Overseas Petroleum and the NCGS

Kashagan Discovery: An Example of the Successful Use of a Multidisciplined Approach in Reducing Geologic Risk

The Kashagan field is one the largest discoveries made in the last several decades. The oil is hosted within a late Paleozoic isolated carbonate platform that is approximately 75 km in length and 35 km in width. The field is located under the present-day North Caspian sea, offshore Kazakhstan, and has been penetrated by two exploration wells. The success of these wells is due in part to the management of geologic risk during both the pre-drill and drilling phases of the project.

Drilling for sub-salt Paleozoic carbonate reservoirs in the North Caspian sea presents numerous subsurface and surface challenges. The goal of such drilling is to safely penetrate carbonate reservoirs that range in depth from 4 to 5 km, are sealed by thin and variable shale and carbonate lithologies, and which are likely to contain karstified reservoir intervals and over-pressured and H₂S-rich hydrocarbons. The surface challenges include operating in shallow, ecologically-sensitive waters which are subjected to harsh winter and ice conditions. OKIOC has met these challenges by thorough pre-drill geologic and geophysical study, careful planning, and operational execution which reduced geologic risk and allowed for the controlled penetration of the Kashagan reservoir.

The Kashagan reservoir is situated beneath thick and variable salt and is located some 50 to 100 km from neighboring onshore wells and fields which could provide geologic control. Thus the pre-drill delineation of both reservoir quality and seal facies was problematic. Study of offset analog fields, sequence stratigraphic concepts and regional correlation of well log, biostratigraphic and seismic data were used to project known reservoir and seal horizons into the prospect area. This allowed for the mapping of probable Kashagan reservoir and seal facies, delineation of reservoir intervals, and the development of a detailed well prognosis and drilling plan. During drilling, progress was monitored through cuttings examination, logging-while-drilling analysis and changes in ROP, and confirmation and refinement of the well prognosis was made through the use of well-bore geophysical surveys and synthetic models. Well results document that penetration of the predicted seal and reservoir stratigraphy was achieved with meter-scale accuracy.

The Kashagan East 1 and Kashagan West 1 exploration wells successfully penetrated a significant oil column that is hosted in late Devonian to Carboniferous platform carbonates and is sealed by Permian shale and evaporite. As predicted, the majority of the oil is reservoir in 3rd-Order highstand sequences of Upper Visean to Bashkirian age. Preliminary data suggest that the Kashagan oil is light (~45 degrees API), has a high GOR (~2800-3000 scf/bbl), is over-pressured, and contains significant quantities of H₂S (~19%). These results verify that geologic risks were properly identified and successfully managed.

William G. Zempolich

Education:

1983 Duke University, Durham, North Carolina; B.S., Geology (with distinction), B.A., Chemistry. Senior Independent Study: Experimental Dolomitization of Aragonite Ooids

1985 University of Michigan, Ann Arbor, Michigan; MS Geology.

Thesis: Diagenesis of Proterozoic Carbonates: The Beck Spring Dolomite of Eastern California.

1995 Johns Hopkins University, Baltimore, Maryland; Ph.D., Geology. Dissertation: Deposition, Early Diagenesis, and Late Dolomitization of Deepwater Resedimented Oolite: The Middle Jurassic Vajont Limestone of the Venetian Alps, Italy

Experience:

1998-Present: Head of Geology and Geophysics, Offshore Kazakhstan International Operating Company BV, The Hague, Netherlands (Operator for shareholder consortium composed of BP Amoco, BG Group, ENI-Agip, Inpex, ExxonMobil, Phillips, Shell, StatOil and TotalFinaElf).

1997-1998: Geological Research Advisor, Mobil Exploration and Producing Technology Center, Dallas, Texas



1992-1997: Geological Advisor, Mobil, New Exploration and Producing Ventures, Dallas, Texas

1987-1988: Exploration Geologist, Mobil Exploration and Producing U.S., Oklahoma City, Oklahoma

1986-1987: Operations Geologist, Mobil Oil Corporation, Exploration and Producing Division, Denver, Colorado

1985-1986: Geologist, Mobil Exploration and Producing Services Incorporated, Dallas, Texas

Professional Interests and Awards:

Carbonate Geology, Sequence Stratigraphy, Low-Temperature Geochemistry

Martin Van Couvering Award-AAPG/SEPM/SEG Pacific Sections, Excellence in Geological Sciences (1989).

National Association of Geology Teachers/United States Geologic Survey Summer Scholarship, (1983).

Deans List, Duke (1980-82, Magna Cum Laude 1983).

Atlantic Coast Conference Honor Roll, Duke (1980-1983).

Memberships:

American Association of Petroleum Geologists
Society of Sedimentary Geology

NCGS 2002 Calendar

Monday, January 14, 2002 AAPG Distinguished Lecture

William Zempolich, ExxonMobil, The Hague, Netherlands

“The Kashagan Discovery: An Example of the Successful Use of a Multidisciplined Approach in Reducing Geologic Risk”

Chevron Park, San Ramon. Call Dan Day at **925-736-6039** for time and room number.

Saturday, January 26, 2002 NCGS Field Trip

Dr. Gary Greene, California State University Moss Landing Marine Laboratory

Moss Landing Marine Laboratories and Point Lobos Field Trip

See announcement on next page for details.

Wednesday January 30, 2002

Roger Ashley, USGS Menlo Park

“Lode Gold Deposits of the Sierra Nevada and Their Environmental Impacts”

Orinda Masonic Center

Wednesday February 27, 2002

James Moore, USGS Menlo Park

“The Highest Sierra” (tentative title)

Orinda Masonic Center

Wednesday March 27, 2002

Donald L. Gautier, USGS Menlo Park

“The Ghost of Malthus, the Global Greenhouse and the Perilous Geography of Petroleum”

Orinda Masonic Center

Wednesday April 24, 2002

Charlie Bacon

“The Geology and New Bathymetric Surveys of Crater Lake” (tentative title)

Orinda Masonic Center

Wednesday, May 15, 2002 AAPG Distinguished Lecture

James Harrell

“Archaeological Geology in Egypt: Ancient Oil Wells and Mummy Bitumen, Earliest Geological Map, First Paved Road, Pyramid Temple Pavements, and the Sphinx Age Controversy”

Orinda Masonic Center

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



Moss Landing Marine Laboratories and Point Lobos Field Trip

Saturday, January 26, 2002

Trip Leader:

Dr. Gary Greene, California State University Moss Landing Marine Laboratories

Dr. H. Gary Greene is a marine geologist who has studied the geology of the Monterey Bay region for the past 35 years. He received his BS (Geology/Paleontology) from Long Beach State University in 1966, his MS (Geology/Geophysics) from SJSU/ MLML in 1969, and a Ph.D. (Geology/Marine Geology) from Stanford in 1977. His doctoral thesis was on the geology of the Monterey Bay region and since then he has explored the offshore areas of California, including Point Lobos. In 1994, after 28 years with the USGS, he took up the directorship of Moss Landing Marine Laboratories. Dr. Green is currently the director at MLML in the Geological Oceanography Group.

Dr. Greene has been Chief or Co-Chief Scientist on over 60 oceanographic cruises including the NSF Ocean Drilling Program. His expertise lies in the of active plate margins, both transform margins like California and New Zealand and subducting margins such as along South America and the Aleutian Islands. He has spent over 10 years investigating the island-arc regions of the South Pacific. Presently, his research involves the characterization of marine benthic habitats and the study of underwater landslides. His research has focused on Marine Geophysics, Plate Boundary Tectonics, Submarine Canyon and Coastal Processes. His recent work includes onshore/offshore geology of Point Lobos using detailed sonar images of the offshore.

This field trip will start with a morning tour of Moss Landing Marine Laboratories situated just a few hundred meters east of the head of the Monterey Submarine Canyon, the largest such feature on the west coast of the Americas. Weather permitting, we will have a picnic lunch at Point Lobos State Reserve. Following lunch, Dr. Gary Greene will talk about the onshore/offshore geology at Point Lobos. If the weather is not permitting, we will hear his presentation indoors at the Moss Landing Marine Lab.

Time: **Saturday, January 26, 2002** Meet at San Ramon - 7:30 a.m. San Jose - 8:30 a.m.
Return Saturday evening to San Ramon at 6:00 p.m.

Departure: **Danville** - Park and Ride Parking Lot, Sycamore Valley Road exit off I-680. Traveling north on I-680, take the Sycamore Valley Road offramp and turn right onto Sycamore Valley Road. Make an *immediate left* into the Park and ride lot at the next stoplight. If traveling south on I-680, take the Sycamore Valley Road exit and turn left onto Sycamore Valley Road, crossing over the freeway. Turn *left* into the Park and Ride lot at the second stoplight over the bridge, *immediately after* the stoplight for the I-680 onramp heading north to Sacramento.

San Jose - Location to be announced. **Please indicate you will be meeting in San Jose by checking this box:**

Cost: **\$30 for adults** (18 and over); **\$20 for adolescent** (11 to 17). Cost includes transportation, lunch, refreshments, and guidebook.

***** **REGISTRATION FORM** *****

Name _____

Address (Street/City/Zip) _____

Phone (day) _____ **Phone (evening)** _____ **E-mail or Fax No.** _____

Indicate if you are a nonmember (cost is \$35) **Regular Lunch** **Vegetarian Lunch** **(Please check one)**

I am willing to drive my van or SUV on this trip (check if YES) Mileage will be paid by the NCGS

Please write a check to NCGS and mail with the completed registration form to: **Jean Moran, P.O. Box 1861, Sausalito, CA. 94966**

If you have any questions or need additional information, e-mail Jean at jeanm@stetsonengineers.com or call **415-331-6806** (even.)

Biggs Award For Excellence In Earth Science Teaching For Beginning Professors

Purpose: To reward and encourage teaching excellence in beginning professors of earth science at the college level.

Eligibility: Earth science instructors and faculty from all academic institutions engaged in undergraduate education, who have been teaching full-time for 10 years or less. (Part-time teaching is not counted in the 10 years.)

Award Amount: An award of \$750 is made possible as a result of support from the **Donald and Carolyn Biggs Fund**, maintained by the GSA Foundation, the GSA Geoscience Education Division, and GSA's Science, Education & Outreach Programs. This award also includes up to \$500 in travel funds to attend the award presentation at the GSA annual meeting.

Deadline and Nomination Information: Nomination forms for the 2002 Biggs Earth Science Teaching Award can be located at www.geosociety.org or by contacting **Leah Carter** at **(303) 357-1037** or mailto: lcarter@geosociety.org.

Nominations must be received by May 1, 2002.

Mail Nomination Packets to:

Leah Carter
Program Officer Grants, Awards, and Medals
Science, Education & Outreach
The Geological Society of America
P.O. Box 9140, Boulder, CO 80301-9140, USA
mailto: lcarter@geosociety.org
(303) 357-1037

Northern California Geological Society
c/o Dan Day
9 Bramblewood Court
Danville, CA 94506-1130