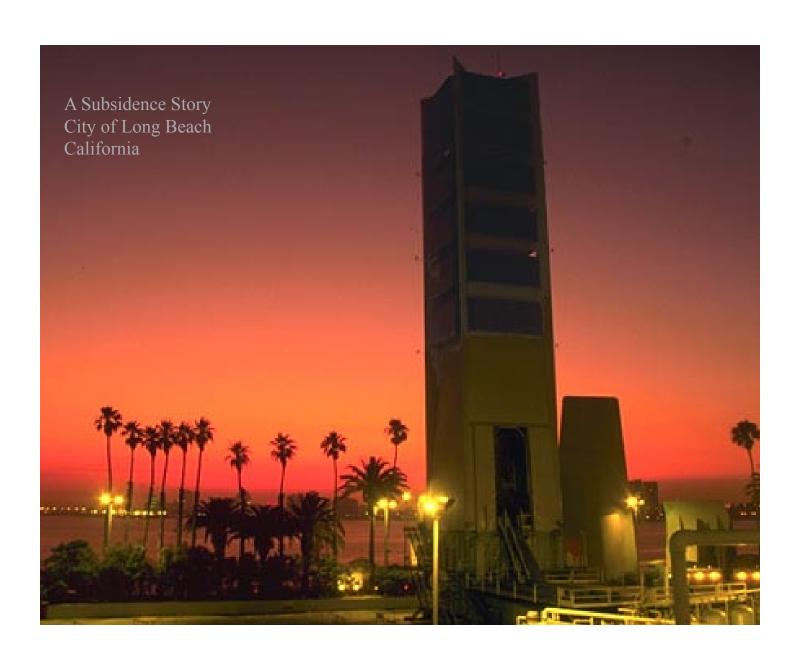
# Pacific Petroleum Geologist NEWSLETTER



Pacific Section • American Association of Petroleum Geologists

November & December • 2007



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Every Issue

4 Message from the President - J. Kuespert

Member Society News

Feat ures

5 AAPG 100th Anniversary - C.A. Sternbach

7 Technical Article

A Subsidence Story
City of Long Beach
California
(Part I - West Side Wilmington Oil Field)

Mike Henry, Dave Newman & DOP Staff

10 Poison Oak - Scott Hector

11 SPE - PSAAPG 2008 Joint Meeting

# Message from the President Jon Kuespert



Greetings as we get into the Fall. Here in Southern California the Santa Ana winds are blowing hard and pushing fires across the landscape. From Malibu to San Diego Mother Nature is changing people's lives and modifying the Southern California landscape. Please remember to be safe and compassionate towards our fellow southern California colleagues.

One of the big events that the PSAAPG is gearing up for is the 2008 Bakersfield Convention. This will be a joint meeting with the Western Sections of the SPE, the SEPM and the SEG. The call-for-papers has gone out and the PSAAPG deadline is the end of November. I encourage you to submit an abstract and give a talk. These are busy times, we know that you are trying to keep oil and gas production up, but when business is good there is little time, and when business is bad there may not be the support from our companies. Now is the time to contribute, especially if you are a first-timer. The audience will be great, the venue superb, and the convention committee is doing a great job lining up activities. Please support us in this endeavor. Let's continue the success of the 2007 National Convention in Long Beach. To find out more please go to our website, www.PSAAPG.org

We are also working on a PSAAPG education initiative. This is going to be a multi-prong approach in which we combine some of our talents with the strengths of the National AAPG. It is important for us to groom the next-generation of geologists so that when we retire the talent pool can be maintained. To that end we are moving forward with several programs:

The first program is the Imperial Barrel competition. This Imperial College of London program was first run in the U.S. at the 2007 National Convention in Long Beach. Graduate-level students from around the world competed with a common oil and gas dataset. The dataset has geologic, geophysical, engineering, land and economic data useful to develop a prospect. We are now searching for school-sponsored student teams from Pacific Section area schools. Invitations have gone out for the preliminary round, and one school's team will be chosen to represent the PSAAPG at San Antonio (expenses paid) and go for a grand prize of \$20,000. We are also still searching for a Pacific Section coordinator, names and volunteers are appreciated. For more info please see the Imperial Barrel Award website, www. aapg.org/iba, or contact me at jkuespert@breitburn.com.

The second program is the Teacher Of The Year award (TOTY). This award honors a teacher who makes an impact on our students, our future. Please contact Sandra Szymanski at Chevron, SandraSzymanski@chevron. com for more info or with nominations.

The third program is related to our involvement with schools. We have formed a PSAAPG committee to look into options that will provide us both an immediate and a long-term impact. Kurt Neher of Occidental, kurt\_neher@oxy.com, is leading this charge. We are not sure yet what we will do, but we have gotten a good start on what we may be able to do. We have also gotten some guidance from the AAPG leadership conference in Keystone, CO. As this is a 2+ year effort it may take some time to get going. Ideas and volunteers are appreciated.

We would also like to start building a library of talks. These canned talks could be used by our various societies to fill in for missing speakers, and can also serve as educational outlines for novice speakers. If you would be willing to contribute a canned talk to this effort, preferably in PowerPoint, please speak with me or another officer.

Thanks, and have a wonderful Holiday!

The 100th Anniversary Committee's mission is to develop plans and options to celebrate AAPG's 100th Anniversary (2017) in a grand fashion honoring AAPG's history, anticipating the future, and in line with AAPG's Strategic Plan and standing committees.

The charge of the committee is to research, develop, and produce a plan recognizing the 100th Anniversary of the founding of AAPG in 1917.

Summary of Initiatives under Consideration

The celebration could be titled "The Creative Century and the Legacy of Discovery". Stories of inspiration: "100 who made a difference" will include video interviews of key AAPG personalities, senior members, Sidney Power's medalists, past presidents, and significant personalities in the Energy Profession. Plans include digitally linking interviews to the AAPG Web site. A key focus is the philosophy of exploration and the personal side of overcoming challenges.

Our committee's request was responsible for the inaugural videotaping of the Opening Ceremony at the AAPG 2006 Annual Convention in Houston, now standard at all annual meetings. During the summer of 2007, an initiative was undertaken to interview and digitally record Rocky Mountain legends using newly acquired digital recording equipment. A "Discovery Thinking" forum was proposed and accepted for the San Antonio (April 2008) Convention, which will be co-sponsored by DPA.

Possible publications include the following:

• "Lessons from History: 100 Great Ideas in the Search for Energy." A reprint series of key papers and breakthroughs in exploration thinking, with editorial comments regarding historical significance. This project will be a collaborative effort with the History of Petroleum Geology committee. • "100 AAPG World Heritage Sites: Field Trip Locations Based On Outstanding Geology." These will be published and video recordings made by local experts linked to the AAPG Web site. For those able to visit the sites in person, an AAPG plaque and extended material documenting the geologic significance of the site will be available.

A major annual meeting is planned for 2017. This will include celebrations of the history and future of the AAPG. Cooperative efforts with other global professional societies will be planned.

Near term goals are to develop existing and new plans in cooperative efforts with other AAPG committees and design a centennial logo. The committee plans to meet at the annual meeting in San Antonio, and other possible locations throughout the year.

Our committee is growing. The initiation of an advisory board is anticipated.

### C.A. Sternbach, Chairman

Committee members: Charles Sternbach, Ted Beaumont, Ed Dolly, Jeff Lund, Jane McColloch, Mike Party, Bill Stephens, Paul Weimer, Steve Sonnenberg, Andrew Hurst, Bob Shoup, and John Kaldi.

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# **AAPG Imperial Barrel Award Program**



AAPG's Imperial Barrel Award Program (IBA) is an annual prospect evaluation competition created for geoscience graduate students. The program is rigorous and contributes to AAPG's mission of promoting petroleum geoscience training and advancing the careers of geoscience students. University teams analyze a dataset in 6-8 weeks prior to the competition and deliver their results in a 30-minute presentation to a panel of industry experts. Students gain experience using real technology on a real dataset. Additionally, students benefit from feedback from the industry panel, the opportunity to impress potential employers in the audience, and the chance to win cash prizes for their schools.

Contact Carol McGowen, Mike Mlynek, or your local AAPG Section or Region representative for IBA application information. Application forms will also be available on the IBA website (www.aapg.org/iba).



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# A Subsidence Story City of Long Beach California

#### CITY OF LONG BEACH

Long Beach was once known as the "Sinking City." Oil and Gas production from the giant Wilmington Oil Field, where 3.6 billion barrels of oil have been produced, created a land surface "subsidence bowl" of up to 29 feet deep in and around Long Beach Harbor (Harbor) and the City of Long Beach (City). Over 20 square miles have been affected adjacent to the shoreline from the Harbor to Seal Beach. Early 1940's ground water pumping by the Navy on Terminal Island contributed to the sinking, but the majority of the subsidence reesulted from oil and gas extraction. Damage to public and private property and the rebuilding of the Harbor facilities have cost hundreds of millions of dollars.

Although subsidence has been arrested, monitoring and control by the City's Department of Oil Properties is ongoing and will continue indefinity into the future. Stable land surfaces are critical for continued regional economic growth and cannot be jeopardized by the effects of oil and gas production.



Wharf Awash in the Harbor Area at High Tide Due to Sinking from Subsidence



Well Heads Raised 20 Feet Prior to Adding Dirt Fill



Location of Wilmington Oil Field

#### LONG BEACH SUBSIDENCE HISTORY

West Wilmington Oil Field (Fault Blocks)

Minor land subsidence related to ground water with-drawal was noticed in the area by 1928. Appreciable subsidence was observed in 1938, six years after discovery of the Wilmington Oil Field. Major subsidence was first measured in the 1940's at the Naval Shipyard on Terminal Island where large volumes of shallow groundwater were extracted during the dry dock construction. However, the land continued to sink after significant Navy groundwater pumping ceased. By 1945 more than four feet of subsidence was measured.

Experts brought in by the City and Navy concluded that oil, gas, and associated water production were lowering pressures in the oil reservoirs. The fluid pressure provided less support to the unconsolidated sands which then compacted due to the weight of the overlying material. This in turn, allowed the land surface above to sink. Ultimate amounts of subsidence predicted by the studies ranged from ten to senventy feet.

### Subsidence - Continued

The sinking land surface became centered directly over the Wilmington Oil Field as oil and gas production continued. Long Beach Harbor wharves and facilities were inundated by the Pacific Ocean, rail lines were destroyed, and building, streets and bridges were damaged. Earthquakes related to the subsidence sheared the steel casing of hundreds of oil wells below the surface. Subsidence reached a maximum rate of two feet per year in 1951 and 1952.

Research showed that the most practical means of stopping subsidence, while producing oil and gas, was to repressure the same oil reservoirs through water injection. Water injection (know as water flooding) in other oil fields demonstrated that additional oil could be produced beyond just pumping (primary recovery). Engineering calculations concluded that water injection could recover an additional 400 million barrels of oil from the Wilmington Oil Field while maintaining a stable land surface.

Before field-wide water injection could begin, cooperative oil field redevelopment plans were needed to ensure that the thousands of mineral rights owners, the City, and the State of California would receive their fair share of the revenue and pay their fair share of the costs. This process is called "unitization" and required special laws, negotiations, legal agreements and re-engineering.



Extent of Subsidence Bowl through 1974



Harbor Area Under Water Due to Subsidence



Fault Blocks and Long Beach Unit Boundaries

In 1958, the California Subsidence Act was passed treating a "Subsidence District" in which the City of Long Beach was empowered to be the lead agency in controlling subsidence, completing unitization, and operating a large area of the West Wilmington Oil Field. West Wilmington was divdided into six major "fault blocks" and the Units were formed in Fault Block II, III, IV and V. Both unitized and non-unitized operations were required to meet the City's water injection requirements to repressure the reservoirs. This mititgation method took effect around 1960, and by 1967 the entire 20 square mile area was stablized.

After the sinking was stopped, a water injection volume equal to 105% of the total volume of produced substance (oil, gas and water) was found to prevent future reservoir compaction and subsidence. Today, water injection continues to be maintained at rates greater than production. (End Part I)

by Mike Henry, Dave Newman & DOP Staff



Dike Built to Hold Back Water 1956



Harbor Area Subsidence 1954



Newsletter Deadline

January - February

December 20th

Poison Oak by Scott Hector

When I was six years old, I picked some poison oak. It was fall, and the red leaves were so beautiful. As a first grader (one of five students in all eight grades in the one-room mountain school, high in the Santa Cruz Mountains) I was sure that my pick floral beauty would please the teacher best. After all, hadn't she just sent all five of us out with orders to bring back the prettiest things we could find?

Imagine my shock when I didn't receive the accolades I expected! I had never seen a person so upset over something so beautiful. Instead of accolades, I was soon attending an ic-cold meeting between my parents, the teacher and me. Big words like "psychological testing" permeated the air. Mrs. Isidoro was at first sure that I had an "in" for here and had acted as a scurrilous rogue and that I was a deviant in the making. However, as the converstion continued, she began to give me the benefit of a doubt.

The years rolled by, and I became one of Mrs. Isidoro's best students. She taught me for all eight years of elementary school. If the poison oak issue had gone the other way, those would have been ight long years for me.

About 25 years later, I stood at a precipice looking at

the hundreds of feet of hillside covered with poison oak. I was still in the Santa Cruz Mountains, but this time looking down on the La Honda oil field from a hill above. I was doing field work, the day was almost done, and I needed to get down. I started to walk on top of the greasewood and poison oak, and finally started to roll my body down the steep hillside. I picked up momentum, and was afraid I might start hurtling out of control down the slope. However, the poison oak seemed to break and slow my roll whenever I thought I was picking up too much speed. The "Poison Oak Roll" worked, and I was able to get out of the remote area before sundown. (I knew by this time that I was pretty much immune to poison oak.)

Sadly, I never got to pick poison oak for teachers in high school or college. However, the itchy vine has greeted me from time to time in my career, especially at sites in the Coast Range basins from Ventura to La Honda. When I see it, my thoughts turn back to my childhood and the well-meaning intentions of a small child for his teacher. The only thing I can compare the red vine to, with its slick surfaces, the brilliant colors, the tempting shapes, but the rash of disappointment that often follows -- is a geologist's prospect package!



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# SPE Western Region Society of Engineers and Pacific Section American Association of Petroleum Geologists 2008 Joint Meeting

Technical Sessions March 31 through April 2, 2008 - Bakersfield, California

Once again the Western Region North American Society of Engineers and the Pacific Section American Association of Petroleum Engineers are uniting our annual conventions into one fully packed event in Bakersfield, California. The theme of the conference is "Adding Reserves through Collaboration, Innovation and Technology Transfer". The committee is dedicated to serving this theme with an integrated technical and continuing education program featuring innovative technology, and encouragement of professional and social collaboration throughout this united affair.

Allen Waggoner and Jan Gillespie are serving as PSAAPG co-chairs of the technical program along with Jeff Jones (SPE). The call for papers has gone out so do not hesitate to send your abstract in through the PSAAPG website (www.psaapg.org). Along with PSAAPG and WRSPE, other contributing societies will include SEPM and SEG. The convention is relatively early this year (end of March), so the abstract submittal deadline of November 30, 2007 is near. Meeting this deadline will ensure inclusion of accepted abstracts in the published convention abstract CD. In addition to seeking presentations and posters addressing the collaboration/integration theme of the convention, the technical committee is encouraging creative contributions highlighting innovative technological advances affecting petroleum reserve additions in our region, and as always, presentations representing broader, yet vital geoscience advances.



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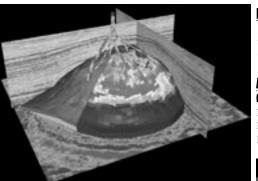
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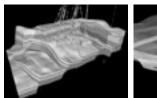
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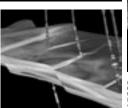
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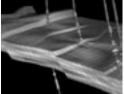
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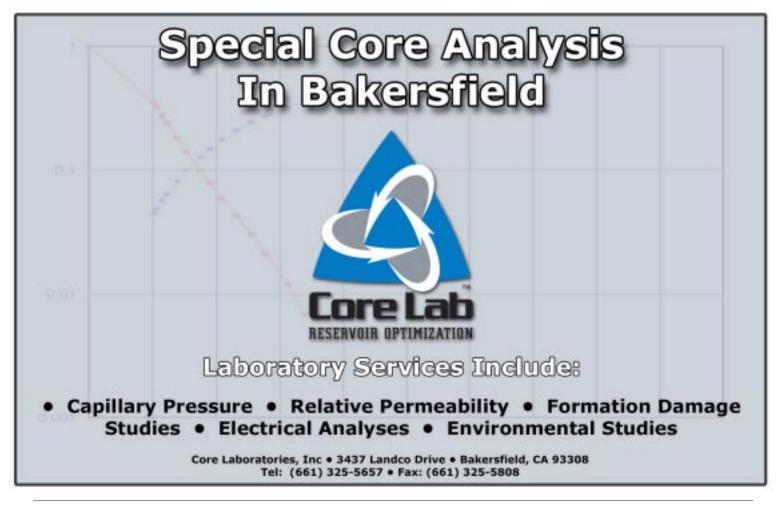
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In addition to firming up oral and poster sessions, the continuing education committee is formulating the short course and field trip line-up. If you have ideas or a trip or course to offer, do not hesitate to contact Anil Mathur (Continuing Education Chair), (Ed Wasburn, PSAAPG Field trip liaison, EWashburn@chevron.com), or Tracey Fleming-Reese (PSAAPG Short Course liaison, tracey\_fleming-reese@oxy.com). And yes, the exhibitor invitations will be going out soon as well, so look for information from Larry Knauer and plan to show your wares.

Look for future updates in this space regarding the continuing formulation of this convention including guest speakers, social events, student activities etc. We are proud of the progress of this esteemed committee to date and we are confident that the conference will prove to be a rewarding experience to all that contribute to the technical programs and attend the events.



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# Alaska Geological Society www.alaskageology.org

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Luncheon meetings are held monthly September through May, usually on the third Thursday of the month, at the Anchorage Hilton (500 W. 3rd Avenue) from 11:30 a.m. to 1:00 p.m. The cost is \$18 for members with reservations; no reservations add \$5; non-members add \$2. For reservations, call the AGS reservation voice mail at 907-258-9059 or contact **David Hite** at hiteconsult@acsalaska.net by noon on Monday before the meeting.

2007 - 2008 Officers

President Robert B. Blodgett rblodgett@usgs.gov

Coast Geological SocietyP. O. Box 3055Contact: Shaun Simonwww.coastgeologicalsociety.orgVentura, CA 93006805.495.2197



Dinner meetings are held monthly September through June, usually on the third Tuesday of the month, at the Veterans of Foreign Wars Hall at 3801 Market Street in Ventura. Social hour starts at 6:00 p.m., dinner is served at 7:00 p.m., and the talk starts at 8:00 p.m. The cost of dinner is \$18 (with reservations), \$20 (without reservations), or \$10 (students and K-12 teachers); the talk is free. For reservations, contact **Dave Brown** at 805.653.7975 or make reservations online at www.coastgeologicalsociety.org. Reservations should be made by 4:00 p.m. on Friday before the meeting.

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November 20th - "Evolution of the Colorado River: Culmination of a Major Cenozoic Transformation of SW North

American Drainage Patterns", Marty Grove, UCLA

December - TBA

Los Angeles Basin Geological Society www.labgs.org

515 So. Flower Street, Ste 4800 Contact: Jon Kuespert Los Angeles, CA 90071 213.225.5900 x224



Luncheon meetings are held monthly September through November and January through June, usually on the third or fourth Thursday of the month, in the Monarch Room at The Grande at Willow Street Conference Centre (4101 E. Willow Street) in Long Beach. Lunch is served at 11:30 a.m., and the talk starts at 12:15 p.m. The cost is \$20 (with reservations), \$25 (without reservations), or \$5 (students). Reservations can be made online at www.labgs.org or by contacting **Jon Keuspert** at jkuesper@breitburn.com or (213) 225-5900 ext. 224. Reservations must be made prior to Tuesday before the meeting.

2007 - 2008 Officers

President Jon Kuespert jkuespert@breitburn.com

November - No Meeting December - No Meeting

Northwest Energy Association P. O. Box 6679 Contact: James Jackson dlgellar@msn.com Portland, OR 97228-6679 503-771-3887



Luncheon meetings are held monthly September through May, usually on the second Friday of the month, at the Multnomah Athletic Club (1849 SW. Salmon Street) in Portland. Meeting time is at 7:30 - 9:00 am. The cost is \$15. For information or reservations, contact **Shelley Thomas** at 503-848-2947 or **Treck Cardwell** at 503-226-4211 ext. 4681.

Northern California Geological Society

9 Bramblewood Court

www.ncgeolsoc.org

Danville, CA 94506-1130

Barbara.Matz@shawgrp.com



Evening meetings are held monthly September through May, usually on the last Wednesday of the month, at the Masonic Center (9 Altarinda Road) in Orinda. Social hour starts at 6:30 p.m., and the talk starts at 7:00 p.m. (no dinner). For reservations, leave your name and phone number at (925) 424-3669, or at danday94@pacbell.net before the meeting. Cost is \$5 per regular member; \$1 per student member.

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November 28 - Flooding hazards Associated with Sea Level and Climate Change, Dr. Jeffrey Mount, U.C.Davis

December - No Meeting

Field Trip: May 2008, Point Lobos to Point Reves: Evidence of ~180 km offset of the San Gregorio &

Northern San Andreas Fault; Kathleen Burnham, Independent Researcher

Sacramento Petroleum Association P. O. Box 571 Contact: Rick Blake Sacramento, CA 95812-0571 925-422-9910



Luncheon meetings are held monthly January through November, on the third Wednesday of the month at the Hungry Hunter Restaurant (450 Bercut Drive) in Sacramento. The meetings starts at noon. The cost is \$16. For information or reservations, contact **Pam Ceccarelli** at 916-322-1110 or pceccare@consrv.ca.gov.

2007 - 2008 Officers

PresidentRick Blakeblake2@llnl.govVice PresidentMarc Brennenmarc.brennen@halliburton.comSecretary/TreasurerPam Ceccarellipceccare@consrv.ca.gov

San Joaquin Geological Society

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Dinner meetings are held monthly October through June, usually on the second Tuesday of the month, at the American Legion Hall (2020 H Street) in Bakersfield. The icebreaker starts at 6:00 p.m., dinner is served at 7:00 p.m., and the talk starts at 8:00 p.m. The cost of dinner is \$20 (with reservations) or \$23 (without reservations); the talk is free. For reservations, contact **Janet AcAlee** at jmcalee@pxp.com or (661) 395-5438.

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# Petrel

Petrel\* seismic-to-simulation solution unites the subsurface domains of geophysics, geology, and reservoir engineering.

With Petrel software, asset team members can easily integrate their work—throughout the life of the field. No more over-the-wall data transfers, with the associated inaccuracies and errors. Traditional workflow and software barriers between technical disciplines are eliminated, opening the way for optimal reservoir understanding.

"In new assets and in older fields, leveraging technology is a key element of profitability and adding value for our shareholders. New insights and efficiencies from technologies within the Petrel suite of workflow tools provide significant potential benefits to companies like ours."—Steve Farris, CEO, Apache Corporation

With Petrel software, all work processes lead to one shared earth model, resulting in faster, better decisions.

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