

ASC chief petroleum officer cites deficient O&G resources disclosures, says agency to issue guidance

Phillip Chan, a chief petroleum officer at the Alberta Securities Commission, said the ASC has received deficient disclosures of oil and gas resources so Canadian regulators have decided to issue more guidance. He made his remarks at the September Ryder Scott Canada reserves conference in Calgary.

Unconventional resources have outpaced and surpassed conventional in Canada. During an eight-year span to the 2011-2012 period, proved and probable reserves disclosed in Canada dropped from 74 percent conventional to 40 percent, Chan showed. The remaining 60 percent comprise unconventional resources—bitumen, coalbed methane and oil and gas shale.

“NI 51-101 and COGEH were written mainly for conventional resources but they also apply to unconventional,” said Chan. National Instrument 51-101 sets public disclosure standards for oil and gas activities in Canada. The three-volume *Canadian Oil and Gas*

Evaluation Handbook provides a set of standards and guidelines for reserves and resources evaluations.

Chan said that disclosure of ROTR (resources other than reserves) is voluntary. However, if the issuer discusses anticipated results—for instance in barrels, cubic feet or net present values—then compliance with NI 51-101, Section 5.9 is required. Disclosure items include an issuer’s interest in ROTR, location of the resources, expected product types and risks and uncertainties in recovery.

“Discussion of risks and uncertainties is missing or inadequate. Contingent or prospective resources are disclosed, but the following year, they are not and no explanation is provided.”

—Chan

Chan outlined some deficiencies in reporting ROTR as follows:

- ◆ Issuer has not made it clear whether it is disclosing lease gross, gross or net volumes or company interest or whether the volumes are risked.
- ◆ Discussion of significant positive and negative factors in estimating resources quantity is missing or insufficiently disclosed.
- ◆ Disclosures are in non-standard product types and metrics.
- ◆ Issuer is not always clear on what project is being evaluated or how it is intended to progress.
- ◆ Discussion of risks and uncertainties is missing or inadequate. Section 5.9 provides boilerplate cautionary statements to use.
- ◆ Issuer poorly describes contingencies and steps to remove them.



Chan at the Calgary Conference

- ◆ Contingent or prospective resources are disclosed, but the following year, they are not and no explanation is provided.

Chan said that Canadian regulators plan to provide more guidance for resources disclosures, including a Society of Petroleum Evaluation Engineers update to COGEH, ongoing updates and amendments to NI 51-101 and staff notices from the ASC and Canadian Securities Administrators.

“Proposed amendments to NI 51-101 are progressing through approval stages and there will be a public comment period,” said Chan. His presentation, “Booking Unconventional Reserves and Resources under Canadian Disclosure Rules NI 51-101,” is posted on the Ryder Scott website at ryderscott.com/Presentations/index.php.

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Differentials, supply-demand weaken Canada M&A

A large supply of available buying-selling opportunities in the Canadian oil patch is going unnoticed as equity performance in the U.S. market strengthens and commodity prices in Canada remain weak. "Unlike the past 20 years, it's a buyer's market in Canada now," said Cheryl Sandercock, a director at Scotia Waterous in Calgary. She made her remarks at the First Annual Ryder Scott Canada Reserves Conference on Sept. 5.

She said buyers are applying higher risk and discount rates to value acquisition or merger opportunities. Where buyers used to pay for proved plus probable reserves discounted at 10 percent, now PDPs (proved developed producing) may be discounted at 10 percent and proved plus probable at 20 percent,



Sandercock at the Calgary Conference

her slide example showed.

Although differentials between Canada and U.S. oil prices tightened recently, in late 2012 and early 2013, the spread was wide. Then, U.S. light and heavy crude sold at a

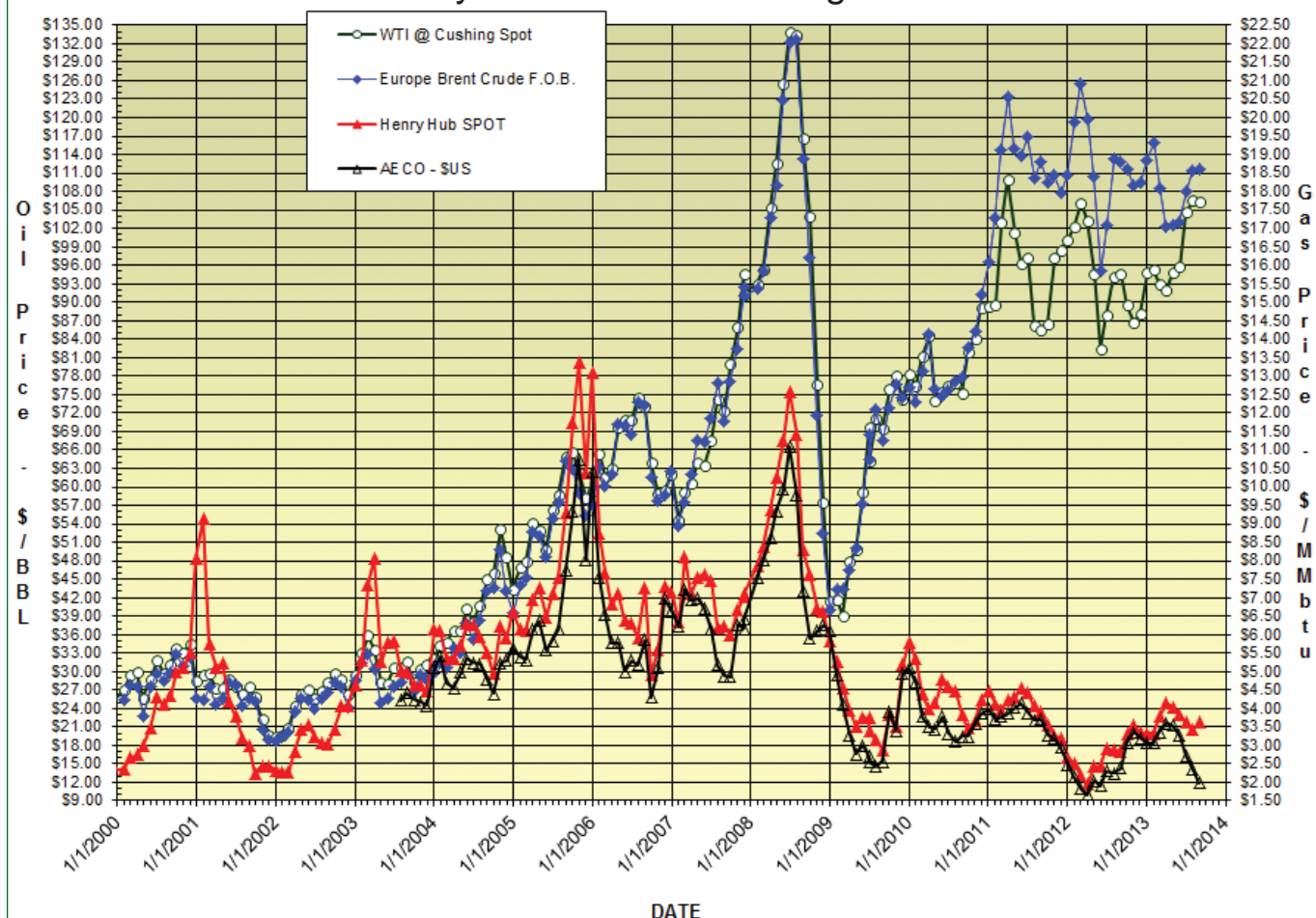
premium to oil in Canada because of North American transportation bottlenecks and forecasts for continuing constraints, said Sandercock.

"Buyers of public equity are looking at opportunities in the U.S. while year-to-date figures suggests 2013 will be an historical low for equity issuance in Canada," she remarked. Sandercock showed that only 40 to 50 percent of potential oil and gas mergers, acquisitions and divestitures on the Canada market have successfully transacted since 2011, creating a large supply.

Complicating this, Sandercock added, is that most Canadian producers are carrying increased leverage (debt) levels, are capital constrained and are unsuccessfully pursuing divestitures to fund large

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Price history of benchmark oil and gas in U.S. dollars





More than 100 executives, managers and technical professionals attended the First Annual Ryder Scott Canada Reserves Conference at the Fairmont Palliser hotel in the Alberta Room on Sept. 5. Twelve North American experts discussed petroleum reserves issues at the one-day oil and gas conference in Calgary. The speaker lineup included professionals in geology/engineering, E&P, law, government, academia, banking and consulting. All presentations are posted on the Ryder Scott website at ryderscott.com/Presentations/index.php.

COGEH improvements due for YE 2014, says Elliott



Elliott at conference

David C. Elliott, president at Geosgil Consulting Ltd., presented "Resource Classification: The Impact of Unconventional Resources," at the Ryder Scott Canada reserves conference Sept. 5. He examined worldwide resources and reserves classification systems with emphasis on the Society of Petro-

leum Engineers Petroleum Resources Management System and the Canadian Oil and Gas Evaluation Handbook.

Although both frameworks provide general guidance on unconventional resources, he said that the main focus is on conventional reserves. "The Alberta Securities Commission has conducted hundreds of reviews on contingent resources disclosures, which are increasing, and has found a lack of consistency," said Elliott, who retired from the ASC last year.

The inconsistencies prompted him, as a chief petroleum advisor at the agency in 2011, to request that the Society of Petroleum Evaluation Engineers in Calgary improve COGEH guidelines on contingent resources. As a result, the chapter formed the SPEE Calgary resource guidelines subcommittee

"The Alberta Securities Commission has conducted hundreds of reviews on contingent resources disclosures ...and has found a lack of consistency." — Elliott

that issued a working draft of resources guidelines for ROTR (Resources Other Than Reserves) May 31 and an interim draft Aug. 14. The SPEE committee aims to issue the final guidelines for use in year-end 2014 reporting.

The draft addresses all types of ROTR, discovered and undiscovered petroleum initially in place, prospective and contingent resources and topics, such as project descriptions and aggregation.

In looking at contingent resources, Elliott pointed out that the SPE-PRMS and COGEH address economic and technical contingencies but non-technical contingencies—political, regulatory and social—are growing in importance. "Nowadays, social factors have become a major issue and are important in determining resource classifications, but we don't have much guidance on them," Elliott said.

His and all presentations are posted on the Ryder Scott website at ryderscott.com/Presentations.



With fellow presenters, Phillip Chan, chief petroleum officer and manager at the ASC, (second from right) makes his comments at a question-and-answer session at the Ryder Scott Canada Reserves Conference. From left are Vitaliy Charkosvskyy, reserves evaluator at Ryder Scott; John Lee, professor at the University of Houston; David Elliott, former chief petroleum advisor at the ASC; Miles Palke, senior vice president at Ryder Scott; Chan; and Larry Connor, managing senior vice president at Ryder Scott.

Integrated seismic analysis plays bigger role six years into modernized reserves guidelines and rules

Geoscience input for the reporting of reserves has increased since the 2007 SPE-PRMS emphasis on using all geoscience and engineering data and the subsequent revision of U.S. SEC reserves disclosure rules in 2008, said **Doug Uffen**, managing partner at Geo-Reservoir Solutions Ltd. He made his presentation, "Geology and Geophysics in Reserves Estimates," at the Ryder Scott Canada reserves conference Sept 5.

Uffen said that further use of geophysics in estimating reserves has increased with the publication of Chapter 3, "Seismic Applications," in the SPE-PRMS application guidelines in late 2011. Uffen said that historically, the contribution of geophysics to reserves estimates has had limited impact, often just defining the areal extent of the reserves for volumetric analysis. However, over the past two decades, seismic data has been used in integrated studies to predict reservoir properties through reservoir characterization.

Uffen said that properties being investigated more thoroughly in integrated studies are porosity,

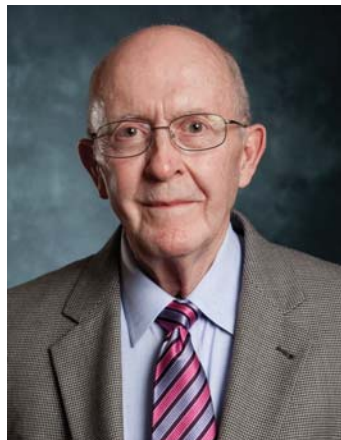
vertical and horizontal permeability, mineralogy, diagenesis and faulting. "Seismic data has poorer vertical resolution than well logs but with both combined, spatial and vertical resolutions can be enhanced," he remarked.

Uffen showed various examples of maps where integrated seismic analysis played a role in reservoir characterization. "When the relationship between porosity and permeability is linear, permeability maps can be made from seismic data," he said.

Uffen also cited various inferences derived from geophysics used with rock physics and geology in what he termed a "quantitative interpretation." That integrated approach results in the creation of better geo-models of the reservoir, he said. Innovations in seismic technology can help better define reserves, particularly probable and possible reserves, as well as resource potential, Uffen remarked.

His and all presentations from the conference are posted on the Ryder Scott website at ryderscott.com/Presentations.

Lee outlines reserves issues for U.S. SEC reporting



Lee

John Lee, professor of petroleum engineering at the University of Houston, presented “Booking Unconventional Reserves under U.S. SEC Guidelines” at the Ryder Scott Canada reserves conference Sept. 5. A former fellow at the SEC during its rules-change process, Lee said the following features of those five-year-old “modernized” regulations still dominate guidance and discussion:

- ◆ Change of “certainty” criterion for proved

undeveloped reserves (PUDs) to “reasonably certain”

- ◆ PUDs beyond immediate offsets may be claimed if “reasonably certain” criterion is met.
- ◆ “Reliable technology” concept facilitates the booking of PUDs beyond immediate offsets
- ◆ Five-year limit on reporting PUDs after initial booking

Lee noted that the SEC has not objected to statistical techniques in the SPEE Monograph 3 for estimating PUDs, including those beyond immediate offsets.

He said that to estimate EURs for unconventional, filers are predominately using the Arps hyperbolic model with a conservative b factor (≤ 1.5) and conservative Dmin (5 to 10 percent).

“That decline-curve method is probably preferred by the SEC staff,” he said. Lee cautioned that early production doesn’t fall within long-term trends because of drops in bottom-hole pressures, changed settings on the wellhead choke and production of frack fluid.

“With early data, we use type wells,” said Lee. He also recommended the use of rate-transient analysis and more defensible applications of the volumetric and analog methods based on better reservoir characterization and estimation of recovery factors.

Lee said that the SEC is rigorously enforcing the five-year rule and has taken a hard-line stance as indicated by comment letters in which exceptions are not granted. Among the significant changes at the SEC, he mentioned the SEC’s hiring of **John Hodgin**, a former president at Ryder Scott, and the SEC plans to add an engineering fellow to staff.

The fellow may be familiar with forecasting methods beyond Arps with a Dmin and might serve a two-year term with option for an extension, Lee surmised.

His and all presentations from the conference are posted on the Ryder Scott website at ryderscott.com/Presentations.

Research on fracturing optimization detailed by Chen

Zhangxing (John) Chen, professor at the University of Calgary, presented hydraulic fracturing optimization research on shale gas at the Ryder Scott Canada reserves conference Sept. 5. The research objective was to study increases in the effective reservoir contact area from hydraulic fractures and complex natural fracture networks, he said.

Chen outlined the stimulation optimization design process with an emphasis on the following areas:

- ◆ Wellbore placement and landing point
- ◆ Horizontal wellbore lateral length
- ◆ Completion hardware and isolation techniques
- ◆ Fracture spacing and number of hydraulic fractures per lateral
- ◆ Fracturing fluids and additives, proppant selection and pumping schedule
- ◆ Stimulated reservoir volume (SRV)
- ◆ Fracture monitoring and evaluation

Chen compared typical fracturing treatments of five major U.S. shale plays as measured by several parameters such as average number of frac stages per day, amount of proppant per stage and per well, foot per stage, etc. He offered the following general conclusions:

- ◆ No shales are alike.
- ◆ Optimized stimulation design must start from well planning.
- ◆ Slickwater/gel high-rate fracturing job proved to be

most effective in shale gas plays.

- ◆ SRV, fracture network spacing and conductivity are identified key factors linked to well performance.

His and all presentations from the conference are posted on the Ryder Scott website at ryderscott.com/Presentations.



Chen at the Calgary Conference

Colorado flood flushes out anti-fracking groups

A massive flood in Colorado's Front Range in mid-September washed out DJ basin oil and gas operations and flushed out anti-fracking groups using social media to "break the news." Websites, blogs and posts from Food & Water Watch, WTFrack.org, Erie Rising and others warned that runoff from submerged wells, tanks and wastewater pits could seriously threaten the environment. Images of flooded field operations, some showing toppled storage tanks, were quickly posted on social-media sites, such as Twitter and Facebook.

"We have received social media reports of oil and gas pollution during the flood. So far, we have found no major problems and operators have shut in 1,900 wells in the flooded area," said **Tisha Conoly Schuller**, president and CEO at Colorado Oil & Gas Association, at the Ryder Scott Reserves Conference on Sept. 18 in Houston. She urged the public to provide photos to COGA for further investigation.

On Oct. 2, the Colorado Oil and Gas Conservation Commission said that the flood caused releases totaling about 43,000 gallons or 1,000 barrels across 17 counties—a spill that is 6.5 percent of an Olympic-sized swimming pool. There were no reported releases of chemicals or fracturing-fluid additives. Earlier, COGA said in a statement that "there were no known fracking operations being conducted in the flooded areas."

Generally, the public has remained skeptical of industry-reported spill numbers despite assurances from government officials and producers. That was evident during the Colorado catastrophe.

In the weeks after the flood, operators were inspecting and repairing sites before initiating start-up procedures for the shut-ins.

Boulder, CO, was pelted by as much as 9 inches of rain on Sept. 12. Schuller, a resident, and her family evacuated their house along with hundreds of neighbors seeking shelter during the deluge. Husband **Brian Schuller**, a volunteer firefighter, assisted in 30 evacuations, many by helicopter, while she led industry fundraising efforts for the American Red Cross shelter. In a follow-up interview, Schuller reported that the industry had raised more than \$1.5 million for the Red Cross.

The death toll stood at nine in early October. Nearly 20,000 homes were damaged or destroyed.

A few days removed from the cataclysmic event and admirably on task at the conference, Schuller articulated the pro-industry cause with no hesitation. "Do we have any 'fractivists' here," she asked the crowd of oil and gas professionals. Fractivists is a Twitter term defined as a body of individuals who fight for a purpose higher than self. Anti-fracking groups use hashtags such as #Ban #Fracking to get messages and photos retweeted.

"National campaigns against fracking have targeted Colorado. Those groups are putting together well-organized and -funded efforts to shut down oil and gas production in the United States," said Schuller. "This is coming to your state. It's expensive, contentious and prevents us from doing the real work of advancing the difficult conversations about responsible



energy production."

Schuller said that in 2008, the Colorado Oil and Gas Conservation Commission passed the most comprehensive "overhaul" of conservation and environmental legislation in state history with 16 new rules and 66 amended ones. Colorado has become a national leader in oil-and-gas regulation, said Schuller, adding that the state passed the first hydraulic fracturing disclosure rule, which she said was largely supported by environmentalists, regulators and the industry.

Colorado also passed a groundwater sampling-and-monitoring regulation in January aimed at oil and gas. In February, numerous house- and senate-authored state bills focusing on industry were largely defeated by a coalition of 26 business-and-citizen groups.

"The contentious nature of political conversations is pervasive. The oil and gas industry will have to lead the way in contributing to thoughtful, empathetic and constructive conversations about energy development. Compromise cannot continue to be a dirty word," said Schuller.

She recommended that industry take a grass-roots approach. Schuller said that recently 26 community governments in the state considered bans, moratoria, new regulations and more stringent laws on oil and gas. Twenty-two were "amiably" resolved through collaboration while four jurisdictions, all in Boulder County, passed the initiatives.

Schuller said, "Engage passionately. Articulate the importance of oil and gas in every component of our lives. Anyone who wants to end the production of

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Engineer, geologists join Ryder Scott, others promoted

Two geologists and a petroleum engineer have joined Ryder Scott, which also promoted several professionals during the year.



Kis

Lynn Kis has joined Ryder Scott Canada as a petroleum engineer. Previously, she worked at AJM Petroleum Consultants as vice president engineering starting in 2006, and after the merger, at AJM Deloitte most recently.

Kis has more than 30 years' experience in reservoir and project engineering and has extensive experience in corporate reserves and acquisition-and-divestiture evaluations.

Besides her extensive experience with Canadian oil and gas fields, she has conducted international reserves and resources studies of properties in Albania, Trinidad, Pakistan and the United States.

Kis has also conducted reservoir-engineering analysis of unconventional reserves, such as coalbed methane. At AJM, she supervised project evaluations, including leading a team that planned and coordinated reserves evaluations for a \$3-billion sale of oil and gas assets in western Canada and Ontario. Also at AJM, Kis was an expert witness in dispute resolutions and worked on a major gas facility re-injection/storage project at Aitken Creek, BC.

Kis also was a general manager and later vice president engineering and planning at Pengrowth Corp. during 1998 to 2005. She managed non-operated properties in Alberta and Saskatchewan producing 24,000 BOE/D and evaluated corporate reserves of the company. Kis also analyzed shallow gas drilling programs in southern Alberta, deeper gas programs in northern Alberta and waterfloods and CO₂ schemes in Alberta and Saskatchewan.

While at Pengrowth, Kis also managed non-operated joint-venture activities and corporate reserves evaluations and analyzed potential A&D opportunities.

Before that, she worked at Jordan Petroleum Ltd. for four years starting in 1994 as an engineering manager. Kis analyzed development-and-exploitation opportunities, drilling operations and waterflood optimization in heavy oil fields.

She started her career as a project engineer at the Energy Resources Conservation Board of Alberta before she joined Gulf Canada Inc. where Kis was a senior reservoir project engineer from 1976 to 1979. After that, she worked at Suncor Inc., Brent Petroleum Industries Ltd. and Sundance Oil Canada in senior reservoir engineering and management positions until 1983 when she established a reserves evaluation consulting business serving both majors

and juniors for 10 years until 1994.

Kis has a BS honors degree in applied science from the University of Wales, Cardiff.

She is a member of the Association of Professional Engineers and Geoscientists of Alberta and Society of Petroleum Engineers.



Emberson

Jake Emberson, geologist, is working in the Houston office. He most recently was an associate geologist at Tug Hill Operating LLC and a reservoir navigation specialist at Baker Hughes Inteq. During that time, he performed geological studies on the Mississippi limestone in Kansas. Emberson generated subsurface maps as well as structural and stratigraphic cross sections. He also reviewed

production from offsetting wells, analyzed mud logs and drill-stem test results and supervised well logging and the horizontal steering of lateral wells.

Emberson also modeled horizontal wells, monitored wells in the Fayetteville shale and provided geo-steering recommendations. He started his career at Sandridge Energy Inc. five years ago as a geological technician. Emberson was promoted to associate geologist and served as the primary geologist on gas well projects. He analyzed cross-sections and isopach maps of complex geology in Pecos County, TX.

He has BS degrees in petroleum geology and geography from the University of Oklahoma and is a member of the American Association of Petroleum Geologists and other organizations.



Rosen

Gillian Rosen, geologist, is also working in the Houston office. She was most recently with BHP Billiton Petroleum Corp. for four years as a geologist. Rosen conducted volumetric estimates and analyzed well planning and offshore operations in the Gulf of Mexico. She also performed well-log interpretation and correlation and geocellular modeling. Rosen also conducted regional mapping,

prospect evaluation and basin analysis in a BHP new ventures group that operated in Brazil, Gabon, Uru-

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Sandercock—Cont. from Page 2

capital-intensive field developments, especially for unconventional resources.

Also, increasing AECO gas price differentials to Henry Hub are hurting the Canada gas market, which has been hit by increased transportation tolls and rising production levels from the Marcellus shale play causing a glut. She said that gas is expected to be in a fixed trading range until 2018 when LNG export capability in North America has expanded.

"The widening of gas price differentials is a killer. It's bad for investor confidence," said Sandercock. "Both corporate and asset transactions in western Canada have been slow this year."

Equity investment also has been weak because the oil-and-gas sector has to compete with other more robust markets on the Toronto Stock Exchange.

Health care, paper and forest products and information technology have substantially increased their market capitalization over the last 12 months compared to the energy sector which has remained virtually flat.

Sandercock also discussed oil sands investing, market for conventionals and resource play transactions, including those in the Duvernay shale. Her presentation, with transaction metrics, is posted on the Ryder Scott website at ryderscott.com/Presentations.

Rosen—Cont. from Page 7

guay, Angola and Namibia.

She also performed regional- and prospect-scale mapping, planned 3D seismic acquisitions, integrated paleoclimatic and tectonic data with field analogs and analyzed petroleum-system potential and new prospects in a frontier basin in South Africa. Rosen was also a doctoral research fellow at the University of Florida over the past six years.

She has a BS degree in geological sciences from Binghamton University and an MA degree in earth science from State University of New York – Oneonta. Rosen is a member of AAPG and other professional associations.

Miles Palke, **Eric Nelson**, **Jennifer Fitzgerald**, **Mario Ballesteros**, **Rick Robinson** and **Anna Hardesty** were promoted to senior vice president – group coordinator. **Steve Phillips**, a senior vice president, was additionally named group coordinator for geoscience. **Tim Smith** and **Paula Wood** were promoted to vice president – project coordinator. **Moksh Dani**, **Eric Sepolio** and **Gabrielle Guerre** were promoted to senior petroleum engineer.

Publisher's Statement

Reservoir Solutions newsletter is published quarterly by Ryder Scott Co. LP. Established in 1937, the reservoir evaluation consulting firm performs hundreds of studies a year. Ryder Scott multidisciplinary studies incorporate geophysics, petrophysics, geology, petroleum engineering, reservoir simulation and economics. With 130 employees, including 90 engineers and geoscientists, Ryder Scott has the capability to complete the largest, most complex reservoir-evaluation projects in a timely manner.

Schuller—Cont. from Page 6

fossil fuels doesn't realize our complete interdependence. Industry needs to join the discussions and change the quality of the conversation."

She suggested those in the industry engage in backyard barbecue conversations, join citizen-and-business coalitions, participate in rallies and engage with state, county and community leaders.

"Be politically active," she said. "The conversation doesn't advance without your participation."

On Oct. 8, the Denver Post published an interview with Colorado Department of Public Health and Environment chief medical officer Dr. **Larry Wolk**. In the Post article, he was quoted, "Although much attention was focused on spills from oil and gas operations, it is reassuring the sampling shows no evidence of oil and gas pollutants. There were elevated E. coli levels, as we expected, in some locations."

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