HAS UNCONVENTIONAL BECOME CONVENTIONAL?
GENERAL MEETING P.17

DISPLACEMENT EFFICIENCY IN CEMENT JOB DEMYSTIFIED
NORTHSIDE P. 13

HOW TO PREDICT RESERVOIR PERFORMANCE WITH SUBSURFACE UNCERTAINTY AT MULTIPLE SCALES
COMPLETIONS & PRODUCTION P. 19

FUTURE AND PRESENT E&P MLP STRATEGIES
BUSINESS DEVELOPMENT P. 27

1ST ANNUAL SPE-GCS OILSIM COMPETITION FUNDRAISER
P. 32

SPEGCS.ORG
Networking becomes increasingly important when oil sells for as low as $46 per barrel. By attending local SPE events like the Digital Energy Conference (March 3-5) and the ESP Workshop (April 22-24) in The Woodlands, as well as Gulf Coast Section study group luncheons, you will learn how to survive – even thrive! – in a low oil price situation. These SPE meetings are where best practices are shared, where good ideas happen, where you learn what works and what doesn’t.

Surely you have heard that “two heads are better than one.” Well, how much better is a group of 25 heads? Of 250 heads? This industry has experienced several of these downturns during my career, and each time, the phoenix has risen from the ashes stronger and wiser than before, with new technologies and techniques that take oil drilling and production to a whole new level. How did this happen? By collaborating and sharing more than ever.

In this country we cannot team up to control prices like a cartel. But we can come together to solve technical problems, to share new ways to use old tools, to show demos of new technology. Why sit at your desk and worry and fret, when you can go to an SPE meeting and learn how to make things better at your job? Your boss will be so impressed that maybe you will keep your job. If you do lose your job due to layoffs, SPE is your safety net. You can attend one SPE study group meeting per month at the Student/Unemployed rate of only $10 so you can stay abreast of new technology in between jobs. And when things start to pick up again, your SPE friends will be the first to tell you of any job openings.

So “pick a chin, and keep it up!” as my double-chinned friend Virginia Brooks likes to say. This, too, shall pass. The world will continue to need even more fuel, lubricants, plastics, fertilizers, wax, polyester, etc., as the global population continues to grow, and solar and wind energy cannot supply the molecular building blocks. Therefore, growing demand will swallow this oil glut soon enough, and when the next boom comes, let’s all promise – once again – not to go overboard with irrational exuberance.

STUDENT CHAPTERS

One of our goals this year is to strengthen our relationships with the four Student Chapters in our area: University of Houston, Rice University, Texas A&M, and Houston Community College. I have received requests recently to write the required letter of section support for three more SPE Student Chapters: Lamar University, Prairie View A&M, and Lone Star College.

But before the Gulf Coast Section commits to supporting them financially, we want to make sure we have enough support from our members to ensure their continued success. I figure the alumni from these colleges would be the best source of support, as they know the campus and the tenured professors, and can be excellent role models.
### STUDY GROUPS

<table>
<thead>
<tr>
<th>Number</th>
<th>Group</th>
<th>Date (YMD)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Research &amp; Development</td>
<td>3.05.2015</td>
<td>Big Data and the Process of Everything</td>
</tr>
<tr>
<td>11</td>
<td>HSSE-SR</td>
<td>3.06.2015</td>
<td>2015 HSE Student Invitational</td>
</tr>
<tr>
<td>13</td>
<td>Northside</td>
<td>3.10.2015</td>
<td>Displacement Efficiency in Cement Job Demystified</td>
</tr>
<tr>
<td>15</td>
<td>Drilling</td>
<td>3.11.2015</td>
<td>Building Drilling Efficiencies to Avoid Hazards through Real-Time Analytics</td>
</tr>
<tr>
<td>17</td>
<td>General Meeting</td>
<td>3.12.2015</td>
<td>Has Unconventional Become Conventional?</td>
</tr>
<tr>
<td>19</td>
<td>Completions &amp; Production</td>
<td>3.18.2015</td>
<td>How to Predict Reservoir Performance with Subsurface Uncertainty at Multiple Scales</td>
</tr>
<tr>
<td>21</td>
<td>Westside</td>
<td>3.18.2015</td>
<td>Effect of Dynamic Active Fracture Interaction on Completion and Fracturing Practices</td>
</tr>
</tbody>
</table>

### COMMITTEES

<table>
<thead>
<tr>
<th>Number</th>
<th>Committee</th>
<th>Date (YMD)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Reservoir</td>
<td>3.19.2015</td>
<td>Correct Forecasts Often Aren’t; Reservoir Study 2.0 = ?</td>
</tr>
<tr>
<td>25</td>
<td>Water &amp; Waste Management</td>
<td>3.24.2015</td>
<td>Using Pre-Drill Groundwater Monitoring as a Stakeholder Outreach Tool</td>
</tr>
<tr>
<td>27</td>
<td>Business Development</td>
<td>3.25.2015</td>
<td>Future and Present E&amp;P MLP Strategies</td>
</tr>
<tr>
<td>29</td>
<td>Auxiliary</td>
<td>03.13.2015</td>
<td>Young Professionals Dealing with Volatility</td>
</tr>
<tr>
<td>30</td>
<td>Continuing Education</td>
<td>3.24.15</td>
<td>Technical Writing Workshop</td>
</tr>
<tr>
<td>31</td>
<td>Continuing Education</td>
<td>3.26.15</td>
<td>Networking and Mentoring to Build Beneficial Relationships</td>
</tr>
<tr>
<td>32</td>
<td>OilSim Competition Fundraiser</td>
<td>4.10.15</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Casino Night Scholarship Fundraiser</td>
<td>03.28.2015</td>
<td></td>
</tr>
</tbody>
</table>

### IN EVERY ISSUE

<table>
<thead>
<tr>
<th>Number</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>SPE-GCS December Membership Report</td>
</tr>
<tr>
<td>6</td>
<td>Then &amp; Now Buddy Woodroof</td>
</tr>
<tr>
<td>35</td>
<td>Event Recap Unimin</td>
</tr>
<tr>
<td>37</td>
<td>Student Chapter Section TAMU-SPE</td>
</tr>
<tr>
<td>38</td>
<td>SPE-GCS Directory</td>
</tr>
</tbody>
</table>

**Board of Directors Meeting**

**Thursday March 19th / 7:30 AM to 10:30 AM**

*Location* SPE Houston Office

10777 Westheimer Rd., Suite 1075, Houston, TX 77042

*Event Contact* SHARON HARRIS

713-457-6821 / 713-779-4216 FAX / sharris@spe.org
Isn’t it time to stop manipulating data through the backend, creating SQL queries to report in Excel, questioning your application security, getting frustrated with poor scenario comparisons, or using third party tools to enter and edit data?

Do your work faster, with less effort. Entero MOSAIC is one comprehensive solution that supports corporate, project, and well level processes for reserves, economics, and declines.

- **SPEED**: Go from weeks to hours in entry, editing, evaluating, reconciling, and reporting
- **EFFICIENCY**: Experience up to 50% in productivity gains
- **INTEGRITY**: Have confidence in your data with better visibility
- **TRUST**: Improve security through role based user/data management
- **INSIGHT**: Built-in stored results with scenario comparisons at the portfolio level

Learn more at www.entero.com/mosaic, or call 713.446.4633.
SP
c- GCS
MEMBERSHIP REPORT
January 2015

1.2015 12.2014
TOTAL: 11,572 TOTAL: 16,787
YP: 2,203 YP: 4,070

<table>
<thead>
<tr>
<th>SPE-GCS MEMBERS</th>
<th>TOTAL</th>
<th>YP</th>
<th>TOTAL</th>
<th>YP</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Members</td>
<td>123</td>
<td>55</td>
<td>128</td>
<td>67</td>
</tr>
<tr>
<td>Transferred to Section</td>
<td>45</td>
<td>18</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

| Unpaid          | 5,835 | 1,875 | 2,678 | 1,047 |

<table>
<thead>
<tr>
<th>STUDENT MEMBERS</th>
<th>PAID</th>
<th>UNPAID</th>
<th>PAID</th>
<th>UNPAID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas A&amp;M</td>
<td>884</td>
<td>361</td>
<td>1,363</td>
<td>149</td>
</tr>
<tr>
<td>Rice</td>
<td>55</td>
<td>20</td>
<td>82</td>
<td>22</td>
</tr>
<tr>
<td>HCC</td>
<td>25</td>
<td>24</td>
<td>69</td>
<td>20</td>
</tr>
<tr>
<td>UH</td>
<td>290</td>
<td>173</td>
<td>520</td>
<td>155</td>
</tr>
</tbody>
</table>

| Total           | 1,286| 591    | 2,086| 349    |

| Total Paid/Unpaid | 12,858| 6,426 | 18,873| 3,027 |
| % Paid           | 66.7% | 86.2% |


SPOTLIGHT
RAFAEL G. BARROETA

Rafael G. Barroeta is the current Chair of the SPE-GCS Reservoir Study Group, and he has been very active in the group since 2011, serving as Program Coordinator, Special Activities Chair, and Annual Reservoir Forum Co-Chair, among other roles. He played a major role in helping the Reservoir Study Group win the 2014 section award for Study Group of the Year.

Rafael is a Senior Reservoir Engineer in the Worldwide Subsurface Engineering support team at Occidental Oil and Gas. Previously, he worked as Principal Consultant at SPT Group (now Schlumberger) for 5 years doing consulting services on reservoir simulation, uncertainty assessment, history matching, and reservoir optimization. Before that, he worked at PDVSA Intevep in Venezuela for 5 years, collaborating on reservoir engineering projects involving chemical EOR and conformance studies in oilfield operations. He holds a B.S. degree in Polymer Science and an M.E. degree in Reservoir Engineering from Universidad Simon Bolivar in Venezuela, and an M.S. degree in Petroleum Engineering from University of Tulsa.

Rafael has also been involved in many volunteer activities with the SPE International, including Session Chair for the SPE History Matching ATW in Cartagena in 2011, Peer Reviewer for SPE Journal in 2013, and a permanent collaborator on the “SPE Opinion Panel Survey” committee.

DON’T MISS OUT – RENEW YOUR DUES TODAY!
Never discard your cores, as a couple of Bakersfield oil men will attest. On a trip to Argentina, they presented a piece of core from what at that time was the world’s deepest well to First Lady Eva Peron (Remember...“Don’t Cry for Me Argentina”?), in exchange for which they received an autographed photo.

This is a rerun from several years ago, but I love the story about the pesky seagulls that made a nuisance of themselves at Sun Oil Co.’s South Jersey shore bulk storage station. It seems that these “dumb birds” had figured out a way to break open the clam and oyster shells that they dug up from the mud flats at low tide, namely by dive-bombing Sun’s steel storage tanks and dropping the crustacea from sufficient altitude such that they break open upon contact with the top of the storage tanks. A disgruntled warehouseman had to climb up on top of the large storage tanks (small storage tanks were apparently not targeted) every couple of days and sweep off the broken shells because the weight of the accumulated shells might squash the tanks.

Put on your thinking caps and check out this month’s History Quiz, as it relates to this vignette.

East Texas crude oil - $2.90/bbl; U.S. active rig count – 2,574

Dubai goes virtually “all-in” with ARCO, by signing a 35-year 1,180 sq. mile concession onshore. Ironically, now 35 years later, ARCO and the concession have both gone away.

The Soviets lament that they have apparently reached a production output peak (11.86 MMbd), which they may never surpass without a new giant field discovery.

Diamond Shamrock and Houston Oil & Minerals take leases on 214,000 acres in the Nehalem basin of northwestern Oregon (year-round ski season at Mt. Hood is great, but not a prolific oil-producing area).

Sound familiar...The Soviets begin making moves toward replacing Afghani President Karmal with a military chief, while the Afghans and their Islamic neighbors raise $7 million in aid for the Afghani Muslim Freedom Fighters in their ongoing conflict with the Soviets.

U.S. active rig count – 2,624

Indonesia’s falling crude oil production has caused it to become a virtual net importer of oil, and thus the government is seriously considering withdrawing from its OPEC membership.

Officials investigate a fire and explosion at BP PLC’s 446,500 b/d Texas City refinery in which 14 contractors were killed and 100 were injured.

Meanwhile 100 miles southwest of Houston on the Matagorda Ship Channel, a subsidiary of Gulf Coast LNG Partners LP petitions the U.S. Federal Energy Regulatory Commission for authorization to build and operate an LNG receiving terminal at that point.

Bartering is alive and well in the oilpatch...Japan’s Mitsubishi Corp. closes a deal with Pertamina to import 20,000 b/d of Indonesian crude oil as a partial repayment for a $310 million loan from Mitsubishi and partners to support Indonesian natural gas development projects.

Light sweet crude oil - $54.24/bbl; Natural gas - $6.80/MMbtu; U.S. active rig count – 1,282

THE REST OF THE YARN

This month we continue our look back at the life and times of industrialist and philanthropist Andrew Carnegie.

Carnegie didn’t feel comfortable getting married while his formidable mother Margaret was alive. She died in November 1886, and five months later, when he was 51, Carnegie wed Louise Whitfield, age 30. The couple had one daughter, Margaret, nicknamed Baba.

An affectionate husband and father, Carnegie lovedretreating with his family to Skibo, his estate in the Scottish Highlands, one of the most beautiful pieces of real estate on the face of the earth.

Here he rode horses, golfed, swam, entertained, and read voraciously. He had a knack for balancing relaxation with hard work, and this may account for his robust health through the years.

In 1901, when he was 65, he was still as bubbly as ever, excited about the infinite future of steel, especially his steel. But once again his divided mind asserted itself—he hankered to become a full-time doer of good deeds. As it happened, the financier J.P. Morgan was interested in acquiring Carnegie Steel. Morgan asked Carnegie how much the firm...
would cost. Carnegie told him $480 million, which, in 1901 was serious money. Morgan accepted his price. Carnegie’s personal share was in excess of $200 million. He was now the richest man in the world in terms of liquid assets, and he began bestowing vast sums upon good causes.

Next month, Andrew’s approach to philanthropy is revealed.

**THEN & NOW**

**MARCH QUIZ**

Refer back to the conflict between man and seagull in the March 1955 segment. This month’s quiz is actually a contest to see who can come up with the most creative solution to the “dive-bombing seagull” problem faced by Sun Oil. What might they have done circa 1955 to discourage those pesky birds from this practice?

**ANSWER TO FEBRUARY’S QUIZ**

Of the four combined groups of companies: a) Kerr McGee, Occidental, and Phillips; b) Tenneco, Atlantic Richfield, and Getty; c) Standard Oil of Indiana, American Petrofina, and Murphy; and d) Sun, Continental, and Tenneco, only group a) Kerr McGee, Occidental, and Phillips failed to earn a combined $1 million in net profit in calendar year 1974.

**CONGRATULATIONS TO JANUARY’S WINNER**

No winner in January

If you would like to participate in this month’s quiz, e-mail your answer to contest@spe.org by noon, March 15. The winner, who will be chosen randomly from all correct answers, will receive a $50 gift card to a nice restaurant.

**Marathon Oil increases productivity in Eagle Ford Shale well by 21%**

The BroadBand Sequence fracturing technique effectively stimulated perforation clusters that would not have produced by conventional techniques. Enabled by a proprietary engineered composite fluid of degradable particles and fibers, the BroadBand Sequence technique increased production by 21% over 115 days.

Read the case study at slb.com/BroadBand
You planned for this.

You have the experience and expertise of the global leader in wellbore intervention on speed dial to solve problems so production can resume.

Call us or visit BakerHughes.com/GOM-Intervention today for peace of mind tomorrow.
As companies have embraced the digital oilfield and implemented more and more sensors, we are now awash in data. Having more data does not mean we are necessarily improving business outcomes. Increasingly connected devices ("Things") are becoming the main source of the information glut. This Internet of Things (IoT) will soon be generating millions of sensor readings and events every day. The main challenge is to quickly mine knowledge from data and operationalize this knowledge in an end-to-end digitized business processes. The knowledge mined and operationalized from IoT/Big Data will be one of the more compelling digital transformation enablers.

Dr. Setrag Khoshafian will provide a compelling viewpoint on why massive systems of connected devices and groundbreaking analytics mean nothing if there is no way to orchestrate both the physical assets and people within the business. The Process of Everything (PoE) will provide the context to coordinate the data and events to execute business rules, automate decisions, drive processes, and learn and adapt to guide human actions, resulting in maximized production, lower maintenance costs, and increased profitability.

DR. SETRAG KHOSHAFIAN

Dr. Setrag Khoshafian is one of the industry’s pioneers and recognized experts in Digital Enterprises, especially intelligent business process management (iBPM). He has been a senior executive in the software industry for the past 25 years, where he has invented, architected, and steered the production of several enterprise software products and solutions. Currently, he is Pega’s Chief Evangelist involved in numerous technology, thought leadership, marketing, alliance, and customer initiatives. The majority of his time is spent with Fortune 500 companies, specifically on their transformational journeys leveraging digital technologies (especially process digitization). His interests and expertise spans all aspects of innovation in Digital Enterprises. This includes Internet of Things/Internet of Everything (he pioneered the vision and use cases of the Process of Everything), intelligent BPM; Predictive & Adaptive Analytics; Social, Mobile & Cloud; and Real-Time Lean Six Sigma.

Previously he was the Senior VP of Technology at Savvion where he invented and led the development of the world’s first web-centric BPM platform. He was a senior architect at Ashton-Tate, where he invented Intelligent SQL, and previously an OODBMS researcher at MCC, where he invented several object database technologies. Dr. Khoshafian is a frequent speaker and presenter at international workshops and conferences. He is the lead author of more than 10 books and more than 50 publications in various industry and academic journals. His recent books include Intelligent BPM: The Next Wave. Dr. Khoshafian holds a PhD in Computer Science from the University of Wisconsin-Madison. He also holds an MSc in Mathematics.
C.R. (Charlie) Williams II was named Executive Director for the Center for Offshore Safety (COS) in March 2012. Charlie retired from Shell as Chief Scientist of Well Engineering and Production Technology after a 40-year career. He is a mechanical engineering graduate of the University of Tennessee and Professional Engineer and recipient of the 2012 OTC Special Citation for his work on COS.

Dr. Malick Diara joined ExxonMobil in 2009 with more than 20 years of experience in international health. He is the Public Health Manager of the ExxonMobil Corporate Department of Medicine and Occupational Health. His key responsibilities are focused on infectious disease prevention and control in company workplaces. He is a physician with a Medical Doctorate from Dakar School of Medicine in Senegal (1987), a Master’s in Business Administration from the Paris School of Business – Institut Superieur de Gestion (1991), and a Master’s in Public Health from Tulane University, Louisiana (1997).

George King is a registered professional engineer in Texas and Oklahoma with 43 years of experience since joining Amoco Research Center in 1971. George’s technical work has provided advances in shale developments, environmental risk reduction in well construction and fracturing, sand control reliability and underbalanced perforating. George has a BS in Chemistry from Oklahoma State, a BS in Chemical Engineering and an MS in Petroleum Engineering from the University of Tulsa. He also taught Fracturing and Completions courses at the University of Tulsa for 11 years as an adjunct professor.

The HSSE-SR Study Group is hosting a Student Invitational to highlight current Health, Safety and Environment issues in the oil and gas industry. Approximately 120 Advanced Placement science students from Fort Bend ISD and Katy ISD will have an opportunity to ask questions and interact with professionals one-on-one to learn more about the presentation topics. SPE Members are encouraged to attend this meeting to engage with the students.

**AGENDA**

9:30 – 9:40 am  Introduction and Welcome – Trey Shaffer, SPE HSSE-SR Technical Director
9:55 – 10:30 am Safety – Charlie Williams, Center for Offshore Safety
10:30 – 10:45 am Break
10:45 – 11:15 am Health – Malick Diara, ExxonMobil
11:15 – 11:45 am Break/Lunch
11:45 – 12:15 pm Environment – George E. King, Apache
12:15 – 1:00 pm Question and Answer Session
1:00 – 1:15 pm Closing Remarks – Trey Shaffer

**C.R. (CHARLIE) WILLIAMS**

C.R. (Charlie) Williams II was named Executive Director for the Center for Offshore Safety (COS) in March 2012. Charlie retired from Shell as Chief Scientist of Well Engineering and Production Technology after a 40-year career. He is a mechanical engineering graduate of the University of Tennessee and Professional Engineer and recipient of the 2012 OTC Special Citation for his work on COS.

**DR. MALICK DIARA**

Dr. Malick Diara joined ExxonMobil in 2009 with more than 20 years of experience in international health. He is the Public Health Manager of the ExxonMobil Corporate Department of Medicine and Occupational Health. His key responsibilities are focused on infectious disease prevention and control in company workplaces. He is a physician with a Medical Doctorate from Dakar School of Medicine in Senegal (1987), a Master’s in Business Administration from the Paris School of Business – Institut Superieur de Gestion (1991), and a Master’s in Public Health from Tulane University, Louisiana (1997).

**GEORGE E. KING**

George King is a registered professional engineer in Texas and Oklahoma with 43 years of experience since joining Amoco Research Center in 1971. George’s technical work has provided advances in shale developments, environmental risk reduction in well construction and fracturing, sand control reliability and underbalanced perforating. George has a BS in Chemistry from Oklahoma State, a BS in Chemical Engineering and an MS in Petroleum Engineering from the University of Tulsa. He also taught Fracturing and Completions courses at the University of Tulsa for 11 years as an adjunct professor.

**EVENT INFO**

**Friday**

**3.06.15**

9:30 AM

**SPEAKERS**

C.R. (Charlie) Williams  
Executive Director  
Center for Offshore Safety

Dr. Malick Diara  
Public Health Manager  
ExxonMobil

George E. King  
Apache

**LOCATION**

Norris Center Westchase  
9990 Richmond Ave.  
Suite 102  
Houston, Texas 77042

**EVENT CONTACT**

Diana Smith  
713-253-7728  
dianaksmith4@gmail.com

**MEMBERS**

$40

**NON-MEMBERS**

$50
CoolSet™
Curable Resin-Coated Proppant

Prevent proppant flowback without activator

CoolSet proppant – frac fluid and breaker friendly – is your no-activator, low-temperature solution to enhance conductivity and increase hydrocarbon production.

Get more from your wells at FairmountSantrol.com/CoolSet

For direct technical data
CoolSet Product Director
Taso Melisaris
713.234.5450 x 42271
Technology@FairmountSantrol.com
Gefei Liu, President of Pegasus Vertex, Inc., received his BS degree from the University of Science and Technology of China and an MS degree from the University of Texas at Austin. He has over 20 years of experience in engineering and software development for the drilling industry, and has published many technical papers and one book on drilling hydraulics. He is also actively involved in SPE lunch and learn programs and has given presentations for SPE-GCS, SPE Evangeline, and Canadian Association of Drilling Engineers (CADE).

Displacement Efficiency in Cement Job Demystified

Successful cement jobs require that the drilling fluid is fully displaced by the cement slurry. Good mud removal ensures good bonding of the cement to the casing and the formation. Failure to remove all the mud from the annular spaces leads to mud channels, which will weaken the cement bonding and cement-seal integrity.

Conventional hydraulics calculation is necessary, but not enough to cover the displacement efficiency with computational fluid dynamics (CFD). This presentation shows the R&D on the assessment of the risk of mud channeling as a function of fluid properties, flow rate, wellbore geometry, and well path. The goal is to address the risks and optimize the displacement efficiency in order to deliver a cement sheath to be able to retain annular-seal integrity.

GEFEI LIU

Gefei Liu, President of Pegasus Vertex, Inc., received his BS degree from the University of Science and Technology of China and an MS degree from the University of Texas at Austin. He has over 20 years of experience in engineering and software development for the drilling industry, and has published many technical papers and one book on drilling hydraulics. He is also actively involved in SPE lunch and learn programs and has given presentations for SPE-GCS, SPE Evangeline, and Canadian Association of Drilling Engineers (CADE).
THE MISSING PIECE
TO MAXIMIZE YOUR PRODUCTION

You can’t put together the puzzle without all the pieces. MicroSeismic’s completions evaluation services and real-time microseismic monitoring help you fill in the blanks with recommendations on improved well spacing and stage length, frac coverage area, and analysis on how each well is completed. Our goal is to provide transparent results that you can rely on to maximize your production.

MicroSeismic
MicroSeismic.com/GCSPE  866.593.0032
Building Drilling Efficiencies to Avoid Hazards Through Real-Time Analytics

Many conversations around unconventionalailtics center on the need for drilling cheaper, deeper and being ever mindful of the well economics; this is a good basis of thinking as long as wellbore quality and process safety are not sacrificed.

With the completion cost of an unconventional well representing over 60% of the total well cost, it is very important to deliver to the completion and production teams a quality wellbore. It all begins with good drilling practices and “listening to the well.” By keeping our finger on the pulse of the well during drilling operations, many events that eventually lead to a poor quality hole or stuck pipe, sidetracks and well control incidents can be seen coming. The “health of the well” is clearly reflected in the analytics derived from basic real-time data at the rig site combined with cutting analysis, LWD data and other analysis, forming the basis of good well listening. However, these skills are not that common and when they are, the rush to drill the well quickly, sometimes takes priority over paying attention to basic good drilling practices.

When well economics are very tight, a solution can be the provision of Real-Time Analytical Analysis through the use of an existing drilling team. When equipped with a quality analysis tool, these highly skilled teams can also provide Drilling Hazard Avoidance (DHA) advice to the well’s decision makers both on location and through the client’s Real-Time Operation Centers (RTOC). With this insight, these teams have the opportunity to come up with recommendations to completely avoid these hazards, delivering a quality wellbore quickly and safely while avoiding well control incidents and drilling hazards.

PAT YORK

Pat York has been in the oil and gas industry for 42 years. He is currently the Global Director with Well Engineering & Project Management for Weatherford. He has been involved in Drilling Hazard Management since 2005 and Solid Expandable Technology since its global implementation in 1998. Since 2004, he has collaborated with clients on complex drilling and completion projects.

He has served in several management, business development and operational roles as well as executive management in the solid expandable and drilling hazard mitigation arena. He received his Bachelor’s Degree in Electronic Engineering Technology at Northwestern State University in 1972 and pursued his MBA degree there in Economics and management before launching his career in the oil industry.
Take the Shock Out of Your Drilling Operations

Keep your drill bits running longer and deeper with the APS Active Vibration Damper™ system

- Adapt to a continuously changing environment
- Suppress undesired drilling dysfunctions
- Extend bit & drilling tool life
- Improve overall rate of penetration
- Significant cost/foot savings

For more information, visit www.aps-tech.com or call us at 281.847.3700

Delivering Award-Winning, Technology-Driven Engineered Solutions to the Oil & Gas Industry

World-Class Completions & Production Solutions
- Completion Fluids Products/Services
- Well Testing Equipment/Services
- Fluids Management

VIBRATION TECHNOLOGY
LEADING THE INDUSTRY IN STUCK PIPE RECOVERY
INNOVATIVE TECHNOLOGY FOR REMOVING STUCK TUBULARS
+ WORKOVER
+ COMPLETIONS
+ DRILLING

www.layne.com

NOW IN THE WOODLANDS, TX
Providing routine and special core analysis on whole core, plugs, and cuttings.
www.trican.us | 832-943-5103

© 2014 TETRA and the TETRA logo are registered trademarks of TETRA Technologies, Inc. All rights reserved.

tetratec.com

TRICAN GEOLOGICAL SOLUTIONS
Has Unconventional Become Conventional?

This presentation will explore what historically has been meant by unconventional resources and unconventional recovery techniques. The role that unconventional resources are likely to play in the future will then be presented in order to answer the question: Has Unconventional become Conventional?

DR. CHRISTINE EHLIG-ECONOMIDES

Christine Ehlig-Economides is Professor of Petroleum Engineering at the University of Houston. She holds the William C. Miller Chair honoring Charles V. Fitzpatrick. She was previously Professor at Texas A&M University for 10 years and before that worked 20 years for Schlumberger. While at A&M, she managed research in production and reservoir engineering in conventional and shale reservoirs and helped the petroleum engineering department to grow and evolve to a broader energy scope. Dr. Ehlig-Economides is a world-renowned expert in reservoir engineering, pressure transient analysis, integrated reservoir characterization, complex well design and production enhancement.

Dr. Ehlig-Economides was elected to the National Academy of Engineering in 2003, was a member of the National Academy of Science Committee on America’s Energy Future, and is currently a member of the NRC Board on Energy and Environmental Systems (BEES). She is one of the 16 Quantum Reservoir Impact (QRI) Scholars and has recently been named a Chief Scientist for the Sinopec Research Institute on Petroleum Engineering as one of the Thousand Talents in China. Dr. Ehlig-Economides earned her PhD in Petroleum Engineering from Stanford University, an M.S. in chemical engineering from the University of Kansas and a B.A. in Math-Science from Rice University.

Register at: http://www.spegcs.org/events/2831/
**ORANGE IS THE NEW GREEN**

Flotek’s citrus-based, environmentally friendly CnF® fracturing additives will revolutionize the way the world thinks about fracturing and will improve your production.

For more information contact cesimkt@flotekind.com or call 832-308-CESI (2374)

---

**Are you having EAGLE FORD PROBLEMS?**

**No problem for Signa.**

Know what to expect...
- Knowledge
- Feasibility
- Engineering

...Expect what you know
- Management
- Execution
- Analytics

Over 1 Million feet of Eagle Ford experience

→ IMPROVED ROI
→ MINIMAL NPT

Drilled one foot @ a time

Signa Engineering Corp.
Houston, TX USA
www.signaengineering.com

---

**2014 PROFESSIONAL ENGINEERING EXAM RESULTS FOR PETROLEUM ENGINEERING**

- First Timers: 71%
- Second+ Timers: 3%
- National Average Pass Rate: 57%

PE Exam Application Deadline Date: July 1, 2015
Next Petroleum PE Exam Date: October 30, 2015

**2015 HOUSTON COURSES**

- AUGUST 24 – 28 / OCTOBER 5 – 9

P: 405-822-6761 | E: bingwines@cox.net
winrockengineeringinc.com

---

**PetroSkills**

To maximize convenience, PetroSkills will deliver our most popular courses multiple times in Houston for the first few months of 2015.

Enroll soon to ensure your seat!

- **Basic Petroleum Engineering Practices – BE:**
  April 20-24, July 6-10

- **Production Operations 1 – P01:**
  March 16-27, June 1-12

- **Applied Reservoir Engineering – RE:**
  April 20 - 1 May, June 1-12, July 20-31

- **Completions and Workovers – CAW:**
  April 20-24, May 18-22, June 22-26

- For details on these or our other 250 sessions in the Gulf Coast, contact Patty Davis, (832) 420-1203 or pattydavis@petroskills.com, or see details and full selection at www.petroskills.com

Did you get your copy of our 2015 Training Guide?
If not, sign up for free at www.petroskills.com/contact
Subsurface uncertainty is one of the main challenges in using reservoir models to predict field performance for development and depletion planning purposes. The importance of reliable characterization of subsurface uncertainty and its impact on reservoir performance predictions is increasingly recognized as essential to robust decision making in the upstream industry, which is especially true for large projects in complex geologic settings. However, despite recent advances in reservoir modeling and simulation, reliable quantification of the impact of subsurface uncertainty remains difficult in practice. Many factors lead to this state of affairs; technically, a fundamental difficulty is that reservoir heterogeneity at multiple scales may have strong effects on fluid flows.

This lecture presents an analysis of the challenge and possible resolutions. Indeed, relying on computing power alone may not address the challenge. Instead, we must look at reservoir modeling and performance prediction holistically, from modeling objectives to appropriate techniques of incorporating reservoir heterogeneity into the models. We present a goal-driven and data-driven approach for reservoir modeling with the theoretical reasoning and numerical evidence behind them, including real field examples. The one idea that participants of this lecture should take away is that appropriate parameterization of multi-scale reservoir heterogeneity that is tailored to the business questions at hand and available data are essential for addressing the challenge of subsurface uncertainty.
The most efficient field frac network starts with predictable frac spacing and predictable frac volume.

Plug-and perf cannot deliver predictable, consistent frac results, and neither can open-hole completions. With Multistage Unlimited single-point injection, fracs initiate right where you plan them and proppant volume in every frac is exactly what you want. The result: an efficient field frac network for maximum reservoir connectivity.

ncfrac.com
+1 281.453.2222
info@ncfrac.com

©2014, NCS Energy Services, LLC. All rights reserved. Multistage Unlimited and “Leave nothing behind.” are trademarks of NCS Energy Services, LLC. Patents pending.
WESTSIDE

Effect of Dynamic Active Fracture Interaction on Completion and Fracturing Practices

Multiple hydraulic fractures created using limited entry techniques interact with each other and cause accelerated growth of some individual fractures at the expense of the slowdown of others. The created fractures are not parallel with each other and some of them may intersect and coalesce with adjacent fractures. The net effect is a complex and non-uniform production pattern. This presentation will discuss the cause and effect of these phenomena and methods by which they may be altered.

ALI DANESHY

Ali Daneshy is President of Daneshy Consultants International and adjunct professor in the Cullen College of Engineering at the University of Houston, where he teaches a graduate course on hydraulic fracturing. He has over 45 years of experience in the technology and application of hydraulic fracturing and has published numerous papers on the subject. He is Co-Editor-in-Chief of the Hydraulic Fracturing Journal, a quarterly publication entirely dedicated to the technology of hydraulic fracturing. At the present time, his main focus is on research, consulting, and teaching short courses related to horizontal well fracturing.

SPE-GCS WESTSIDE STUDY GROUP

Quarterly Attendance Award

In September 2014, SPE-GCS Westside Study Group established an incentive program to improve and encourage participation in its monthly luncheons. Westside Quarterly Attendance Award’s goal is to recognize individuals for their commitment and support to SPE. Each quarter, three different levels of awards, Platinum, Gold and Silver, are given to attendees who have attended the most events. This is a spin-off of the Young Professionals’ Executive Club, which awards YPs for participating and volunteering in YP events. Maybe other study groups can copy this incentive program for their events so that SPE members will continue to attend even with oil at $46/bbl.

The Westside Study Group announced the Q4 2014 Quarterly Attendance Award winners at their January 2015 luncheon:

PLATINUM AWARD
$100 Gift Card
Tim Pawlik
CMGL

GOLD AWARD
$50 Gift Card
Robert Eggert
Robert W. Eggert, Jr. LLC

SILVER AWARD
$25 Gift Card
David Koseluk
Halliburton

SPEAKER
Ali Daneshy
President
Daneshy Consultants International

LOCATION
Norris Center Westchase
9990 Richmond Ave.
Suite 102
Houston, Texas 77042

EVENT CONTACT
Sandeep Pedam
713-591-5738
sandeep.pedam@conocophillips.com

MEMBERS
$40

NON-MEMBERS
$45
Now may be a good time to look at some innovative alternatives...

With oil prices down cost saving products will improve your bottom line. Binder has some good ones!

- If you want to streamline your frac to one chemical for slickwater, linear gel, or cross-linked gel, who do you call? **Binder:** One chemical can provide 70% drag reduction at 60% lower dosage. At half the viscosity of guar, this same chemical can place 150,000 lbs more sand per stage. And, the damage caused by crosslinkers is eliminated.

- If you want to eliminate the hydration tanks and hydrate at 33 F in less than one minute, who do you call? **Binder:** Eliminate the hydration tanks, feed to the blender and do it in 45 seconds.

- If you want to significantly increase your hydrocarbon recovery, who do you call? **Binder:** Binder polymers and flow-back chemistry pull more oil from the formation.

- If you want a green drilling system that is easy to run, great ROP and good hole stability, who do you call? **Binder:** The Binder Maxim System will do all of that at a fraction of the cost.

- When your drillstring is packed off or your coil is stuck, who should you use? **Binder:** Binder has freed 47 drillstrings and coiled tubing strings in the past 18 months.

Give us a call - we take innovative chemistry to the field

9391 Grogans Mill Road, Suite A-1
The Woodlands, TX  77380
(281) 419-9047 office
(281) 362-5612 fax

Long-term scale inhibition: now built into every fracture

SCALEGUARD proppant-delivered scale inhibition

SCALEGUARD* technology is an encapsulated ceramic proppant infused with scale-inhibiting chemicals to maintain optimum production and recovery rates from scale-prone wells, while reducing well costs and chemical usage.

SCALEGUARD technology features an engineered internal porosity and can be blended with any product from our high quality proppant portfolio, without compromising the high conductivity of the proppant pack. Scale-inhibiting chemicals infused within the proppant are released into the fracture only on contact with water to deliver highly efficient production assurance.

Now long-term scale prevention is available throughout your entire production system from a single, simple treatment while you frac.

carboceramics.com/scaleguard
RESERVOIR

Correct Forecasts Often Aren’t; Reservoir Study 2.0 = ?

After comparing forecasts of production, reserves, cost, schedule and value creation with the actuals realized, IPA (Independent Project Analysis) concluded that the state of the field development forecasting business is the equivalent of a yellow or red card in soccer. Something has to be done to make the forecasts more realistic and less biased towards the optimistic. At the same time, the E&P business is facing a VUCA future (volatile, uncertain, complex and ambiguous) and it is very important to account for the key uncertainties and risks in individual field developments and in the aggregate portfolio of company assets – as individual field and composite ambitions are arrived at and communicated. Add to this the need for E&P to adapt and to turn itself into a better-performing E&P 2.0 via imagination, innovation (of technology, big data, the internet of everything, AI, business model, collaboration 2.0) and “creative destruction” to combat low oil and gas prices, the high break-evens and the too low return on investment in the view of investors. All these aspects will be addressed and a key recommendation is that 2015 must be the year of cross-discipline thinking!

HELGE HOVE HALDORSEN

Helge Hove Haldorsen currently holds the positions of VP Strategy & Portfolio and Mexico Country Manager for Statoil Development and Production North America in Houston. Helge has an MSc in Petroleum Engineering from The Norwegian Institute of Technology in Trondheim and a PhD in Reservoir Engineering from the University of Texas at Austin. Helge was a Second Lieutenant in The Royal Norwegian Navy and held various positions within reservoir engineering at Esso Exploration Norway in Stavanger; Sohio Petroleum Company in San Francisco and Anchorage; and The British Petroleum Company in London. Helge joined Hydro in 1987 and held a number of key management positions with the company: Chief Reservoir Engineer, VP Exploration & Research and President E&P International. After the acquisition of the Houston-based independent Spinnaker by Hydro in 2005, Helge served as the President until the merger with Statoil in October 2007. Helge has served on the Society of Petroleum Engineer’s (SPE) Board of Directors for 3 years and he has been an SPE Distinguished Lecturer and an SPE Distinguished Author. He has written many technical papers and articles and has been a Professor of Industrial Mathematics at the University of Oslo as well as a lecturer at Stanford University.

EVENT INFO

Thursday
03.19.15
11:30 AM TO 1:00 PM

SPEAKER
Helge Hove Haldorsen
SPE President and
VP Strategy & Portfolio
Statoil

LOCATION
Petroleum Club of Houston
1201 Louisiana Street
Houston, TX  77002

EVENT CONTACT
Juan Carlos Picott
jpicott@maxoilsolutions.com

MEMBERS
$35

NON-MEMBERS
$40

March, 2015 25
PRODUCTIONEER
USED BY EVERYONE, FROM THE FIELD PUMPERS
ALL THE WAY UP TO MANAGEMENT

What our customers are saying: “Productioneer is a great data repository and analysis tool. Data entered in the field is immediately available to corporate office.”

Mi4 Corporation
Ph: (713) 401-9584
sales@productioneer.com
www.productioneer.com

FEATURES
- FIELD DATA CAPTURE
- ALLOCATIONS
- REPORTS & GRAPHS
- CUSTOMIZABLE TEMPLATES
- FULLY MANAGED SERVICE

24/7 SUPPORT HOTLINE (866) 421-6665

ORDER TODAY!
ENVIRONMENT 24/7
Building a Culture of Environmental Awareness

by Gregory M. Anderson, Richard C. Haut, PHD and Tom Williams

Learn more and order your copy today!

www.environment247.org

SPE Digital Energy Conference and Exhibition

3–5 March 2015
The Woodlands, Texas
The Waterway Marriott Hotel
www.spe.org/go/regDEC

Register by 19 February and save up to USD 100!

With the support of the SPE Digital Energy Technical Section and the SPE Gulf Coast Section

Exceptional Solutions, Unconventional World.

sales@petrolink.com
www.petrolink.com
Using Pre-Drill Groundwater Monitoring as a Stakeholder Outreach Tool

Successful unconventional shale exploration and production is dependent on hydraulic fracturing. However, concerns over environmental issues related to exploitation in densely populated areas are increasing. Having a strategy in place to document baseline environmental and particularly groundwater conditions prior to exploration can help manage risk with stakeholders. This presentation will present experience gained in the United States shale exploration regions related to baseline groundwater sampling.

RYAN LEATHERBURY

Ryan Leatherbury is a Client Service Manager for Weston Solutions, Inc. Ryan is Weston’s Oil and Gas practice leader in Central Texas and manages Weston’s Eagle Ford Shale Service Center in San Antonio, Texas. Ryan has a BS in Civil Engineering from Rice University and has more than 20 years of environmental investigation, remediation, and compliance experience. Ryan’s specialty is environmental information management, particularly for environmental investigation and enterprise compliance.
BUSINESS DEVELOPMENT

Future and Present E&P MLP Strategies

Please join us for a discussion of the present and future strategies of upstream Master Limited Partnerships (MLPs).

The SPE BD Study Group is putting together a panel of industry representatives to discuss how the rapidly changing price environment of both gas and liquid production has spurred quick jettisoning of $4 / $100 strategies, sending upstream MLPs into intense corrective/creative mode.

Discussions will center around the A&D market specific to MLP appropriate assets, hedging strategies and emerging MLP trends.

TOPICS INCLUDE THE FOLLOWING:
• Increasingly accurate production forecasts that are now, more than ever, key to syncing asset valuations with the MLP yield/distribution model.
• Appropriate hedging strategies.
• What happens when some of the drilling results are less than predicted (i.e., MLPs taking on too much drilling risk)?
• How is the MLP approach to asset development changing?
• How will the new price environment affect hedging access and duration?
• Will the lower commodity environment spark MLP consolidations, or disaggregation into smaller MLPs?

We will follow the popular format of a business & social networking hour, with complimentary hors d’oeuvres and a cash bar followed by an hour an a half long program, including a Q&A session. It will begin at 5 pm in the Mezzanine of the Four Seasons Hotel in Downtown Houston.

EVENT INFO

Wednesday
3.25.15
5:00 PM TO 7:00 PM

SPEAKER
Please check online for updates!

LOCATION
Four Seasons Hotel
1300 Lamar
Houston, TX 77010

EVENT CONTACT
Matt Bormann
281-345-8019
mbormann@wwtco.co

MEMBERS
$40 / $50 WALK-INS

NON-MEMBERS
$45 / $50 WALK-INS
SAFETHERM® aqueous-base or water-miscible insulating packer fluid system is designed to minimize convective and conductive heat loss to assure flow in deepwater and other low temperature environments. The system is proven to control annular pressure build up and maximize produced fluid quality.

An operator in West Africa used SAFETHERM insulating packer fluid to slow the cooling of stationary crude in the production line. As a result they successfully tested four deepwater wells with zero installation problems or QHSE incidents.

miswaco.com/completions

† Mark of M-I LLC

Combat heat loss where it counts

Software, Expertise, Services, Training

Innovative Custom-Engineered Drilling and Completion Solutions

Software sales, training and technical support

Liner Hanger Systems Expandable Systems Completion Systems Safety and Kelly Valves Window Cutting Products Rental Tools

Serving the Oil and Gas Industry Since 1917
Tel: 713-729-2110  Fax: 713-728-4767  www.tiwtools.com

Advanced Drilling Mechanics Solutions

DrillScan

www.drillscan.com

Houston Office
2000 South Dairy Ashford, suite 420
Houston, TX 77077
Phone: +1 (281) 676-6970
contact-us@drillscan.com

Geosteering Services

Highly qualified personnel with 20+ years DD & LWD experience
24/7 Real-time monitoring or reports from LAS files
Proprietary software

Geosteering Software

TST interpretation for GR only measurements
Image displays / interpretation of azimuthal GR, resistivity or density measurements
Resistivity modelling / interpretation for LWD propagation resistivity
Software sales, training and technical support

info@geosteering.com
Call 281 573 0500

SPE-GCS CONNECT
Dealing with Volatility

Recent market “shifts” remind us that energy is a volatile industry that requires massive capital investment and long operational horizons. The ability to predict the future is tentative at best. How, then, do companies adjust their portfolios to adapt to fundamental change?

BILL ARNOLD

Bill Arnold is Professor in the Practice of Energy Management at the Jones Graduate School of Business at Rice University in Houston, Texas. Bill joined Rice in June 2009 and taught courses on the Geopolitics of Energy and Managing Energy Transitions. He actively engages with professionals in academia and industry from around the world. Previously, as Royal Dutch Shell’s Washington Director of International Government Relations and Senior Counsel for the Middle East, Latin America, and North Africa, he engaged at the highest levels of government in the US and abroad to provide geopolitical insights, develop business strategies, build scenarios, and advance multi-billion dollar projects. He had been with Shell since 1993.

Bill held a White House appointment as Senior Vice President of the Export Import Bank of the United States from 1983 to 1988, when he received the Distinguished Service Award. He was Eximbank’s liaison officer to the Berne Union, the World Bank and the International Monetary Fund. He developed special export credit packages for Brazil and Mexico during the first Latin American debt crisis.

His international banking experience includes: Executive Vice President/International Banking Division of First City National Bank–Houston (now JPMorganChase); General Manager, COMIND International Banking Corporation (now Banco do Brasil); and Vice President/Manager of the Latin America Division of Texas Commerce Bancshares (now JPMorganChase).

Bill holds a Bachelor of Arts degree in economics from Cornell University, a Master of Arts in Latin American Studies, and a Master of Business Administration/International Finance from the University of Texas at Austin. In his early 20s he was Field Director of Amigos de las Americas, a private international development organization with more than 250 volunteers in Honduras and Guatemala. He served in the US Army and was awarded the Army Commendation Medal.
Technical Writing Workshop

All technical professionals want to tell their technical story of the work they have done. We can effectively communicate the results of our work in two ways: writing reports, file notes, or conference papers and making oral presentations at meetings and internal conferences.

Writing reports is by far the most important tool we have to record our work and to show our colleagues and management our technical capability. Usually, written reports are followed by presenting a summary of the key messages. Presentations of final reports and/or work are made for two reasons: 1) for informational purposes or 2) for making decisions. Presenting the results of reports in a brief, clear and logical fashion will enable the audience, which is typically management, to make decisions.

The purpose of this workshop is to present tips on writing good presentation papers and making effective presentations for both SPE and your work. The workshop is designed to be interactive.

BYRON HAYNES, JR.

Byron Haynes, Jr., has over 30 years of industry experience in studies and operations on primary depletion, waterflood, and miscible gas flood projects in Alaska, Gulf of Mexico, Colombia, North Sea, Kuwait, Qatar, Oman, and in state government oil and gas regulation. He is currently the Reservoir Engineering Learning Advisor in the Subsurface Global Learning and Development Group in Shell. His responsibilities include teaching, budgeting, coordinating, and developing reservoir engineering training for Shell worldwide.

Byron has been a Technical Editor for the *SPE Reservoir Engineering and Evaluation* magazine since 2005 and has won awards as outstanding Technical Editor for the magazine in 2007, 2013, and 2014. He has taught technical editor workshops for SPE at the Fall Annual Technical Conferences from 2008 – 2011. Byron has served on various SPE committees, including the US Registration Committee and the Ethics and Professionalism Committee. He has authored or co-authored 15 SPE papers.

Byron is a graduate of the University of Texas at Austin with a BS and MS in Petroleum Engineering. He is a registered professional engineer in Texas and Alaska and is a member of the SPE, AAPG and the West Texas Geological Society.

EVENT INFO

THURSDAY

4.9.15

5:00 PM TO 8:00 PM

SPEAKER

Byron Haynes Jr
Reservoir Engineering Learning Advisor
Shell Global Solutions US, Inc.

LOCATION

Hilton Houston
9999 Westheimer Road
Houston, TX

EVENT CONTACT

Nii Ahele Nunoo
507-304-5416
nii.nunoo@nov.com

MEMBERS

$45

NON-MEMBERS

$50
Networking and Mentoring to Build Beneficial Relationships

Networking is one of the most powerful tools for accelerating and sustaining successful careers. Networking is about making the right connections and building beneficial relationships. Learn how to grow your networking skills to influence change and to build collaborative relationships in order to add value for both your career and for your employer.

Mentoring will always be an integral part of our development; this relationship-based process for the transmission of knowledge (relevant to work, career or professional development) will enable us to gain personal and professional skills needed to face the challenges ahead. Its importance becomes evident as we recognize the value of the networking, advice and support a mentor can give us when developing a quality and healthy relationship. Building fluency in the use of Networking and Mentoring supports the Soft Skills of Networking, Diversity, Mentoring and Teamwork. This 3-hour workshop was developed in collaboration between the SPE Talent Council and the SPE Soft Skills Committee.

**SUSAN HOWES**

Susan Howes is Organizational Capability Consultant in the Reservoir Management department at Chevron, with prior assignments as Reservoir Management Consultant in the Reservoir Management Framework group and as Manager of the Horizons Program. Susan Howes is formerly Learning and Organizational Development Manager at Anadarko.

Susan Howes is a petroleum engineering graduate of the University of Texas and is a Past President of the Chevron Women’s Network. She currently serves as Chair of the SPE Soft Skills Committee, was the 2010 Chair of the SPE Talent Council, and is an SPE Distinguished Member.

**PEGGY RIJKEN**

Peggy Rijken is the Team Leader for the Productivity Enhancement team in the reservoir and Production Engineering department at Chevron, with prior assignments as a hydraulic fracture engineer and as a geomechanics specialist.

Rijken is a petroleum engineering graduate of the University of Texas (PhD) and holds a Masters in Mining and Petroleum Engineering from Delft University of Technology in The Netherlands. Rijken currently serves on the SPE Talent Council Committee and the ATCE SPE reservoir engineering committee. She has previously served on the ATCE well completions committee and served on the ATCE SPE well stimulation committee prior to becoming the committee chair.
OilSim Competition Fundraiser

This brand new fundraiser is being launched to bring in the additional scholarship money over and above our traditional golf, tennis, and sporting clays tournaments. Not only is this a fun social activity with other SPE members, but it is also an educational experience similar to a capstone project, which makes it a good training investment for employees who need the Big Picture of how our industry works using a simulated field development project.

Participants will be grouped in teams of 4 by the committee. After registration and introductions, each team will act as a virtual petroleum company in the business simulation “OilSim” to explore and develop an offshore oil and gas prospect. An experienced OilSim instructor will guide the participants through the process while encouraging friendly competition amongst the teams.

On behalf of the entire 2014-2015 SPE-GCS OilSim Competition Fundraiser Committee, we look forward to seeing everyone for a fun-filled day of competition!

EVENT SCHEDULE
Registration 7:30 – 8:00 AM
Intro & Instructions 8:00 AM – 10:30 AM
Challenge #1 10:30 AM – 12:00 PM
Lunch 12:00 PM – 1:00 PM
Challenges #2 & #3 1:00 PM – 4:00 PM
Happy Hour 4:00 PM – 6:00 PM (TopGolf)

LOCATION
The Frontline Group of Texas, LLC
15021 Katy Freeway, Suite 575
Houston, TX 77094
281-453-6000

PLAYERS & INTERESTED SPONSORS, PLEASE CONTACT
Lindsey Ferrell
512-913-7112
lferrell@frontline-group.com
Kristin Obenhaus

DIAMOND SPONSORS

DIAMOND LEVEL SPONSOR
$3500
Company name on the competition sponsor board
Recognition in the competition program
Entitled to register/sponsor 4 competitors (from your organization or from a pool of interested students)

PLATINUM LEVEL SPONSOR
$2500
Company name on the competition sponsor board
Recognition in the competition program
Entitled to register/sponsor 3 competitors (from your organization or from a pool of interested students)

GOLD LEVEL SPONSOR
$1500
Company name on the competition sponsor board
Recognition in the competition program
Entitled to register/sponsor 2 competitors (from your organization or from a pool of interested students)

SILVER LEVEL SPONSOR
$750
Company name on the competition sponsor board
Recognition in the competition program
Entitled to register/sponsor 1 competitor (from your organization or from a pool of interested students)

BRONZE SPONSOR
$500
Company name on the competition sponsor board
Recognition in the competition program
In-kind donations for ditty bags and door prizes are also accepted.

REGISTRATION DEADLINE
March 31, 2015
Mario Ruscev is Chief Technology Officer of Baker Hughes Incorporated. Dr. Ruscev has more than three decades of technology and operations experience in the oilfield services industry. He joined Baker Hughes from leading Russian seismic company Geotech Seismic Services, where he served as Chief Executive Officer. He previously served as Chief Executive Officer of FormFactor, a semiconductor testing equipment manufacturer that uses nanotechnology, and spent more than two decades with Schlumberger in a number of senior roles in France, the United Kingdom and Norway.

Early in his career, Dr. Ruscev formed a research team that developed imaging systems such as container imaging into gaseous sensors that provided images of container contents. This led to the development of the airport luggage screening system that remains in use today. He has led a number of teams whose work has significantly advanced the success of wireline logging tools, seismic resolution and measurement capabilities, and underground water management and carbon sequestration. Dr. Ruscev earned his doctorate in nuclear physics from the Pierre and Marie Curie University in Paris and his Ph.D. in nuclear physics from Yale University, and is a Director of the Global Carbon Capture and Storage Institute.

**NAME**

**Mario Ruscev**

**Chief Technology Officer**

**Baker Hughes Incorporated**

**LOCATION**

Kingwood Country Club
1700 Lake Kingwood
Kingwood, Texas 77339

**EVENT CONTACTS**

Cameron Conway
cconway@kb-machine.com

Robin Smith
Robin.Smith@halliburton.com

Marc Davis
mdavis@championspipe.com

**SCHOLARSHIPS FOR GULF COAST ENGINEERS**

Most important of all, your support goes directly to funding valuable scholarships for many Gulf Coast students embarking on a career in Petroleum Engineering or related fields. We know how desperately the industry needs to attract new talent. Every penny made by the golf tournament is invested in the drive to educate more young engineers.

**43rd Annual SPE Gulf Coast Section Golf Tournament**

**Monday**

04.13

7:15 AM TO 8:30 PM

Come and join us at the biggest and best tournament in Houston! Great golf, great prizes, great food!

The Houston golf community’s biggest charity golf tournament takes place again at the Clubs of Kingwood. And 2015 promises to be our best ever, as we celebrate the 42nd playing of the annual event. Sponsorship gives you the chance to play any of the four beautiful and challenging courses at Kingwood Country Club or at the nearby Deerwood Country Club - one of Texas’s best.
EXCELLENCE DELIVERED.

It’s what we do. It’s who we are.

- Casedhole Solutions
- Directional Services
- Coiled Tubing
- Fracturing

Experience you trust. Service you expect.
cjenergy.com

A Safe Biocide
(Except for Bugs)

New from Universal Bacteria Specialist: An environmentally friendly biocide with 1,450 ppm FACs.

ENVIROLYTE biocide offers you a safe, biodegradable alternative to toxic biocides for controlling bacteria in crude oil production and processing.

- 1,450 ppm free available chlorine and neutral 6.5 pH
- Can treat produced water before reuse
- Clears well of downhole micro-organisms
- Protects production equipment
- Eliminates microbial-induced corrosion

SAFE FOR PEOPLE. GOOD FOR PRODUCTION.

UNIVERSAL BACTERIA SPECIALIST

Find out more at www.universalbacteria.com or call 281.342.9555

© 2014 Universal Bacteria Specialist (UCS1405/0614)

WELLSITE GEO SCIENCE SERVICES

New from Universal Bacteria Specialist:
An environmentally friendly biocide with 1,450 ppm FACs.

ENVIROLYTE biocide offers you a safe, biodegradable alternative to toxic biocides for controlling bacteria in crude oil production and processing.

- 1,450 ppm free available chlorine and neutral 6.5 pH
- Can treat produced water before reuse
- Clears well of downhole micro-organisms
- Protects production equipment
- Eliminates microbial-induced corrosion

SAFE FOR PEOPLE. GOOD FOR PRODUCTION.

UNIVERSAL BACTERIA SPECIALIST

Find out more at www.universalbacteria.com or call 281.342.9555

© 2014 Universal Bacteria Specialist (UCS1405/0614)

WELLSITE GEO SCIENCE SERVICES

When time is money, Wellsite Geoscience is money well spent.

Whether you’re exploring a basin, producing a well or completing a shale play, time is money. That’s why Weatherford Laboratories brings a suite of formation evaluation technologies right to the wellsites. Utilizing mud gas and cuttings, these technologies provide detailed data on gas composition, organic richness, mineralogy and chemostratigraphy in near real time. As a result, operators now have an invaluable tool to assist with sweet spot identification, wellbore positioning, completion design and hydraulic fracturing. We call it Science At the Wellsite. You’ll call it money well spent.

SCIENCE AT THE WELLSITE™

WELLSITE GEO SCIENCE SERVICES

When time is money, Wellsite Geoscience is money well spent.

Whether you’re exploring a basin, producing a well or completing a shale play, time is money. That’s why Weatherford Laboratories brings a suite of formation evaluation technologies right to the wellsites. Utilizing mud gas and cuttings, these technologies provide detailed data on gas composition, organic richness, mineralogy and chemostratigraphy in near real time. As a result, operators now have an invaluable tool to assist with sweet spot identification, wellbore positioning, completion design and hydraulic fracturing. We call it Science At the Wellsite. You’ll call it money well spent.

SCIENCE AT THE WELLSITE™

Dyna-Drill
Manufacturers of Drilling Motor Components

- Mud Motor Power Sections (Sizes: 2 7/8” to 11 1/2”)
- Coiled Tubing Power Sections (Sizes: 1 11/16” to 3 3/4”)
- Matrix-3® Coated Bearings
- Precision Machining

www.dyna-drill.com

Power That Lasts™

Integrated Energy Services, Inc.

Robert Barba
Petrophysicist

Log Analysis
Completion Optimization

500 N. Capital of TX Hwy
Building 4-150
Austin, TX 78746
C: (713) 823-8602
F: (713) 583-9400
RBarba75@gmail.com

www.integrated-energy-services.com
The Gulf Coast Section encourages its members to be involved with student chapters and other sections to help grow the overall SPE family. John Jackson (J.J.), the SPE Gulf Coast Section Newsletter Chair and Young Professional (YP) Sponsorship Chair, has been working with various SPE sections throughout the United States to educate members on the importance of proppants and the benefits of being involved in SPE. Over the past few months, with the help of his company (Unimin Energy Solutions), John has traveled to Texas A&M University, Louisiana State University (LSU), Texas Tech University, and the Four Corners Section (San Juan College). For more information on how you can help spread the word about membership, contact Membership Chair Xuan VandeBerg.
Know Production. No Surprises.

Reservoir Characterisation Using Tracer Technology

- Expertise in waterflood, injection gas, CO2 and EOR chemical tracer applications
- Long term wellbore fluid inflow characterisation using no wires, fibres or well intervention
- Unconventional stage production measurement using Tracerco patented technology
- Global network of laboratories and operational capabilities providing local service provision to key oil and gas regions

Tracerco, 4106 New West Drive, Pasadena, TX 77507 USA
Tel: +1 281 291 7769 Toll Free: 1 800 288 8970
www.tracerco.com/reservoir-characterisation

CORROSION-RESISTANT
COMPOSITE PIPELINE SOLUTIONS

Flexpipe Systems’ composite linepipe products are flexible, reliable and customizable. We are the answer to your next pipeline project.

ShawCor Industrial Solutions, Inc.
Rexpiping.com

The Up-To-Date, Practical Guide to Modern Petroleum Reservoir Engineering by DR. NNAEMEKA EZEKWE
Available from Amazon.com, informIT.com, and other fine resellers.

IMPROVE YOUR HORIZONTALS

ON-BOTTOM TOOL FACE ORIENTATION
INCREASED MOTOR LIFE
INCREASED ROP & HORIZONTAL REACH CAPABILITY
ELIMINATES ORIENTATION TIME LOSSES

Slider Automated Directional Drilling

sib.com/Slider
The Well Log

*The Well Log (TWL)* is a student-run SPE journal within the Petroleum Engineering department at Texas A&M University. The first issue premiered in September 2014, and the response from students, faculty, and those in the industry has been great. It features a compilation of review articles, original research, interviews with distinguished professors, and other unique content pieces.

The purpose of TWL is to give students an opportunity to work with a technical journal related to the oil and gas industry and to develop their writing and professional skills. Since the journal is entirely student-run, a team of undergraduate and graduate students do all the readings, selection, editing, designing, and finally the publishing and promoting. An online format was chosen because it is not only more financially sustainable, but also allows greater reader accessibility to TWL. Furthermore, this format allows authors to be more involved in their own promotion, as much of the publicity is done via Facebook, personal blogs, emails, etc. We are growing as we progress and discover our needs, and we encourage anyone interested in collaboration to send us their articles to be considered for publishing in upcoming issues. We would also like to invite all GCS Connect readers to check out our journal at www.TheWellLog.com.

Tanner Wachsman
Editor-in-Chief & Founder
twachsman@tamu.edu

**DVG MEMORIAL GOLF TOURNAMENT**

A Few of our members at last year's DVG memorial golf tournament

**UPDATE**

In last month’s column, we stated that we celebrated our 25th Anniversary. This was an unfortunate mistake in the SPE International records. TAMU-SPE has been a student chapter for a much longer time. We apologize for any confusion, and are thankful for the support of our former students.
SPE GULF COAST SECTION
DIRECTORY
YOUR GUIDE TO YOUR ORGANIZATION LEADERS

Gulf Coast Section Officers – 2015–2015

CHAIR
Jeanne Perdue, Occidental
713-215-7348
jeanne.perdue@oxy.com

VICE CHAIR
Ivor Ellul, RPS Knowledge Reservoir
713-595-5100
iellul@knowledge-reservoir.com

SECRETARY
Sunil Lakshminarayanan, Occidental
713-344-1249
sunil.lakshminarayanan@gmail.com

TREASURER
Lucy King, Miller and Lents, Ltd
713-308-0343
lking@millerrandlents.com

VICE TREASURER
Alex McCoy, Occidental
713-366-5653
alexander.mcroy@oxy.com

CAREER MANAGEMENT
Nii Ahele Nunoo, NOV
507-304 5416
Nii.Nunoo@nov.com

COMMUNICATIONS
Subash Kannan, Anadarko
832-636-7679
subash.kannan@anadarko.com

COMMUNITY SERVICES
Marissa Davis, Baker Hughes
281-231-3418
Marissa.Davis@BakerHughes.com

EDUCATION
Gabrielle Guerre, Ryder Scott
713-750-5491
gabrielle.guerre@ryderscott.com

MEMBERSHIP
Xuan VandeBerg
832-444-5143
stem.fields@gmail.com

PAST CHAIR
Mike Strathman, Trinity Group
713-614-6227
mike.strathman@att.net

PROGRAMS
David Tumino, Murphy Oil
281-717-5123
tuminospe@hal-pc.org

SOCIAL ACTIVITIES
Jim Sheridan, Baker Hughes – retired
281-740-0913
sherim@operamail.com

TECHNOLOGY TRANSFER
Carol Piovesan, APO Offshore
281-282-9291
cpiovesan@apooffshore.com

YOUNG PROFESSIONALS
Pavitra Sainani, ExxonMobil
832-624-0505
pavitra.a.sainani@exxonmobil.com

DIRECTORS 2013-15
Trey Shaffer, ERM
832-209-8790
trey.shaffer@erm.com
John Lee, Univ. of Houston
713-743-4877
wjlee3@uh.edu
Deepak Gala, Shell
281-544-2181
deeak.gala@shell.com

DIRECTORS 2015-16
Jenny Cronlund, BP Exploration
281-366-8966
jenny.cronlund@bp.com
Torrance Haggerty, T.R. Consulting
281-714-5472
thaggerty06@gmail.com
Eric Kocian, ExxonMobil
832-624-7962
eric.m.kocian@exxonmobil.com

PAST CHAIR
Mike Strathman, Trinity Group
713-614-6227
mike.strathman@att.net

PROGRAMS
David Tumino, Murphy Oil
281-717-5123
tuminospe@hal-pc.org

SOCIAL ACTIVITIES
Jim Sheridan, Baker Hughes – retired
281-740-0913
sherim@operamail.com

TECHNOLOGY TRANSFER
Carol Piovesan, APO Offshore
281-282-9291
cpiovesan@apooffshore.com

YOUNG PROFESSIONALS
Pavitra Sainani, ExxonMobil
832-624-0505
pavitra.a.sainani@exxonmobil.com

DIRECTORS 2013-15
Trey Shaffer, ERM
832-209-8790
trey.shaffer@erm.com
John Lee, Univ. of Houston
713-743-4877
wjlee3@uh.edu
Deepak Gala, Shell
281-544-2181
deeak.gala@shell.com

DIRECTORS 2015-16
Jenny Cronlund, BP Exploration
281-366-8966
jenny.cronlund@bp.com
Torrance Haggerty, T.R. Consulting
281-714-5472
thaggerty06@gmail.com
Eric Kocian, ExxonMobil
832-624-7962
eric.m.kocian@exxonmobil.com

PAST CHAIR
Mike Strathman, Trinity Group
713-614-6227
mike.strathman@att.net

PROGRAMS
David Tumino, Murphy Oil
281-717-5123
tuminospe@hal-pc.org

SOCIAL ACTIVITIES
Jim Sheridan, Baker Hughes – retired
281-740-0913
sherim@operamail.com

TECHNOLOGY TRANSFER
Carol Piovesan, APO Offshore
281-282-9291
cpiovesan@apooffshore.com

YOUNG PROFESSIONALS
Pavitra Sainani, ExxonMobil
832-624-0505
pavitra.a.sainani@exxonmobil.com

DIRECTORS 2013-15
Trey Shaffer, ERM
832-209-8790
trey.shaffer@erm.com
John Lee, Univ. of Houston
713-743-4877
wjlee3@uh.edu
Deepak Gala, Shell
281-544-2181
deeak.gala@shell.com

DIRECTORS 2015-16
Jenny Cronlund, BP Exploration
281-366-8966
jenny.cronlund@bp.com
Torrance Haggerty, T.R. Consulting
281-714-5472
thaggerty06@gmail.com
Eric Kocian, ExxonMobil
832-624-7962
eric.m.kocian@exxonmobil.com

SPE GULF COAST NORTH
AMERICA REGIONAL DIRECTOR
Bryant Mueller, Halliburton
281-818-5522
bryant.mueller@halliburton.com

Committee Chairs
AWARDS
Jeremy Viscomi,
Petroleum Technology Transfer Council
785-864-7396
jviscomi@pttc.org

CASINO NIGHT
Julia P. Clarke, Fugro Consultants, Inc.
713-369-5400
jpcclarke@fugro.com

ESP WORKSHOP
Noel Putscher, Newfield
281-674-2871
nputscher@newfield.com

GOLF CO-CHAIRS
Cameron Conway, KB Industries
281-217-0660
cconway@kb-Industries.com
Marc Davis, Champions Pipe and Supply
713-248-3956
mdavis@championspipe.com
Robin Smith, Consultant
713-907-1694
Robin77095@att.net

INTERNSHIPS
Gabrielle Guerre, Ryder Scott
713-750-5491
gabrielle.guerre@ryderscott.com

NEWSLETTER
John Jackson, Unimin Energy
832-247-0233
jsjackson@unimin.com

OILSIM COMPETITION
Kristin Obenhaus, Frontline Group
281-453-6037
kobenhaus@fronlin-group.com
Lindsey Ferrell, Frontline Group
512-913-7112
lferrell@frontline-group.com
SCHOLARSHIP
Tanhee Galindo, Nexeo Solutions
832-823-1511
gcs-scholarship@spemail.org

SPONSORSHIP
John Vozniak, Archer Oil Tools
713-502-0981
jvozniak@mac.com

SPORTING CLAYS
Paul Conover, NOV
713-346-7482
paul.conover@nov.com

TENNIS
James Jackson, Halliburton
713-366-5704
james.jackson@halliburton.com

WEB TECHNOLOGY
Shivkumar Patil, Aker Solutions
713-369-5352
Shivkumar.Patil@akersolutions.com

SECTION MANAGER
Kathy MacLennan, SPE-GCS
713-779-9595 x 813
kmaclennan@spe.org

Study Group Chairs
BUSINESS DEVELOPMENT
Ricardo Concha, Credit Suisse
713-890-1400
ricardo.concha@credit-suisse.com

COMPLETIONS & PRODUCTION
Mark Chapman, CARBO Ceramics
281-921-6522
mark.chapman@carboceramics.com

DIGITAL ENERGY
Rick Morneau, Morneau Consulting
281-315-9395
rickmorneau@outlook.com

DRILLING
Ernie Prochaska, NOV Downhole
832-714-3842
ernie.prochaska@nov.com

PUBLICITY
Baljit Singh, Consultant
832-588-7470
baljits@aol.com

GENERAL MEETING
Raja Chakraborty, Shell
281-544-2148
Raja.Chakraborty@shell.com

HSSE AND SOCIAL RESPONSIBILITY
Trey Shaffer, ERM
832-209-8790
trey.shaffer@erm.com

INTERNATIONAL
Owen Jones, ExxonMobil Development Company
832-624-2019
owen.jones@exxonmobil.com

NORTHSIDE
Robert Estes, Baker Hughes
713-879-4414
robert.estes@bakerhughes.com

PERMIAN BASIN
Amy Timmons, Weatherford
713-836-6563
amy.timmons@weatherford.com

PETRO-TECH
Jessica Morgan, Blackstone Minerals
713-929-1633
jmorgan@blackstoneminerals.com

PROJECTS, FACILITIES, CONSTRUCTION
Chris Shaw, Shell
281-544-6796
C.Shaw@shell.com

RESEARCH & DEVELOPMENT
Skip Davis, Technology Intermediaries
281-359-8556
skdavis@technologyintermediaries.com

RESERVOIR
Rafael Barroeta, Occidental
713-366-5356
rafael_barreeta@oxy.com

WATER & WASTE MANAGEMENT
Barbara Denson, Weston Solutions
281-701-6891
barbara.denson@westonsolutions.com

WESTSIDE
Sandeep Pedam, ConocoPhillips
832-486-2315
sandeep.pedam@conocophillips.com

CONNECT INFORMATION

NEWSLETTER COMMITTEE
CHAIRMAN | John Jackson
editor@spegcs.org

AD SALES | Pat Stone
starlite1@sbcglobal.net

BOARD LIAISON | Subash Kannan

NEWSLETTER DESIGN | DesignGood Studio
designgoodstudio.com

SPE HOUSTON OFFICE

GULF COAST SECTION MANAGER
Kathy MacLennan | kmaclennan@spe.org

GCS ADMINISTRATIVE ASSISTANT
Sharon Harris | sharris@spe.org

HOURS & LOCATION
10777 Westheimer Road, Suite 1075
Houston, Texas 77042
P 713-779-9595 | F 713-779-4216
Monday - Friday 8:30 a.m. to 5:00 p.m.

PHOTO SUBMISSIONS
We are looking for member photos to feature on the cover of upcoming issues! Photos must be at least 9” by 12” at 300 DPI. Email your high resolution picture submissions to: editor@spegcs.org

CHANGE OF ADDRESS
To report a change of address contact:
SPE-GCS Member Services Dept.
P.O. Box 833836
Richardson, Texas 75083-3836
1.800.456.6863 | service@spe.org

CONTACT
For comments, contributions, or delivery problems, contact editor@spegcs.org.

ADVERTISE YOUR BUSINESS IN THE SPE-GCS NEWSLETTER

Connect is printed 12 times per year and contains premium positions for advertisers wanting to reach some of the most influential oil & gas professionals in the world.

For information on advertising in this newsletter or on the SPE-GCS website, please contact:
Pat Stone, Star-Lite Printing, Inc
281-530-9711 / starlite1@sbcglobal.net
Why can Weatherford deliver more real time data at the wellsite than any other mudlogging company?

Our Global Operations Manager for Surface Logging Systems, Tim, is all smiles these days. That's because he and his team recently designed a new state-of-the-art mudlogging cabin. The spacious interior makes room for more laboratory services at the wellsite. New exploration companies have access to more data in real-time, so they can make better decisions faster. It's one more way Weatherford Mudlogging is committed to Excellence from the Ground Up.

March CALENDAR

<table>
<thead>
<tr>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
<th>SATURDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Northside</td>
<td>Drilling</td>
<td>General Meeting</td>
<td>Auxiliary</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Young Professionals</td>
<td>Completions &amp; Production Westside</td>
<td>Reservoir Board of Directors Meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Continuing Education Business Development</td>
<td>Continuing Education</td>
<td>Casino Night</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water &amp; Waste Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
</tr>
</tbody>
</table>

EXCELLENCE FROM THE GROUND UP

SURFACE LOGGING SYSTEMS
www.weatherford.com/surfacelogging
mudlogging.services@weatherford.com