, SPE

We have a great line-up of events in April and May and we hope you are excited for them!

This week, we have a evening event on Mastering Soft Skills with Narandja Milanovich and Gary Eagleson. It takes place on Thursday and time is running short, so make sure to register now!

Our General Meeting this month features Hannah Chittenden of ESG Solutions, discussing microseismic monitoring of hydraulic fracture stimulations.

Later this month, we are hosting a joint lunch event with the Young Professionals group, featuring Distinguished Lecturer Randall LaFollette who will be talking about the importance of data mining to the development of unconventional reservoirs.

Finally, we are very excited to host the SPE Low Permeability Symposium in Denver this year. The Symposium is a great way to connect with other E&P professionals and increase your technical knowledge of low permeability unconventional plays. Make sure to register by April 15th and save $100 on registration fees!

Read below for more details on these and other events!

Cheers,

Marija Mircevska

Newsletter Editor

SPE Low Permeability Symposium

5–6 May 2016 | Denver, Colorado

Hyatt Regency Denver at Colorado Convention Center

Register before April 15 to save $100 on registration.

SPE is excited to hold the SPE Low Permeability Symposium in Denver this year on 5–6 May. This symposium is focused on education for our members, focusing on increasing efficiency, lowering finding costs, and also highlighting areas where there are ongoing studies of low permeability reservoir characterization and performance.

Topics that will be covered include:

- Hydraulic fracturing themes - placement, refraccing, fluids, surfactant and proppants
- Advances in Petrophyscis for low perm reservoirs
- Imaging of tight rocks
- PVT analysis
- Well performance and production data optimization

The symposium is delivering these topics through a range of forums and sessions:

- Opening Plenary Session: Panel “Increasing Completion Efficiency in Today’s Difficult Operating Environment”
- Keynote Lunches: Alex Epstein “The Moral Case for Fossil Fuels” and Awards Lunch with Helge Hove Haldorsen
- Technical program
- Education Track (included with full registration or can attend on $75 day pass)
- Short Courses

The Low Perm Symposium is a great way to connect with other E&P professionals and increase your technical knowledge of low permeability unconventional plays. Don't miss this opportunity. For further information about any part of the Symposium program go to www.spelps.org for more details.

April 5, 2016

GENERAL MEETING

A Decade Monitoring Shale Gas Plays Using Microseismicity: Advances in the Understanding of Hydraulic Fracturing

Hannah Chittenden, ESG Solutions

Denver Athletic Club
April 20, 2016, 11:30 AM - 1:30 PM

Tickets:

Members	$25
Non-Members	$35
Walk-Ins	$40

Register Now

Abstract: Over the past decade, microseismic monitoring has become the most widely used approach to understand the in-situ reservoir behavior during hydraulic fracture stimulations. From early monitoring performed in the Barnett Shale to current programs in the Horn River and Marcellus formations, we review the evolution of microseismic monitoring from the viewpoint of data collection (single versus multi-well array configurations, use of long lateral stimulation wells), data analysis and the incorporation of microseismic parameters to constrain and validate reservoir models.

We conclude with a look at multi-array microseismic results from hydraulic fracture stimulations of various North American shale plays to illustrate how microseismic analysis has aided in the understanding of reservoir characteristics and in turn, helped to plan more effective stimulation programs. We highlight case studies where microseismic monitoring was used to help assess fracture dimensions, stage spacing and well spacing. In addition, we look at how the use of advanced analysis techniques such as seismic moment tensor inversion (SMTI) has helped propel the industry forward and allowed operators to gain a better estimate of the stimulated reservoir volume, the discrete fracture network and the effective fluid flow by understanding details on individual

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rupture mechanisms and how these mechanisms change depending on treatment program, local stresses and local geology.

Biography: Hannah Chittenden is a Geophysical Analyst and Project Coordinator with ESG's global energy services division, where she oversees analysis and reporting for hydraulic fracture monitoring projects. Hannah joined ESG in 2014 as a geophysicist and has since taken on many responsibilities both in the office and in the field. Hannah is currently a G.I.T. pursuing her professional designation (P.Geo) and a member of the AAPG. She holds a Master's Degree in Tectonic Geology from the University of Bern and a B.Sc. in Geology from McMaster University in Canada where she worked as an intern for the Stable Isotope Laboratory. Prior to joining ESG, Hannah worked as a research assistant where she published her work investigating foreland basins and the influence of bedrock architecture on the development of alpine landscapes.

SPRING EVENING EVENT

Mastering Soft Skills

Narandja Milanovich and Gary Eagleson

Denver Athletic Club, Centennial Room

Thursday, April 7, 5 - 7:30 PM

5 - 6 PM - Networking and Refreshments
6 - 7:30 PM - Dinner and Workshop

Tickets:
Members - $40/person
Non-members - $50/person

Register

This SPE Evening Event will feature networking with peers and a workshop on "Mastering Soft Skills." Personal Mastery of Soft Skills enables Technical Professionals and Managers to reach new levels of performance.

The instructors are Narandja Milanovich and Gary Eagleson.

Narandja is a member of SPE's Soft Skills Committee and has co-authored articles on Soft Skills in JPT and other publications. With over 30 years of upstream oil and gas experience, including facilities engineering, project management, engineering management, and coaching and teaching learning and leadership development, Narandja holds bachelors and masters degrees of mechanical engineering from Rice University. She also holds masters degrees in counseling and psychology.

Gary is an independent engineering consultant with over 35 years experience in engineering and project management for major E&P and service companies.

SPE 36TH ANNUAL RACQUETBALL WINTER TOURNAMENT

A special thanks to the sponsors of the tournament. Through their generosity, the tournament was able to raise approximately **$2,000** towards the Denver Section SPE Scholarship fund.

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HSSE STUDY GROUP

Assessing Fatalities in Oil and Gas Extraction

Kyla Retzer, Epidemiologist with the National Institute for Occupational Safety and Health (NIOSH)

April 14, 2016, 11:30 AM - 1:00 PM

Halliburton, 1125 17th Street, 19th Floor Training Room

RSVP: Clory Martin

Abstract: The NIOSH Fatalities in Oil and Gas Extraction (FOG) is a national database that collects detailed information about oil and gas extraction fatalities in the U.S. It is used to inform NIOSH, industry, and other stakeholder groups, and guide interventions that will prevent future loss of life in this industry. FOG includes all identified fatal events to U.S. land-based and offshore oil and gas extraction workers, irrespective of the industry code of the employer. Fatal events are identified through: 1) preliminary descriptions, citations, and closed investigations from the Occupational Safety and Health Administration's (OSHA) Occupational Safety and Health Information System (OIS) or the Integrated Management Information System (IMIS); 2) media reports; 3) formal investigations from federal, state, and local agencies; 4) motor vehicle crash reports; 5) emergency responder and police reports; 6) coroner and medical examiner reports; and 7) death certificates.

Biography: Kyla Retzer is an epidemiologist at Centers for Disease Control and Prevention (CDC). She works in the National Institute for Occupational Safety and Health (NIOSH) Western States Office in Denver. The NIOSH provides National and World Leadership to Prevent Workplace Illness and Injuries. Ms. Rezter has spent six years with the CDC and is the main NIOSH contact for assessment regarding fatalities in oil and gas extraction. Ms. Rezter earned a Master of Public Health (M.P.H.) in Epidemiology from the University of North Texas Health Science Center at Fort Worth.

COMPLETIONS STUDY GROUP

Fiber-Optics Results From an Intra-Stage Diversion Design Completions Study in the Niobrara Formation of DJ Basin (SPE 179106)

Dr. Muthukumarappan "Kumar" Ramurthy, Halliburton

April 21, 2016, 11:30 AM - 1:00 PM

Halliburton, 1125 17th Street, 19th Floor Training Room

RSVP: Dale Hopwood

Abstract: Hydrocarbon production has been long existent in the Denver Julesburg basin and with the development of horizontal drilling technology the Niobrara has become one of the most economical plays even with lower oil prices. The multi-bench Niobrara formation is the primary target in the basin followed by the Codell. Even with the better economics, the Niobrara and the Codell completions are not optimized yet. The operators are still aiming for more and more stages with lesser spacing thus increasing the costs. The objective of this study is to show that stage spacing can be

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TOURNAMENT RESULTS

A/B Division

Shawn Lopez - 1st Place

Nick Ricca - 2nd Place

Nick Michaelson - 3rd Place

C+ Division

Adam Cohen- 1st Place

Alexander Grobbel - 2nd Place

Ryan Spence - 3rd Place

C Division

John Berning - 1st Place

Dave Rebol - 2nd Place

Alex Sale - 3rd Place

Novice Division

Chelsea Newgord - 1st Place

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optimized with low cost diversion technology yielding equal or better production with fewer stages thus lowering costs.

In this optimization study, two Niobrara "C" bench lateral wells from the same pad that are next to each other were selected as candidates. The first well, Well-K was completed with 28 stages geometrically spaced at 153 feet utilizing the perf-n-plug methodology. The second well, Well-L was completed with 20 stages, geometrically spaced at 215 feet, also utilizing the perf-n-plug methodology. Well-L was stimulated utilizing the intra-stage diversion process and had approximately 404,000 lbm less proppant than Well-K. Well-K was completed without the diversion technology. Following stimulation and flowback, Fibercoil with Distributed Temperature Survey (DTS) and Distributed Acoustic Survey (DAS) capabilities were run in both the wells to diagnose the contribution from each perforation cluster. The Fibercoil results clearly showed that Well-L with larger stage spacing and intra-stage diversion had 80% fracture initiation as opposed to 60% with the limited-entry Well-K that had shorter stage spacing. The production results so far are very encouraging for the L-well. The 180-day cumulative oil production for Well-L is almost similar to Well-K with the normalized barrels of equivalent oil (BOE) per foot, BOE/ft. difference being lower by 3%.

This study has clearly shown us that with some additional enhancement intra-stage diversion can be used to optimize stage spacing without compromising production. The post-frac fracture modeling analysis along with the Fibercoil results including warm-back analysis and production for the two wells is presented.

JOINT YP & PROFESSIONALS EVENT

Lessons Learned from Data Mining in Unconventional Reservoirs

Randall LaFollette, Distinguished Lecturer

April 27, 2016, 11:30 AM - 1:00 PM

Maggiano's, 500 16th Street

Tickets:

$30 - Members
$40 - Non-members

Tickets include lunch. Please let us know of any dietary restrictions.

Abstract: The task of identifying key production drivers in unconventional reservoirs remains challenging, even after decades of exploration and production in North America during which tens of thousands of horizontal unconventional wells have been drilled and completed. Tens to hundreds of variables, categorized as reservoir quality, well architecture, completion, stimulation, and production metrics, are involved and there are many different interrelationships among the variables to be considered. Further, formation evaluation is typically minimal and there are unknown variables in the system that can only be guessed at, ignored, or proxied.

The author’s team has combined Geographical Information Systems (GIS) analysis and multivariate analysis using boosted regression trees for improved data mining results as compared to univariate

methods. The purpose of this lecture is to discuss key elements of data mining in unconventional reservoirs, in order to raise awareness of cutting-edge statistical tools and methods being brought to bear in the industry. The presentation will provide highlights of real world examples of data mining projects in three different shale plays.

If there were only one idea for audiences to take away from the lecture, it would be that exploiting unconventional reservoirs is a highly complex task with many moving parts and data mining is a needed tool to be applied to better understand the importance of specific well productivity drivers. Another way to say it is that the talk is intended to provide the audience with improved statistical methods for the “statistical” plays so that multi-million dollar decisions can be truly data-driven.

Biography: Randy LaFollette is the Director, Applied Reservoir Technology, for Baker Hughes Pressure Pumping. Mr. LaFollette holds a BSc degree in Geological Science from Lehigh University, Bethlehem, Pennsylvania. He has 37 years of experience in the industry. He is active in SPE, and AAPG, aiding with conference organization and presenting on various reservoir, completion / stimulation, and data-mining topics. Mr. LaFollette is a subject matter expert in Geoscience and Petroleum engineering for Baker Hughes and leads a team of experts responsible for structuring and implementing geospatial and data-mining studies of stimulation effectiveness linking reservoir quality, well architecture, well completion, and treatments performed to production results.