



# WORKSHOP

## TECHNICAL PROGRAM

[www.spe.org/meetings](http://www.spe.org/meetings)

4-6 August 2010 | Keystone Resort | Keystone, CO

# Maximizing Tight Oil in the Bakken

## Technical Program Committee

**Chairperson**  
**Shah Kabir**  
Hess

**Christopher Jablonowski**  
University of Texas  
at Austin

**Mohamed Soliman**  
Halliburton  
Energy Services

**Joseph Ayoub**  
Schlumberger

**Leonard Kalfayan**  
Hess

**Archie Taylor**  
Continental Resources

**David Cramer**  
ConocoPhillips

**Randy LaFollette**  
BJ Services

**Peter Valko**  
Texas A&M University

**Ali Daneshy**  
Daneshy Consultants Int'l.

**Kimberly Mitchell**  
Marathon Oil

Oil production from microdarcy formations presents significant challenges in all facets of completion, production, and reservoir engineering. This applied technology workshop is aimed at discussing current best practices and the evolving technologies addressing complex multidisciplinary issues. Specifically, we will explore how we design well spacing and stimulation to meet production performance and commensurate with economic objectives.

One of the focal points of this workshop will be performance monitoring with respect to multistage fracture design options, over the entire well, leading to forecasting long-term performance. Besides current best practices, we will address leading-edge technologies with regard to well architecture and stimulation, and maximizing recovery with both primary and enhanced recovery methods.

## SPONSORS



HALLIBURTON



## **General Information:**

### **Americans With Disabilities Act**

Our events and functions are accessible to all attendees with wheelchairs. If you require special arrangements, please contact our staff at the Registration Desk.

### **Alcohol Policy**

SPE recognizes the legitimate serving of alcoholic beverages in the process of conducting business and social activities. We also recognize that the use and consumption of alcohol carries with it the requirement for all attendees to consume those beverages responsibly.

### **Commercialism**

In remaining consistent with workshop objectives and SPE guidelines, commercialism in presentations will not be permitted. Company logos should be used only to indicate the affiliation of the presenter(s).

### **Continuing Education Units**

Attendees will receive 2.0 CEUs.

One CEU equals 10 contact hours of participation. CEUs will be awarded through SPE Professional Development for participation and completion of SPE workshop. A permanent record of a participant's involvement and awarding of CEUs will be maintained by SPE.

### **Documentation**

Following the workshop, a URL containing released copies of the workshop presentations will be available to attendees. A summary report of the workshop will also be made available. The copyright of the report will belong to SPE.

### **Guest/Spouse**

Only registered guests are permitted to attend the receptions.

### **Electronic Devices**

As a courtesy to the speakers and your fellow registrants, please turn off all mobile phones during presentations.

### **Name Badges**

Please wear your badge at all times. It is a courtesy to your fellow registrants, speakers and sponsors.

### **Photography Policy**

SPE reserves the exclusive rights to all recording or reproductions of the workshop. Unauthorized recording is expressly prohibited, whether by video, still or digital camera, mobile phone, or any other means or form of reproduction.

Any person attending may be photographed or videotaped, and by your attendance, you give permission to use your image in possible future marketing publications including print, online, and video.

### **Workshop Format**

Workshops maximize the exchange of ideas among attendees and presenters through brief technical presentations followed by extended Q&A periods. Focused topics attract an informed audience eager to discuss issues critical to advancing both technology and best practices.

Many of the presentations are in the form of case studies, highlighting engineering achievements and lessons learned. In order to stimulate frank discussion, no proceedings are published and members of the press are not invited to attend.

## Tuesday, 3 August

1800-1930

Welcome Reception – *Mountain View Room*

## Wednesday, 4 August

0700-0800

Registration – *Longs Peak Foyer*

Materials sponsored by **HALLIBURTON**

Continental Breakfast – *Longs Peak Foyer*

*\*All Technical Sessions will be located at the Keystone Conference Center*

0800-0930

Chairperson's Welcome

**SESSION I: ESTABLISHING PRIMARY BUSINESS DRIVERS – OBTAINING HIGH INITIAL PRODUCTION AND ITS IMPACT ON ECONOMICS**

*Chairs: Kimberly Mitchell, Marathon Oil  
Leonard Kalfayan, Hess*

**Keynote Address: Successful Fracturing of Horizontal Wells - Key Technology for Bakken Production**

*Ali Daneshy, Daneshy Consultants Int'l.*



Maximize your well's potential by first understanding the reservoir.

BJ Services believes that the first step in any engineered well service plan is to fully understand the geomechanical and chemical factors that drive well performance.

Through the Understand the Reservoir First™ process, this knowledge helps BJ Services focus its technology and provide customers with effective solutions—not just implement a one-size-fits-all approach.

Call your BJ Services representative to see how our process and technologies can optimize the production on your tight oil play.

Real world. World class. Worldwide.

[www.bjservices.com](http://www.bjservices.com)



**Presentation 1: Variations in Rock-Pore Types, Reservoir Quality, and Effects on Fluid Flow in the Bakken**

*Randy LaFollette, BJ Services*

**Presentation 2: Evaluation of Key Factors Affecting Successful Oil Production in the Bakken Formation, North Dakota**

*Darren Schmidt, University of North Dakota*

0930-1000

**Coffee Break** – *Longs Peak Foyer*

1000-1130

## **SESSION II: ECONOMIC ASSESSMENTS – METHODS AND CASE STUDIES**

**Chairs:** *Christopher Jablonowski, University of Texas at Austin*

*Shah Kabir, Hess*

**Presentation 1: Mathistad #1 and #2 Case History - Evaluating Drainage, Fracturing, Well Performance and Optimum Spacing in the Bakken and Three Forks**

*Archie Taylor, Continental*

**Presentation 2: Performance Analysis of the Bakken - A Reservoir Engineering Perspective**

*Stuart Cox, Marathon*

**Presentation 3: Valuing Seismic in the Bakken - The Business Case**

*Ellen Coopersmith, Decision Frameworks*

1130-1300

**Keynote Lunch:** *Chuck Van Allen, Hess – Longs Peak*

sponsored by



1300-1430

## **SESSION III: OPTIMUM FRACTURING – COMMON OPTIONS AND CASE HISTORIES**

**Chairs:** *David Cramer, ConocoPhillips*

*Ali Daneshy, Daneshy Consultants Int'l.*

**Presentation 1: Effects of Micro Structure Along Horizontal Laterals Upon Fracture Stimulation**

*Tom Olsen, Beacon E&P Company*

**Presentation 2: Bakken Fracture and Refracture Completion Diagnostics**

*Buddy Woodroof, ProTechnics*

**Presentation 3: Refracturing in the Bakken**

*Mike Vincent, Insight Consulting*

1430-1500

**Coffee Break** – *Longs Peak Foyer*

1500-1700

## **SESSION IV: OPTIMUM FRACTURING – TECHNOLOGY TRENDS**

**Chairs:** *Ali Daneshy, Daneshy Consulting Int'l*

*Joseph Ayoub, Schlumberger*

**Presentation 1: Evolution of Horizontal Well Fracturing with Multi-Stage Packer Ball Drop Systems**

*Dean Tymko and Cam Stempfle, Penn West Energy Trust*

**Presentation 2: Multi-Stage Completion Techniques for the Bakken**

*Mike Eberhard, Halliburton*

**Presentation 3: Bakken Completions in Dunn County, ND – An Atypical Approach?**

*Galen Brenize, Anschutz Exploration Corporation*

**Learning Nuggets of the Day**

1700-1900

**Reception – Soda Ridge Stables (Shuttle will leave from the Lodge)** sponsored by



**Thursday, 5 August**

0700-0800

**Registration – Longs Peak Foyer**

Materials sponsored by **HALLIBURTON**

**Continental Breakfast – Longs Peak Foyer**

*\*All Technical Sessions will be located at the Keystone Conference Center*

0800-0930

**SESSION V: DIAGNOSING LONG-TERM FRACTURE PERFORMANCE**

*Chairs: Peter Valko, Texas A&M University*

*Mohamed Soliman, Halliburton Energy Services*

**Presentation 1: Fracture Mapping in Tight Oil Reservoirs**

*Norm Warpinski, Pinnacle Technologies*

**Presentation 2: Application of DTS with Thermal Tracer for Real-Time Fracture Diagnostics in Horizontal Wells**

*Ding Zhu, Texas A&M University*

**GLOBAL ENERGY.  
LOCAL COMMITMENT.**

*Long-reach horizontal drilling  
Multistage hydraulic fracturing  
CO<sub>2</sub> injection*

The Bakken region is rich with hard-to-reach oil and gas, locked inside low-permeability shales. Successful drilling and extraction calls for new technologies — and Hess is at the forefront of these innovations.

► To learn more, visit us at [www.hess.com](http://www.hess.com)



**ENERGY ON THE MOVE**



**Presentation 3: Top-Down, Intelligent Reservoir Modeling – Application in the Bakken**  
*Shahab Mohaghegh, West Virginia University*

0930-1000

**Coffee Break – Longs Peak Foyer**

1000-1130

**SESSION VI: FORECASTING RESERVOIR PERFORMANCE**

**Chairs: Mohamed Soliman, Halliburton Energy Services**  
**Archie Taylor, Continental Resources**

**Presentation 1: What Makes Simulation of Oil Shale Different?**  
*Tony Settari, University of Calgary*

**Presentation 2: Analytical Modeling of Shale Oil**  
*Hossein Kazemi, Colorado School of Mines*

**Presentation 3: Lessons Learned to Date With Empirical, Analytical, and Numerical Modeling**  
*Pathman Arulampalam, Hess*

1130-1300

**Keynote Lunch: Lyn Canter, Whiting – Longs Peak**

1300-1430

**SESSION VII: MONITORING RESERVOIR PERFORMANCE AND EVALUATION**

**Chairs: Peter Valko, Texas A&M University**  
**Archie Taylor, Continental Resources**

**Presentation 1: Well-Performance Analysis for Tight-Oil Reservoirs**  
*Dilhan Ilk, Texas A&M University*

**Presentation 2: Formation Linear Flow Model Applied to the Bakken Shale**  
*Jeffrey Callard, Oklahoma University*

**Presentation 3: Pre, During, and Post Fracturing DTS Flow Profiling in Tight Gas Wells**  
*Jose Sierra, Halliburton*

1430-1500

**Coffee Break – Longs Peak Foyer**

1500-1700

**SESSION VIII: DEALING WITH FORMATION DAMAGE AND PRODUCTION CHEMISTRY ISSUES**

**Chairs: Leonard Kalfayan, Hess**  
**Randy LaFollette, BJ Services**

**Presentation 1: Assuring Production Through Scale Management in Multi-Zone Bakken Wells**  
*Larry Cenegy, Hess*

**Presentation 2: Incorporation of Chemical-Laden Solids in the Hydraulic Fracture Proppant Bed in Order to Achieve Long-Term Organic and Inorganic Deposition**  
*Steve Szymczak, BJ Services*

**Presentation 3: Solid Speciation in Bakken Wells Across the Williston Basin and Their Implications to Future Production Challenges**  
*Kevyn Smith, EOG*

**Learning Nuggets of the Day**

## Friday, 6 August

0700-0800

**Continental Breakfast** – *Longs Peak Foyer*

*\*All Technical Sessions will be located at the Keystone Conference Center*

0800-0930

### **SESSION IX: BEST PRACTICES/WAY FORWARD—DESIGNING WELL ARCHITECTURE AND STIMULATION TECHNOLOGY**

**Chairs:** *David Cramer, ConocoPhillips*  
*Randy LaFollette, BJ Services*

#### **Presentation 1: Improved Production and Profitability with Superior Bakken Completions**

*Russell Rankin, Brigham Exploration*

#### **Presentation 2: Evolution of the Sanish Field Bakken Completions**


*John Paneitz, Whiting*

#### **Presentation 3: Discussion of Bakken Best Practices on the Canadian Side of the Williston Basin**

*Brad Rieb, BJ Services*

0930-1000

**Coffee Break** – *Longs Peak Foyer*



In tight oil, highly efficient horizontal drilling, fracturing and completions are now a reality.

To solve even your most complex tight oil challenges, the experts from Halliburton deliver proven methodologies and the industry's largest portfolio of services and technologies. Indeed, no other service company has a track record of squeezing more production and cost out of existing wells — or more fully optimizing new ones.

What's *your* tight oil challenge? For solutions, go to [Halliburton.com/unconventional](http://Halliburton.com/unconventional).

Solving challenges.™

**HALLIBURTON**

1000-1130

## SESSION X: BEST PRACTICES/WAY FORWARD—MAXIMIZING OIL RECOVERY

*Chairs: Joseph Ayoub, Schlumberger  
Kimberly Mitchell, Marathon Oil*

### **Presentation 1: Beyond Primary Recovery**

*Kishore Mohanty, University of Texas at Austin*

### **Presentation 2: Recovery Potential Analysis of Bakken Tight Oil Wells**

*Peter Valko, Texas A&M University*

### **Presentation 3: A Proposed Shale/Tight Rock Classification to Assist with Fracturing Potential**

*Ahmed Abou-Sayed, Advantek International*

1130-1200

## Wrap-Up Discussion and Closing Comments

# 2010 SPE North America Workshops

24-25 August

**Distributed Fiber-Optic Sensing for Well  
and Reservoir Monitoring**

**Barton Creek Resort**  
Austin, TX

4-6 October

**SPE/AAPG Naturally Fractured Reservoirs**

**The Lodge at Vail**  
Vail, CO

6-7 October

**Final Commissioning and Initial Start-Up**

**Omni La Mansion del Rio**  
San Antonio, TX

5-10 December

**AAPG/SPE/SEG/SPWLA Hedburg Research Conference:  
Critical Assessment of Shale Resource Plays**

Austin, TX

## Upcoming Conferences

20-22 September

**SPE Annual Technical Conference and Exhibits (ATCE)**

Florence, Italy

19-21 October

**SPE Canadian Unconventional Resources  
and International Petroleum Conference (CURIPC)**

Calgary, Canada