SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

Challenged by the market turmoil caused by oil price volatility and tight global financial markets, the In-Situ Thermal Heavy Oil industry must find a way to become more competitive. It is only through increasing operational efficiency, decreasing NPT, reducing cost through well designs or new technology, elevating reliability and enhancing communication that we will be able to compete on a world scale. By integrating Engineering and Operations in both slant and vertical thermal developments, Drilling and Completions will deliver on efficiency measures through collaborative interaction with each other and by accessing the knowledge of the industry.

OBJECTIVES
This two-day workshop will bring together operators, service companies, regulatory authorities, research bodies, academia, and other interested parties in an open and collaborative environment. The first day of this workshop offers two tracks – one focused specifically on Drilling and the other on Completions. The second day brings together attendees for shared learnings on topics related to both disciplines, and the dynamic discussions that will follow these presentations. This workshop will take a holistic approach that includes the integration of geosciences with reservoir, completion, and production engineering disciplines.
About Society of Petroleum Engineers
The Society of Petroleum Engineers (SPE) is a not-for-profit professional association for members engaging in oil and gas E&P, providing resources for technical knowledge. Income from this event will be invested back into SPE to support many other member programs. Scholarships, certification, the Distinguished Lecturer program, and SPE’s energy education program Energy4me are just a few examples.

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

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 1.6 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 all attendees.
COMMITTEE MEMBERS

Drilling Committee

Co-Chairs
Marius Bordleanu, Suncor Energy

Doug Hollies, Codeco Oilsands Engineering

Jeff Arvidson, Devon Energy
Arnie Canonigo, MEG Energy
Gregori Colomine, Nexen Energy ULC

Bryan Hnatiuk, Decades Upstream Consulting Services Ltd.
Owen Hnatiuk
Stephen Lai, Pason Systems
Juan Pablo Martin, Tenaris
Harry Schaepsmeyer
Blair Stengler, Devon Energy
Jaleh Zadeh

Completions Committee

Co-Chairs
Kurtis Thompson, MEG Energy

Colby Sutton, RGL Reservoir Management

Matt Crockett, Suncor Energy
Jonathan Heseltine, C-FER Technologies
Nicholas Miles, Weatherford
Blair Neil, Exceed Oilfield Equipment
Alexandra Robertson, Nexen Energy ULC
Mitchel Stretch, Schlumberger
Pat Webb, Devon Energy
Adam Welty, Armour Valve
Gina Wozney, GRW Consulting Ltd.

GENERAL INFORMATION

Electronic Devices
As a courtesy to the speakers and your fellow registrants, please turn off all electronic devices during presentations.

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

Photography and Recording Policy
SPE reserves the exclusive rights to all video/audio recording or reproductions of the workshop.
Unauthorized video/audio recording is expressly prohibited in the session room(s) or poster area, 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.
When we share diverse thoughts, backgrounds and passions, we all create something much larger than ourselves. It’s this type of collaborative approach that has shaped Canada into what it is today. At Suncor, we believe the best way to build Canada’s future is by working together.

together.suncor.com
# SCHEDULE OVERVIEW

## TUESDAY, JUNE 13

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700–0800</td>
<td>Registration and Breakfast</td>
<td></td>
</tr>
<tr>
<td>0800–0845</td>
<td>Opening Remarks and Keynote Presentation</td>
<td>Palomino C</td>
</tr>
<tr>
<td>0900–1030</td>
<td><strong>Session 1</strong>&lt;br&gt;Drilling Track: Directional Drilling&lt;br&gt;Completions Track: Thermal Well Design</td>
<td>Palomino C, Palomino D</td>
</tr>
<tr>
<td>1030–1100</td>
<td>Coffee Break</td>
<td>Palomino Foyer</td>
</tr>
<tr>
<td>1100–1230</td>
<td><strong>Session 2</strong>&lt;br&gt;Drilling Track: Drilling Operations&lt;br&gt;Completions Track: Artificial Lift Strategies</td>
<td>Palomino C, Palomino D</td>
</tr>
<tr>
<td>1230–1330</td>
<td>Keynote Lunch</td>
<td>Palomino C</td>
</tr>
<tr>
<td>1330–1500</td>
<td><strong>Session 3</strong>&lt;br&gt;Drilling Track: Cement Operations and Technology&lt;br&gt;Completions Track: Workovers</td>
<td>Palomino C, Palomino D</td>
</tr>
<tr>
<td>1500–1530</td>
<td>Coffee Break</td>
<td>Palomino Foyer</td>
</tr>
<tr>
<td>1530–1700</td>
<td><strong>Session 4</strong>&lt;br&gt;Drilling Track: Thermal Well Construction - Casing and Liners&lt;br&gt;Completions Track: Design and New Technologies</td>
<td>Palomino C, Palomino D</td>
</tr>
<tr>
<td>1700–1800</td>
<td>Networking Reception</td>
<td>Palomino Foyer</td>
</tr>
</tbody>
</table>

## WEDNESDAY, JUNE 14

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700–0800</td>
<td>Registration and Breakfast</td>
<td></td>
</tr>
<tr>
<td>0800–0930</td>
<td>Combined Drilling and Completions Track</td>
<td>Palomino C</td>
</tr>
<tr>
<td>0930–1000</td>
<td>Coffee Break</td>
<td>Palomino Foyer</td>
</tr>
<tr>
<td>1000–1130</td>
<td><strong>Session 5 – Re-Entries and Re-Drills</strong></td>
<td>Palomino C</td>
</tr>
<tr>
<td>1130–1300</td>
<td>Networking Lunch</td>
<td>Palomino D</td>
</tr>
<tr>
<td>1300–1430</td>
<td><strong>Session 6 – New Thermal Production Systems</strong></td>
<td>Palomino C</td>
</tr>
<tr>
<td>1430–1500</td>
<td>Coffee Break</td>
<td>Palomino Foyer</td>
</tr>
<tr>
<td>1500–1630</td>
<td><strong>Session 8 – Production Optimization</strong></td>
<td>Palomino C</td>
</tr>
</tbody>
</table>
SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

TECHNICAL AGENDA
TUESDAY, 13 JUNE

0700–0800 | Registration and Breakfast

0800–0815 | Opening Remarks - Workshop Chairs

0815–0845 | Keynote Presentation: Why are SAGD Wells Not All Created Equal: Asset Design Criteria for Drilling and Completing Suncor’s Wells Through the Lifecycle
John Graham, Suncor Energy

Drilling Track
0900-1030 | Session 1: Directional Drilling
Session Chairs: Gregori Colomine, Nexen Energy ULC
Owen Hnatiuk

With depressed commodity prices, maximizing recoverable resources has become critically important to increasing project value and accurate cost-effective wellbore placement is fundamental to this process. This session discusses recent advances in SAGD ranging technologies, wellbore positioning survey techniques and the use of empirical data to increase positional certainty.

- Presentation 1: Why Your Wells Are Not Where You Think They Are
  Angus L. Jamieson, University of the Highlands and Islands

- Presentation 2: A New Well Positioning Technique for SAGD Applications
  Sean Hinke, Halliburton

- Presentation 3: Absolute Wellbore Placement via No-Access Ranging from Surface
  Clinton Moss, Scientific Drilling International

1030-1100 | Coffee Break  Sponsored by: DELTA SCREENS

1100-1230 | Session 2: Drilling Operations
Session Chairs: Jeff Arvidson, Devon Energy
Arnie Canonigo, MEG Energy

SAGD drilling operations have many opportunities for efficiencies due to the repetitive nature of the process. This session will explore some technologies and techniques that have compressed drilling schedules without compromising quality or safety.

- Presentation 1: Operational Efficiency
  George McHardy, Nabors

- Presentation 2: Lodestone Active Ranging System
  Clinton Moss, Scientific Drilling International

- Presentation 3: Maximizing Extended Reach Drilling Efficiency with Unconventional Thinking
  Sean Hinke, Halliburton

Completions Track
0900-1030 | Session 1: Thermal Well Design
Session Chairs: Mitch Stretch, Schlumberger
Kurtis Thompson, MEG Energy

This first session of the workshop is intended to focus on well design for full life cycle operating scenarios and to consider the range of well completion selection strategies, but from a more rigid “manufactured” design perspective to allow cost effective repeatability. The manufacturing approach versus the trade-off required to ensure a broad range of operating conditions will be discussed. Thermal well design optimization for the Life of the Well include topics such as:

- Presentation 1: Driving Wellhead Efficiencies through Team Collaboration
  Dean Piquette, Wood Group

- Presentation 2: Application of Vacuum-Insulated Tubing (VIT) in Thermal Oil Sand Projects
  Mirko Zatka, Canadian Natural Resources Ltd.

- Presentation 3: Vacuum Insulated Coil Tubing (VICT)
  Darren Johannson, Majus Canada Ltd.

1030-1100 | Coffee Break  Sponsored by: DELTA SCREENS

1100-1230 | Session 2: Artificial Lift Strategies
Session Chairs: Blair Neil, Exceed Oilfield Equipment
Adam Welty, Armour Valve

This session will focus on thermal artificial lift strategies and the ongoing studies to improve production.

- Presentation 1: Using Improved Engineering Models, Field Monitoring and Data Analytics to Optimize ESP Utilization
  Todd Zahacy, C-FER Technologies

- Presentation 2: Considerations and Challenges for Artificial Lift in SAGD Environments
  Leon Waldner, Nexen Energy ULC

- Presentation 3: Advancements in Rigless Coiled Tubing ESP Deployment
  Clint Jones, Petrospec
Drilling Track
1330-1500 | **Session 3: Cement Operations and Technology**

Session Chairs: Bryan Hnatiuk, Decades Upstream Consulting Services Ltd.
Jaleh Zadeh

This session will examine developments and advancements in understanding and design of cement properties for Thermal applications to optimize the cement integrity. A quality primary cement job in thermal wells exposed to multiple thermal cycles is critical for casing support, zonal isolation, mitigation of gas/fluid migration, and general long term well integrity.

- **Presentation 1:** Using Foam Cement in Areas of Major Losses to Reduce Risk of Cap Rock Integrity in the Oil Sands
  Troy Abs, Suncor Energy

- **Presentation 2:** Collaborative Approaches to Improving Cement Design for Thermal Wells
  Trent Kaiser, Noetic Engineering

- **Presentation 3:** Cement Design Properties and the Effects of Enhanced Hydration Prior to Cement Placement
  Kelly Soucy, Magnum Cementing Services

Completions Track
1330-1500 | **Session 3: Workovers**

Session Chairs: Colby Sutton, RGL Reservoir Management
Pat Webb, Devon Energy

This topic will focus on thermal workovers; their problems and solutions.

- **Presentation 1:** Intermediate Casing Failures: Diagnosis, and Repair Strategies
  Pat Webb, Devon Energy

- **Presentation 2:** Optimizing Underperforming Horizontal Producers
  Tim Gorham, Chevron

- **Presentation 3:** Regaining Control of Blowouts from Thermal Wells
  Dwight Bulloch, Capstone

1500-1530 | Coffee Break  Sponsored by: Delta Screens

1530-1700 | **Session 4: Completions: Design and New Technologies**

Session Chairs: Matt Crockett, Suncor Energy
Jonathan Heseltine, C-FER Technologies

Emerging technologies have the potential to improve operational efficiencies and cost competitiveness throughout the thermal well lifespan. This session will focus on innovative technologies and designs that benefit wellbore diagnostics, remediation, resource recovery, completions and workover operations.

- **Presentation 1:** Downhole Heating - A New and Robust Re-Creation of a Proven but Ignored Technology
  J.M. Karanikas, Salamander Solutions/Shell

- **Presentation 2:** Optimized Fluid Placement for Matrix Stimulation
  Armando Sanchez, Wavefront

- **Presentation 3:** New High Temperature Casing Patch Installations
  Blair Temple, Imperial Oil

1700-1800 | Networking Reception
**SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions**

**WEDNESDAY, 14 JUNE**

**0700-0800** | Registration and Breakfast

**Combined Drilling and Completions Track**

**0800-0930** | **Session 5: Re-Entries and Re-Drills**

**Session Chairs:** Matt Crockett, Suncor Energy
Blair Stengler, Devon Energy

Industry experts present and discuss the best practices for either re-entering or re-drilling under-performing thermal wells.

- Presentations - casing assessment and preparation for re-entry
- Re-Drilling Operations - liner removal, sidetracking and whipstocking
- Re-completions - what techniques and technologies are available to return the wells to service

**Presentation 1:** Thermal Well Assessment and Preparation for Re-Entry
Rick Stahl, Northern Blizzard

**Presentation 2:** Re-drills
Vince Boucher, Suncor Energy

**Presentation 3:** Drilling SAGD Wells...Now vs Then: A Directional Perspective
Ryan Quigg, Weatherford

**0930-1000** | Coffee Break  
Sponsored by: Delta Screens

**1000-1130** | **Session 6: New Thermal Production Systems**

**Session Chairs:** Stephen Lai, Pason Systems
Mitchel Stretch, Schlumberger

Steam is not the only way to stimulate or produce a heavy oil or bitumen reservoir. There are a variety of additives and processes that are being used to enhance production that may alter the sub-surface operating conditions that define our current well structures. Solvent enhancement of the steam through processes like NSolv, SAP, ES-SAGD, SA-SAGD, LASER are either in service or getting very close to commercial development. More non-steam stimulation systems like VAPEX, THAI, ET-DSP, and ESEIEH are other processes that look to change the oil in the reservoir and allow production at much lower temperatures. How will these processes affect our modern well designs, completion systems and workover routines?

**Presentation 1:** Multi-Lateral Technology Advances in Thermal Applications
Gary Gill, Consultant

---

**THERE IS NO “ONE-SIZE-FITS-ALL” SAND CONTROL SOLUTION**

Sand control solutions need to be as flexible and unique as the reservoirs they operate in. RGL provides a range of technologies, products and services designed to the highest quality to maximize production and minimize operating costs.

**RGL’S proSERIES™ ENGINEERED SAND CONTROL SOLUTIONS**

RGL has expanded its product portfolio to include solutions for the broadest range of reservoir conditions.

**RGL’S proLAB™ SAND CONTROL LABORATORY**

Introducing an elite Technical Team dedicated to developing successful completions programs by focusing on near well-bore conditions and sand control strategies for optimized production.

Sand Control is complex. Success lies in the right solution.
- **Presentation 2:** Radio Frequency Reservoir Heating (ESEIEH)
  Shirish Deshpande, Suncor Energy and Derik Ehresman, Harris Corporation
- **Presentation 3:** The Carbon Cost: How Carbon Taxes Could Affect In-Situ Economics
  Jared Wynveen, McDaniel & Associates

1130-1300 | Networking Lunch
Sponsored by: [Weatherford](#)

1300-1430 | **Session 7: Operational Project Execution Efficiencies**
Session Chairs: Jeff Arvidson, Devon Energy  
Gregori Colomine, Nexen Energy ULC
Operational efficiency for Drilling and Completions in Major Projects is essential for profitability and affects the payout of each individual development phase. Come and learn what various companies are doing to decrease their cost through operations efficiency and organization of their work flow. Could you adopt any of these in your project?

- **Presentation 1:** Integrated Wellpad Consolidation – Using Single and Dual Parallel Rows of Wells
  Ashley Leroux, iTS
- **Presentation 2:** New Thermal Wellhead that Provides Dual Barrier Protection and Eliminates Welding
  Ryan Miller, Nexen Energy ULC
- **Presentation 3:** Moving with the Times
  Kirk Parker, Akita Drilling

1430-1500 | Coffee Break  Sponsored by: [Delta Screens](#)

1500-1630 | **Session 8: Production Optimization**
Session Chairs: Colby Sutton, RGL Reservoir Management  
Gina Wozney, GRW Consulting Ltd.
The ability to produce thermal wells effectively has many different aspects to it and each area will play a part in making In-situ Oilsands projects successful. Various technologies like flow control devices, sand control systems, artificial lift types and insulated tubing/casing systems are being used differently in many different thermal development fields. How these systems are used will define the ultimate profitability of the projects.

---

Tenaris

**RIG DIRECT IS HERE**

Service and support when and where you need us.

With an unparalleled tubular product portfolio, local manufacturing and service centres, Tenaris takes your projects further.

[www.tenaris.com/canada](http://www.tenaris.com/canada)
SPE Workshop: Enhancing Life Cycle Costs of Thermal Wells Through Drilling and Completions

- **Presentation 1**: Wellbore Simulation for Production Optimization  
  Raj Bal, Madala Software
- **Presentation 2**: Sand Control Design and Evaluation Experiments for Optimal Thermal Production  
  Mahdi Mahmoudi, RGL Reservoir Management
- **Presentation 3**: Optimizing the Long-Term Economics of High Curvature ESP-Lifted Wells using ESP Reliability Data  
  John Graham, Suncor Energy and Craig Radke, C-FER Technologies

Please provide your feedback about this workshop by answering 5 short survey questions:  
www.spe.org/go/SPEaca217

Did you Know...  
In 2016, the SPE Canadian Educational Trust was converted into a new entity, the SPE Canadian Educational Foundation (SPECEF). With the new governance structure, SPECEF has the flexibility to create new programs, scholarships and energy educational initiatives that will benefit SPE Canada members.

For more information about SPECEF or to give a tax deductible donation, please visit:  
www.spe.org/canada

### Oil and Gas Screens

98% +/- .0015” PRECISION.

When tolerance is an important factor for your wire wrapped screen, go ahead and set your standard high.

*Delta Screens, Setting the New Standard.*

OUR QUALITY COMES THROUGH  
www.deltascreens.com  
+1 (713)-856-0300
NOTES:

Your workshop badge gives you free access to the Global Petroleum Show and the C-Train (June 13-15).

Hunting Energy Services

- Premium Connections for Drilling and Completions
- VIT Supplier
- Full Manufacturing Facility
- Complete Field Services

www.huntingplc.com
1-888-773-0334
Upcoming SPE Canada Events and Training

Events

**SPE Workshop: Production Forecasting for Heavy Oil and Unconventional Resources**
26–27 Sep 2017 | Calgary, Alberta

**SPE Workshop: The Duvernay Liquids Rich Shale - What Makes it Different and How Do We Optimize It?**
18 Oct 2017 | Calgary, Alberta

**SPE Workshop: Well Integrity Life Cycle Management for Subsea Field Development**
24–25 Oct 2017 | St. John’s, Newfoundland

**SPE Workshop: Unlocking the Montney, Success Through Change**
7–8 Nov 2017 | Calgary, Alberta

**SPE Thermal Well Integrity and Design Symposium**
28–30 Nov 2017 | Banff, Alberta

**SPE Canada Co-located Unconventional Resources and Heavy Oil Technical Conference & Exhibition**
13–14 Mar 2018 | Calgary, Alberta

Training Courses

**Fracturing Fundamentals for Non-Fracers – Instructor: Carl Mongomery**
19 Jun 2017 | St Johns, Newfoundland

**Evaluation of Canadian Oil and Gas Properties**
19–23 Jun 2017 | Sproule Academy, Calgary, Alberta

**Evaluation of Canadian Oil and Gas Properties**
11–15 Sep 2017 | Sproule Academy, Calgary, Alberta

**Toe-to-Heel Air Injection (THAI) - A Promising In-Situ Combustion Emerging Technology Instructor: Alex Turta**
15 Sep 2017 | Calgary, Alberta, Canada

**Evaluation of Canadian Oil and Gas Properties**
23–27 Oct 2017 | Sproule Academy, Calgary, Alberta

**Unconventional Resource Assessment and Valuation – Instructor: James Gouveia**
30 Oct–3 Nov 2017 | Calgary, Alberta, Canada