SPE Thermal Well Integrity and Design Symposium

27–29 November 2018 | The Fairmont Banff Springs | Banff, Alberta, Canada

Corporate Sponsor:
Variperm CANADA LIMITED
Welcome to the SPE Thermal Well Integrity and Design Symposium

In the tightening economic window our industry is facing, effective thermal well design and integrity has never been more critical than it is today. It is paramount that well integrity is considered throughout the entire life cycle of a well, from its initial design to abandonment. Making smart technical decisions related to well design is crucial and can have a significant impact on well integrity, well longevity, and project economics. Well Integrity Management Systems (WIMS) can assist with these challenges, provided that they are structured as much more than dashboards and data management tools. WIMS that include technical, operational, and organizational processes assist thermal operators in ensuring that well integrity is at the forefront and diligently managed throughout the well life cycle through proactive risk management.

Well construction and servicing in thermal assets has evolved from large-scale greenfield projects to brownfield projects requiring innovative re-entry and infill well trajectories and completion designs. Thermal well design requires consideration not only to the initial well construction phase but also into production operations, especially during transient conditions such as startup, restart, shut-in, and changing reservoir/geomechanical conditions. Sand control design and production optimization are key focuses. The industry is also faced with the challenge of repurposing wells to extend their service life and address well integrity conditions at the end of life. This calls for innovative technology and often engaging discussions with local regulators to take steps to ensure that well integrity and compliance to regulations are maintained.

Through the progression of new technology and practical sharing of ideas among participants of this year’s symposium, collectively as an industry we will take steps to improve the collective recovery, efficiency, and longevity of existing and planned thermal wells. Join your fellow SPE members and experts in the global thermal in-situ community at this Symposium as they share the latest in thermal well design practices and well integrity solutions at this year’s 2018 SPE Thermal Well Integrity and Design Symposium.

Thank You To Our Sponsors

Corporate & Bowling:

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Bronze Partner: Quantum Completions Systems

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## COMMITTEE MEMBERS

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- **Wendy Akins**
  - Nexen Energy ULC

**Symposium Vice Chairperson**
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  - Codeco Oilsands Engineering

**Isaac Khallad**
- ConocoPhillips Canada

**John Krener**
- Chevron

**Juan Pablo Martin**
- Tenaris

**Raina May**
- MEG Energy

**Trent Pehlke**
- Suncor Energy Inc.

**Ian Peleshok**
- Alberta Energy Regulator

**Uliana Romanova**
- Baker Hughes, a GE Company

**Jesse Stevenson**
- Variperm Canada Ltd.

**Colby Sutton**
- RGL Reservoir Management Inc.

**Blair Temple**
- Imperial Oil Resources Ltd.

**Bruce Thornton**
- Osum Oil Sands Corporation

**Gina Wozney**
- GRW Engineering

**Todd Zahacy**
- C-FER Technologies

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**In Lieu of Speaker and Committee Gifts...**

On behalf of the Program Committee and Symposium speakers, SPE Canada is pleased to make a donation of **$1000** to Inn From the Cold. Inn From the Cold provides shelter, sanctuary, and healing to assist homeless children and their families achieve independence. Since the beginning of 2018, they have provided care to over 500 children experiencing homelessness.

For more information about the charity, visit: [http://innfromthecold.org](http://innfromthecold.org)
Schedule Overview

**TUESDAY, 27 NOVEMBER**

0700–0800 | Registration  
*Van Horne Foyer*

**Sponsored by:**  
*Breakfast  
*Van Horne C*

0800–0810 | Opening Remarks  
*Van Horne A*

0810–0930 | Session 1: Opening Keynote Session  
*Van Horne A*

0930–1000 | Coffee Break and Exhibition  
*Coffee Break Sponsored by:  
*Van Horne B*

1000–1130 | Session 2: Casing and Connection Integrity and Design  
*Van Horne A*

1130–1300 | Lunch & Exhibition  
*Van Horne B/C*

1300–1430 | Session 3: Diagnostics and Well Integrity Remediation and Repairs  
*Van Horne A*

1430–1500 | Coffee Break, e-Poster and Exhibition  
*Coffee Break Sponsored by:  
*Van Horne B/Foyer*

1500–1630 | Session 4: Cement Design  
*Van Horne A*

1630–1830 | Networking Reception  
*Van Horne B*

1930–2130 | Bowling Social Event*  
*Sponsored by:  
*Banff Bowling & Entertainment Centre*

*Please note: This is a ticketed sold out event. Tickets purchased are in the back of your badge.

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**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 symposium 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 2.45 CEU’s. One CEU equals 8 contact hours of participation. CEUs will be awarded through SPE Professional Development for participation and completion of SPE symposium. A permanent record of a participant’s involvement and awarding of CEUs will be maintained by SPE.

**Proceedings**  
Technical papers will be published. A digital Proceedings card giving online access to papers is included in registration prices. Non-paperced presentations, approved for release, will be shared after the Symposium.

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

**Photography and Recording Policy**  
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.

**Symposium Format**  
Symposiums maximize the exchange of ideas among attendees and presenters through technical presentations followed by extended Q&A. Focused topics attract an informed audience eager to discuss issues critical to advancing both technology and best practices. There is a combination of papers and invited presentations which can take the form of case studies, best practices and technology reviews highlighting engineering achievements and lessons learned. In order to stimulate frank discussion members of the press are not invited to attend.
WEDNESDAY, 28 NOVEMBER

0700–0800 | Registration
Foyer
Sponsored by: Variperm

Breakfast
Van Horne C

0800–0930 | Session 5: Flow Control Devices and Sand Control I
Van Horne A

0930–1000 | Coffee Break, e-Posters and Exhibition
Van Horne B/Foyer

1000–1130 | Session 6: Completions – SAGD and Beyond
Van Horne A

1130–1300 | Lunch & Exhibition
Lunch Sponsored by: CSTL
Van Horne B/C

1300–1430 | Panel Discussion – Tapping into the Resource
Van Horne A

1430–1500 | Coffee Break, e-Posters and Exhibition
Van Horne B/Foyer

1500–1700 | Breakout Sessions 1-3
#1: Operating Practices – $$$ and Sense
Sir Edward Beatty
#2: Wellbore Cleanouts and Remediation – When Do You Give Up?
Baron Shaughnessy
#3: Identifying the Risks Associated with Longer Lateral Well Designs and Operations
Van Horne A

THURSDAY, 29 NOVEMBER

0700–0800 | Registration
Foyer
Sponsored by: Variperm

Breakfast
Van Horne C

0800–1000 | Session 7: Flow Control Devices and Sand Control II
Van Horne A

1000–1030 | Coffee Break, e-Posters and Exhibition
Van Horne B/Foyer

1030–1200 | Session 8: Thermal Liner Design and Integrity
Van Horne A

1200–1300 | Lunch & Exhibition
Van Horne B/C

1300–1430 | Session 9: Well Design for Production Optimization
Van Horne A

1430–1500 | Coffee Break, e-Posters and Exhibits
Van Horne B/Foyer

1500–1630 | Session 10: Determining the Impact of the SAGD Process on Well Integrity
Van Horne A

27–29 November 2018
Fairmont Banff Springs
Banff, Alberta, Canada
0800–0930 | Van Horne A
Session 01: Opening Keynote Session - Drilling into the Problem... Injecting Life Back into Alberta and Producing a Better Future
Moderators: Wendy Akins, Nexen Energy ULC; Doug Hollies, Codeco Oilsands Engineering
Speakers: Darcy Spady, 2018 SPE International President, Broadview Energy Asset Management
Stephen Arseniuk, Senior Technical Advisor, Canada’s Oil Sands Innovation Alliance (COSIA)
Bryan Helfenbaum, Executive Director of Advanced Hydrocarbons, Alberta Innovates

0930–1000 | Coffee Break & Exhibition
Van Horne B

1000–1130 | Van Horne A
Session 02: Casing and Connection Integrity and Design
Session Chairpersons: Barkim Demirdal, Devon Energy; Bruce Thornton, Osum Oil Sands Corporation

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<tr>
<td>1000-1030</td>
<td>193359</td>
<td>Structural Reliability Study of OCTG Casing and Connections for Thermal Wells</td>
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<td>S.M. Khan, A. Hamilton, EVRAZ NA</td>
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<td>1030-1100</td>
<td>193361</td>
<td>Post Yield Strain Fatigue Experiments to Validate Low Cycle Methodology</td>
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<td>for Tubular and Connections</td>
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<td>S. Krishna, R.M. Krishnamurthy, R. Milligan, K. George, Blade Energy</td>
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<td>Partners; J.V. Krener, J.P. Powers, Chevron ETC</td>
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<td>1100-1130</td>
<td>193363</td>
<td>Unified Basis for Thermal Casing/ Connection System Design</td>
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1130–1300 | Lunch & Exhibition | Van Horne B/C

1300–1430 | Van Horne A
Session 03: Diagnostics and Well Integrity Remediation and Repairs
Session Chairpersons: Linda Blair, EVRAZ NA; Ian Peleshok, Alberta Energy Regulator

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<tr>
<td>1300-1330</td>
<td>193362</td>
<td>SAGD Production Casing Failure Diagnosis and Repair</td>
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<td>W.L. Plaxton, T. Pehlke, D. Baxter, M. Crockett, Suncor Energy Inc.; T.M.</td>
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<td>Kaiser, Noetic Engineering 2008 Inc.</td>
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<td>1330-1400</td>
<td>Invited</td>
<td>Composite External Wrap Repair</td>
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<td>Presenter</td>
<td>B.W. Temple, Imperial Oil Resources Ltd.</td>
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<td>1400-1430</td>
<td>193346</td>
<td>Three-stage SAGD Liner Intervention to Remediate a Liner System Using</td>
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<td>Concentric Coiled Tubing Jet Pump Technology</td>
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<td>S.T. Winkler, G. Luebke, Quantum Downhole Systems Inc.; C. Jensen, Scribe</td>
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<td>Solutions; R. Cross, West Rock Energy Consultants Ltd.; T. Bradshaw, Connacher</td>
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<td>Oil and Gas Ltd.</td>
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1430–1500 | Coffee Break, e-Posters and Exhibition
Van Horne B

1430–1500 | Foyer
e-Poster Schedule

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<tr>
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<tr>
<td>193374</td>
<td>Increase Exposed Bitumen Reserves by Optimizing Wellbore Placement in Oil</td>
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<td>Sands with Extra-Deep Azimuthal Resistivity LWD Service</td>
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<td>A. Vetsak, Baker Hughes GE Canada; B. Jablonski, Formerly of Statoil Canada</td>
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<td>193368</td>
<td>CT Diagnosis of Well Trajectory and Completion Decision Guidance for SAGD</td>
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<td>Paired Horizontal Wells</td>
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<td></td>
<td>X. Chen, S. Sun, D. Tong, Liaohe Oilfield Company of Petrochina</td>
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</tbody>
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Technical Agenda | TUESDAY, 27 NOVEMBER

1500–1630 | Van Horne A
Session 04: Cement Design
Session Chairpersons: Mark Chartier, Noetic Engineering Inc.; Raina May, MEG Energy

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<tr>
<th>Time</th>
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<tr>
<td>1500-1530</td>
<td>Invited Presenter</td>
<td>Learnings with Intermediate Cementing on SAGD Wells H. Zafar, Nexen Energy ULC</td>
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<tr>
<td>1600-1630</td>
<td>Invited Presenter</td>
<td>Thermal Cement Designs and Effects on Properties for Thermal Stimulated Wells K. Soucy, A. Trebilco, Magnum Cementing Services</td>
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1630–1830 | Networking Reception | Van Horne B

1930-2130 | Bowling Social Event* | Banff Bowling & Entertainment Centre

Sponsored by:

* Please note: This is a ticketed sold out event. Tickets purchased are in the back of your badge.

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<tr>
<th>Time</th>
<th>Paper #</th>
<th>Presentation</th>
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| 0800–0830  | Invited | Qualification and Implementation of an Erosion Resistant FCD for SAGD Producer Wells  
S. Thompson, Athabasca Oil Corporation; D. Zhu, RGL Reservoir Management Inc. |
| 0830–0900  | 193353  | Flow Control Devices in SAGD - A System-based Technology Solution            
L.H. Burke, Devon Energy; C.A. Ghazar, FORCE Reservoir Management               |
| 0900–0930  | 193370  | Material Selection for Thermal Inflow Control Device Manufacturing to Minimize the silica and calcium carbonate scaling potential  
X. Qiu, M. Pan, L. Gong, J. Huang, J. Luo, H. Zeng, University of Alberta; M. Mamhoudi, R. Sabbagh, V. Fattahpour, RGL Reservoir Management Inc. |

**Coffee Break, e-Posters and Exhibition**
Van Horne B

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<th>Time</th>
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| 1000–1030  | 193352  | Experience with the Vacuum Insulated Tubing (VIT) Utilization at Gas Fields in the Northern Part of Western Siberia  
A. Belomestnov, K. Marchenko, TMK; I. Melnikov, Gazprom                           |
| 1030–1100  | 193365  | Thermodynamic Analysis of a Modified Autonomous Flow Control Device for SAGD Sub-Cool Management  
M.R. Konopczynski, Tendeka Inc.                                                  |
| 1100–1130  | Invited | Vacuum Insulated Tubing (VIT)-Does It Work? Can the Additional Cost Be Justified?  
G. Wozney, GRW Engineering                                                        |

**Lunch & Exhibition**
Van Horne B/C

**Panel Session: Tapping into the Resource**
Moderators: Barkim Demirdal, Devon Energy; Trent Pehlke, Suncor Energy Inc.

A thought provoking session where you can ask the “Experts” on all things related to thermal well integrity and design. Our panel has an average of more than 25 years’ experience in CSS and SAGD and have likely seen whatever you have experienced, know what you are currently experiencing and can probably tell you what you are about to experience in your projects. Take this opportunity to tap into this valuable resource and learn from those that have been a part of insitu thermal projects in Canada since the early days of commercial development.

Panelists:
Russ Bacon, RMB Oilfield Consulting Ltd. (formerly Imperial)
Don Hennessey, Hennessey Consulting (formerly AER)
Doug Hollies, Codeco Oilsands Engineering
Clint Olmstead, ConocoPhillips Canada
Gina Wozney, GRW Engineering
Mirko Zatka, Canadian Natural Resources Ltd.
Technical Agenda | WEDNESDAY, 28 NOVEMBER

1430–1500 | Coffee Break, e-Posters and Exhibition
Van Horne B

1430–1500 | Foyer
e-Poster Schedule

193354 SAGD Circulation Phase: History-Match Field Data in Lloydminster Reservoir Using a Discretized Thermal Wellbore Modelling Simulator
D.A. Ayala Rivas, I.D. Gates, University of Calgary

193357 SAGD Circulation Phase: Thermal Efficiency Evaluation of Five Wellbore Completion Designs in Lloydminster Reservoir
D.A. Ayala Rivas, I.D. Gates, University of Calgary

1500–1700

Breakout Sessions

Break Out Option #1: Operating Practices – $$$ and Sense | Sir Edward Beatty

Moderators:
Ulana Romanova, Baker Hughes, A GE Company; Gina Wozney, GRW Engineering

Operating practices have a direct impact on the well integrity and longevity of thermal wells. Decisions about how to operate thermal wells also need to be based on well design, which is related to reservoir characteristics and production technology.

Well startup, and managing subcool and workover operations—in regards to potential well failures and project economics—are just a few aspects of operating practices to be discussed in this breakout session.

Break Out Option #2: Wellbore Cleanouts and Remediation – When Do You Give Up? | Baron Shaughnessy

Moderators:
Mark Chartier, Noetic Engineering 2008 Inc.; JJ Forsyth, Cenovus Energy; Jesse Stevenson, Variperm Canada Ltd.

Similar to other wells, thermal wells require workovers and maintenance tasks. However, due to the severity of the thermal service loads and the corresponding operating conditions, the wellbore maintenance frequency can be dramatically increased relative to the non-thermal arena. At some point in the well life, operational inefficiency and deteriorating economics start to play a role in the decision making process of “What to do next?” with a certain wellbore. Loss of sand control, wellbore deformations, corrosion issues, poor cement jobs (including surface casing vent flows), improper wellbore placement and poor recovery/injectivity can all become issues that dramatically increase the OPEX of a given well. When do you give up on a well and what do you do next? Re-drill? Re-enter? Abandon and walk away?

Break Out Option #3: Identifying the Risks Associated with Longer Lateral Well Designs and Operations

Moderators:
Doug Hollies, Codeco Oilsands Engineering; John Krener, Chevron; Colby Sutton, RGL Reservoir Management Inc.

As our industry continues to strive for performance and economic improvements, one area operators are pushing the limits for horizontal in-situ thermal development wells is the length of the lateral sections drilled.

There is a perception that longer wells should be more profitable through the reduction of the cost of surface equipment per meter of reservoir accessed. Whether this is true or not will depend on the effective design, execution and production life of these longer wells. The challenges of running longer completions in shallower SAGD fields and distributing steam in low operating pressure reservoirs are a few key concerns. Regardless of the technical challenges, when your project management team says drill further, completion and production teams need to be ready. Join this break out group to discuss design considerations, execution strategies, and operational tactics that are key factors for success with extending producer and injector laterals in thermal projects.
0800–1000 | Van Horne A

**Session 07: Flow Control Devices and Sand Control II**

**Session Chairpersons:** Trent Pehlke, Suncor Energy Inc.; Colby Sutton, RGL Reservoir Management Inc.

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<tr>
<td>0800–0830</td>
<td>Invited</td>
<td>Methodology for Flow Control Deployment</td>
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<td>A.S. Tuttle, Variperm Canada Ltd.</td>
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<td>0830–0900</td>
<td>193364</td>
<td>Optimization of Placement of Flow Control Devices under Geological Uncertainty</td>
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<td>in Steam Assisted Gravity Drainage</td>
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<td>S. Nejadi, S.M. Hubbard, R.J. Shor, J.J. Wang, I.D. Gates, University of Calgary</td>
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<td>0900–0930</td>
<td>193349</td>
<td>Staged, Risk-Based Approach for Assessing Erosion Resistance of SAGD Flow Control Devices</td>
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<td>S.S. Prasad, T.A. Zahacy, C-FER Technologies</td>
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<tr>
<td>0930–1000</td>
<td>Invited</td>
<td>Experience with Sand Control Methods at the Leismer SAGD Project</td>
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<td>M. Picone, S. Thompson, Athabasca Oil Corporation</td>
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1000–1030 | Coffee Break, e-Posters & Exhibition | Van Horne B/Foyer

1000–1030 | Foyer e-Poster Schedule

**193358** Visualisation of Fines Migration in the Flow Entering Apertures through the Near-wellbore Porous Media

S. Ansari, Y. Yusuf, D.S. Nobes, L. Kinsale, University of Alberta; R. Sabbagh, RGL Reservoir Management Inc.

**193335** Non-Magnetic Motors for Better Wellbore Placement

R. Quigg, Weatherford Canada Partnership

1100–1130 | 193355 | Standalone Sand Control Failure: The Role of Wellbore and Near Wellbore Hydro-Thermo-Chemical Phenomenon on the Plugging and the Flow Performance Impairments of the Standalone Sand Screen |


1130–1200 | 193356 | Addressing Thermal Loading Uncertainties for Liner Design |


1200–1300 | Lunch & Exhibition | Van Horne B/C

1300–1430 | Van Horne A

**Session 09: Well Design for Production Optimization**

**Session Chairpersons:** Blair Temple, Imperial Oil Resources Ltd.; Todd Zahacy, C-FER Technologies

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<tr>
<td>1300–1330</td>
<td>193372</td>
<td>Reducing Operational Cost and Accelerating Oil in a Thermal Field with Cyclic Steam Stimulation Operation in South Oman</td>
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<td>K.S. Mahrazy, A. Alwazeer, K. Salhi, Petroleum Development Oman</td>
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<tr>
<td>1330–1400</td>
<td>193366</td>
<td>An Experimental Investigation into the Sand Control and Flow Performance of the Remedial Tubing Deployed Scab Liners in Thermal Production</td>
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<td>V. Fattahpour, M. Roostaei, C. Sutton, M. Mahmoudi, B. Feranui, RGL Reservoir Management Inc., P. Nolan, Canadian Natural Resources Ltd.</td>
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<tr>
<td>1400–1430</td>
<td>Invited</td>
<td>High Resolution Downhole Imaging Technology to Collect Visual Information from Wells</td>
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<td>S. Robinson, DarkVision Technologies Inc.; T. Pehlke, Suncor Energy Inc.</td>
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Technical Agenda | THURSDAY, 29 NOVEMBER

1430–1500 | Coffee Break, e-Posters & Exhibition
Van Horne B/Foyer

1430–1500 | Foyer
e-Poster Schedule

193373  Casing Failure Using Machine Learning Algorithms: Five Case Studies
C. Noshi, S.F. Noynaert, J.J. Schubert, Texas A&M University

1500–1630 | Van Horne A
Session 10: Determining the Impact of the SAGD Process on Well Integrity
Session Chairpersons: John Krener, Chevron; Isaac Khallad, ConocoPhillips Canada

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<td>1500-1530</td>
<td>Invited</td>
<td>Modelling Cumulative Internal Corrosion in a SAGD Well</td>
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<td>1530-1600</td>
<td>Invited</td>
<td>Summary of PPS Liner Design: Changes to Address Strain Localization and Corrosion Concerns</td>
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<td>Presenter</td>
<td>R. Nekzad, Cenovus Energy</td>
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<td>1600-1630</td>
<td>Invited</td>
<td>Thermal Wells Surface Casing Vent Flow and Gas Migration – Regulatory Issues and Opportunities</td>
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<td>Presenter</td>
<td>B. Demirdal, Devon Energy</td>
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SANJEL ENERGY SERVICES is leading the Canadian Industry with in-depth experience and commitment to technological innovations & performance. We bring over 20 years of research in Thermal applications, and have over a century of cumulative experience providing success in well integrity.

ATTEND THE SEMINAR:
S.S. Iremonger* & J. Taylor, Sanjel Energy Services will be presenting their paper: Design and Application of a New High Performance Lightweight Thermal Cement.

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### SPE Canada Upcoming Events

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<tr>
<td>26–27 Feb 2019</td>
<td>SPE Workshop: Subsurface Data Analytics</td>
<td>Calgary, Alberta</td>
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<tr>
<td>16 April 2019</td>
<td>SPE/CHOA Slugging it Out Conference</td>
<td>Calgary, Alberta</td>
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<tr>
<td>May 2019</td>
<td>SPE Workshop: PRMS/Reserves</td>
<td>Calgary, Alberta</td>
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<tr>
<td>11–12 June 2019</td>
<td>SPE Workshop: Using Instrumentation and Data to Optimize Thermal Operations</td>
<td>Calgary, Alberta</td>
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<tr>
<td>30 Sep - 2 Oct 2019</td>
<td>SPE Annual Technical Conference and Exhibition</td>
<td>Calgary, Alberta</td>
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### Don’t let your SPE member benefits run dry.

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