Why should you attend?

- Learn the geological characteristics of CSG/CBM and the fundamental factors that determine the commercial potential of a particular play
- Recognise the objectives, timing and costs required for the various stages of exploration, pilot testing and development
- Review the unique characteristics, challenges and key lessons learned for each commercial CSG/CBM basin in Australia and in North America
- Understand the unique lab data required for CSG/CBM evaluations and the common measurement errors and mistakes in lab data interpretation
- Become familiar with the drilling and completion options for CSG/CBM and their impact on productivity and ultimate recovery
- Review the life-cycle of CSG/CBM wells and the different methods, and common errors, involved in forecasting production for each cycle
- Learn what technical processes and tools are applied to designing and evaluating the effectiveness and impacts of hydraulic fracturing
- Review the benefits and limitations of the five different categories of computer simulation models
- Gain an understanding of the current development trends and emerging technology
- To better appreciate water management and environmental issues pertaining to CSG/CBM

For further information, please visit [http://www.spe.org/training/courses.php](http://www.spe.org/training/courses.php) or call +60.3.2182.3000
Course Description

This four-day course will begin with the reservoir characterisation process then proceed to techniques for calculating water and gas volumes and recovery factors from either existing production data, exploration data or pilot well data. Special emphasis will be placed on the methods unique to CSG/CBM, as compared to conventional gas reservoirs. Techniques will also be presented on identifying sweet spots, optimising drilling and completion methods, maximising reserve bookings, and identifying work-over opportunities. The technical level will increase as the course proceeds but the starting assumption is that all attendees are already involved or trained in evaluating CSG/CBM or other gas reservoirs.

The process of drilling wells into coal seams for commercial gas development has been tested around the world and in some cases it has been very successful. This process has been referred to as CBM, CSM, CSG or CMM development but no matter the name, the process must be adapted to account for the unique coal characteristics and economic drivers found in each basin.

Who Should Attend?

Engineers, geologists, managers, consultants, technical support staff and service providers wanting to learn more about the unique methods for evaluating CSG/CBM development.

About Your Course Instructor

Steve Hennings, M.S., P.E. is the Principal Engineer for Source Rock Engineering, in Littleton, Colorado. He is a registered professional engineer and holds a Bachelors degree in Petroleum Engineering and a Masters degree in Finance. His 30 years of experience are spread between reservoir, completions and production engineering assignments ranging from rig foreman to computer simulation specialist to regional technical coordinator. He has field and reservoir experience in a large number of basins, covering every phase of exploration and development. His focus for the past ten years has been exclusively on developing Coal Gas, Tight Oil and Shale reservoirs in the United States, Canada, Australia, China, India and other countries. Occasionally he also conducts courses for the SPE to share lessons learned from his ongoing participation in unconventional reservoir development. These courses are listed in the SPE Training Catalogue and include “Shale and Tight Oil Evaluation and Development”, “Coalbed Methane Reservoir Analysis” and “Shale Hydraulic fracturing: Design and Analysis”.

Hennings is a member of the Society of Petroleum Engineers, Rocky Mountain Association of Geologists, and the Society of Mining Engineers. In 2008 he shared the prestigious annual Stefanko Award for his technical contributions.

Scott Thomson, B.Sc., M.Sc., M.B.A., Managing Director of CoalBed Energy Consultant. Scott has more than 35 years of experience in resource assessment, coal seam geology, gas, exploration, and the practical application of geophysics. He has worked as a private consultant in the resource industry since 1998 specialising in coal seam gas and technology development. Previously Scott managed several small service businesses in addition to being involved in the development of advanced geological, drilling, and geophysical technologies.

Over the past ten years Scott has focused on private consulting and research activities related to the developing CSG industry, and coal mine methane, geology, and drilling technology.

Scott is a graduate of the University of Newcastle, University of New England, and Deakin University. In 2008 he shared the prestigious annual Stefanko award for presenting and co-authoring “A Petroleum Industry Approach to Coal Mine Gas Drainage”.

Scott conducts CSG training for the international Society of Petroleum Engineers and also frequently provides private training for several Australian CSG operators.

CEUs

Engineers are responsible for enhancing their professional competence throughout their careers. Licensed, chartered, and/or certified engineers are sometimes required by government entities to provide proof of continued professional development and training. Training credits are defined as Continuing Education Units (CEUs) or Professional Development Hours (PDH).

Attendees of SPE training courses earn 0.8 CEUs for each day of training. We provide each attendee a certificate upon completion of the training course.
Day One

Geological Overview and Fundamentals
- CSG/CBM development history
- Key geologic properties
- Storage of gas in coal: The Adsorption Isotherm
- Gas storage measurements from core
- Primary and secondary reservoir characteristics
- Data sources and terms unique to CSG/CBM
- Designing an exploration program
- Key geologic differences between existing commercial plays

Water management and environmental issues
- Water handling and disposal of CSM
- Providing health and safety solution
- Ideas and development of making carbon based energy green

Day Two

Resource Assessment
- Resource volumetric calculations
- Adjusting for gas saturation: Gas Contents from Core
- Common mistakes in core analysis
- Verifying gas saturation through field testing
- Determining net pay from electric logs
- Common mistakes in log analysis
- Calculating total maximum gas recovery
- Production characteristics
- Reserve guidelines
- Transitioning from resource to reserve volumes
- Understanding and estimating coal permeability

Day Three

Completion and Development
- Designing a pilot development program
- Coal damage mechanisms
- Well design options
- Selecting a well design
- Horizontal well considerations
- Evaluating horizontal wells
- Damage mechanisms

Day Four

Reservoir and Production Engineering
- Production techniques and strategies
- Correlating well performance to geology and well design
- Lineament and flexure analysis
- Types of well tests
- Common mistakes in well test analysis
- Reservoir performance analysis techniques
- Constructing type curves
- Decline curve analysis
- Designing computer simulation for different objectives
- Data requirements for computer simulation
- Class examples: Gas resource and production rate calculations
- Due diligence
- Development strategies and timelines

DAILY TRAINING SCHEDULE

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 8:30 a.m.</td>
<td>Registration Opens</td>
</tr>
<tr>
<td>8:30 - 9:00 a.m.</td>
<td>Welcome Coffee and Tea</td>
</tr>
<tr>
<td>9:00 - 10:30 a.m.</td>
<td>Training Session</td>
</tr>
<tr>
<td>10:30 - 10:45 p.m.</td>
<td>Coffee Break &amp; Discussion</td>
</tr>
<tr>
<td>10:45 - 13:00 p.m.</td>
<td>Training Session</td>
</tr>
<tr>
<td>13:00 - 14:00 p.m.</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>14:00 - 15:15 p.m.</td>
<td>Training Session</td>
</tr>
<tr>
<td>15:15 - 15:30 p.m.</td>
<td>Coffee Break &amp; Discussion</td>
</tr>
<tr>
<td>15:30 - 17:00 p.m.</td>
<td>Training Session</td>
</tr>
</tbody>
</table>
Advanced Reservoir Engineering for CSG/CBM
29 April – 2 May 2013 | Hilton Brisbane, Queensland, Australia

Registration Form

Date: _____________________________________  
Member No: ________________________________________
First Name: ___________________________________  
Last Name: ________________________________________
Company: _______________________________________  
Job Title: ________________________________________
Address: ________________________________________________________________________________  
Town/City: __________________________  
Country: ___________________  
Postal Code: ____________________________
Telephone No: ____________________________  
Email: ______________________________________

Registration Fees: (Please select appropriate box)

<table>
<thead>
<tr>
<th>Early Bird Registration On/Before 28 March 2014</th>
<th>Registration After 28 March 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPE Member</td>
<td>☐ US$ 3,700.00</td>
</tr>
<tr>
<td>Non-SPE Member</td>
<td>☐ US$ 3,800.00</td>
</tr>
</tbody>
</table>

- Registration Deadline: 15th April 2014
- Fee includes course registration, workbook with training materials, 4 luncheons and daily coffee breaks
- If attendance is not sufficient for the course by 28 March 2014, SPE reserves the right to cancel the course

Payment By Cheque
☐ U.S. Dollars Cheque to Society of Petroleum Engineers  
☐ Payment Enclosed (Check No. ______________________)

Payment By Credit Card
Credit Card Payment will be in U.S. Dollars only
☐ American Express  
☐ Master Card  
☐ Visa  
☐ Diners Club

Card Number: ____________________________  
Expiration Date (mm/yy): ______________________

Security Code (3 digit on back of card / 4 digit on the front of Amex): ______________________

Credit Card Billing Address & Zip/Postal Code: ____________________________________________________________________________

Name of Card Holder Signature: ____________________________  
Note: Forms will not be processed and space cannot be guaranteed unless accompanied by payment for total amount

Cancelation Policy
a) A processing fee of US$150.00 will be charged for cancellation received before 15th April 2014.
b) Cancellation received after 15th April 2014, a 25% refund will be made to the registrant.
c) No refund on cancellation received seven (7) days, 15th April 2014, prior to the starting of the Course date.
d) No refund will be issued if a registrant fails to show up at the Training Course.

This form may be used as a company invoice
Mail completed registration form with remittance and any supporting material to:

Society of Petroleum Engineers  
Level 35, The Gardens South Tower,  
Mid Valley City, Lingkaran Syed Putra,  
59200 Kuala Lumpur, Malaysia  
Tel: 60.3.2182.3000 | Fax: 60.3.2182.3030  
E-mail: trainingapac@spe.org

*For group booking, please contact us at trainingapac@spe.org

For further information, please visit http://www.spe.org/training/courses.php or call +60.3.2182.3000
Society of Petroleum Engineers

Visit us online at www.spe.org/training

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- SPE conferences and workshops
- Local SPE sections
- Other major cities

Contact Us
If you have an active role in choosing training for yourself, your company, or others and would like more information about SPE's training program, contact us at trainingapac@spe.org

For further information, please visit http://www.spe.org/training/courses.php or call +60.3.2182.3000

What are the benefits of becoming an SPE Member?

- Belong to a network of 110,000 professional members in 141 countries
- Discounted member registration to conferences, workshops, and courses with direct access to innovative technologies, technical knowledge and interaction with worldwide industry professionals
- Special pricing on books and subscriptions to SPE periodicals
- Access to OnePetro, one of the industry's largest online technical libraries with more than 90,000 technical documents from multiple professional societies
- Opportunities to present technical papers in a journal or at a conference
- Leadership and volunteer opportunities helping members build industry relationships though service to the society
- A Career Center with tools aiding members with continuous development of new skills
- Enhance your career with various programs, including eMentoring, Distinguished Lecturer, Training Courses and online communities