SPE International
Society of Petroleum Engineers

SPE workshop

Efficient Waterflood – Exploring Strategies for Optimisation and Enhanced Recovery

23 – 24 JULY 2019
BANDAR SERI BEGAWAN, BRUNEI DARUSSALAM

Waterflooding oil wells, with the combination of technology, method advancement and intervention, have been utilised by the industry for decades. This holistic approach can be applied successfully and efficiently with close integration of subsurface ad surface teams.

This workshop focuses on designing and managing efficient waterflood techniques and strategies for field optimisation while increasing recovery and reducing costs. Subject matter experts and experienced professionals will share success stories, surveillance strategies, intervention planning programmes, new technologies for improved oil recovery, and methods for facilitating waterflood management.

Session Highlights

- Breaking Boundaries
- Designing a Waterflood
- Effective Waterflood Surveillance Management
- Optimising Data for Improved Waterflood Management
- Fixing Well Issues with Water Injection Methods
- New Technologies Beyond Waterflood
- Special Case Studies

GROUP REGISTRATIONS AVAILABLE!
Contact us at spekl@spe.org to arrange your group.

go.spe.org/20WA02W

SIGN UP BEFORE 31 May 2019 FOR SUPER EARLY BIRD DISCOUNT!

Who Should Attend

Industry professionals in the following areas:

- Asset Management
- Data Management
- Field Development Planning
- Geoscience
- Petroleum Engineering
- Production Chemistry
- Production Engineering and Technology
- Production Surveillance and Operations
- Wells Engineering

Technical Programme Committee

CO-CHAIRS

Andrew Parker
Petroleum Engineering Manager, Offshore East
Brunei Shell Petroleum

Pengiran Suraini Pengiran Haji Hashim
Business Opportunity Manager East Abandonment and PP Discipline Lead
Brunei Shell Petroleum

COMMITTEE MEMBERS

Dev Menon
General Manager
AWH International Logistics Sdn Bhd

Chua Ai Tieng
Reservoir Engineer
Brunei National Petroleum Company

Manish Kumar Choudhary
Senior Reservoir Engineer
Brunei Shell Petroleum

Waznah Ali
Reservoir Engineer
Brunei Shell Petroleum

Amiruddin Haji Abdi Manaf
Head of Exploration & New Opportunity
Ministry of Energy, Manpower and Industry

Aminuddin Mohammad
Principal Well Engineer
PETRONAS

M Nasir M Yunus
Head Drilling (Wells Management), Malaysia Petroleum Management
PETRONAS

Zahidah Md Zain
Principal Scientist (Reservoir Technology)/ Head (R&D Unconventional Technology)
PETRONAS Research Sdn Bhd

Sharifudin Salahudin
Managing Director
Sutera Energy Solutions

Radhakrishnan Karantharath
Global Reservoir Advisor
TGT Oilfield Services DMCC

Sergey Aristov
Product Technology Domain Champion
TGT Oilfield Services Sdn Bhd

Awgku Alizul Azahari Awgku Matali
Senior Reservoir Engineer
Vestigo Petroleum Sdn. Bhd.

Workshop Objectives

This workshop aims to foster cross-discipline knowledge sharing on waterflood management amongst operators and service companies, in a collaborative effort to achieve optimised field operations.

WORKSHOP STATISTICS

10+
hours of peer-to-peer networking opportunities

30+
hours of knowledge sharing and technical discussion

30
expert-led technical discussion topics

ATTENTION NON-MEMBERS: Join our worldwide membership!

Non-member full workshop attendees can join SPE at no additional cost. Look for your exclusive offer by email shortly after the event.

LEAGUE OF VOLUNTEERS

Engage • Support • Contribute

Join our league of dedicated members who provide the energy that makes our society work.

- Enhance your leadership skills
- Contribute to programmes and activities with your knowledge and experience
- Meet and network with members near you and around the globe
- Demonstrate thought leadership in your area of expertise and interest at both local and international levels

www.spe.org/volunteer

Contact us at volunteer@spe.org for more information

Technical Programme Preview

TUESDAY, 23 JULY 2019

0800 – 0850	Arrival of Delegates and Registration
0850 – 0900	Safety Announcement by Hotel
0900 – 1000	**Session 1: Opening Session** Co-chairs: Andrew Parker, **Brunei Shell Petroleum**; Pengiran Suraini Pengiran Haji Hashim, **Brunei Shell Petroleum**; Manish Kumar Choudhary, **Brunei Shell Petroleum**
1000 – 1030	Group Photo/Coffee and Tea Break
1030 – 1145	**Session 2: Breaking Boundaries** Session Managers: M Nasir M Yunus, **PETRONAS**; Amiruddin Haji Abdi Manaf, **Ministry of Energy, Manpower and Industry** This session focuses on the selection criteria for onshore and offshore waterflood, which had evolved with the availability of newer and cheaper water treatment systems and technologies. At the same time, practitioners will also look at parameters to ensure waterflood can be executed in a low oil price environment while covering the gas cap field reservoir quality. Other area which will be covered include local policies and requirements (how operators are involved), applications of industry standards, implementations of waterflood best practices and hydrocarbon recovery technologies.
1145 – 1245	Networking Luncheon
1245 – 1445	**Session 3: Designing a Waterflood** Session Managers: Manish Kumar Choudhary, **Brunei Shell Petroleum** This session covers the fundamentals involved in designing a waterflood for field implementation, and techniques used in mapping out inter-well connectivity via modelling techniques (seismic attributes, static and dynamic modelling) to actual field observation (i.e tracers, pressure transient analysis). Further examples will be shared on techniques for optimising well count and placement. This session focuses on the selection of injection modes (matrix vs. fracture mode), the importance of injection water quality, souring risks, and their planned mitigations. Presentations will discuss case studies or technical solutions related to a newer type of surface facilities (i.e. recycled facilities to rental infrastructure to low-cost developments), which can change the extent and design of waterflood in the field.
1445 – 1500	Coffee and Tea Break
1500 – 1700	**Session 4: Effective Waterflood Surveillance Management** Session Managers: Aminuddin Mohammad, **PETRONAS**; Dev Menon, **AWH International Logistics Sdn Bhd**

POSTER SOLICITATION & INFORMATION

All participants are encouraged to prepare a poster for the Workshop. Presentations on both research and field experience are welcomed. Posters, including unconfirmed / partial results, are to be presented at an assigned time and are open for discussion. Posters will be on display for the entire Workshop period.

When preparing your poster:
- Avoid commercialism. No mention of trademarks / product name
- Poster size should be approximately 0.8m x 1.2m (W x H) or size A0 in portrait layout
- Identify topic by title, affiliation, address, and phone number
- Include a brief abstract that summarises the technology to be addressed
- Make the display as self-explanatory as possible
- Place the information in sequence: beginning with the main idea or problem, method used, results, etc. (Draw a plan keeping the size and number of illustrations in mind)
- Keep illustrations simple by using charts, graphs, drawings, and pictures to create interest and visually explain a point
- Use contrasting colours
- Use large print for narrative materials. (We suggest a minimum of 24 points or 3" high letters for the title)

*Note that the Workshop Programme Committee will review all poster abstracts / materials prior to display, and reserves the right to refuse permission to display any poster considered to be commercial in nature. If you are interested to participate, please email your proposed topic with a short abstract (between 200-300 words) to **Hanna-Rose Abdul Jalil** at **hajalil@spe.org** by **31 May 2019**.

The Society of Petroleum Engineers (SPE) is a not-for-profit organisation. Income from this event will be invested back into SPE to support many other Society programmes. When you attend an SPE event, you help provide even more opportunities for industry professionals to enhance their technical and professional competence. Scholarships, certification, the Distinguished Lecturer programmes, and SPE's energy education programmes Energy4me are just a few examples of programmes that are supported by SPE.

Waterflood surveillance provides a comprehension of reservoir behaviours and identifies opportunities to improve oil recovery. It is an iterative process of reservoir performance improvement through continuous monitoring, modelling, data analysis, and utilisation of new technologies. Effective surveillance management and industry best practices will help operators closely monitor and proactively act to minimise decline rate. What are the surveillance techniques currently available and key lessons learnt by the operators? What and how do we monitor so that we can prolong production life and assure optimum results throughout?

1700 – 1900 **Session 5: Optimising Data for Improved Waterflood Management**

Session Managers: Chua Ai Tieng, **Brunei National Petroleum Company**; Waznah Ali, **Brunei Shell Petroleum**

In this digital age with rapid advancement in technology, a vast amount of information is readily available and easily accessible. It is even more important that data is managed, stored, and used to its fullest potential. This session focuses on how data acquired is optimised for improved waterflooding management, with key focus areas in:

- Development in data application for quality control
- Swift analysis
- Efficient visualisation to maximise hydrocarbon production
- Implementation of tools such as waterflood dashboards, voidage trackers, and what is used in souring prediction

1900 onwards Welcome Dinner

WEDNESDAY, 24 JULY 2019

0900 – 1100 **Session 6: Fixing Well Issues with Water Injection Methods**

Session Managers: Sharifudin Salahudin, **Sutera Energy Solutions**; Sergey Aristov, **TGT Oilfield Services Sdn Bhd**

Maintaining waterflood wells, both injectors and producers as well as facilities, are crucial to meeting the asset's production and injection goals. This requires effective surveillance and monitoring of the health of the entire system and intervening at a timely manner to fix problems encountered. The best way to resolve a problem is to avoid the problem, hence, the importance of surveillance and prediction. This session aims to discuss the monitoring and optimisation systems employed as well as common problems encountered and their remediation.

1115 – 1315 **Session 7: New Technologies Beyond Waterflood**

Session Managers: Zahidah Zain, **PETRONAS Research Sdn Bhd**; Radhakrishnan Karantharath; **TGT Oilfield Services DMCC**

Primary production usually only recovers around 15-20% of the oil in place. The recovery from secondary process using water injection, which is the most cost-effective mechanism, varies according to formation characteristics, and is usually in the range of 10-50% of the remaining oil in the reservoir. This greatly enhances the productivity and economics of field development. Exploration activities are decreasing due to extensive capital investment. The decline of new discoveries increased the focus to improve recovery from existing reservoirs. This session focuses on new technologies to improve recovery with waterflood and beyond, using innovative tertiary recovery mechanisms. Technologies to improve the sweep and displacement efficiency for enhancing recovery factor will be the focus in this session. Also, improved surveillance techniques to monitor the vertical/areal sweep efficiency, connectivity between the wells and displacement efficiency, which are the main influencing factors for improved recovery, will also be discussed.

1315 – 1415 Networking Luncheon

1415 – 1615 **Session 8: Special Case Studies**

Session Managers: Durrah Nafeesah Hj Idris, **Ministry of Energy, Manpower and Industry**; Awgku Alizul Azahari Awgku Matali, **Vestigo Petroleum Sdn. Bhd**

This session focuses on waterflood best practices and lessons learnt, such as design and execution case histories, including past performance with various success rates. Presentations on the implementation of new or emerging and reliable technologies such as artificial intelligence and digitisation will also be discussed. Attendees will benefit from lessons in waterflood management and intervention success stories, including the pre-defined waterflood strategies in the field development planning (FDP) to the field depletion strategy rejuvenation in late life.

1615 – 1630 Coffee and Tea Break

1630 – 1700 **Session 9: Open Discussion with Sli.do and Workshop Summary**

Co-Chairs: Andrew Parker, **Brunei Shell Petroleum**; Pengiran Suraini Pengiran Haji Hashim, **Brunei Shell Petroleum**

SPONSORSHIP SUPPORT INFORMATION

Sponsorship support of the event helps offset the cost of producing workshops and allows SPE to keep the attendance price within reach of operation-level individuals, those who benefit most from these technical workshops.

Supporters benefit both directly and indirectly by having their names associated with a specific workshop. While SPE prohibits any type of commercialism within the workshop room itself, the Society recognises that supporting companies offer valuable information to attendees outside the technical sessions.

SPONSORSHIP CATEGORIES

Sponsorship categories are offered on a first-come basis. Please contact SPE to enquire and verify the availability of categories. Existing supporters have the opportunity to renew the same level of support for annual workshops.

SPONSORSHIP BENEFITS

In addition to onsite recognition, SPE will recognise sponsors on the SPE website and in all printed materials for the workshop. Based on the category selected, supporting companies also receive logo visibility on promotional workshop items.

FOR MORE INFORMATION

For a detailed list of available sponsorship opportunities, including benefits and pricing, contact **Hanna-Rose Abdul Jalil** at **hajalil@spe.org** .

GENERAL INFORMATION

DOCUMENTATION

- Proceedings will not be published; therefore, formal papers and handouts are not expected from speakers.
- Work-in-progress, new ideas, and interesting projects are sought.
- Note-taking by attendees is encouraged. However, to ensure free and open discussions, no formal records will be kept.

WORKSHOP DELIVERABLES

- The committee will prepare a full report containing highlights of the Workshop and the report will be circulated to all attendees.
- Powerpoint presentations will be posted online and provided to attendees after the Workshop. Provision of the materials by Discussion Leaders will signify their permission for SPE to do so.

COMMERCIALISM

In keeping with the Workshop objectives and the SPE mission, excessive commercialism in posters or presentations is not permitted. Company logos must be limited to the title slide and used only to indicate the affiliation of the presenter.

ATTENDANCE CERTIFICATE

All attendees will receive a Workshop attendance certificate. This certificate will be provided in exchange for a complete Attendee Survey Form.

CONTINUING EDUCATION UNITS

This Workshop qualifies for SPE Continuing Education Units (CEU) at the rate of 0.1 CEU per hour of the Workshop.

TRAVEL/VISA

Attendees are advised to book their airline tickets early. All travellers must be in possession of passports valid for at least six (6) months with proof of onward passage. Contact your local travel agent for information on visa requirements.

DRESS CODE

Business casual clothing is recommended. The Workshop atmosphere is informal.

REGISTRATION FEE

- Registration fee ONLY includes all workshop sessions, coffee breaks and luncheons for the registrant.
- Accommodation is NOT included. SPE will provide details of recommended hotels upon receipt of your registration.
- Taxes: Registration Fees are made free and clear of, and without any deduction or withholding for and on account of, any taxes, duties or other deductions. Any such deduction or withholding, if required by the laws of any country are the sole responsibility of the Participant.

REGISTRATION POLICY

- Registration fee MUST be paid in advance for attending the Workshop.
- Full fixed fee is charged regardless of the length of time the registrant attends the Workshop, and cannot be prorated or reduced for anyone.

Principal Aspects of Water Flooding – From Water Source to Oil Export

22 July 2019 | Bandar Seri Begawan, Brunei Darussalam

Course Description

This one-day training course is designed to provide valuable insights into the waterflooding technique. Key themes, which will be discussed during the training course includes application, requirement and economics. Participants is expected to delve into technologies, processes involved, and obtain a broad understanding of the important role that each profession plays in a successful waterflood.

Participants will be shown relevant and real examples to demonstrate the components covered during this course. Content covered include:

- Evaluating the application of waterflooding
- The where, when, why and how of subsurface design
- Complexities of the delivery and specification of the injectant
- Monetising field value with waterflooding

Objectives

The key learning objective is for participants to obtain fundamental knowledge of the waterflooding process. In turn, this will prepare the participants for the corresponding SPE Workshop: Efficient Waterflood – Exploring Strategies for Optimisation and Enhanced Recovery.

Your Instructor

Andrew Parker is a Petroleum Engineer with over 30 years' experience working on a broad range of reservoirs, hydrocarbon types and recovery mechanisms for various companies (the last 18 years with Shell). His assignments have enabled him to live in Japan, Australia, Brunei, Egypt, and The Netherlands. He held positions including Petroleum Engineering Manager, Chemical EOR R&D Manager, Global Waterflood Consultant (within Shell), Field Development and Project Manager, Chief Reservoir Engineer, Consultant and Reservoir Engineer.

In relation to waterflooding, he has been involved in all aspects from the construction and commissioning of water treatment plants, design of floods and the operation and optimisation of floods both onshore and offshore. Andrew is an experienced trainer having given a significant number of courses globally within Shell and externally on the subject of Waterflooding and Chemical EOR.

Daily Technical Programme

MONDAY, 22 JULY 2019

0900 – 0930	Registration and Welcome Coffee and Tea
0930 – 1030	**Session 1: Introduction and Basic Principles** **Examining the subsurface and evaluate the application of waterflooding** • Depositional setting • Reservoir drive • Fluid properties • Operating pressure and voidage replacement
1030 – 1045	Coffee Break and Discussion
1045 – 1200	**Session 2: Flood Design and Water Chemistry** **The where, when, why and how of subsurface design** • "Drainability" vs "floodability" • Patterns and pattern development • Well completion and lifting strategies • Matrix or managed fracturing injection • Scaling
1200 – 1300	Networking Luncheon
1300 – 1515	**Session 3: Facilities Requirement** **Complexities of the delivery and specification of the injectant** • Water source selection • Determining injection water quality requirements • Example facility line-ups for sea water and produced water sources • Facilities walk through (photos of typical equipment)
1515 – 1530	Coffee Break and Discussion
1530 – 1700	**Session 4: Surveillance** **How to keep making money: Monetising field value with waterflooding** • Monitoring methods and requirements • Frac growth monitoring • Diagnostic tools • Flood optimisation • Surveillance for infill

REGISTRATION FORM

SPE WORKSHOP:

Efficient Waterflood – Exploring Strategies for Optimisation and Enhanced Recovery

23 – 24 July 2019 | Bandar Seri Begawan, Brunei Darussalam

Society of Petroleum Engineers

ATTENDEE INFORMATION

SPE Member	☐ Yes ☐ No	Membership Number	
First Name		Last Name/Family name	
Job Title			
Company Name			
Mailing Address			
City		State/Province	
Postal Code		Country	
Office Phone		Office Fax		Company URL	
Direct Line		Mobile Phone	
Email Address			

Do you wish to be considered a Discussion Leader (10-15 minutes presentation)? ☐ Yes ☐ No

If yes, please indicate the subject/topic on which you would like to present:

Please state your Technical Discipline (Select one ONLY):

☐ Completions ☐ Drilling ☐ Health, Safety and Environment ☐ Management and Information

☐ Production and Operations ☐ Reservoir ☐ Projects, Facilities and Construction

Please state your expectation for the Workshop, so that we can tailor a portion for the Workshop to answer attendees' concerns

I would like to receive updates on products, services and events from SPE. ☐ Yes ☐ No

If yes, your information will be used in accordance with SPE Privacy Policy and you can unsubscribe at any time by sending your request to spekl@spe.org.

REGISTRATION CATEGORY

Description		Fee Per Person			Tick (✓)	Amount (USD)
		Super Early Bird by 31 May	Early Bird by 21 June	Standard after 21 June		
Workshop and Training Course *22 – 24 July 2019*	Member	USD 1,960	USD 2,060	USD 2,160		
	Non-Member	USD 2,320	USD 2,420	USD 2,520		
Workshop ONLY *23 – 24 July 2019*	Member	USD 1,500	USD 1,600	USD 1,700		
	Non-Member	USD 1,700	USD 1,800	USD 1,900		
Training Course ONLY *22 July 2019*	Member	USD 500	USD 600	USD 700		
	Non-Member	USD 700	USD 800	USD 900		
					TOTAL AMOUNT (USD)	

TERMS & CONDITIONS

Registration Fee

- Fee includes workshop sessions, workbook, certificate, daily luncheons and coffee breaks.
- Fee DOES NOT include accommodation. SPE will provide details of recommended hotels upon receipt of your registration.
- Registration of participant will only be confirmed upon registration and receipt of full payment or an acceptable employer's letter of guarantee.
- All outstanding payments must be received on or prior to the date of the event for participants to be allowed to attend. SPE reserves the right to cancel the registration if no payment is received prior to or on the date of the event.
- Full fee is charged regardless of the length of time the Participant attends the event and cannot be pro-rated.

Taxes

- Fee are made free and clear of, and without any deduction or withholding for and on account of, any taxes, duties or other deductions. Any such deduction or withholding, if required by the laws of any country are the sole responsibility of the Participant.

Cancellation Policy

- A processing fee of USD150.00 will be charged for cancellation received thirty (30) days or more prior to the first day of the workshop.
- Registration cancelled between fifteen (15) days to twenty-nine (29) days prior to the first day of the event will be refunded 25% of the registration fees.
- Registration cancelled fourteen (14) days or less prior to the first day of the workshop will not be eligible for a refund.
- Participant who failed to attend will not be eligible for a refund.
- Cancellation must be notified in writing to SPE.

Privacy Policy

- SPE cares about the protection of your personal information. SPE's Privacy Policy describes your rights and choices regarding the personal information that you provide to us.
- SPE reserves the right to cancel a Training Course if number of participants is not sufficient. A minimum of 30 days' notice will be given.
- SPE's Privacy Policy describes the practices regarding how SPE, through its affiliated corporate entities, collects, uses, discloses, or transfers the personal information that you share with us or that we collect about you when you become an SPE member, attend one of our events or visit our websites, or use our mobile applications.
- Please visit our website at www.spe.org/about/privacypolicy.php for further details on SPE's Privacy Policy. We reserve the right to amend the SPE Privacy Policy at any time and will place the latest version on our website.

Disclaimer

- SPE reserves the right to change the speaker(s), date(s), venue or to cancel the event should circumstance beyond its control arises.
- SPE will not be liable to you for any damages, costs, losses or expenses of any kind incurred or suffered by you as a result of or in relation to SPE modifying, postponing or cancelling the event or any part of the event.
- The Participant acknowledges and agrees that by registering for this event, the Participant accepts these Terms and Conditions and agrees to be bound by them.

PAYMENT METHODS

☐ **Telegraphic Transfer**
Bank details will be provided in the invoice.

☐ **Credit Card**
SPE accepts American Express, Visa, MasterCard and Diners Club and payment will be processed in US Dollars only.

To pay online, go to:
www.spe.org/go/20wa02
For manual payment, you will receive an email with instruction on securely submitting your payment.

SPE Contact:
Society of Petroleum Engineers
Suite 12.01, Level 12, Menara IGB
Mid Valley City, Lingkaran Syed Putra
59200 Kuala Lumpur Malaysia
Tel: +60 3 2182 3000 Fax: +60 3 2182 3030
Email: spekl@spe.org

SIGN UP BEFORE 31 MAY 2019 FOR SUPER EARLY BIRD DISCOUNT!