

DEBORAH RYAN, P.E.
Partner
Senior Reservoir Engineer



MHA Petroleum Consultants LLC

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EDUCATION

- Masters of Petroleum Engineering, Curtin University of Technology, Perth, Australia, 2008
- Bachelor of Chemical Engineering, Curtin University of Technology, Perth, Australia, 2004
 - Graduated with Honors
 - 2004 GTL Prize for Best Design Project, and Research Project published for 2004 Biomass Conference in Glasgow, Scotland

PROFESSIONAL PROFILE

- Fourteen years of experience in oil and gas engineering
- Experience in conventional and unconventional reservoir engineering
- Excellent working knowledge of Petrel/Eclipse, CMG, Aries, Petroleum Experts, IHS Harmony, PVTsim and Microsoft Office Suite
- US Basin experience: DJ, Bakken, Powder River, Uinta, San Juan, Utica, Marcellus, Green River, Permian, Piceance, San Joaquin, Tuscaloosa, Black Warrior, Raton, Illinois
- International experience: United States, Australia, Libya, UK, Hungary, Belize, Ecuador, Mexico, China

WORK EXPERIENCE

MHA PETROLEUM CONSULTANTS, LLC: Denver, Colorado, U.S.A.

- (2018 – present) **Partner**
- (2012 - 2017) **Senior Reservoir Engineer**

Reserves & Resource Estimation: Responsible for reserves and resource estimates using empirical, analytical, and dynamic simulation techniques for conventional and/or unconventional reservoirs. Prepared reports under both SEC and PRMS guidelines

Field Development Planning: Experience building Petrel models using geostatistics to interpret geologic data and evaluate the hydrocarbon in place and dynamic simulation experience (Eclipse/CMG) to history match and create production forecasts for existing and new wells. Also experienced in uncertainty and probabilistic applications and theory.

Reservoir Engineering Support: Well test and pressure/rate transient analysis theory and application, PVT analysis and evaluation, creating lift curves for existing and new

wells. EOR design and assessment, including waterflood projects, CO2 and hydrocarbon gas injection and steam injection. Economic and technical recommendations for value-added projects which include: infill drilling, recompletions and improved recovery projects.

Spacing Hearings: Appeared as expert reservoir engineering witness for spacing hearings in Utah and Idaho.

- Utah (On behalf of Badlands Energy, Oct 2015, Cause # 139-135)

Teaching & Mentoring: Teaches conventional and unconventional reservoir engineering classes for PetroSkills (Reservoir Engineering for Other Disciplines, Unconventional Reserves and Resources Evaluation) Works with clients on project specific mentoring, either one on one, or in groups.

ARROW ENERGY: Brisbane, Queensland, Australia

- (2011 – 2012) **Senior Reservoir Engineer**

Responsible for delivery of the Phase 1 Curtis Island LNG Development, focusing mainly on coal seam gas simulation modeling, resources maturation planning and field development planning in the Surat Basin. Duties included uncertainty analysis conducted in Petrel/Eclipse; work with Development team to optimize and generate the most economic development; provide the RE input for the EIS submission for the upstream part of the LNG project; responsibility for delivering the Surat Basin HMP in conjunction with the exploration team and determination of the well numbers and testing requirements to support the field development planning and reduce the subsurface uncertainty.

- (2009 – 2010) **Reserves Engineer**

Served as the company focal point for reserves; responsible for management of external reserves certifiers; provided reserves recommendations to Executive Management based on SPE-PRMS reserves to support ASX announcements and annual reports. Worked with internal departments to collate all required data to support reserves certification. Provided Reserves and Reservoir Engineering support for Field Development Planning and LNG Feasibility study.

WOODSIDE ENERGY: Perth, Western Australia

- (2Q 2009) **Reservoir Engineer, Perth, Western Australia**
Laminaria-Corallina Development Team

Responsible for reserves and forecasting, dynamic simulation and history matching, support of infill drilling operations and optimizing production through infill drilling and reservoir management.

- (1Q 2009) **Petroleum Engineer, Tripoli, Libya**

Libya Development Team Responsible for well test and fluid sampling planning, and development well completion modeling in carbonate reservoir to support field development planning (Prosper and Eclipse). Basin PVT modeling and well test analysis reporting. Mentored Libyan nationals in Eclipse and PVT software packages.

- (3Q & 4Q 2008) **Reservoir Engineer, Perth, Western Australia**
Greater Western Flank Development Team (NWS)

Responsible for Lady Nora appraisal well planning and operations support. Planning of PVT program for gas fluid sampling and contingency planning for oil discovery. Successful implementation of gas, oil and water samples, with 34/35 successful pressure

points and 12/12 fluid samples, including a 10L dead oil sample after encountering oil column. Thin oil rim analogue and feasibility study and reserves evaluation following oil discovery, presented to JV partners.

- (2006 – 2008) **Graduate Petroleum Engineer**, Perth, Western Australia
Vincent Development Team Eclipse dynamic simulation to support well planning and forecasting; Co-ordinated Reservoir Management Plan prior to field start-up; PVT sampling analysis and characterization during both offshore operations and onshore support; Offshore work including support for horizontal geo-steering (with periscope) and water injector well injectivity tests; Offshore representative for development of well clean-up and facility start-up; Coil-tubing horizontal well intervention program into 2Km horizontal wells from a semi-sub to clean up the horizontal wells

PUBLICATIONS

- E. Lagendijk and D. Ryan. "From CSG to LNG: Modeling and Understand Key Subsurface Uncertainties for the Development of a Surat Basin Opportunity, in Queensland, Australia" CSUG/SPE 137651. Presented at the Canadian Unconventional Resources & International Petroleum Conference, Calgary, Alberta, Canada, October 2010.
- D. Savimaki (Ryan) and J.Seidle, An Assessment of Selected Rate-Decline Models for Horizontal Oil Wells in the Niobrara Formation, SPE 167011. Presented at the SPE Unconventional Resources Conference and Exhibition-Asia Pacific held in Brisbane Australia, 11-13 November 2013.