SENIOR CONSULTANT – PETROPHYSICIST

Mr. Smith is a development geologist and petrophysicist with over 41 years of experience in formation evaluation, field studies, petrophysical integration of subsurface data, acquisition and integration of routine and special core analysis, production log interpretation, and thin bed pay analysis. USA experience includes Permian Basin, Gulf of Mexico, California onshore, Wyoming, Louisiana, and North Dakota.

International experience acquired while working overseas in Egypt, Sharjah, Kuwait, Bahrain, Indonesia, and Trinidad and Tobago, West Indies. His responsibilities have included project management of reservoir modelling projects, core analysis projects, petrophysical assurance and guidance in well location and long term field development planning, and the coaching and mentoring of petrophysicists, geologists, and reservoir engineers in multi-cultural teams.

PROFESSIONAL EXPERIENCE

2013 to Present – Senior Consultant, International Reservoir Technologies, Inc. Lakewood, Colorado, USA

Since January of 2017, Mr. Smith has been providing the petrophysical support for the Almond tight gas sand reservoir study in the Trail Creek and Canyon Creek Units. The mature gas assets are part of Wexpro's fields in the Vermillion Basin in Southern Wyoming. He is part of a multidiscipline team to build a static and dynamic model to optimize future drilling locations and completion strategies.

Total Organic Carbon in the Permian Basin

Provided estimates of Total Organic Carbon (TOC) for Tensor Geophysical Systems (TGS) Permian Basin study using density log calibration via core measured TOC. Elimination of poor hole conditions allowed for linear best-fit equations for Bell Canyon-Brushy Canyon, Avalon Shale, Bone Springs, and Wolfcamp formations.

Abdali and Ratqa Zubair Field Study

Incorporate well log, core and production data into a reliable field wide porosity, permeability, and saturation models as part of the reservoir description used in the static model.

Raudhatain Zubair Field Study

Integrated well log, core and production data for consistent porosity, permeability, and saturation models used in the building of the RAZU static and dynamic models.

Bahrain Zone Petrophysical Study, Kingdom of Bahrain

A porosity and fluid saturation model was created in the Mauddud formation for over 450 wells within the Bahrain Field. A multi-mineral probabilistic model was used to track the movement of downdip crestal gas injection and updip water encroachment in a carbonate reservoir with macro, meso, and micro-porosity.

Sabriyah Zubair Field Study
New porosity and water saturation models were constructed in the Zubair and Ratawi reservoirs, consisting of both clastic and carbonate reservoirs. These models supplied the input for property modelling within a static model.

2012 to 2013 – Consulting Petrophysicist, Sedona, Arizona, USA

Mississippi Limestone Petrophysical Study
High Mount Exploration with porosity and water saturation analyses for 370 wells in NE Oklahoma

    Key Achievements:
- Ran multiple versions to assess porosity distribution within a fractured limestone reservoir.

Instructor for British Petroleum E-learning Thin Bed Pay Analysis
Co-taught nine online students (via the BP Learning Center) to recognize and characterize thin bed pay on logs using Thomas-Steiber technique for conventional logs (gamma ray and porosity) and Advanced Deterministic analyses for advanced logs (image, NMR, dipole sonic, multicomponent resistivity logs).

    *Key Achievements***:**
- Corrected and streamlined course lectures, handouts and exercises to improve course efficiency and learning.

1998 to 2011 - BP AMERICA

2010 to 2011 - Discipline Lead Petrophysicist, PORT of SPAIN, Trinidad, W. I.
Improved petrophysical screening, scoping, and assurance of resource opportunities created in Reservoir Management team. Ensured fit for purpose toolkits and workflows across asset teams and better subsurface formation evaluation and integration between multidiscipline teams. Influenced well planning and subsurface data acquisition with cost effective and new technology logging tools. Provided petrophysical assurance for yearly compliance and reserve reviews.

    Key Achievements:
- Completed a petrophysical model refresh for 220 wells in the offshore Columbus Basin, including new models for vshale, porosity, permeability, water saturation, and net pay.
- Lead the conversion of the existing Geolog petrophysical database to a Techlog database in 2010.
- Completed conversion of petrophysical modeling software (Vshale, Porosity, Permeability, Water Saturation, and Saturation Height function) from Geolog loglan scripts to Techlog python scripts.
- Provided petrophysical assurance for yearly compliance and reserve reviews.
- Assessment of hydrocarbon potential of offshore NCMA block 22 for lease sale.
- Develop the petrophysical skills of other National subsurface staff in the Trinidad office thru coaching and mentoring.
- Establish cross-border petrophysical hydrocarbon evaluation with PDVA for unitization agreement between Trinidad and Venezuela.
- Co-taught a Formation Evaluation course at University of West Indies and mentor several University of Trinidad and Tobago students completing their final year projects.

2009 - Senior Petrophysicist

Completed a full field petrophysical evaluation of Kapok field, a multiple fault block, multi-stacked pay sandstone reservoir located offshore near the border of Trinidad and Venezuela. Provided well by well net pay summation for 16 reservoirs.

Key Achievements:

- Created a more robust and consistent petrophysical interpretation across Kapok Field with new vshale, porosity, permeability, and water saturation models.
  Highlighted areas for further field development and provided identification of reservoirs with paleo-residual gas.
- Determined the petrophysical uncertainty associated for all petrophysical models.

2009 - Senior Petrophysicist, Houston, Texas, USA

Support new well delivery and petrophysical support for DC-142 and DC-121 operations and data acquisition plans.

Key Achievements:

- Implemented standardized multi-well log analysis and workflow in Geolog which allowed quicker updates and summation results in true vertical or true stratigraphic thickness analysis for the entire Atlantis Field

2008 - Senior Petrophysicist, TNK-BP, Tyumen, Russia

Advised Field Development Group for 3 months on future brown-field development for Bolshekhetskiy Fields. Project work included core acquisition and testing programs, waterflood performance, and petrophysical model assessment. Assignment terminated early due to TNK-BP termination.

2004 to 2008 - Senior Petrophysicist, KUWAIT

Seconded to Kuwait Oil Company (KOC) to lead the North Kuwait Field Development (NKFD) team in petrophysical data acquisition and interpretation projects being delivered to Sabriyah, Raudhatain, Ratqa and Abdali fields. Provide appropriate petrophysical assurance and guidance for subteam reservoir development meetings, such as well location decisions and long term development planning, through coaching and assisting KOC petrophysicists, geologists, and reservoir engineers within the NK Asset.

Key Achievements:

- Project Manager and delivered "Integrated Study, Design, and Construction of Raudhatain and Sabiriyah Mauddud Static and Dynamic Reservoir Models" project ($6.5 MM, 2 year project).
- Coordinated project deliverables, costs, and schedules for the RA-0211 Special Core Analysis to assess impact of asphaltene precipitation on oil production in the Zubair reservoir.
- Establishment of TDT log database and log presentation plots data to allow quick and efficient evaluation of water movement through the use of time-lapse TDT plots for Raudhatain field reservoirs.
- Initiated petrophysical team building and coaching of KOC staff with a field trip to local outcrops to review basic log response of clastic reservoirs and the layout of key reservoir cores.
- Updated reservoir description data (porosity, lithology, and water saturation) for Raudhatain Upper Burgan static model rebuild with the addition of a core calibrated net sand analysis.

2001 to 2004 - Senior Petrophysicist, INDONESIA

Provide Asset teams with petrophysical analysis and formation evaluation and interpretation support.

Coordinate future data acquisition of Offshore NW Java development drilling programs.

Key Achievements:
- Delivered Tangguh petrophysical model used in evaluation of the Vorwata Field development program, which included a sensitivity analysis of the previous porosity, permeability, and water saturation calculations, improved water salinity analysis in the aquifer and perched water legs, and better identification of residual gas above the water legs.

- Assisted with the planning and execution of subsurface data acquisition for the ONWJ development drilling campaign (six wells) in the first half of 2003. Significant tasks included pre-drill planning, pore pressure analysis, and real-time LWD logs to assist in drilling shallow gas zones safely, lower logging costs, and improve formation evaluation of the key target horizons.

- Provided real-time porosity, water saturation, and net pay calculations for two wells in the Bawean concession, which led to the cancellation of expensive testing and coring programs when hydrocarbons were not found.
- Contributed formation evaluation in the shallow, unconsolidated sands of Terang-Sirasun Field, which helped the team to revise reserves and extension of the production sharing concession.

1999 to 2001 - Staff Geologist, HOUSTON, Texas, USA
Member of a multi-discipline exploitation team responsible for drilling prospects on the high pressure, high temperature Tuscaloosa trend of Central Louisiana for the gas fields acquired from Chevron.

Key Achievements:
- Drilled seven consecutive deeper pool discoveries and undrilled offset fault blocks at Judge Digby Field, including one well that had the Louisiana state record initial production rate of 100 MSCFD.
- Reservoir petrophysics of vshale, porosity, and water saturation was used in mapping net pay trends and calculating per well hydrocarbon pore volumes to estimate per well reserves.

1978-1998   AMOCO PRODCUTION COMPANY

1998 to 1999 - Geological Manager of Exploitation, UAE
Responsible for inventory of prospects within and around the Sajaa Gas Field in Sharjah, UAE.

Key Achievements:
- Recommended drilling untested deeper gas pools below established gas reservoirs.

1991 to 1998 - Senior Geologist, EGYPT
Seconded to Gulf of Suez Petroleum Company as development geologist to work on various multi-discipline and prospect quality teams within the Gulf of Suez and Western Desert production sharing concessions.

Key Achievements:
- Recommended several downthrown Miocene clastic exploration prospects resulting in new discoveries adjacent to productive upthrown Premiocene (Nubia and Nezzazat fields) fault blocks adjacent to October Field.
- Recommended infill Nubia development wells and a new platform at October field to help maximize oil rates and improve sweep efficiency of peripheral water flood project.

1988 to 1991 - Exploitation Geologist/Petrophysicist, HOUSTON
Assigned to International Field Studies Group to evaluate development of oil fields.

Key Achievements:
- Established Nubia net pay parameters for reservoir simulation model of October Field, Egypt Lead.
- Recommended infill drilling locations for Batanga Formation turbidite sandstone reservoir, Oguendjo Fields, Gabon.

1987 to1988- Petrophysics Training, TULSA, Oklahoma, USA
Completed one year Petrophysics Training at Amoco Research Center in Tulsa, Oklahoma and completed Dakota Formation Field Study, Swan Field, Moxa Arch, Central Wyoming
Key Achievements:
- Completed petrophysical evaluation and field study of the Swan Field, Moxa Arch of Central Wyoming, which included integration of core and log data into a facies prediction model.

1978 to 1987, Geologist, DENVER, Colorado, USA
Exploitation and exploration geologist.

Key Achievements:
- Development geologist for Central Wyoming foreland basin province.
- Exploration geologist working Williston basin carbonate plays.
- Exploration geologist for Northern San Joaquin Basin sandstone reservoirs.
- Exploitation geologist for Anschutz Ranch East Reservoir Management Team in Southwest Wyoming thrust belt.

EDUCATION

M.S. Geology, University of Southern California, 1978
B.S. Geology, University of California, Riverside, 1976

Industry Training: Cased Reservoir Monitoring and Production Log Interpretation, Low Resistivity Pay, Reservoir Recovery Processes (SCAL), Formation Testing Workshop, Static Description Workshop, Net Pay and Perm Workshop, EarthVision Workflow Manager, ZMAP Fault Polygons, Sequence Stratigraphic Workshop, Seismic Facies Analysis, Interpretation of 3D Seismic Data, Shows and Seals,

PROFESSIONAL MEMBERSHIPS

Society of Petrophysicists and Well Log Analysts (SPWLA)
Society of Petroleum Engineers (SPE)
Houston Geological Society

COMPUTER SKILLS

Techlog; Geolog; Powerlog; Interactive Petrophysics, Prizm, GeoGraphix, OpenWorks (StratWorks and PetroWorks); ZMAP; GEODES; EarthVision; Microsoft Office (Word, Excel, PowerPoint, Project).