

David F. Yard, P.E.

Oklahoma Registration #: 14582

Phone: 405-370-2426

DFYard@att.net or Columbia.Engineering.OKC@gmail.com

RE Advisor (highest level of technical expertise) for CHK, the world's leader in UNCONVENTIONAL RESOURCE PLAYS. Substantial experience in conventional reservoir engineering, asset management, production engineering, CO2 floods, pressure maintenance of mature oil fields, pressure transient analysis, retrograde condensate reservoirs, nodal analysis, and production optimization. Work experience in Russia, Algeria, USA (Permian, GOM TX, GOM LA, Mid-Continent, Marcellus shale, Utica shale, and Eagle Ford shale).

KEY ACCOMPLISHMENTS

- Leader of horizontal drilling in the USA – First published in 1989
- Investment Advisor to National Petroleum (Geneva) on 52 fields in various regions of Russia
- Project Management of integrated teams and projects both upstream and down stream
- Management Experience – upstream, midstream and various other non-petroleum related businesses
- Stochastic, probabilistic and decision engineering of conventional and unconventional resource plays
- Developed a new and radical method of “continuous, normalized, type well profiles” for shale basins in USA

EXPERIENCE

Stronghold Resource Partners, LLC

Oklahoma City, OK, Midland, TX, Big Springs, TX, Austin, TX & Dallas, TX (Head Quarters)

6/2016 – 11/2019

Vice President, Engineering and Evaluations

- SRP is an investment management company, specializing in O&G, mining, metals, and timber
- A spinoff of executive financial specialists of American Energy Partners upon the death of Aubrey McClendon.
- Responsible for the valuation and risk assessment of \$700,000,000 of projects in which our investors participate.

Chesapeake Energy, Inc. – Reported to Dan Hensley (Reservoir Engineering Director)

Oklahoma City, Oklahoma

6/2011 – 10/2015

Reservoir Engineering Advisor

- Strong shale experience in Marcellus, Utica, Permian
- Expert engineering witness and technical advisor to CHK legal staff on litigation and regulatory issues
- Exploratory and Field Development engineering, for strategic planners and management
- Mentoring of younger engineers
- SEC compliance, quality control

Senior Reservoir Engineer – Eastern Division

- Special Projects
 - PVT studies of retrograde condensate reservoirs in nano-darcy shale reservoirs
 - The effects of drilling through abandoned coal mines and gob gas extraction projects.
 - Economic optimization of horizontal well completions, clusters, stages, and SRVs.
 - Analysis of various Analytical Models for evaluating shale plays (Limits, Fekete (IHS) RTA)

Chaparral Energy, LLC – Reported to Delon Flinchum (Manger of CO2 projects)

Oklahoma City, Oklahoma

3/2006 – 6/2011

Reservoir Engineer – Field Studies Group

- Transferred to Field Studies Group 2/2007. Duties include engineering waterfloods and CO2 floods for the company. Primary work was done in Excel and Petra while economic evaluations were done using ARIES
- Further detail would be unethical due to the proprietary nature of the projects
- Also designed programs in Excel for wellhead allocation of production, wellbore diagrams, statistical distribution, stochastic modeling of wildcat prospects, material balance, and others.
- Worked in Permian, OK, LA and Mid-Continent

District Reservoir Engineer – TX Gulf, Louisiana, E. TX

- Duties include all basic duties of a reservoir engineer
- Economic evaluation of all properties in the district, prospect evaluation, plus pre-drill and post-drill analysis
- Responsible for booking Probable and Possible reserves and unitization of a waterflood project in central Oklahoma

DAVID F. YARD, P.E., COLUMBIA ENGINEERING, LLC, & SPCC Plans, LLC

Oklahoma City, Oklahoma

10/1986 – **Present**

****Point of Clarity - All companies worked for since 1986, except Chaparral, CHK, SRP, OCC and Delhi, were contract work of Columbia Engineering to their clients-paychecks, however, were issued from companies mentioned below.**

Since 11-16-2019 all work for SRP is through Columbia Engineering, LLC although I am still listed as VP Engineering.

CONSULTANT

- Columbia Engineering was started in 1986
- By 1993 established Columbia Engineering as one of the most respected petroleum engineering/consulting companies in Oklahoma and around the world
- Client base ranged from small individuals with minor royalty interests to multi-billion-dollar institutions and the Federal Government
- Clients included Amoco, Arthur Anderson, Dominion E&P, Inc., Union Oil of California, FDIC, Sonatrach (Algeria), National Petroleum (Geneva), Tengasco, Arvest Bank, Panaco, Oklahoma Marginal Well Commission, Questar, JMA Operating, Quantum Energy, Chaparral Energy, and many other independent oil and gas companies. An international consulting company acquired Columbia Engineering, Inc's contract base in 1995
- Member of the Interstate Oil and Gas Compact Commission and have acted as an expert witness in hundreds of OCC cases on regulatory compliance issues
- Developed EPA required spill plans (SPCC Plans, LLC) for more than 22,000 wells in Oklahoma, Texas, New Mexico, Kansas, Arkansas, and Louisiana. SPCC Plans, LLC was sold to Campbell & Assoc. - 5/2008
- Other specialties related to reservoir engineering include coalbed methane extraction, reservoir/formation evaluation, pressure transient analysis, Nodal Analysis, production optimization, exploitation of assets, evaluation of enhanced recovery projects, acquisition and divestiture analysis, asset management, and environmental compliance
- Geographic areas worked include offshore Gulf of Mexico, coastal areas of Texas and Louisiana, Oklahoma, New Mexico, Kansas, Arkansas, Wyoming, Utah, Tennessee, Illinois, various regions of Russia, Tunisia, England, France, South America, and Algeria

LANDMARK GRAPHICS/HALLIBURTON ENERGY SERVICES - ALGERIA

Asset Performance Consulting Group (*continuation of Columbia Engineering contract*)

Hassi Messaoud, Algeria

August 2002 – 2005 (2nd round in Algeria – 1st round was 2000 – 2001, see below)

Contract

- Responsible for engineering duties of the Sonatrach/Halliburton Production Optimization Team
- Duties include gathering and screening data from 40+ years of production and research from 1100+wells
- Interpreting the data and making recommendations to Sonatrach Management as to ways of increasing or optimizing production in the field. These recommendations include pressure maintenance reviews, gas lift analysis, choke analysis, frac recommendations, horizontal drilling recommendations, recommend in-fill drilling opportunities, etc.
- Responsible for administrating DSS software and creator of the "Master Database" which is an Excel model which does most of what DSS is designed to do
- Efforts with one other Expat blossomed Halliburton's contract to 16 Expats with a 10-fold increase in contract value to Halliburton in 2004

OKLAHOMA CORPORATION COMMISSION/OIL AND GAS CONSERVATION DIVISION

Oklahoma City, Oklahoma
March 2002 – August 2002

MANAGER OF TECHNICAL SERVICES

- The Technical Services Department is organized into five sections: Engineering, Geology, Statistics, Production/Prorations and Document Handling
- Our mission was to balance the rights of all parties, assist the domestic oil and gas industry, protect and preserve the environment, prevent the waste of the state's natural resources by ensuring compliance with the applicable laws and rules, process applications and permits, and collect, verify, maintain, and disseminate accurate information for the regulated industry, surface and mineral owners, other governmental agencies and the people of the State of Oklahoma
- As Manager of Technical Services, responsible for a staff of 32 geologists, engineers, and support personnel.
- No oil, gas, or coalbed methane well was drilled, completed, plugged, or enhanced in the State of Oklahoma without my consent

TECC-OKC (SERPRO-PARIS)/SONATRACH – ALGERIAN NATIONAL OIL COMPANY

Hassi Messaoud, Algeria (*continuation of Columbia Engineering contract*)
2000 – 2001

TECHNICAL CONSULTANT – PRODUCTION ENGINEERING DEPARTMENT

- Sonatrach is the 6th largest oil company in the world
- Their largest asset is the Hassi Messaoud Oil Field, which covers 600 square miles with more than 1,100 oil wells
- Combined production was 365,000 bopd plus associated gas of nearly 1.5 bcfpd.
- The field was 40 years old, extremely heterogeneous with asphaltene, salt, gas breakthrough, and water problems
- Projects included the start-up and analysis of a \$2.5 million separator (1st remote separator in the field), the evaluation of short radius and horizontal development wells, and co-development of an economic model for the field, and a strong knowledge of the reservoir, well control, and gathering system

COLUMBIA PRODUCTION COMPANY

Oklahoma City, Oklahoma
1990 - 1994

PRESIDENT

- As President; responsible for all administrative and asset management functions of the company
- Overseeing all day-to-day operations of the company
- Responsible for the economic and reserve evaluation of all acquisitions, as well as the funding and payment of the company's debt structure
- Responsible for EH&S compliance with all local, state, and federal regulatory agencies, including EPA, OCC, FERC, DOT, OSHA and others
- Responsibilities included the exploitation of purchased assets for value maximization, reservoir and production management, litigation assistance
- Review of all exploratory projects
- Columbia Production Company grew from \$1,000 capitalization in 1990 to a multi-million-dollar company in three years and was acquired by another company in 1994
- During this same period...was co-owner and co-instigator of several other companies including Columbia Engineering, Columbia Technical Marketing, Mid-America Waste Management (garbage company), Columbia Executive Protection Services.

DELHI GAS PIPELINE/MARATHON OIL – Reported to Brian Bounds (Manager of Operations – Northern Region)

Oklahoma City, Oklahoma

8/1988 – 12/1989

NORTHERN REGION PRORATIONS MANAGER

- Delhi hired me as a reservoir engineer
- Promoted to Northern Region Prorations Manager in the second month of employment.
- Duties included: supervising the activities and monitoring the project status of nearly 300 people in Colorado, Oklahoma, Kansas, and Arkansas
- Directly responsible for the annual business plans and pro-forma statements of the Northern Region and for the ratable transportation of gas on nearly 4,000 miles of pipeline from approximately 11,000 contracts
- Eliminated all employee overtime, reduced the staff personnel, and increased the profits of the Northern Region by 168%
- Responsibilities also included working directly with the Oklahoma Corporation Commission in developing new rules, regulations, and ordinances concerning pipeline activities, as well as, assessing the effectiveness of existing codes, rules and ordinances

MUSTANG PRODUCTION COMPANY – Reported to Don Rahmes (Manager of Engineering)

Oklahoma City, Oklahoma

8/1983 – 10/1986

SENIOR RESERVOIR ENGINEER

- Senior Reservoir Engineer responsible for property evaluations, acquisition of new properties, testing and evaluation of all wells, and the design of production facilities based on well performance
- Responsible for the computerization of engineering and property evaluation programs.
- Computerization project saved the company enough money in the first year to warranted immediate involvement in the bonus package program, which was reserved for management and key personnel
- Responsibilities also included working with the Oklahoma Corporation Commission. This included expert testimony on all engineering related issues

FLOPETROL – JOHNSTON/SCHLUMBERGER – Reported to Don Rahmes (Manager OKC)

Houston, TX/Victoria, TX/Oklahoma City, OK

3/1978 – 8/1983

FIELD ENGINEER / REGIONAL SALES

- Started career with the Schlumberger organization as a Field Engineer in 1978.
- As a Field Engineer was responsible for running DSTs on both onshore and offshore wells as well as operating downhole equipment for cementing and stimulation programs
- Progressed to a regional sales position in less than three years
- Responsibilities included product sales as well as working as an industry instructor on production system design technology (NODAL Analysis), analysis of pressure transient data, and well completion procedures
- Successfully increased product sales in Oklahoma by nearly 300% in the first year after transferring to Oklahoma from Texas

EDUCATION AND PROFESSIONAL TRAINING

Bachelor of Science, Mining Engineering - 1976

Minor concentration in Business & Economics

Columbia University, School of Engineering and Applied Sciences (SEAS)
New York City, New York

Advanced Education:

- "Reservoir Evaluation Data Analysis" - Schlumberger 1979
- "Production Systems Analysis" - Schlumberger 1980
- "Drilling of Oil & Gas Wells" - University of Houston 1981
- "Well Test Interpretation I & II" - Schlumberger 1982
- "Microcomputer Applications for Engineers & Managers" - OSU 1983
- "Economic Evaluation & Investment Decision Methods" - Co. Sch. of Mines 1983
- "Reservoir Analysis" - Douglas Hilche 1984
- "Formation Evaluation, Advanced Concepts" - Oil and Gas Consultants International 1985
- "Oil and Gas Prorating" - Texas RR Commission 1986
- "Horizontal Completions" - Halliburton Industries 1990
- "Oilfield Pollution Abatement Strategies" - OSU 1990
- "Symposium on Environmental Regulations" - Society of Petroleum Engineers 1991
- "Hazardous Materials Incident Response Operations" - EPA (40 hr. Certification) 1992
- "Certified Environmental Auditor" - OSU (NREP Tested) 1992
- "Environmental Issues in the Oil Patch" - OSU 1992
- "Dealing with Environmentally Sensitive Properties" - OSU 1992
- "Developing Area-Specific Waste Management Plans for E & P Operations" - IHRDC 1992
- "Environmental Title Concerns in Buying & Selling Oil & Gas Properties" - OSU 1992
- "Environmental Considerations in Real Estate Transactions" - OSU 1992
- "Resolving Environmental Disputes through Mediation" - OSU 1993
- "Completing the Environmental Transaction Screen Process" - OSU 1993
- "Cost-Effective Remedial and Corrective Actions" - Woodward-Clyde/OSU 1993
- "Environmental Issues 1993 Underground Storage Tanks" - OSU 1993
- "Building and Selling Entrepreneurial Firms" - The Geneva Companies 1993
- "SPCC Regulations and Environmental Compliance" – TB 2 1994
- "Onshore 3-D Seismic Technology for Increased Gas Recovery" - GRI/DOE 1994
- "OSHA HAZWOPER" - OSU 1995
- "ISO 9000 Executive Overview" - OSU 1995
- "Coalbed Methane Engineering" - S.A. Holditch & Assoc. 1998
- "New Oil from Old Fields" – Petro Skills 2002
- "Log Applications for Stimulation Design" – OGCI 2003
- "DSS Fundamentals Course" – Halliburton 2004
- "DSS Advance Power User Course" – Halliburton 2004
- "Stochastic Modeling for the Oil and Gas Industry" – Decision Engineering, Inc. 2005
- "Crystal Ball for the Oil and Gas industry" – Decision Engineering, Inc. 2005
- "Artificial Lift Systems (Sucker Rod Pumps) Trouble Shooting" – Marginal Well Commission 2005
- "Advanced Crystal Ball for the Oil and Gas Industry" – Oracle 2007
- "CO2 Flooding School" – APTA 2007
- "ECLIPSE – Black Oil Simulator" – Schlumberger 2008
- "TEMPEST – MORE – Compositional Simulator – Roxar 2009
- "Modeling Hassi Guettar Field using PETREL & ECLIPSE" – Dr. Lonnie Kennedy 2010
- CO2 Conference – Midland, Texas 2010
- SEC Reservoir Reporting – John Lee, Texas A&M 2011
- Shale School – CHK Internal Proprietary 2011
- Facilities Design School (Surface facilities)– CHK Internal Proprietary 2011
- Bridging the Gap Between Res. Engr. And Facility Design, SPE San Antonio, TX 2012
- Decline Plus School – Fekete Engineering 2012 & 2013
- Unconventional Analytical Modeling (1 week) – Fekete Engineering 2012 & 2013
- Unconventional Resource Assessment and Evaluation (1 week) – Rose & Assoc. 2014
- Rock Geomechanics, Dr. Zoback – Stanford University (10 weeks) – 2015
- SPE Petroleum Data Analytics Series (1 week), Shahab Mohaghegh, West Virginia University-2020

TRAINING/SOFTWARE SKILLS COMPUTER PROGRAMS

Author of many oil and gas related computer programs that address most aspects of reservoir engineering. Some of the more sophisticated programs include.

- Tight Gas Sand Model – 1993
- Bush-Helander & Craig Waterflood Models – 2000
- Curvefit - Production Analysis Model 1984
- 1st - 3-D Reservoir Model for Horizontally Drilled Wells – 1989
- Pressure Transient Analysis Model: (1st automated model for PCs) –1983
- Nodal Analysis Model (1st model designed for PCs) –1983

Other software used-some *not* necessarily proficient

- CRYSTAL BALL – Decision Engineering (Oracle)
- ROSE STATISTCAL SOFTWARE
- ARIES – Landmark Graphics
- DSS – Landmark Graphics (DSS Administrator)
- INSIGHT – Landmark Graphics (Real Time Software)
- INSIGHT ANYWHERE – Landmark Graphics
- POWERTOOLS – IHS Energy
- PETRA – IHS Energy
- PERFORM – IHS Energy
- WEM – Nodal Analysis Modeling Program
- SAPHIR – Kappa Engineering
- DCA – SPE (Jeff Carroll)
- VIRTUWELL – Fekete Engineering
- R.T.A. – Fekete Engineering
- DECLINE PLUS – Fekete Engineering
- WELL TEST – Fekete Engineering
- EXCEL – Advanced User & Programmer
- ECLIPSE – Schlumberger
- TEMPEST – MORE – Roxar
- CMG
- LIMITS – Object Reservoir
- SPOTFIRE (Big Data Analysis)
- All other MS Office Applications

PROFESSIONAL AFFILIATIONS

- **University of Oklahoma (OU)** College of Law, *Oil & Gas, Natural Resources & Energy Center* (2017 to 2019)
- **Oklahoma State University (OSU)** 1992-2000
Adjunct Professor: Petroleum Engineering, International Security, SPCC & Waste Management
Steering Committee Member - Center for Organizational Improvement
- **Interstate Oil & Gas Compact Commission (IOGCC)** 1988-Present
Member of the Energy Resources, Research and Technology Committee
- **Society of Petroleum Evaluation Engineers (SPEE)** 1987-Present (2016 & 2017 Chairman – OKC)
- **Society of Petroleum Engineers (SPE)**
Director of Oklahoma City Section 1987-1990
Chairman of Oklahoma City Section 1986-1987
Founder & Chairman of Micro-users Group 1984
- **International Association for Energy Economics (IAEE)**
Vice Chairman of Oklahoma City Section 1988-1993

PROFESSIONAL REGISTRATIONS & CERTIFICATIONS

- REGISTERED AS A PROFESSIONAL PETROLEUM ENGINEER, Oklahoma #: 14582
- CERTIFIED FOR Hazardous Materials Incident Response Operation, EPA

PUBLICATIONS

PUBLISHED PAPERS & PRESENTATIONS

- "Forecasting Reserve Potential from Horizontal Wells Using Crystal Ball" – Oracle
- "Optimizing Oil and Gas Assets" – SPE
- "Using Stochastic Modeling to Forecast Reserves from Waterfloods" – Oracle
- "Engineering Analysis of Short Radius & Horizontal Wells in Hassi Messaoud" – Sonatrach
- "Security Issues for CEOs & Execs Working Abroad" – OSU
- "Waste Management & SPCC Plans for the E/P Industry" – OSU
- "Dealing with Environmentally Sensitive Properties" – OSU
- "The Economic Considerations of Horizontal Drilling" - OSU / IAEE
- "Horizontal Drilling, Past, Present and Future" - Professional Development Institute
- "Horizontal Drilling and Its Impact on Oil Reserves" – IAEE
- "FERC Orders and the Evolving Natural Gas Market" – SPE
- "Evaluating Producing Properties & Mineral Interests" – OSU
- "Evaluating Mineral Interests for Estates and Probate" – NARO
- "Tools for Evaluating Reserves" - IAEE / OCU
- "Build-up Analysis of DSTs" – SPE

INSTRUCTION & LECTURING

- Instructor of seminars for Schlumberger on the topics of Pressure Transient Analysis and Nodal Analysis.
- **Guest lecturer:** Society of Petroleum Engineers, Oklahoma City Geological Society (Technical lecturer for the 1983 Eason Awards Banquet), North Texas Geological Society, Society of Independent Professional Earth Scientists, International Association for Energy Economics (1989 International Conference, Caracas, Venezuela, 1992 North American Conference, New Orleans, National Association of Royalty Owners (1988 National Convention, Dallas, TX.), and the 1990 Dallas Energy Conference.
- Lecturer - Energy Economics / Wharton Business School, Univ. of Pennsylvania –Graduate Studies
- Lecturer - Oklahoma City University / Continuing Legal Education Programs
- Lecturer - Oklahoma State University / International Security, SPCC & Waste Management
- Lecturer – University of Oklahoma College of Law – "Energy Project Finance and Economics"
- Co-Instructor (8 yrs.) - "Principles and Practices Review Course for Professional Engineers"

SPECIAL INTEREST

- 1988 – Present - Appointed by Governors Henry Bellmon, and Frank Keating of Oklahoma as a member of the **Interstate Oil & Gas Compact Commission**, representing Oklahoma on the Energy Resources, Research and Technology Committee.
 - 1989 - Received a Centennial Year Senatorial Citation for my involvement in the advancement of the oil and gas industry in Oklahoma.
 - 1989 – Guest lecturer in Energy Economics at Wharton Business School, Univ. of Pennsylvania –Graduate Studies
 - 1989 - Member of America Mensa, Ltd.
 - 1996- 2006 - Alumni Representative to Oklahoma for Columbia University
 - 2000 - 2004 – Member-Hassi Messaoud Environmental Council, Hassi Messaoud, Algeria
 - 2009 – Worked on pre-drill evaluation for 25% owner of Antelope project, Papua New Guinea.
 - (Guinness Book of World Records as highest rates ever tested from a well)
-