Enhanced Oil Recovery (EOR)

• Alkaline Surfactant (ASP)

• Thermal, CO2

Nitrogen Injection

# SENIOR ENGINEER / PROJECT LEADER

Accomplished Senior Reservoir Engineer with a strong background in oil/gas reservoir development, and Enhanced Oil Recovery (EOR). Skilled at adding value to Brownfield reservoirs using technical innovation, and capital discipline. Extensive experience in a multi-disciplined technical team leadership role - developing various heavy, and light oil fields in Kern County, Texas, and the Middle East. Dynamic leader with the ability to develop and empower employees to achieve a high level of performance.

## **AREAS OF EXPERTISE**

- Brownfield Re-Development Plans
- Development Drilling
- Waterfloods, Development and Surveillance
- Reserve Analysis
- Team Leadership and Development
- Property and Evaluation
- Hydraulic Fracturing experience: Antelope Shale Reservoirs S. Belridge, Lost Hills, MWSS Fields
- Development Sacramento Basin Dry Gas Fields
- Black Oil and Thermal Simulation (CMG-Stars)

## **CAREER HIGHLIGHTS**

- Started and provided RMT Leadership support for the following Elk Hills Improved Oil Recovery (IOR) projects: ESOZ N2 injection pressure maintenance project; 31S Stevens Pattern Waterflood Start Up; First Alkaline Surfactant Polymer (ASP) Pilot in the ESOZ reservoir, Evaluation and implementation of the Elk Hills Stevens zone CO2 pilot, and ethane/permeate gas miscible flood pilots for potential CO2 Carbon Sequestration.
- Provided Engineering heavy oil simulation support for the successful acquisition of Round Mountain working interest. Led the horizontal develop. of the Pyramid Hills Waterflood in the Round Mtn Field.
- Engineered the drilling of the first Heavy Oil horizontal well in Kern Front Field.
- Led the Oxy heavy oil expansion of Kern Front, development of North Antelope Hills, and West side Kern County heavy oil Antelope play.
- Led the development of Elk Hills 26R gas cap blowdown during a critical financial time for Oxy.
- Developed the first team visualization surveillance process for Occidental.
- Developed the first Light Oil Steamflood pattern pilot in the Kingdom of Bahrain. Led the implementation for the first multi-lateral horizontal well drilled. Developed waterflood surveillance elements for Bahrain.
- Lead Reservoir Engineer for the Hill Sect 19 Tulare Steamflood Expansion in the S. Belridge Field
- Participated in various M&A activities for Oxy including Barry Petroleum and Round Mountain fair market evaluations.
- Established Successful Mineral Management Service for platform Hondo Santa Yanez Unit
- Received "Best of the Best" Award for community service with Oxy of Elk Hills.

# **EXPERIENCE**

California Resources Corporation (CRC), Bakersfield, CA Apr 2014 – Nov 2019 (CRC was spun off from Occidental Petroleum)

# **Senior Reservoir Engineering Advisor**

Apr 2017 - Nov 2019

Provided reservoir engineering expertise, guidance and consultation support to CRC engineering staff for all CRC San Joaquin Basin assets, along with LA Basin Wilmington and Huntington Beach Fields.

- Provided development plan evaluations and guidance to CRC management.
- Provided thermal steam flood, and waterflood surveillance guidance for Kern Front, Antelope Shale, Lost Hills, and Elk Hills Reservoirs.
- Evaluated water conformance control using Internal Control Devices (ICD's).
- Participated in development of in-house Reservoir Engineering training, and mentorship programs for early career engineering staff.
- Designed cyclic steam trials for the Elk Hills Shale (Porcilinite) reservoirs.
- Evaluated chemical EOR technologies including Nano, ASP, and Microbial across CRC range of producing fields- Wilmington, Huntington Beach, Elk Hills, BV Hills.

# Asset Team Manager: Elk Hills Field, CA,

Apr 2015 - Mar 2017

Managed a team of 70 muliti-disciplined engineers, geologists and petro physicists responsible for the production of over 75K boepd- gross with budgets ranging from \$50-\$500 MM Capx. Developed and mentored new supervisors. Delivered opex control support during low commodity pricing.

- Completed over 300 new wells and 300 capital workovers.
- Proposed and implemented a miscible CO2 pilot in the Stevens MBB Sands.
- Initiated the first Opal CT shale dry gas cycling program in Elk Hills.
- Started waterflood in the New Field Discovery BV Nose.

**Chief Reservoir Engineer / Asset Development Manager,** Bakersfield, CA Feb 2014 – Mar 2015 Led a team of 50 subsurface engineers, geoscientist and technical staff in the development of thermal and light oil fields including: Kern Front, BV Hills, and Pleito Ranch.

- Grew Pleito Ranch Field from 500 bopd to over 5000 bopd with successful drilling campaign.
- Introduced new Enhanced Oil Recovery (EOR) technologies.

## Occidental Petroleum (Midland Tx, Bakersfield Ca, Bahrain)

Mar 1996 – Feb 2014

**Reservoir Management Team Leader:** Tatweer Petroleum, Bahrain Apr 2009 – Feb 2014 (Seconded to Tatweer – Joint Venture with Mubadala and the Kingdom of Bahrain)

Managed a team of 30 multi-disciplinary Engineers, Geologists and Petro Physicists responsible for the production of 26,000 bopd and 331 MMcfpd associated gas. Delivered reservoir support for reserves, waterflood designs, steamflood and chemical flooding of shallow carbonate reservoirs.

- Increased BRMT reservoirs production by 20% over three years.
- Drill and completed over 200 wells and over 300 rig workovers.
- Added 150 MMbbl of PUD reserves.
- Directed a Mauddud pilot waterflood with a 32-40-acre five spot waterflood expansion. Initiated
  Mauddud chemical flood lab experiments with Surtek and UT Austin. Developed IWAG pilot design in
  Mauddud down dip waterflood patterns. Proposed a high-volume lift development for the Mauddud
  reservoir.
- Completed the first light oil carbonate steamflood pilot in the Bahrain Field, the second in the Middle East. Provided waterflood surveillance support for Tatweer waterflood workflow.

# Asset Development Manager, Bakersfield, CA

Jan 2008 - Mar 2009

Served as Subsurface Asset Manager for 40 staff members including reservoir engineers, petrophysics and data processing. Staff responsible for the development planning of the Vintage Ventura assets that included the Rincon, San Miguelito and South Mountain Fields.

Team (RMT) Leader/Reservoir Simulation Engineer, Elk Hills, CA

Jan 1998 - Dec 2007

Developed and led the 25-member Oxy 31S-Reservoir Management Team (RMT) to become a top quartile performing asset team of production engineers, reservoir engineers, geologists, Petro Physicist, and geophysicists. Managed an annual capital budget of \$40M with production of 17,000 boepd.

- Provided Heavy and Light Oil simulation support for Round Mtn Acquisition, and Elk Hills
- Hired over 15 technical personnel for the Elk Hills reservoir management team (RMT)
- Grew production to over 3000 boepd within four years.
- Implemented and completed Stevens pattern waterflood development.
- Established a three-year reserve replacement rate of 100%.
- Averaged \$100M net performance income.
- Developed key performance indicators (KPI) for F&D and Opex.

Senior Staff Evaluation Reservoir Engineer, Midland, Tx

Jan 1996 - Dec 1998

**Exxon USA, (Midland Tx, Thousand Oaks Ca)** 

Jan 1988 - Dec 1995

(Exxon Purchased Celeron Oil and Gas Calif Assets)

Staff Operations and Reservoir Engineer, (S. Belridge, Midway Sunset, Santa Ynez Offshore) Fields

Celeron Oil and Gas (Santa Barbara, Bakersfield, Ca)

Jul 1986 – Dec 1987

Reservoir Engineer (South Belridge and Midway Sunset Fields)

Chevron USA. (Bakersfield, Ca)

Jun 1981 – Jun 1986

Production Engineer, Drilling Engineer, Field Foreman (Lost Hills, Cymric, Kern River Fields)

# **EDUCATION**

Bachelor of Science (BS), Petroleum Engineering, BSPTE

University of Southern California (USC)

Graduate studies towards a Master of Science in Petroleum Engineering, USC

EIT Certification: XE059133

## **AFFILIATIONS**

SPE: Society of Petroleum Engineers

API: American Petroleum Institute – San Joaquin Chapter Board Member: Kern Tree Foundation: 2014' – Present

## **REFERENCES**

Upon requests