

## Microbial Enhanced Oil Recovery (MEOR)

Conventional methods used to recover oil from reservoirs leave the majority of oil in place. Enhanced oil recovery is used to access trapped oil and increase the productivity of oil fields. Microbial methods are used effectively to enhance both onshore and offshore oil recovery, as well as in applications such as corrosion control and prevention of well souring.

The Saskatchewan Research Council (SRC) brings together extensive experience in both biotechnology and petroleum research to provide an integrated approach to innovative MEOR research.

Custom-built, large volume 1-D core displacement apparatus for MEOR

At SRC, we combine our unique capacities in microbiology, genetics, core displacement, physical modelling and numerical simulation to use biotechnology in oil and gas applications.

### MEOR Capabilities and Services

#### **Microbial Culturing and Assessment:**

- Culturing of a diverse range of micro-organisms obtained from either the client or external sources, including extremophiles (adapted to extreme environments such as oil reservoirs)
  - Diverse range of culturing conditions, including both aerobic and anaerobic
- Nutrient screening in reservoir environment
- Growth curve analysis
- Control of deleterious by-products (corrosion and H<sub>2</sub>S production)
- Live and dead cell analysis
- Species identification
- DNA testing at SRC laboratories



Fermenter for large-scale microbial culturing

## 1-D Core Displacement and 3-D Physical Modelling:

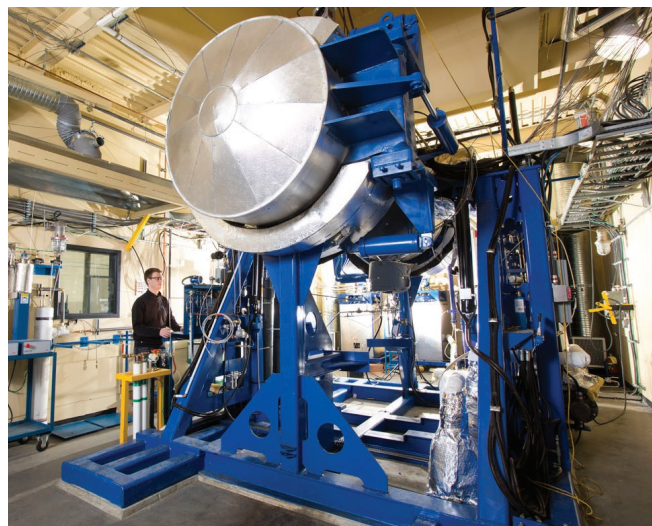
- Experimental modelling of oil production and recovery mechanisms using:
  - Conventional and large volume 1-D coreflood apparatus
    - Up to 1.4 m x 10 cm diameter core, with side sampling ports
    - Up to 20 MPa pressure at ambient to 250°C
  - Large 3-D physical models
    - 2.5 m x 1.06 m diameter overburden vessel
    - Up to 10 MPa pressure at 10 to 250°C
  - Vertical or horizontal configuration
- Testing microbial growth under reservoir conditions in the presence of a porous medium
- Analyzing microbial growth distribution in physical models

## Applied MEOR Services:

- Support of field implementation
  - Reservoir screening
  - Monitoring and analysis
- Microbial processes in oil systems
  - Phase behavior analysis and fluid characterization of oil viscosity, density and interfacial tension measurements
- Numerical simulation
  - Tuning advanced simulators to predict field-scale performance of MEOR processes using laboratory derived microbiological and oil production performance data is currently in development

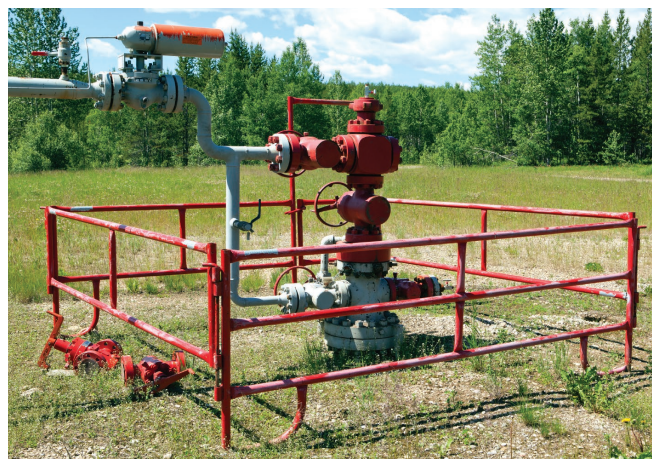
**Contact us to speak with an MEOR expert about how we can improve your oil field's productivity and economics.**

*The Saskatchewan Research Council (SRC) is one of Canada's leading providers of applied research, development and demonstration (RD&D) and technology commercialization. SRC provides services and products to its 1,500 clients in 20 countries around the world.*



Large 3-D physical model

SRC conducts applied research, development, design, testing, piloting, scale up, demonstration and technology commercialization relevant to our strategic economic sectors and we use the knowledge gained to help clients solve technology problems, make improvements, seize opportunities, maintain competitiveness, increase productivity and develop new markets.



Wellhead at a potential EOR site