

Petrogenium. Academy

Upstream (EOR & Water Flooding)

Water Flooding Design and Operation

Consultant / Trainer

Andrew Parker



The **Petrogenium. Water Flooding Design and Operation** is designed to provide valuable knowledge of the interlinking aspects for the oil recovery technique of waterflooding. Key themes, which will be discussed during the training course include the physics, chemistry, practical application, lessons learnt, operational focus and economics. Participants will delve into technologies, processes involved, and obtain a solid understanding of the important role that each profession plays in a successful waterflood.



Participants

This **Petrogenium.** course designed for cross disciplined technical staff to provide a basis of understanding for the topics covered.



Learning Objectives

The course presents real and relevant examples to illustrate key concepts, supported by practical exercises to reinforce participants' understanding. It covers the evaluation and application of waterflooding, the principles of subsurface design including its timing, purpose, and implementation, the complexities involved in injectant delivery and specification, and approaches to monetizing field value through waterflooding..

3 DAY TRAINING COURSE

Topics

The case for waterflooding

The basics of oil recovery

- Properties and genesis of oil
- Rock and water properties
- Imbibition/Drainage process
- Capillary trapping
- Aspects of sweep

The physics of immiscible displacement

- Darcy's law
- Relative permeability and wettability
- Fractional flow
- Application of BLW
- Exercise 01: Estimate a waterflood forecast range

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Contact Petrogenium.:

Email: training@petrogenium.com

Website: <https://www.petrogenium.com/training/>

Because Experience Matters

Topics

The importance of Chemistry

- Water properties
 - Ion concentration and distribution
 - Mixing and scaling tendency
- Geochemistry
 - Sandstones: Types of clays which can impact flooding
 - Carbonates: Salinity and pH
- Exercise 02: Estimate the clay swelling potential for a proposed waterflood

Geomechanics:

- In-situ stress
- Impact of depletion and cooling
- Matrix injection design attributes
- Fracturing injection design attributes

Geology and Geophysics:

- Yes, Geology is important
- The role of Geophysics in waterflooding

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Contact Petrogenium.:

Email: training@petrogenium.com

Website: <https://www.petrogenium.com/training/>

Because Experience Matters

Topics

Flood design:

- Throughput vs recovery
 - Determining the volume of required injection water
 - Estimate number of wells and how to optimise cash flow
- Pattern selection
 - Impact of well cost
 - Traditional patterns, the pros and cons
 - Matrix vs fracturing
 - Phasing
 - Repurposing
- Exercise 03: Propose the waterflood pattern and recovery forecast for a newly discovered field

Well selection:

- Well orientation
- Well completion aspects
 - Sand control
 - Crossflow
 - Zone selectivity
 - “smart” components
 - Gauges, fibre and tracers

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Contact Petrogenium.:

Email: training@petrogenium.com

Website: <https://www.petrogenium.com/training/>

Because Experience Matters

Topics

Facilities Specification:

- Specifying the required water quality
- Facility/process options
- Operability
- Green or Brown?
- Exercise 04: Select the required process

Waterflood Management:

- Determining the gearing ratios
- Defining critical equipment
- Key aspects to monitor
- The use of dashboards
- Exercise 05: Identify what went wrong and propose how to fix it

Why select Petrogenium.?

The above support will be provided by principal consultants with 30+ years world-class experience in the technology and hands-on know-how from operation of refinery units.

Contact Petrogenium.:

Email: training@petrogenium.com
Website: <https://www.petrogenium.com/training/>

Because Experience Matters