

INTEGRATED WATER MANAGEMENT

OVERVIEW

There are many factors, such as reservoir geology, water compatibility, and water injection specification parameters, scaling potential, type and capacity of process equipment that are often misinterpreted or overlooked when designing or improving a water treatment plant.



The three-day course provides participants with information required to set up, troubleshoot and maintain a water injection project.

OBJECTIVES

By reviewing actual field case studies and working interactively on exercises to identify best practices, at the end of the course you will know how:

- ❖ Reservoir properties can influence waterflood behaviour.
- ❖ To select appropriate source waters for injection.
- ❖ Water injection specifications are determined.
- ❖ To identify what the main challenges are and where they exist.
- ❖ Various mitigation strategies may be implemented to solve potential problems.

TRAINERS

Oil Plus's trainers have over 30 years' experience working on waterflooding operations worldwide. We have a similar number of years presenting training courses in North America, Europe, the Middle East, Africa, India, South East Asia and Australia.

WHO SHOULD ATTEND

Process engineers, production and operations chemists, and laboratory personnel with little or no chemistry background, will also benefit.

Anyone wishing to improve their understanding of water management in the oil industry.

REQUIRED TOOLS

Laptop computer and calculator.

CONTENT

- ❖ **Introduction to water injection technology** – The oilfield water cycle.
- ❖ **Basic geology and fluid properties** – Provides a practical overview of reservoir engineering factors that affect water injection planning, design and implementation.
- ❖ **Source water characterisation and injection water specifications** – Details injection water requirements, advantages and disadvantages of source waters and the consequences of formation damage.
- ❖ **Scale and scale control** – Explains why scales form and the effect they have in an oilfield environment.
- ❖ **Macro and microbiological control** – Outlines processes, problems and solutions associated with bacteria in oil and water systems.
- ❖ **Corrosion and corrosion control** – Provides a general overview of corrosion problems, prevention and monitoring.
- ❖ **Water treatment equipment and processes** – Highlights the different types of process equipment used in a water treatment system, and the 'pro's and con's' of using the various types of equipment when preparing specifications as part of a conceptual design or FEED study.
- ❖ **Chemicals and their selection** – Provides an in-depth overview of the types, applications and selection of oilfield chemicals.
- ❖ **System monitoring** – Gives operations personnel a practical understanding on monitoring and reporting the key water quality characteristics, how to troubleshoot, de-bottleneck and implement maintenance programmes.
- ❖ **Water injection project integration** – Provides a formalised and logical approach to the development of a successful and cost-effective water injection project, including health, safety and environmental considerations.

CONTENT DELIVERY

English

COURSE DURATION

3-Days

COURSE COST & DATES

Available upon request – contact mail@oilplusltd.com



INTEGRATED WATER MANAGEMENT TRAINING COURSE

DAY 1		DAY 2		DAY 3	
Time	Subject	Time	Subject	Time	Subject
08:30	Delegate registration and coffee	08:30	Morning coffee	08:30	Morning coffee
09:00	SESSION 1 Introduction to Integrated Water Management <ul style="list-style-type: none"> Oilfield water cycle Total process Water injection chemicals Oil and gas production chemicals Implications of inadequate injection water treatment Example (L-field) water injection key criteria and costs Appreciation of concentration / size 	09:00	SESSION 1 Oilfield Microbiology <ul style="list-style-type: none"> Introduction Plankton Macro-biological fouling Micro-biological activity Microbially influenced corrosion Reservoir souring and its prediction Bacteria identification – sampling and analysis Online monitoring and control Chemical disinfection Resistance to chemical action Biocide testing and evaluation Control in sea water injection systems Control in non-sea water injection systems H₂S scavenging References 	09:00	SESSION 1 System Monitoring <ul style="list-style-type: none"> Introduction General facilities and well operating data Water quality monitoring philosophy Water sampling Monitored water quality parameters Data use Common errors in monitoring References
10:00	Coffee break	10:00	Coffee break	10:00	Coffee break
10:30	SESSION 2 Basic Geology and Fluid Properties <ul style="list-style-type: none"> Introduction Water – rock cycle Sedimentary rocks Oil and gas source rocks Structural process Petroleum traps Fluid Properties Oil Recovery Reasons for waterflooding Impact of waterflooding Rock properties in waterflood management References 	10:30	SESSION 2 Corrosion and Corrosion Control <ul style="list-style-type: none"> Introduction Sources of corrosion Factors influencing corrosion Corrosion prevention and control Iron sulphide scales and Schmoob References 	10:30	SESSION 2 Water Injection Project Integration <ul style="list-style-type: none"> Introduction Data requirements Aspects of health and safety Environmental aspects Troubleshooting, de-bottlenecking and maintenance
12:30 13:30	Lunch break	12:30 13:30	Lunch break	12:30 13:30	Lunch break
13:30	SESSION 3 Source Water Characteristics and Injection Water Specifications <ul style="list-style-type: none"> Introduction General injection water requirements Source water characteristics Aquifer, lake / river, produced and sea waters Water injection specification Formation damage Clay swelling and fines movement Injected particle plugging Consequences of formation damage Scaling up of coreflood results 	13:30	SESSION 3 Water Treatment Equipment and Processes <ul style="list-style-type: none"> Introduction Water treatment equipment and processes Bulk separation Produced water treatment Sea water and aquifer water Sulphate removal Deoxygenation Injection systems Valves and pipework Utilities 	13:30	SESSION 3 Questionnaires and Assignment
15:00	Coffee break	15:00	Coffee break	15:00	Coffee break
15:30	SESSION 4 Scale and its Control <ul style="list-style-type: none"> Introduction Why scales form Scale in the oilfield Common scaling minerals Dealing with scale Sea water sulphate removal Scale removal Case histories High temperature applications References 	15:30	SESSION 4 Chemicals and their Selection <ul style="list-style-type: none"> Introduction Water injection Types of chemicals Corrosion inhibitors Scale inhibitors Biocides and disinfection Coagulants and flocculants Oxygen scavengers Antifoam Produced water treatment chemicals Miscellaneous chemicals Chemical evaluation and optimization Safety and chemical handling 	15:30	SESSION 4 Course Wrap-up <ul style="list-style-type: none"> Review and discussion Feedback forms Certificates
16:30	Finish	16:30	Finish	16:30	Finish

The course will start promptly at 08:30 am, finishing around 16:30 pm. Beverages, lunches and snacks will be provided during the week.
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