



Oil, Gas and Chemical

Surface Water Treatment & Water Injection Process Solutions

Course Introduction

Water injection has proved to be one of the most economical methods for reservoir pressure management. The technology can be valuable in helping maintain reservoir pressure, enhancing production of hydrocarbon reserves, and reducing the environmental impact through reinjection of treated and filtered produced water.

One of the most efficient methods of enhancing heavy oil recovery is water injection. In heavy oil recovery, Halliburton's temporary water injection systems provide operators with a cost-effective means of quickly analyzing the potential benefits of using water injection to manage a specific reservoir and enhance overall productivity.

Target Audience

- Process design
- Unit Operator
- Environmental
- Process safety engineer
- Gasoline blender engineer
- Lab supervisor
- Supply chain engineer
- Distillates analyst
- Models engineer
- Chemical Operator
- Chemical Plant Operator
- Chemical Process Technician
- Control Room Supervisor
- Gas Plant Process Operator
- Gas Production Operator
- Gas Terminal Operations and Storage
- Gathering Pipeline engineer
- Oil Terminal / Storage engineer
- Pipeline Maintenance / Equipment / Compliance / Repair

- Pipeline Testing / Technician / Supervisor / Safety
- Plant Equipment Operator
- Plant Operations Technician
- Plant Shutdown
- Plant Supervisor
- Power Distribution
- Power Plant Manager
- Process Supervisor
- Refinery Operations Technician / Manager
- Terminal Operator / Manager
- Utilities Operator

Learning Objectives

Enhancing the Oil Recovery Process

- Understanding Water Treatment Process
- Determine the Injection Water Recourses
- Know Biological Water Treatment
- Know the principle of Corrosion for Water Treatment
- Understanding the operation process of Water Injection

Course Outline

- **01 Day One**

Module (01) Enhanced Oil Recovery Processes

- 1.1 Introduction
- 1.2 Review of Geology and Hydrocarbon Accumulations
- 1.3 Surface Tension
- 1.4 Capillarity & Saturation
- 1.5 Fluid Displacement
- 1.6 Reservoir Drive Mechanisms
- 1.7 Oil Recoveries & Production Engineering Overview
- 1.8 Decline Analysis
- 1.9 Pressure Maintenance Schemes
- 1.10 Line Drive Water Floods
- 1.11 Pattern Water Floods
- 1.12 Other Tertiary Schemes

• 02 Day Two

Module (02) Injection Water Sources

- 2.1 Produced Water
- 2.2 Quantities
- 2.3 General Impurities
- 2.4 Treatment Overview
- 2.5 Fresh Water
- 2.6 Quantities
- 2.7 Treatment Overview
- 2.8 Sea Water
- 2.9 General Impurities
- 2.10 Treatment Overview

Module (03) Injection Water Quality Requirements:

- 3.1 Solids,
- 3.2 Dissolved Solids
- 3.3 pH
- 3.4 Basic Review of Chemical Calculations
- 3.5 Precipitate Reactions and Their Significance
- 3.6 Introduction to Clay Mineralogy and Its relationship to Formation Damage and Solids Control

• 03 Day Three

Module (04) Produced Water Handling

- 4.1 Inlet Separation

- 4.2 CPIs
- 4.3 Filtration
- 4.4 Skim Tanks
- 4.5 Oil in Water Emulsions
- 4.6 Treating
- 4.7 Polishing Equipment
- 4.8 Flotation
- 4.9 Disposal Options
- 4.10 Regulatory Requirements

Module (05) Biological Water Treatment

- 5.1 Problems Caused by Organisms in Water
- 5.2 Plugging
- 5.3 Types of Microorganisms
- 5.4 Problem Definition and Scope
- 5.5 Sampling, Monitoring
- 5.6 Treatment for Control
- 5.7 Biological
- 5.8 Lagoons
- 5.9 Biological Tower & Bio-Disc

• 04 Day Four

Module (06) Corrosion & Water Treatment

- 6.1 Introduction
- 6.2 Principles: Subsidence
- 6.3 Filtration
- 6.4 Dissolved Gas Removal
- 6.5 Coagulation
- 6.6 Chlorination
- 6.7 Iron Removal
- 6.8 Water Softening
- 6.9 Silica Removal
- 6.10 TDS Removal
- 6.11 Application to Sea Water

Module (07) Operations and Operating Problems

- 7.1 Skim and Settling Tanks
- 7.2 Parallel Plate Separators
- 7.3 Filters, Gas Flotation Units

- 7.4 Lime Soda Process
- 7.5 Coalescers
- 7.6 Ion Exchange Unit
- 7.7 Electrostatic Treaters

• **05 Day Five**

Module (08) Design Considerations

- 8.1 Water Source
- 8.2 Water Problems
- 8.3 Water Quality Needs
- 8.4 Compatibility
- 8.5 Scales
- 8.6 Corrosion Control
- 8.7 Recycling Economics
- 8.8 Case studies

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
April 28, 2025	May 2, 2025	5 days	4250.00 \$	UAE - Dubai
Aug. 4, 2025	Aug. 8, 2025	5 days	4950.00 \$	England - London
Nov. 17, 2025	Nov. 21, 2025	5 days	4250.00 \$	UAE - Abu Dhabi
Feb. 2, 2025	Feb. 6, 2025	5 days	4250.00 \$	KSA - Jeddah