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COURSE BROCHURE

# Injection Water Treatment Plant Design Training Course

16 – 20 August 2027
Dar es Salaam

# Injection Water Treatment Plant Design Training Course

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Injection Water Treatment Plant Design is a 1-week training course for facilities, production and water treatment engineers who specify, size and troubleshoot the plants that feed water injection wells, and who leave with an injection water system design and treatment sheet. Poorly conditioned injection water plugs wells, sours reservoirs and corrodes flowlines. Jupiter Prime Training presents injection water treatment plant design as a single chain from source to sandface.

## Why Injection Water Treatment Plant Design Matters Now

Three forces shape injection water treatment plant design today. Mature fields are injecting larger volumes of mixed seawater, aquifer water and produced water, so source compatibility has become a daily concern. Discharge limits push operators to reinject produced water carrying oil, solids and bacteria, while reservoir engineers want steady injectivity. Good conditioning protects wells and reservoir quality; poor conditioning brings plugged injectors, souring and scale. The course rests on water chemistry, filtration theory and hydraulic design principles.

## Who Gains Most from Injection Water Treatment Plant Design

- Engineers responsible for specifying filtration, deaeration and dosing packages for new or expanded injection plants
- Engineers responsible for daily operation of injection pumps, filters and chemical injection skids
- Specialists responsible for water sampling, laboratory analysis and treatment chemical selection
- Engineers responsible for injection well performance and injectivity surveillance

A facility team sending process, operations and laboratory engineers together gains most.

## Injection Water Treatment Plant Design Capabilities

Participants turn water analyses and reservoir limits into equipment choices and dosing settings that keep injectors open.

- Assess seawater, aquifer and produced water sources for compatibility and scaling tendency — source selection and blending decisions
- Specify coarse, fine and media filtration stages against a target particle size — injectivity protection for reservoir engineers
- Design vacuum and gas stripping deaeration with oxygen scavenger backup — corrosion control for materials engineers
- Build a chemical treatment schedule for biocide, scale inhibitor and coagulant — operations and laboratory teams
- Calculate injection pump head and distribution header pressure losses — facility sizing and power demand
- Apply injectivity index and filter performance trends to treatment adjustments — surveillance meetings and remedial planning

## Key Injection Water Treatment Plant Design Terms

- Injectivity index — the injection rate a well accepts per unit of pressure above reservoir pressure.
- Membrane filtration index — a laboratory measure of how quickly suspended matter blocks a test filter, indicating water plugging tendency.
- Deaeration — removal of dissolved oxygen from injection water to limit corrosion.
- Reservoir souring — the generation of hydrogen sulphide in the reservoir by sulphate reducing bacteria fed by injected water.
- Scaling tendency — the likelihood that mixed waters precipitate mineral deposits such as barium or calcium sulphate under reservoir conditions.
- Sulphate removal — membrane treatment that lowers sulphate in seawater before injection to reduce scaling and souring risk.

## Injection Water Treatment Plant Design Day by Day

## Day 1: Water Sources and Reservoir Demands

- Seawater, Aquifer and Produced Water Characteristics — Choosing the Primary Injection Source
- Water Compatibility Testing — Blending Ratios and Scale Risk
- Reservoir Pore Throat and Particle Size Limits — Filtration Target Setting
- Injection Water Quality Specification — Agreeing Limits With Reservoir Engineers
- Produced Water Reinjection Constraints — Oil in Water and Solids Loading

## Day 2: Solids Removal and Filtration Trains

- Coarse Screens and Strainers — Protecting Downstream Filtration Equipment
- Dual Media and Walnut Shell Filters — Matching Media to Water Type
- Cartridge and Membrane Filtration — Final Polishing Before Injection
- Coagulant and Flocculant Selection — Improving Filter Capture Efficiency
- Backwash Cycle Design — Filter Run Length and Waste Volume

## Day 3: Deaeration, Chemistry and Souring Control

- Vacuum Tower and Gas Stripping Deaerators — Dissolved Oxygen Targets
- Oxygen Scavenger Dosing — Backup Control During Upsets
- Batch and Continuous Biocide Dosing — Bacterial Growth Control
- Sulphate Removal Membranes and Nitrate Treatment — Reservoir Souring Mitigation
- Scale Inhibitor Selection and Squeeze Support — Mineral Deposit Prevention

## Day 4: Pumps, Headers and Injectivity Monitoring

- Injection Pump Selection and Head Calculation — Capacity and Power Demand
- Distribution Header and Flowline Hydraulics — Pressure Allocation Between Wells
- Materials and Lining Choices for Injection Lines — Corrosion Allowance Decisions
- Water Sampling Points and Online Analysers — Quality Assurance Coverage
- Injectivity Index and Pressure Trending — Early Plugging Detection

## Day 5: Practising the Injection Water System Design and Treatment Sheet

- Source Blend and Quality Specification Case — Applying Compatibility Results
- Filtration and Deaeration Train Sizing Case — Applying Equipment Selection Rules
- Chemical Dosing Schedule Case — Applying Biocide and Inhibitor Choices
- Pump and Header Hydraulic Check — Applying Pressure Loss Calculations
- Injection Water System Design and Treatment Sheet — Final Peer Review

## Applying Injection Water Treatment Plant Design After the Course

- Lead a gap check of the current injection plant against an agreed water quality specification, using filter performance and dissolved oxygen trends.
- Run a compatibility and scaling review of any planned change in source water blend before it reaches the injection header.

## Injection Water Treatment Plant Design Questions FAQ

### What is injection water treatment plant design and why does it matter now?

It is the engineering of the equipment and chemistry that condition water before injection. It matters now because mature fields inject more mixed and produced water, raising plugging, souring and scale risk.

### Which roles gain most from injection water treatment plant design training?

Facilities, production and water treatment engineers gain most. Laboratory and corrosion specialists also benefit, especially when attending with colleagues from the same plant.

## How does injection water treatment plant design differ from a waterflood surveillance course?

It concentrates on the surface plant rather than the reservoir. Waterflood surveillance studies sweep and voidage; this course designs the filtration, deaeration, dosing and pumping behind each injector.

## What do you bring back from injection water treatment plant design training?

You bring back an injection water system design and treatment sheet for a case plant, with a source blend, filtration and deaeration train, dosing schedule and hydraulic check to adapt to your own facility.

## Injection Water Treatment Plant Design: The Way Forward

The injection water system design and treatment sheet first informs the choice of filtration and deaeration stages. Facilities, operations and laboratory engineers use it together to set limits and dosing. After its first use, the perspective worth revisiting is how produced water reinjection shifts solids, oil and bacterial loading across the whole chain.