WATER STANDARD

LOW-SALINITY ENHANCED OIL RECOVERY (EOR)

Increasing Oil Recovery without Chemical Addition Offshore and Onshore

Pilot data for low-salinity water injection shows recovery can be increased from 2 to 40%.

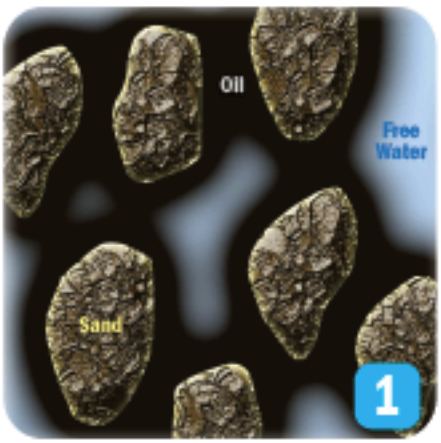
Low salinity injection changes the wettability characteristics of the reservoir rock. Low-salinity water injection can shift the properties of a reservoir to a state of water wetness, increasing microscopic sweep efficiency and oil recovery.

THE WATER STANDARD SOLUTION SUPPORTS:

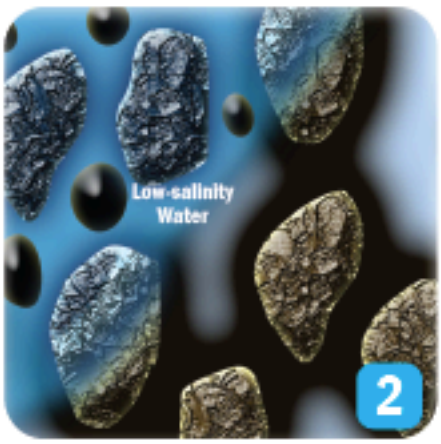
- A consistent injection water quality that does not vary with seawater temperature or salinity or changes in any onshore source water used
- Flexible treatment processes from the same systems to accommodate changing reservoir needs and EOR program optimization without retrofitting equipment
- The increase of recovery while lowering costs
- The ability to go from a low salinity flood to a CEOR or sulphate reduced flood from the same system

HOW DOES IT WORK?

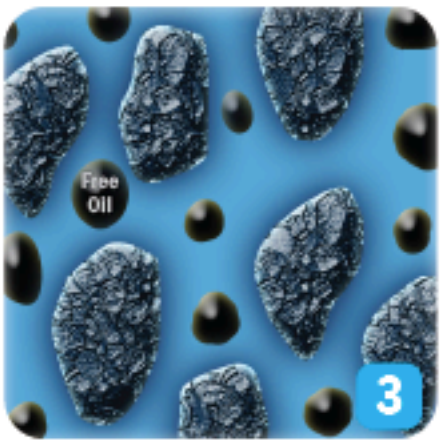
OIL-WET STATE (OIL ADHERES TO SAND)



INTRODUCTION OF LOW-SALINITY WATER



WATER-WET STATE (RELEASE OF OIL)



1- Polar molecules in oil are attracted to the negatively charged clay surface. Divalent cations (calcium, magnesium) act as bridges between the negatively charged molecules in the oil and the negatively charged clay surface.

2- Low-salinity water breaks the oil-wet bond, by replacing the divalent cations with monovalent cations, resulting in the release of oil from the rock surface.

3- When low salinity water is injected, the ion exchange equilibrium changes and bound oil becomes mobile, resulting in increased oil recovery.

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