



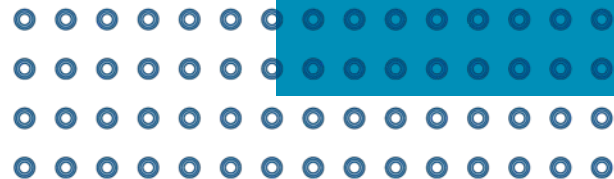
IDE
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Produced Water Treatment Proposal Midland, Texas

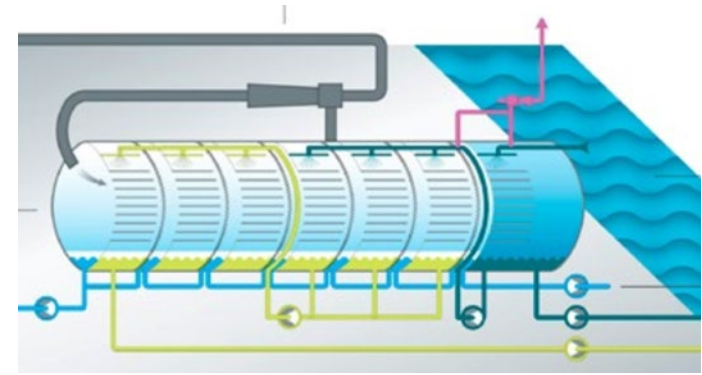
April, 2026



Project Description

Pilot water treatment facility for produced water

- Goal: reduce produced water quantity and create clean desalinated water for different purposes
- Water Source: Permian Basin produced water
- Feed Capacity: 20K barrels per day (bpd)= 0.84 MGD
- Product Quality: Distillate water quality
- IDE Scope: Process design, equipment supply, installation, and commissioning



Feed & Product Water Quality

Feed Water Quality

Parameter	Concentration*	unit
Total Dissolved Salts	142,111	mg/L
Chloride (Cl)	89,500	mg/L
Sodium (Na ⁺)	46,720	mg/L
Calcium (Ca ⁺²)	2,987	mg/L
Silica (SiO ₂)	24	mg/L
COD	6,568	mg/L
TOG	1,863	mg/L
Total Hardness	9,911	mg/L as CaCO ₃
Magnesium (Mg ⁺²)	441	mg/L
Strontium (Sr)	552	mg/L
Sulfate (SO ₄)	540	mg/L
Alkalinity	201	mg/L as CaCO ₃
Dissolved CO ₂	342	mg/L
Bicarbonate (HCO ₃ ⁻)	245	mg/L
Iron (Fe)	26.5	mg/L
Temperature	80 (25)	°F (°C)
pH	6.7	

Product water (Distillate) quality

TDS < 70 mg/L

Cl < 32 mg/L

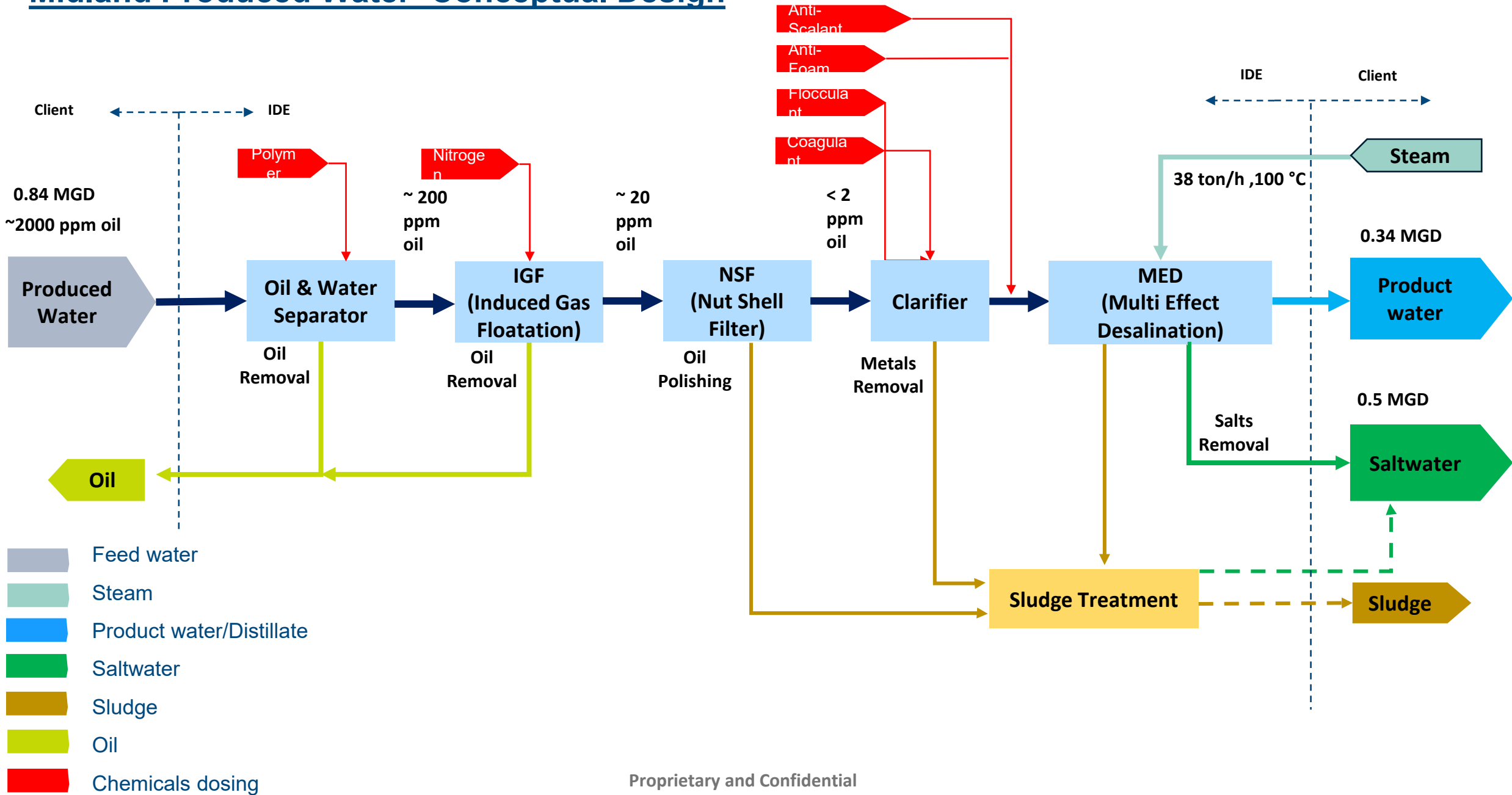
Oil ~ 0 ppm



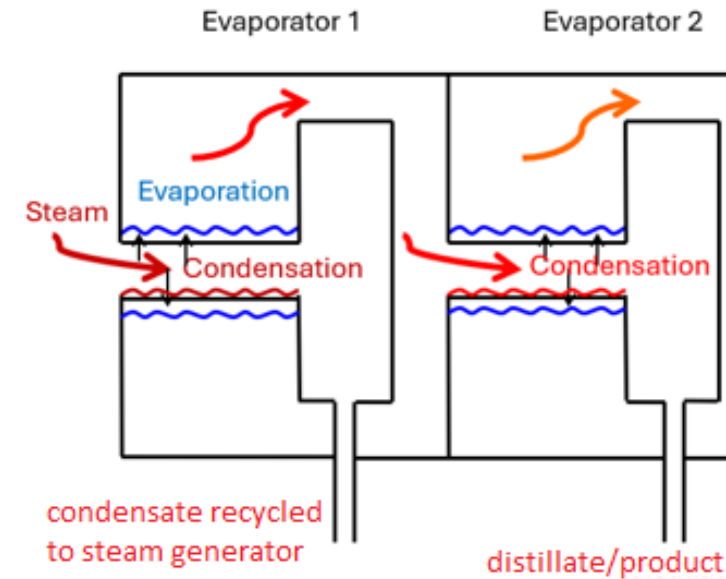
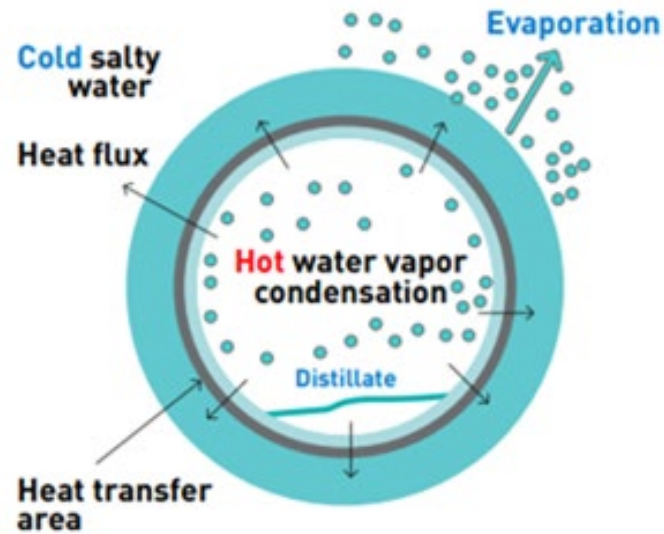
* Based on BP Raw Water analysis report, Jan 2025

* Assumed TSS of 100 for calculations

Midland Produced Water- Conceptual Design



MED- Multi Effect Desalination



- The MED process utilizes waste heat for highly efficient water distillation, based on a series of evaporator-condensers.
- Water flows into a falling film condenser, where it is de-aerated and moderately heated. In this heat exchange process, some of the water is evaporated and flows into the next effect – where it condenses and provides heat for an additional evaporation process, and so on, according to the number of effects.
- The non-evaporated water flows into the next group of effects for further evaporation, until the brine from the last group is discharged from the MED as final brine.
- The condensate water from each effect is collected and flows out of the MED as product.



Design Major Advantages

- Reduce the saltwater stream capacity up to 40%.
- Reliable, robust treatment, ensuring continuous production of distillate water.
- Potential for reuse of resources through oil recovery from the oil separator and IGF, and NSF.
- Design optimization with NSF to reduce chemical consumption, consumables, and waste production.
- Minimal pretreatment requirements for MED operation – enables robust operations with less required maintenance.
- Utilizing energy efficient technologies in the MED design.
- The MED is a prefabricated skid that ensures quality, safety, reduces the installation cost and shorten the construction time.
- Simple operation with low manpower.

THANK YOU

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