

Water Treatment Case History

H₂S Elimination in Well Test Fluids

Challenge

A North Caspian Sea operator needed a treatment package capable of Hydrogen Sulphide (H₂S) removal from aqueous fluid returns from well flow back and stimulation activities. These activities were planned for new well perforation flow backs and acid stimulation in the Caspian Sea off the coast of Kazakhstan. Production wells here typically produce gas with extremely high concentrations of H₂S (>30%).

CETCO Solution

The operator approached CETCO Energy Services (CETCO) to propose a treatment based on their requirements. CETCO initially designed and mobilized a temporary equipment package that consisted of a 100 bbl capacity Nautilus™ tank, also known as weir box, and a CrudeSorb® adsorption media RFV 2000 skid.

CETCO designed the treatment process and formulated a complex chemical treatment philosophy in order to satisfy client requirements. Fluid from well return was routed to the CETCO Nautilus™ tank where acidification took place in order to liberate H₂S gas. Acid and H₂S scavengers were injected to the process to strip off the H₂S gas. Treated effluent was then either pumped to the RFV 2000 skid or recycled back to the Nautilus™ tank while liberated H₂S gas was routed to flare. NaOH was used for neutralization of the acidified water.

Outcome

Operational success was demonstrated by CETCO throughout the trials as treatment methods were adapted to changing fluid and client requirements. CETCO successfully treated approximately 2,600 bbl of flowback fluids for subsequent disposal. The water was exported by CETCO to a standby barge for transportation to an offshore disposal site. In all cases, zero H₂S was detectable in the treated water.

The final specifications for the treated water were given as:

Component	Limits
H ₂ S	< 7 ppm detectable in vapor space
Oil in Water	< 20 mg/l
pH Range	6 - 10
pH Stable	The fluid must not release Hydrogen Sulphide gas as a result of further pH change*

*The solubility of Hydrogen Sulphide in solution is dependent on key factors including pH.

