

CASE STUDY

MANAGING EMISSIONS FROM SOUR WATER TANK EFFLUENT AT PETROLEUM REFINERY



SCOPE

A major Norwegian oil refiner planned a discharge and clean out of their sour water storage tanks.

The PROBLEM

The sour water tank is typically a high hazard, high risk tank used to store and cycle increasingly soured water from a unit process. At some point in operations, this process fluid becomes too contaminated for use and must be discharged. Safe discharging requires managing potentially hazardous emissions such as hydrogen sulfide (H₂S) gas or mercaptans. Therefore, this fluid must be properly treated prior to disposal such that no release of H₂S or mercaptans occurs during the discharge process.

The operator of the facility noted that precise concentrations of hydrogen sulfide or mercaptans in the fluid or tank vapor space could not be obtained. However, historical concentrations indicated high treatment requirements using the product Scavex WTC. Given the high-cost nature of these requirements, the operator requested treatment dosages be verified directly on-site as part of the planning process.

The dimensions of each sour water tank indicated a 22-meter (72 ft.) outer diameter with a 6000 m³ (38,800 bbl) volume capacity. Although the tanks were kept in operation during the planning process, the final fluid height of the first tank at the time of treatment dosage field testing was measured at 1.9 meters (6.2 feet) indicating a holding of 720-725 m³ (191,525 gal) of residual soured process water.

Our SOLUTION

To accommodate the client's request, West Penetone developed a sample collection and testing apparatus that could be used to determine the most efficient chemical treatment program on-site in real time.

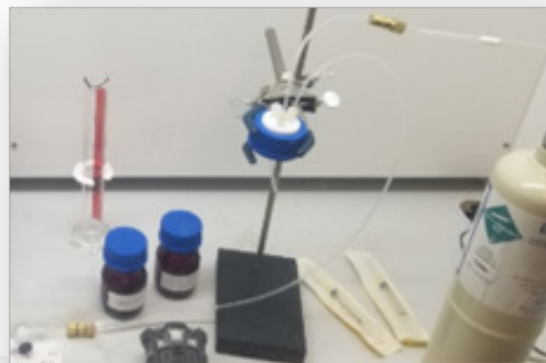
The apparatus provided the means to forcibly purge dissolved gases from the process liquid through the process of degasification, where an inert gas stream is sparged directly through the untreated control or treated liquid samples to promote more rapid headspace volatilization and release of H₂S and mercaptan.



Our **SOLUTION** (continued)

Collected gas samples could then be immediately tested and compared against control samples to determine what treatment volumes would be effective in eliminating hazardous gas emissions.

Using this apparatus clearly demonstrated that the contents of the sour water tank could be mixed and treated effectively with **SCAVEX WTC** for purposes of safe discharging and minimizing worker exposure to H₂S and mercaptan emissions.



Sparging Test Kit Apparatus

RESULTS ACHIEVED

- ▶ **SCAVEX WTC** was successfully used in the full-scale treatment process at a dosage of 11:1 fluid to treatment chemical to manage both H₂S and mercaptan emissions, as predicted with the use of the sparging test kit apparatus. No release issues or extreme pH adjustments prior to or after discharge and disposal were reported.

*A comprehensive and **integrated approach***

With over 100 years of product development, manufacturing and application experience, the West Penetone family of companies has designed and patented many products to satisfy the needs of our clients world wide.

Our technical group provides customers effective support to ensure that contaminants are paired with the right chemistry for any task.

Establishing and maintaining a collaborative approach with our customers in tackling their operational and maintenance challenges is key to realizing efficiencies and cost savings.

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