

Enviro-Syn® HCR-3000® Increases Production 8-Fold in Offshore Well Descale Treatment

North Sea, Norway

CHALLENGE

A North Sea operator working offshore Norway had an oil well with persistent precipitation of acid soluble scale, predominantly calcium carbonate (CaCO_3) with some organic content from hydrocarbons. Hydrochloric acid (HCl) was used previously, causing significant corrosion issues on tubing and equipment during deployment and flowback to platform. The operator sought a solution that was safe to deploy, and had high dissolution capacity and rate to deal with the large volume of scale. In addition, the completion metals in this field are high chrome (e.g., L80-13Cr) requiring a product with ultra-low corrosivity to metals at high temperature, even with long exposure time.

SOLUTION

Enviro-Syn® HCR-3000® Synthetic Acid™ was selected and deployed using coiled tubing from the platform.

Enviro-Syn HCR-3000 provides a safe, effective alternative to conventional strong mineral acids (e.g., HCl) to greatly reduce hazardous effects, such as fuming and corrosion on skin and metals, through unique control of reaction rates while providing many technical and operational benefits. Enviro-Syn HCR-3000 has similar solubilizing abilities to 20% HCl and reduces the amount of scale reprecipitated after injection compared to treatment with HCl.

FEATURES & BENEFITS

- Chloride free
- Comparable solubilizing capabilities to 20% HCl
- Minimal reprecipitation at high pH levels (> 4)
- Compatible with typical oilfield elastomers (e.g., Viton, Nitrile and EPDM)
- Stable corrosion inhibitor (CI) package, free of hazardous chemicals such as formic acid and propargyl alcohol (PA)



HSE & ESG ADVANTAGES

Engineered to protect workers, equipment, and the environment.



Non-Corrosive to Skin



Non-regulated for air, land and sea transport



Low-Fuming



Biodegradable

RESULTS

Pre- and post-treatment caliper readings demonstrated that treatment with Enviro-Syn HCR 3000 was very successful (Figs. 1 and 2). All the scale was removed and the well was restored to full production capacity as below.

- **Oil production (Qo) increased by 83%, from 138 to 253 m³/day.**
- **Gas production (Qg) increased by 134%, from 32,368 to 75,652 m³/day.**
- **Gas needed for gas lifting (Qgl) decreased by 14.4%, from 116,325 to 99,538 m³/day.**

Before handing well over to production, a low pressure flush was performed with a closed hydraulic master valve (HMV) to get rid of any loose scale in the production line. Thereafter the bottom hole assembly (BHA) was rigged down and the well handed over to production.

The operator has subsequently made treatment with Enviro-Syn HCR-3000 a standard operating procedure (SOP) for their offshore well operations.



FINDINGS



Safety & Handling

- HCR-3000 delivered safe, low-corrosion scale removal with performance comparable to strong acids, while significantly improving production.



Optimized Well Performance

- **Demonstrated 8X production increase** impact (headline claim) driven by effective scale removal and improved well efficiency.

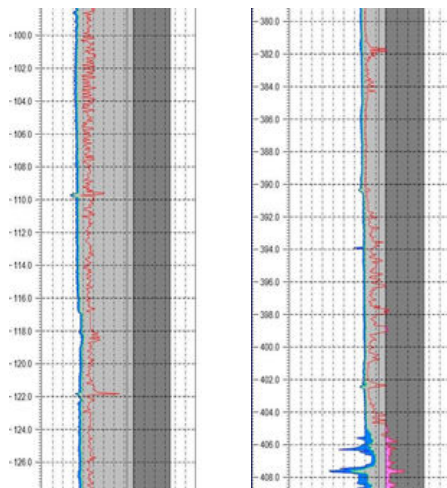


Figure 1. Pre-treatment caliper readings showing large scale deposits.

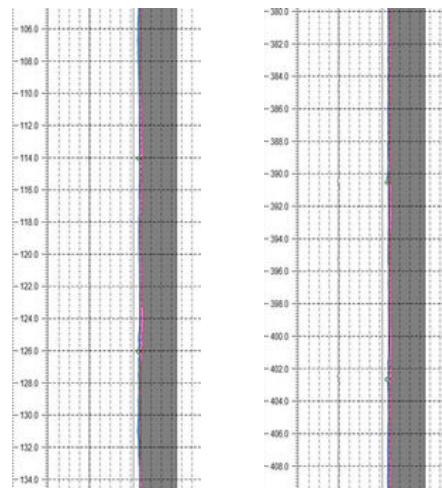


Figure 2. Post-treatment caliper readings showing that the scale has been removed.

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