

Soltellus 2402L: A Cost-Effective and Sustainable Solution for Optimizing Oilfield Operations

A Halite & Calcium Carbonate Control Case Study



Background

Oilfield operations require significant water use to manage scale formation and prevent halite salt precipitation, both of which can severely impact production efficiency. Traditional methods rely on high freshwater consumption and chemical scale inhibitors, such as phosphonates, but excessive freshwater use not only increases operational costs but can also contribute to environmental concerns.

Challenges of Scale & Halite Formation

- **High Freshwater Costs:** Water sourcing and disposal expenses can impact profitability, with costs reaching millions annually.
- **Scale Formation:** Mineral deposits can restrict flow rates, increase maintenance requirements, and reduce overall production efficiency.
- **Environmental Impact:** The use of traditional phosphonate-based inhibitors contributes to chemical discharge concerns.

Objective

A Williston Basin oilfield operator sought a solution to reduce freshwater costs while maintaining well productivity and preventing halite salt precipitation. The goal was to implement a sustainable alternative to traditional phosphonate-based scale inhibitors, ensuring compatibility with other treatment components and optimizing well operations.

Solution

In a 120-day field trial, the operator piloted Soltellus™ 2400L. The biodegradable polymer was initially injected at 200 ppm before being reduced to 100 ppm after five days, while freshwater flow rates were gradually decreased, and phosphonate scale inhibitors were phased out. Soltellus™ 2400L effectively inhibited halite salt formation and remained compatible with existing biocide and corrosion inhibitor treatments, supporting a more streamlined and sustainable oil production process.

Results

- **Performance:** Soltellus™ 2400L effectively prevented halite precipitation and eliminated the need for phosphonate scale inhibitors while maintaining well stability.
- **Freshwater Savings:** The operator achieved a 50% reduction in freshwater use, decreasing from 177 bbl/day to 76 bbl/day across four wells.
- **Cost Savings:** Reduced freshwater dependency resulted in over \$175,000 in annual cost savings.
- **Increased Revenue:** Improved well efficiency led to a production rate increase, generating over \$1.4 million in additional revenue.

Impact

By integrating Soltellus™ 2400L into their operations, the Williston Basin operator reduced freshwater consumption, minimized scale formation, and enhanced well productivity. This solution not only led to substantial cost savings but also supported environmental sustainability.

Next Steps

Future trials will explore the expanded application of Soltellus 2400L in additional wells, with a focus on optimizing dosage strategies for different operational conditions. Further research will also assess long-term impacts on well longevity and corrosion inhibition performance.