

Acid Alternative for Iron Sulfide Removal

INDUSTRY	BASIN	APPLICATION	TREATMENT
Upstream Chemicals	Permian Basin	Downhole FeS removal	SIC-1318 (non-acid)

SUMMARY

The Challenge

Previous acid treatments at the facility resulted in significant H_2S release during and after the treatment. Each event forced the facility to flare, raised H_2S exposure concerns for personnel, and required a sharp increase in H_2S scavenger injection to hold outlet concentrations within limits. The result was added emissions, added chemical spend, and added operating cost — none of which the treatment was intended to produce.

Smart Chemical Services evaluated an acid alternative treatment designed to remove the iron sulfide without the aggressive H_2S release that accompanies conventional hydrochloric acid (HCl). The alternative treats the system in a controlled manner and limits the potential for rapid H_2S liberation.

After implementation, H_2S release during the removal process fell sharply. Facility operations stabilized, scavenger rates no longer had to be raised to cover the treatment, and flaring and the associated emissions dropped — delivering both operational and ESG benefits.

RESULTS AT A GLANCE

Key Statistics

93%

FLARE REDUCTION

The acid-alternative treatment cut flare volume by approximately 93%, sharply reducing the environmental impact of H_2S release and facility flaring.

ZERO

POST-TREATMENT FLARE

No flare was observed after treatment, confirming H_2S release was controlled without the disruption seen during previous HCl treatments.

10–15%

IMPROVEMENT IN BOPD

Oil production rebounded and stabilized above the pre-treatment range. Gas production was maintained and water production remained stable.

\$3.5MM

PER YEAR SAVINGS OPPORTUNITY

The reduced H_2S load creates an opportunity to optimize scavenger consumption and cut annual chemical spend by up to \$3.5MM/year.

CHANGING THE MECHANISM

The Strategy

Smart Chemical's strategy was to replace the conventional HCl iron sulfide cleanout with **SIC-1318**, a non-acid alkaline chelant treatment designed to remove FeS without driving the H_2S -generating reaction pathway associated with hydrochloric acid. A chelating agent complexes the released iron and holds it in solution, while the alkaline chemistry keeps the iron sulfide deposit dissolving and minimizes the potential for redeposition.

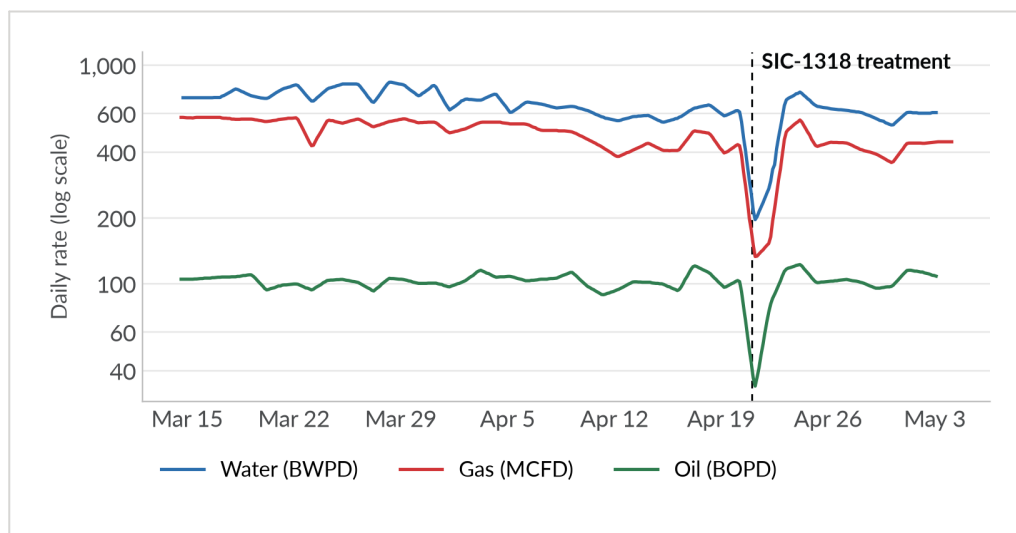
This approach targets the primary failure mode of the existing treatment — the significant H_2S release following HCl application — while still meeting the objective of removing downhole iron sulfide. By changing the treatment mechanism instead of tuning the existing program, SIC-1318 delivers a cleaner wellbore with less H_2S -related flaring, less operational disruption, and no added scavenger demand.

TWO PILOT WELLS

Results

Pilot Well #1

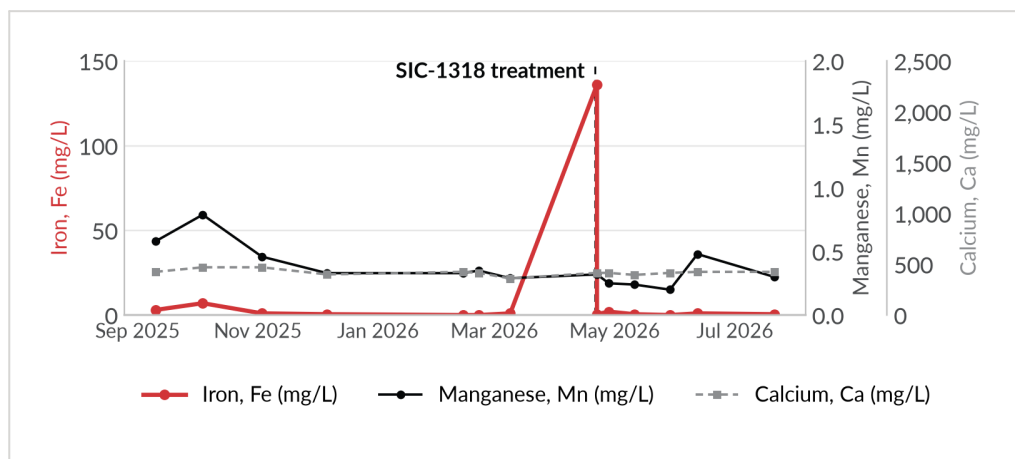
Results from the first acid alternative treatment are shown below, both analytically and economically. Production declined steadily leading up to the April 21 treatment, with gas and oil reaching their lowest levels of the period. Following treatment, production rebounded quickly and then flattened into a more stable operating trend — a recovery with none of the continued decline seen before treatment.



Pilot Well #1: daily gas, oil, and water production (log scale). SIC-1318 treatment on April 21, 2026.

- **3–5% reduction in motor amperage**, with lower and more consistent motor loading.
- **25–30% reduction in pump intake pressure**. The treatment lowered PIP and held it in a more stable operating range.
- **Iron confirms FeS removal**. Post-treatment iron levels rose sharply, showing substantial FeS dissolution in and around the pump and motor. As production continued, iron returned to a low, stable level, confirming

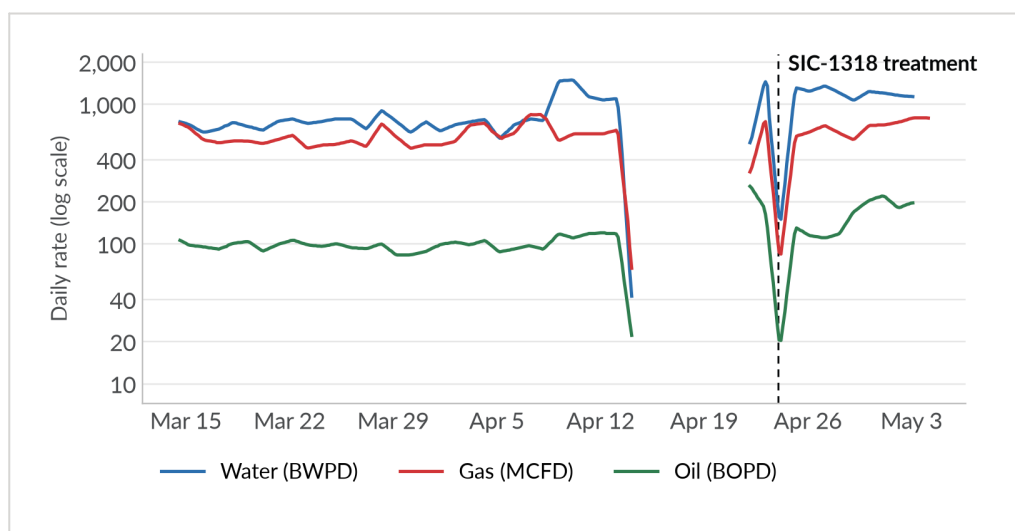
the accumulated FeS had been removed.



Pilot Well #1: produced-water iron, manganese, and calcium. The post-treatment iron spike shows FeS being dissolved and carried out.

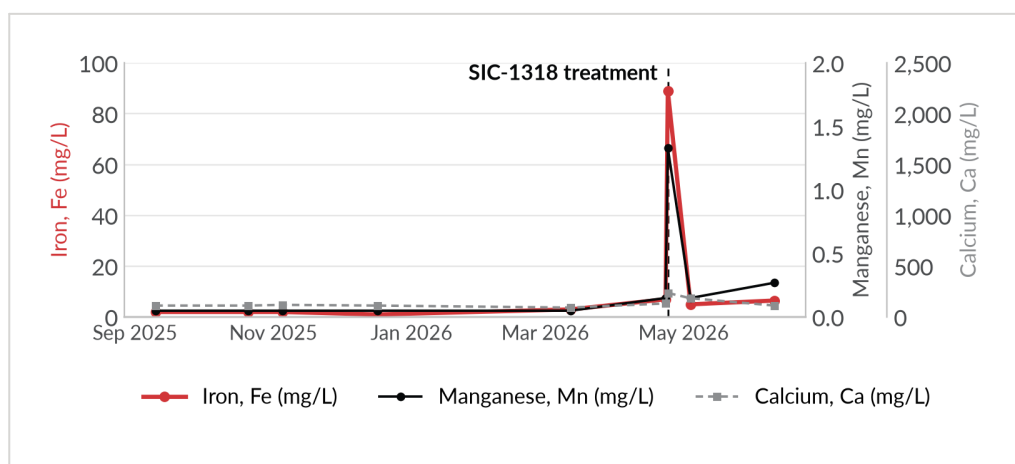
Pilot Well #2

The second well received the same acid alternative treatment. Production declined steadily from March into early April and settled well below Q1 levels. Following the April 24 treatment, oil and gas production rebounded clearly and stabilized at improved levels while water production held steady – a positive production response with no increase in water.



Pilot Well #2: daily gas, oil, and water production (log scale). SIC-1318 treatment on April 24, 2026.

- **30% reduction in motor amperage.** Amperage variability dropped significantly, giving a tighter, more consistent range post-treatment.
- **25–30% reduction in pump intake pressure,** indicating improved downhole flow conditions.
- **Iron confirms FeS removal.** Post-treatment iron levels rose sharply, again showing substantial FeS dissolution in and around the pump and motor. As production continued, iron returned to a low, stable level, confirming effective removal of the accumulated FeS.



Pilot Well #2: produced-water iron, manganese, and calcium. The post-treatment iron spike shows FeS being dissolved and carried out.

IN THE OPERATOR'S WORDS

Testimonial

"We utilized their acid alternative to remove downhole scale while avoiding the flaring typically associated with conventional acid treatments. Their... chemistry helped restore well performance while providing a safer, more operationally efficient treatment option. Their team brought a strong technical understanding of both the product and the procedure, working closely with our... personnel to optimize both. The ability to address scale while significantly reducing flaring provided meaningful operational and environmental benefits."

— Permian Basin Engineer

Key Takeaway

By replacing HCl with a non-acid FeS removal strategy, the treatment delivered **93% flare reduction**, **zero post-treatment flare**, a **10–15% improvement in stabilized oil production**, lower PIP, more stable motor loading, and a pathway to optimize **up to \$3.5MM/year** in scavenger costs.

Dealing with H₂S during acid jobs?

Talk with our team about a non-acid FeS removal program built around your wells. Visit www.smartchemical.com