

CASE STUDY 400 | NATURAL GAS | Pro3 Nano®

# REPLACEMENT OF TRIAZINE WITH Pro3® NANO TO TREAT CHALLENGING SOUR GAS FROM A GATHERING SYSTEM

**Q2 Technologies** has brought to market **Pro3® Nano**, a novel nanoparticle non-triazine H<sub>2</sub>S scavenger. **Pro3® Nano** removes H<sub>2</sub>S from gas streams and converts it into non-hazardous elemental sulfur. When combined with the SulfurCycle process, **Pro3® Nano** is regenerable allowing the reagent to be used multiple times resulting in much lower operating costs compared to triazine scavengers. With a larger operating range and significantly lower cost than Triazine, SulfurCycle and **Pro3® Nano** add value to reserves by allowing operators to produce otherwise uneconomical wells.

## CHALLENGES

- Sour gas is produced and comingled from multiple wells on plunger cycles, resulting in rapidly changing flow rates between 100Mcf/d and 1,500Mcf/d.
- H<sub>2</sub>S content of the gas ranges from 20ppm to 5,500ppm, which varies within minutes at the point of treatment.
- Low market value for the gas demands a more cost-effective treatment than Triazine to produce these wells economically.

## TAKE-AWAYS:

- **Pro3® Nano** allowed operator to produce a high H<sub>2</sub>S well while increasing production 3X.
- Operating Expenses per unit of sulfur were cut by more than 90% when using **Pro3® Nano**.
- SulfurCycle operations enjoy >98% availability while meeting the 4ppm specification 100% of the time over a 3-month trial.

## SOLUTION

- **Pro3® Nano** replaced Triazine reducing the cost of treatment and allowed treatment of more sour gas which could not be sweetened with Triazine, thereby increasing production and margins.
- The SulfurCycle process was deployed to regenerate the **Pro3® Nano** and handle the wild swings in flow rate and H<sub>2</sub>S concentrations to sweeten the gas below the pipeline specification of 4ppm.

## RESULTS

- Triazine was only capable of economically treating the lowest ppm H<sub>2</sub>S gas <200ppm.
- **Pro3® Nano** allowed for economic treatment of 5,500ppm H<sub>2</sub>S.
- Only 250Mcf/day could be economically treated with Triazine
- SulfurCycle with **Pro3® Nano** economically treats >750Mcf/d.
- Radical swings in flow rate and H<sub>2</sub>S concentrations required overdosing with Triazine such that Triazine to H<sub>2</sub>S ratios were well below 2:1.
- **Pro3® Nano** achieves ratios as high as 20 ppm H<sub>2</sub>S:1 ppm **Pro3® Nano**.
- Spent Triazine required pigging to keep the pipeline flowing freely.
- SulfurCycle produces non-hazardous elemental sulfur which is disposed of in the local landfill.