

Odor Control Study SulfeLox® Versus Calcium Nitrate

Background

Faced with increased chemical prices, a large facility in Tennessee wanted to trial SulfeLox® as a potential alternative to their Bioxide program. USP Technologies was brought in to prove that SulFeLox® could replace nitrate at a 3:1 volume ratio which in a long-term program opens the door for cost savings up to 25%. Additionally, the program would need to provide similar H₂S performance (<10ppm vapor average) to ensure the life cycle of the manifolded force mains.

PS 1 feeds into a dual 12" force main that has three smaller force mains that manifold in before discharging at the control point downstream. PS 1, PS 2, and PS 3 are all equipped to use Bioxide for sulfide control at the discharge and have performed well for over 20 years. The retention time for this force main is relatively long (7-8 hours), and provides a perfect application to switch to SulFeLox® for hydrogen sulfide control. In June of 2023, the city turned off their chemical feed to establish baseline conditions, followed by 30 days of dosing SulFeLox® at Pump Station 1.

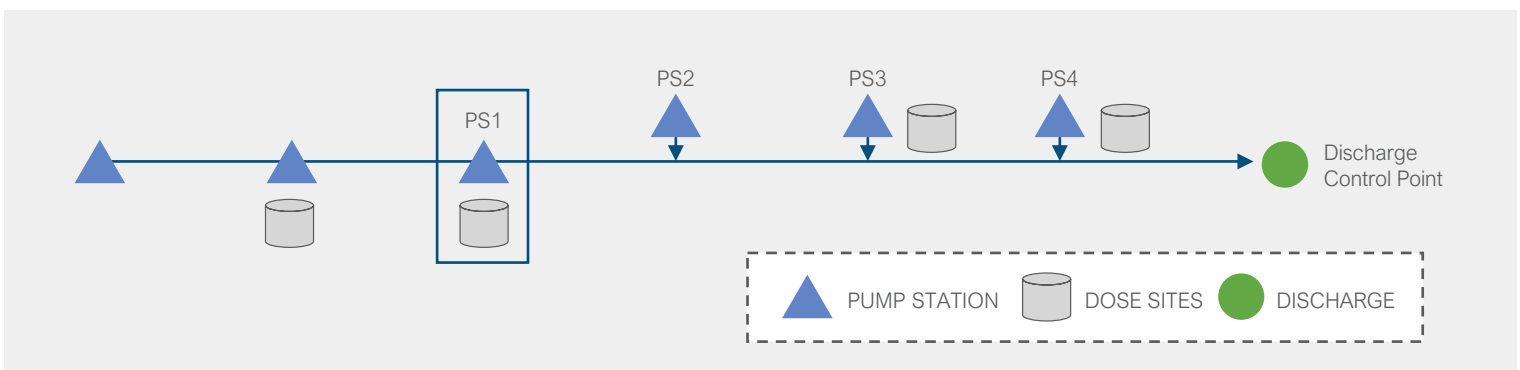
KEY RESULTS:

20%

Estimated Cost Savings

22%

Decrease in Vapor
H₂S v CaN



Technology

SulFeLox® is a buffered iron solution that combines the effectiveness of iron salts with the safety benefits of calcium nitrate – all at less cost. It is specifically designed to control H₂S in wastewater collection systems by binding it into non-volatile ferrous sulfide (FeS). It contains no free acid and has a lower hazard rating than traditional iron salt technologies, and equal or lower than calcium nitrate, enabling use in residential and commercial areas.

SulFeLox® can go anywhere nitrates can and is specifically designed to replace nitrate where it performs the worst – in long, slow-moving, sulfide generating sewers. Typical applications for SulFeLox® can substitute for nitrate on a 1:2 to 1:3 basis, meaning significantly fewer deliveries, and approximately 15-20% less cost.

Results are examples only. They are not guaranteed. Actual results may vary.

Performance

For program comparison, USP collected liquid and vapor H₂S data in three scenarios:

BASELINE
No chemical feed

BIOXIDE
Usage and H₂S data collected from previous year's reports

SulfeLox®
Dosing at steadily decreasing rates for almost 30 days (Flat Dose vs 24-hourly profile)

Treatment	Dissolved Sulfide (mg/L)	Average Vapor H ₂ S (ppm)
Baseline	1.6	31.9
Bioxide	0	7.75
SulFeLox (Flat Dose)	0	8.3
SulFeLox (Hourly Profile)	0	6.1

Results

USP Technologies produced the above results through the approximate replacement ratio of 3:1 of Bioxide with SulFeLox® within three weeks of system startup. Estimates provided for a year long program on this line would provide approximately 20% cost savings over the current treatment program in addition to reduced number of chemical deliveries. Finally, a 22% decrease in vapor H₂S (ppm) levels was observed versus the same time period last year.

About USP Technologies

USP Technologies is the leading supplier of peroxygen-based technologies and services for environmental applications. We have been serving the water, wastewater and remediation markets for over 20 years and have offices and field service locations throughout North America. Our consultative approach to problem solving includes application assessment, technology selection and development of a tailored treatment approach. Our full-service programs successfully integrate storage and dosing equipment systems, chemical supply, inventory and logistics management, and ongoing field and technical support. This approach provides cost-effective, “hands-off” solutions to our customers. USP Technologies also can provide access to experienced application partners for a turn-key program encompassing engineering, site characterization and technology selection, program implementation, execution and report generation.