



PO Box 600 San Felipe, Texas 77473
(979) 885-0005 Fax: (979) 885-3208

February 22, 2018

Anthony Daniel
City of Broken Arrow
Director of Utilities
Email: adaniel@brokenarrowok.gov

Subject: Proposal - SULFeND® Full Service Treatment for Sulfide Control on the County Line Road Interceptor – Extended Pilot.

Dear Anthony,

Thank you for inviting Pencco Inc. to evaluate the critical hydrogen sulfide odor concern emanating from the County Line wastewater line. Pencco Inc. recognizes this odor concern is a high priority for the Broken Arrow as the County Line Road line segment produces high sulfide loadings and odor complaints to the area of the city near 101st and County Line.

Pencco Inc. is pleased to provide Broken Arrow with the following proposal for a full-service SULFeND® program to control odors along the County Line Road line.

Prior to this proposal, Pencco Inc. conducted an extensive sulfide survey on the County Line Road line to fully understand the sulfide loadings. Based on our findings, vapor levels along the County Line Road segment exceed over 180 ppm vapor H₂S and liquid sulfide loadings over 138 lbs./day. Based on the sulfide levels measured, we estimate a target feed of 180-210 gallons per day of SULFeND® for complete control during the summer and winter seasons to achieve 25 ppm on daily average for vapor H₂S and < 0.5 mg/L for dissolved sulfide. The target usage was derived from our sampling data and extrapolated for the year based on normal conditions. In similar applications, we have observed seasonal fluctuations which can be utilized for optimization of chemical usage, with winter and spring generally requiring less treatment. The proposal is comprehensive in nature and include full-service delivery of the chemicals, equipment, labor and services required to reliably and safely apply the technology or the duration of the project, excluding any required dose site civil work or improvements.

The attached diagram shows dosing and monitoring points on the County Line Road line.

Program Cost – Extended Pilot

The price per gallon is good through January 1st, 2019.

Cost for extending the SULFeND® program at the city of Broken Arrow for 4 months is:

- SULFeND Price per gallon: \$2.38
 - Pencco estimates an average usage to require a load per each 20 days
 - In addition, as the weather warms up and increases the bacterial respiration rate, the quantity to meet the goals of the program may increase above the estimated 210 gpd average.
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- Pencco estimates the usage to be 6 to 7 loads of 4200 gallons of chemical for the 4 months – the City will only pay for the delivered quantity
- Total estimated 7 load cost is \$69,972.00

Equipment Provided

- (1) 6000 gallon high density polyethylene tank (see attached drawing)
- Ultrasonic level transmitter and high fill switch
- (1) 16.5' by 16.5' Poly lined Steel Containment with steps for ingress and egress
- Leak Detection System for Containment
- (1) NEMA 4 Fiberglass Enclosure including:
 - 500 ml Calibration System
 - Pump Mounting Shelf
 - Dual Fan Cooling System
 - Double Pole Power Switch Box
 - Power Outlet for Pumps
 - Leak Detection System
 - Drain to Containment
 - Chemical Inlet and Outlet
 - Field Connection Enclosure
 - Control Panel Mount
 - Stainless Steel Frame mount for Panel and Piping
 - Alarm Light on Panel
- (1) NEMA 4 Polycarbonate Control Panel including:
 - Touchscreen Monitor and Controls
 - Independent Cooling System
 - Sierra Wireless LS300 Programmable Modem for Web monitoring and control
- PLC Control System with
 - 48 point Curve Fit
 - 48 point modified flow pace capability with customer flow signal
 - Spare discrete and analog inputs and outputs for custom communication to customer system
- (2) Blue White A2V Variable Speed Peristaltic Pumps (up to 14.7 gph)
- Portable Eye Wash and Shower System
- (3) RTX OdaLogs for testing and optimization
 - 91st St.
 - 101 St and 193rd Rd
 - 8511 S 9th St.
- Delivery to Site
- Complete assembly and installation on prepared site
- Start-up, Calibration, and testing

The scope includes the following service:

Continued Services Provided by Pencco

1. Maintenance of storage and feed system, Start-up, and Optimization
2. SULFEND[®] Solution
3. Sampling and data collection/Reporting. Once every other week at 3 sites.
4. Program management
5. Emergency Service

Program Goals at Final Control Point:

- <25 ppm average H₂S in vapor
- <0.5 mg/L Dissolved Sulfide in liquid

SULFeND® Program

Upon successful completion, the City of Broken Arrow can elect to continue the program. The standard SULFeND program includes:

- The SULFeND System deployed for the test
- Monthly Service
 - Mechanical System check and wear part replacement
 - An RTX OdaLog placed at the terminal control point
 - Liquid Sampling Check
- Program Engineer Overview
 - Routine reviewing of data
 - Maintaining the Website
 - Inventory Management
- Web Cellular service
 - Complete access by Customer – monitoring and control
 - Future web upgrades
- Emergency Service
- Priority Access to our survey team for future odor and corrosion control situations

Cost for Permanent Program

1. SULFeND Price per gallon: \$2.38 (locked until January 1, 2019)
2. Program Fees: \$1,450.00 per month

Notes:

1. Pricing does not include applicable tax
2. Proposal is valid for 90 days
3. Terms are Net 30
4. SULFeND pricing is locked until January 1, 2019, price adjustments are based on our documented cost changes for raw materials and manufacturing costs
5. In the event that the program is successful and the City does not elect to go forward, there is a \$4,000 demobilization fee.

We appreciate the opportunity and look forward to serving you and the City.

If approved, please sign below and return.

Sincerely,

Vincent Marano

Vincent Marano
Pencco, Inc.

City Manager

Date

Approved as to form: *Leshi Myers*
Asst. City Attorney

County Line Road Line Diagram

