Case Study

Site Description – Wastewater Treatment Facility

Site Location: Central Texas Area

Site Description: A residential sub-division (approximately 4,500 acres in size) located in the central Texas with one wastewater treatment plant. A gravity collection system collected effluent from 3 sections through various lift stations and pumped it to the wastewater treatment plant. Total distance of the 8" force main is approximately 7,810 feet. The effluent is then transferred to a storage pond via a gravity line and irrigated. It's an activated sludge process consisting of the following items; aeration basin, final clarifier, and chlorine contact chamber. The sludge is stabilized by aerobic digestion.

Problems - prior to treatment

- **Grease Accumulation** - present in all lift stations creating both technical and odor problems.
- **Grease removal -** was required very two weeks.
- **Anaerobic -** state of the sewage.
- **Hydrogen Sulfide -** excessive hydrogen sulfide odor
- **Pump Controls -** constant interruption of automatic controls
- **Lift Stations -** required constant supervision and frequent grease removal.
- **High Chemical Usage** - a continuous introduction of ferric chloride helped to control the grease but interfered with the operation of the plant.
- **Sewer Chokes -** constant clogging of lift stations
- **Equipment -** corrosion of the metal and concrete

Treatment Period - 11 years ongoing treatment for maintaining facility.

Flow Rates – beginning and ending

Beginning Average - 13,000 gallons per day
Ending Average - 90,000 gallons per day
Peak Flow Rate - 530,000 gallons per day
The flow rate increased 700% from the start of the project to the end.

Application of the Wastewater Process

All the lift stations were treated in the Initial treatment. During the first month the Oppenheimer Formula V was added once a week. Thereafter, was added at varying times from 7 - 21 day intervals.

Test Samples and Description of Testing

- Samples were taken on a weekly basis and analyzed by a certified independent third party laboratory facility. The Biological Oxygen Demand (BOD) - EPA 405.1
- Total Suspended Solids (TSS) - EPA 160.2
- Total Volatile Suspended Solids (TVSS) - EPA 160.4
- Settleable Solids (SS) - EPA 160.5
- Ammonia Nitrogen (NH_3N) - EPA 350.2

Starting Levels: The average Total Petroleum Hydrocarbons (TPH) level was 131,192 parts per million (PPM).

Testing standards: All tests were performed by an independent 3rd party laboratory.

Recommended Treatment Method (in-situ) :

Goal: The goal of the program is to reduce the amount of sludge produced and to increase the efficiency of the wastewater treatment facility.

Grease Accumulation - Non-accumulation of grease in all lift stations. Grease pumping and removal was no longer required.
Anaerobic - Reduced plant treatment odor and ammonia. The neighbors stopped complaining about the excessive odor that was coming from the facility.
Hydrogen Sulfide - Effective elimination of the odor. Ultimately resulting in a safer work environment.
Pump Controls - Reduced labor, cost savings, and chemical maintenance of controls.
Lift Stations - Reduced labor, maintenance, and improved inspection conditions.
Sewer Chokes - Clogs in all the lift stations were eliminated. Eliminating the need for the operator to wade through sewerage to unclog the drains.
Equipment - The hydrogen sulfide corrosion was under control. This reduced wear and tear on the equipment and lowers the cost to replace it.
BOD/COD - Reduction of BOD/COD levels and lowered effluent values.
Sludge - Significant reduction in sludge production as well as a denser sludge.
Nitrogen - Reduction of the nitrogen content.
Organic Matter - Effective stabilization of the biological decomposition, lower effluent values on settable and suspended solids.

Outcome: Despite a 54% increase in the daily flow rate into the wastewater treatment plant the excellent results were achieved. The flow rate increased dramatically because of the new houses that were built in the subdivision. The increased flow rate did not result in higher costs to the plant. Because of the use of The Oppenheimer Process the actual operating costs were reduced. Application of the process indicates that the wastewater purification can be stabilized and low effluent values can be achieved for settable and suspended solids, organic matter (BOD) and ammonia.