



Polymer Manufacturer in Texas Utilizes MICROBE-LIFT® Technology to Improve Effluent Quality

Location: Polymer Manufacturer, Texas

Background: A water-soluble polymer manufacturer was having difficulty with an activated sludge treatment system that failed to meet permit limits. The treatment system was designed with an initial flocculation phase, whereby the pH was adjusted to 12 or above, followed by an anaerobic treatment phase, which discharged to a typical aerobic activated sludge treatment process.

Objective: The facility was under pressure to improve the efficiency of treatment in the activated sludge system to meet effluent NPDES limits including COD, BOD, and TSS.

After a complete evaluation of the system, **Ecological Laboratories** technical staff determined that high phenolics in the waste stream, often exceeding 30 mg/l in the aerated basin, was inhibiting microbial treatment. Variation in the form of phenol shocks in the influent provided continual disruptions in both the anaerobic and aerobic systems.

Bioaugmentation with **MICROBE-LIFT®** technology, a consortium of strains capable of effectively degrading phenolic wastes, was the obvious solution. A program was developed including an initial dosage of 5 ppm dosed into the aerobic digester followed by a 1-ppm daily maintenance dosage.

Results Achieved: The following chart indicates the improvement in effluent quality two weeks after initiation of treatment. The results will continue to improve as the bacteria become more acclimated to the specific waste stream, again showing the cost-effectiveness of the use of bioaugmentation.

Effluent Data	Before	After	Percent Improvement
pH	8.35	7.66	
Alkalinity	5300		
NH ₃ (N)	33.93	1.28	96%
PO ₄ (P)	14.76		
BOD	2689	148	94%
COD	4833	545	89%
TSS	824	128	84%
Cd	0.82		
T. Chromium	0.16		
Copper	0.44		
H ₂ S	9.60		

Fig.1: This chart shows a dramatic increase in treatment efficiency based on the introduction of the consortium of strains in **MICROBE-LIFT®** technology. All data is reported in mg/l with the exception of pH.

Polymer Manufacturer Utilizes MICROBE-LIFT®/IND to Improve Effluent Quality

Through the bioaugmentation program and some diversion of flow, control was achieved even when the influent concentration of phenol was over 100 mg/l.

In addition, the anaerobic digester had also been disrupted because of toxic conditions. The dosing of MICROBE-LIFT® formulation directly into the primary digester was able to bring the digester back on line much faster than it would recover otherwise.

The use of MICROBE-LIFT® formulation in municipal anaerobic digesters is a well-established beneficial practice. Solids balancing of an anaerobic digester is the primary method of affecting control over these systems. Often this balance is difficult to maintain, especially with the aging and undersized systems and heavily increased solids loading we experience today. Anaerobic digesters handling industrial waste are even more difficult to balance. In this case, heavy metals provide additional toxicity. Application of MICROBE-LIFT® formulation to these systems has demonstrated its ability to quickly restore proper operating parameters, showing increased gas production and overall solids removal efficiency. Although MICROBE-LIFT® technology is sensitive to metal toxicity, the effective use of this bacterial augmentation can overcome these toxic conditions especially if the heavy metal toxicity is cyclical.

The excellent efficiency of MICROBE-LIFT® bacteria to oxidize hydrocarbons makes it particularly effective against complex organic compounds that end up in the digester. In addition, MICROBE-LIFT® technology's affinity for hydrogen sulfide oxidation makes it beneficial in controlling odor problems always associated with malfunctioning anaerobic digester systems.

For more information on MICROBE-LIFT® Technology contact
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