



Biotifx® FOG Reduces Grease Cap, Sludge and Odors; Improving Lagoon Performance

SUMMARY

A mid-western food processing facility with a large wastewater lagoon was seeing significant fat, oil and grease (FOG) and sludge build up resulting in poor treatment during summer months, and low capacity year round. After three weeks of treatment with Biotifx® FOG, there was a significant reduction in FOG and sludge build up and an improvement in overall lagoon performance.

BACKGROUND

The food processing facility was operating a 22 million gallon wastewater lagoon. Influent to the lagoon averaged 50,000 gallons per day. Water from the lagoon was pumped through an irrigation system to nearby farm fields. The amount of water that could be irrigated was limited by season and nitrogen concentration. Due to a build-up of a thick protein/FOG cap on the lagoon, dissolved oxygen was low and nitrogen removal was poor thus limiting the rate that facility could land-apply the water. The lagoon was also having its sludge dredged regularly at a significant cost.

MATERIALS AND METHODS

Starting in June of 2017, the lagoon was given an initial dose of 160Kg of Biotifx® FOG (~2 ppm of total lagoon volume) followed by a weekly dose of 3Kg Biotifx® FOG (2ppm weekly flow). Monitoring of pond performance was conducted by:

- Taking regular pictures of FOG cap on lagoon
- Measuring effluent nitrogen
- Measuring lagoon sludge depth with sludge judge

During treatment, the surface aerators were removed for mechanical reasons so all results seen were without aeration.

RESULTS

Prior to product application, the FOG cap covered 100% of the lagoon and was six inches thick on average (Image 1). This was typical coverage and thickness of this lagoon in previous years. After 3 weeks of treatment, the FOG/protein cap was reduced to 60% coverage and was only two inches thick (Image 2). In addition, sludge build-up on the bottom of the lagoon and effluent nitrogen were significantly reduced after treatment (Table 1). The reduction in nitrogen was likely the result of FOG cap removal allowing for better oxygen transfer into the lagoon.



Image 1: Lagoon before treatment



Image 2: Three weeks after treatment



SUMMARY

The primary benefit of nitrogen reduction was the ability to irrigate more water on the farmland currently available. Treatment prevented the client from needing to rent additional land to irrigate the water from their lagoon. This along with having 75% less sludge to dredge, saved significant dollars in equipment and land rental fees. As an additional benefit, odor generated in the lagoon was significantly reduced.

Table 1: Results Summary

| MEASURED VARIABLES | BEFORE TREATMENT | 3 WEEKS AFTER TREATMENT |
|--|---|--|
| FOG cap % surface coverage | 100% | 60% |
| FOG cap thickness (inches) | 6 | 2 |
| Sludge on lagoon bottom (inches) | 24 | 6 |
| Total volume of FOG cap and sludge in lagoon | 32,400 Cubic Yards (6,543,958 Gallons) | 7,800 Cubic Yards (1,575,397 Gallons) |
| Effluent nitrogen (mg/L) | 614 | 526 |
| Gallons dischargeable based on nitrogen | 16 million | 18 million |
| Odor Rank (1 None - 10 Worst) | 8 | 2 |