Bioaugmentation with MICROBE-LIFT® Technology Reduces Sludge Production 20% Allowing Digester to Handle Increased Load

Location: **City of Busan (formerly Pusan), South Korea**

Background: Busan is the second largest metropolis in South Korea. With a population of 3.6 million, it is second in size only to Seoul. With rapid urban development the city of Busan was continually challenged with increasing wastewater treatment demand. The city's anaerobic digester was only functioning at 70% of design efficiency based on volatile suspended solids (VSS) reduction.

Objective: In 1999, Ecological Laboratories was approached by the City of Pusan in Korea about the use of one of it's bacterial products to improve the efficiency of it's anaerobic digestors, which were functioning at 70% of design efficiency based on volatile suspended solids (VSS) reduction. While a version of the product had been used in septic tanks, primarily an anaerobic environment, with good success, the product had not been applied to commercial size anaerobic digestors.

Pilot studies were conducted in 5,000-liter pilot reactors that remained from the original design work on the digestors. With encouraging results achieved in the pilot trials, field trials were later pursued.

MICROBE-LIFT®/IND Application Program

Day	Tank 1	Tank 2	Tank 3	Tank 4	Total
1	6 gal.	4 gal.	3 gal.	4 gal.	17 gal.
4	6 gal	4 gal.	3 gal.	4 gal.	17 gal.
7	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
10	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
13	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
16	3 gal.	2 gal.	.5 gal.	2 gal.	8.5 gal.
19	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
22	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
25	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
28	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
31	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
34	3 gal.	2 gal.	1.5 gal.	2 gal.	8.5 gal.
Maintenance (2x/wk)					
	1.5 gal.	1 gal.	0.5 gal.	1 gal.	

Total first 37 days = 127 1/2 gallons
Annual Maintenance = 416 gallons

Fig. 1: *This table provides the dosage schedule for the Busan field trial. The annual maintenance rate is 416 gallons.*

Results achieved: Within 90 days the VSS reduction went from 70% of design efficiency to 130% of design efficiency. The plant has continued to use the product with the exception of one year during which an alternate product from a Japanese supplier was used and the plant efficiency returned to the 70% VSS reduction efficiency observed prior to the bioaugmentation with MICROBE-LIFT®/IND. The following year when the MICROBE-LIFT®/IND was again added, the digestors again resumed the 130% VSS reduction observed the first time with the MICROBE-LIFT®/IND.

Fig. 2: *Harbor in Busan, South Korea*

For more information on MICROBE-LIFT® Technology contact
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