

SCD Probiotics®

Case Study Summary – SCD Probiotics® Technology used to save energy in the aeration process of the wastewater treatment facility in Mohali, India

Wastewater – Saving energy (CSS-030-2007)

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Industry:	Private Industrial Company
Application:	SCD Probiotics Technology introduced to the wastewater treatment facility
Where:	Mohali, India
When:	Since 2007
Product:	Customized solution using ProBio Balance™ Plus
SCD Customer:	Ecosystem Technology, Chennai, India

Background

A wastewater treatment facility in Mohali, India encountered confounding problems due to their outflow standards not meeting multiple established standards regulations. The parameters from wastewater characteristic as Biologic Oxygen Demand, Chemical Oxygen Demand and Total Suspended Solids were higher than the Indian Environmental Regulation Standards. The facility needed to find a resolution to reduce their baseline parameters. Researchers want to achieve this by using SCD Probiotics Technology. After product application, goals of the project were achieved with significant improvements in energy savings and water quality.

Introduction

Because India is currently facing an 18% deficit in power generation, Indian industries are focused on finding ways to save energy in industrial processes and industrial waste management. Many wastewater treatment facilities use aerators to maintain wastewater quality parameters within regulation standards. The customer wanted to reduce energy in the aeration process in order to maintain or improve the quality of the wastewater treated, and to increase the efficiency of the system. The reduction of foul odors and sludge production was also a goal of the trial.

The Philips wastewater treatment plant in Mohali has a design of a daily capacity of ~150 cubic meters/day. The treated wastewater generated from the common facilities (serving 1,300 people) is then used for other purposes in the office complex, primarily gardening.

Objectives

Using SCD Probiotics products, the researchers would like to achieve the following specific objectives:

- Reduce energy consumption in wastewater treatment plant by 50% after one year operation with SCD Probiotics



- Reduce sludge production
- Reduce odors once aeration is stopped
- All outflow standards established by regulations must be met; further reduction of baseline outflow results is desired (see Table I)

Table I: Indian Environmental Regulation Standards

Parameter	Unit	Outflow Standard
Chemical Oxygen Demand (COD)	mg/l	≤ 250
Biological Oxygen Demand (BOD)	mg/l	≤ 30
Total Suspended Solid (TSS)	mg/l	≤ 100
Oil & Grease (O&G)	mg/l	≤ 10
Chloride (Cl)	mg/l	≤ 250

Methodology

The system used is a Fluidized Aerobic Bed Bio Reactor (FAB) where two lobe air blowers diffuse air from the bottom through diffusers/nozzles. The secondary product made from ProBio Balance™ Plus was introduced to the system beginning August 1, 2007. It is added to the equalization tank that receives the water inflow from canteens, restaurants, toilets and bathrooms.

Results

The goals of the project were achieved with significant improvements in energy savings and water quality. Energy consumption was reduced by up to 54% when compared to previous year (for month to month comparisons see Table II on page 3). Mean Wastewater Characteristics improved after the application of SCD Probiotics (see Table III on page 4).

In addition, the client received the following benefits:

- Sludge production was reduced.
- Odor from the wastewater treatment operation was eliminated.
- Maintenance of the wastewater treatment operation was easier and less expensive than in previous years.
- Setup and cost for the probiotic applications were minimal; all expenses associated with the project were within budget and a positive return on the investment was achieved.

Due to their success saving energy in the Mohali WWT plant, Philips Electronics India Limited has initiated the same program at two additional sites: Vadodara, Gujarat and Philips Innovation Campus (PIC) in Bangalore.



Table II: Energy consumption reduced up to 54%.

Month	Water (KL)	Power (KWH)	KWH/KL	% Reduction	
June 2006	605	3508	5.80	(compared with previous year)	
July 2006	322	3169	9.84		
August 2006	310	1567	5.05		
September 2006	721	3576	4.96		
October 2006	957	2904	3.03		
November 2006	1077	3315	3.08		
December 2006	660	3693	5.60		
January 2007	903	3404	3.77		
February 2007	388	2781	7.17		
March 2007	336	2792	8.31		
April 2007	717	2791	3.89		
May 2007	1249	3326	2.66		
June 2007	953	3076	3.23	Start SCD 1/8/2007	
July 2007	336	1918	5.71		
August 2007	293	1741	5.94		17.55
September 2007	731	2221	3.04		-38.74
October 2007	815	1710	2.10		-30.86
November 2007	1045	1636	1.57		-49.14
December 2007	1465	3476	2.37		-57.60
January 2008	1710	3547	2.07		-44.97
February 2008	1117	2539	2.27		-68.29
March 2008	1159	2167	1.87		-77.50
April 2008	1008	1915	1.90		-51.19
May 2008	929	1948	2.10		-21.26
June 2008	568	1470	2.59		-19.82
July 2008	416	1415	3.40		-40.41
August 2008	353	953	2.70		-54.57

Table III: Mean wastewater characteristics prior to SCD Probiotics application (April-July 2007) and after SCD Probiotics application (August 2008).

Date of Lab Result	pH	TSS	COD	BOD	O&G	Chloride (Cl)
		mg/l	mg/l	mg/l	mg/l	mg/l
INFLOW						
	6-8	200-300	400	200	3.2	50
OUTFLOW						
18 April 2007	7.1	30	104	36	1.9	102
17 May 2007	7.6	23	46	15	1.7	31
13 June 2007	7.7	16	50	17	1.0	46
17 July 2007	6.9	16	43	15	1.0	34
Start SCD Probiotics						
06 August 2007	7.1	18	16	6	1.8	38
24 August 2007	6.7	18	43	16	1.2	38
24 September 2007	7.4	16	71	25	0.8	44
10 October 2007	7.2	36	158	56	2.2	31
2 November 2007	7.7	23	30	10	1.2	42
27 November 2007	7.9	28	31	12	2.0	35
1 January 2008	7.6	28	54	19	1.8	79
28 January 2008	7.8	32	58	21	1.6	42
11 February 2008	7.5	36	60	22	1.8	34
8 March 2008	7.7	40	49	18	2.2	40
14 April 2008	7.3	42	48	17	1.8	30
9 May 2008	7.7	48	48	15	2.2	34
23 June 2008	7.0	42	25	11	1.8	38
23 July 2008	6.8	32	44	15	1.2	134
25 August 2008	6.8	28	16	5	2.4	42

Conclusions

By applying SCD Probiotics products, wastewater treatment facilities see positive improvements to their overall productivity and environment. This success can be described as a reduction of energy consumed, sludge and odor produced, improvements to wastewater characteristics, easier operation, and less cost for the plant.

