Well-Operated Municipal Plant Achieves $130,000 Cost Savings from Microbe-Lift® Technology in Deutsch-Wagram, Austria

Location: **Deutsch-Wagram Municipal Treatment Plant, Austria**

Background: The sewage treatment plant of the borough Deutsch-Wagram is situated in the south west of the settlement on the left shore of the Rußbach and has been in operation since 1969. The drainage area is 350 hectares and the degradation performance is more than 90% based on mechanical, chemical and biological treatment. The waste water entering the sewage work at the supply tank is lifted up with screw pumps to the level of the sewage work and passes through a bar screen. A mechanical scraper removes coarse matter from the waste water. Then, the wastewater flows through the circular degritter where granular components are separated. Through a distributor structure the mechanical pre-cleaned wastewater enters the activated sludge tank with a capacity of 1440 m^3. The biological treatment is carried out by the activated sludge process. To cover the oxygen demand, air is supplied with cage rotor aerators into the wastewater. In the secondary settling tank, with a capacity of 2.300 m^3, the sludge settles down and is separated from the wastewater, treated biologically, then discharged to the receiving water (Rußbach). Through a siphon pipe the settled sludge enters the sludge recycling pump station. With screw pumps the sludge is pumped back into the activated sludge tank.

The quantity of water for a population equivalent of 8.200 is treated in the activated sludge tank, designed for a population equivalent of 6.000. The chemical cleaning is carried out with the addition of iron salts to precipitate phosphorous from the wastewater and is removed with the excess sludge from the process. Nitrates can be removed (denitrification) with high efficiency from the wastewater when operated with that objective. The sludge is thickened in the sludge storage tank and the sludge liquor pumped back into the supply tank. The thickened sludge either can be directly used in agriculture or the produced sludge granulate is scattered on the fields after de-watering with a sludge press.

Objective: The plant is operated by an O&M firm from the Netherlands. Located close to a residential area, the plant had regular problems with odors and oil & grease buildup in the head-works and aeration basins despite achieving better than 95% reduction for BOD and TSS. In addition, the plant was expending a significant portion of its operating budget for sludge handling and disposal.

A bioaugmentation program was implemented in 1998 for a period of one year to determine if the bioaugmentation program could consistently reduce the amount of sludge generated in the plant. Improving odors and oil and grease breakdown were secondary objectives but were not considered to be enough on their own to justify the cost of product treatment, approximately US $30,000/year.

Fig.1: *Wastewater Plant at Deutsch-Wagram*

Deutsch Wagram

Table 1. Average of some main parameters from the annual report of 1997

parameter	average / year	unit	degradation eff.
Waste water / d	1320	m^3/Tag	-
Sludge volume	810,2	ml/l	-
BSB_5: supply	286,3	mg/l	-
BSB_5: discharge	5,4	mg/l	98,0 %
CSB: supply	574,5	mg/l	-
CSB: discharge	39,1	mg/l	92,5 %
NH_4-N: supply	47,5	mg/l	-
NH_4-N: discharge	1,4	mg/l	97,0 %
NO_3-N: supply	33,2	mg/l	-
NO_3-N: discharge	4,8	mg/l	85,5 %
PO_4-P: supply	5,6	mg/l	-
PO_4-P : discharge	0,5	mg/l	91,4 %

Fig. 2: Average values of some main effluent parameters from the annual report of 1997.

Dosage Schedule for MICROBE-LIFT® Technology in the Sewage Work of Deutsch-Wagram:

Dosages were recommended based on loading (COD; BOD5, resp. hydraulic loading) degradation efficiency, problem zones and working capacity.

Before initial inoculation, 2 gallons of MICROBE-LIFT® formulation were applied in the pump station, supply tank, and secondary settling tank. The addition was carried out either by direct applying or spraying in a dilution of 1:10 to 1:50 with water in a water can.

Initial treatment, start on 1st April

April 1998, ¼ gallon was applied on the floating layer and the sidewalls of the supply tank near the pump screw in a dilution of 1:10 with water. 4 gallons were applied into the activated sludge tank. On the floating layer of the secondary settling tank ¾ of a gallon was sprayed in a dilution of 1:10.

On April 2.1998, at 3 a.m. 1 gallon was added at the pump station.

Dosage schedule:

1 US gallon = 1 bottle = 3,7853 liter		gallons per month
Initial:	6 gallons	
Next four weeks (once per week):	1,5 gallon	6
Maintenance (once per week):	1 gallon	2

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Dosages

Next four weeks once per week:

9.4.1998	1 gallon was added into the activated sludge tank
17.4.1998	1 gallon was added into the activated sludge tank
23.4.1998	1 gallon was added into the activated sludge tank
30.4.1998	1 gallon was added into the activated sludge tank

Maintenance once per week:

8.5.1998	½ gallon was added into the activated sludge tank
13.5.1998	½ gallon was added into the activated sludge tank
20.5.1998	½ gallon was added into the activated sludge tank
28.5.1998	½ gallon was added into the activated sludge tank
6.8.1998	½ gallon

If required (based on seasonally high flow rates) at the pump station, into the supply tank and into the secondary settling tank MICROBE-LIFT®/IND is applied additionally.

Results Achieved

After collecting one full year's worth of data, it was determined that for the year, under slightly higher flow and organic loading, that the plant had generated 34% less sludge for handling and disposal, reducing the cost for chemical treatment as well as for transportation and disposal.

Additional benefits included improved solids settling characteristics as reflected by the SVI, reduction of the odors from the plant and a significant reduction in the oil & grease buildup.

Table 2. Sludge pressing results:

without	24.7.98-1.8.98;
with MICROBE-LIFT®/IND	9.12.-17.12.98

Duration of pressing	volume of raw sludge	TS - of press-cake %	press-cake t
28.7.-1.8.97	2083 m^3	26	270,18
24.7.-1.8.98	1330 m^3	31	178,12
- 2 day -	753 m^3	+ 19 absolute	- 92,06
1.12.-10.12.97	2065 m^3	25	208,41
9.12.-17.12.98	1529 m^3	27	194,46
- 1 day	-536 m^3	+ 8 absolute	-13,95

Fig. 3: *This chart shows a comparison of the duration of pressing and the volume of sludge when treated with MICROBE-LIFT® vs. without treatment.*

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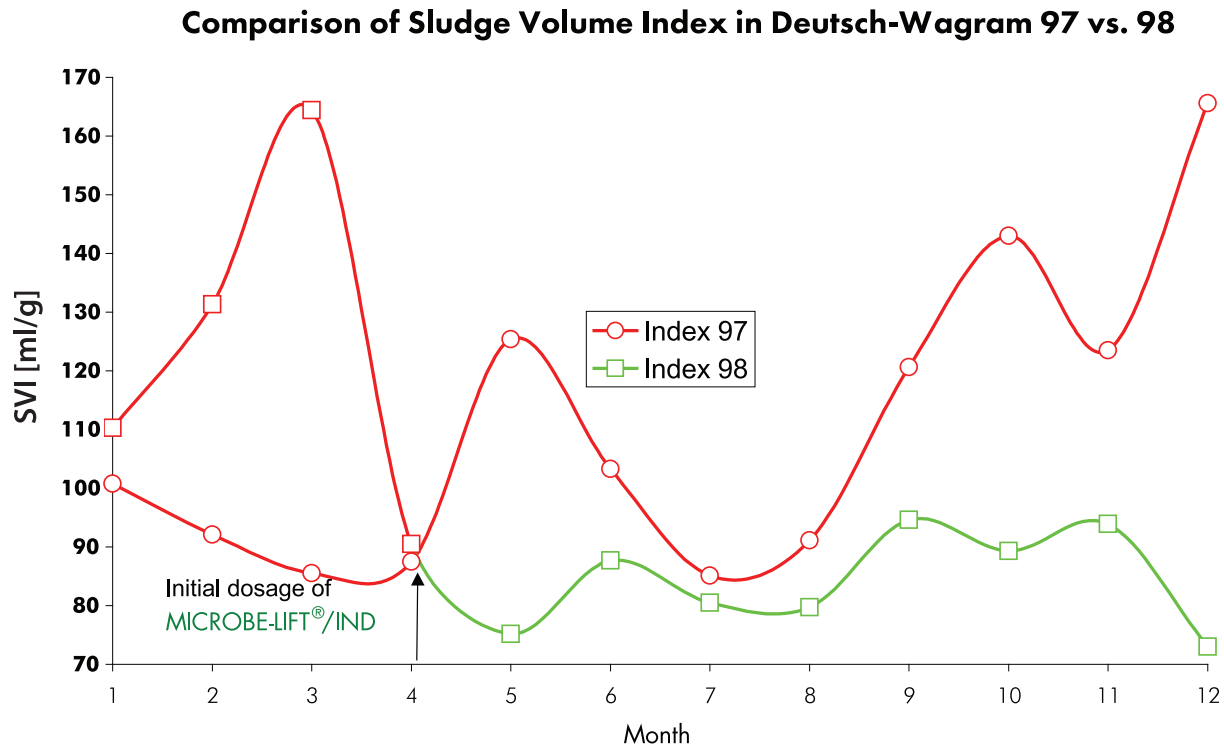

Fig 4: *SVI Data from Deutsch-Wagram*

Sludge handling and disposal costs were reduced by US $160,000 resulting in a net operating cost savings of US $130,000.

For more information on MICROBE-LIFT® Technology contact
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CS13107