

SOLIDS ACCUMULATING SEPARATOR

The solids accumulating separator was operated on two occasions at Don Aardema dairy in Wendell Idaho. The separator operated in a satisfactory manner on the morning of the first operation. An air valve became clogged during the afternoon. On the second occasion, September 30, 2001 the air valve was replaced and a new polymer was used.



Pilot Separator 9/30/01

At the Aardema dairy, flush manure is first processed through a Fan separator to remove coarse solids. The liquid is then processed through a gravity separator to remove sand and other coarse solids. The liquid from the gravity separator was processed through the Cyclus EnviroSystems solids separator.

Both the influent (liquid from the gravity separator) and the effluent from the pilot separator were analyzed by two laboratories. The thickened solids were also analyzed. Table 1 presents the results.

Table 1, Solids Separator Performance

	Influent Concentration	Effluent Concentration	Thickened Solids Concentration
pH	6.85	7.13	6.38
Suspended Solids (mg/L)	7,440	3,030	
COD (mg/L)	15,100	4,900	92,000
TKN (mg/L)	1,600	400	4,000
Ammonia (mg/L)	307	139	213
Total P (mg/L)	132	27	790
Sulfide (mg/L)	7.7	3.3	12.5

Figure 1 below presents the percent removals achieved by the separator.

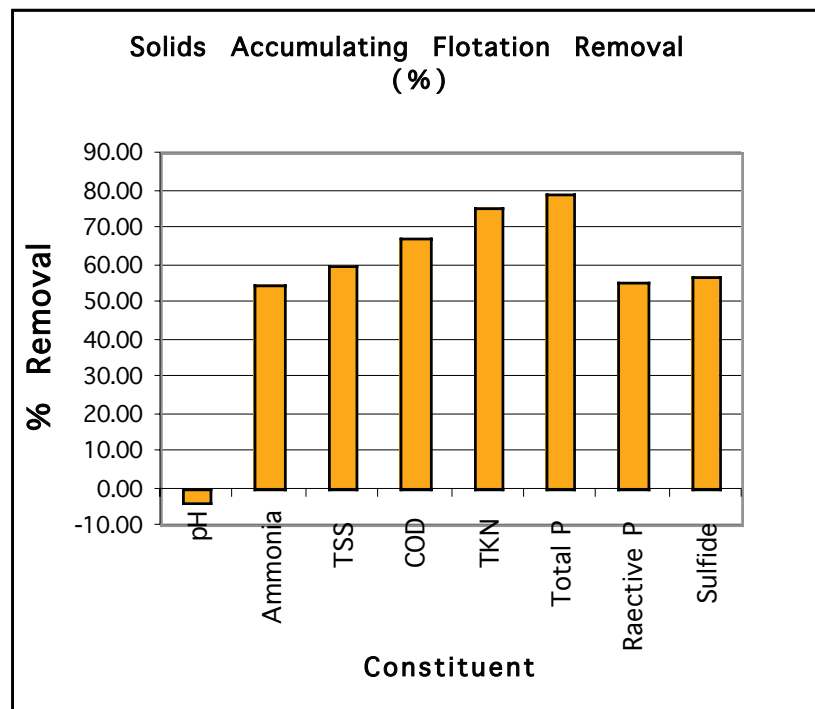


Figure 1 Separator Performance Percent Removal of Constituents

The solids that were removed were concentrated in the float. The thickened solids contained substantially higher concentrations than the influent solids. Figure 3 presents the percentage increase in concentration from the influent to the thickened solids.

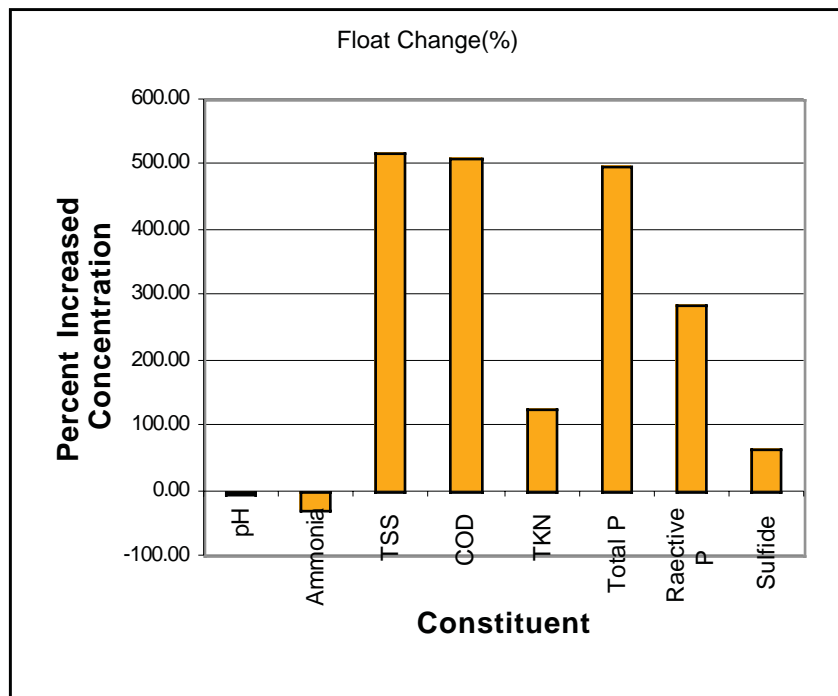


Figure 2 Increase in Float Concentration

The separator removed a significant percentage of the pollutants and concentrated those pollutants in a thick viscous slurry having a consistency similar to ketchup. Significant removals of odor causing substances such as ammonia and sulfide occurred. Both substances were discharged with the gas stream since neither accumulated in the float. Both substances can be removed from the float gas with a biofilter.

The flotation separator was operated on dilute waste (after the Fan separator and gravity separator) and more concentrated waste (after the Fan separator but before the gravity separator). The operating results established the surface loading rates shown below.

Table 2, Operating Loadings

Solids Concentration	0.75%	0.75%	0.2%
Flow (gpm)	9.2	15.3	11.5
Flow with sat (gpm/sf)	3.1	3.8	3.4
Depth of Blanket (ft)	6.0	6.0	6.0
Run time (hrs)	5	3	1.5
Cycles per day	4.7	7.8	15.6
Loading (ppd/sf)	52	87.5	175

The operating loadings were considerably greater than the loadings of conventional separators which operate at a maximum loading of 35 ppd/sf.