Chemical Analysis of the ESep System Drain Water

Experiment: We had a set of samples taken from the ESep System analyzed by an outside lab (Karlabs, Kalamazoo, MI). A summary is shown in the table below, where:

Truck is a representative sample of the material that is pumped from the pumper truck
T1 is a sample of the water drained from the first, gravity-separation tank
T2 is a sample of the water drained from the second, processing tank

Results: The water output for T1 and T2 are dramatically lower than the as-pumped trap waste. The values are somewhat higher for the water drained from the second tank (T2) as compared to that from the first (T1). This reflects the release of carbohydrates, proteins, detergents, and other materials into the water phase from the grease emulsion as it is broken. The grease and oil numbers shown are determined by HEM, which is n-hexane extractable material, and includes detergents and other hexane-soluble materials, in addition to any remnant brown grease.

Silica-Gel Treated Hexane Extractable Material (SGT-HEM) analysis was performed on the tank drain water so that non-polar and polar materials could be differentiated. These numbers are shown in the table in blue. These numbers indicate that the vast majority of the HEM is polar, and likely to be primarily detergents rather than intact oil and grease. These results are to be expected, given the nature of the wastewater stream.

Example *ESep™* Process analysis

all values are in mg/L	*TRUCK*	*DISCHARGE*	
		T1	T2
Biological Oxygen Demand (BOD)	30,200	6,910	7,380
Chemical Oxygen Demand (COD)	36,900	11,300	12,200
Total Suspended Solids (TSS)	27,000	1,700	2,360
Total Fats, oils & Grease (HEM)[a]	33,000	1,700	3,000
Non-polar FOG (SGT-HEM)	nd[b]	***130***	***57***
Total Kjeldahl Nitrogen (TKN)	1,050	114	381

[a] Includes detergents, *etc.* [b] not determined