

Testing of the Oil Recovery System  
At  
Tha Chana Palm Oil Co., Ltd.  
On  
April 21-2010 to April 29-2010

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The test unit at site; situated at the end of the sterilizers, next to the pit where oil from sterilizers, from decanters, from sterilizer blow down and from the oil recovery tanks sludge drain all meet. The test unit has a treatment capacity of 500 liters/hour. It is designed for operation of waste water with oil content between 15 % oil and 0.8 % oil. The recovered oil should be with less than 2 % moisture



A view into the pit from where all the POME is collected and from where it is pumped to the two existing oil recovery tanks



The test unit arrived from Malaysia with a 2 days delay, but luckily without any damage. The unit was assembled, moved to the site next to the POME pit, where steam supply for heating of the unit (90 Deg C) was arranged. The test unit was filled with water and made ready for operation on the following day



A view into the POME pit where the oil skimmer now has been placed ready for operation



Right after the incident with overflow from the pretreatment tank the first recovered oil started to flow from the test unit

After a short time of operation CPO started flowing from the top of the pretreatment tank. The unit was stopped and the incident investigated, adjustments were made and the testing continued. Later the incident occurred again and a throughout investigation identified a piece of plastic folio blocking a butterfly valve. The valve was removed and thereafter the unit was running without any further problems



The oil recovered during the afternoon of April 24, the first day of testing the oil recovery unit. Note the relatively dark color of the recovered oil. The dark color indicates that this is **not** fresh CPO.



During the first day of the testing the pit surface was covered with a thick layer of old partly hardened oil and it was expected that the Free Fatty Acid content would be high. The analysis later proved the expectations, the FFA was 19.47 %



In the morning of April 25 most of the old dark oil had been removed, and more CPO like oil covered the surface of the pit. It is believed that POME running into the pit is mainly coming from the canal collecting POME from underneath and around the sterilizers. The canal outlet to the pit is seen in the top center of the picture.



The oil being recovered during the morning of April 25 later proved to have an FFA % of 5.71 % and the impurities were as low as 0.07 %. Unfortunately the oil loss in the effluent from the test unit was not measured



The effluent from the test unit is sent back into the POME collection pit. The pipes seen are from sterilizer blow down and the canal below the pipes is leading POME from underneath and around the sterilizers to the pit.



The sterilizers blow down pipes and the canal from the sterilizers leading to the pit.



In the morning of April 26 the surface of the pit was covered with a layer flotation sludge and dark oil. It proved to be the result of sludge blow down from the existing oil recovery tanks.



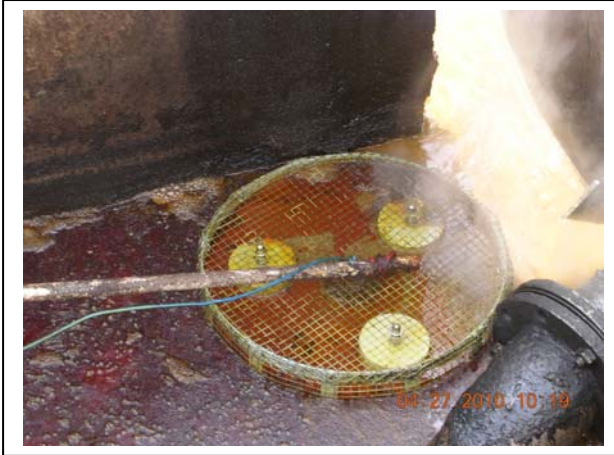
Even though the oil in the pit was mainly from the oil recovery tank blow down, the oil recovered by the test unit seems to be quite clear and transparent. The FFA in the recover oil was 7.11 %, the moisture was 0.57. Impurities were not measured



Close up of the recovered oil outlet hose from the test unit



During the afternoon of April 26 almost no more free oil was found in the pit, most of the oil left in the pit is emulsified. In the upper right corner of the picture the outlet canal leading sludge blow down from the existing oil recovery tanks to the pit is seen, and remains of the darker old oil is seen.



The POME Pit in the morning of April 27



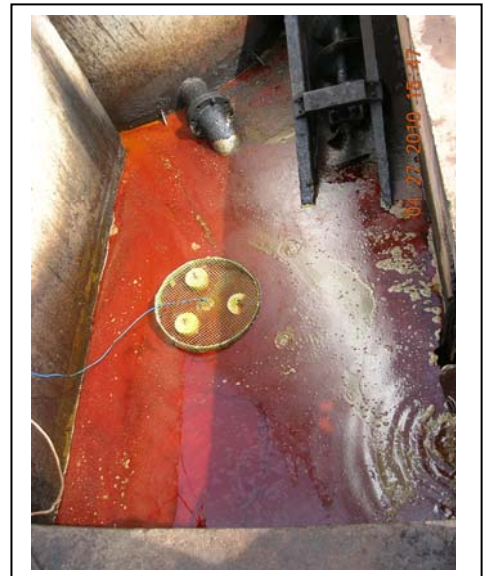
The barrel with recovered oil



Inaccuracy in the sampling of POME from the pit, resulted in the mounting of a sampling valve and a small hose at the test unit pump (outlet was higher than inlet)



Oil sampling for visual inspection



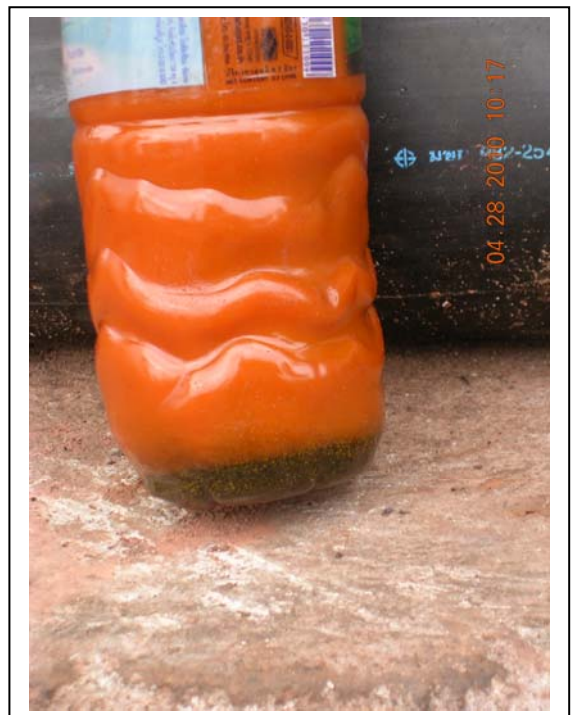
The POME pit with decanter/centrifuge effluent



Another sludge blow down from the existing oil recovery tanks



Close up of the oil skimmer; note all the black fiber on the skimmer



The above pictures show oil samples, left at the test site overnight, samples taken on April 27. The black fiber is most probably coming from the decanters; the efficiency of the decanters seems to be slightly reduced at full load. Biomass fiber is known to be very good to soak up oil, and is commonly used in connection with oil spill. It is believed that the fiber content in the POME will soak oil that is then discharged together with effluent from the MORE test unit.

## Test results from the MORE oil recovery test unit

THACHANA PALMOIL LABORATORY

THACHANA PALMOIL CO,LTD., THACHANA DISTRICT ,SURATTHANI PROVINCE

วันเดือนปี	Time	Sample	Sample wt.	(KOH)(N)	KOH (ml)	%FFA	Mean	% moisture	% Impurity
24-04-53		1	3.5732	2.54	27.4	19.48			
		2	3.6024	2.54	27.7	19.53	19.47		
		3	3.6247	2.54	27.7	19.41			
25-04-53		1	4.0008	2.54	9.0	5.71	5.71		0.07
26-04-53		1	3.5202	2.53	10.0	7.19			
		2	3.5423	2.53	9.9	7.07	7.11	0.57	
		3	3.6064	2.53	10.1	7.09			
27-04-53	10.10 น.	1	4.0752	2.53	9.5	5.90			
		2	4.3643	2.53	10.0	5.80	5.83	1.76	
		3	4.1410	2.53	9.5	5.80			
	10.20 น.	1	4.2920	2.53	9.6	5.66			
		2	4.6135	2.53	10.2	5.59	5.61	1.66	
		3	4.8175	2.53	10.6	5.57			
	15.20 น.	1	4.0569	2.53	8.0	4.99			
		2	2.4068	2.53	4.8	5.05	5.04		
		3	3.3851	2.53	6.8	5.08			
	16.30 น.	1	3.7677	2.53	8.1	5.44			
		2	3.3517	2.53	7.3	5.51	5.49	1.47	0.15
		3	3.5693	2.53	7.8	5.53			