

CHAPTER - V

CORROSION IN EFFLUENT TREATMENT SYSTEM IN

VEGETABLE OIL REFINERY

2 to 2.5 tons of Kernel is produced annually in Malaysia. Around one million ton of Kernel oil is extracted in over 15 refineries in Malaysia. The industry under study produces 350 tons of crude oil per day. Effluent generated is around 12 – 15 m³/ hour. The plant has both extraction and refining. The effluent generation and treatment is shown in Figure 26. Typical characteristics of the effluent is as shown in the table in page 87.

The analysis of the effluent from the table indicates low pH, high solids, high BOD and COD and oil and grease. All these factors are contributing to the corrosion of steel and concrete.

The pH of the effluent is 4.5, which is acidic. The temperature is 70⁰C which is high enough to enhance corrosion. The presence of Oil and Grease is 40 ppm in comparison to 0.2 ppm at the inlet. Presence of fats reduces the pH of the waste water. Increase of iron content in the wastewater also contributes to corrosion. B.O.D. and C.O.D. levels are comparatively low but the low pH, fats, high temperature and iron are major factors contributing for corrosion of materials.

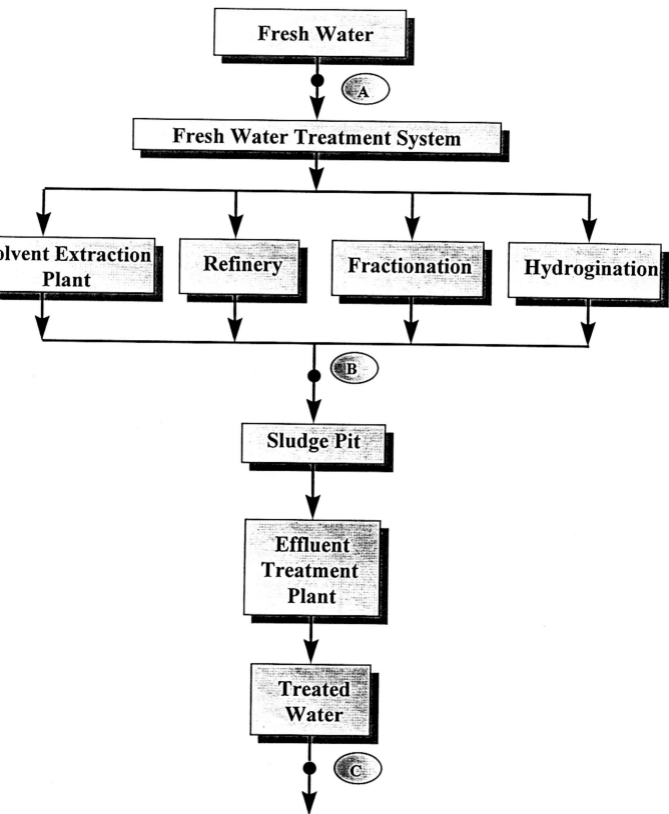


Figure 26 : Plant Waste Water Flow Diagram

ANNEXURE "C"

Parameter Location	A	B	C
pH	7.4	4.5	6-9
Temperature	28° C	70° C	45° C
B.O.D. at 30° C (mg / ltr.)	2	500	50
C.O.D. (mg / ltr.)	45	945	100
Suspended Solids (mg / ltr.)	12	536	50
Oil & Grease (mg / ltr.)	ND	48	ND
Iron (mg/ltr)	0.2	40	0.001

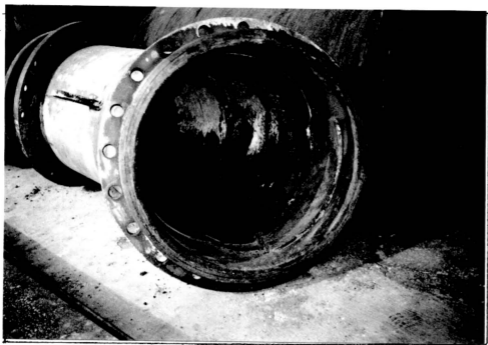
The enclosed photographs indicate the material corrosion by waste water of the plant. The corrosion at effluent inlet sump, re-circulation basin, cooling tower, conveying pipe section are indicated in the photograph. The deterioration of material surfaces under corrosive environment of the waste water is evident. The inlet water and waste water characteristics clarifies the corrosive nature of the waste water.



CONCRETE CORROSION IN EFFLUENT SUMP



CONCRETE CORROSION IN RECIRCULATION BASIN



CORROSION IN STEEL PIPE



CORROSION OF EFFLUENT BASIN