

Memo To: John Stetson

Publication No. 74-e66

From: Pat Lee

WA-22-0030

Subject: ITT Rayonier and Grays Harbor Paper  
Effluent Survey

Date: December 17, 1974

On July 31, 1974 the water quality investigations staff conducted an effluent survey at the combined operation facilities of ITT Rayonier and Grays Harbor Paper at Hoquiam. The survey consisted of an efficiency study on the clarifier and a compositing of a number of the other effluents. Field tests were conducted on the clarifier, the Grays Harbor Paper line, the filter plant, and lines 004 and 005. A sample was also collected on the log pond outfall.

A field inspection of the clarifier showed everything to be working properly. The field results on the clarifier operation are as follows:

	Influent				Effluent			
	Max.	Min.	Median	Mean	Max.	Min.	Median	Mean
Temperature °C	29.0	26.0	26.3		28.0	27.0	27.5	
pH	9.2	5.1	8.0		6.9	6.5	6.6	
Conductivity (umhos/cm)	1950	850	1020		710	610	700	
Settleable Solids (ppm)	90	50	60	65	1.0	Trace	Trace	0.4

Field data shows normal clarifier operation of interest is the high variability of the influent characteristics. Our lab reported the following information from our influent and effluent composites.

	Influent	Effluent	%Reduction	ITT Values
pH	7.5	6.4		6.6
Turbidity	90.	40.	56.	
Conductivity	900.	620.		
COD	1560.	700.	55.	
BOD	315.	175.	44.	110.
TSS	610.	90.	85.	
TSNVS	60.	38.	27.	
SCS	550.	52.	91.	28
Color	760.	570.		
Fecal Coliform		45.		

The field results on the filter plant are as follows:

	Max.	Min.	Median	Mean
Temperature	18.9	17.8	18.3	
pH	7.8	6.6	6.9	
Conductivity	82.	65.	67.	
Settleable Solids	Trace	Trace	Trace	Trace

The lab results are as follows:

pH	7.1
Turbidity	2 JTS
Conductivity	89 umho/cm
COD	16 ppm
BOD	<4 ppm
TSS	22 ppm
TSNUS	11 ppm
SCS	11 ppm
Color	3
PBI	14
Total Coliform	16,000 colonies/100 ml
Fecal Coliform	<2 colonies/100 ml

These results were what we expected on this type of operation.

The field results on the Grays Harbor line are as follows:

<u>Time</u>	<u>pH</u>	<u>T°C</u>	<u>Flow (gpm)</u>
10:55	2.6	24.0	2,100
11:55	2.4	23.0	2,250
12:55	2.5	23.0	2,400
13:55	2.9	23.2	2,400
14:55	3.0	23.0	2,150
15:55	3.2	23.0	2,200

The lab results on the composite are as follows:

pH	2.2
Turbidity	180 JTU
Conductivity	3400 umhos/cm
COD	351. ppm
BOD	54. ppm
Color	23
T.S.S.	520
T.S.N.U.S.	226
SCS	294

I traced the log pond outlet down to the harbor. By then, the flow had increased enough from the standing water by the road to take a sample. Lab analysis of the sample showed 157 ppm of COD, 180 ppm of PBI's 10,000 and 530 colonies of total and fecal coliform per 100 ml were counted. Only a trace of oil was noted on the surface of the discharge.

The following field tests were conducted on D-1 and the cooling water discharge:

	<u>Cooling Water</u>		<u>D-1</u>	
	T°C	pH	T°C	pH
1100	33.0		25.6	11.2
1200	31.0	10.2	21.4	5.6
1300	35.2	10.1	26.0	7.9
1400	32.4	9.9	26.0	7.6
1500	30.0	9.8	25.8	8.8
1600	29.4	9.8	26.0	5.0

The following are the lab tests conducted on the remaining effluent composites:

	<u>DOE Values</u>				<u>ITT Values</u>	
	<u>Cooling Water</u>	<u>Air Purge Hut</u>	<u>Rennie Island</u>	<u>D-1</u>	<u>Rennie Island</u>	<u>D-1</u>
pH	9.7	2.9	9.9	7.8		
Turbidity JTU	5	81.	1.*	9*		
Conductivity (umho/cm)	530.	950.	8800.	3000.		
COD ppm	23.	1720	51,100.	1370.		
BOD ppm	<8.	245.	16,000.	285.	12,400	180.
Color	52	335.	42,000.	3410.		
Total Coliform (col/100 ml)	340.					
Fecal Coliform (100 ml)	<20.					
T.S.S. ppm	38.	1156.	825.	175.		
T.S.N.V.S. ppm	22.	24	300.	60.		
S.C.S. ppm	16	1132.	525	115.	190	15.
P.B.I. ppm	18					

\* Turbidity affected by high color result

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