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May 29, 1974

Memo to: Mike Palko

From: Pat Lee

Subject: Survey at Boise Cascade at Vancouver.

A clarifier efficiency study was conducted at Boise Cascade in Vancouver, Washington on March 13, 1974. The influent and effluent were composited proportional to flow for four hours, and a series of field tests were conducted at the same two locations every half hour. The composites were split with Boise Cascade (Rick Webe) before leaving. Visual inspection of the clarifier showed a number of operational defects which could be corrected. These included a ineffective skimmer operation which allowed scum to be carried over the weirs into the outfall, a condition with influent to the clarifier surging over the protective skirt in the middle of the clarifier allowing an obvious short circuit to occur, and finally the V notch weirs were not balanced which allowed much more flow through the western end of the clarifier contributing to the short circuit problem.

A summary of the field tests is as follows:

Field Results

9 Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C	19.6	18.4		19.1	18.8	18.3		8.6
pH (Units)	9.7	6.9		7.4	8.0	7.4		7.5
Conductivity (μmhos/cm^2)	675	475		600	675	500		550
Settleable Solids (mls/l)	60	17	36	34	1.8	.5	1.0	.8
Flow (MGD)					11.4	9.8	11.0	11.2

The maximum pH and maximum conductivity occurred at the same time (1500 hours) in the influent.

The lab results on the composite samples are as follows:

	DOE Results	Boise Cas.	DOE Results	Boise Cas.
	Influent		Effluent	
BOD	106	50	40	50
K			---*	
TSS-Whatman 40	561	592	89	98
SCS-Whatman 40	232	255	18	27
TSS-Gooch	606	593	117	121
SCS-Gooch	273	266	35	43

*Impossible to calculate due to 4 day lag in response.

As can be seen by the above data, the data from the two labs is remarkably similar except for the one BOD value. That value (the Boise Cascade influent value) is probably wrong as their effluent is 50 ppm also. Thus to accept their values is to imply the clarifier is not providing any BOD reduction, an illogical assumption.

To verify the accuracy of Boise Cascade's flow meter, measurements were made with a General Oceanics digital flow meter in the outside laundry ring. These measurements had some built-in disadvantages as I could only measure half the flow at any one time plus some of the discharge went over the weirs and right to the effluent line. Still -

at 1200 DOE-9.3 MGD and Boise Cascade-10.8 MGD

at 1400 DOE-9.0 MGD and Boise Cascade-10.6 MGD

PL:jmh

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: P. Lee

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LAB FILES

DATA SUMMARY

Source Boise Cascade @ Vanc. Collected By P. Lee

Date Collected 3-13-74 Goal, Pro./Obj.

Log Number:	74- 770	771									STORET
Station:	INF	EFF									
pH											00403
Turbidity (JTU)											00070
Conductivity (umhos/cm)@25°C											00095
COD											00340
BOD (5 day)	106	40									00310
Total Coliform (Col./100ml)											31504
Fecal Coliform (Col./100ml)											31616
NO3-N (Filtered)											00620
NO2-N (Filtered)											00615
NH3-N (Unfiltered)											00610
T. Kjeldahl-N (Unfiltered)											00625
O-PO4-P (Filtered)											00671
Total Phos.-P (Unfiltered)											00665
Total Solids											00500
Total Non Vol. Solids (Gooch)											
Total Suspended Solids (Gooch)	606	117									00530
Total Sus. Non Vol. Solids (Gooch)	333	82									
TSVS	273	35									
Whatman 40	561	89									
" SNCS	329	71									
" SCS	232	18									
BOD "K"	—	—*									

Note: All results are in PPM unless otherwise specified. ND is "None Detected"
Convert those marked with a * to PPB (PPM X 10^3) prior to entry into STORET

* Impossible to calculate due to 4 day lag in BOD Response

Summary By Stephen E. Neff Date 4-12-74