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M E M O R A N D U M
February 2, 1987

To: Roger Ray

From: John Bernhardt *JB*

Subject: Tabulation of Data Collected During Class II Facility
Inspection Performed at Inland Empire Paper Company,
August 28-30, 1984

The findings of this survey were initially documented in a November 1, 1984, letter to Esvelt Environmental Service (Bernhardt, 1984). This information along with other data were used as part of an evaluation to improve the operating efficiency of Inland Empire Paper's (IEP's) wastewater treatment facility. The data tables presented in the letter were preliminary, with the agreement being that the tables would be finalized at a later date. These data are finalized in this report. Also included are brief comments.

The sampling schedule is given in Table 1. Sampling focused on the single large clarifier located on IEP's grounds. There are additional unit processes located within the confines of the mill, but Ecology was not allowed access beyond the clarifier. The inspection included influent and effluent 24-hour composites with periodic grab samples. The sampling was repeated twice (August 28-29 and August 29-30) because a plant upset occurred during the first sampling effort. Also included was an abbreviated receiving water survey in the Spokane River in the vicinity of the outfall.

The clarifier monitoring data are presented in Table 2. The primary findings were:

1. The August 29-30 split samples showed BODs collected by the IEP composite sampler were lower. A field check indicated IEP's field compositors were poorly maintained (not cleaned regularly) and not refrigerated. IEP instituted corrective measures.
2. Temperature of the discharge was fairly high, with the highest recorded level being 28.0°C (82.4°F).

Memo to Roger Ray

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3. Fecal coliforms of about 1,000 col/100 mL were higher than the 200 col/100 mL average per week or 400/month limits applied to municipal secondary treatment plants. The NPDES permit for IPC does not include any limits for this parameter.
4. The Total Phosphate-P discharge of about 35 pounds per day was significant with respect to the Spokane River Wasteload Allocation effort.

The Spokane River intensive survey data are presented in Table 3. The river sampling was limited to conventional pollutants. For those parameters measured, IEP effluent did not appear to have a significant impact on water quality. This was an expected outcome since the dilution ratio (river flow:effluent) was 1,069:1 at the time of the survey.

Some near-field impact was observed. Upon discharge, the effluent appeared to quickly rise to the surface then fan out and gradually disperse while moving down-river. The wastewaters initially moved along the side of the stream where the discharge pipe is located (corresponds to stations with "A" designation). These near-field impacts were visually observed based on color. Some indication of these dispersion characteristics was also observed with temperature and specific conductivity profiles (Table 4).

The results for the Ecology quality assurance samples given to the IEP laboratory are given in Table 5. BOD₅ fell within the acceptable range, one TSS and NH₃-N sample was slightly out of range, and both O-PO₄-P samples were out of range. IEP was appraised of these findings.

Photographs relating to noteworthy aspects of the inspection and receiving water survey can be found in the Appendix.

JB:cp

Attachments

Table 1. Sampling schedule - Inland Empire Paper Company Class II inspection, August 1984.

Sample Location	Sampler	Date	Time	Field Parameters				LABORATORY PARAMETERS																		
				Temperature	Conductivity			pH	Turbidity	Conductivity	COD	BOD	Fecal Coli.	% KES*	Nutrients					Solids				Color	Alk. (CaCO ₃)	Metals**
					pH	Dis. Oxygen									NH ₃ -N	NO ₂ -N	NO ₃ -N	O-PO ₄ -P	Total P	TS	TNVS	TSS	TNVSS			
TREATMENT PLANT GRAB SAMPLES				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Clarifier Influent	Ecology	8/28	1013	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
			1630	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
Clarifier Effluent	Ecology	8/29	1040	X	X	X	X																			
		8/28	0958	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
			1615	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
		8/29	1028	X	X	X	X																			
TREATMENT PLANT COMPOSITES																										
Clarifier Influent	Ecology	8/28-29	1013-1028					X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X
		IEP	8/28-29	1013-1028				X	X	X					X	X	X	X	X	X	X	X	X	X		
	Ecology	8/29-30	1035-1000				X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	
		IEP	8/29-30	1035-1000				X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	
Clarifier Effluent	Ecology	8/28-29	0958-1040					X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	
		IEP	8/28-29	0958-1040				X	X	X					X	X	X	X	X	X	X	X	X	X		
	Ecology	8/29-30	1050-1000				X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	
		IEP	8/29-30	1050-1000				X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	
SPOKANE RIVER																										
Station 1 - 100 ft above outfall	Ecology	8/28	1330	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 2A - near bank 100 ft below outfall	Ecology	8/28	1400	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 2B - far bank 100 ft below outfall	Ecology	8/28	1415	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 3A - near bank 500 ft below outfall	Ecology	8/28	1430	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 3B - far bank 500 ft below outfall	Ecology	8/28	1435	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 4A - near bank 1000 ft below outfall	Ecology	8/28	1450	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		
Station 4B - far bank 1000 ft below outfall	Ecology	8/28	1457	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X		

*Percent of fecal coliforms.

**Copper, zinc, nickel, chromium, cadmium, lead.

Table 2. Analytical results for process waters sampled during Class II inspection performed at Inland Empire Paper Company, August 28-30, 1984 (mg/L unless otherwise stated).

Parameter	AUGUST 28 - 29								AUGUST 29 - 30					
	24-hour Composite ^{1/} Final				Grab Samples ^{3/} Final				24-hour Composite Final				Grab Samples ^{4/}	
	Pump House		Effluent		Pump House		Effluent		Pump House		Effluent		Pump House	Final Effluent
	Ecol.	IEP	Ecol.	IEP	a.m.	p.m.	a.m.	p.m.	Ecol.	IEP	Ecol.	IEP	House	
<u>General</u>														
Time Collected	1013-1018		0958-1040		1013	1630	0958	1615	1035-1000		1050-1000		1040	1028
<u>Field Analysis</u>														
Flow (MGD)	--	--	--	--	2.05	--	--	--	--	--	--	--	2.29	--
Temperature (°C)	--	--	--	--	31.0	32.2	26.8	28.0	--	--	--	--	21.2	25.0
pH (S.U.)	--	--	--	--	6.9	6.8	6.7	6.6	--	--	--	--	7.6	7.2
Spec. Cond. (umhos/cm)	--	--	--	--	525	590	510	500	--	--	--	--	290	390
Dissolved Oxygen	--	--	--	--	0.4	0.1	0.0	0.0	--	--	--	--	3.1	0.4
<u>Laboratory Analyses</u>														
pH (S.U.)	7.4	7.1	6.8	7.2	6.7	6.5	6.5	6.3	7.1	6.8	7.1	6.6	--	--
Spec. Cond. (umhos/cm)	340	355	483	408	554	557	478	479	429	417	381	385	--	--
Turbidity (NTU)	160	160	110	200	190	97	100	110	95	160	110	160	--	--
F.C. (#/100 mL)	--	--	--	--	300 ^{2/}	200 ^{2/}	970	1000	--	--	--	--	--	--
% KES (Klebsiella)	--	--	--	--	0	0	76	13	--	--	--	--	--	--
COD	560	--	280	--	--	--	--	--	620	610	250	230	--	--
BOD ₅	140	--	100	--	--	--	--	--	200	130	90	72	--	--
Nitrate-N	0.45	0.50	0.50	0.30	0.45	0.45	0.05	0.15	0.50	0.50	0.25	0.05	--	--
Nitrite-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	--	--
Ammonia-N	1.6	3.5	1.9	2.6	3.2	3.3	2.3	2.2	3.6	0.20	2.1	0.20	--	--
O-Phosphate-P	0.65	1.3	0.80	0.65	1.4	1.4	1.1	1.2	1.4	1.0	0.95	0.70	--	--
T-Phosphate-P	1.8	3.0	1.8	1.5	2.4	2.6	2.0	2.0	2.9	2.5	2.0	1.9	--	--
Total Solids	610	540	520	500	930	960	510	540	730	780	430	410	--	--
T. Non-Vol. Solids	210	200	300	230	380	380	310	320	270	270	230	230	--	--
T. Susp. Solids	300	270	78	160	350	400	67	100	290	360	74	70	--	--
T. Non-Vol. Susp. Sol.	20	24	18	24	17	23	8	20	8	17	8	12	--	--
Alkalinity (as CaCO ₃)	53	--	44	--	40	--	45	--	38	40	44	41	--	--
Color (units)	310	250	500	730	710	550	550	420	500	310	410	400	--	--
Copper (ug/L)	59	--	28	--	--	--	--	--	43	70	127	39	--	--
Zinc (ug/L)	147	--	112	--	--	--	--	--	159	305	389	151	--	--
Nickel (ug/L)	<1	--	<1	--	--	--	--	--	<1	<1	325	30	--	--
Chromium (ug/L)	9	--	9	--	--	--	--	--	12	14	7	9	--	--
Cadmium (ug/L)	0.8	--	0.5	--	--	--	--	--	0.5	0.6	0.9	0.6	--	--
Lead (ug/L)	21	--	9	--	--	--	--	--	98	20	7	7	--	--

^{1/} Data presented include samples collected from Ecology and Inland Empire Paper Company compositors analyzed at Ecology lab.

^{2/} Estimated value.

^{3/} August 28

^{4/} August 29

Table 3. Analytical results for Spokane River water quality samples collected during Class II facility inspection performed at Inland Empire Paper Company, August 28, 1984 (mg/l unless otherwise indicated).

Parameter	100 feet abv. outfall - mid river (Station 1)	IEP ^{2/} Final Effluent	100 feet blw outfall - near bank (Station 2A)	100 feet blw outfall - far bank (Station 2B)	500 feet blw outfall - near bank (Station 3A)	500 feet blw outfall - far bank (Station 3B)	1000 feet blw outfall - near bank (Station 4A)	1000 feet blw outfall -far bank (Station 4b)
<u>General</u>								
Time Collected	1330	1615	1400	1415	1430	1435	1450	1457
<u>Field Analysis</u>								
Flow (MGD)		2.29	8933/ ^{3/}					
Temperature (°C)	15.7	32.2	15.7	15.7	15.8	15.7	15.7	15.7
pH (S.U.)	7.3	6.8	7.4	7.5	7.5	7.6	7.5	7.4
Spec. Cond. (umhos/cm)	173	590	173	175	181	176	174	174
Dissolved Oxygen	9.5	0.1	9.4	9.5	10.1	9.7	9.4	9.3
<u>Laboratory Analyses</u>								
pH (S.U.)	7.1	6.3	7.6	7.8	7.8	7.9	7.9	7.9
Spec. Cond. (umhos/cm)	133	479	133	128	137	129	133	134
Turbidity (NTU)	1	110	1 ^{1/}	4 ^{1/}	1	2 ^{1/}	1 ^{1/}	1 ^{1/}
F.C. (#/100 mL)	4	1000	4 ^{1/}	3 ^{1/}	10 ^{1/}	2 ^{1/}	4 ^{1/}	7 ^{1/}
KES, % of Fecal Coli.	0	13	50	0	50	0	50	71
Nitrate-N	0.35	0.15	0.36	0.36	0.36	0.36	0.36	0.38
Nitrite-N	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ammonia-N	0.01	2.2	<0.01	<0.01	0.04	0.01	0.02	0.02
O-Phosphate-P	0.02	1.2	0.02	--	0.04	0.02	0.02	0.02
T-Phosphate-P	0.04	2.0	0.04	0.02	0.04	0.02	0.08	0.03
Total Solids	100	540	100	120	110	120	110	110
T. Non-Vol. Solids	70	320	70	70	66	73	80	73
T. Susp. Solids	<1	100	2	2	2	2	3	2
T. Non-Vol. Susp. Solids	<1	20	2	2	2	2	3	2
Color (units)	29	420	17	13	21	21	17	21

^{1/} Estimated count.

^{2/} Collected during p.m. grab sampling at treatment plant.

^{3/} 1,382 cfs.

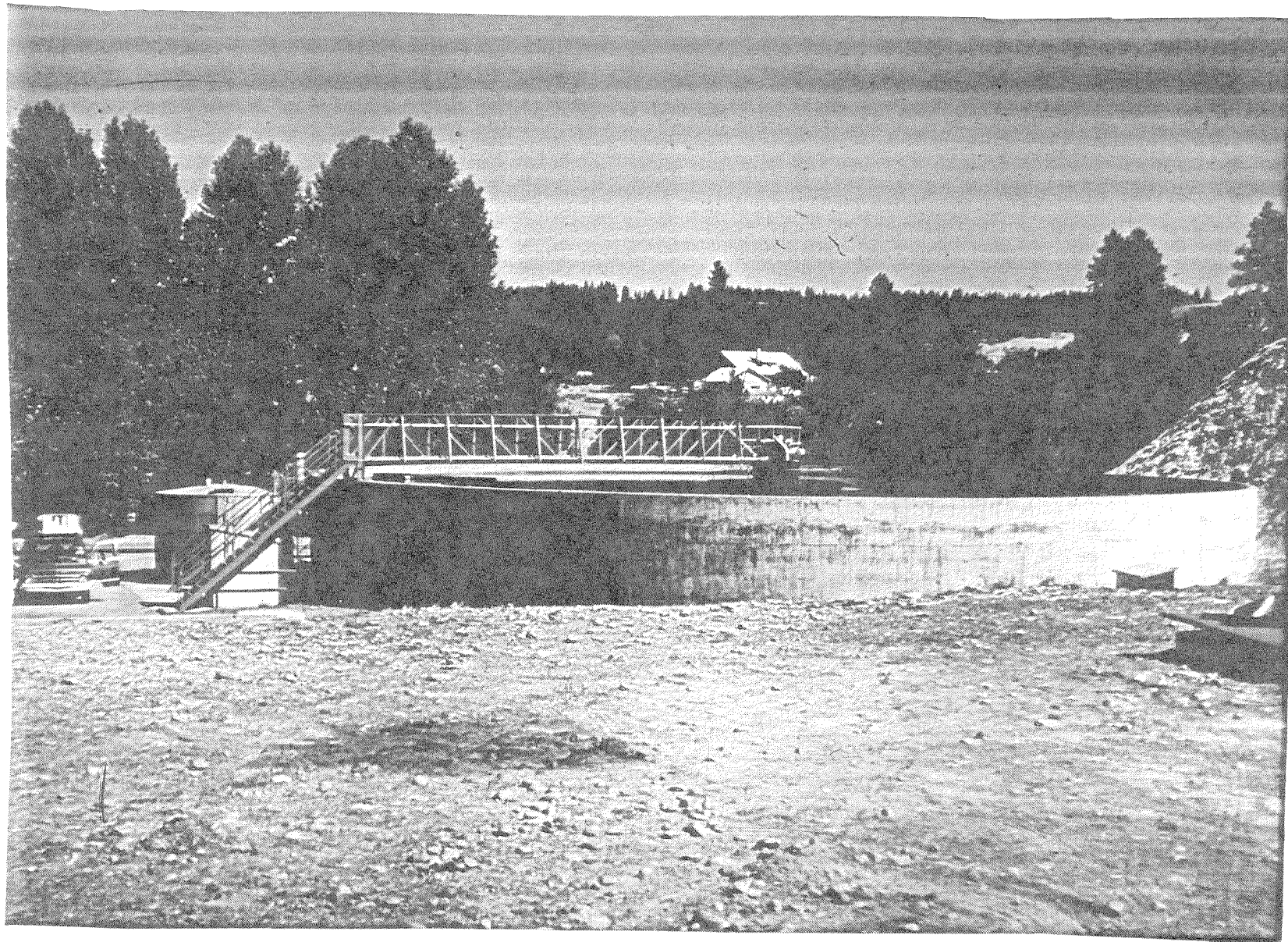
Table 4. Temperature ($^{\circ}\text{C}$) and specific conductance ($\mu\text{hos/cm}$) profiles obtained at Spokane River stations sampled during Inland Empire Paper Company Class II facility inspection, August 29, 1984.

Station 1 (control)						Location of Discharge
Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)				
Surface	173	15.7				←
Station 2B - 100 feet blw dischg - Station 2A						Direction of River Flow
Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	
Surface	175	15.7	Surface	179	15.9	↓
1	175	15.7	1	180	15.9	
2	175	15.7	2	179	15.9	
3	175	15.7	3	178	15.7	
4	175	15.6	4	175	15.7	
5	175	15.6	5	175	15.7	
6	175	15.6	6	178	15.7	
bottom	175	15.6	7	177	15.7	
			7.5	176	15.7	
Station 3B - 500 feet blw dischg - Station 3A						
Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	
Surface	176	15.7	Surface	181	15.8	
1	176	15.7	1	180	15.8	
2	176	15.7	2	178	15.8	
3	175	15.7	3	176	15.7	
4	175	15.7	4	176	15.7	
5	175	15.7	5			
6	175	15.7	6	(field instrument malfunctioned)		
7	175	15.7	7			
8	175	15.6	8			
Station 4B* - 1000 feet blw dischg - Station 4A*						
Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	Depth (m)	Spec. Cond. (umhos/cm)	Temp. (°C)	
Surface	180	16.0	Surface	180	16.1	
1	181	16.0	1	181	16.1	
2	181	16.0	2	180	16.0	
3	181	15.9	3	180	15.9	
4	181	15.8	4	180	15.9	
5	181	15.8	5.2 (bottom)	180	15.9	
6	181	15.8				
7	180	15.8				
8 (bottom)	180	15.7				

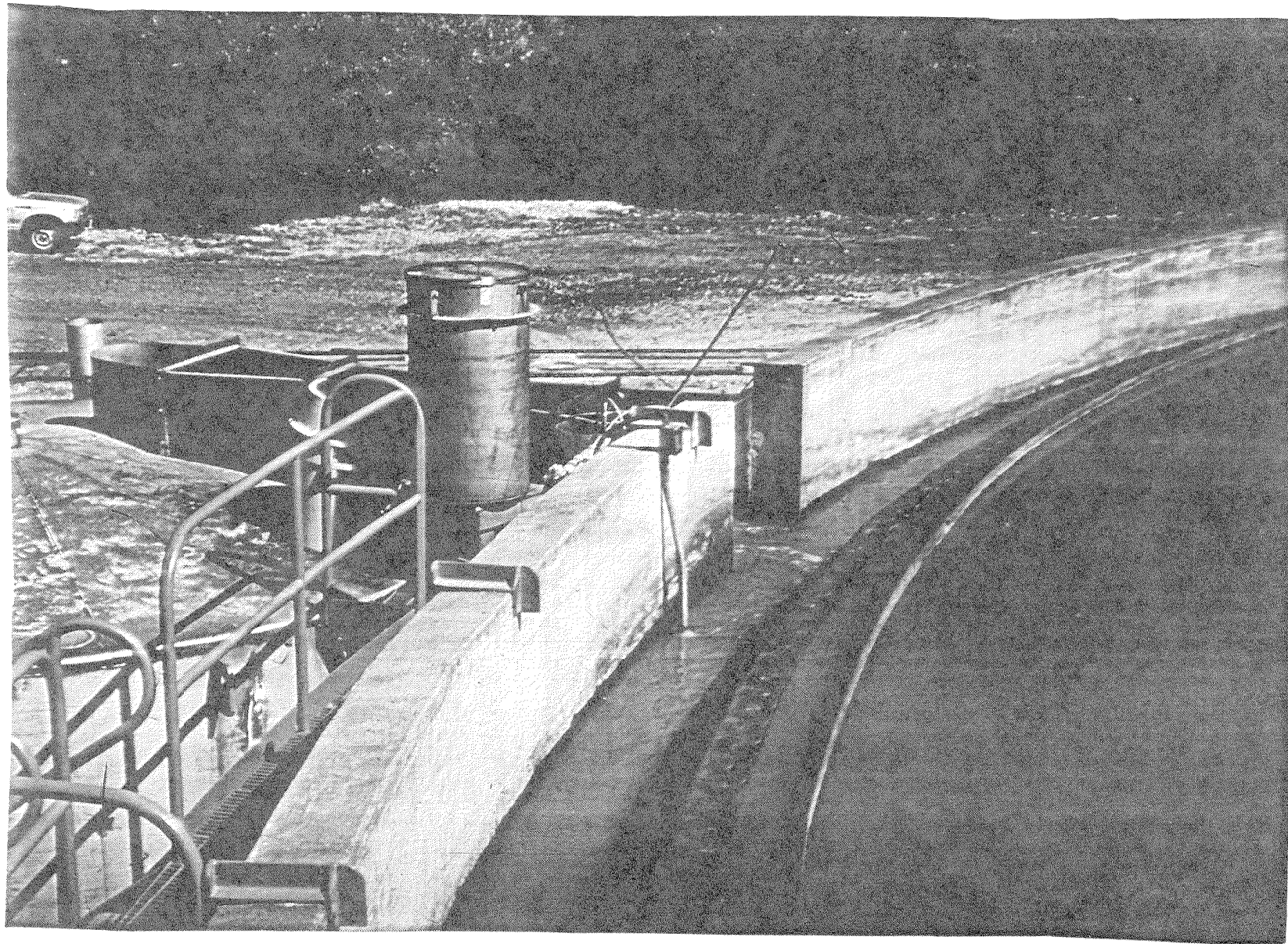
*Collected August 30.

Table 5. Analytical results for Ecology quality assurance samples provided to Inland Empire Paper Company (mg/L).

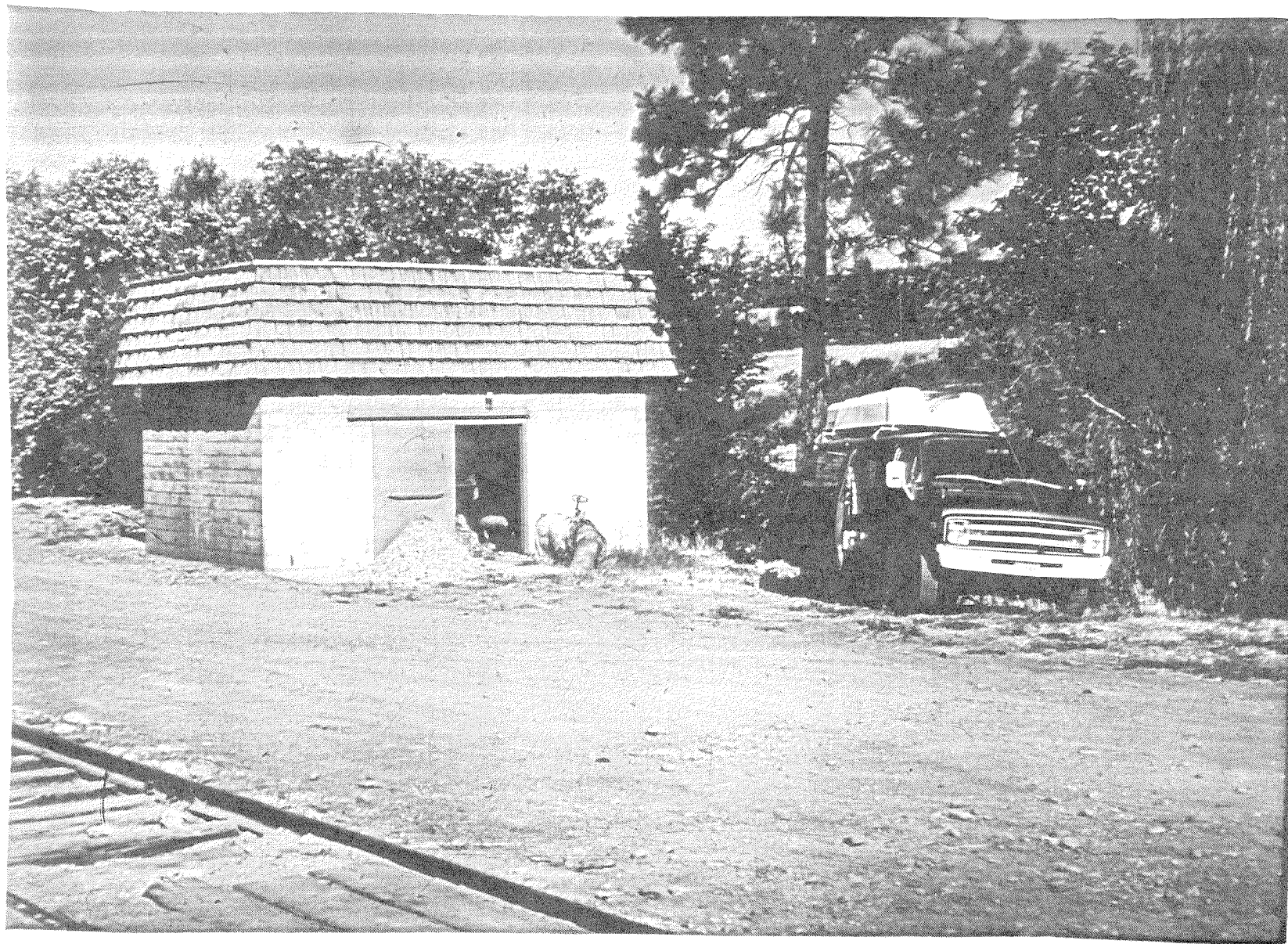
Analysis	IEP Results	True Value	Acceptable Range
BOD	1.65	2.63	1.3 - 4.0
BOD	92.2	103	76.4 - 130
TSS	24.5	35	26.0 - 34.6
TSS	516	550	477 - 586
O-PO ₄	0.15	0.05	0.04 - 0.06
O-PO ₄	1.11	0.35	0.33 - 0.37
NH ₃ -N	0.51	0.28	0.23 - 0.33
NH ₃ -N	1.79	1.90	1.68 - 2.12



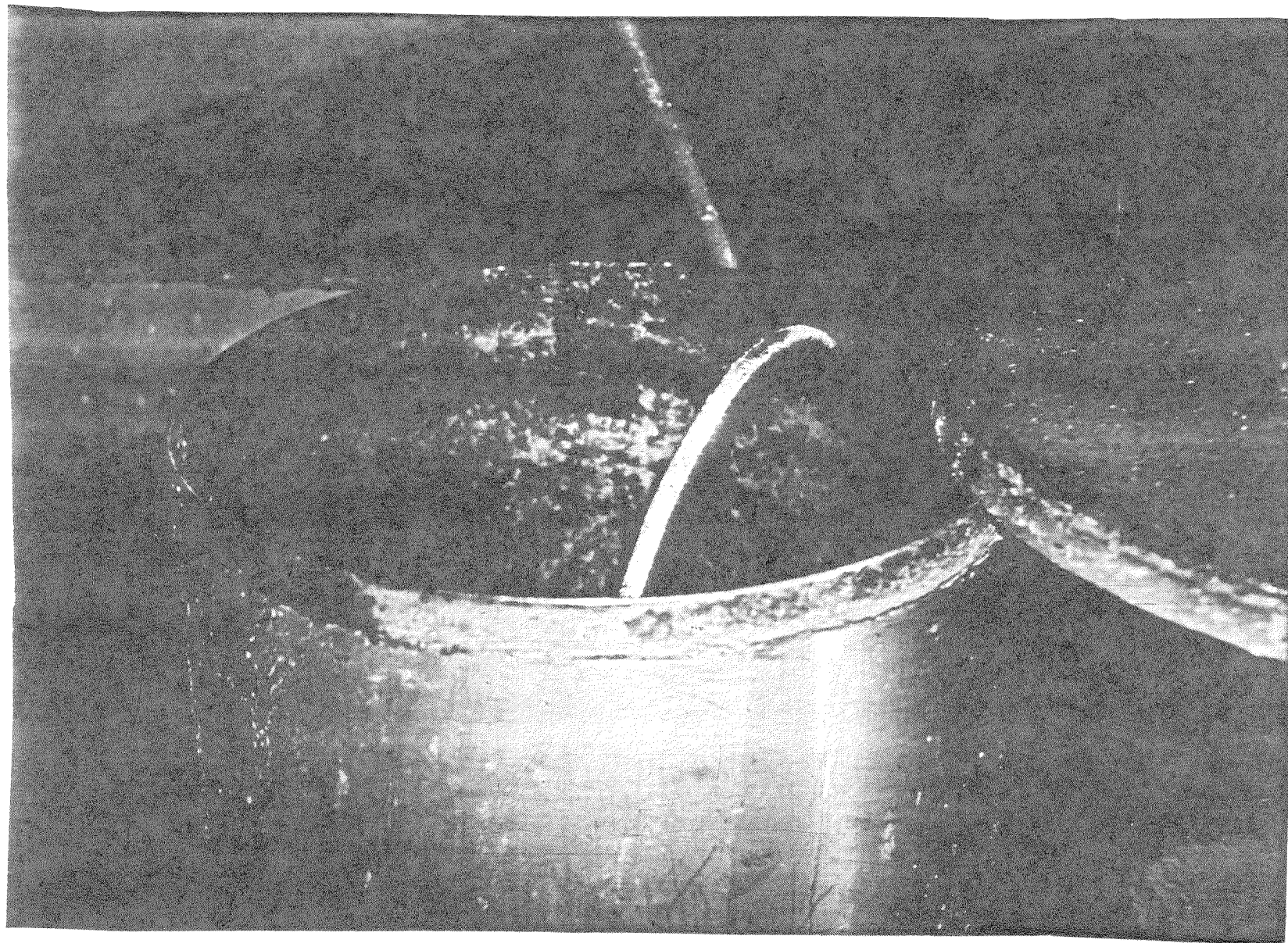
1. IEP CLARIFIER, AUGUST 1984



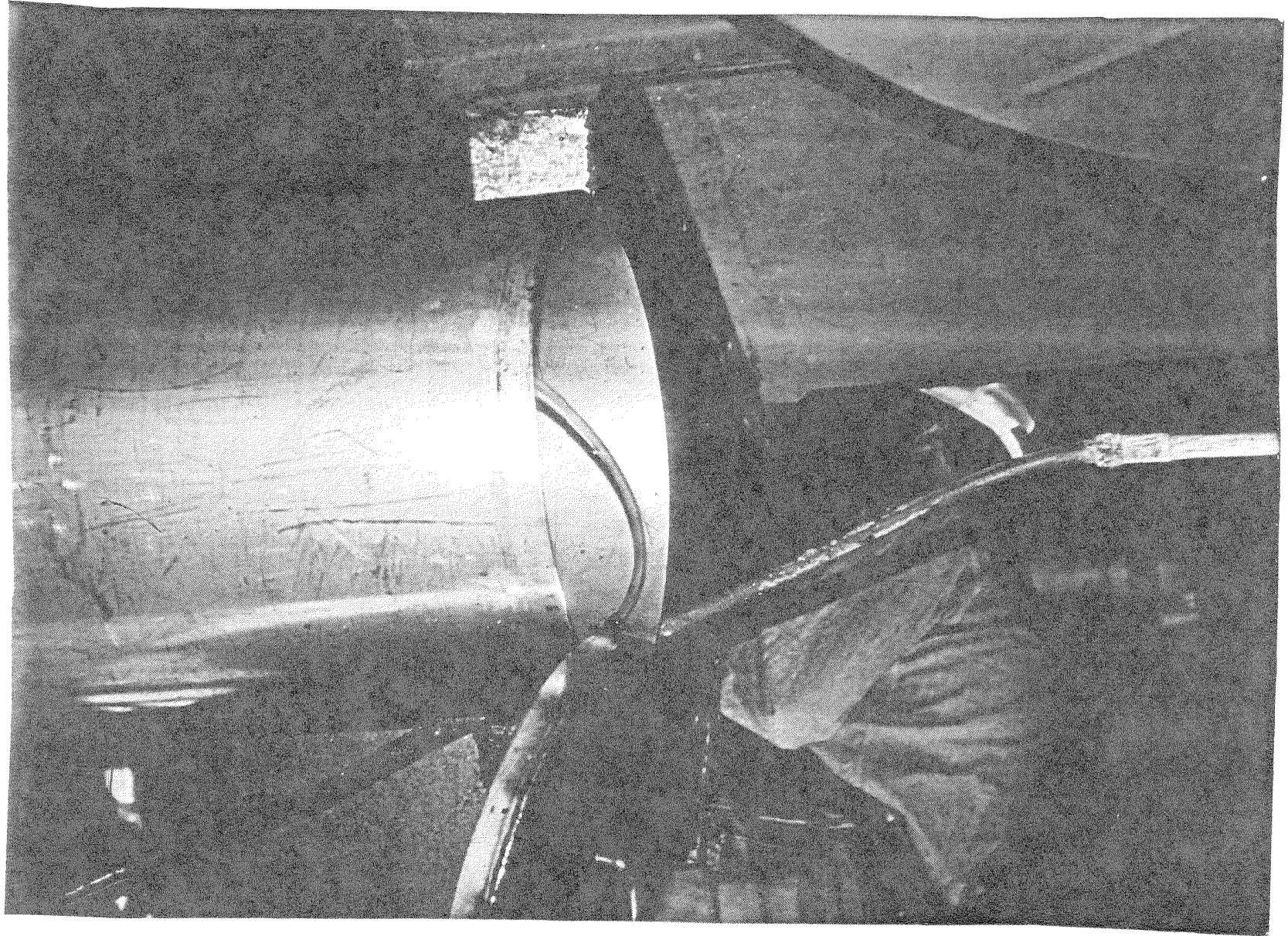
2. IEP and Ecology compositors at clarifier outlet (parshall flume); August 1984



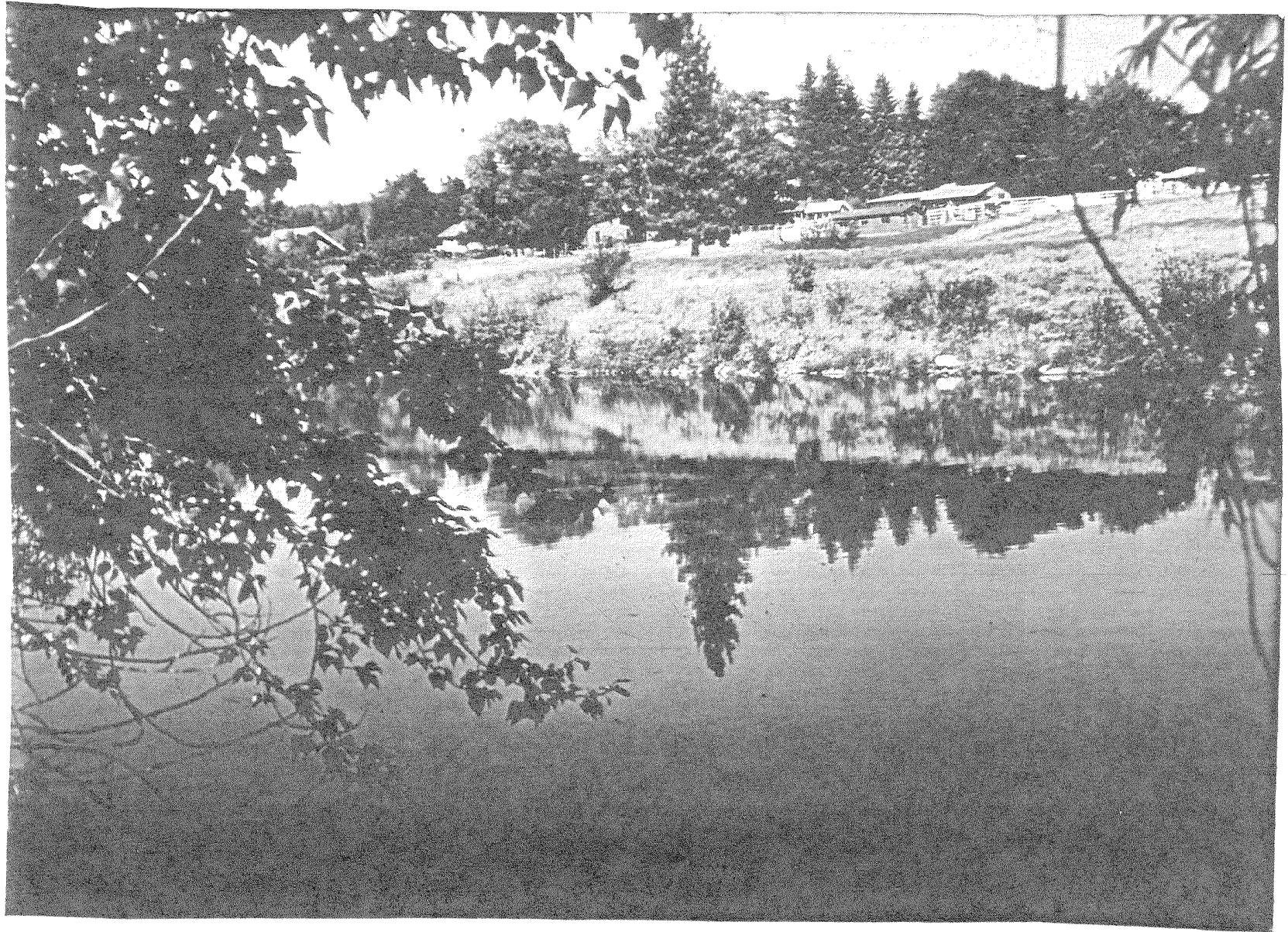
3. IEP Pump house, August 1984



4. IEP pumphouse compositor noting uncleaned condition (also lacked refrigeration),
August 1984



5. IEP Pumphouse clarifier after cleaning, August 1984



6. Spokane River in vicinity of IEP outfall; August 1984