Publication No. 71-e28

TO: Mike Palko & Tom Haggarty DATE: December 6, 1971

FROM: Ron Pine

SUBJECT: Inland Empire Paper Co., Spokane

The analysis results of composite samples taken at Inland Empire Paper Co. are presented in Table 1. The samples were collected from the influent to the clarifier and from the clarifier effluent prior to discharge into the Spokane River. The two composites were initiated at 6:30 PM on October 26, 1971 and terminated at 7:00 PM on October 27, 1971.

Table 1. All values are in milligrams/liter.

Parameter	Influent	Effluent	% Reduction	Loading lbs/day
BOD_5	110	55	50	1235
COD	720	160	74	3594
Specific Conductivity µmhos/cm	375	402		
Turbidity J.T.U.	160	40		
pH (Lab)	6.6	6.5		
*Zinc	18.0 ±.5	15.5 ±.5		38
T.S.	831	434	47	9748
T.N.V.S.	268	247		5548
T.S.S.	506	49	90	1101
T.S.N.V.S.	33	11		247
S.C.S.	473	38	92	853
Whatman 40 Solids				
T.S.S.	454	22	79	494
T.S.N.V.S.	53	8		180
S.C.S.	401	14	72	314

* Zinc concentration in raw water supply 0.09 ±.02 mg/l.

RP:bj

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY — WATER POLLUTION CONTROL DIVISION

ANALYTICAL REPORT SHEET

ROUTING

Original to LABORAT
Copies to:
Mike Palko
~~Dave Dominick~~
DON PROVOST

To: M. F. Palko

3.2.23

The following are the analytical results from survey conducted at:

Inland Empire

Collected 10/27/70

LAB. NO.	STATION NO.	pH	micromhos/cm specific conductivity	ppm BOD	ppm COD	J.T.U. Turbidity	ppm Zinc	
70-3496	Influent	6.6	375.	110.	720.	160.	18.0 ± .5	
3497	Effluent	6.5	402.	55.	160.	40.	15.5 ± .5	
3498	Raw water						0.09 ± .02	
	% reduction			50	74			
	PPM T.S.	PPM T.N.V.S.	PPM T.S.S.	PPM T.S.N.V.S.	PPM S.C.S.	PPM Whatman 40 T.S.S.	PPM Whatman 40 T.S.N.V.S.	PPM Whatman 40 S.C.S.
70-3496	831.	268.	506.	33.	473.	454.	53.	401.
3497	434.	247.	49.	11.	38.	22.	8.	14.
% red	47		90		92			97

Flow = 2.673

Notes:

Summarized by Pat Lee

Date 11/4/70

MEMORANDUM

Department of Ecology
P. O. Box 829
OLYMPIA, WASHINGTON
98504

	Check
Information	
For Action	
Permit	
Other	

TO: RON PINE

DATE: October 21, 1971

FROM: MIKE PALKO MP

SUBJECT: Twenty-four Hour Survey at Inland Empire

Arrangements have been made with the mill manager at Inland Empire, Mr. Clyde B. Anderson, for you to start the twenty-four hour survey on the afternoon of October 26th. I asked him if he would make arrangements for your people to obtain the total flow through the clarifier for the survey and told him that you would be taking a composite of the influent and effluent of the clarifier. He was informed that you would obtain a grab sample of their raw water for heavy metal analysis. I suggested that you split the composite sample with them so they can perform BOD and suspended solids tests on the samples we obtain.

MP:mh
68/2

MEMORANDUM

Department of Ecology

Check

Information
For Action
Permit
Other

TO: Tom Haggarty & Mike Palko

DATE: December 3, 1971

FROM: Ron Pine

SUBJECT: Water Quality of Spokane River Below Inland Empire Paper Co.

On October 27, 1971 a water quality study was made of the Spokane River as effected by the discharge from Inland Empire Paper Co. The objective of the study was to determine whether the water quality of the Spokane River has improved since the industry shut down their pulping operation on September 30, 1971. The results of a previous study conducted on October 10, 1967, at a time when the industry was manufacturing pulp, was compared with the results of the subject study.

The Spokane River flow during the 1967 study was 1,330 cfs. The river flow during the subject study was 1,800 cfs, however, this figure is obtained from provisional data and is accurate ± 100 cfs.

Station descriptions for both studies are presented in Table 1. The data for the present study and for the October 10, 1967 study are presented in Tables 2 and 3 respectively. Figure 1 identifies the station locations.

RESULTS AND DISCUSSION

It is apparent that the water quality of the Spokane River below Inland Empire Paper Company has improved since the 1967 study. The most significant improvements were in the PBI and BOD_5 values. In 1967 the PBI values were zero above the mill with average values of 3.3 mg/l below the mill. Maximum and minimum PBI values below the mill were 7.0 mg/l and 0.0 mg/l respectively.

The maximum, minimum and average BOD_5 levels found below the mill in 1967 were 6.7 mg/l, nil and 3.7 mg/l respectively, whereas, during the subject study all values were nil.

In 1967 there was an immediate depression in dissolved oxygen saturation of 5% at station 2S which was not evident during the subject study. The indicated slight depression below the mill is probably a combination of what is left of the Inland Empire Paper Co. discharge and the pooling effect behind Felts Field Dam.

The values for all of the parameters measured during the subject study were within the water quality standards established for the Spokane River.

RP:bj

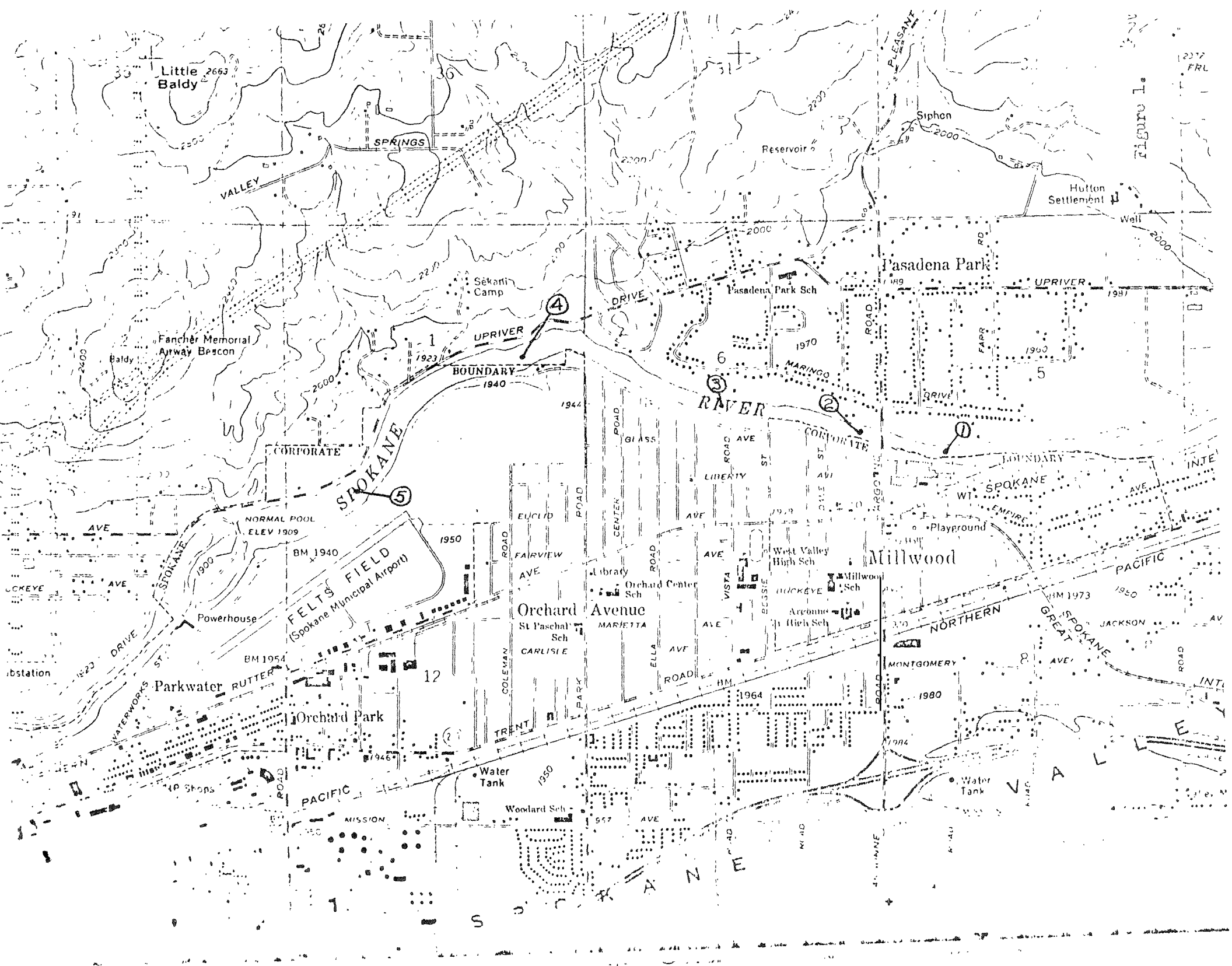


Figure 1.
Little Baldy
SPRINGS
VALLEY
Siphon
Reservoir
Hutton Settlement
Well
Pasadena Park
Pasadena Park Sch
UPRIVER
DRIVE
Sekani Camp
Fancher Memorial Airway Beacon
Baldy
BOUNDARY
1940
RIVER
CORPORATE
SPOKANE
NORMAL POOL ELEV 1909
BM 1940
FELTS FIELD (Spokane Municipal Airport)
Powerhouse
Orchard Avenue
St Paschal Sch
Orchard Center Sch
Library
West Valley High Sch
Millwood
Millwood Sch
Playground
Argonne Jr High Sch
PACIFIC
NORTHERN
GREAT
Parkwater
Orchard Park
RUTTER
TRENT
Water Tank
Woodard Sch
MISSION
SPOKANE VALLEY
1 2 3 4 5

Table 1. Description of stations where water quality data was collected during studies conducted on October 10, 1967 and October 27, 1971.

Station Number	Description
1	200 yards above Inland Empire Paper Co. discharge.
2 S	50 yards Argonne Road Bridge (south side of river)
2 N	Same as 2 S (north side of river)
3 S	One-half mile downstream from Argonne Road Bridge (south side of river).
3 N	Same as 3 S (north side of river).
4	Opposite boat launching area midway between Felts Field (City) Dam and Inland Empire Paper Company.
5	One-half mile upstream from Felts Field Dam.

Table 2. Water quality data collected from the Spokane River in the vicinity of Inland Empire Paper Co., October 27, 1971.

Station Number	Time PST	Depth in Feet	Temp C	mg/l D.O.	% Sat.	Conductance µmohs/cm	mg/l BOD_5	mg/l PBI	Total Coliform	Fecal Colifor
1	1250	3	5.7	10.8	89.0	115	Nil	0.0	500	<20
		10	5.7	10.8	89.0	115	---	---	---	---
2 S	1310	3	5.7	10.8	89.0	115	Nil	0.0	450	<20
		10	5.7	10.8	89.0	115	Nil	0.0	---	---
2 N		3	---	---	---	---	Nil	0.0	---	---
3 S	1325	3	5.7	10.6	87.8	118	Nil	0.0	440	<20
		10	5.7	10.4	84.9	115	---	---	---	---
3 N	1332	3	5.7	10.8	89.0	115	Nil	0.0	---	---
		10	5.7	10.6	87.8	110				
4	1340	3	5.7	10.8	89.0	100	Nil	0.0	500	<20
		10	5.7	10.4	84.9	105	---	---	---	---
5	1350	3	5.7	10.4	84.9	110	Nil	0.0	350	<20
		10	5.7	10.4	84.9	105	---	---	---	---
6	1355	3	5.7	10.6	87.8	110	Nil	0.0	500	<20
		10	5.8	10.4	85.8	110	---	---	---	---

Table 3. Water quality data collected from the Spokane River in the vicinity of Inland Empire Paper Co., October 10, 1967.

Station Number	Time	Depth in Feet	Temp C	mg/l D.O.	% Sat.	mg/l BOD_5	mg/l PBI
1	0830	3	13.5	8.6	85.2	Nil	0.0
		10	13.5	8.6	85.2	Nil	0.0
2 S	0900	3	14.0	8.0	80.0	6.7	2.0
		10	14.0	8.2	82.0	5.7	0.0
2 N	0925	3	14.0	8.9	89.1	Nil	7.0
		10	14.0	8.8	88.1	Nil	2.0
3 S	0930	3	14.5	8.1	81.2	4.9	5.0
		10	14.0	8.2	82.0	4.5	3.0
3 N	1000	3	14.0	8.5	85.2	2.8	0.0
		10	14.0	8.6	86.2	2.5	0.0
4	1015	3	15.0	8.2	84.0	4.1	6.0
		10	14.0	8.2	82.0	5.4	7.0
5	1040	3	15.0	8.5	87.0	3.8	5.0
		10	15.0	8.5	87.0	4.0	2.0

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY — OFFICE OF TECHNICAL SERVICES

ANALYTIC REPORT SHEET

Routing

Original to LAB
Copies to: Ron Pine

o. [illegible]

The following are the analytical results [illegible] conducted [illegible]

[illegible] 03-0223

Collected [illegible] 0/27/71

LAB. NO	STATION NO	PBI ppm	BOD ppm	Total Coliform /100	Fecal Coliform /100			
71-3499	1	0.	1	500.	<20.			
3500	2N	0	1	450.	<20.			
3501	2S	0.	1					
3502	3N	0.	1	440.	<20			
3503	3S	0.	1					
3504	4	0	1	[illegible]00.	<20			
3505	5	0		350.	<20.			
3506	6	0	1	500	<20			

Notes: * Samples with depletion [illegible] less than 2 ppm. are considered unreliable and should be reported as nil

Summarized by Pat Lee

Date 11/8/71

MEMORANDUM

HECK
INFORMATION
FOR ACTION
PERMIT
OTHER

TO Mr. Pi[illegible] S.[illegible] egional Office, Olympi[illegible]

FROM [illegible]es A. Sterling, District Supervisor, Spo[illegible]

SUBJECT Special Temperature Studies for
Kaiser, Trentwood and Inland Empir[illegible]

DATE January 15, 1975

State of Washington
Department of Ecology

During the month of August 1975 a special temperature survey of the Spokane River is contemplated to check the compliance with quality standards of thermal discharges from Kaiser, Trentwood and Inland Empire. I feel such a study is necessary due to the temperature standards of the Spokane River and the extreme low flow experienced during the summer months. I also feel that by having your section do such a survey, the quality of results obtained will be of sufficient character to base specific management decisions regarding control of these discharges.

Attached hereto are pertinent pages of draft NPDES permits for KACC-Trentwood and Inland Empire Paper Co. The specific requirements for the permittee to conduct these surveys will be deleted from the final permits. I feel the month of August would be quite indicative of a typical low flow period and the survey should be conducted over a period of at least 2-4 days.

If you should have any questions regarding this request please feel free to contact me at your convenience.

RAC:ad[illegible]

Attachments

Daniel J Evans *Governor* John A Biggs *Director* Spokane WA 99207 Telephone (509) 456 2926

D. The permittee shall continue to explore methods of recycle and reuse, flow reduction and waste treatment towards the goal of meeting the Best Available Technology Economically Achievable by not later than July 1, 1983. Progress reports shall be submitted to this Department once every six (6) months for review.

E. The periodic discharge of screened wastewater shall be authorized under the terms and conditions of this permit through the controlled overflow required as part of condition S2 of this permit.

S6. SPECIAL PROVISIONS FOR TEMPERATURE

For the purpose of checking compliance with adopted water quality standards for the Spokane River, a special temperature survey will be required to be run one week per month during low flow period from June 1 through October 1, 1975.

For the purpose of monitoring pertinent temperatures, continuous temperature record~~s~~ers shall be installed to record temperatures immediately upstream from the plant outfall. Spokane River flow rate will be obtained from any gauging stations located immediately upstream from the Inland Empire Paper Company outfall taking into consideration allowances for groundwater inflows and surface water diversions up to the point of discharge.

An example set of calculations appear on the following page to illustrate the acceptable method of calculating allowable clarifier effluent temperatures for a given upstream water temperature.

INLAND EMPIRE

TEMPERATURE

Standard:

Temperature - water temperatures shall not exceed 68° F. due in part to measurable (0.5° F.) increases resulting from human activities; nor shall such temperature increases, at any time, exceed $t = 110/(T-15)$; for purposes hereof, "t" represents the permissive increase and "T" represents the water temperature due to all causes combined.

$$Te = (K+1)\,\Delta T + Tr$$

JULY, AUGUST, SEPTEMBER
SPOKANE RIVER MA7CD LOW FLOW

$Qr = 300.$ cfs = 193.8 mgd (10 year)

$$K = \frac{.11\ Qr}{Qe} = 7.1 \text{ for } Qe = 3.0 \text{ mgd}$$

(°F)

T	ΔT	Tr	Te
50	3.14	46.86	72.3
55	2.75	52.25	74.5
58	2.56	55.44	75.
61	2.39	58.61	75.
64	2.24	61.76	75.
66	2.16	63.84	75.
68	2.08	65.92	75.

Where: Tr = upstream river temperature
Te = allowable effluent temperature

Note: 75° F is the allowable effluent limitation for Inland Empire Paper Company

C. Recording of Results

The permittee shall record each measurement or sample taken pursuant to the requirements of this permit for the following information: (1) the date, exact place and time of sampling; (2) the dates the analyses were performed; (3) who performed the analyses; (4) the analytical techniques or methods used; and (5) the results of all analyses.

D. Representative Sampling

Samples and measurements taken to meet the requirements of this condition shall be representative of the volume and nature of the monitored discharge.

E. Test Procedures

All sampling and analytical methods used to meet the monitoring requirements specified in this permit shall, unless approved otherwise in writing by the Department, conform to the latest edition of the following references:

1. American Public Health Association, Standard Methods for the Examination of Water and Wastewaters.

2. American Society for Testing and Materials, A.S.T.M. Standards, Part 23, Water, Atmospheric Analysis.

3. Environmental Protection Agency, Water Quality Office Analytical Control Laboratory, Methods for Chemical Analysis of Water and Wastes.

S3. OTHER CONDITIONS

In accordance with RCW 90.48 as amended and Chapter 372-24 WAC of the Washington State Department of Ecology, the following special conditions for discharges to waters of the State are hereby made a part of this NPDES Waste Discharge Permit:

A. Thermal Discharge Special Provisions

For the purpose of checking compliance with adopted water quality standards for the Spokane River, a special temperature survey shall be conducted one week per month during the low flow period from June 1 through October 1, 1975.

For the purposes of monitoring pertinant temperatures, continuous temperature recorders will be installed at the raw water intake during the analyses periods. Spokane River flow rate will be obtained from any gauging stations located immediately upstream from the KACC-Trentwood lagoon outfall taking into consideration allowances for groundwater, point of discharge.

→ influenced surface water discharging upstream

An example set of calculations and graph appear on the following two pages to illustrate the acceptable method of calculating allowable lagoon effluent temperatures for a given raw water temperature.

KACC — TRENTWOOD

Permit No. WA-000089-2

TEMPERATURE

Standard:

Temperature - water temperatures shall not exceed 68° F due in part to measurable (0.5° F) increases resulting from human activities; nor shall such temperature increases, at any time, exceed $t = 110/(T-15)$; for purposes hereof, "t" represents the permissive increase and "T" represents the water temperature due to all causes combined.

$$T_{effluent} = (K+1)\ T + T_{river}$$

JULY, AUGUST, SEPTEMBER
SPOKANE RIVER MA7CD LOW FLOW

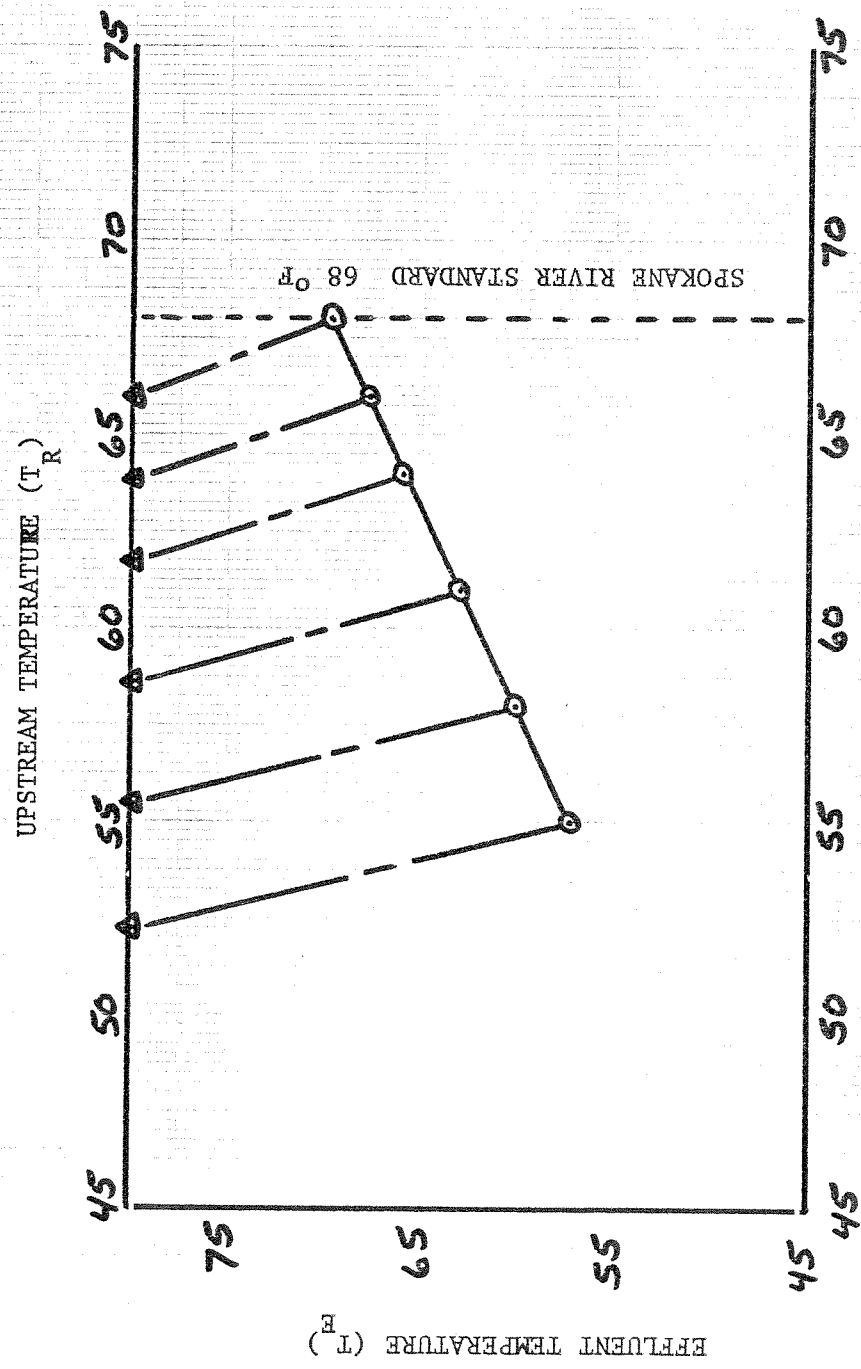
Q_{river} = 300. cfs = 193.8 MGD (10 year)

$K = \frac{.11\ Q_r}{Q_e} = .814$ for Q effluent = 26.2 MGD

(°F)

T	ΔT	Tr	Te
55	2.75	52.25	57.24
58	2.56	55.44	60.08
61	2.39	58.61	62.95
64	2.24	61.76	65.82
66	2.16	63.84	67.76
68	2.08	65.92	69.69

Permit No. WA-000089-2



THEORETICAL
DOWNSTREAM TEMPERATURE (T)

KAISER ALUMINUM AND CHEMICAL CORPORATION - TRENTWOOD

K = .814
RIVER FLOW = 300 cfs
EFFLUENT FLOW = 40.6 cfs