

December 20, 1973

State of
Washington
Department
of Ecology



Memo to: Howard Steeley and Gerry Calkins

From: Hans Cregg

Subject: Kalama STP Efficiency Survey.

On August 29, 1973, an efficiency study was conducted at the Kalama wastewater treatment plant. The survey lasted 8 hours and ran without incident.

Lab results show that BOD, COD and solids reduction are low. Coliform count can not be determined from the existing lab data. However, it was noticed that the plant's chlorine contact chamber was covered with a scum layer approximately 6-10 inches thick. This condition was pointed out to the operator and hopefully has been corrected. It is further felt that the absence of any Cl residual is probably due to the deplorable condition that exists in the chlorine contact chamber.

HC:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Kalama Plant Type Primary Population 600 Design 2,000
 Served Capacity
 Receiving Water Columbia River Engineer _____
 Date 8-29-73 Survey Period 8 hours Survey Personnel H. Cregg
 Comp. Sampling Frequency _____ Weather Conditions Sunny & warm
 (last 48 hours)
 Sampling Alequot 1,000 ml

PLANT OPERATION

Total Flow 80,000 GPD How Measured Estimate
 Max. (Flow) _____ Time of Max. _____ Min. _____ Time of Min. _____
 Pre Cl₂ _____ #/day Post Cl₂ 6 #/day

FIELD RESULTS

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	20.2	19.4	19.9	20.0	20.0	19.4	19.5	19.4
pH	7.2	6.9	--	7.0	6.6	6.4	---	6.5
Conductivity (umhos/cm)	---	---	---	---	---	---	---	---
Settleable Solids	14.0	13.0	13.3	13.0	.2	.1	.15	

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-3175	73-3176	
5-Day BOD	184	161	12.5%
COD	418	300	28.2%
T.S.	406	332	18.2%
T.N.V.S.	184	169	8.2%
T.S.S.	211	103	51.1%
N.V.S.S.	22	7	68.1%
pH	7.1	6.9	
Conductivity	530	530	
Turbidity	75	47	37.3%

Kalama

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample Before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		Cl Residual	
		Total	Fecal	ppm	(after secs.)
73-3177	0830	<4 X 10 ⁵	<2 X 10 ⁵	.15 in	15sec / .75 in
3178	1030	"	"	0	0 3 min.
3179	1130	"	"	0	0
3180	1230	"	"	0	0
3181	1330	"	"	0	0
3182	1430	"	"	0	0

Operator's Name _____ Phone # _____

Comments: The coliform count is less than 4 X 10⁵. In order to
obtain absolute results, additional coliform samples should
be taken.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

ORIGINAL TO: A. CREEG.....
 COPIES TO:

 LAB FILES

Source KALAMA STP

Collected By H.C.

Date Collected 8/28/73

Goal, Pro./Obj. _____

Log Number:	77-3175	76	77	78	79	80	81	82			STORET
Station:	INF	EFP	0830	1030	1130	1230	1330	1430			
pH	7.1	6.9									00403
Turbidity (JTU)	75	47									00070
Conductivity (umhos/cm)@25°C	530	530									00095
COD	418	300									00340
BOD (5 day)	184	161									00310
Total Coliform (Col./100ml)	-	-	<4x10 ⁵	<4x10 ⁵	4x10 ⁵	<4x10 ⁵	<4x10 ⁵	<4x10 ⁵			31504
Fecal Coliform (Col./100ml)	-	-	<2x10 ⁵	<2x10 ⁵	<2x10 ⁵	<2x10 ⁵	<2x10 ⁵	<2x10 ⁵			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	406	332									00500
Total Non Vol. Solids	184	169									
Total Suspended Solids	211	103									00530
Total Sus. Non Vol. Solids	22	7									

Note: All results are in PPM unless otherwise specified. ND is "None Detected"
 Convert those marked with a * to PPB (PPM X 10³) prior to entry into STORET

Summary By Stephen P. Roll Date 10-17-73

15-1010-1

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
SEWAGE TREATMENT PLANT OPERATION AND MAINTENANCE
PRACTICES QUESTIONNAIRE

FORM APPROVED
BUDGET BUREAU NO. 45-11527

CHECK ONE <input checked="" type="checkbox"/> 1ST AUDIT <input type="checkbox"/> RE-AUDIT	DATE OF AUDIT	PLANT DESCRIPTION CODE (For Official Use Only)
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A. GENERAL INFORMATION

1. PROJECT (State, Number) Washington	SCOPE OF PROJECT (new plant, additions, etc.) Secondary treatment plant
2. PLANT LOCATION (City, county) Kalama, Washington Cowlitz County	IDENTIFICATION OF AREAS SERVED Town of Kalama and partial area surrounding

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) 95%	3B. PLANT DESIGN (population equivalent) 2000	3C. SERVED BY PLANT (Domestic) approx. 600
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4. TYPE OF COLLECTION SYSTEM

4A. <input type="checkbox"/> COMBINED <input checked="" type="checkbox"/> SEPARATE <input type="checkbox"/> BOTH	4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd) unable to measure
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5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT 1956	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER 1955	6B. PLANT 1956	6C. ANCILLARY WORKS

7A. SIZE OF PLANT SITE (acres) 1/2 acre	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) land available.
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8A. IN THE SPACE PROVIDED BELOW FURNISH A SIMPLIFIED FLOW DIAGRAM OR A WRITTEN DESCRIPTION OF THE PLANT UNITS IN FLOW SEQUENCE. INCLUDE THE METHOD OF ULTIMATE SLUDGE DISPOSAL. SHOW APPROXIMATE SURFACE AREA OF STABILIZATION PONDS AND NUMBER OF CELLS. INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.

8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.

9. RECEIVING STREAM

9A. NAME OF STREAM Columbia River			
9B. STREAM FLOW IS <input checked="" type="checkbox"/> PERENNIAL <input type="checkbox"/> INTERMITTENT		<input checked="" type="checkbox"/> INTERSTATE <input type="checkbox"/> INTRASTATE	
<input checked="" type="checkbox"/> NATURAL <input type="checkbox"/> REGULATED		<input type="checkbox"/> COASTAL	

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd) .055 dry season	1B. PEAK FLOW RATE (mgd)		1C. MINIMUM FLOW RATE (mgd) .035
	DRY WEATHER .080	WET WEATHER ?	
2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm) 2.5	3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (MLLSS) (mg/l) 8.0		
4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l) tr.	5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml) ?		

5. ANNUAL AVERAGE PLANT REDUCTION

6A. BOD (%)	6B. SETTLEABLE SOLIDS (%)	6C. SUSPENDED SOLIDS (%)	6D. COLIFORM (%)
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7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? YES NO

7B. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES? YES NO

8. ARE CHLORINATION FACILITIES PROVIDED? YES NO
IF YES, ANSWER 8A THRU G

IF YES, IS CHLORINATION CONTINUOUS? YES NO
IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION
Help purify

8B. TYPE OF CHLORINATOR
Unknown make

8C. POINT OF APPLICATION OF CHLORINE
sewer manhole before final effluent tank

8D. CAN BYPASSED SEWAGE BE CHLORINATED? YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
6 #/x

8F. CHLORINE RESIDUAL IN EFFLUENT
1.0 PPM AT END OF 1 1/2 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
150 #/x

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?
 YES NO IF YES, ANSWER A THRU G BELOW, ANSWER H IN EITHER CASE.

9A. FREQUENCY (times monthly)

9B. AVERAGE DURATION (hours)

9C. REASON FOR BYPASSING

9D. ESTIMATED FLOW RATE DURING BYPASS IS
 WITHIN HYDRAULIC CAPACITY OF PLANT
 BEYOND HYDRAULIC CAPACITY OF PLANT BY

9E. DOES SEWAGE OVERFLOW IN DRY WEATHER?
 YES NO

9F. TYPE OF DIVERSION STRUCTURE

9G. AGENCIES NOTIFIED OF BYPASS ACTION

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNITS? (If no, has this caused any operational problems?)
 YES NO

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? (If no, explain)
 YES NO Old services no check valves

10B. CHECK TYPE OF BACK FLOW PREVENTION DEVICE
 DOUBLE CHECK VALVE PRESSURE OPERATED PHYSICAL DISCONNECT OTHER(specify)

11. USES OF TREATMENT PLANT EFFLUENT Dumped in Columbia River through the outfall

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL
Unknown

13. HAVE THERE BEEN ANY ODOOR COMPLAINTS BEYOND THE PLANT PROPERTY? (If yes, explain)
 YES NO

14. OBSERVED APPEARANCE AND CONDITION OF EFFLUENT, RECEIVING STREAM, OR DRAINAGE WAY

15. STABILIZATION PONDS

K. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?

YES NO no ponds

L. BANKS AND DIKES MAINTAINED (erosion etc.)?

YES NO None

C. FENCING AND "WARNING - POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR?

YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR

E. WATER DEPTH (feet)

_____ HIGH _____ LOW _____ MEDIUM

F. ADEQUATE CONTROL OF DEPTH?

YES NO

G. SEEPAGE REPORTED?

YES NO

H. ANY REPORTS OF GROUND WATER CONTAMINATION FROM POND (If yes, give details)?

YES NO

I. MOSQUITO BREEDING PROBLEM?

YES NO

IF YES, NAME OF SPECIES IF KNOWN

J. CAN SURFACE RUN-OFF ENTER POND?

YES NO

C. SUPERVISORY SERVICES

1. IS A CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATING AND MAINTENANCE PROBLEMS?

YES NO IF YES IS IT ON: CONTINUING BASIS OR UPON REQUEST BASIS

IF CONTINUING BASIS, WHAT IS THE FREQUENCY OF VISITS:

2. DO OPERATORS AND OTHER PERSONNEL ROUTINELY ATTEND SHORT COURSES, SCHOOLS OR OTHER TRAINING ACTIVITIES?

YES NO

IF YES, CITE COURSE SPONSOR AND DATE OF LAST COURSE ATTENDED

IF NO, DO YOU KNOW OF ANY COURSES AVAILABLE TO SERVE THIS AREA?

Have attended at irregular times

3A. ARE ALL EQUIPMENT AND PARTS OF THE PRESENT PLANT STILL IN OPERATION?

YES NO (If no, explain)

B. ARE PROCESSING UNITS OPERATING AT DESIGN EFFICIENCY?

YES NO (If no, explain)

4. HAVE THERE BEEN ANY DIFFICULTIES WITH THE SEWAGE TREATMENT PLANT?

A. STRUCTURAL YES NO (If yes explain)

B. MECHANICAL YES NO (If yes, explain)

C. OPERATIONAL YES NO (If yes, explain)

D. BASED ON OPERATING EXPERIENCE TO DATE WHAT IF ANY CHANGES WOULD YOU RECOMMEND TO IMPROVE OPERATION OF THE PLANT?

Secondary treatment plant being added to improve plant operation

5. ARE OPERATING RECORDS MAINTAINED? YES NO
(If maintained, check general items included)

REPORTED? YES NO
 TO WHOM? State Dept. of Health

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		X	when req.	X	X		X			X	
WEEKLY											
MONTHLY											
ANNUALLY											

6. ARE LABORATORY RECORDS MAINTAINED? (check appropriate box)

NOT AT ALL DAILY WEEKLY MONTHLY ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

LOG BOOK TABULAR SHEET SEPARATE BY OPERATION CONTROL CHARTS GRAPHS

WHAT PLANT AND/OR LABORATORY EQUIPMENT, GAGES AND METERS ARE CALIBRATED PERIODICALLY?

7. IS LABORATORY TESTING ADEQUATE FOR THE CONTROL REQUIRED FOR THIS SIZE AND TYPE OF PLANT?

YES NO (If no, explain)

B. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS None
B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pc) None	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pc) None
D. VOLUME OF INDUSTRIAL WASTES (mgd)	E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)

G. HAVE INDUSTRIAL EFFLUENT PROBLEMS BEEN SOLVED? YES NO (If yes, how?)

9A. METHOD OR METHODS USED TO ASSESS INDUSTRIAL WASTE TREATMENT COST (check appropriate box)

NO CHARGE BY CITY PROPERTY TAX WATER USE ASSESSMENT CHARGE BASED ON FLOW
 CHARGED BASED ON BOD CHARGE BASED ON SS OTHER METHODS (describe)

COMMENT ON HOW CHARGE IS COLLECTED (fixed charge, sliding scale, etc.)

9B. IS INDUSTRIAL WASTE ORDINANCE IN EFFECT AND ENFORCED? YES NO

10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?
 Dept. of Health and Dept. of Ecology - Washington State

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? YES NO
 IF YES, WHO WROTE AND PROVIDED IT? Dept. of Ecology

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
 14 hours per week

D. PLANT PERSONNEL (Annual Average Staff for Most Recent Year Reported in Section "F")

JOB CATEGORY	NUMBER	TOTAL MAN-HOURS PER WEEK	TOTAL NUMBER CERTIFIED OR LICENSED	RANGE IN YEARS EMPLOYED AT PRESENT PLANT	RANGE IN YEARS OF EXPERIENCE IN TREATMENT
1. SUPERINTENDENT	1	3		8	8
2. OPERATORS	2	15		1-2	
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS					
6. TOTAL					

E. LABORATORY CONTROL

Enter test codes opposite appropriate items. If any of the below tests are used to monitor industrial wastes place an "X" in addition to the test code.

CODES

- 1 - 7 or more per week 3 - 1, 2, or 3 per week 5 - 2 or 3 per month 7 - Quarterly 9 - Annually
 2 - 4, 5 or 6 per week 4 - as required 6 - 1 per month 8 - Semi-Annually

ITEM	RAW	PRIMARY EFFLUENT	MIXED LIQUOR	FINAL	SLUDGE		DIGESTOR	RECEIVING STREAM
					RAW	SUPER-NATANT		
1. BOD	2							
2. SUSPENDED SOLIDS	1			1				
3. SETTLEABLE SOLIDS	1			1				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	1			1				
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	1			1				
9. TEMPERATURE								
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE				1				
12. VOLATILE ACIDS								
13. M. B. STABILITY								
14. ALKALINITY								
15.								
16.								
17.								
18.								
19.								

F. OPERATION AND MAINTENANCE COST FOR PLANT

YEAR OF OPERATION	SALARIES/WAGES	ELECTRICITY	CHEMICALS	MAINTENANCE	OTHER ITEMS	TOTAL
MOST CURRENT YEAR 19	bombed with water dept.					
PRIOR YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE