

February 5, 1974

WA-04-1020

Memo to: Stew Messman, John Glynn

From: Pat Lee

Subject: Efficiency Study at the Concrete STP.



An efficiency study was conducted at the Concrete Lagoon on January 8, 1974. The influent and effluent were composited on the half hour for eight hours. The banks of the lagoon were in good shape and the premises were well fenced. The lagoon was frozen except in circular patterns around the 2 aerators. The chlorine contact chamber also had the top inch or two covered with ice. The laboratory and field results (summarized on the efficiency study form) show the lagoon to be operating fairly well. Disinfection was good except for the 0930 sample whose high count was due to the temporary breakdown of the chlorinator.

PML:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

Aerated

City Concrete Plant Type Lagoon Population 570 Design 1000
Served Capacity

Receiving Water Baker River Engineer STew Messman

Date 1/8/74 Survey Period 0830-1630 hours Survey Personnel Pat Lee

Comp. Sampling Frequency half hour Weather Conditions Sunny but cold
(last 48 hours)

Sampling Alequot (flow - MGD) (10000) = mls. sampled

PLANT OPERATION

Total Flow 23,220 gallons in 8 hours How Measured Totalizer

Max. (Flow) .075 MGD Time of Max. 1230-1630 Min. .070 MGD Time of Min 0830-1200

Pre Cl₂ 0 #/day Post Cl₂ 3 #/day

FIELD RESULTS

Influent

Effluent

8 Determinations

	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	9.3	7.0	---	8.7	1.6	0.8	----	1.4
pH	8.0	7.4	---	7.4	7.5	7.3	----	7.4
Conductivity (umhos/cm)	750	625	656	650	600	500	540	550
Settleable Solids	7.0	2.0	3.7	3.0	<.05	<.05	<.05	<.05

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	74-0011	74-0012	
5-Day BOD	100	<18	>82%
COD	180	73	59%
T.S.	384	284	26%
T.N.V.S.	205	179	13%
T.S.S.	128	40	69%
N.V.S.S.	39	21	46%
pH	8.3	7.8	--
Conductivity	580	540	--
Turbidity	90	15	--

Concrete STP

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		Cl Residual	
		Total	Fecal	ppm	(after secs.)
74-0013	0930	> 40,000	800	.1	180
0014	1030	1,200	<10	.75	"
0015	1130	120	<10	1.0	"
0016	1230	220	<10	1.0	"
0017	1330	180	<10	1.0	"
0018	1630	20	<10	1.0	"

Operator's Name Jack Hoover Phone # 853-2141

Comments: Total oils in effluent = 3 ppm @ 1400 hrs.

Nutrients in effluent in ppm.

NO ₃ -N	=	1.80	T-Kjeldahl-N	=	13.0
NO ₂ -N	=	.05	O-PO ₄ -P	=	.10
NH ₃ -N	=	13.0	T-PO ₄ -P	=	5.60

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO:
P. Lee
COPIES TO:
.....
.....
LAB FILES:

DATA SUMMARY

Source Concrete STP

Collected By P. Lee

Date Collected 1-8-74

Goal, Pro./Obj. _____

Log Number:	74-0011	12	13	14	15	16	17	18			STORET
Station:	INF	EFF	0930	1030	1130	1230	1370	1630			
pH	8.3	7.8									00403
Turbidity (JTU)	90.	15.									00070
Conductivity (umhos/cm)@25°C	580.	540.									00095
COD	180.	73.									00340
BOD (5 day)	100	<18									00310
Total Coliform (Col./100ml)	-	-	>4x10 ⁴	1200	EST 120	EST 220	EST 180	EST 20			31504
Fecal Coliform (Col./100ml)	-	-	800	<10	<10	<10	<10	<10			31616
NO3-N (Filtered)	-	1.80									00620
NO2-N (Filtered)	-	.05									00615
NH3-N (Unfiltered)	-	13.									00610
T. Kjeldahl-N (Unfiltered)	-	13.									00625
O-PO4-P (Filtered)	-	.10									00671
Total Phos.-P (Unfiltered)	-	5.60									00665
Total Solids	384	284									00500
Total Non Vol. Solids	205	179									
Total Suspended Solids	128	40									00530
Total Sus. Non Vol. Solids	39	21									
Chlorides	16	16									
Total Oils		3.									

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. Hall Date 1-25-74

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

FORM APPROVED
BUDGET BUREAU NO. 42-111527

CHECK ONE: 1ST AUDIT RE-AUDIT

DATE OF AUDIT: 1/8/74

PLANT DESCRIPTION CODE (For Official Use Only): Aerated Lagoon

A. GENERAL INFORMATION

1. PROJECT (State, Number): Washington

SCOPE OF PROJECT (new plant, additions, etc.): Routine Efficiency

2. PLANT LOCATION (City, county): Concrete, Skagit

IDENTIFICATION OF AREAS SERVED: Concrete

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%): 75

3B. PLANT DESIGN (population equivalent): 1000

3C. SERVED BY PLANT (domestic): 570

4. TYPE OF COLLECTION SYSTEM

4A. COMBINED SEPARATE BOTH

4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd):

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT: 1973

6. YEAR PRESENT SYSTEM PLACED IN OPERATION:

6A. SEWER: 1973

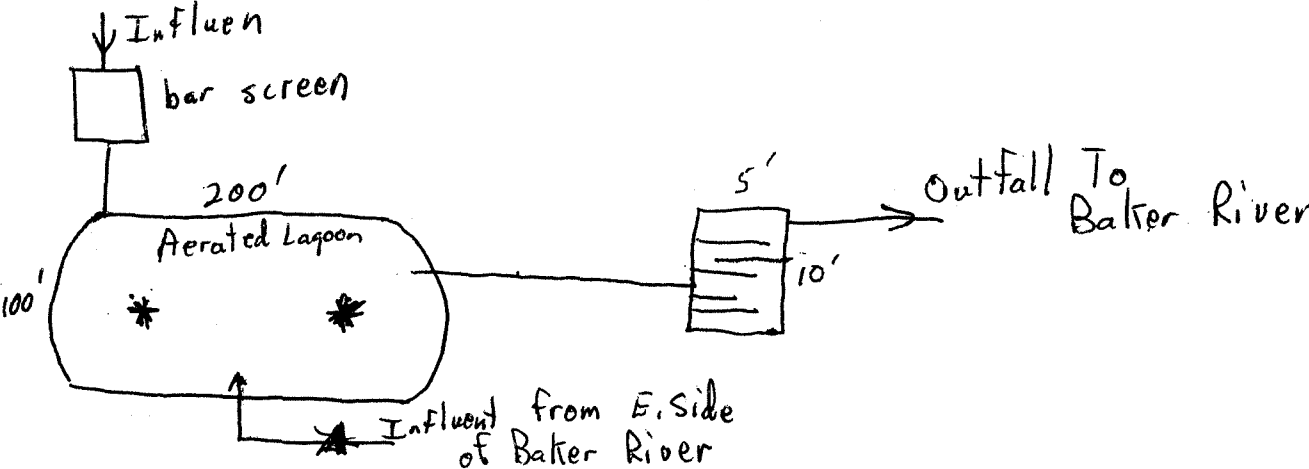
6B. PLANT: 1973

6C. ANCILLARY WORKS:

7A. SIZE OF PLANT SITE (acres): 1

7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): 1

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: Baker River

9B. STREAM FLOW IS: PERENNIAL INTERMITTENT NATURAL REGULATED

INTERSTATE INTRASTATE COASTAL

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd): .1

1B. PEAK FLOW RATE (mgd):

DRY WEATHER: .15

WET WEATHER: .25

1C. MINIMUM FLOW RATE (mgd): .04

2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm):

3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (mg/l):

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l):

5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml):

5. ANNUAL AVERAGE PLANT PERFORMANCE

6A. BOD (%) : 85

6B. SETTLEABLE SOLIDS (%) : 99

6C. SUSPENDED SOLIDS (%) : 85

6D. COLIFORM DENSITY : <100

7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	7B. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8. ARE CHLORINATION FACILITIES PROVIDED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, ANSWER 8A THRU G	IF YES, IS CHLORINATION CONTINUOUS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION
disinfection

8D. TYPE OF CHLORINATOR *Wallace + Tiernan feed gas dispenser*

8C. POINT OF APPLICATION OF CHLORINE *effluent* 8D. CAN BYPASSED SEWAGE BE CHLORINATED? YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day) *3* 8F. CHLORINE RESIDUAL IN EFFLUENT *1* PPM AT END OF *3* MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb) *100*

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) *0* 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

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

11. USES OF TREATMENT PLANT EFFLUENT *none*

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL *recreation*

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

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

15. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?
 YES NO

D. BANKS AND DIKES MAINTAINED (erosion etc.)?
 YES NO

C. FENCING AND "WARNING - POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR?
 YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR
daily

E. WATER DEPTH (feet)

10 HIGH *d* LOW *9* 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?

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?

none

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

REPORTED TO WHOM? YES NO **DOE**

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		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: NO	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS
B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pc)	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pc)
D. VOLUME OF INDUSTRIAL WASTES (mgd)	E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES
F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)	

6. 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?

Sleavh-Kors Tacoma

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE?

YES NO

IF YES, WHO WROTE AND PROVIDED IT?

S-K + DOE

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

5-10

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					
2. OPERATORS	1	20	0	1	1
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. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS	2			2				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	2			2				
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	2			2				
9. TEMPERATURE								
10. COLIFORM DENSITY				2				
11. RESIDUAL CHLORINE								
12. VOLATILE ACIDS								
13. M. B. STABILITY	2			2				
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						
PRIOR YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
Pat Lee	E H	DOE

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
W.S. Hoover	Operator	City of Concrete	1/8/74