

January 21, 1974

Memo to: Howard Buntten, John Arnquist
From: Pat Lee
Subject: Efficiency Study at Fairfield Lagoon



An efficiency survey was conducted at the Fairfield Lagoon on December 11, 1973. The influent and effluent were composited on the half hour with sampling aliquots of 1000 ml. The plant grounds were well fenced and the banks seemed to be in good condition. The operator, Julius Spielmann, had never met anyone from our department and had a number of questions needing answering. The survey results show good disinfection with both fecal coliform counts showing less than 200 colonies per 100 ml. The effluent BOD was also very good with less than 20 ppm and the effluent suspended solids almost meets the new EPA Standards.

PL:jmh

(EFFICIENCY STUDY)

City Fairfield Plant Type Lagoon Population 500 Design 800
 Served Capacity
 Receiving Water Rattler's Run Engineer John Arnquist
 Date 12-11-73 Survey Period 1000-1400 hours Survey Personnel Pat Lee
 Comp. Sampling Frequency half hour Weather Conditions Cold & Rainy
 (last 48 hours)
 Sampling Alequot 1000 ml.

PLANT OPERATION

Total Flow no flow data available How Measured _____
 Max. (Flow) _____ Time of Max. _____ Min. _____ Time of Min. _____
 Pre Cl₂ _____ #/day Post Cl₂ 2 #/day

FIELD RESULTS

5 Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	19.4	17.5	-----	19.0	2.4	2.3	-----	2.3
pH	7.2	7.1	-----	7.1	7.3	7.3	-----	7.3
Conductivity (umhos/cm)	350	325	345	350	400	400	400	400
Settleable Solids	4.0	2.0	2.8	2.5	0.0	0.0	0.0	0.0

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-4513	73-4514	
5-Day BOD	< 100	< 20	
COD	62	70	
T.S.	398	399	
T.N.V.S.	265	284	
T.S.S.	92	37	60%
N.V.S.S.	23	3	87%
pH	7.2	7.6	
Conductivity	640	690	
Turbidity	40	30	

Fairfield

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		Cl Residual	
		Total	Fecal	ppm	(after secs.)
73-4515	1300	<400	<200	.4	180
4516	1400	<400	<200	.3	180

Operator's Name Julius Spielman Phone # 283-2414

Comments: _____

 NH₃-N = 6.3 ppm

 T.Kjeldahl-N = 8.8 ppm

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

FORM APPROVED
BUDGET BUREAU NO. 42-11527

CHECK ONE: 1ST AUDIT RE-AUDIT DATE OF AUDIT: 12/11/73 PLANT DESCRIPTION CODE (For Official Use Only): Lagoon

A. GENERAL INFORMATION

1. PROJECT (State, Number): Washington SCOPE OF PROJECT (new plant, additions, etc.): Routine
2. PLANT LOCATION (City, county): Fairfield IDENTIFICATION OF AREAS SERVED: Town of Fairfield
3. POPULATION: Spokane

3A. FRACTION OF AREA POPULATION SERVED (%): 100 3B. PLANT DESIGN (population equivalent): 800 3C. SERVED BY PLANT (domestic): 500

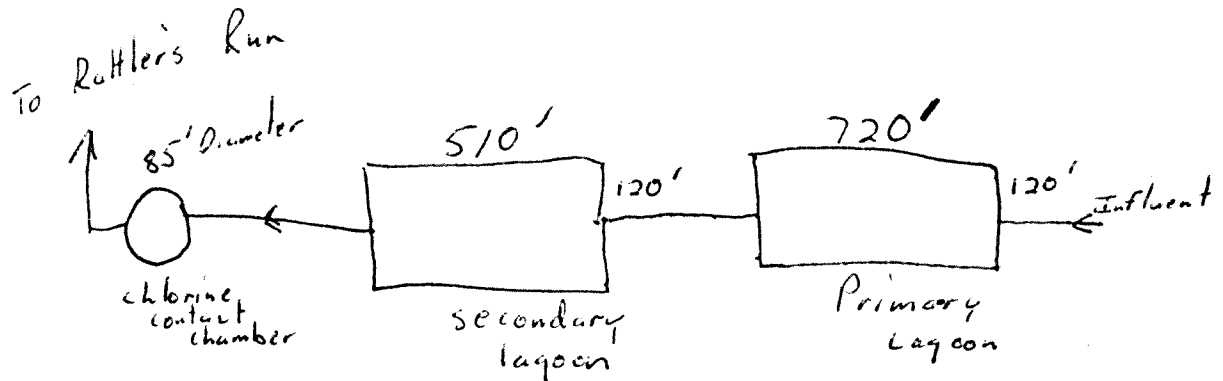
4. TYPE OF COLLECTION SYSTEM

4A. COMBINED SEPARATE BOTH 4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd): no estimate - but there is runoff

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT: 1966 6. YEAR PRESENT SYSTEM PLACED IN OPERATION:
6A. SEWER: 1920 6B. PLANT: 1966 6C. ANCILLARY WORKS: 1973 (chlorine)

7A. SIZE OF PLANT SITE (acres): 10 7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): 5

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: Rattlers Run

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): no flows Available 1B. PEAK FLOW RATE (mgd):
 DRY WEATHER: _____ WET WEATHER: _____ 1C. MINIMUM FLOW RATE (mgd): _____
2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm): no data Available 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 (%) _____ 6B. SETTLEABLE SOLIDS (%) _____ 6C. SUSPENDED SOLIDS (%) _____ 6D. COLIFORM DENSITY (%) _____

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

Disinfection

8D. TYPE OF CHLORINATOR

Wallace + Tiernan V-Notch

8C. POINT OF APPLICATION OF CHLORINE
after secondary lagoon

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
2

8F. CHLORINE RESIDUAL IN EFFLUENT
4 PPM AT END OF 3 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
300 lbs.

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

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
none

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

15. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?

YES NO

D. BANKS AND DIKES MAINTAINED (EROSION ETC.)?

YES NO erosion

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

YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR

daily

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?

no

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)

bank erosion

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?

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

REPORTED? YES NO

TO WHOM?

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?
 none

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 <i>none</i>	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)	

8. 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?

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

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
 5

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

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
Pat Lee	E II	DOE

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Julius Spielmann	Operator	City of Fairfield	12/11/77

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

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

Source FAIRFIELD STP

Collected By P. Lee

Date Collected 12-11-73

Goal, Pro./Obj. _____

Log Number:	73-4513	14	15	16							STORET
Station:	INF	EFF	1300	1400							
pH	7.2	7.6									00403
Turbidity (JTU)	41.	31.									00070
Conductivity (umhos/cm)@25°C	640.	690.									00095
COD	62.	70.									00340
BOD (5 day)	<100	<20									00310
Total Coliform (Col./100ml)			<400	<400							31504
Fecal Coliform (Col./100ml)			<200	<200							31616
NO3-N (Filtered)											00620
NO2-N (Filtered)											00615
NH3-N (Unfiltered)		6.3									00610
T. Kjeldahl-N (Unfiltered)		8.8									00625
O-PO4-P (Filtered)											00671
Total Phos.-P (Unfiltered)											00665
Total Solids	398	399									00500
Total Non Vol. Solids	265	284									
Total Suspended Solids	92	37									00530
Total Sus. Non Vol. Solids	23	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 D. Roll Date 1-17-74