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State of Washington Department of Ecology

Memo to: Gerry Calkins

From: Pat Lee

Subject: Efficiency Study at LaCenter STP.

A short efficiency study was conducted on LaCenter STP from 0900 to 1200 hours on November 14, 1973. The survey was cut short due to the doubtful validity of the results because of infiltration. The heavy rains that preceded us to LaCenter caused the normal flow rates through the plant to double by the time of the survey. The maximum flow rate while we were there was 55,000 GPD, three times the annual average daily flow rate. The results of the survey show that even in it's overloaded condition, the plant was able to provide good disinfection, 25% reduction in BOD and 33% in suspended solids. The plant grounds were neat and the operator, Arnold Harmon, said he needed new reporting sheets as he was almost out.

PL:jmh

(EFFICIENCY STUDY)

City LaCenter Plant Type Activated Sludge ~~Population Served~~ ~~800~~ ~~Design Capacity~~ ---

Receiving Water East Fork Lewis River Engineer Howard Steeley

Date 11-14-73 Survey Period 0900-1200 hour Survey Personnel P. Lee & D. Anderson

Comp. Sampling Frequency half hour Weather Conditions (last 48 hours) Heavy Rain

Sampling Alequot (MGD) 2000 = sampling alequot in mls.

1933 x 24 46,392 .046 mgd .005?

PLANT OPERATION

Total Flow 35800 gallons in three hours How Measured Totalizer

Max. (Flow) 55,000 GPD Time of Max. 1100 Min. 42,000 GPD Time of Min. 1200

Pre Cl_2 0 #/day Post Cl_2 10 #/day

FIELD RESULTS

Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Effluent Max.	Effluent Min.	Effluent Mean	Effluent Median
Temp. °C	13.2	12.4	----	12.6	12.9	12.2	----	12.4
pH	7.0	6.2	----	6.4	6.6	6.0	----	6.2
Conductivity (umhos/cm)	---	---	----	---	---	---	----	---
Settleable Solids	5.	2.	4.	4.	33	7	16	8

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent 73-4211	Effluent 73-4212	% Reduction	
5-Day BOD	60	45 .046 834	25%	17.76
COD	65	45	31%	17.26
T.S.	197	172	13%	65.9
T.N.V.S.	95	72	24%	27.6
T.S.S.	102	69	33%	26.4
N.V.S.S.	47	35	26%	13.4
pH	7.2	6.8		
Conductivity	180	170		
Turbidity	28	20		

LaCenter

BACTERIOLOGICAL RESULTS

$Na_2S_2O_3$ added to sample before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF) Total	Fecal	Cl Residual ppm	(after secs.)
73-4213	0915	$>1.6 \times 10^5$	440	.2	180
14	0930	18,500	<200	.5	
15	1000	<400	<200	.5	
16	1030	12,000	<200	.5	
17	1100	34,000	<200	.35	
18	1130	18,000	<200	.35	

Operator's Name Arnold Harmon Phone # 263-2477

Comments:

NO_3-N	=	7.5 ppm	8.34 2.87
NO_2-N	=	.01 "	.003
NH_3-N	=	0.4 "	.15
T-Kjeldahl-N	=	3.0 "	1.15
O-PO_4-P	=	.10 "	.038
T-PO_4-P	=	2.25 "	.86

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-R1527

CHECK ONE: [ ] 1ST AUDIT [ ] RE-AUDIT

DATE OF AUDIT: 11-14-73

PLANT DESCRIPTION CODE (For Official Use Only): Activated Sludge

A. GENERAL INFORMATION

1. PROJECT (State, Number): Wash

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

2. PLANT LOCATION (City, county): La Center - Clark

IDENTIFICATION OF AREAS SERVED: La Center

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%): 100

3B. PLANT DESIGN (population equivalent):

3C. SERVED BY PLANT (domestic): 700-800

4. TYPE OF COLLECTION SYSTEM

4A. [ ] COMBINED [X] SEPARATE [ ] BOTH

4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd): Doubles Normal Flow - .02 mgd

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT: 1968

6. YEAR PRESENT SYSTEM PLACED IN OPERATION

6A. SEWER: 1969

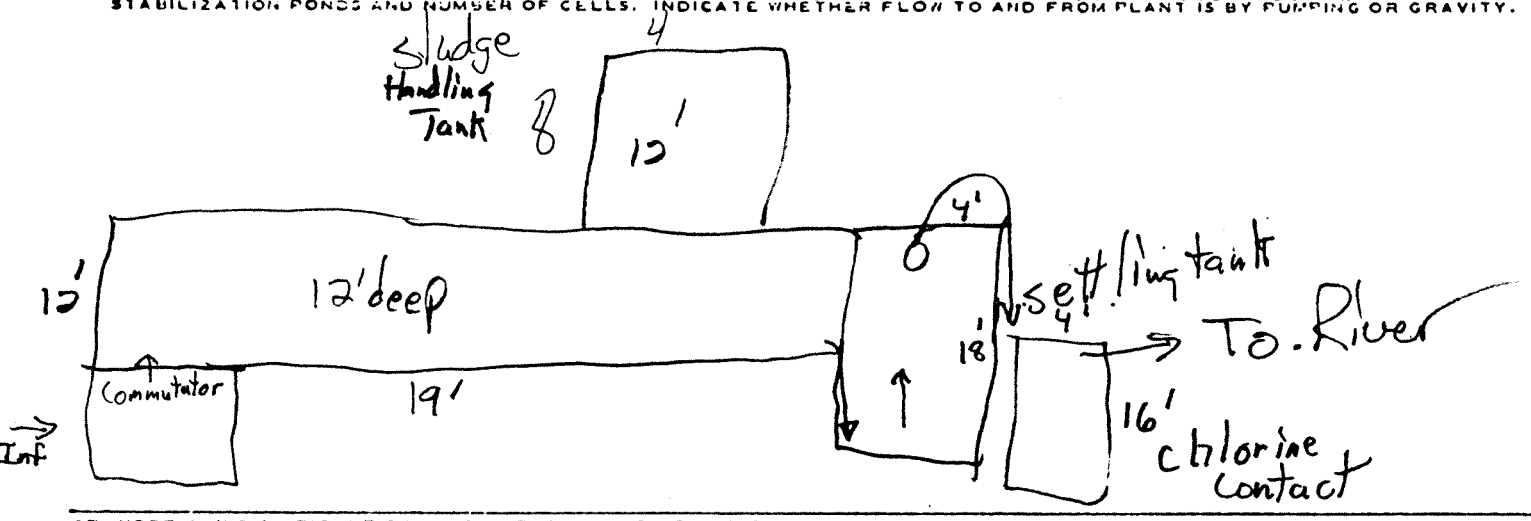
6B. PLANT: 1968

6C. ANCILLARY WORKS:

7A. SIZE OF PLANT SITE (acres): 2

7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): 2

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: East Fork Lewis River

9B. STREAM FLOW IS: [X] PERENNIAL [ ] INTERMITTENT [X] NATURAL [ ] REGULATED [X] INTERSTATE [ ] INTRASTATE [ ] COASTAL

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE: 18,000

1B. PEAK FLOW RATE (mgd): DRY WEATHER 10,000. WET WEATHER 45,000

1C. MINIMUM FLOW RATE (mgd): 5,600. 2

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

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

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

5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE:

6. ANNUAL AVERAGE PLANT REDUCTION

6A. BOD (%):

6B. SETTLEABLE SOLIDS (%): 99

6C. SUSPENDED SOLIDS (%):

6D. COLIFORM DENSITY:

FWPCA-12 (Rev. 4-63)

7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? [ ] YES [X] NO

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

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

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

8A PURPOSE OF CHLORINATION

Disinfection

8B. TYPE OF CHLORINATOR

Wallace + Tiernan

8C. POINT OF APPLICATION OF CHLORINE

Effluent

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
[ ] YES [X] NO

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

10

8F. CHLORINE RESIDUAL IN EFFLUENT

1.2 PPM AT END OF 1 MINUTES

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

200

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?
[X] 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 [X] NO

9F. TYPE OF DIVERSION STRUCTURE

9G. AGENCIES NOTIFIED OF BYPASS ACTION

DOE

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

[X] YES [X] NO

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? (If no, explain)

[ ] YES [X] 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

fishing - etc.

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? (If yes, explain)

[ ] YES [X] NO

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

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?

☐ YES ☐ NO

B. 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

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?

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)

Roof leaks

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?

over loaded

5. ARE OPERATING RECORDS MAINTAINED? (If maintained, check general items included) [X] YES [ ] NO | REPORTED? [ ] YES [ ] NO TO WHOM?

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAIN-TENANCE	OTHER
DAILY	X	X									
WEEKLY											
MONTHLY											
ANNUALLY											

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

[ ] NOT AT ALL [X] DAILY [ ] WEEKLY [ ] MONTHLY [ ] ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

[ ] LOG BOOK [X] 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?

[X] YES [ ] NO (If no, explain)

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS
B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pe)	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pe)
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? Pettijohn Engineering

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? [ ] YES [X] 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

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	25	1	1	3
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
2 – 4, 5 or 6 per week
3 – 1, 2, or 3 per week
4 – as required
5 – 2 or 3 per month
6 – 1 per month
7 – Quarterly
8 – Semi-Annually
9 – Annually

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

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Arnold Harmon	City Laboratory	Operator	

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: P. Lee

COPIES TO:

LAB FILES

DATA SUMMARY

Source La Center STP

Collected By P. Lee

Date Collected 11/14/73

Goal, Pro./Obj.

Log Number: 73-	4211	12	13	14	15	16	17	18			STORET
Station:	INF	EFF	0915	0930	1000	1030	1100	1130			
pH	7.2	6.8									00403
Turbidity (JTU)	28.	21.									00070
Conductivity (umhos/cm)@25°C	180.	170.									00095
COD	66	46									00340
BOD (5 day)	59.	44.									00310
Total Coliform (Col./100ml)	-	-	>1.6×10^5	18,500	<400	12,000	34,000	18,000			31504
Fecal Coliform (Col./100ml)	-	-	440	<200	<200	<200	<200	<200			31616
NO3-N (Filtered)	-	7.5									00620
NO2-N (Filtered)	-	.01									00615
NH3-N (Unfiltered)	-	0.4									00610
T. Kjeldahl-N (Unfiltered)	-	3.0									00625
O-PO4-P (Filtered)	-	.10									00671
Total Phos.-P (Unfiltered)	-	2.25									00665
Total Solids	197	172									00500
Total Non Vol. Solids	95	72									
Total Suspended Solids	102	69									00530
Total Sus. Non Vol. Solids	47	35									
Color	91	31									
Chlorides	8	8									

Note: All results are in PPM unless otherwise specified. ND is "None Detected"
Convert those marked with a * to PPB (PPM X 10^3) prior to entry into STORET

Summary By Stephen D. Roll Date 12-14-73