

December 19, 1973

WA-27-2010

Memo to: Gerry Calkins

From: Hans Cregg

Subject: Woodland STP Efficiency Survey.

On August 28, 1973, an efficiency study was conducted on the Woodland wastewater treatment plant. The plant is designed as a primary treatment facility.

As can be readily seen from the lab results, the plant is extremely inefficient. BOD, COD, and solids reductions are extremely low. Total and fecal coliform count is greater than 160,000 and 40,000 respectively. These figures could be significantly reduced if the chlorine feed rate is adjusted to maximum daily flow. Presently the feed rate reflects the low chlorine demand of early morning flows.

In general, the plant appeared to be clean and well kept.

HC:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Woodland Plant Type Primary Population 1100 Design Capacity
 Served

Receiving Water Northfork Lewis River Engineer _____

Date 8-28-73 Survey Period 8 hours Survey Personnel Hans J. Cregg

Comp. Sampling Frequency hourly Weather Conditions Fair & warm
 (last 48 hours)

Sampling Alequot 1,000 ml.

PLANT OPERATION

Total Flow .11 MGD How Measured Estimated

Max. (Flow) _____ Time of Max. _____ Min. _____ Time of Min. _____

Pre Cl₂ _____ #/day Post Cl₂ _____ #/day

FIELD RESULTS

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	21.0	19.2	20.2	20.4	21.0	19.8	20.5	20.4
pH	6.8	6.0	6.6	6.8	6.4	6.0	6.3	6.4
Conductivity (umhos/cm)								
Settleable Solids	6.0	1.5	--	--	.3	.2	--	--

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-350	73-351	
5-Day BOD	163	114	30%
COD	370	359	3%
T.S.	384	352	6%
T.N.V.S.	177	179	0%
T.S.S.	166	130	22%
N.V.S.S.	21	23	0%
pH	7.0	6.8	
Conductivity	570	500	
Turbidity	55	65	0%

Woodland

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)	Cl Residual	
			ppm	(after secs.)
73-352	0830	>1.6 X 10 ⁵	.4 → 15sec	1.0 → 3 min
353	1030	>1.6 X 10 ⁵	.2 → 15sec	.4 → 3 min
354	1230	>1.6 X 10 ⁵	<.15 → 15sec	<.15 → 15sec
355	1330	>1.6 X 10 ⁵	0 → 15sec	0 → 3 min
356	1430	>1.6 X 10 ⁵	0 → 15sec	0 → 3 min
357	1530	>1.6 X 10 ⁵	0 → 15sec	0 → 3 min

Operator's Name David R. Kroon Phone # _____

Comments: Notice high coliform count.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

ORIGINAL TO: .H. GREEN.....
COPIES TO:
.....
.....
LAB FILES.....

Source Woodland STP

Collected By H.C.

Date Collected _____

Goal, Pro./Obj. _____

Log Number:	73- 2150	51	52	53	54	55	56	57			STORET
Station:	INF EFF	0830	1030	1230	1330	1430	1530				
pH	7.0	6.8									00403
Turbidity (JTU)	55	65									00070
Conductivity (umhos/cm)@25°C	570	500									00095
COD	370	359									00340
BOD (5 day)	163	114									00310
Total Coliform (Col./100ml)	-	-	>16x10 ⁵	→	→	→	→	→			31504
Fecal Coliform (Col./100ml)	-	-	>49,000	→	→	→	→	→			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	384	352									00500
Total Non Vol. Solids	177	179									
Total Suspended Solids	166	130									00530
Total Sus. Non Vol. Solids	21	23									

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

Exhibit

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

FORM APPROVED
BUDGET BUREAU NO. 42-0152

CHECK ONE <input 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)	SCOPE OF PROJECT (new plant, additions, etc.)
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2. PLANT LOCATION (City, county) <i>Woodland, Contra Costa</i>	IDENTIFICATION OF AREAS SERVED <i>City of Woodland</i>
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B. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) <i>66%</i>	3B. PLANT DESIGN (population equivalent) <i>?</i>	3C. SERVED BY PLANT (domestic) <i>1100</i>
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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, m ³ /d) <i>0.07</i>
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5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT <i>1952</i>	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER <i>1952</i>	6B. PLANT <i>1952</i>	6C. ANCILLARY WORKS

7A. SIZE OF PLANT SITE (acres) <i>1</i>	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) <i>1</i>
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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.

The sewerage enters the plant through a 8in. pipe, that is located in the center of the clarifier, near the surface. The settleable solids settle to the bottom and eventually is worked into the digester below the clarifier, by rake arms. The effluent from the clarifier travels over the wier around the clarifier and out a opening to a V Notch Weir. From the V-Notch Weir the effluent drops to a chlorine chamber directly below the weir. From the chlorine chamber the effluent travels about a quarter of a miler, to the river.

8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.

9. RECEIVING STREAM

9A. NAME OF STREAM <i>North Fork Lewis River</i>

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

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (m ³ /d) <i>111</i>	1B. PEAK FLOW RATE (m ³ /d)		1C. MINIMUM FLOW RATE (m ³ /d)
	DRY WEATHER	WET WEATHER <i>?</i>	

2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm)	3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (mg/l) <i>2.6 PPM</i>
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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 (%) <i>94%</i>	6C. SUSPENDED SOLIDS (%)	6D. COLIFORM (%)
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7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? YES NO

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

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

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

8A. PURPOSE OF CHLORINATION
Kill coliform Bacteria.

8D. TYPE OF CHLORINATOR
Wallace & Tiernan Bell Jar Type

8C. POINT OF APPLICATION OF CHLORINE
Detention Tank

8D. CAN BYPASSED SEWAGE BE CHLORINATED? YES NO

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

8F. CHLORINE RESIDUAL IN EFFLUENT
1.0 ppm AT END OF 15 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
1200 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)
1 time per year

9B. AVERAGE DURATION (hours)
unknown

9C. REASON FOR BYPASSING
Breakdown

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
Valves

9G. AGENCIES NOTIFIED OF BYPASS ACTION
Cook County Health + DEE

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNITS? (If no, has this caused any operational problems?)
 YES NO
None

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? (If no, explain)
 YES NO
They will be provided in new system to be built in 74

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
City water supply - recreation

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

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

E. WATER DEPTH (ft)

_____ 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: *when required*

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)

Break down due to age of system

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 & changes in primary system being done in 1974.

5. ARE OPERATING RECORDS MAINTAINED? (If maintained, check general items included) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						REPORTED TO WHOM? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <i>DEPARTMENT OF HEALTH</i>					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>	
WEEKLY											
MONTHLY							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
ANNUALLY			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						

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 <i>None</i>
D. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pc)	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pc)
E. 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?
The Paper Company, Eric Parker & Associates

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

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

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	<i>2</i>	<i>10</i>	<i>2</i>	<i>1 to 4</i>	<i>1 to 7</i>
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		DISEASE
					RAW	SUPER-NATANT	
1. BOD							
2. SUSPENDED SOLIDS							
3. SETTLEABLE SOLIDS	/	/					
4. SUSPENDED VOLATILE							
5. DISSOLVED OXYGEN	5	5					
6. TOTAL SOLIDS							
7. VOLATILE SOLIDS							
8. pH	/	/					
9. TEMPERATURE	/						
10. COLIFORM DENSITY							
11. RESIDUAL CHLORINE	/			/			
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 1972	3,411.12	333.91				
PRIOR YEAR 1971	2,534.61	391.58				
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
David R. Krom	Sup. of Public Works	City of Woodland	8/1/73
Conny Toney	Asst. - - -	- - -	-