

April 12, 1974

State of  
Washington  
Department  
of Ecology



Memo to: John Arnquist, Rhys Sterling

From: Mike Harris

Subject: Efficiency Survey Conducted on Bridgeport STP.

On March 20, 1974, Darrel Anderson and I conducted an efficiency survey at the Bridgeport sewage treatment plant. We began the survey at 0900 hours after first conferring with the plant superintendent, Mr. J. Livingston. Mr. Livingston seemed well versed upon procedures necessary in the operating of the sewage treatment plant. This particular plant was fairly new, constructed in 1964, and consisted of a grit chamber, oxidation ditch, clarifier, chlorine contact chamber, sludge beds (which were not being used) and a fairly well kept lab. The grounds were approximately 100 yards by 70 yards in size and well fenced, so security was no problem. There was need for improvement though as to general housekeeping within the confines of the compound.

High total coliform count was 820 colonies/100 ml and high fecal coliform count was an estimated 10 colonies/100 ml. 5-day BOD had a 95% reduction rate and COD had a 95% reduction rate also.

There was a high chlorine residual early in the survey - +2.0 ppm but as the day progressed, the chlorine residual decreased to approximately 0.3 ppm.

MH: jmh

STP Survey Report Form

Efficiency Study

Oxidation

City Bridgeport Plant Type Ditch Pop. Served 1000 Design Unknown  
Capacity

Receiving Water Columbia River Perennial XX Intermittent \_\_\_\_\_

Date 3-20-74 Survey Period 0900-1600 hours Survey Personnel M. Harris  
D. Anderson

Comp. Sampling Frequency 1/2 hour Sampling Alequot 1000 mls.

Weather Conditions (24 hr) clear-warm Are facilities provided for complete by-  
pass of raw sewage? XX Yes \_\_\_\_\_ No/Frequency of bypass Unknown

Reason for bypass \_\_\_\_\_ Is bypass chlorinated? XX Yes \_\_\_\_\_ No

Was DOE Notified? \_\_\_\_\_ Discharge - Intermittent \_\_\_\_\_ Continuous XX

Plant Operation

Total flow 110,000 GPD How measured Flow meter not connected

Maximum flow Not determined Time of Max. \_\_\_\_\_  
Estimated by plant operator.

Minimum flow Not determined Time of Min. \_\_\_\_\_

Pre Cl<sub>2</sub> None #/day Post Cl<sub>2</sub> 9 #/day

Field Results

Influent

Effluent

<u>15 Determinations</u>	<u>Max.</u>	<u>Min.</u>	<u>Mean</u>	<u>Median</u>	<u>Max.</u>	<u>Min.</u>	<u>Mean</u>	<u>Median</u>
Temp °C	13.0	12.0		13.0	11.0	10.0		11.0
pH (Units)	9.0	8.4		8.7	8.6	8.3		8.4
Conductivity (µmhos/cm <sup>2</sup> )	1375	900		1100	1025	900		950
Settleable Solids (mls/1)	100	4.5	37.0	16.0	Trace	0	0	0

Laboratory Results on Composites

	<u>Influent</u>	<u>Effluent</u>	<u>% Reduction</u>
Laboratory No.	<u>74-885</u>	<u>74-886</u>	
5-Day BOD ppm	<u>340</u>	<u>&lt;16</u>	<u>95%</u>
COD ppm	<u>788</u>	<u>39</u>	<u>95%</u>
T.S. ppm	<u>998</u>	<u>531</u>	<u>47%</u>
T.N.V.S. ppm	<u>430</u>	<u>323</u>	<u>25%</u>
T.S.S. ppm	<u>588</u>	<u>19</u>	<u>97%</u>
N.V.S.S. ppm	<u>109</u>	<u>8</u>	<u>93%</u>
pH (Units)	<u>7.6</u>	<u>7.5</u>	
Conductivity (µmhos/cm <sup>2</sup> )	<u>980</u>	<u>850</u>	
Turbidity (JTU's)	<u>123</u>	<u>5</u>	

Laboratory Bacteriological Results

Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl <sub>2</sub> Residual	
		Total Coliform	Fecal Coliform	Fecal Strep	15 sec	180 sec
74-887	0900	20*	<10		+2.0	+2.0
888	1000	360*	<10		0.75	0.75
889	1100	180*	<10		0.75	0.75
890	1300	180*	<10		0.2	0.4
891	1400	460	10*		0.3	0.4
892	1500	820	10*		0.15	0.3

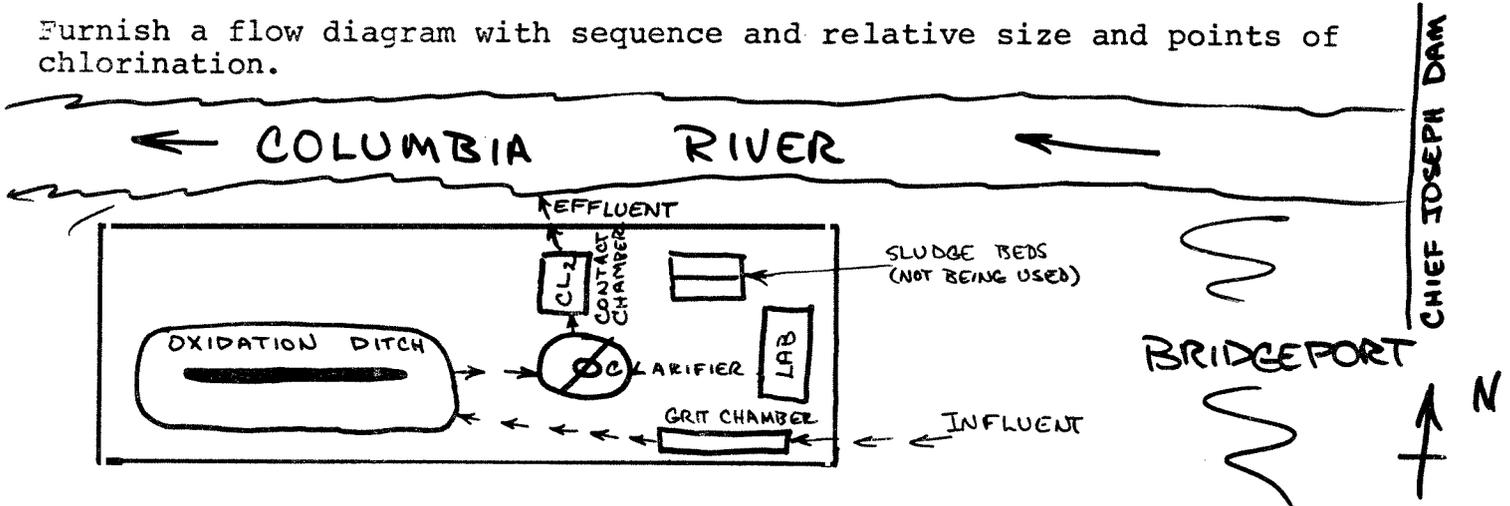
\*Estimated

Additional Laboratory Results

NO <sub>3</sub> -N ppm	-	16.0	
NO <sub>2</sub> -N ppm	-	.03	
NH <sub>3</sub> -N ppm	-	.20	
T. Kjeldahl-N ppm	-	1.6	
O-PO <sub>4</sub> -P ppm	-	7.30	
T-PO <sub>4</sub> -P ppm	-	9.30	

Operator's Name J. Livingston Phone No. 686-4041 (City Hall)

Furnish a flow diagram with sequence and relative size and points of chlorination.



Type of Collection System

Combined  Separate  Both

Estimate flow contributed by surface or ground water (infiltration)

Unknown MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd)

Dry \_\_\_\_\_

Dry \_\_\_\_\_

Wet \_\_\_\_\_

Wet \_\_\_\_\_

COMMENTS: \_\_\_\_\_

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO:  
ANDERSON

COPIES TO:  
.....  
.....

DATA SUMMARY

LAB FILES .....

Source BRIDGEPORT STP

Collected By D. ANDERSON

Date Collected 3/20/74

Goal, Pro./Obj. \_\_\_\_\_

Log Number:	74-885	886	887	888	889	890	891	892	STORET
Station:	INF	EFF	0900	1000	1100	1300	1400	1500	
pH	7.6	7.5							00403
Turbidity (JTU)	123	5							00070
Conductivity (umhos/cm)@25°C	980	850							00095
COD	788	39							00340
BOD (5 day)	340	<16							00310
Total Coliform (Col./100ml)			20*	360*	180*	180*	460	820	31504
Fecal Coliform (Col./100ml)			<10	<10	<10	<10	10*	10*	31616
NO3-N (Filtered)		16.0							00620
NO2-N (Filtered)		.03							00615
NH3-N (Unfiltered)		.2							00610
T. Kjeldahl-N (Unfiltered)		1.6							00625
O-PO4-P (Filtered)		7.30							00671
Total Phos.-P (Unfiltered)		9.30							00665
Total Solids	998	531							00500
Total Non Vol. Solids	430	323							
Total Suspended Solids	588	19							00530
Total Sus. Non Vol. Solids	109	8							

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

\* ESTIMATED

Summary By Mary Holcomb Date 4/4/74

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

FORM APPROVED  
BUDGET BUREAU NO. 42-11527

CHECK ONE: <input type="checkbox"/> 1ST AUDIT <input checked="" type="checkbox"/> RE-AUDIT	DATE OF AUDIT <b>3-20-74</b>	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.)
2. PLANT LOCATION (City, county) <b>BRIDGEPORT - DOUGLAS</b>	IDENTIFICATION OF AREAS SERVED <b>TOWN OF BRIDGEPORT</b>

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) <b>100%</b>	3B. PLANT DESIGN (population equivalent) <b>UNK.</b>	3C. SERVED BY PLANT (domestic) <b>APP. 1000</b>
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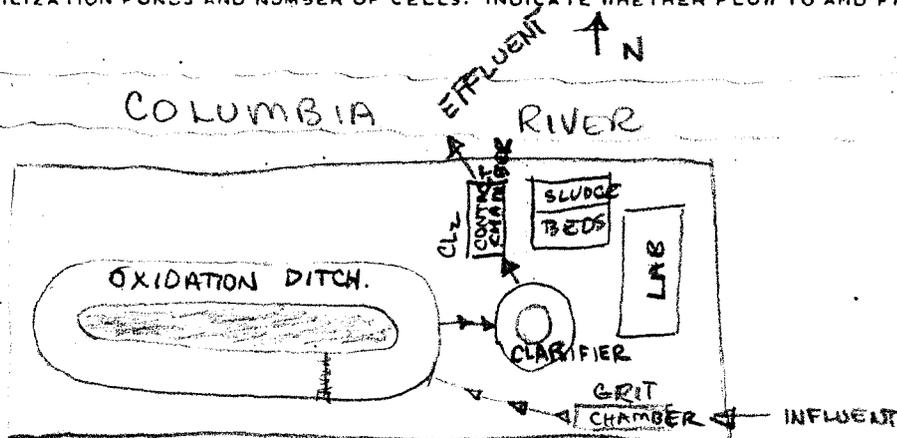
4. TYPE OF COLLECTION SYSTEM

4A. <input type="checkbox"/> COMBINED <input checked="" type="checkbox"/> SEPARATE <input type="checkbox"/> BOTH	4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd) <b>UNK.</b>
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5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT	6. YEAR PRESENT SYSTEM PLACED IN OPERATION	
	6A. SEWER	6B. PLANT <b>1964</b>
		6C. ANCILLARY WORKS

7A. SIZE OF PLANT SITE (acres) <b>11 ACRE</b>	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) <b>1/4 ACRE</b>
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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 <b>COLUMBIA RIVER BELOW CHIEF JOSEPH DAM</b>	
9B. STREAM FLOW IS: <input checked="" type="checkbox"/> PERENNIAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> NATURAL <input checked="" type="checkbox"/> REGULATED	<input checked="" type="checkbox"/> INTERSTATE <input type="checkbox"/> INTRASTATE
	<input type="checkbox"/> COASTAL

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd) <b>110,000 GPD</b>	1B. PEAK FLOW RATE (mgd) DRY WEATHER	1C. MINIMUM FLOW RATE (mgd) WET WEATHER
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 (ppm 100 ml)	

5. ANNUAL AVERAGE PLANT REDUCTION

6A. BOD (%)	6B. SETTLEABLE SOLIDS (%)	6C. SUSPENDED SOLIDS (%)	6D. COLIFORM DENSITY (%)
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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

DISINFECTION

8D. TYPE OF CHLORINATOR

WALLACE & TIERNAN - V-NOTCH

8C. POINT OF APPLICATION OF CHLORINE

AFTER CLARIFIER

8D. CAN BYPASSED SEWAGE BE CHLORINATED?

YES  NO

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

#9

8F. CHLORINE RESIDUAL IN EFFLUENT

PPM AT END OF 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)

UNKNOWN

9B. AVERAGE DURATION (hours)

UNKNOWN

9C. REASON FOR BYPASSING

UNK.

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

UNKNOWN

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

YES  NO

UNK.

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 - FISHING - IRRIGATION

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

YES  NO

UNK.

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

CLEAR

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 REPAIRING - "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)

FLOW RECORDER NOT CONNECTED

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)

DECEMBER, 1973 - BEARINGS WENT OUT ON ROTORS. APP. 2 WEEKS TO REPAIR.

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 maintained, check general items included)

REPORTED?  YES  NO  
 TO WHOM? STATE OF WASH. D.S. A.S.

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"/>							
WEEKLY		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>							
MONTHLY		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>							
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?  
unk

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: <u>NONE</u>	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)	

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?  
unk

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  
10/unk

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				
2. OPERATORS	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 AREA
					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								
12. VOLATILE ACIDS								
13. M. B. STABILITY								
14. ALKALINITY								
15. Relative stability	/			/				
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
M. HARRIS		D.O.E.

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
J. Livingston	Superintendent	City of BRIDGEPORT	3-20-77
B. C.	OPERATOR	" " "	3-20-77

G. NOTATIONS BY EVALUATOR

1. ADDITIONAL REMARKS (If remarks refer to a particular item, identify by number)

city hall 686-4041  
Wednesday 0800

operator - John Livingston

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

Good security, excellent plant appearance

3. REQUIREMENTS OF HIGHER AUTHORITY

3A. DOES THE PLANT PROVIDE THE DEGREE OF TREATMENT PRESENTLY REQUIRED BY THE STATE? (If no, explain)

YES  NO

3B. ARE THERE ANY PENDING ACTIONS (enforcement conferences, change in water quality standards, etc.) THAT WOULD REQUIRE UPGRADING OF TREATMENT BY THIS PLANT?

YES  NO (If yes, explain)

3C. NUMBER OF STATE INSPECTIONS OF PRESENT PLANT TO DATE.

4. IS ANY FOLLOW-THRU ACTION REQUIRED TO (1) CORRECT DEFICIENCIES IN THE PLANT OR ITS OPERATION OR (2) RESOLVE INDUSTRIAL WASTE PROBLEMS? (If yes, describe required corrective action)

YES  NO