

Publication No. 73-e75

TO: Mike Price

WA-10-0010

FROM: Pat LeeSUBJECT: Ruston STP Efficiency StudyDATE: October 16, 1973State of  
Washington  
Department  
of Ecology

An eight hour efficiency study was conducted on Tacoma STP #3 located in Ruston on September 12, 1973. The influent and the effluent were composited on the half hour, proportionate to flow. The plant and the surrounding area was very neat and clean. The operator had in fact just installed a waterfall with water tapped from an underground spring. While I was there, four or five septic tank trucks dumped their load into the plant's influent. After talking to the operator, I discovered that Tacoma #3 is the only plant in the Tacoma area that will accept septic tank trucks.

The field and laboratory results (summarized on the efficiency study form) show that the plant is operating well with a BOD reduction of 60%, total solids reduction of 52% and a suspended solids reduction of 87%. Coliform samples were collected from the end of the chlorine contact chamber.

PL:jmh

cc: Ron Pine  
Ron Devitt  
Files

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Ruston Plant Type Primary Population 50,000 Design 100,000  
Tacoma #3 North Slope Served Capacity  
 Receiving Water Commencement Bay Engineer Mike Price  
 Date Sept. 12, 1973 Survey Period 0800-1600 hrs. Survey Personnel Pat Lee  
 Comp. Sampling Frequency 1/2 hour Weather Conditions Warm  
(last 48 hours)  
 Sampling Alequot 300 mls. to 1000 mls.

PLANT OPERATION

Total Flow 1,900,000 gallons How Measured Totalizer  
 Max. (Flow) 5 MGD Time of Max. 0900-1600 hrs. Min. 1.5 MGD Time of Min. 0800  
 Pre Cl<sub>2</sub> ----- #/day Post Cl<sub>2</sub> 310 #/day

FIELD RESULTS

Influent

Effluent

9 Determinations

	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	22.0	19.1	20.8	21.0	21.5	18.9	20.2	20.0
pH	6.6	6.2	---	6.4	6.8	6.2	---	6.6
Conductivity (umhos/cm)	700	450	530	500	525	400	480	500
Settleable Solids	35.0	8.0	13.6	11.0	0.2	0.0	0.1	0.1

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-3343	3344	
5-Day BOD	245	100	60
COD	590	175	70
T.S.	638	307	52
T.N.V.S.	242	167	31
T.S.S.	392	49	87
N.V.S.S.	66	2	97
pH	7.3	7.2	
Conductivity	540	530	
Turbidity	130	40	69

Ruston

BACTERIOLOGICAL RESULTS

Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> added to sample Before After Sampling min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		Cl Residual	
		Total	Fecal	ppm	(after secs)
73-3345	0830	<20000	<10000	71.0	3 minutes
3346	0930	<20000	<20000		
3347	1030	<20000	<20000		
3348	1130	126000	16000		
3349	1230	<20000	<20000		
3350	1330	25000	<20000		

Operator's Name O.L. Crivellone Phone #

Comments:

	Influent	Effluent
Color	415	320
Chlorides	32	25

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-R1527

CHECK ONE:  1ST AUDIT  RE-AUDIT

DATE OF AUDIT: **9-12-73**

PLANT DESCRIPTION CODE (For Official Use Only):

A. GENERAL INFORMATION

1. PROJECT (State, Number): **Washington**

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

2. PLANT LOCATION (City, county): **Tacoma Northern Slope # 3 Ruston**

IDENTIFICATION OF AREAS SERVED: **Northern Tacoma + Ruston**

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%): **20**

3B. PLANT DESIGN (population equivalent): **100,000**

3C. SERVED BY PLANT (domestic): **50,000**

4. TYPE OF COLLECTION SYSTEM

4A.  COMBINED  SEPARATE  BOTH **90%**

4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd): **.5**

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT: **1952**

6. YEAR PRESENT SYSTEM PLACED IN OPERATION:

6A. SEWER: **~1900**

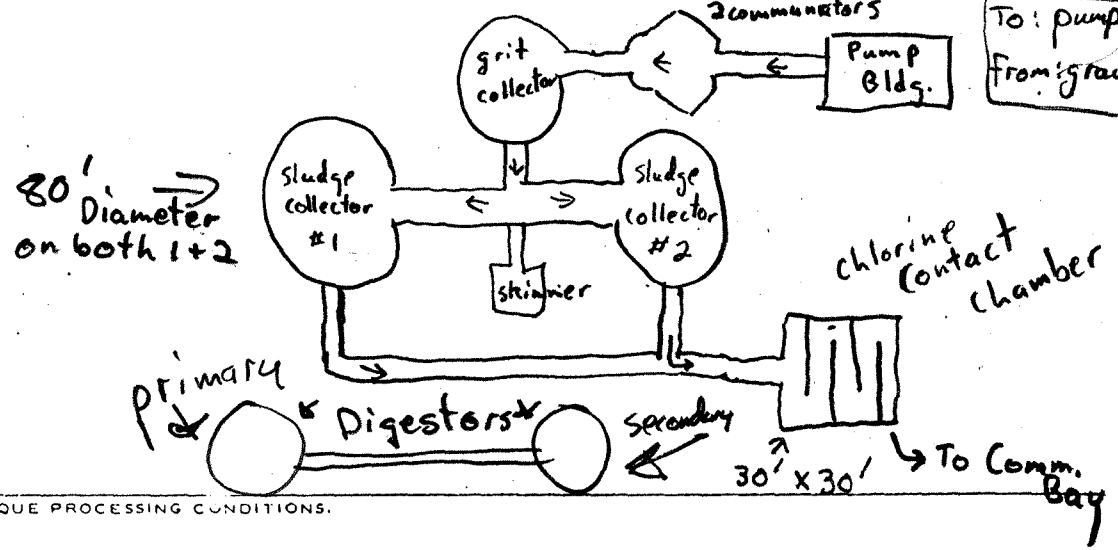
6B. PLANT: **1969**

6C. ANCILLARY WORKS:

7A. SIZE OF PLANT SITE (acres): **2-3**

7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): **2-3**

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: **Commencement Bay**

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): **5**

1B. PEAK FLOW RATE (mgd):

DRY WEATHER: **3**

WET WEATHER: **21**

1C. MINIMUM FLOW RATE (mgd): **.5**

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

3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (mg/l): **10**

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l): **11**

5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml): **11**

6. ANNUAL AVERAGE PLANT REDUCTION:

6A. BOD (%): **11**

6B. SETTLEABLE SOLIDS (%): **99.9%**

6C. SUSPENDED SOLIDS (%): **11**

6D. COLIFORM DENSITY (%): **11**

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  
*Disinfection*

8B. TYPE OF CHLORINATOR  
*Fisher-Porter*

8C. POINT OF APPLICATION OF CHLORINE  
*Contact Chamber*

8D. CAN BYPASSED SEWAGE BE CHLORINATED?  
 YES  NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)  
*310*

8F. CHLORINE RESIDUAL IN EFFLUENT  
\_\_\_\_\_ PPM AT END OF \_\_\_\_\_ MINUTES

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

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  
*rec-fishing*

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  
*marky*

15. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?

YES  NO

B. BANKS AND DIKES MAINTAINED (erosion etc.)?

YES  NO

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)

20 HIGH

16 LOW

18 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?

5. ARE OPERATING RECORDS MAINTAINED? <input type="checkbox"/> YES <input type="checkbox"/> NO <i>(If maintained, check general items included)</i>						REPORTED? <input type="checkbox"/> YES <input type="checkbox"/> NO TO WHOM?					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		X	X	X	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? <sup>PH</sup>  
 YES  NO *(If no, explain)*

B. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS <i>none</i>
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 <i>(explain)</i>	

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?  
*Consulting Engineer*

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

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	40	1	20+	20+
2. OPERATORS	5	200	5	25+	25+
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS					
6. TOTAL	6	240	6	45+	45+

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								
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS							2	
8. pH							2	
9. TEMPERATURE							2	
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE		2						
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 1973	88,313			37,590	27,000	154,903
PRIOR YEAR 1972	80,104			34,800	4,000	118,904
PRIOR YEAR 1971	78,800			28,396	1,440	<del>108,636</del>
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Lyman Ketchum	Superintendent	City of Tacoma	9-11-73
O.L. Crivellone	Operator	"	9-12-73



G. NOTATIONS BY EVALUATOR

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

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

neat + clean

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