

May 28, 1974

WA-18-0020

STATE OF
WASHINGTON
DEPARTMENT OF
ECOLOGY



Memo to: Ron Robinson

From: Pat Lee

Subject: Efficiency Study of Port Angeles STP.

A routine efficiency study was conducted on the Port Angeles STP on March 19, 1974. The influent and effluent were composited for eight hours while a series of coliform samples were collected out of a manhole about 150 yards downline of the plant out of their effluent pipe. The plant grounds were very neat and clean and the plant personnel were of high morale. The plant seems to be doing an adequate job of primary treatment with a 36% reduction of BOD and a 75% reduction in suspended solids. As can be seen by the lab results, disinfection of coliform was poor and needs to be corrected by carrying a larger chlorine residual. I split samples with the plant and their values for the sample they ran are as follows:

	Port Angeles STP		Dept. of Ecology	
	Influent	Effluent	Influent	Effluent
BOD	237 ppm	90 ppm	125 ppm	80 ppm
S.S.	87 ppm	37 ppm	141 ppm	35 ppm

Our effluent values line up with theirs but the influent values don't. They use a Hach BOD meter.

PL:jmh

STP Survey Report Form

Efficiency Study

City Port Angeles Plant Type Primary Pop. Served 16,000 Design 24,500
 Capacity
 Receiving Water Port Angeles Harbor Perennial Intermittent _____
 Date 3-19-74 Survey Period 0830 - 1630 Survey Personnel Pat Lee
 Comp. Sampling Frequency half hour Sampling Alequot (Flow MGD) x 200
 Weather Conditions (24 hr) Sunny Are facilities provided for complete by-
 pass of raw sewage? Yes _____ No/Frequency of bypass Once a month
 Reason for bypass Clean laundry trough Is bypass chlorinated? Yes _____ No
 Was DOE Notified? Discharge - Intermittent _____ Continuous

Plant Operation

Total flow 1,320,000 How measured Totalizer
 Maximum flow 5.5 MGD Time of Max. 1600
 Minimum flow 2.8 MGD Time of Min. 1630
 Pre Cl₂ _____ #/day Post Cl₂ 135 #/day

Field Results

Influent

Effluent

<u>9 Determinations</u>	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C	12.0	8.7		11.0	11.8	8.8		10.7
pH (Units)	8.2	6.6		7.4	7.8	6.6		7.3
Conductivity (µmhos/cm ²)	---	---		---	---	---		---
Settleable Solids (mls/l)	14.0	5.0	7.1	6.0	1.0	Trace	.4	.3

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	<u>74-852</u>	<u>74-853</u>	
5-Day BOD ppm	<u>125</u>	<u>80</u>	<u>36</u>
COD ppm	<u>205</u>	<u>120</u>	<u>41</u>
T.S. ppm	<u>364</u>	<u>313</u>	<u>14</u>
T.N.V.S. ppm	<u>167</u>	<u>161</u>	<u>3</u>
T.S.S. ppm	<u>141</u>	<u>35</u>	<u>75</u>
N.V.S.S. ppm	<u>15</u>	<u>3</u>	<u>80</u>
pH (Units)	<u>7.5</u>	<u>7.5</u>	
Conductivity (µmhos/cm ²)	<u>390</u>	<u>430</u>	
Turbidity (JTU's)	<u>60</u>	<u>30</u>	

Laboratory Bacteriological Results

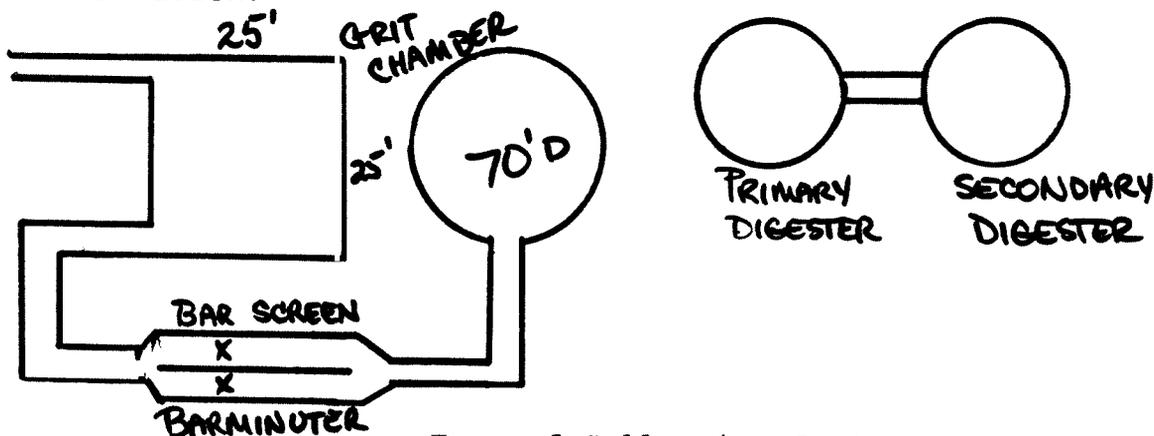
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
74-854	0900	>40,000	1200		.4
855	1000	>40,000	1000		<.05
856	1100	>40,000	1800		<.05
857	1200	>40,000	1500		<.05
858	1300	>40,000	1300		<.05
859	1400	>40,000	2800		.4

Additional Laboratory Results

NO ₃ -N ppm	-	.45	
NO ₂ -N ppm	-	.05	
NH ₃ -N ppm	-	8.3	
T. Kjeldahl-N ppm	-	9.5	
O-PO ₄ -P ppm	-	2.2	
T-PO ₄ -P ppm	-	5.3	

Operator's Name Ken Rodocker Phone No. 457-0411 Ext. 247

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)

_____ MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd)

Dry 2.5 MGD for 1973

Dry 5.0

Wet _____

Wet 9.7

COMMENTS: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: LEE.....
COPIES TO:
.....
LAB FILES

DATA SUMMARY

Source Port Angeles STP

Collected By P. LEE

Date Collected 3/19/74

Goal, Pro./Obj. _____

Log Number:	74	852	853	854	855	856	857	858	859		STORET
Station:	INF	EFF	0900	1000	1100	1300	1200	1400			
pH	7.5	7.5									00403
Turbidity (JTU)	60	30									00070
Conductivity (umhos/cm)@25C	390	430									00095
COD	205	122									00340
BOD (5 day)	125	81									00310
Total Coliform (Col./100ml)			>4000	>4000	>4000	>4000	>4000	>4000			31504
Fecal Coliform (Col./100ml)			1200	1000	1800	1500	1300	2800			31616
NO3-N (Filtered)		.45									00620
NO2-N (Filtered)		.05									00615
NH3-N (Unfiltered)		8.3									00610
T. Kjeldahl-N (Unfiltered)		9.5									00625
O-PO4-P (Filtered)		2.20									00671
Total Phos.-P (Unfiltered)		5.30									00665
Total Solids	364	313									00500
Total Non Vol. Solids	167	161									
Total Suspended Solids	141	35									00530
Total Sus. Non Vol. Solids	15	3									
CHLORIDE	14	21									

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 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. 42-111527

CHECK ONE: <input type="checkbox"/> 1ST AUDIT <input checked="" type="checkbox"/> RE-AUDIT	DATE OF AUDIT 3-19-74	PLANT DESCRIPTION CODE (For Official Use Only) Primary
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A. GENERAL INFORMATION

1. PROJECT (State, Number) Washington	SCOPE OF PROJECT (new plant, additions, etc.) Routine
2. PLANT LOCATION (City, county) Port Angeles Clallam	IDENTIFICATION OF AREAS SERVED Port Angeles

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) 190/15,775	3B. PLANT DESIGN (population equivalent) 24,500	3C. SERVED BY PLANT (domestic) 16,000
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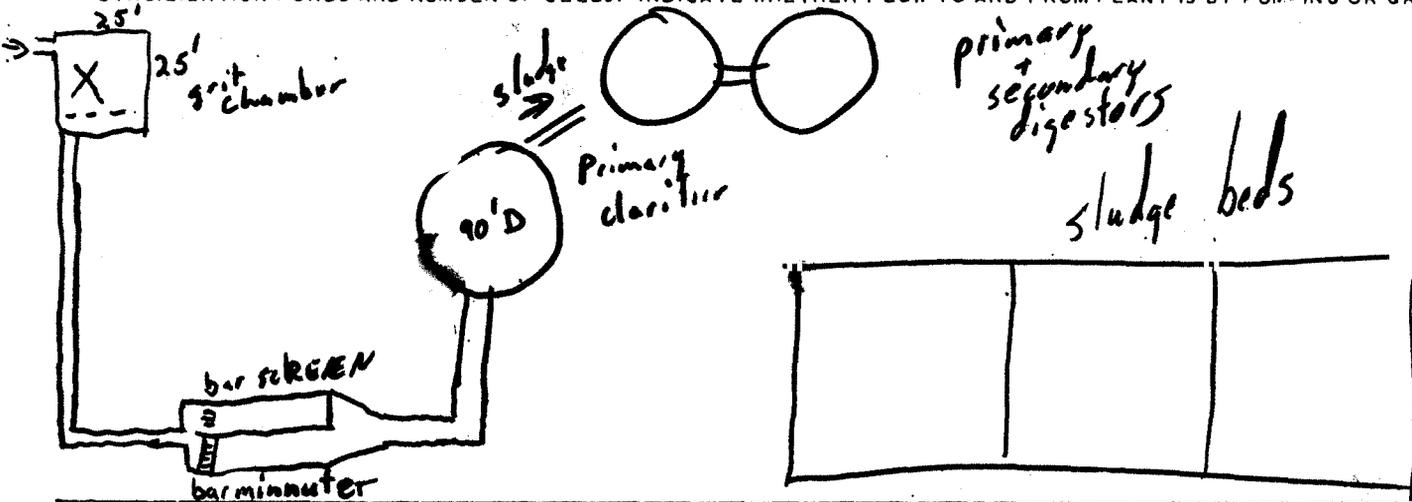
4. TYPE OF COLLECTION SYSTEM

4A. <input type="checkbox"/> COMBINED <input type="checkbox"/> SEPARATE <input checked="" type="checkbox"/> BOTH	4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd) 1
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5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT 1/69	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER 1/69	6B. PLANT 1/69	6C. ANCILLARY WORKS

7A. SIZE OF PLANT SITE (acres) 4.2	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) 4.3-5
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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 Port Angeles Harbor	<input type="checkbox"/> INTERSTATE <input type="checkbox"/> INTRASTATE
9B. STREAM FLOW IS <input checked="" type="checkbox"/> PERENNIAL <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> NATURAL <input type="checkbox"/> REGULATED	<input checked="" type="checkbox"/> COASTAL

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd) 2.5 for 1973	1B. PEAK FLOW RATE (mgd) DRY WEATHER: 5.0 WET WEATHER: 9.7	1C. MINIMUM FLOW RATE (mgd) 2.0
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 PERFORMANCE

6A. BOD (%) 40	6B. SETTLEABLE SOLIDS (%) 70	6C. SUSPENDED SOLIDS (%) 50	6D. COLIFORM DENSITY (%)
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yes at pumping st.

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

8D. TYPE OF CHLORINATOR
Wallace + Tiernan

8C. POINT OF APPLICATION OF CHLORINE
pret post

8B. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
135

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

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

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

9B. AVERAGE DURATION (hours)
2 hrs

9C. REASON FOR BYPASSING
clean laundry trough

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
DOE

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
sludge - fertilizer

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL
recreation

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

C. FENCING AND LEAKING - "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

uw - chelalis

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? (If maintained, check general items included) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						REPORTED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO TO WHOM? DOE					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY	<input checked="" type="checkbox"/>										
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?

YES NO (If no, explain)

B. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM: NO	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?
CH₂M

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE?

YES NO

IF YES, WHO WROTE AND PROVIDED IT?
CH₂M

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
20

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	5	6
2. OPERATORS	2	80	2		
3. LABORATORY TECHNICIANS	1	40	1		
4. LABORERS	3	120	2		
5. PART-TIME LABORERS					
6. TOTAL	7	0	6		

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	RECEIV. STRE
					RAW	SEWER- Primary		
1. BOD	3			3				
2. SUSPENDED SOLIDS	5			5				
3. SETTLEABLE SOLIDS	1			1				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	1			1				
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	1			1		1	5	
9. TEMPERATURE	1					1	5	
10. COLIFORM DENSITY				1				
11. RESIDUAL CHLORINE				1				
12. VOLATILE ACIDS						1	5	
13. M. B. STABILITY								
14. ALKALINITY						1	5	
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
Kien Rodocker	supt	City of P.A.	