

August 12, 1974

State of
Washington
Department
of Ecology



Memo to: John Glynn

From: Hans Cregg

Subject: Efficiency Survey Conducted at Vashon STP

The Vashon efficiency study was conducted on March 13, 1974. The plant, although designed for secondary treatment, does little for wastewater quality. As the lab results indicate, reduction is little or non-existent or of a negative nature. It is difficult to pinpoint the problem to any particular plant unit. I would rather suspect that the plant, as a whole, is operating at a low efficiency level. In order to remedy the situation, I would suggest that the individual plant units be cleaned, pumped and periodically revised. A further source of concern is the high coliform count. Increasing the amount of chlorine used would probably alleviate this problem.

HC:jmh

STP Survey Report Form

Efficiency Study

City Vashon Plant Type Secondary Pop. Served 450 Design 315
 Receiving Water Intermittent stream to Puget Sound Perennial Intermittent
 Capacity
 Date 3/13/74 Survey Period 8 hours Survey Personnel H. Cregg
 Comp. Sampling Frequency Every 1/2 hour Sampling Alequot 1000 mls
 Weather Conditions (24 hr) Showers Are facilities provided for complete by-
 pass of raw sewage? Yes No/Frequency of bypass
 Reason for bypass Is bypass chlorinated? Yes No
 Was DOE Notified? Discharge - Intermittent Continuous

Plant Operation

Total flow 86,000 GPD How measured V -Notched Weir
 Maximum flow Time of Max.
 Minimum flow Time of Min.
 Pre Cl₂ None #/day Post Cl₂ 3.75 #/day

Field Results

Influent

Effluent

<u>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	9.2	8.6		9.2	9.4	8.8		9.0
pH (Units)	7.2	6.5		7.0	7.2	6.6		6.9
Conductivity (µmhos/cm ²)	425	200		300	400	300		400
Settleable Solids (mls/l)	---	---	---	---	---	---	---	---

Laboratory Results on Composites

	<u>Influent</u>	<u>Effluent</u>	<u>% Reduction</u>
Laboratory No.	<u>74-773</u>	<u>74-774</u>	
5-Day BOD ppm	<u>34</u>	<u>>33</u>	<u>0</u>
COD ppm	<u>76</u>	<u>72</u>	<u>6</u>
T.S. ppm	<u>193</u>	<u>212</u>	<u>0</u>
T.N.V.S. ppm	<u>95</u>	<u>135</u>	<u>0</u>
T.S.S. ppm	<u>54</u>	<u>31</u>	<u>43</u>
N.V.S.S. ppm	<u>11</u>	<u>ND</u>	<u>---</u>
pH (Units)	<u>7.1</u>	<u>7.1</u>	
Conductivity (µmhos/cm ²)	<u>270</u>	<u>340</u>	
Turbidity (JTU's)	<u>26</u>	<u>23</u>	

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: CRESG
COPIES TO:
.....
.....
LAB FILES

DATA SUMMARY

Source VASHON STP

Collected By HANS CREGG

Date Collected 3/13/74

Goal, Pro./Obj. _____

Log Number:	74	773	774	775	776	777	778					STORET
Station:	INF	EFF	1000	1130	1300	1330						
pH	7.1	7.1										00403
Turbidity (JTU)	26	23										00070
Conductivity (umhos/cm)@25°C	270	340										00095
COD	76	72										00340
BOD (5 day)	34	>33										00310
Total Coliform (Col./100ml)			>40,000	>40,000	>40,000	>40,000						31504
Fecal Coliform (Col./100ml)			>4,000	>4,000	>4,000	>4,000						31616
NO3-N (Filtered)		.09										00620
NO2-N (Filtered)		.01										00615
NH3-N (Unfiltered)		5.2										00610
T. Kjeldahl-N (Unfiltered)		9.3										00625
O-PO4-P (Filtered)		6.30										00671
Total Phos.-P (Unfiltered)		10.3										00665
Total Solids	193	212										00500
Total Non Vol. Solids	95	135										
Total Suspended Solids	54	31										00530
Total Sus. Non Vol. Solids	11	ND										

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 3/29/74

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

FORM APPROVED
BUDGET BUREAU NO. 45-11527

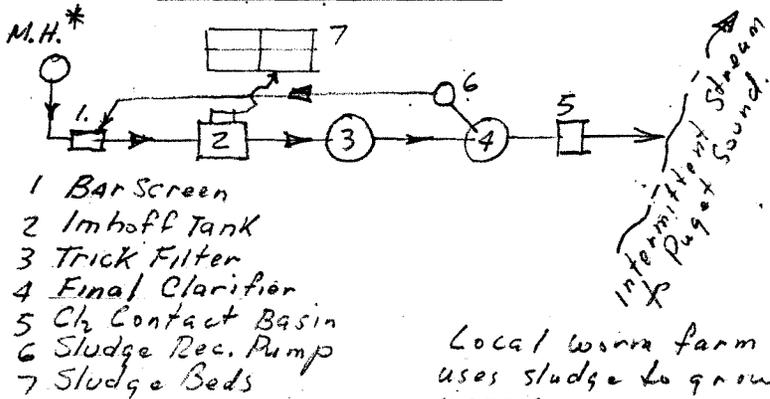
CHECK ONE: <input type="checkbox"/> 1ST AUDIT <input type="checkbox"/> RE-AUDIT	DATE OF AUDIT	PLANT DESCRIPTION CODE (For Official Use Only)
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A. GENERAL INFORMATION

1. PROJECT (State, Number)	SCOPE OF PROJECT (new plant, additions, etc.)	
2. PLANT LOCATION (City, county) <i>VASHON, WASHINGTON - KING COUNTY</i>	IDENTIFICATION OF AREAS SERVED	
3. POPULATION		
3A. FRACTION OF AREA POPULATION SERVED (%)	3B. PLANT DESIGN (population equivalent) <i>315 PE</i>	3C. SERVED BY PLANT (domestic) <i>450</i>
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) <i>0.058 MGD.</i>	
5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT <i>1956</i>	6. YEAR PRESENT SYSTEM PLACED IN OPERATION	
	6A. SEWER <i>1956</i>	6B. PLANT <i>1956</i>
	6C. ANCILLARY WORKS <i>—</i>	
7A. SIZE OF PLANT SITE (acres) <i>1.5 Acres</i>	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) <i>.75 Acres</i>	

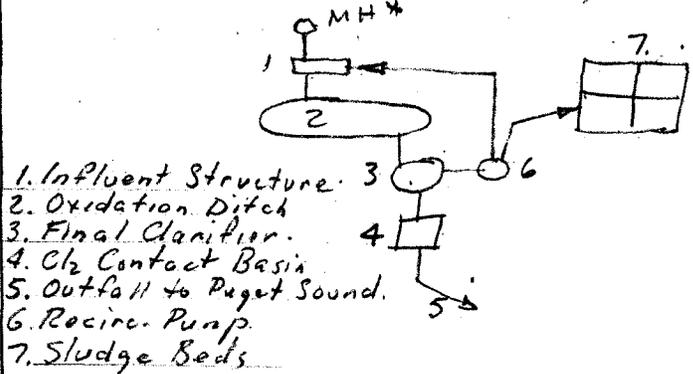
8A. IN THE SPACE PROVIDED BELOW FURNISH A SIMPLIFIED FLOW DIAGRAM OR A WRITTEN DESCRIPTION OF THE PLANT UNITS IN FLOW SEQUENCE. INCLUDE THE METHOD OF ULTIMATE SLUDGE DISPOSAL. SHOW APPROXIMATE SURFACE AREA OF STABILIZATION PONDS AND NUMBER OF CELLS. INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.

EXISTING PLANT



* Gravity Flow thru plant

PROPOSED PLANT (1975)



* Gravity Flow thru plant.

8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.

None

9. RECEIVING STREAM

9A. NAME OF STREAM <i>unnamed</i>		9B. STREAM FLOW IS	
<input type="checkbox"/> PERENNIAL	<input checked="" type="checkbox"/> INTERMITTENT	<input checked="" type="checkbox"/> NATURAL	<input 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 (mgd) <i>0.12 mgd.</i>	1B. PEAK FLOW RATE (mgd)		1C. MINIMUM FLOW RATE (mgd) <i>0.017 MGD.</i>
	DRY WEATHER <i>0.030 MGD</i>	WET WEATHER <i>0.69 mgd.</i>	
2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm) <i>No tests</i>	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)		

5. ANNUAL AVERAGE PLANT PERFORMANCE

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
Post Chlorination to kill coliforms.

8D. TYPE OF CHLORINATOR
Gas - old style Wallace & Tiernan.

8C. POINT OF APPLICATION OF CHLORINE
Ch₂ Contact basin following final clarifier

8D. CAN BYPASSED SEWAGE BE CHLORINATED? YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
3.75

8F. CHLORINE RESIDUAL IN EFFLUENT
Varies widely 0.1 to 0.8
 ppm AT END OF _____ MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
150 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)~~ ~~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~~

10. 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 *Back flow device will be installed with new improvements, which are pending.*

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
Puget Sound

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? (If yes, explain)
 YES NO
Digester (Imhoff tank) gasses have been cause of complaints in past.

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

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? <i>DSHS</i>					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		X	X		X						
WEEKLY											
MONTHLY							X				
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? *None*

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
B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pc)	<i>No industrial waste at present</i>
D. VOLUME OF INDUSTRIAL WASTES (mgd)	C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pc)
F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)	E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES

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?

District engineer

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? YES NO

IF YES, WHO WROTE AND PROVIDED IT? *operation requested from DCS.*

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

7hrs

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	14	1	13/4	13/4
2. OPERATORS					
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS					
6. TOTAL					

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 (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

N. A.

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?

Yes.

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)

Trickling filter is overloaded.

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)

Replaced recirc. pump.

C. OPERATIONAL YES NO (If yes, explain)

Floating sludge in digester gas chambers is always a problem.

D. BASED ON OPERATING EXPERIENCE TO DATE WHAT IF ANY CHANGES WOULD YOU RECOMMEND TO IMPROVE OPERATION OF THE PLANT?

Proceed with plans to construct new plant.

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								
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.								
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						
PRIOR YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
<i>Roy L. Wilkinson</i>	<i>Superintendent</i>	<i>Vashon Sewer District</i>

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
<i>Same</i>			

M E M O R A N D U M

March 5, 1975

State of
Washington
Department
of Ecology



TO: JOHN GLYNN
FROM: HANS CREGG
SUBJECT: Vashon STP

The Vashon survey was conducted on January 28, 1975. The plant does little in the area of wastewater treatment.

The lab results indicate reduction is either non-existent or of a negative nature. This is the second time that this plant has been visited, so far no improvement in its operation has been made.

Housekeeping is notorious and judging by the condition of the available equipment, few if any tests are being conducted.

I feel that a little cleanup and care would improve the overall operation of this system.

HJC:bj

STP Survey Report Form

Efficiency Study

City Vashon Plant Type Primary Pop. Served 500 Design 300
 Receiving Water Intermittent stream to Puget Sound Perennial Intermittent
 Date Survey Period 8 hours Survey Personnel H. J. Cregg
 Comp. Sampling Frequency hourly Sampling Alequot 1000 mls
 Weather Conditions (24 hr) showers Are facilities provided for complete by-
 pass of raw sewage? Yes No/Frequency of bypass
 Reason for bypass Is bypass chlorinated? Yes No
 Was DOE Notified? Discharge - Intermittent Continuous

Plant Operation

Total flow How measured V-notched weir
 Maximum flow Time of Max.
 Minimum flow Time of Min.
 Pre Cl₂ #/day Post Cl₂ 4 #/day

Field Results

Influent

Effluent

<u>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	9	8.5		9.0	10.0	8.8		9.0
pH (Units)	7.3	6.5		7.0	7.0	6.5		7.0
Conductivity (µmhos/cm ²)	425	250		300	450	300		400
Settleable Solids (mls/l)	--	--	--	--	--	--	--	--

Laboratory Results on Composites

	<u>Influent</u>	<u>Effluent</u>	<u>% Reduction</u>
Laboratory No.	<u>75-0429</u>	<u>75-0430</u>	
5-Day BOD ppm	<u>DATA WAS LOST BY LAB</u>	<u> </u>	<u>--</u>
COD ppm	<u>80</u>	<u>92</u>	<u>NEG</u>
T.S. ppm	<u>214</u>	<u>240</u>	<u>NEG</u>
T.N.V.S. ppm	<u>124</u>	<u>146</u>	<u>NEG</u>
T.S.S. ppm	<u>53</u>	<u>36</u>	<u>30</u>
N.V.S.S. ppm	<u>4</u>	<u>2</u>	<u>50</u>
pH (Units)	<u>7.3</u>	<u>7.4</u>	
Conductivity (µmhos/cm ²)	<u>300</u>	<u>350</u>	
Turbidity (JTU's)	<u>20</u>	<u>23</u>	

Laboratory Bacteriological Results

Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
75-0431	1000	< 20	< 10		
75-0432	1100	2300	Est 40		
75-0433	1100	< 20	< 10		
75-0434	1200	Est 1900	Est 70		
75-0435	1500	33000	240		
75-0436	1600	36000	260		

Additional Laboratory Results

NO ₃ -N ppm -	1.23
NO ₂ -N ppm -	0.02
NH ₃ -N ppm -	11
T. Kjeldahl-N ppm -	12.2
O-PO ₄ -P ppm -	0.5
T-PO ₄ -P ppm -	4.1

Operator's Name _____ Phone No. _____

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 _____

Dry _____

Wet _____

Wet _____

COMMENTS: _____

