Publication No. 76-e12

MEMORANDUM

May 13, 1976

To: Ron Robinson

From: Douglas Houck

Subject: Puyallup STP
Class II Inspection

On January 15, 1976 we arrived at the Puyallup sewage treatment plant to conduct a Class II inspection. Three composite samplers were installed and adjusted to take a 250 ml alequot every 30 minutes. One sampler was installed after the comminutor, another at the overflow from the west clarifier and the third at the end of the chlorine contact chamber. The location of our first two samplers corresponded with the location of Puyallup's.

At the time of the survey the treatment plant was bypassing more raw sewage than it was allowing to enter the plant. This is because Puyallup's collection system is mostly combined and it had been raining heavily prior to the survey. When this occurs Puyallup cannot use its Parshall flume but instead measures the flow with a Palmer Bowlus flume. The Parshall flume measures the flow coming into the plant while the Palmer Bowlus flume measures all the flow from the main trunk line, most of which was being bypassed. The hydraulic capacity of the plant is 4 MGD so that the amount of raw sewage bypassed is the reading from the P-B flume minus 4 MGD. At the time of the survey the P-B flume was measuring a flow of 11 MGD. The calibration of the flume could not be checked due to lack of equipment and at the time, knowledge of how a P-B flume worked. In the next Class II survey a check can be made by actual gaging of the flow using something similar to a pigmy or Gurley meter. It did appear that if the flow increased much more than 11 MGD that the flume would probably experience partial submergence.

The plant's laboratory procedures were gone over with Eldon Eden and found to be adequate. The following table gives DOE's and Puyallup's results along with their NPDES monthly average permit limitations. The values given for Puyallup's BOD_5s are those obtained from their own sampler. These values show that Puyallup's automatic sampler is adequate.

	DOE		Puyallup		NPDES
	Inf.	Eff.	Inf.	Eff.	Monthly Avg.
BOD_5 (mg/l)	25	18	21.3	13.8	150
TSS (mg/l)	59	20	50	21.7	100
Fecal Coliform (colonies/100 ml)		Est 90			700
pH		6.7			6.5 - 8.5
Chlorine Residual (mg/l)		2.4			Min. 0.5

The results show that they easily meet their permit limitations except for pH. This unusually low pH is most likely due to the extreme dilution with rain and groundwater that the raw sewage undergoes. This is also why the BOD_5 of the influent was only 25 mg/l. It is recommended that the next Class II inspection be made during the summer months.

DH:ee

STP Survey Report Form

Efficiency Study

City Puyallup Plant Type Primary Pop. Served 15,000 Design Capacity 4 MGD

Receiving Water Puyallup River Perennial X Intermittent ____

Date 1-15/16-76 Survey Period 24 hrs. Survey Personnel Houck, Robinson

Comp. Sampling Frequency 30 min. Sampling Alequot 250 ml

Weather Conditions (24 hr) rainy Are facilities provided for complete by-pass of raw sewage? X Yes ____ No/Frequency of bypass 60-90 days/year

Reason for bypass Excess flow Is bypass chlorinated? X Yes ____ No

Was DOE Notified? Yes Discharge - Intermittent X Continuous ____

Plant Operation

Total flow 5.8 MGD How measured Palmer-Bowlus flume

Maximum flow 3.5 Time of Max. 1100 - 1300

Minimum flow 1.4 MGD Time of Min. 0600

Pre Cl_2 Summer 30 #/day Post Cl_2 Summer 190 Winter 170 #/day

Field Results

Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Effluent Max.	Effluent Min.	Effluent Mean	Effluent Median
Temp °C								
pH (Units)				6.1				6.0
Conductivity (μmhos/cm^2)								
Settleable Solids (mls/l)								

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	76-0186	-0188	
5-Day BOD ppm	25	18	28%
COD ppm	57	39	32%
T.S. ppm	220	191	13%
T.N.V.S. ppm	148	130	12%
T.S.S. ppm	59	20	66%
N.V.S.S. ppm	28	2	93%
pH (Units)			
Conductivity (μmhos/cm^2)			
Turbidity (JTU's)			

Laboratory Bacteriological Results

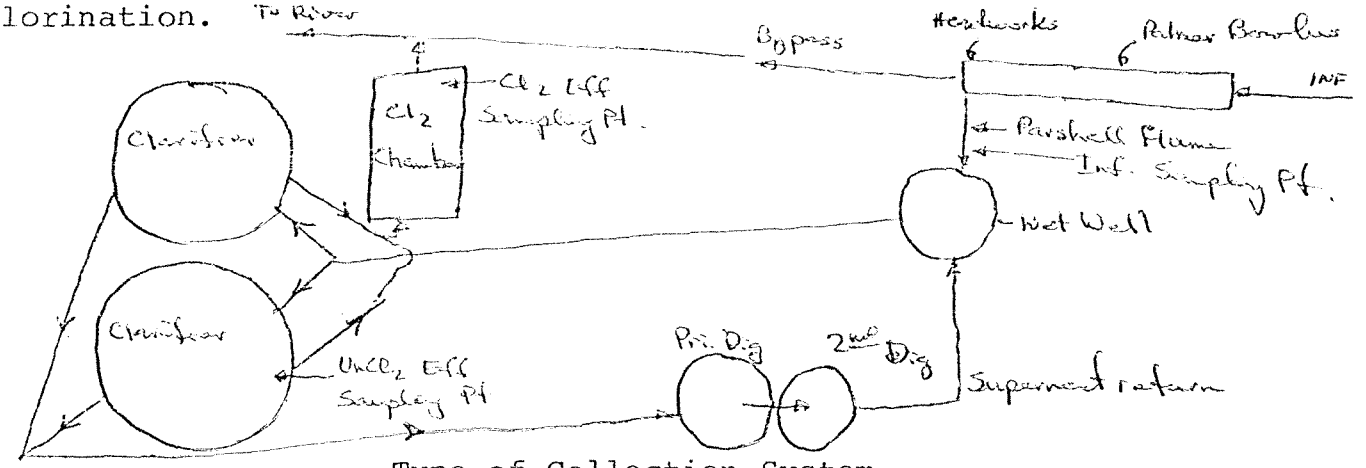
Lab No.	Sampling Time	Colonies/100 ml (MF) Total Coliform	Fecal Coliform	Fecal Strep	Cl_2 Residual
76-0164			Est 90		2.6
-0165			<200		

Additional Laboratory Results

NO_3-N ppm	-	1.3
NO_2-N ppm	-	ND
NH_3-N ppm	-	3.3
T. Kjeldahl-N ppm	-	
O-PO_4-P ppm	-	0.40
T-PO_4-P ppm	-	1.3

Operator's Name Eldon Eden Phone No. 845-5257

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



Type of Collection System

__ Combined __ Separate X Both

Estimate flow contributed by surface or ground water (infiltration)

Reg. 1.5 - 2.0 MGD Winter 10 MGD

Plant Loading Information

Annual average daily flow rate(mgd)	Peak flow rate(mgd)
Dry	Dry 2.7
Wet 7.3 MGD	Wet 11.12 MGD

COMMENTS: