

MEMORANDUM

March 30, 1976

To: John Glynn

From: Douglas Houck

Subject: Everett STP Class II Inspection

On March 9, 1976 Mike Morhous and I arrived at Everett to conduct a Class II Inspection. We were not able to review their laboratory procedures at the time since their lab man was attending a chlorination class. I returned on the 17th to complete this part of the inspection.

Composite samplers were installed at the influent and pre- and post chlorinated effluent. The influent sampler was located just after the parshall flume. All three composite samplers were adjusted to take a 250 ml aliquot every 30 minutes. The influent and chlorinated effluent samplers were acid cleaned to sample for heavy metals.

The parshall flume and stilling well appeared well maintained. The accuracy of the flume could not be checked as the recorder-totalizer is not located in the headworks building.

On the 10th, Morhous returned to pick up the samplers and split the composite samples with the city of Everett. The following table gives DOE's and Everett's results along with their NPDES monthly average permit limitations.

	<u>DOE</u>		<u>Everett</u>		<u>NPDES</u>
	<u>Inf.</u>	<u>Eff.</u>	<u>Inf.</u>	<u>Eff.</u>	<u>Monthly Avg.</u>
BOD ₅ (mg/l)	150	7	167	4.2	30
T.S.S. (mg/l)	204	6	191	8	55
Fecal Coliform (Colonies/100 ml)		<10			200
pH		6.6			6.5 - 9.0
Chlorine Residual (ppm)		0.7			0.5
Cr (mg/l)	< 0.02	<0.02			0.1*
Cu (mg/l)	0.12	0.02			0.1*
Zn (mg/l)	0.38	0.10			0.1*

* Daily Maximum

The 40 percent difference in the effluent BOD₅ is most likely due to the fact that Everett was not dechlorinating and reseeded their sample. They are now taking their grabs sample for BOD before its been chlorinated. Our laboratory results show only a 1 ppm decrease in the BOD₅ of the chlorinated vs. unchlorinated effluent sample. It is of interest to note that they just meet their zinc daily maximum limitations. They seem to have no problem meeting the other heavy metals limitations. Although the permit also gives loading limitations these are of questionable importance as the city measures only the influent flow. With the long detention time in their polishing pond there is now no way to correlate the incoming flow with the effluent concentrations. Their laboratory techniques were good except that they weren't dechlorinating and reseeded the effluent BOD sample and on the 17th the temperature of their fecal coliform incubator was 44.8°C.

It is recommended that Everett take their BOD₅ sample before its been chlorinated, they stop running the FC/FS ratio test from their effluent, they start analyzing for hexavalent chromium colorimetrically and that they look into the possibility of discontinuing chlorination of their effluent.

DH:ee

STP Survey Report Form

Efficiency Study

City Everett Plant Type Secondary Pop. Served _____ Design Capacity _____
 Receiving Water Snohomish River Perennial Intermittent _____
 Date 3-9/10-76 Survey Period 24 hrs Survey Personnel Houck, Morhous, Glynn
 Comp. Sampling Frequency 30 min Sampling Alequot 250 ml
 Weather Conditions (24 hr) Clear 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 Totalizer
 Maximum flow _____ Time of Max. _____
 Minimum flow _____ Time of Min. _____
 Pre Cl₂ _____ #/day Post Cl₂ 160 #/day

Field Results

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C								6.7
pH (Units)				6.8				6.4
Conductivity (µmhos/cm ²)								
Settleable Solids (mls/l)								

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	<u>76-691</u>	<u>76-694</u>	
5-Day BOD ppm	<u>150</u>	<u>7</u>	<u>95%</u>
COD ppm	<u>370</u>	<u>42</u>	<u>89%</u>
T.S. ppm	<u>413</u>	<u>180</u>	<u>56%</u>
T.N.V.S. ppm	<u>193</u>	<u>126</u>	<u>31%</u>
T.S.S. ppm	<u>204</u>	<u>6</u>	<u>97%</u>
N.V.S.S. ppm	<u>30</u>	<u><1</u>	<u>98%</u>
pH (Units)	<u>7.1</u>	<u>6.9</u>	
Conductivity (µmhos/cm ²)	_____	_____	
Turbidity (JTU's)	_____	_____	

Laboratory Bacteriological Results

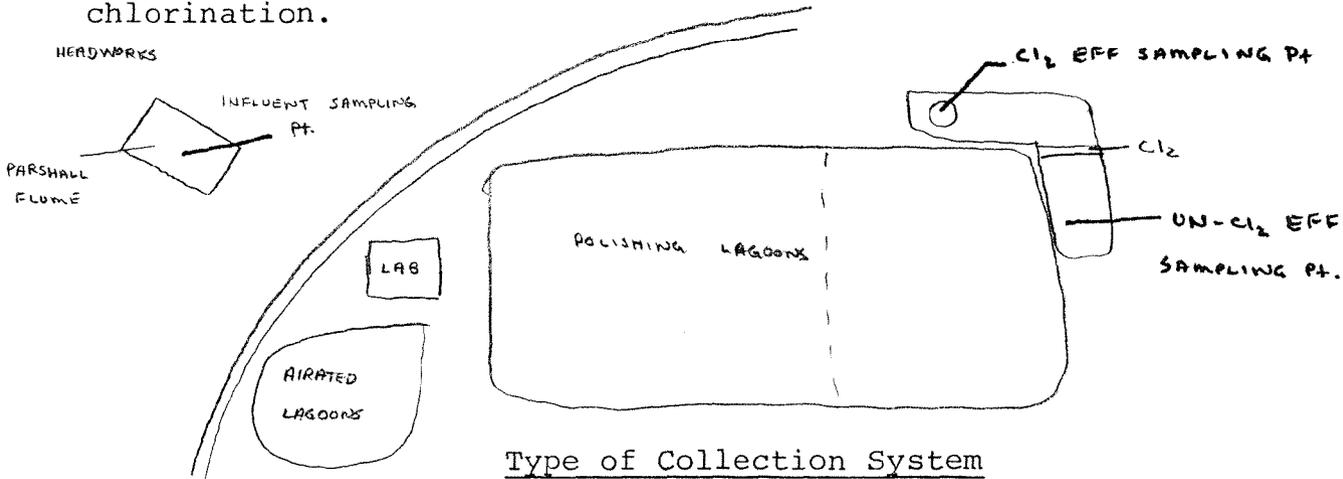
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
76-696			<10		0.7
76-697			<10		

Additional Laboratory Results

		Inf.	Eff.
NO ₃ -N ppm	- 0.09	<0.02	<0.02
NO ₂ -N ppm	- <0.02	0.12	0.02
NH ₃ -N ppm	- 12.2	<0.05	<0.05
T. Kjeldahl-N ppm	-	0.38	0.10
O-PO ₄ -P ppm	- 2.9	0.05	<0.05
T-PO ₄ -P ppm	- 3.9		

Operator's Name Loren Postma 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 10.85

Wet 41.95

COMMENTS: _____



DATA SUMMARY

ORIGINAL TO:
..D.H.....
COPIES TO:
.....
.....
.....
LAB. FILES.....

Source Everett STP

Collected By Huckel & Morkous

Date Collected 3-9/10-76

Log Number:	76- 691	692	693	694	695	696	697
Station:							
pH	7.1	7.0		6.9			
Turbidity (NTU)							
Sp. Conductivity (umhos/cm)							
COD	370.	42.		42.			
BOD (5 day)	150.	8		7.			
Total Coliform (Col./100ml)							
Fecal Coliform (Col./100ml)						<10	<10
NO3-N (Filtered)		1.8	0.07	0.07	0.09		
NO2-N (Filtered)		<0.02	0.03	0.03	<0.02		
NH3-N (Unfiltered)		12.6	12.4	12.4	12.2		
T. Kjeldahl-N (Unfiltered)							
O-PO4-P (Filtered)		2.8	2.9	3.0	2.9		
Total Phos.-P (Unfiltered)		4.4	4.2	4.0	3.9		
Total Solids	413	180		180			
Total Non. Vol. Solids	183	122		126			
Total Suspended Solids	204	11		6			
Total Sus. Non Vol. Solids	30	1		<1.			
Chromium & Cadmium	<0.02			<0.02			
Copper	0.12			0.02			
Nickel	<0.05			<0.05			
Zinc	0.38			0.10			
Lead	0.05			<0.05			

Note: All results are in PPM (mg/L) unless otherwise specified. ND is "None Detected"
" < " is "Less Than" and " > " is "Greater Than"