

M E M O R A N D U M

February 24, 1976

To: John Glynn

From: Darrel Anderson 

Subject: Everett Sewage Lagoons

On January 21, 1976 Allen Moore and myself conducted an efficiency survey at the city of Everett sewage lagoons. Total flow was obtained for a 24-hour period from the influent only, accordingly the loading data was computed from that 24-hour flow period. An automatic composer (city of Everett) was used - 0845 to 1600 hrs - on the influent and the sample was split. Since the effluent is controlled by a tidal gate, compositing was from 1045 hrs to 1500 hrs. Disinfection was very good, fecal was <10/100 ml, BOD reduction is 92% and T.S.S. is 91%. Ammonia was 12 ppm which seems to be high for this type of treatment. Overall housekeeping was good.

DLA:ee

STP Survey Report Form

Efficiency Study

31 MGD

City Everett Plant Type Secondary Pop. Served 54,000 Design Capacity 96,000

Receiving Water Snohomish River Perennial Intermittent

Date 21 Jan 76 Survey Period 0730 - 1600 Survey Personnel Allen Moore,

Comp. Sampling Frequency (See memo) Sampling Alequot 1000 ml
Darrel Anderson

Weather Conditions (24 hr) cool, dry 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 Tide gate Continuous

Plant Operation

Total flow 10.28 MGD How measured Totalizer

Maximum flow -- Time of Max. --

Minimum flow -- Time of Min. --

Pre Cl₂ -- #/day Post Cl₂ 160 #/day

Field Results

Influent

Effluent

Determinations	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C			(No data)		7.5	7.0		7.0
pH (Units)			Automatic		7.5	7.0		7.2
Conductivity (µmhos/cm ²)			compositor		500	400		400
Settleable Solids (mls/l)					T	T	T	T

Laboratory Results on Composites

Laboratory No.	Influent	Effluent	% Reduction	lbs/day
	<u>76-271</u>	<u>76-272</u>		
5-Day BOD ppm	<u>96</u>	<u>48</u>	<u>92</u>	<u>685.9</u>
COD ppm	<u>200</u>	<u>57</u>	<u>71</u>	
T.S. ppm	<u>526</u>	<u>180</u>	<u>65</u>	
T.N.V.S. ppm	<u>329</u>	<u>134</u>	<u>60</u>	
T.S.S. ppm	<u>159</u>	<u>12</u>	<u>91</u>	<u>1,028.8</u>
N.V.S.S. ppm	<u>42</u>	<u>2</u>	<u>95</u>	
pH (Units)	<u>7.5</u>	<u>7.4</u>		
Conductivity (µmhos/cm ²)	<u>730</u>	<u>390</u>		
Turbidity (JTU's)	<u>80</u>	<u>8</u>		

Laboratory Bacteriological Results

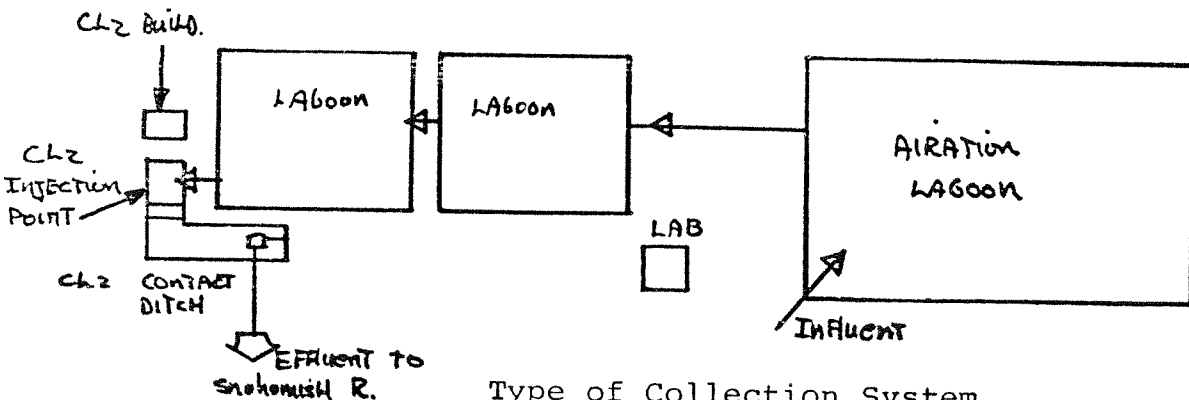
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
76-273	1055	Est 40	<10		
274	1145	1000	<10		0
275	1315	2500	<10		0
276	1500	Est 140	<10		0

Additional Laboratory Results

		lbs/day			Inf	Eff
NO ₃ -N ppm	-	0.23	22.29	Color (color units)	- 150	63
NO ₂ -N ppm	-	0.03		Copper	-	<0.01
NH ₃ -N ppm	-	8.9	762.9	Zinc	-	0.04
T. Kjeldahl-N ppm	-	12	1,028.8	T. Chromium	-	<0.05
O-PO ₄ -P ppm	-	2.1	180	Cadmium	-	<0.01
T-PO ₄ -P ppm	-	2.7	231.5			

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 MGD

Wet 41.95 MGD 24 Mar. 75

COMMENTS: Effluent discharge on outgoing tide only

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

ORIGINAL TO:
A.W.M.
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LAB FILES

OLYMPIA LABORATORY

DATA SUMMARY

Source Everett STP

Collected By A. Moore

Date Collected 1-21-76

Log Number: 76-271 272 273 274 275 276

Station:	INF	LABOR EFF	1055	1145	1315	-				
pH	7.5	7.4								
Turbidity (NTU)	80.	8.								
Sp. Conductivity (umhos/cm)	730.	390.								
COD	200.	57.								
BOD (5 day)	96.	<8.								
Total Coliform (Col./100ml)			EST 40	1000	2500	EST 140				
Fecal Coliform (Col./100ml)			<10	<10	<10	<10				
NO3-N (Filtered)		0.23								
NO2-N (Filtered)		0.03								
NH3-N (Unfiltered)		8.9								
T. Kjeldahl-N (Unfiltered)		12.								
O-PO4-P (Filtered)		2.1								
Total Phos.-P (Unfiltered)		2.7								
Total Solids	526.	180.								
Total Non. Vol. Solids	329.	134.								
Total Suspended Solids	159.	12.								
Total Sus. Non Vol. Solids	42.	2.								
COLOR (color units)	150.	63.								
Copper		<0.01								
ZINC		0.04								
T. Chromium		<0.05								
Cadmium *		<0.01								

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

* Not Requested
ECY 040-2-32