

August 15, 1974

WA-34-1020

Memo to: Rhys Sterling and Howard Bunten

From: Shirley Prescott *SP*

Subject: Pullman STP Efficiency Study



Scott Jeane and I conducted a routine efficiency study on April 30, 1974, on the Pullman STP. The influent and effluent was composited at 45 minute intervals for a 7 1/2 hour period. Lab and field results are shown on the attached report form.

The plant and grounds were well "manicured". Buildings were painted and clean; grounds were fenced, landscaped and mowed. All personnel were neat, clean and courteous. Mr. Fred Cooper, plant manager, is an excellent PR man for his operation. He has tours through the facility at all times and has prepared a fact sheet on the plant and its operation (copy attached), as well as a large display board which he uses in his educational program. This service is used a great deal by the college. There were at least two sizeable tour groups during the period we were there.

We neglected to read the flowmeter before leaving the plant, but in checking back with Mr. Cooper, the flow from noon on 4/29/1974 till noon 4/30/1974 showed 4,100,000 gallons and this was an average day.

SP:jmh

STP Survey Report Form

Efficiency Study

City Pullman Plant Type ^{Activated} Sludge Pop. Served 22,000 Design Capacity _____
 Receiving Water S. Fork Palouse River Perennial X Intermittent _____
 Date 4/30/74 Survey Period 0830 - 1600 hours Survey Personnel S. Jeane - S. Prescott
 Comp. Sampling Frequency 45 minutes Sampling Alequot 840 mls.
 Weather Conditions (24 hr) Clear, dry Are facilities provided for complete by-pass of raw sewage? X Yes _____ No/Frequency of bypass _____
 Reason for bypass _____ Is bypass chlorinated? X Yes _____ No _____
 Was DOE Notified? _____ Discharge - Intermittent _____ Continuous _____

Plant Operation

Total flow 4.1 MGD How measured Totalizer
 Maximum flow 5.1 MGD Time of Max. 0930
 Minimum flow 2.6 MGD Time of Min. 0830
 Pre Cl₂ _____ #/day Post Cl₂ 150 #/day

Field Results

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C	20	18		19	20	18		18
pH (Units)	7.8	7.6		7.6	7.4	7.2		7.2
Conductivity (µmhos/cm ²)	1600	640		860	875	800		800
Settleable Solids (mls/l)	18	11	12		Trace	---	---	---

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	<u>74-1416</u>	<u>1417</u>	
5-Day BOD ppm	<u>>200</u>	<u>>40</u>	<u>80</u>
COD ppm	<u>396</u>	<u>131</u>	<u>67</u>
T.S. ppm	<u>709</u>	<u>424</u>	<u>40</u>
T.N.V.S. ppm	<u>379</u>	<u>276</u>	<u>27</u>
T.S.S. ppm	<u>207</u>	<u>58</u>	<u>73</u>
N.V.S.S. ppm	<u>31</u>	<u>6</u>	<u>81</u>
pH (Units)	<u>7.8</u>	<u>7.7</u>	
Conductivity (µmhos/cm ²)	<u>880</u>	<u>730</u>	
Turbidity (JTU's)	<u>64</u>	<u>30</u>	

Laboratory Bacteriological Results

Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual	
		Total Coliform	Fecal Coliform	Fecal Strep	15"	3 min
1419		>40,000	310		.75	1.0
20		>40,000	530		.75	1.0
21		>40,000	900		.75	1.0
22		>40,000	< 10			
23		39,000	Est. 50			
24		48,000	Est. 30			

Additional Laboratory Results

NO ₃ -N ppm -	.02	
NO ₂ -N ppm -	ND	
NH ₃ -N ppm -	16.0	
T. Kjeldahl-N ppm -	18.1	
O-PO ₄ -P ppm -	4.88	
T-PO ₄ -P ppm -	32.0	

Operator's Name Fred Cooper Phone No. 532-4213

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

(SEE ATTACHED FLOW SHEET)

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 4.0 MGD

Dry 6.5 MGD

Wet _____

Wet _____

COMMENTS: _____

FACTS ABOUT THE PLANT

Design Flow:

Minimum Daily Flow	2.80	Million Gal.per day
Average Daily Flow	4.00	" " "
Maximum Daily Flow	6.50	" " "
Maximum Hydraulic Flow-	12.00	" " "

CITY OF PULLMAN
SEWAGE TREATMENT PLANT
Department of Public Works

Strength of Sewage:

	Suspended Solids	BOD
Minimum	140 ppm	120 ppm
Average	225 ppm	210 ppm
Maximum	270 ppm	250 ppm

This City of Pullman facility is operated by the Department of Public Works and treats the sewage from both the community and the Washington State University campus. WSU contributes financially to the maintenance and operation of the plant.

Pump Station:

Five Raw Sewage Pumps
 2 rated 1,000 gpm @ 13' of head each
 3 rated 2,100 gpm @ 13' of head each
 Volume, wet pit at overflow: 8,950 gallons

The original plant was completed in 1949 at a cost of approximately \$300,000. This plant was a bio-filtration type treatment plant.

Primary Clarifier:

Diameter 70'
 Side wall depth: 8.5' Volume: 246,000 gals.

Due to the increased use of water by the population it became necessary to increase the capacity of the plant. To accomplish this the plant was remodeled in 1965. At that time it was changed to an activated sludge type plant to more effectively treat both the low quantity of sewage received during the summer months and the high quantities received during the winter months with the return of the students to WSU. The remodeling cost was approximately \$500,000.

Aeration Basins:

Two Basins: Volume of each: 350,000 gals.
 Blower Capacity: 3 blowers, each @ 600 cfm
 Activated Sludge Pumps:
 2 pumps, each @ 1,600 gpm @35' of head

Secondary Clarifier:

Diameter: 70'
 Side wall depth: 11

Chlorine Retention Basin:

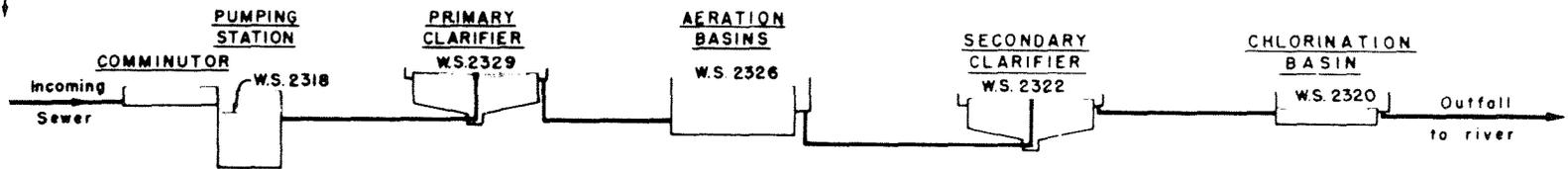
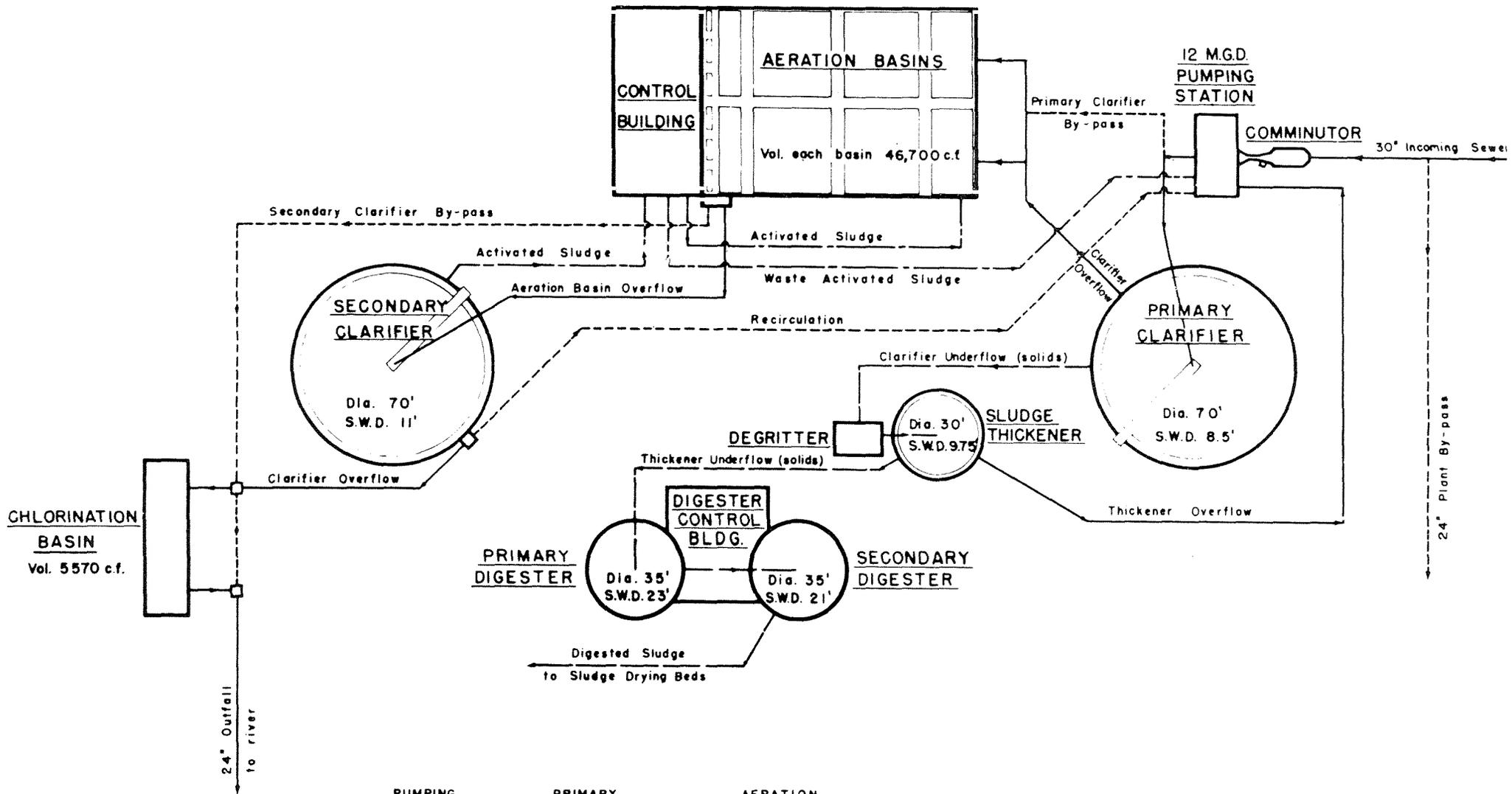
1 Basin" Retention time: 20 min. minimum

Sludge Thickener:

Diameter: 30'
 Side Wall depth:10' Volume: 53,000 gals.

Sludge Digesters:

Primary: Diameter: 35' Vol. 176,200 gals.
 Side wall depth: 23'
 Secondary: Diameter: 35' Vol. 161,200 gals.
 Side wall depth: 21'
 Total Vol: 337,400 gals.



TREATMENT PLANT PROFILE

SEWAGE TREATMENT PLANT
PULLMAN, WASHINGTON
1965

