

M E M O R A N D U M

December 27, 1976

To: Harold Porath, DOE, Yakima
From: Mike Morhous, DOE, Olympia
Re: Wenatchee STP Class II Inspection

On September 8, 1976 Ward Andrews and I arrived at the Wenatchee STP to conduct the above referenced inspection. We met with Tom Coleman and Harold Porath, DOE, and Mel Heckler and Al Board, Wenatchee STP.

Composite samplers were installed at the influent, pre-chlorinated effluent and chlorinated effluent. The influent sampler was located at the headworks. The pre-chlorinated effluent sampler was located at the secondary clarifier. The chlorinated effluent sampler was located above the Parshall flume in the effluent discharge line. All three samplers were adjusted to take a 250 ml aliquot every thirty minutes.

The plant's flow measuring device is a 3 foot Parshall flume. With the exception of the flume throat which measured 36.5 inches at a point approximately 3 feet below the top of the flume, all other dimensions appeared to meet standard construction criteria. A more accurate throat width measurement closer to the bottom of the flume could not be taken because of the 54.5 inch flume depth.

The accuracy of the flume/recorder was checked twice by comparing a calculated instantaneous flow with the recorded flow. The accuracy of the flow recorder was 86% and 103% of the calculated flows which is within the acceptable 15% error limitation.

Laboratory techniques were reviewed with Al Board, Lab Technician. During the review, recommendations were given to improve lab techniques involving D.O., BOD₅ and fecal coliform analyses. A copy of these recommendations has been enclosed.

Subsequent to this inspection, Al Board indicated that the recommendations had been implemented when the split samples were analysed.

During this inspection Tom Coleman asked for a comparison of the orthotolidine and DPD methods of analysing total residual chlorine. The comparison was made with the STP using their Ortho Kit and the results were:

Ortho	between .05 and .1 ppm
DPD	.25 ppm

Orthotolidine procedures for determining total and free residual chlorine have been deleted as an approved method by Standard Methods. Also the EPA does not recognize orthotolidine as an approved procedure for chlorine residuals.

On September 9, Ward and I returned to pick up the composite samplers. The influent and chlorinated effluent composite samples were split with the STP. Upon request the STP was also given one of two simultaneous grab samples taken for fecal coliform analysis.

The following table lists the DOE and Wenatchee STP results together with the NPDES permit effluent limitations.

	DOE		Wenatchee		NPDES (monthly average)
	Inf.	Eff.	Inf.	Eff.	
BOD ₅ (mg/l)	117	<4	121	10	30
(lbs/day)		<99.1			600
COD (mg/l)	270	51	276	38	
(lbs/day)					
TSS (mg/l)	122	9	202	16	30
(lbs/day)		223.7			600
Fecal Coliforms (colonies/100 mls)					200
9/9 at 0925		<10		2	
9/9 at 1005		Est. 20			
Chlorine Residual* (ppm)					
9/8 at 1340		0.6			
9/9 at 0925		0.7			
at 1005		0.7			
pH	7.2	6.8			6.5 to 8.5
Total flow (mgd)		2.98			not to exceed 3.55

* field analysis - DPD

"<" is "less than" and ">" is "greater than"

It was noted that Wenatchee's NPDES permit had no limitations regarding total residual chlorine in the final effluent. It is suggested that clarification of this point should be included in the NPDES permit.

In summary, no major discrepancies were discovered during the inspection and the lab results compared quite well. However, it is recommended that the STP consider the acquisition of an approved test kit for total residual chlorine analysis.

Enclosure

cc: Dick Cunningham
Central Files
Douglas Houck

Recommendations for
Improved Lab Technique

- (a) More frequent calibration of D.O. meter to insure its accuracy.
- (b) Reseeding final effluent sample after dechlorination for more accurate BOD₅ results.
- (c) Setting up three BOD bottles per each BOD dilution, blank and seeded blank. One for initial D.O., two for incubation.
- (d) Storing distilled water used for BOD dilution water at 20°C.
- (e) A centigrade thermometer for hot water bath, preferably with increments of .1°C.
- (f) Filtering a minimum of 2 and preferably 3 different volumes of each grab sample in order to obtain an optimum colony count on one plate of between 20 and 60 colonies and using the following formula:

$$\text{colonies/100 mls} = \frac{\text{count on plate} \times 100}{\text{mls of original sample used}}$$