DEPARTMENT OF ECOLOGY

July 21, 1994

TO: Robert Barwin and Phelps Freeborn
Central Regional Office

THROUGH: Will Kendra WK
EILS Program, Watershed Assessments Section

FROM: Tapas Das TKD
Watershed Assessments Section

SUBJECT: Wenatchee River Basin Class II Inspection at the City of Leavenworth Wastewater Treatment Plant

An announced Basin Class II inspection was conducted at the above facility on September 4-6, 1993. My original intent was to provide the usual inspection report. However, due to the recent reprogramming of Class II activities in EILS, it was necessary to abbreviate the reporting effort on some of my remaining projects. This transmittal memo summarizes the significant findings from my review of the inspection data (attached):

- The wastewater treatment plant (WWTP) performed well during the inspection. Conventional parameters indicate a well-treated, high quality effluent. The WWTP met permit limits for five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, and flow during the inspection. Removal efficiencies for BOD_5 and TSS were 98%.

- Effluent fecal coliform counts were 580 #/100 mL and 1,100 #/100 mL. If fecal counts remained at these levels over time, then weekly and monthly averages would have exceeded permit limits. The permittee's chlorination system be checked and adjusted as necessary.

- The reductions in alkalinity and ammonia from influent to effluent indicate nitrification, however there was no corresponding increase in nitrate-nitrite levels. This was likely due to removal of nitrate via denitrification.

- The permittee's overall sampling and laboratory performance as revealed by sample splits was acceptable. Performance evaluation standards should be used during the next inspection.

- The permittee's composite sample temperatures were higher than the recommended 4°C. The coolers should be inspected and adjusted as necessary to provide better sample cooling.

I transferred to the Air Quality Program at Ecology HQ on June 27. If you have any questions concerning this memo, please contact Norm Glenn at 407-6683.

TD:blt
Attachments

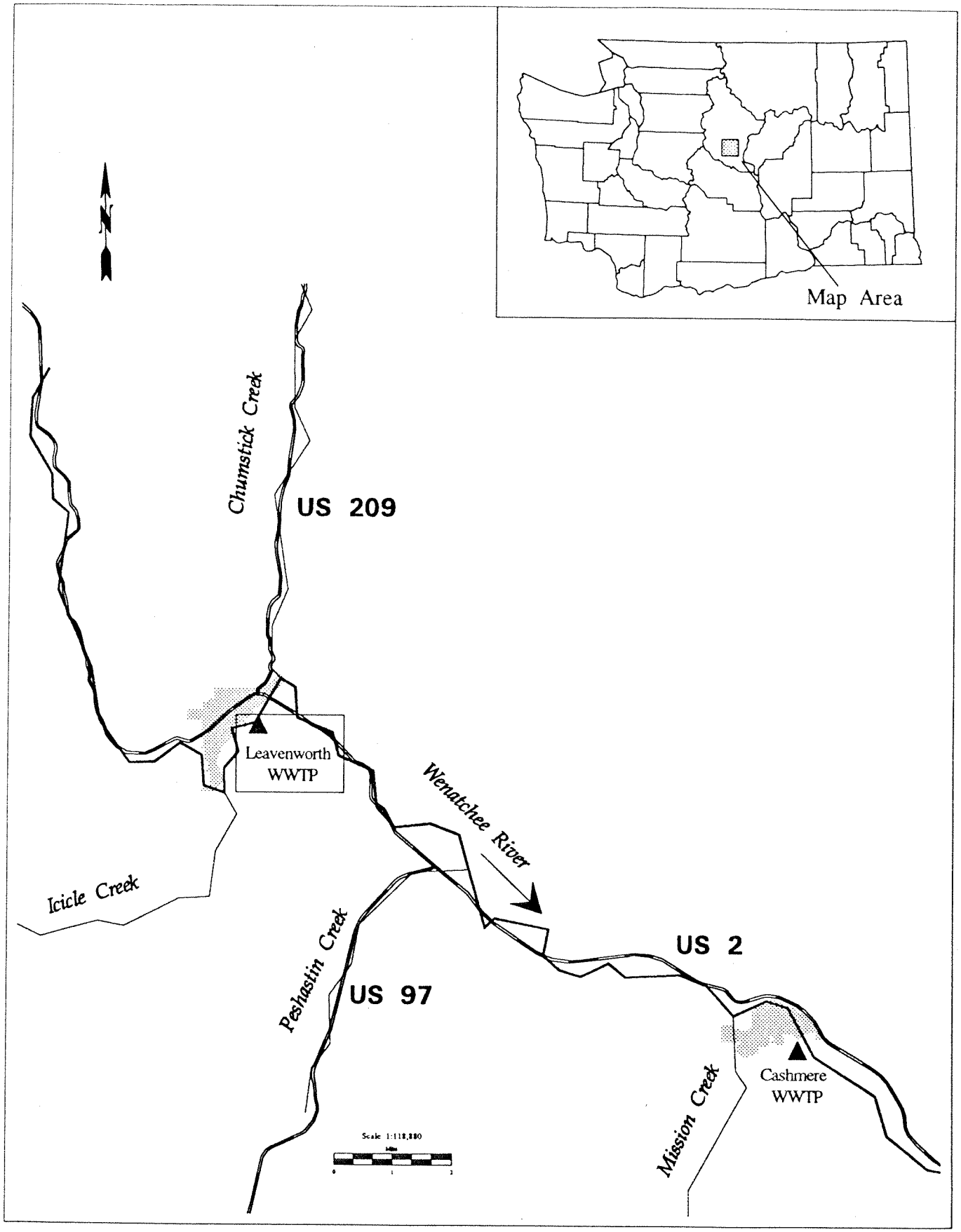

Figure 1. Locations of two WWTP s – Wenatchee River Basin Class II Inspections, 9/93

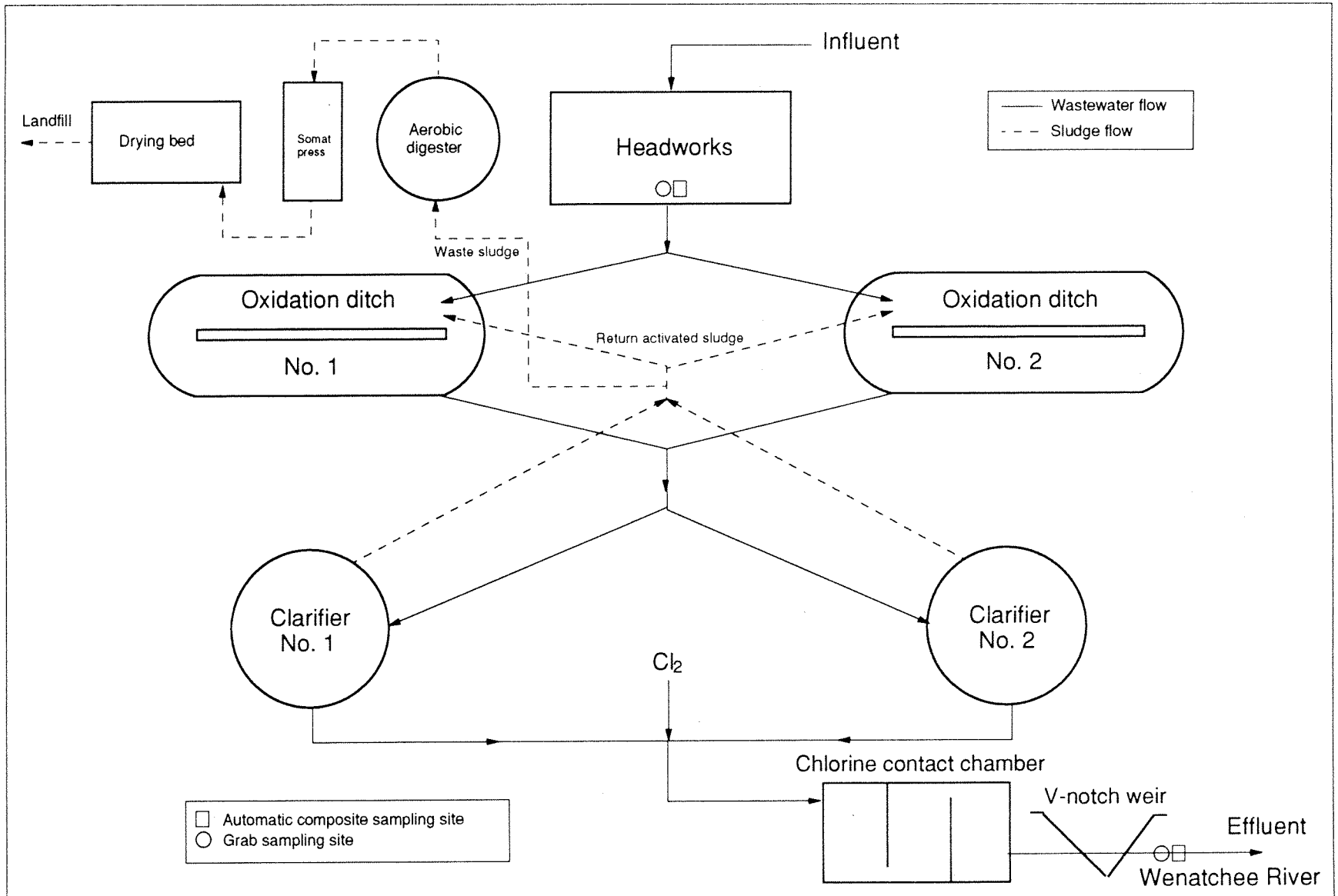

Figure 2. Schematic Diagram of City of Leavenworth WWTP Sampling Sites, 9/93

Table 1. Analytical Methods and Laboratories - City of Leavenworth WWTP
Class II Inspection, 9/93

Parameter	Method*	Lab used
Turbidity	EPA, 1983: 180.1	Ecology; Manchester, WA
Chloride	EPA, 1983: 330.0	Ecology; Manchester, WA
Alkalinity	EPA, 1983: 310.1	Ecology; Manchester, WA
SOLIDS4		
TS	EPA, 1983: 160.3	Ecology; Manchester, WA
TNVS	EPA, 1983: 160.4	Ecology; Manchester, WA
TSS	EPA, 1983: 160.2	Ecology; Manchester, WA
TNVSS	EPA, 1983: 160.4	Ecology; Manchester, WA
BOD5	EPA, 1983: 405.1	Sound Analytical Services, Inc; Tacoma, WA
NUTRIENTS		
NH3-N	EPA, 1983: 350.1	Sound Analytical Services, Inc; Tacoma, WA
NO2+NO3-N	EPA, 1983: 300.0	Sound Analytical Services, Inc; Tacoma, WA
T-phosphorus	EPA, 1983: 365.1	Sound Analytical Services, Inc; Tacoma, WA
Ortho-phosphate	EPA, 1983: 300.0	Sound Analytical Services, Inc; Tacoma, WA
Total Kjeldahl nitrogen	EPA, 1983: 351.2	Sound Analytical Services, Inc; Tacoma, WA
Fecal coliform (MF)	APHA, 1989: 9222D	Ecology; Manchester, WA

* APHA, 1989. Standard Methods for the Examination of Water and Wastewater.
EPA, 1983. Methods for Chemical analyses of Water and Waste.

Table 2. General Chemistry Results, City of Leavenworth WWTP - Wenatchee River Basin Class II Inspection, 9/93
(Composite Results Should be Interpreted with Caution since Sample Temperatures Exceeded 4°C)

Parameter	Location:	Inf-E	Inf-CL	Eff-E	Eff-CL	Inf-1	Eff-1	Eff-T
	Type:	comp	comp	comp	comp	grab	grab	grab
	Date:	9/5-6	9/5-6	9/5-6	9/5-6	9/6	9/6	9/6
	Time:	0800-0800	0800-0800	0800-0800	0800-0800	0910	1010	1020
	Lab ID#3782:	-92	-93	-94	-95	-96	-97	-98
Turbidity (NTU)		93	97	2.4	2.6	142	2.8	2.9
Chloride (mg/L)				24.2	25		22.6	22.7
Alkalinity (mg/L)		138	157	57	57.5	173	60.9	60.7
TS (mg/L)		480		181				
TNVS (mg/L)		157		125				
TSS (mg/L)		192	257	3	5	468	8	7
TNVSS (mg/L)		19		<1				
BOD5 (mg/L)		280	290	5 J	5 J	440	3 J	2 J
NH3-N (mg/L)		24	26	0.18	0.13	31	0.10	0.13
NO2+NO3-N (mg/L)		<0.05	<0.05	1.5	1.3	<0.05	0.36	0.34
Total Kjeldahl nitrogen (mg/L)		35	42	1.1 J	9.5 J	63	0.92 J	1.2 J
Total phosphate (mg/L)		5.5	5.5	2.1	2.2	5.8	1.7	2.0
Ortho phosphate (mg/L)				2.2	2.2		2.3	2.3
F-Coliform MF (#/100 mL)							580	1,100 J
FIELD OBSERVATIONS								
Flow (MGD)				0.39*				
Temperature (°C)		6.6++	10.5++	4.3++	5.1++	22.7	21.3	21.4
pH (S.U.)						7.7	7.3	7.1
Conductivity (μmhos/cm)		410	475	260	230	425	230	230
Chlorine								
Free (mg/L)							0.08	0.06
Total (mg/L)							0.10	0.08

E - Ecology sample, CL - City of Leavenworth sample, Inf - Influent, Eff - Effluent, T - Ecology replicate sample.
J - The analyte was positively identified; the associated numerical result is an estimate.
* Flow was obtained from plant's totalizer for a 24-hr time period (9/5-6).
++ Iced composite sample.

Table 3. Comparison of Results to NPDES Permit Limits, City of Leavenworth WWTP - Wenatchee River Basin Class II Inspection, 9/93

Parameter	NPDES Permit Limits		Inspection Data		Derived Loading	
	Monthly Average	Weekly Average	Ecology Composite	Grab Sample	Composite Result	Grab Result
Influent BOD5						
(mg/L)			280	440		
(lbs/day)					910	1400
Effluent BOD5**						
(mg/L)	30	45	5 J	3 J		
(lbs/day)	84	126			20	10
(% removal)	85				98	
Influent TSS						
(mg/L)			192	468		
(lbs/day)					625	1,520
Effluent TSS**						
(mg/L)	30	45	3	8		
(lbs/day)	97	145			10	30
(% removal)	85				98	
Fecal Coliform++	200	400		800		
(#/100 mL)			---	(580; 1,100 J)		
Total Residual Chlorine (mg/L)	---	---		0.10; 0.08		
pH (S.U.)	Within the range of 6.0 to 9.0			7.3;7.1		
Flow (MGD)	0.7	---			0.39+	

\+ Flow obtained from WWTP's totalizer for a 24-hour time period.

++ The average for fecal coliform bacteria is based on the geometric mean of the samples taken.

** The monthly and weekly averages for BOD5 and TSS are based on the arithmetic mean of the samples taken.

J The analyte was positively identified; the associated numerical result is an estimate.

Table 4. Comparison of Laboratory Results of Sample Splits, Leavenworth WWTP - Wenatchee River Basin Class II Inspections, 9/93

Station:	Inf-E		Inf-CL		Eff-E		Eff-CL	
Lab ID#:	378292		378393		378394		378395	
Date:	9/5-6		9/5-6		9/5-6		9/5-6	
Sampler:	Ecology		CL		Ecology		CL	
Laboratory:	Ecology	WWTP	Ecology	WWTP	Ecology	WWTP	Ecology	WWTP
BOD5 (mg/L)	280	227	290	278	5 J	7	5 J	7
TSS (mg/L)	192	199	257	230	3	3	5	4

E - Ecology sample, CL - City of Leavenworth sample, Inf - Influent, Eff - Effluent.
J - The analyte was positively identified; the associated numerical result is an estimate.