Publication No. 72-e15

State of
Washington
Department
of Ecology

December 19, 1972

Memo to: Ron Pine
Dick Cunningham
Ron Robinson
Tom Shepherd
Rhys Sterling
Files

From: Ron Devitt

Subject: Errata on Chambers Creek
Memo 12/6/72 from RCD

On the table of "algae bloom potential nutrients" change unfiltered orthophosphate phosphorus to filtered orthophosphate phosphorus. On the chart of "nutrients continued" change unfiltered total E to unfiltered total P.

RD:pt
590199

December 6, 1972

State of Washington
Department of Ecology

Memo to: Ron Pine

From: Ron Devitt

Subject: Chambers Creek Monitoring Program

INTRODUCTION

Water quality data was obtained in the Chambers Creek drainage basin to provide encouragement for the installation of sewerage facilities and to select sampling sites for routine environmental monitoring.

STATION LOCATIONS

After the initial data was evaluated (Ron Pine 12-10-71), the following stations were retained for periodic sampling. Original station numbers were used.

#1 Chambers Creek at Chambers Creek Road, upstream of dam.

#2 Leach Creek Bridge at Bridgeport Way.

#3 Flett Creek behind 31 Candlewax, west of gravel pit.

#4 Chambers Creek at Chambers Creek Terrace Bridge, off 81st S.W., south of State game farm.

#11 Clover Creek at South Tacoma Way Bridge.

#12 Spanaway Creek at Military Road Bridge.

#13 Clover Creek at Airport Road Bridge.

#14 North fork of Clover Creek at B St. Bridge west of Elmhurst School

#15 South fork of Clover Creek at 136th St. Bridge, west of Elmhurst School.

DISCUSSION OF DATA

Nutrients:

All nutrient values obtained for NO_3-N and O-PO_4-P exceed the minimum concentrations necessary for potential algae blooms, except Stations 12 on 8-11-71; and 12 and 15 on 3-27-72. These high concentrations are present even at the upstream stations in the study area, indicating that the creek is relatively fertile, and should not be subjected to unnecessary unnatural loading. The biological, chemical, and physical effects of the passage of drainages through Steilacoom Lake were not studied; but without a doubt, nutrients are retained by the biota and sedimentation.

Coliform:

The total coliform values for these drainages should have a median value of less than 240 colonies/100 ml, with less than 20% of the samples greater than 1000 when associated with a fecal source.

The median total coliform values reported on each sampling run exceed 240. Values were highest at all stations except Station 2 on 9-26-72. Examining each station for the three reported values, only Station 12 met water quality standards.

Although Washington State does not have standards established for fecal coliform, the EPA recommends a median value of less than 200 fecal coliform/100 mls for effluents discharged to recreational waters. Stations 11 and 13, on 9-26-72, exceeded 200 fecal colonies/100 mls and enter Steilacoom Lake, which is considered a recreational area.

Dissolved Oxygen:

The dissolved oxygen standard for A water is greater than 8 ppm. The only station below this standard was Station 12, on 9-26-72, with a value of 7.6 ppm.

Recommended Station Locations for Environmental Monitoring:

Because of various municipal, industrial, and storm runoff influences which do enter the drainage system either by direct discharge or seepage, Stations 1, 2, 3, 11, 12, and 13 are suggested for routine monitoring. Ron Robinson, DOE inspector, has an excellent awareness of the exact locations of direct discharges and seepages. Also, complaints have been investigated throughout the drainage area. A conference between DOE regional representatives and Dick Cunningham, Environmental Monitoring, would be beneficial in establishing the routine sampling program. Pierce County Health Department has data that could be of assistance.

Conclusions:

Historical data collected by Washington State DOE, Environmental Monitoring Section and Pierce County Health Department, in conjunction with the data presented herein, indicate that any additional developments using septic tanks and drainfields should be discouraged. Existing water quality in the drainage basin was generally substandard for total coliform. The nutrients NO_3-N and O-OP_4-P were present in concentrations necessary for a potential algae bloom problem. Any additional use of septic tank systems would only aggravate present conditions. It also appears reasonable to assume that any remedy to reduce the sources of coliform contamination and nutrient levels would result in improved water quality.

RD:pt
239893

cc: Dick Cunningham
Ron Robinson
Tom Shepherd
Files

CHAMBERS CREEK

8-11-71	2-2-72		3-27-72		9-26-72			
	Total	Fecal	Total	Fecal	Total	Fecal	Median	% >1,000
1	400	18	300	44	1800	48	400	33
2	250	17	1000	>60	400	300	400	0
3	500	60	400	<20	2500	100	500	33
4	120	<20	90	<20	4000	36	120	33
11	400	40	300	37	1500	240	400	33
12	40	20	40	<20	200	<20	40	0
13	<1400	<20	45	<20	4000	290	<1400	67
14	450	<20	700	40			575	0
15	27	<20	200	23	2000	150	200	33
Median	400		300		1900			
% >1000	11%		0		75%			

The Washington State Water Quality Total Coliform Standard for "A" water is a median value of 240 with less than 20% of the samples exceeding 1000 when associated with a fecal source.

17/03

ALGAE BLOOM POTENTIAL

NUTRIENTS

	FILTERED NO_3 NITROGEN				FILTERED O-PO_4-PHOSPHORUS			
DATE:	8-71	2-72	3-72	9-72	8-71	2-72	3-72	9-72
STATION 1	1.51	1.37	.91	.98	.03	.05	.01	---
2	1.52	1.52	1.09	1.20	.03	.07	.06	---
3	2.05	1.67	1.12	1.66	.03	.07	.02	---
4	1.24	1.34	.81	.95	.01	.03	.01	---
11	.92	1.52	.79	.77	.01	.03	.01	---
12	.59	1.07	.64	.02	<.01*	.01	ND*	---
13	---	1.06	.80	.63	----	.06	.02	---
14	---	1.59	.82	---	---	.10	.02	---
15	---	1.51	.73	.81	---	.05	ND*	---

* Less than critical levels (<.3ppm NO_3-N and/or <.01 ppm O-PO_4-P) to support an algae bloom.

17/04

NUTRIENTS (Cont)

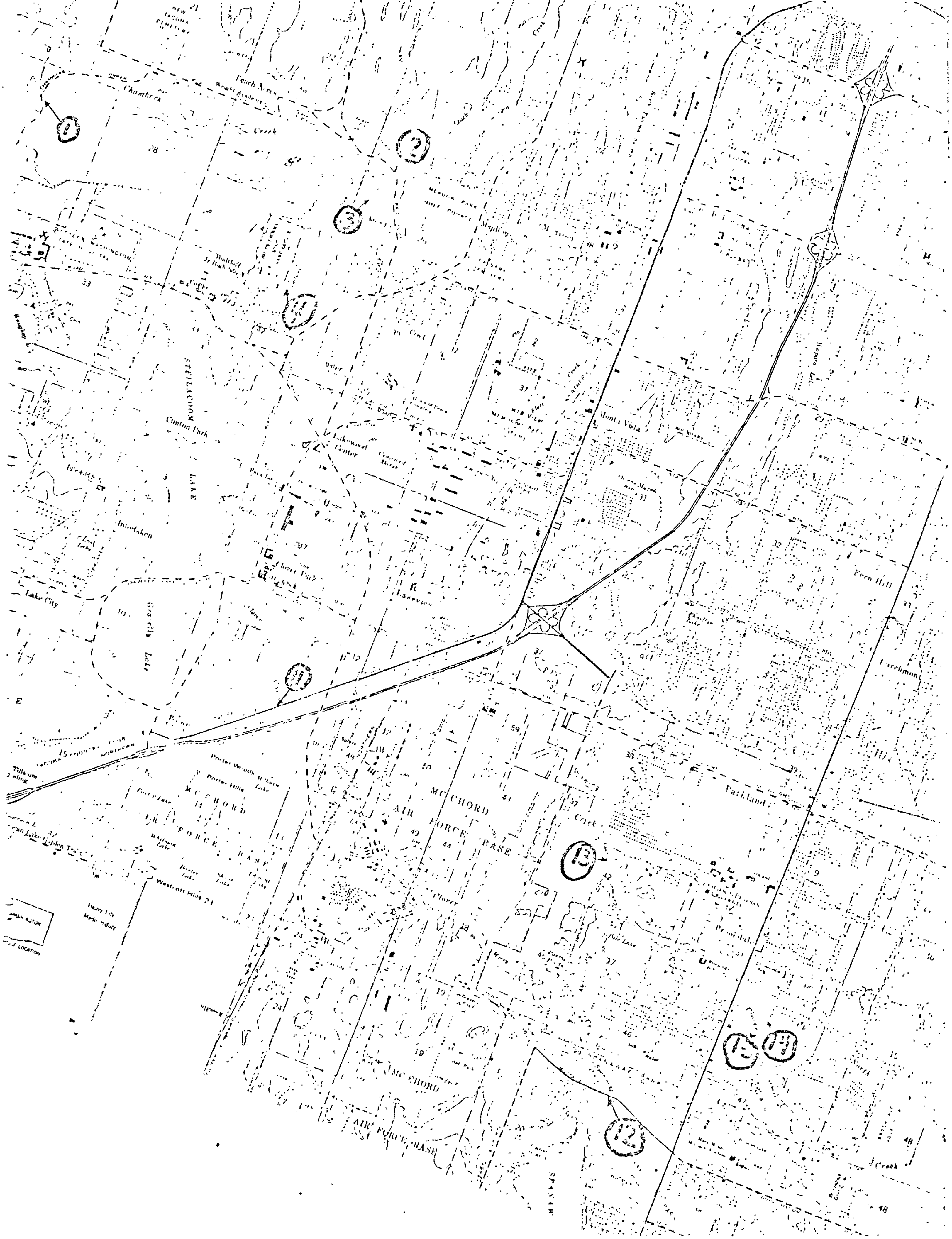
DATE:	FILTERED NO_2-N				UNFILTERED NH_3-N				UNFILTERED T. Kjeldahl-N				UNFILTERED Total -			
STATION:	8-11	2-2	3027	9-26	8-11	2-2	3-27	9-26	8-11	2-2	3-27	9-26	8-11	2-2	3-27	9-26
1.	.01	.01	.01	---	.02	.00	ND	ND	.22	.41	.03	.10	.08	.17	.05	.08
2.	.00	.01	ND	---	.00	.00	.02	.02	.04	.42	.04	.04	.07	.17	.06	.06
3.	.00	.01	.01	---	.04	.00	ND	ND	.04	.50	.05	.68	.05	.17	.11	.19
4.	.00	<.01	ND	---	.02	.00	ND	.02	.30	.31	.03	.16	.05	.13	.02	.15
11.	.01	<.01	ND	---	.02	.00	ND	.04	---	.35	.03	.24	---	.12	.01	.03
12.	<.01	<.01	ND	---	.04	.00	ND	.08	.20	.29	.03	.18	.04	.09	.01	.06
13.	---	<.01	ND	---	---	.00	ND	.02	---	.19	.03	.18	---	.16	.05	.02
14.	---	.01	ND	---	---	.17	ND	---	---	.59	.07	---	---	.13	.11	---
15.	---	<.01	ND	---	---	.01	ND	ND	---	.21	.02	.02	---	.15	<.01	.03

17/05

DISSOLVED OXYGEN AND TEMPERATURE

		8-11-72	2-2-72	% Saturation	3-27-72	% Saturation	9-26-72	% Saturation
1	DO ppm	---	12.6	98	11.0	99	9.1	85
	T°C	---	3.7		9.3		11.1	
2	DO	---	12.4	99	10.8	95	10.1	90
	T°C	---	4.4		8.5		9.3	
3	DO	---	13.4	99	11.0	98	10.2	92
	T°C	---	1.7		8.9		9.5	
4	DO	---	12.4	99	11.7	95	9.2	90
	T°C	---	4.5		9.6		13.0	
11	DO	---	11.2	87	10.3	90	9.05	84
	T°C	---	3.7		8.2		10.5	
12	DO	---	13.9	109	11.8	106	7.6	74
	T°C	---	4.0		9.2		12.7	
13	DO	---	12.2	99	12.3	108	12.2	109
	T°C	---	5.0		8.1		9.0	
14	DO	---	9.6	89	12.0	103	---	---
	T°C	---	.5		7.3		---	
15	DO	---	9.6	89	11.9	104	10.1	89
	T°C	---	.5		8.1		8.6	

17/06



Chambers
Peach Acres
Creek
STEILACOOM
LAKE
Clinton Park
Interlaken
Lake City
Gravelly Lake
Lakewood Center
Clover Park
Lakeview
Monta Vista
Fern Hill
Larchmont
Parkland
MC CHORD
AIR FORCE BASE
Porter Woods
Porter Hills
Westcott Hills
Tillicum
Brookdale
MC CHORD
AIR FORCE BASE
1
2
3
4
11
12
13
14
15