

JOHN SPELLMAN  
Governor



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, LU-11 • Olympia, Washington 98504 • (206) 753-2353

M E M O R A N D U M  
March 11, 1983

To: Files  
From: John Bernhardt and Tim Determan *JD*  
Subject: Progress Report No. 1, Burley Lagoon and Minter Bay Survey

This is the first in a series of status reports on the Minter Bay/Burley Lagoon bacteriological survey. These reports are completed every other month with the first being due on or about March 15, 1983.

Ambient Monitoring

The ambient monitoring task, a major aspect of the overall survey with the purpose of providing data on existing conditions in the two estuaries, was initiated on January 10, 1983. Results to date for fecal coliforms, a key parameter, are summarized in Table 1.

Violations of the freshwater standard of 100 colonies per 100 mL in Burley and Purdy creeks have been sporadic. The sampling runs of January 10-11 and February 21-22 bracketed a month-long period with no observed violations. However, sampling was not full-scale during this span because the Burley ambient network had not yet been fully established. No violations of the 14 colonies/100 mL marine standard have occurred in Burley Lagoon since sampling began nor has the oyster tissue standard of 230 colonies/100 grams been violated.

Minter Bay experienced some water quality violations during the first sampling (January 10-11) with only one violation recorded since (February 21-22 marine sample).

Additional data are required before any conclusions can be drawn concerning the ambient data. However, the data suggest intermittent violations are occurring in both estuaries and their feeder streams. Contributing factors are being evaluated.

### Storm Events

As of this writing, one storm event has been monitored in Minter Bay. Storms obviously have a substantial and immediate impact on this bay as shown in the attached report. A storm event in Burley Lagoon also was monitored during the week of March 7-11. The results are not available as of this writing.

### Source Surveys

One purpose of the storm event and ambient data is to provide information on general areas of streams where coliform sources exist. The data collected thus far are being analyzed with the intent being to perform detailed, in-field surveys starting the week of March 14-18. An attempt will be made to identify specific sources during these surveys. Each stream will be walked for its entire length, if possible, and any suspected sources sampled for fecal coliforms. Both wet- and dry-weather conditions will be represented.

### Land-use Survey

This task has not been initiated as of this writing. Some pertinent information will be collected during the source surveys; however, major effort will not occur until later in the spring. The Soil Conservation Service (SCS) has indicated an interest in this area of work. A cooperative project between this department and SCS is a possibility which is being explored.

### Personnel

Dale Norton, an experienced water quality specialist, was hired to assist the project leader - Tim Determan. Dale will remain with the project for its duration -- until March 31, 1984.

### Quality Assurance

Oyster tissue samples collected on February 28, 1983, were split with the Department of Social and Health Services (DSHS) to ensure compatibility of results. Each laboratory analyzed duplicate samples. The results follow:

<u>Laboratory</u>	<u>Sample A</u>		<u>Sample B</u>	
	<u>Fecal Coliform</u>	<u>Total Coliform</u>	<u>Fecal Coliform</u>	<u>Total Coliform</u>
DSHS (Seattle laboratory)	78	270	45	790
Dept. of Ecology (Tumwater)	80	1,600	50	≥2,400

Memo to Files  
Progress Report No. 1, Burley Lagoon and Minter Bay Survey  
Page Three

The fecal coliform results were very close with higher variability with the total coliform data. High variance is not unusual with total coliform analyses. The standard presently applied for shellfish sanitation purposes is expressed in terms of fecal coliform with the standard being 230 colonies per 100 grams of tissue.

JB:cp

Attachments

Table 1. Summary of Burley Lagoon and Minter Bay fecal coliform sampling data.

Sampling Location	Sampling Results					
	January		February		March	
	10-11	17-18	7-8	21-22	14-15	21-22
<u>BURLEY LAGOON</u>						
<u>Burley Creek</u>						
Headwaters (BU 5.2)	--	--	--	21		
Lower Creek (BU 0.6)	--	--	--	/379/		
Near Mouth (BU 0.3)	36	--	89	/184/		
Unnamed Trib. (X 0.2)	--	--	--	<1		
<u>Purdy Creek</u>						
Headwaters (P 3.6)	--	--	--	4		
Near Mouth (P 0.1)	/122/	14	5	/255/		
Unnamed Trib. (V 0.0)	--	--	--	3		
<u>Bear Creek</u>						
Headwaters (BR 1.8)	--	--	--	3		
Near Mouth (BR 0.0)	--	53	--	58		
<u>Marine Waters</u>						
Mid-lagoon (BES)	10	3	14	5		
Lagoon Outlet (BEX)	5	4	6	<1		
Oyster Tissue	--	230	130	50		
<u>MINTER BAY</u>						
<u>Minter Creek</u>						
Headwaters (M 4.4)	46	5	3	34		
Lower Creek (M 1.3)	88	21	15	41		
Near Mouth (M 0.0)	48	42	12	24		
<u>Huge Creek</u>						
Headwaters (H 3.1)	11	2	1	4		
Near Mouth (H 0.1)	14	25	9	16		
<u>Unnamed Creek</u>						
Headwaters (UN 2.0)	/114/	16	2	29		
Near Mouth	78	15	5	7		
<u>Marine Waters</u>						
Mid-bay (MES)	/63/	10	5	9		
Bay Outlet (MEX)	/75/	3	3	/17/		
Oyster Tissue	/1,300/	230	20	15		

     means either a water or tissue standard was violated.

NOTE: All of the analyses are Membrane Filter (MF) except for the shellfish tissue which are Most Probable Number (MPN).



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, LU-11 • Olympia, Washington 98504 • (206) 753-2353

M E M O R A N D U M  
February 16, 1983

To: Files  
From: John Bernhardt *JB*  
Subject: Minter Bay Storm Event

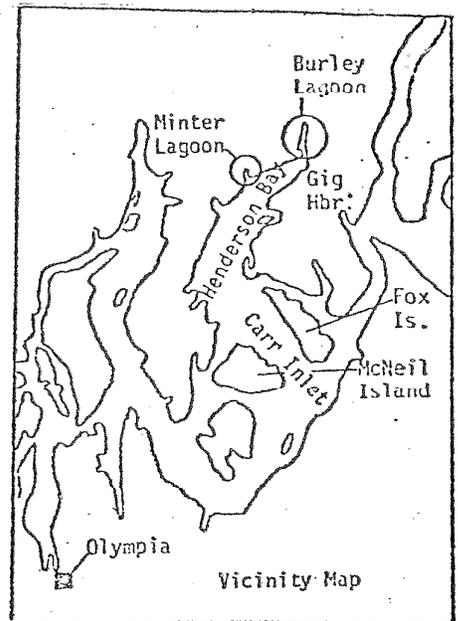
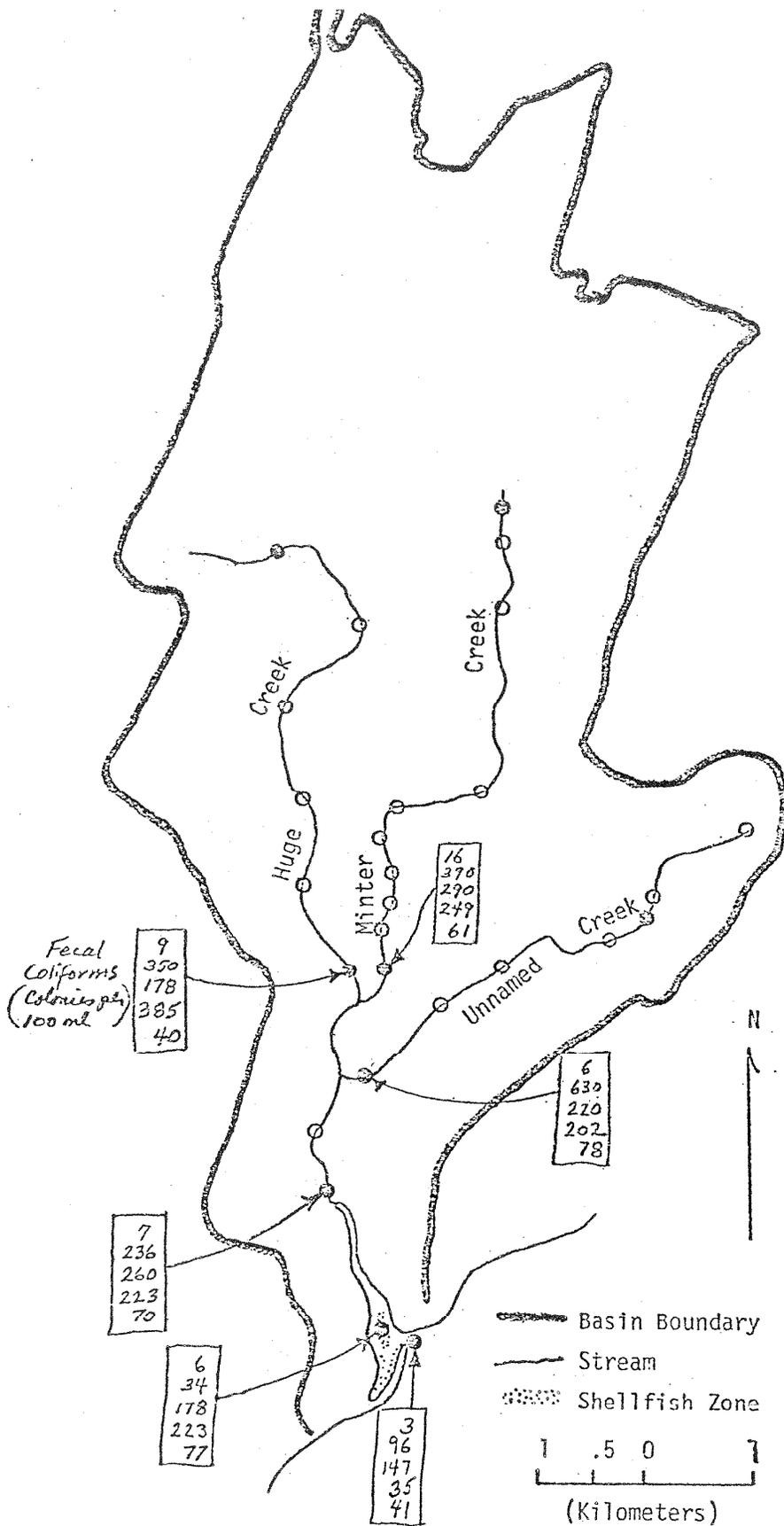
For reference, the state water quality standards for the Minter Bay area are:

- (A) Freshwater - Fecal coliforms shall not exceed a geometric mean value of 100 organisms/100 mL, with not more than 10 percent of samples exceeding 200 organisms/100 mL.
- (B) Marine - Fecal coliforms shall not exceed a geometric mean of 14 organisms/100 mL, with not more than 10 percent of samples exceeding 43 organisms/100 mL.

The fecal coliform standards for both fresh- and marine waters were substantially violated during the February 9-10 storm event monitored. Several things are apparent, based on an initial review of the data collected:

1. Bacterial levels in both the creeks and estuary increased quickly after the onset of rain;
2. Bacterial levels in all three major tributaries of the watershed (Huge, Minter, and Unnamed creeks) increased about the same amount; and
3. Bacterial levels in the bay dropped quickly as rainfall declined and stream flow dropped.

JB:cp



Sample Dates	Rainfall inch/day
3/8	0
2/9	1.17
4/9	↓
2/9	↓
2/10	.47

Figure 1. MINTER BAY AND ASSOCIATED DRAINAGE BASIN

