



STATE OF WASHINGTON

WA-15-1400

DEPARTMENT OF ECOLOGY

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M E M O R A N D U M

May 16, 1983

To: Dick Cunningham  
From: John Bernhardt <sup>JB</sup> and Tim Determan <sup>TAD</sup>  
Subject: Minter Bay and Burley Lagoon

We have collected four months of water quality monitoring data on Burley Lagoon and Minter Bay as of this writing. Our ambient monitoring data show:

1. Burley Lagoon has experienced one water quality violation and no shellfish tissue violations for fecal coliforms (FC) since sampling began on January 10, 1983. FC violations have occurred in some feeder streams; and
2. Minter Bay has experienced intermittent water quality violations and one shellfish tissue violation. The shellfish violation occurred during a period of extreme storm conditions that has not been duplicated. Some violations have occurred in the feeder streams.

The ambient monitoring data to date are shown in Table 1. Median fecal coliform levels for the marine/shellfish data are:

	Burley		Minter		
	median	%>43	median	%>43	
BES	5	0	MES	15	38(3)
BEX	5	0	MEX	12	13(1)
		%>230		%>230	
Oyster	60	0	Oyster	50	14(1)**

\*Number of times exceeded out of eight samples.  
\*\*Number of times exceeded out of seven samples.

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The marine water and shellfish analyses for fecal coliforms are performed using the MPN procedure. Thus, our data are comparable to that collected by DSHS and the Food and Drug Administration (FDA). One quality assurance check between our laboratory and DSHS's has been performed with good results for fecal coliforms in oyster tissue:

<u>Laboratory</u>	<u>Sample A</u>	<u>Sample B</u>
DSHS (Seattle)	78	45
WDOE (Tumwater)	80	50

We have been using MPN for the marine water samples since March and MPN for the oyster tissues for the entire project.

We cannot at this point explain why DSHS and the FDA observed higher fecal coliform levels than our monitoring indicates. There are a number of possibilities which we plan to investigate in detail during the next few months. It may be seasonal variation, interpretive problems associated with short-term studies, something to do with sample handling, or something else.

Because of the difference in WDOE and DSHS results, if provisional re-certification is considered a viable option for Burley Lagoon, several things should be done before going ahead:

1. Split another set of samples between our lab and DSHS (quality assurance);
2. Collect oyster samples at several bay locations to verify if our mid-bay ambient stations are truly representative; and
3. There is a difference in WDOE and DSHS sample collection procedures. We collect our samples directly from the bay while DSHS collects theirs from the shoreside or barge waiting to be processed. Something may be occurring after the oysters leave the water. We could determine if there is a difference by sampling the same groups of oysters under both circumstances.

We have begun to collect data relating to these questions and should be completed during late May or June.

The ambient data suggest that Burley Lagoon might be a candidate for provisional certification based on water and shellfish monitoring results. The provisional certification may be based on rainfall. This approach has been used by DSHS in several other areas. The intensity of the current monitoring effort provides a measure of safety should

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rainfall-related water quality problems develop later. Provisional recertification might be possible for Minter Bay, also. However, additional data are needed before this should be seriously considered.

Rainfall and oyster tissue fecal coliform data thus far collected from Burley Lagoon and Minter Bay are shown in Figure 1. These data show that tissue counts have corresponded fairly well with rainfall. As previously mentioned, the single tissue violation occurred after a period of high rainfall.

Any plan for provisional certification should consider possible seasonal effects to FC densities in shellfish. Past studies have shown that counts tend to increase at higher temperatures due to greater physiological activity. Thus, counts may increase in the summer despite reduced watershed loads.

JB:TAD:cp

Attachment

cc: Dale Norton

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

Sampling Location	Sampling Results							
	January		February		March	April		May
	10-11	17-18	7-8	21-22	21-22	4-5	18-20	2-3
<b>BURLEY LAGOON</b>								
<u>Burley Creek</u>								
Headwaters (BU 5.2)	--	--	--	21	1	7	2	12
Lower Creek (BU 0.6)	--	--	--	<u>/379/</u>	17	46	<u>/58/</u>	<u>/85/</u>
Near Mouth (BU 0.3)	36	--	<u>/89/</u>	<u>/184/</u>	25	<u>/202/</u>	<u>/69/</u>	<u>/71/</u>
Unnamed Trib. (X 0.2)	--	--	--	<1	<1	1	<1	2
<u>Purdy Creek</u>								
Headwaters (P 3.6)	--	--	--	4	2	1	<1	2
Near Mouth (P 0.1)	<u>/122/</u>	14	5	<u>/255/</u>	6	46	9	<u>/95/</u>
Unnamed Trib. (V 0.0)	--	--	--	3	1	9	<1	2
<u>Bear Creek</u>								
Headwaters (BR 1.8)	--	--	--	3	1	4	49	17
Near Mouth (BR 0.0)	--	<u>/53/</u>	--	<u>/58/</u>	40	<u>/76/</u>	7	22
<u>Marine Waters</u>								
Mid-lagoon (BES)	10	3	14	5	3*	<1*	6*	5*
Lagoon Outlet (BEX)	5	4	6	<1	4*	6*	<u>/20*/</u>	7*
Oyster Tissue	--	230	130	50	70	50	11	130
<b>MINTER BAY</b>								
<u>Minter Creek</u>								
Headwaters (M 4.4)	46	5	3	34	71	4	1	2
Lower Creek (M 1.3)	<u>/88/</u>	21	15	41	<u>/54/</u>	12	23	32
Near Mouth (M 0.0)	48	42	12	24	24	15	12	28
<u>Huge Creek</u>								
Headwaters (H 3.1)	11	2	1	4	1	<1	<1	<1
Near Mouth (H 0.1)	14	25	9	16	24	15	7	21
<u>Unnamed Creek</u>								
Headwaters (UN 2.0)	<u>/114/</u>	16	2	29	2	4	51	35
Near Mouth (UN 0.0)	<u>/78/</u>	15	5	7	3	<u>/64/</u>	<u>/63/</u>	22
<u>Marine Waters</u>								
Mid-bay (MES)	<u>/63/</u>	10	5	9	<u>/62*/</u>	12*	<u>/17*/</u>	<u>/71*/</u>
Bay Outlet (MEX)	<u>/75/</u>	3	3	<u>/17/</u>	<u>/43*/</u>	13*	2*	10*
Oyster Tissue	<u>/1,300/</u>	230	20	15	130	80	11	5

/ means either a water or tissue standard was violated.

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

\*Most Probable Number water sample.

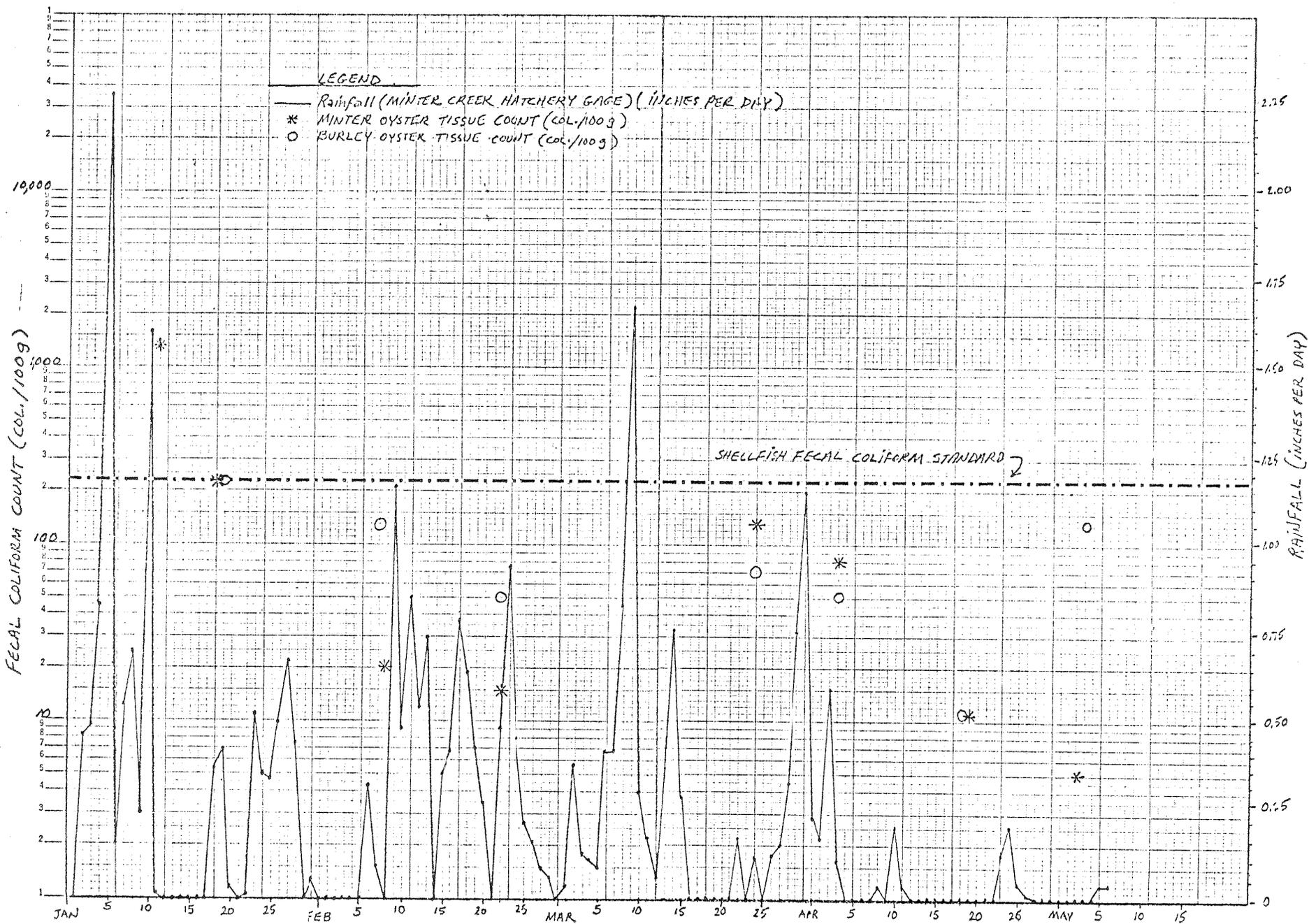


Figure 1. Summary of oyster tissue and rainfall sampling data collected from Burley Lagoon and Minter Bay during 10 January 1983 through 7 May 1983.