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A Bacteriological Assessment
of Brackley Bay and
Covehead Bay, Queens Co.
(Shellfish Area, P.E.I. No. 3)

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Surveillance Report EPS 5-WP-72-18
Atlantic Region

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A BACTERIOLOGICAL ASSESSMENT

of

BRACKLEY BAY AND
COVEHEAD BAY, QUEENS CO.,
(SHELLFISH AREA PEI #3)

by

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Environmental Protection Service
Halifax, N. S.

for

Shellfish Bacteriological Surveillance
Environmental Protection Service

Report Number EPS 5-WP-72-18

January, 1973.

QUESTION 1

1.1.1. The following is a list of the names of the members of a club:

John, Mary, Peter, Susan, Tom, and Victoria.

1.1.2. The following is a list of the names of the members of a club:

John, Mary, Peter, Susan, Tom, and Victoria.

1.1.3. The following is a list of the names of the members of a club:

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1.1.4. The following is a list of the names of the members of a club:

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1.1.19. The following is a list of the names of the members of a club:

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1.1.20. The following is a list of the names of the members of a club:

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ABSTRACT

The tidal waters of Brackley and Covehead Bays, were surveyed bacteriologically during the 1972 tourist season. Both adjoining bodies of water are adjacent to the National Park and other recreational tourist facilities. Sectors of coliform pollution were detected and significant sources of pollution were noted.

The existing shellfish closure, covering the total of both bays, was implemented following a physical sanitary survey in 1966.

This report identifies the sections of pollution, and makes recommendations to rescind the existing closure #3-7. The report further recommends the implementation of a new closure as shown in Figure 1, allowing for the continued closure of Brackley Bay only.

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1. INTRODUCTION

In compliance with a proposal adopted by the Inter-departmental Shellfish Committee Meeting in Ottawa in March, 1972, a bacteriological survey of tidal waters in Brackley Bay and Covehead Bay was carried out by the Mobile Laboratory, Environmental Protection Service, Atlantic Region during June and July 1972.

Following a request in 1970 by the National Parks Superintendent at Stanhope, P.E.I. for a reassessment of shellfish closure #3-7, a survey was conducted during September 1971. A proposal was made in the 1971 report for further survey work to arrive at a more definite conclusion on the water quality in Brackley Bay and Covehead Bay.

A survey was conducted in 1972 by the Mobile Laboratory located in Charlottetown and the sampling and analysis were carried out in conjunction with the sanitary data and the observations noted are compiled for consideration in this report.

The bacteriological survey on Brackley Bay and Covehead Bay was carried out to determine the adequacy of the existing shellfish closure #3-7 during the summer tourist season, and to evaluate the bacteriological water quality in the shellfish growing waters.

A total of 228 water samples were collected from the 50 designated sampling stations and the sampling times were so

arranged as to obtain samples representing conditions at different tidal phases (see Table 1).

A sanitary investigation of the shoreline and surrounding watershed was conducted during the sampling period for evidence of actual or potential sources of coliform pollution.

Salinity determinations were made each day from a composite of water samples collected to determine the dilution effect of rainfall and induced landwash (see Table 2).

Weather data was obtained from Department of the Environment, Atmospheric Environment Service for the area. Parameters such as wind velocity and direction, atmospheric temperature, precipitation and cloud cover were recorded for consideration in this report (see Tables 3 and 4).

2. METHODS

All samples were tested for coliform bacteria by the methods outlined in A.P.H.A. "Recommended Procedures for the Bacteriological Examination of Sea Water and Shellfish", Fourth Edition, 1970. Coliform and fecal coliform densities were determined from all samples by MPN methods using Bacto-Lauryl Tryptose Broth with three or five tubes in each of at least three consecutive decimal dilutions with incubation at 35.5°C for 24 and 48 hours. Confirmation of all positive cultures were completed in (a) Bacto-Brilliant Green Bile Broth with incubation at 35.5°C for 24 and 48 hours; and

in (b) Bacto- E.C. medium with incubation for 24 hours at 44,5°C in a recirculating water bath.

Salinity determinations were made by the Knudsen Method from composite samples. Salinities were expressed as parts per thousand (PPT).

Samples were obtained from the 50 sampling stations with the aid of a rod sampling device. These samples were placed into sterile 8-ounce glass bottles and transported to the Mobile Laboratory within one hour of collection. The samples were immediately inoculated into prepared fermentation tubes in the appropriate graduated quantities for incubation.

3. RESULTS

The location of a total of 50 water quality sampling stations included in the study are shown in Figure 1. Coliform and fecal coliform MPN counts for the 228 water samples collected are recorded in Table 5.

Sampling stations #1-#4, inclusive represent the waters flowing from Mill Creek and Auld Creek, tributaries to Covehead Bay. The median coliform values of these stations for five samplings was within the acceptable limits.

Sampling stations #5-#34 inclusive, represent the waters of Covehead Bay and Covehead Harbour. The median coliform values of these stations for five samplings were within the acceptable limit

during the variable sampling conditions (see Table 5).

Sampling stations #35-#50 inclusive, represent the waters of Brackley Bay and tributaries, i.e. McCullum Creek and Black River. The median coliform values for these stations were, in most instances, higher than acceptable values. The exceptions to these higher values was in the deeper waters at Stations #39, #40 and #46.

Salinity determinations for the composited daily samples show a range differential of 3.0 PPT. The flow of fresh water from the four tributaries (two in Brackley Bay and two in Covehead Bay) into the survey area would account for these differences in salinity values.

Climatological data, as provided by the Department of the Environment, Atmospheric Environment Service, for the area report 0.06 inches of precipitation during the June sampling period, and 0.69 inches during the July sampling period for a total of 0.75 inches.

The sanitary investigation of the shoreline and watershed revealed a number of sources of pollution gaining access to the shoreline waters. The tourist accommodations adjacent to sampling stations #35-#38 inclusive, and near the tributary waters of McCullum Creek and Black River are reflected by the data for stations #41-#45 inclusive, and #46-#50 inclusive.

4. DISCUSSION

The sampling stations used during this survey are the same

locations as those monitored in the 1971 study, (Manuscript Report #A.R. -71-5, Division of Public Health Engineering, Department of the Environment), and were designated to reflect the effect of pollution sources, if any, from within the surrounding watershed.

The bacteriological data of this report documents the presence of high coliform counts within the study areas. The sanitary investigation revealed the locations of sanitary waste outfalls entering the shoreline waters from: (a) two large tourist homes within the watershed to sampling stations #35-#38, (b) a tourist motel and farming activity in the watershed to stations #41-#45, (c) a large camping and recreational operation on the Black River. This latter source has package treatment plant although it was not operating during the survey period.

No effect of landwash was observed due to the minimal rainfall during the study period. More than the normal tourist population and activity was evident in the surrounding area during the study period. Thus the data should be representative of the peak of the tourist season.

5. CONCLUSIONS

Based on the bacteriological information presented in this report, it may be concluded that:

- (a) the waters of Covehead Bay are of satisfactory water quality and the pollution sources identified appear not to significantly affect the bacteriological

status of the water quality of the surrounding area.

- (b) the bacteriological condition of the water in Brackley Bay was unsatisfactory as the bacterial counts were above acceptable standards; this was the result of a number of untreated sanitary waste sources and the subsequent volume of contaminants gaining access to the bay waters,
- (c) a reduced closure area is reasonable and meets with criteria for National Shellfish Standards for Shellfish Growing Waters.

6. RECOMMENDATIONS

It is recommended:

- (a) that Shellfish Closure #3-7, as defined by the Prince Edward Island Fishery Regulations, P.C. 1972-520, March 21, 1972, on Brackley Bay and Covehead Bay be rescinded.
- (b) that a shellfish closure on Brackley Bay, Prince Edward Island be implemented as follows: the waters inside a line from McMillan Point to a point on the north shore off Brackley Bay as indicated on Figure 1, and to be so marked with appropriate shellfish closure monuments with numbers.

TABLE 1. Tidal Phase and Sampling Time for
 Brackley Bay-Covehead Bay, Queens
 Co., (Shellfish Area PEI #3)

DATE 1972	TIDAL PHASE		SAMPLING TIME (hrs)
	HIGH TIDE (hrs)	LOW TIDE (hrs)	
June 27	0530	1400	0930-1200
July 5	1210	1220	1430-1630
July 12	0630	1415	1200-1400
July 16	0930	1600	0930-1200
July 18	1040	1620	1000-1200

TABLE 2. Salinity Results of Composite samples collected from Brackley Bay and Covehead Bay, P.E.I. Shellfish Area #3, during June of 1972.

DATE 1972	SALINITY PARTS PER THOUSAND
June 27	21.6
July 6	20.
July 12	19.4
July 16	18.6
July 18	20.8

TABLE 3. Climatological Data for Brackley Bay-
Covehead Bay, P.E.I., Shellfish Area #3.

DATE 1972	SAMPLING TIME (hrs)	WATER TEMP. °C	AIR TEMP °C	WIND VELOCITY DIRCTION (mph)
June 27	0930-1200	18°	21°	SW 10-15
July 5	1330-1530	17°	24°	W 5-10
July 12	1200-1400	19°	22°	W 0- 5
July 16	0930-1200	18°	20°	NW 5-10
July 18	1000-1200	17°	19°	NW 10-15

TABLE 4. Rainfall Data for Brackley Bay-Covehead Bay, P.E.I., Shellfish Area #3.

DATE 1972	Precipitation in inches
June 28	0.02
June 29	0.04
July 1	0.17
July 3	0.02
July 4	0.29
July 10	0.04
July 13	0.17
.	
TOTAL	0.75

TABLE 5. Coliform and Fecal Coliform Data for Brackley Bay-CoveHead Bay, P.E.I. Shellfish Area #3, 1972.

Station No.	Coli- form June 27	Coli- form July 5	Coli- form July 12	Coli- form July 16	Coli- form July 18	Median Coli- form F.C.				
1	79	13	240	79	23	8	11	8	23	8
2	49	23	23	8	70	13	27	8	27	8
3	350	240	110	79	22	5	79	33	110	79
4	110	13	49	13	33	5	130	49	49	13
5	13	5	<2	<2	<2	<2	8	2	5	2
6	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
7	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
8	<2	<2	<2	<2	5	<2	<2	<2	<2	<2
9	<2	<2	<2	<2	2	<2	<2	<2	<2	<2
10	8	49	<2	<2	<2	<2	<2	<2	<2	<2
11	13	79	5	<2	23	8	5	<2	13	5
12	5	<2	2	2	<2	<2	8	2	2	2
13	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2

TABLE 5. Cont'd

Station No.	June 27		July 5		July 12		July 16		July 18		Median Coliform
	Coliform	F.C.	Coliform	F.C.	Coliform	F.C.	Coliform	F.C.	Coliform	F.C.	
14	<2	<2	<2	<2	<2	8	2	<2	<2	<2	<2
15	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2
16	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
17	<2	<2	<2	<2	<2	<2	<2	13	<2	<2	<2
18	8	2	<2	<2	<2	2	<2	<2	<2	<2	<2
19	<2	<2	<2	<2	13	<2	<2	2	<2	<2	<2
20	<2	<2	<2	<2	<2	5	<2	<2	<2	<2	<2
21	<2	<2	<2	<2	<2	13	8	<2	<2	<2	<2
22	<2	<2	<2	<2	5	<2	<2	<2	<2	<2	<2
23	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
24	8	2	23	8	5	8	<2	<2	<2	8	<2
25	<2	<2	49	5	5	<2	<2	34	8	5	<2
26	5	5	8	2	23	2	<2	<2	<2	5	2

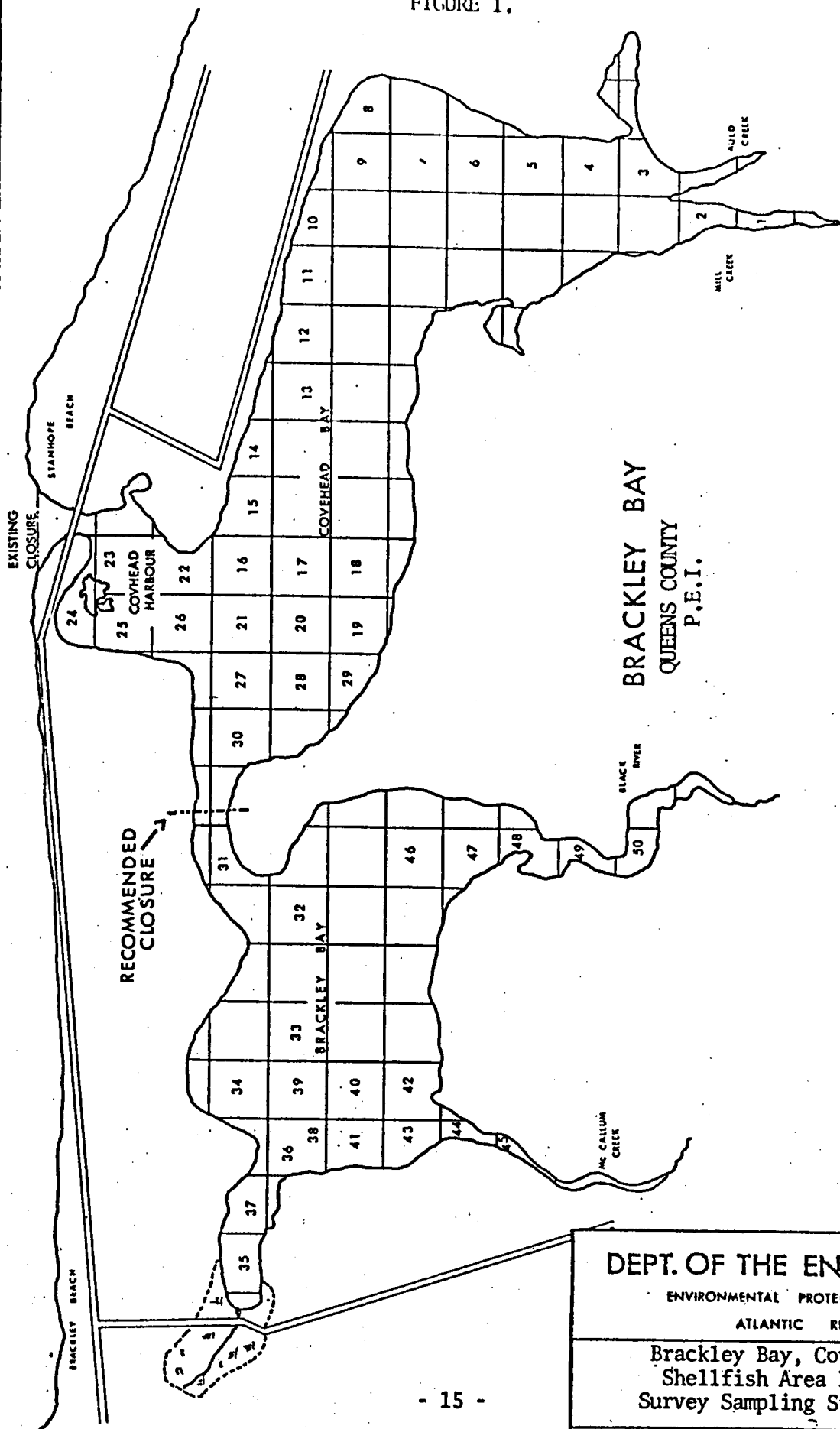
TABLE 5. Cont'd

Station NO.	Coli- form F.C. June 27	Coli- form F.C. July 5	Coli- form F.C. July 12	Coli- form F.C. July 16	Coli- form F.C. July 18	Median Coli- form F.C.
27	8 2	8 <2	49 8	23 5	<2 <2	8 2
28	8 5	2 <2	<2 <2	<2 <2	8 <2	2 <2
29	5 2	<2 <2	<2 <2	<2 <2	2 <2	<2 <2
30	<2 <2	<2 <2	<2 <2	<2 <2	5 2	<2 <2
31	<2 <2	<2 <2	<2 <2	23 <2	<2 <2	<2 <2
32	5 2	<2 <2	<2 <2	33 5	<2 <2	<2 <2
33	23 23	8 2	<2 <2	<2 <2	21 8	8 2
34	<2 <2	<2 <2	23 8	49 13	<2 <2	<2 <2
35	920 240	1600 540	350 79	220 79	350 350	350 240
36	49 23	170 79	220 170	95 33	1600 240	170 79
37	49 23	79 33	240 130			79 33
38	920 350	540 130	540 79			540 130
39	<2 <2	23 <2	49 13			23 <2

TABLE 5. Cont'd

Sample No.	Coll- form June 27	F.C. July 5	Coll- form July 12	F.C. July 16	Coll- form July 18	Median Coll- form P.C.
40	49 +	33 8	8 8			33 8
41	1600 +	540 240	920 540			920 540
42	540	95 33	350 110			350 110
43	150	220 79	350 95			220 95
44	920	540 240	1600 240			920 240
45	1600 +	540 540	1600 350			1600 540
46	<3	8 <2	5 5			5 <3
47	1600 +	13 5	49 23			49 23
48	1600 +	1600 340	920 350			1600 350
49	1600 +	1600 540	1600 350			1600 350
50	1600 +	1600 1600	1600 1600			1600 1600

FIGURE 1.



BRACKLEY BAY
QUEENS COUNTY
P.E.I.

DEPT. OF THE ENVIRONMENT
ENVIRONMENTAL PROTECTION SERVICE
ATLANTIC REGION

Brackley Bay, Covehead Bay,
Shellfish Area P.E.I. #3
Survey Sampling Station 1972

SCALE:	DATE: 1/17/72	DWG. NO.
DRAWN:	CHECKED: [Signature]	APPROVED:



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