

# OCEANOGRAPHICAL STATION LIST

VOLUME 81

COASTAL INVESTIGATIONS OFF PORT HACKING,  
NEW SOUTH WALES, IN 1961

DIVISION OF FISHERIES AND OCEANOGRAPHY  
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL  
RESEARCH ORGANIZATION, AUSTRALIA 1968

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## VOLUME 81

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New South Wales, in 1961

### I. INTRODUCTION

This report records the data collected during the regular working of two stations off Port Hacking by M.V. Saga in 1961. The position of the Port Hacking 50 m station is latitude 34°05'S. and longitude 151°13'E.; the depth of water is 50-60 m. The 100 m station is latitude 34°05'30"S. and longitude 151°15'30"E.; the depth of water is 100-120 m.

### II. METHOD OF COLLECTION AND ANALYSIS OF SAMPLES

#### 1. Physics

Temperature.—Water temperatures were taken with deep-sea reversing thermometers, and readings were corrected for thermal expansion.

Sigma-t.—Sigma-t values were computed from temperature and chlorinity values using the equations of Knudsen (La Fond 1951).

#### 2. Chemistry

Chlorinity.—A chlorinity-temperature meter of the conductivity type (Hamon 1956) was used to measure chlorinity.

Dissolved Oxygen.—A version of the standard Winkler method was used to determine the amount of dissolved oxygen in the sea-water samples. The version used is a modification of that described by Thompson and Robinson (1939) and differs in some respects from the revision by Jacobsen, Robinson, and Thompson (1950). Potassium iodate was used as the iodometric standard, and the reagents necessary to fix the oxygen in solution were used at different concentrations (Rochford 1963). Duplicate titrations were made on approximately every tenth sample. Saturation values were computed using the simpler of the equations given by Richards and Corwin (1956) -

$$O_2 (\% \text{ Satn.}) = \frac{O_2 (\text{ml/l}) \times (33.5 + T^\circ\text{C}) \times 100}{332.4 - (1.854 \times S\text{‰})}$$

Inorganic Phosphate.—The method of Atkins (1923) was used with 1 ml molybdate reagent (300 ml 10% w/v ammonium molybdate and

100 ml 50% v/v sulphuric acid) and 0.1 ml 1% w/v stannous chloride diluted afresh from a 40% stock solution in hydrochloric acid, which was kept under paraffin. The reagents were dispensed automatically by a piston dispenser.

Standard phosphate solutions were made up in distilled water. At air temperatures less than 25°C, analyses were carried out in batches of 10; readings were begun within 10 min of adding reagents, and completed within 10 min. At air temperatures greater than 25°C, batches of 6 were analysed; readings were commenced within 5 min of adding reagents, and completed within 7 min. Each batch was compared with a distilled water blank and a 0.65  $\mu\text{g-atom/l}$  standard in a Hilger Spekker absorptiometer using 4 cm cells and Ilford 608 filters. Each day a complete calibration was made using standards up to 3.25  $\mu\text{g-atom/l}$ . Results are given as  $\mu\text{g-atom/l}$  with no correction for salt error and are precise to  $\pm 10\%$  for values less than 0.5  $\mu\text{g-atom/l}$ , and  $\pm 5\%$  for higher values. To correct for salt effects, the results given should be multiplied by 1.15.

Total Phosphorus.—100 ml samples were drawn from the Nansen bottles into 150 ml Pyrex conical flasks, 0.2 ml of 72% perchloric acid was added, and digestion at 200°–250°C carried out immediately on a sand tray. After evaporation of water, heating was continued until fuming of the salt residue commenced. The samples were then allowed to cool and 100 ml of distilled water and 2 drops of 2% w/v phenolphthalein were added. If alkaline, flasks were allowed to stand for about 24 hr to allow the salts to dissolve. Phosphate was then determined as described above for inorganic phosphate. To correct for salt effects, the results given should be multiplied by 1.15.

Particulate Phosphorus.—125 ml of sea-water were filtered through a HAWP 04700 Millipore membrane. The first 10–15 ml were discarded. A 100 ml filtered sample was then collected and digested for total phosphorus. The difference between the filtered and unfiltered total phosphorus values is expressed as particulate phosphorus.

Nitrate.—After collection, water samples were stored in plastic bottles and preserved with 2 drops of saturated  $\text{HgCl}_2$ . Nitrate was determined at Cronulla by the strychnidine method (Rochford 1947). The reagent was prepared by adding 0.64 g of strychnidine to a litre of nitrate-free sulphuric acid. Five ml of this reagent were added, with minimum agitation, to 5 ml sea-water or standard nitrate solution. The standards were made up in a mixture of equal volumes of artificial sea-water and nitrate-free sulphuric acid. The standards and samples were

shaken to distribute the reagent, and the colour developed for 2 hr. The solutions were read in a Unicam SP 600 spectrophotometer at a wavelength of 530 m $\mu$  using a 5 mm cell. Samples with an absorbance greater than the standard corresponding to 14.4  $\mu$ g-atom/l were diluted with artificial sea-water/sulphuric acid mixture before reading. Results are given in  $\mu$ g-atom/l.

### 3. Zooplankton

A Clarke-Bumpus sampler fitted with a flowmeter and with a net of No. 4 mesh nylon (62 meshes per in.) was used. A series of horizontal and oblique hauls was made. The duration of hauls was 5-60 min, and the usual volume filtered was 5-10 m<sup>3</sup>.

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### III. DATA

Hydrology data were processed in a C.D.C. 3600 Computer. An explanation of headings used is given at the beginning of each listing.

DATA  
PART 1  
HYDROLOGY



## EXPLANATION OF HEADINGS

Part 1Hydrology

DATE	Given as day/month/year
TIME	Given in Zone Time, and is Eastern Australian Standard Time, GMT +10 hr, Code K
LATITUDE LONGITUDE	Given in degrees and minutes
DEPTH	Actual sampling depth, given in metres
TEMP.	Sea temperatures recorded in °C
CHLORINITY	Given in parts per thousand
SIGMA-T	Sigma-t to 2 decimal places
OXYGEN	Given in ml/l
OXYGEN % SAT.	Oxygen percentage saturation
I.P., PART P, TOTAL P, and NITRATE	Inorganic phosphorus, particulate phosphorus, total phosphorus, and nitrate given in µg-atom/l

\*\*\* indicates no data available

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HAUKING	4/ 1/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	20.10	19.39	24.78	5.24	105	0.16	***	0.47	0.1
10	19.30	19.59	25.27	5.32	105	0.23	***	0.49	0.1
20	19.15	19.52	25.19	5.34	105	0.13	***	0.43	0.1
30	17.80	19.63	25.69	4.84	93	0.23	***	0.65	0.1
40	16.80	19.63	25.94	4.53	85	0.47	***	0.61	5.7
50	15.40	19.60	26.23	4.31	79	0.64	***	0.53	5.7
75	14.45	19.58	26.39	4.53	81	0.71	***	1.10	7.0
100	14.92	19.51	26.18	4.62	84	0.71	***	1.22	7.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HAUKING	10/ 1/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	20.70	19.63	24.95	5.32	108	0.11	***	0.33	2.6
10	19.00	19.60	25.43	5.26	104	0.20	***	0.33	2.4
20	17.65	19.67	25.78	5.14	98	0.25	***	0.33	3.1
30	16.35	19.64	26.00	4.44	83	0.55	***	0.73	3.9
40	16.35	19.61	26.02	4.30	80	0.75	***	0.91	5.4
50	15.95	19.61	26.11	4.32	80	0.88	***	0.88	5.7
75	15.55	19.58	26.16	4.43	81	0.71	***	1.12	5.7
100	13.60	19.54	26.50	4.60	81	0.73	***	0.85	6.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	11/ 1/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.62	19.50	25.04	4.60	91	0.22	***	0.85	3.2
10	16.95	19.64	25.92	5.47	103	0.32	***	0.47	3.5
20	17.42	19.63	25.79	4.43	89	0.65	***	0.65	4.4
30	15.58	19.60	26.18	4.24	78	0.62	***	0.81	6.4
40	14.52	19.58	26.38	3.65	69	0.69	***	***	7.5
50	13.80	19.55	26.47	3.62	68	0.78	***	***	6.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	24/ 1/61	1346 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.95	19.75	24.76	5.14	106	0.11	0.16	0.27	2.7
10	21.40	19.75	24.92	5.14	105	0.11	0.12	0.29	2.6
20	21.40	19.74	24.91	5.20	107	0.29	0.47	0.78	2.4
30	21.05	19.74	25.00	5.20	106	0.25	0.07	0.38	2.2
40	19.55	19.68	25.34	4.95	98	0.29	***	0.63	2.7
50	17.00	19.59	25.84	4.76	90	0.63	***	0.67	3.4
75	14.15	19.56	26.41	4.37	78	0.83	0.04	0.94	6.8
100	13.40	19.51	26.51	4.55	60	0.81	0.11	1.01	7.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	25/ 1/61	0959 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	22.00	19.50	24.41	5.08	102	0.10	0.20	0.50	3.0
10	21.30	19.64	24.80	5.01	99	0.11	0.15	0.55	2.5
20	19.00	19.63	25.39	4.56	86	0.37	0.38	0.55	3.4
30	15.90	19.60	26.10	4.16	74	0.67	0.21	0.96	5.0
40	16.60	19.56	25.88	4.52	82	0.37	0.13	0.57	3.7
50	18.50	19.55	25.41	4.38	82	0.56	0.02	0.69	4.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	31/ 1/61	1210 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.45	***	***	5.25	***	***	***	0.58	2.6
10	20.20	***	***	5.39	***	0.19	0.23	0.66	2.6
20	18.40	***	***	4.79	***	0.47	0.15	0.96	3.3
30	16.20	***	***	4.06	***	0.70	0.21	1.11	5.3
40	15.00	***	***	3.89	***	0.78	0.13	1.28	6.8
50	14.90	***	***	3.89	***	0.84	***	1.04	7.3
75	13.70	***	***	4.23	***	0.82	0.41	1.28	7.1
100	13.55	***	***	4.40	***	0.83	0.17	1.02	7.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	7/ 2/61	1120 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I. P.	PART P	TOTAL P	NITRATE
0	21.90	19.70	24.71	4.96	99	0.15	0.14	0.44	2.9
10	21.50	19.70	24.62	4.96	99	0.17	0.11	0.28	2.6
20	21.50	19.68	24.80	5.02	100	0.17	0.22	0.40	2.5
30	20.70	19.68	25.01	5.02	98	0.14	0.21	0.41	1.9
40	17.00	19.66	25.93	4.23	77	0.58	0.08	0.66	3.7
50	16.00	19.60	26.08	3.84	68	0.83	0.04	0.94	5.3
75	14.80	19.57	26.31	3.84	67	0.74	0.14	0.96	5.1
100	14.00	19.54	26.44	4.06	69	0.80	0.12	0.92	7.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	8/ 2/51	1016 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I. P.	PART P	TOTAL P	NITRATE
0	21.60	19.64	24.71	4.79	95	0.25	0.18	0.62	2.6
10	20.40	19.67	25.08	4.91	96	0.23	0.08	0.42	2.4
20	17.90	***	***	***	***	***	***	***	2.8
30	15.00	19.60	26.00	3.84	67	0.77	0.00	0.77	5.1
40	15.20	19.56	26.23	3.95	69	0.65	0.15	1.00	4.9
50	14.75	19.57	26.32	3.95	69	0.96	0.08	1.04	6.8

STATION                      DATE                      TIME                      LATITUDE                      LONGITUDE  
 PORT HACKING                      15/ 2/61                      1046 K                      34   5 S                      151 13 E

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.45	19.69	24.82	***	***	0.08	0.12	0.36	0.7
10	21.35	19.69	24.85	***	***	0.12	0.06	0.28	0.9
20	21.25	19.68	24.86	***	***	0.09	0.08	0.42	0.9
30	20.40	19.64	25.04	***	***	0.10	0.00	0.56	0.1
40	18.30	19.61	25.24	***	***	0.37	0.18	0.70	2.1
50	17.00	19.60	25.85	***	***	0.53	0.10	0.82	4.7

STATION                      DATE                      TIME                      LATITUDE                      LONGITUDE  
 PORT HACKING                      14/ 2/61                      1010 K                      34   5 S                      151 16 E

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.70	19.69	24.75	5.08	101	0.26	0.02	0.38	1.1
10	21.18	19.69	24.90	5.02	99	0.23	0.00	0.26	2.1
20	20.50	19.66	25.04	5.08	99	0.22	0.18	0.46	0.4
30	20.10	19.66	25.15	5.08	98	0.26	0.16	0.44	0.1
40	19.70	19.64	25.23	4.85	93	0.34	0.20	0.62	3.3
50	18.80	19.62	25.42	4.46	84	0.45	0.23	0.68	1.7
75	14.70	19.56	26.31	4.12	72	0.86	0.04	0.90	7.1
100	14.20	19.56	26.42	4.12	71	0.95	0.00	0.96	8.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	21/ 2/61	1035 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	23.10	19.71	24.58	4.91	101	0.05	0.22	0.40	1.5
10	22.50	19.72	24.57	4.96	101	0.05	0.12	0.36	1.5
20	21.60	19.72	24.82	5.08	101	0.06	0.20	0.36	0.4
30	19.10	19.66	25.41	4.29	81	0.26	0.14	0.52	3.0
40	16.40	19.59	25.97	3.72	67	0.63	0.14	0.82	8.2
50	15.20	19.57	26.22	3.84	67	0.70	0.14	0.96	9.6
75	13.80	19.53	25.46	4.15	71	0.74	0.28	1.02	9.8
100	13.60	19.52	26.49	4.17	71	0.72	0.06	0.92	9.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	22/ 2/61	0954 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	22.20	19.58	24.46	5.30	107	0.17	0.08	0.50	0.7
10	21.45	19.61	24.71	5.08	101	0.13	0.16	0.64	1.2
20	18.40	19.61	25.52	4.59	77	0.46	0.08	0.78	3.5
30	14.85	19.56	26.28	3.84	67	0.68	0.08	1.02	7.7
40	14.15	19.54	26.40	3.95	68	0.74	0.00	0.98	8.4
50	13.80	19.53	26.46	4.12	70	0.80	0.20	1.16	8.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	28/ 2/61	1014 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	23.85	19.65	24.08	4.79	99	0.08	0.06	0.48	0.6
10	23.80	19.64	24.08	4.79	99	0.08	0.00	0.32	0.3
20	21.30	19.65	24.81	5.22	103	0.11	0.08	0.30	1.1
30	18.15	19.63	25.61	5.22	197	0.21	0.02	0.62	0.0
40	16.60	19.63	25.98	4.00	72	0.52	0.08	0.78	3.9
50	16.50	19.63	26.00	3.98	72	0.55	0.06	0.74	5.4
75	16.10	19.60	26.06	3.84	69	0.66	0.14	0.90	6.3
100	15.70	19.54	26.06	4.00	71	0.70	0.00	0.70	8.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	2/ 3/61	1110 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.45	19.57	24.66	4.91	97	0.20	0.04	0.66	2.2
10	21.00	19.58	24.60	4.79	94	0.18	0.06	0.64	2.4
20	16.40	19.59	25.49	4.23	79	0.47	0.16	0.90	4.9
30	17.10	19.60	25.82	4.12	75	0.56	0.06	0.92	6.1
40	16.85	19.60	25.88	4.00	73	0.60	0.08	0.90	5.7
50	16.22	19.60	26.03	3.89	70	0.68	0.04	0.88	5.0



STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	8/ 3/61	1030 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	23.40	19.69	24.27	4.84	100	0.13	0.16	0.52	0.3
10	23.40	19.69	24.27	4.84	100	0.09	0.04	0.46	0.6
20	22.75	19.66	24.42	4.90	100	0.10	0.18	0.46	0.2
30	20.62	19.63	24.97	4.79	94	0.23	0.16	0.60	0.8
40	18.65	19.62	25.47	4.50	85	0.35	0.10	0.70	1.8
50	17.90	19.64	25.68	4.33	80	***	***	0.82	2.3

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	15/ 3/61	K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	23.00	19.64	24.32	4.62	94	0.33	0.04	0.72	1.0
10	22.75	19.64	24.39	4.45	91	0.34	0.08	0.72	1.1
20	21.87	19.67	24.68	4.56	91	0.28	0.14	0.54	1.2
30	19.10	19.66	25.41	4.16	79	0.53	0.00	0.66	2.5
40	17.50	19.66	25.81	3.93	72	0.60	0.20	0.94	4.6
50	15.72	19.59	26.13	3.65	65	0.82	0.12	0.96	8.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	21/ 3/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	S-CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.82	19.52	24.49	4.87	97	0.07	0.00	0.34	0.0
10	20.24	19.64	25.08	4.98	97	0.19	0.20	0.50	0.0
20	18.25	19.72	25.71	4.09	76	0.36	0.16	0.52	3.2
30	18.10	19.72	25.74	4.20	78	0.39	0.08	0.66	4.2
40	17.75	19.69	25.79	4.03	75	0.47	0.00	0.66	5.5
50	16.78	19.63	25.94	3.92	71	0.43	0.36	0.82	7.8

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	22/ 3/61	1026 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	23.20	19.76	24.42	4.60	94	0.24	0.04	0.34	0.0
10	23.18	19.76	24.43	4.60	94	0.17	0.08	0.40	0.0
20	23.20	19.77	24.44	4.48	92	0.14	0.00	0.46	0.0
30	21.54	19.70	24.81	4.82	96	0.16	0.24	0.54	0.0
40	20.73	19.66	24.98	4.87	95	0.21	0.00	0.46	0.0
50	17.92	19.68	25.73	4.20	78	0.42	0.32	0.88	2.6
75	17.92	19.70	25.76	4.20	78	0.44	0.28	0.84	3.5
100	18.03	19.72	25.76	4.31	80	0.41	0.24	0.86	2.3

STATION: PORT HAKING DATE: 29/ 3/61 TIME: 1215 K LATITUDE: 34 5 S LONGITUDE: 151 13 E

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.00	19.64	24.88	5.58	110	0.13	0.08	0.27	0.0
10	19.02	19.64	25.40	4.50	85	0.30	0.17	0.47	3.0
20	17.03	19.65	25.90	4.32	79	0.47	0.00	0.47	7.2
30	16.90	19.64	25.92	4.26	77	0.55	0.00	0.55	7.5
40	16.85	19.64	25.94	4.26	77	0.56	0.00	0.56	8.2
50	16.82	19.64	25.94	4.20	76	0.58	0.00	0.58	6.8

STATION: PORT HAKING DATE: 29/ 3/61 TIME: 1136 K LATITUDE: 34 5 S LONGITUDE: 151 16 E

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.30	19.59	24.72	5.26	104	0.22	0.08	0.54	0.0
10	20.05	19.67	25.17	5.16	100	0.15	0.50	0.68	0.0
20	18.73	19.68	25.53	4.86	92	0.32	0.06	0.70	1.6
30	16.11	19.70	25.71	4.56	85	0.46	0.06	0.70	4.2
40	16.00	19.69	25.73	4.62	86	0.43	0.41	0.84	3.8
50	17.94	19.69	25.74	4.56	85	0.41	0.39	0.40	3.7
75	17.90	19.69	25.75	4.56	85	0.41	***	***	3.8
100	17.89	19.69	25.75	4.56	85	0.39	0.15	0.54	4.2

STATION	DATE	TIME	LATITUDE	LONGITUDE
PORT HACKING	4/ 4/61	1000 K	34 5 S	151 13 E
DEPTH	SIGMA-T	OXYGEN	I.P.	TOTAL P
TEMP.	CHLORINITY	OXYGEN % SAT.	PART P	NITRATE
0	19.67	5.28	0.39	0.56
10	19.67	4.98	0.32	0.64
20	19.67	4.80	0.45	0.45
30	19.57	4.50	0.56	0.56
40	19.67	4.38	0.56	1.16
50	19.57	4.38	0.54	1.08

STATION	DATE	TIME	LATITUDE	LONGITUDE
PORT HACKING	5/ 4/61	1020 K	34 5 S	151 16 E
DEPTH	SIGMA-T	OXYGEN	I.P.	TOTAL P
TEMP.	CHLORINITY	OXYGEN % SAT.	PART P	NITRATE
0	19.71	5.22	0.20	0.46
10	19.67	5.10	0.20	0.48
20	19.64	4.98	0.35	0.54
30	19.64	4.86	0.37	0.64
40	19.64	4.68	0.39	0.82
50	19.64	4.38	0.45	0.70
75	19.65	4.38	0.55	0.81
100	19.64	4.32	0.54	0.82

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	11/ 4/61	1125 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	21.30	19.71	24.89	5.02	99	0.14	0.04	0.52	0.0
10	21.09	19.73	24.98	5.13	101	0.17	0.00	0.46	0.0
20	20.24	19.80	25.30	4.96	96	0.18	0.10	0.54	0.0
30	19.96	19.79	25.36	4.74	92	0.20	0.00	0.70	1.0
40	19.40	19.79	25.51	4.79	92	0.32	0.00	0.58	1.2
50	18.72	19.75	25.63	5.20	99	0.30	0.28	0.76	1.6
75	18.20	***	***	4.17	***	0.39	0.14	0.70	3.4
100	18.09	19.74	25.77	4.40	82	0.37	0.02	0.64	4.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	12/ 4/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.05	19.64	25.39	4.95	94	0.34	0.36	1.00	0.2
10	18.60	19.69	25.53	4.90	92	0.32	0.10	0.80	0.2
20	18.55	19.70	25.60	4.72	89	0.37	0.12	0.84	1.1
30	18.18	19.72	25.72	4.67	87	0.49	0.10	0.70	2.9
40	18.00	19.73	25.78	4.44	83	0.45	0.10	0.64	2.7
50	18.00	19.70	25.74	4.44	83	0.51	0.06	0.80	2.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	18/ 4/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.94	19.71	25.77	5.21	97	0.19	0.04	0.62	0.9
10	17.90	19.73	25.81	5.04	93	0.19	0.08	0.82	0.2
20	17.90	19.73	25.81	5.10	95	0.24	0.20	0.70	0.4
30	17.95	19.72	25.78	4.99	93	0.21	0.06	0.64	0.0
40	17.92	19.72	25.79	4.99	93	***	***	0.64	0.0
50	17.84	19.70	25.78	4.99	92	0.24	0.04	0.64	0.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	19/ 4/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.85	19.74	25.32	5.21	100	0.05	0.00	0.30	0.0
10	19.80	19.75	25.35	4.78	92	0.09	0.08	0.36	0.0
20	19.58	19.79	25.46	4.60	88	0.19	0.12	0.50	0.0
30	19.01	19.78	25.60	5.43	103	0.17	0.06	0.29	0.2
40	19.80	19.78	25.39	5.37	103	0.13	0.00	0.18	0.0
50	***	19.77	***	4.71	***	0.26	0.02	0.70	0.0
75	17.92	19.72	25.79	5.37	100	0.44	0.16	0.74	1.8
100	17.78	19.71	25.81	5.43	100	0.43	0.00	0.61	1.5

STATION                      DATE                      TIME                      LATITUDE                      LONGITUDE  
 PORT HACKING                24/ 4/61                1340 K                34   5 S                151 13 E

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.15	19.65	25.88	4.85	89	0.43	0.00	0.43	2.7
10	17.10	19.66	25.90	4.62	84	0.42	0.10	0.52	3.2
20	17.10	19.67	25.92	4.57	83	0.38	0.10	0.58	3.2
30	16.95	19.66	25.94	4.46	81	0.48	0.02	0.50	4.2
40	15.65	19.60	26.10	4.06	72	0.54	0.00	0.54	7.2
50	14.75	19.56	26.30	4.12	72	0.70	0.03	0.73	8.0

STATION	DATE	TIME	LATITUDE	LONGITUDE
PORT HACKING	27/ 4/61	1100 K	34   5 S	151 16 E

  

DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.30	19.69	25.40	5.02	96	0.09	0.36	0.61	***
10	19.25	19.71	25.44	4.96	94	0.17	0.00	0.30	0.0
20	19.27	19.72	25.45	5.13	98	0.08	0.00	0.32	***
30	19.16	19.71	25.46	5.10	97	0.04	0.07	0.38	***
40	18.73	19.69	25.24	4.96	93	0.12	0.00	0.31	0.1
50	18.63	19.68	25.26	5.02	94	0.19	0.03	0.37	0.0
75	17.60	19.63	25.74	4.79	88	0.30	0.07	0.49	0.6
100	16.21	19.60	26.03	4.40	79	0.40	0.07	0.47	1.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	3/ 5/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.12	19.76	25.24	5.08	97	0.18	0.00	0.68	0.0
10	19.17	19.76	25.23	5.08	97	0.21	0.24	0.90	***
20	19.22	19.76	25.22	5.02	96	0.19	0.26	0.78	***
30	19.10	19.78	25.27	5.02	95	***	***	1.00	0.0
40	19.13	19.78	25.27	5.02	95	0.29	0.00	0.66	***
50	18.65	19.76	25.61	4.91	93	0.70	0.00	0.82	0.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	3/ 5/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.61	19.82	25.50	4.79	92	0.13	0.08	0.72	0.0
10	19.62	19.81	25.48	4.96	95	0.13	0.00	1.04	***
20	19.40	19.82	25.55	5.01	96	0.10	0.00	0.26	***
30	19.47	19.81	25.22	5.02	96	0.12	0.20	0.72	***
40	18.70	19.79	25.69	4.96	94	0.22	0.18	0.78	0.0
50	18.01	19.73	25.78	4.79	89	0.38	0.00	0.68	0.6
75	17.71	19.70	25.81	4.51	83	0.39	0.04	0.74	0.6
100	16.73	19.68	26.02	4.29	78	0.52	0.14	0.70	1.2



STATION		DATE		TIME		LATITUDE		LONGITUDE	
PORT HACKING		9/ 5/61		1015 K		34 5 S		151 16 E	
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.80	19.78	25.65	5.02	95	0.19	0.52	***	0.9
10	18.80	19.78	25.65	5.10	96	0.25	***	***	0.4
20	18.80	19.78	25.65	5.02	95	0.19	***	***	0.4
30	18.85	19.79	25.65	5.10	96	0.18	***	***	0.0
40	18.80	19.79	25.66	5.10	96	0.17	***	***	0.3
50	18.70	19.78	25.68	5.10	96	0.19	0.12	***	0.0
75	18.90	19.78	25.62	4.96	94	0.12	***	***	0.0
100	18.40	19.79	25.76	5.13	96	0.14	0.24	***	0.0

STATION		DATE		TIME		LATITUDE		LONGITUDE	
PORT HACKING		17/ 5/61		1000 K		34 5 S		151 13 E	
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.20	19.77	25.79	5.13	96	0.16	0.00	0.60	0.3
10	18.19	19.79	25.82	5.13	96	0.19	0.02	0.52	0.9
20	18.19	19.80	25.83	***	***	0.27	0.00	0.82	0.3
30	18.20	19.80	25.83	5.13	96	0.24	***	***	0.2
40	18.15	19.77	25.80	5.10	95	0.24	***	***	0.3
50	18.15	19.79	25.83	5.13	96	0.27	***	***	0.1

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PUPT HACKING	17/ 5/61	1030 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.35	19.79	25.78	5.19	97	0.18	***	***	0.3
10	18.25	19.78	25.79	5.10	95	0.14	0.30	0.94	0.4
20	18.25	19.79	25.80	5.19	97	0.18	***	***	0.4
30	18.25	19.79	25.80	5.13	96	0.15	***	***	0.6
40	18.35	19.78	25.76	5.10	96	0.26	***	***	0.4
50	18.30	19.79	25.79	5.10	95	0.16	0.14	0.80	0.4
75	18.30	19.79	25.79	5.13	96	0.22	1.08	1.66	0.4
100	18.20	19.75	25.76	4.96	93	0.24	***	***	0.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	23/ 5/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.60	19.79	25.71	5.15	97	0.12	0.32	1.08	0.3
10	18.33	19.78	25.77	5.10	95	0.07	0.28	1.17	0.3
20	18.20	19.80	25.83	5.10	95	0.15	0.44	1.21	0.3
30	18.32	19.80	25.80	5.10	95	0.12	0.38	0.88	0.2
40	18.22	19.79	25.81	5.10	95	0.14	0.38	0.64	0.2
50	18.20	19.77	25.79	5.10	95	0.19	0.06	0.39	0.4

STATION	DATE	TIME	LATITUDE		LONGITUDE				
PORT HACKING			34	5 S	151	16 E			
	24/ 5/61	1100 K							
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.82	19.78	25.69	5.30	100	0.19	0.00	0.56	0.4
10	18.60	19.79	25.71	5.24	99	0.19	0.44	0.74	0.4
20	18.58	19.79	25.72	5.30	100	0.23	0.00	0.98	0.4
30	18.45	19.79	25.73	5.13	96	0.22	0.38	0.82	0.1
40	18.40	19.61	25.52	5.30	99	0.19	0.10	0.87	0.4
50	18.32	19.71	25.67	5.30	99	0.24	0.00	0.56	0.3
75	18.33	19.78	25.77	5.30	99	0.22	0.88	1.16	0.6
100	18.35	19.78	25.76	5.30	99	0.17	0.28	0.74	0.1

STATION	DATE	TIME	LATITUDE		LONGITUDE				
PORT HACKING			34	5 S	151	15 E			
	29/ 5/61	1000 K							
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.31	19.66	25.61	5.41	101	0.24	0.28	0.52	0.0
10	18.30	19.78	25.78	5.41	101	0.13	0.06	0.42	0.1
20	18.30	19.78	25.78	5.36	100	0.21	0.00	0.40	0.2
30	18.32	19.77	25.76	5.30	99	0.13	0.16	0.58	0.0
40	18.25	19.78	25.75	5.30	99	0.14	0.00	0.49	0.2
50	18.13	19.78	25.82	5.24	98	0.24	0.32	0.58	0.2

STATION	DATE	TIME	LATITUDE			LONGITUDE			
PORT HACKING	31/ 5/61	1100 K	34	5	S	151	10	E	
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.41	19.65	25.57	5.18	97	0.26	0.94	1.40	0.3
10	18.42	19.76	25.72	5.30	99	0.25	0.00	0.53	0.2
20	18.40	19.76	25.72	5.13	96	0.31	0.00	0.42	***
30	18.39	19.76	25.73	5.18	97	0.21	0.18	0.58	0.0
45	18.42	19.76	25.72	5.13	96	0.26	0.00	0.48	0.0
50	18.35	19.76	25.74	5.36	100	0.22	0.00	0.26	0.1
75	18.25	19.76	25.76	5.13	96	0.25	0.36	0.78	0.7
100	18.19	19.74	25.75	5.07	95	0.28	0.18	0.70	0.7

STATION	DATE	TIME	LATITUDE			LONGITUDE			
PORT HACKING	14/ 6/61	1000 K	34	5	S	151	13	E	
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.50	19.75	25.93	5.47	101	0.21	0.45	0.66	0.1
10	17.50	19.75	25.93	5.39	99	0.23	0.14	0.44	0.0
20	17.40	19.75	25.96	5.47	100	0.23	0.35	0.58	0.0
30	17.48	19.75	25.94	5.36	99	0.24	0.22	0.46	0.2
40	17.50	19.74	25.92	5.41	100	0.27	0.20	0.70	0.0
50	17.42	19.74	25.94	5.44	100	0.31	0.29	0.60	0.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	15/ 6/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.53	19.74	25.91	4.46	82	0.14	0.16	0.36	1.0
10	17.50	19.74	25.92	4.54	84	0.19	0.00	0.39	1.2
20	17.51	19.74	25.92	4.68	86	0.23	0.00	0.40	0.7
30	17.43	19.74	25.94	4.57	84	0.21	0.28	0.64	0.6
40	17.49	19.74	25.92	4.74	87	0.20	0.26	0.52	1.0
50	17.52	19.74	25.91	5.19	96	0.21	0.04	0.34	1.0
75	17.50	19.74	25.92	4.37	80	0.15	0.26	0.56	0.7
100	17.20	19.71	25.95	5.02	92	0.41	0.16	0.62	1.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	21/ 6/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.30	19.77	26.01	5.08	93	0.40	0.12	0.76	0.4
10	17.22	19.78	26.04	4.94	90	0.29	0.08	0.50	0.8
20	17.21	19.78	26.04	4.85	89	0.41	0.06	0.50	0.6
30	17.18	19.78	26.05	4.96	91	0.34	0.20	0.54	0.6
40	17.18	19.78	26.05	4.85	89	0.17	0.28	0.62	0.8
50	17.10	19.79	26.06	4.62	84	0.25	0.10	0.40	0.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	27/ 6/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.70	19.78	26.17	5.30	96	0.20	0.10	0.52	1.2
10	16.65	19.78	26.18	5.25	95	0.23	0.16	0.60	1.1
20	16.61	19.77	26.17	5.19	94	0.19	0.08	0.54	0.9
30	16.60	19.79	26.20	5.22	94	0.20	0.24	***	0.8
40	16.60	19.79	26.20	5.08	92	0.21	0.18	0.60	10.0
50	16.58	19.79	26.21	5.13	93	***	***	0.60	0.9

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	28/ 6/61	1037 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.70	19.79	26.18	5.19	94	0.31	0.00	0.40	***
10	16.73	19.79	26.17	5.19	94	0.33	0.00	0.34	***
20	16.73	19.78	26.16	5.19	94	0.29	***	0.48	***
30	16.71	19.78	26.16	5.19	94	0.25	0.00	0.40	***
40	16.75	19.78	26.15	5.27	96	0.33	***	0.52	***
50	16.68	19.78	26.17	5.16	93	0.33	0.04	0.38	***
75	16.53	19.78	26.21	5.25	95	0.29	0.18	0.50	***
100	16.40	19.78	26.24	4.74	85	0.38	0.00	0.38	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	4/ 7/61	1008 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.F.	PART P	TOTAL P	NITRATE
0	16.58	19.79	26.21	5.30	96	0.31	0.00	0.58	1.1
10	16.61	19.79	26.20	5.30	96	0.33	0.00	0.48	1.0
20	16.62	19.78	26.18	5.27	95	0.35	0.42	0.89	1.2
30	16.60	19.78	26.19	5.13	93	0.36	0.00	0.61	1.5
40	16.60	19.78	26.19	5.25	95	0.34	0.10	0.58	1.5
50	16.60	19.78	26.19	5.36	57	0.34	0.24	0.88	1.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	5/ 7/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.73	19.79	25.93	5.31	98	***	***	0.70	***
10	17.04	19.74	26.03	5.34	97	0.26	0.50	0.94	***
20	17.12	19.76	25.04	5.31	97	0.29	0.00	0.58	***
30	***	19.76	***	5.17	***	0.27	0.02	0.52	***
40	16.96	19.76	26.08	5.25	96	0.29	0.08	0.66	***
50	16.96	19.76	26.08	5.17	94	0.29	0.04	0.64	***
75	16.92	19.76	26.09	5.14	94	0.32	0.00	0.76	***
100	16.20	19.73	26.21	5.14	92	0.35	0.26	0.90	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	10/ 7/61	1000 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.13	19.79	26.31	5.40	97	0.24	0.16	0.62	1.4
10	16.14	19.80	26.32	5.37	96	0.32	0.06	0.46	2.0
20	16.10	19.80	26.33	5.35	96	0.37	0.04	0.54	1.5
30	16.12	19.80	26.33	5.29	95	0.39	0.26	0.65	1.6
40	16.16	19.80	26.31	5.32	95	0.38	0.32	0.70	0.7
50	16.10	19.80	26.33	5.35	96	0.39	0.14	0.54	1.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	12/ 7/61	1026 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.18	19.78	26.29	5.46	98	0.22	***	0.22	1.0
10	16.20	19.78	26.28	5.43	97	0.25	0.18	0.68	1.3
20	16.16	19.78	26.29	5.46	98	0.26	0.16	0.64	1.0
30	16.13	19.80	26.33	5.40	97	0.32	0.04	0.54	0.8
40	16.25	19.80	26.30	5.35	96	0.32	0.14	0.64	1.3
50	16.20	19.80	26.31	5.35	96	0.27	0.00	0.40	1.2
75	16.18	19.80	26.31	5.37	96	0.22	0.00	0.53	0.9
100	16.15	19.79	26.31	5.37	96	0.27	0.34	0.74	1.3



STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	24/ 7/61	1026 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.43	19.75	26.42	5.41	96	0.36	0.18	0.66	1.4
10	15.42	19.77	26.45	5.36	95	0.37	0.14	0.68	1.5
20	15.40	19.77	26.45	5.36	95	0.43	0.12	0.64	1.5
30	15.37	19.77	26.46	5.36	95	0.50	0.00	0.50	1.5
40	15.36	19.77	26.46	5.36	95	0.33	0.22	0.72	1.5
50	15.40	19.77	26.45	5.41	96	0.36	0.00	0.54	1.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	31/ 7/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.70	19.72	26.31	5.39	96	0.31	0.28	0.64	1.8
10	15.62	19.76	26.39	5.30	94	0.32	0.20	0.60	1.5
20	15.60	19.76	26.39	5.33	94	0.34	0.00	0.64	2.0
30	15.60	19.76	26.39	5.36	95	0.26	0.00	0.66	1.5
40	15.55	19.76	26.40	5.33	94	0.32	0.14	0.66	1.9
50	15.35	19.74	26.42	5.30	93	0.33	0.06	0.70	1.9

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	1/ 8/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.80	19.77	26.36	5.50	98	0.28	0.08	0.48	1.0
10	15.80	19.77	26.36	5.50	98	0.28	0.00	0.58	1.0
20	15.81	19.77	26.36	5.47	97	0.27	0.06	0.52	1.0
30	15.79	19.77	26.36	5.47	97	0.33	0.16	0.56	***
40	***	19.77	***	5.33	***	0.28	0.10	0.48	1.3
50	15.71	19.77	26.38	5.30	94	0.27	0.16	0.56	1.3
75	15.41	19.75	26.42	5.19	92	0.36	0.00	0.60	2.4
100	15.00	19.71	26.46	5.05	88	0.40	0.06	0.72	2.9

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	7/ 8/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN X SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.14	19.70	26.41	5.56	98	0.30	***	0.46	1.2
10	15.12	19.72	26.44	5.56	98	0.26	0.14	0.60	1.0
20	15.11	19.72	26.45	5.50	96	0.31	***	0.46	1.1
30	15.11	19.71	26.43	5.56	98	0.33	0.10	0.54	***
40	15.27	19.71	26.40	5.53	97	0.32	0.14	0.68	1.1
50	15.14	19.70	26.41	5.50	97	0.38	***	0.54	1.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	8/ 8/61	1049 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.15	19.72	26.44	5.50	97	0.28	0.14	0.60	***
10	15.12	19.72	26.44	5.58	98	0.28	0.12	0.60	***
20	15.12	19.71	26.43	5.44	95	0.27	0.14	0.66	***
30	15.14	19.71	26.43	5.44	95	0.25	***	0.60	***
40	15.15	19.71	26.42	5.44	95	0.25	***	0.52	***
50	15.15	19.71	26.42	5.44	95	0.27	0.10	0.46	***
75	15.15	19.71	26.42	5.41	95	0.30	0.00	0.40	***
100	14.90	19.71	26.46	5.53	97	0.94	***	0.40	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	14/ 8/61	1025 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.40	19.69	26.34	6.52	115	0.19	0.14	0.48	0.0
10	15.30	19.69	26.36	6.19	109	0.29	0.21	0.60	0.7
20	15.12	19.69	26.40	5.61	98	0.33	***	0.33	2.2
30	15.10	19.69	26.41	5.55	97	0.40	0.24	0.74	1.8
40	14.95	19.69	26.44	5.87	103	0.31	0.23	0.64	1.0
50	15.00	19.69	26.43	5.90	103	0.30	0.24	0.60	0.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	16/ 8/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.61	19.71	26.32	6.19	110	0.12	0.52	0.52	***
10	15.45	19.71	26.36	6.25	110	0.13	0.46	0.46	***
20	15.52	19.71	26.34	6.19	109	0.20	0.82	0.82	***
30	15.47	19.70	26.34	5.73	101	0.21	0.02	0.02	***
40	15.20	19.70	26.40	5.61	99	0.37	0.96	0.96	***
50	15.15	19.70	26.41	5.55	97	0.42	0.16	0.76	***
75	15.17	19.74	26.46	5.55	97	0.31	0.72	0.72	***
100	14.59	19.69	26.32	5.55	96	0.42	0.46	0.46	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	19/ 8/61	1020 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.90	19.70	26.24	5.58	99	0.33	0.33	0.33	8.0
10	15.90	19.69	26.23	5.58	99	0.33	0.33	0.33	7.5
20	15.90	19.70	26.24	5.52	98	0.33	0.33	0.33	6.0
30	15.80	19.69	26.25	5.58	99	0.33	0.33	0.33	10.5
40	15.90	19.69	26.23	5.47	97	0.33	0.33	0.33	6.5
50	15.90	19.69	26.23	4.91	87	0.28	0.28	0.28	7.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	23/ 8/61	1005 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.22	19.70	26.17	5.64	101	0.28	0.09	0.22	0.3
10	16.15	19.69	26.17	5.73	103	0.30	0.24	0.34	0.4
20	16.10	19.70	26.19	5.64	101	0.33	***	0.20	0.5
30	16.00	19.69	26.20	5.70	102	0.27	0.12	0.25	0.3
40	15.90	19.69	26.23	5.67	101	0.29	0.18	0.33	0.5
50	15.40	19.68	26.33	5.15	91	0.29	0.07	0.21	0.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	28/ 8/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	14.80	19.71	26.30	6.07	106	0.22	0.52	0.96	0.4
10	15.40	19.70	26.35	5.93	105	0.20	0.26	0.56	0.4
20	15.40	19.70	26.35	5.61	99	0.26	0.14	0.60	0.4
30	15.20	19.70	26.40	5.61	99	0.18	***	0.34	0.9
40	15.20	19.70	26.40	5.64	99	0.25	0.70	1.08	0.4
50	15.20	19.70	26.40	5.73	101	0.30	0.12	0.42	0.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	28/ 8/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.30	19.70	26.38	5.84	103	0.13	0.24	0.60	0.1
10	15.30	19.70	26.38	5.81	102	0.22	0.32	0.74	0.2
20	15.20	19.70	26.40	5.61	99	0.29	0.24	0.62	0.6
30	15.30	19.69	26.36	5.58	99	0.28	0.10	0.50	0.5
40	15.20	19.70	26.40	5.61	99	0.25	0.08	0.58	0.5
50	15.20	19.70	26.40	5.73	101	0.27	0.08	0.50	0.5
75	15.10	19.69	26.41	5.78	101	0.22	0.10	0.54	0.5
100	14.80	19.69	26.47	5.67	99	0.22	0.18	0.52	0.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	4/ 9/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	14.80	19.53	26.25	5.72	99	0.20	0.22	0.80	0.0
10	14.75	19.54	26.28	5.44	95	0.18	0.10	0.58	0.4
20	14.70	19.54	26.29	5.51	96	0.23	0.16	0.48	0.5
30	14.80	19.54	26.26	5.67	99	0.19	0.26	0.58	0.6
40	14.75	19.54	26.28	5.74	100	0.18	0.04	0.50	0.2
50	14.50	19.54	26.33	5.69	98	0.22	0.06	0.52	0.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	5/ 9/61	1015 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	14.80	19.54	26.26	5.45	95	0.23	0.12	0.44	***
10	14.80	19.54	26.26	5.73	100	***	***	0.50	***
20	14.80	19.54	26.26	5.51	96	0.25	0.00	0.52	***
30	14.90	19.55	26.26	5.60	98	0.25	0.12	0.50	***
40	14.90	19.55	26.26	5.27	92	0.26	0.00	0.42	***
50	14.80	19.61	26.36	5.27	92	0.37	0.04	0.62	0.4
75	14.80	19.64	26.40	5.29	92	0.42	0.24	0.70	1.3
100	14.80	19.66	26.43	5.26	92	0.44	0.00	0.64	1.1

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	13/ 9/61	1025 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	15.17	19.52	26.16	6.12	107	0.19	0.20	0.58	***
10	14.92	19.53	26.22	6.03	105	0.17	0.24	0.62	0.1
20	15.00	19.55	26.23	5.95	104	0.24	0.14	0.58	***
30	15.03	19.56	26.24	5.82	102	0.19	0.14	0.50	***
40	15.01	19.56	26.25	5.76	101	0.19	0.02	0.54	***
50	14.95	19.57	26.27	5.96	104	0.25	0.32	0.70	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	14/ 9/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.25	19.63	26.06	5.96	107	0.17	0.24	0.58	***
10	16.20	19.63	26.07	5.89	106	0.12	0.20	0.54	***
20	16.20	19.65	26.10	5.78	104	0.17	0.20	0.50	***
30	16.10	19.65	26.13	5.78	103	0.17	0.18	0.48	***
40	16.10	19.64	26.11	5.80	104	0.27	0.18	0.48	***
50	16.20	19.65	26.10	5.87	105	0.18	0.08	0.46	***
75	15.90	19.58	26.07	5.60	100	0.37	0.08	0.58	0.1
100	15.10	19.65	26.35	4.94	87	0.54	0.14	0.72	2.3

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	20/ 9/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.05	19.62	26.10	5.35	96	0.31	0.16	0.50	0.4
10	15.95	19.62	26.14	5.41	96	0.36	0.08	0.50	0.4
20	15.90	19.63	26.14	5.35	95	0.40	0.12	0.48	0.4
30	15.91	19.62	26.13	5.47	97	0.36	0.12	0.54	0.7
40	15.90	19.63	26.14	5.35	95	0.39	0.00	0.58	0.4
50	15.95	19.61	26.10	5.52	98	0.36	0.10	0.54	0.4
75	15.90	19.61	26.12	5.29	94	0.35	***	***	0.4
100	15.30	19.60	26.24	5.47	96	0.44	0.12	0.60	0.6



STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	25/ 9/61	1025 K	34 5 S	151 14 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.35	19.66	26.08	5.58	100	0.19	0.38	0.68	***
10	16.20	19.66	26.12	5.58	100	0.20	0.24	0.50	***
20	15.90	19.64	26.16	5.52	98	0.34	0.16	0.58	0.3
30	15.70	19.64	26.20	5.15	91	0.30	***	0.66	0.7
40	15.40	19.63	26.26	4.94	87	0.39	0.12	0.78	1.4
50	15.10	19.64	26.34	4.65	81	0.49	0.04	0.78	2.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	26/ 9/61	1015 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	16.06	19.65	26.13	5.70	102	0.15	0.32	0.72	***
10	15.97	19.64	26.14	5.76	103	0.20	0.02	0.56	***
20	15.92	19.64	26.15	5.58	99	0.20	0.28	0.82	***
30	15.91	19.61	26.11	5.58	99	0.18	0.22	0.66	***
40	15.90	19.64	26.16	5.64	100	0.16	0.20	0.70	***
50	15.48	19.65	26.27	5.29	193	0.27	0.22	0.72	1.2
75	14.72	19.64	26.42	4.39	76	0.57	0.04	0.86	5.9
100	14.32	19.62	26.48	4.46	77	0.62	0.20	1.06	5.6

STATION	DATE	TIME	LATITUDE		LONGITUDE				
PORT HACKING			34	5 S	151	13 E			
	3/10/61	1030 K							
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.20	19.56	25.74	5.78	106	0.15	0.20	0.58	***
10	16.50	19.58	25.94	5.29	95	0.23	0.22	0.66	0.4
20	15.70	19.62	26.18	4.44	79	0.54	***	0.66	2.5
30	15.60	19.62	26.20	4.66	82	0.50	0.10	0.54	3.7
40	15.50	19.62	26.22	4.64	82	0.54	0.22	0.74	3.5
50	14.95	19.59	26.30	4.54	79	0.55	0.20	0.86	4.8

STATION	DATE	TIME	LATITUDE		LONGITUDE				
PORT HACKING			34	5 S	151	13 E			
	9/10/61	1350 K							
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.05	19.37	25.02	5.73	108	0.02	0.06	0.40	***
10	18.05	19.47	25.41	5.90	109	0.04	0.32	0.62	***
20	17.29	19.62	25.80	5.81	106	0.97	0.44	0.58	***
30	16.42	19.62	26.01	4.95	89	0.06	0.22	0.70	2.6
40	15.42	19.61	26.22	4.55	80	0.29	0.38	1.10	6.3
50	14.70	19.61	26.38	4.37	76	0.54	***	1.02	6.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	9/10/61	1240 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.90	19.76	25.60	5.47	104	0.15	0.14	0.56	0.4
10	19.00	19.76	25.57	5.55	105	0.21	***	0.34	0.5
20	19.15	19.77	25.55	5.44	103	0.21	0.24	0.52	***
30	18.63	19.77	25.68	5.52	104	0.13	0.36	0.68	***
40	18.20	19.76	25.77	5.58	104	0.14	0.08	0.48	***
50	17.30	19.75	25.98	5.64	103	0.16	0.04	0.36	***
75	15.80	19.70	26.26	4.66	83	0.42	0.16	0.74	4.4
100	15.70	19.62	26.18	4.43	79	1.25	1.14	1.74	6.8

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	19/10/61	1000 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.20	19.63	25.59	5.58	104	0.10	0.02	0.52	***
10	17.95	19.62	25.64	***	***	0.13	0.00	0.48	***
20	17.60	19.61	25.71	5.58	103	0.17	0.06	0.50	0.1
30	16.65	19.58	25.90	5.47	99	0.25	0.02	0.64	0.5
40	16.20	19.58	26.01	5.01	90	0.40	0.28	0.96	1.6
50	15.55	19.58	26.15	4.81	85	0.55	0.08	0.92	4.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PUPT HACKING	20/10/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.70	19.65	25.45	5.47	103	0.14	0.00	0.34	***
10	18.60	19.65	25.52	5.57	105	0.13	0.12	0.32	***
20	18.10	19.65	25.65	5.52	103	0.19	0.00	0.20	***
30	16.90	19.63	25.91	5.01	91	0.23	0.00	0.24	0.12
40	16.20	19.63	26.07	4.65	83	0.40	0.00	0.40	2.6
50	15.50	19.61	26.21	4.47	79	0.54	0.00	0.60	4.4
75	14.90	19.57	26.28	4.60	60	0.56	0.00	0.71	5.7
100	14.50	19.56	26.36	4.29	74	0.66	0.00	0.78	6.5

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	23/10/61	1030 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.50	19.61	25.49	5.56	104	0.11	0.04	0.42	***
10	18.40	19.62	25.53	5.56	104	0.11	0.04	0.44	***
20	18.10	19.60	25.58	5.58	104	0.17	0.10	0.52	***
30	16.90	19.60	25.87	5.14	93	0.32	0.18	0.88	0.9
40	15.90	19.59	26.09	4.65	83	0.57	0.14	0.92	3.4
50	15.20	19.57	26.22	4.43	78	0.73	0.06	0.94	5.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	24/10/61	1129 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.10	19.61	25.34	5.52	105	0.08	0.14	0.46	***
10	19.60	19.60	25.42	5.61	105	0.06	0.16	0.38	***
20	19.20	19.60	25.55	5.58	104	0.08	0.44	0.62	***
30	16.80	19.62	25.92	5.21	94	0.18	0.08	0.50	***
40	16.10	19.60	26.06	4.57	62	0.39	0.04	0.64	3.3
50	15.40	19.58	26.19	4.37	77	0.48	0.18	0.86	4.1
75	15.00	19.58	26.28	4.75	83	0.52	0.04	0.74	4.6
100	14.70	19.58	26.34	4.74	82	0.56	0.10	0.90	6.2

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	30/10/61	1010 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.90	19.63	25.67	5.64	105	0.16	0.10	0.40	***
10	17.53	19.63	25.76	5.53	102	0.18	0.06	0.54	***
20	17.40	19.63	25.79	5.44	100	0.22	0.32	0.78	0.2
30	17.50	19.63	25.77	5.53	102	0.20	0.36	0.68	0.1
40	17.70	19.63	25.75	5.53	102	0.21	0.36	0.60	***
50	17.50	19.63	25.77	5.61	103	0.21	0.14	0.40	***

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	31/10/61	1030 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.75	19.64	25.47	5.38	101	0.23	0.59	0.82	***
10	17.90	19.70	25.77	5.55	103	0.23	0.53	0.76	***
20	17.95	19.70	25.75	5.35	98	0.18	0.12	0.48	***
30	17.70	19.68	25.79	5.32	99	0.18	0.40	0.68	***
40	17.10	19.66	25.90	4.90	89	0.25	0.41	0.66	0.3
50	17.60	19.63	25.67	5.02	93	0.32	0.04	0.36	0.4
75	***	19.60	***	4.78	***	0.40	0.32	0.82	2.1
100	16.95	19.60	25.86	5.09	93	0.32	0.34	0.78	0.9

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	6/11/61	1015 K	34 9 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.80	19.57	25.81	5.30	98	0.46	0.10	0.80	1.0
10	16.95	19.57	25.82	5.24	95	0.38	0.14	0.78	1.5
20	16.25	19.58	25.99	5.55	99	0.38	0.26	0.76	2.1
30	16.00	19.58	26.05	4.84	66	0.45	0.20	0.80	2.6
40	15.65	19.57	26.12	4.67	83	0.51	0.28	0.88	3.6
50	15.30	19.57	26.20	4.59	81	0.60	0.16	0.88	5.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	7/11/61	1034 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.55	19.57	25.42	5.81	109	***	***	0.46	0.2
10	17.50	19.57	25.68	6.12	112	0.22	0.66	1.92	0.2
20	15.80	19.57	25.08	4.61	82	0.52	0.06	0.92	3.2
30	15.50	19.57	26.15	4.41	78	0.60	0.30	0.94	5.4
40	15.00	19.57	26.26	4.39	77	0.64	0.22	0.86	2.0
50	14.50	19.57	26.35	4.95	86	0.35	0.22	0.80	2.0
75	14.95	19.57	26.27	4.33	76	0.60	0.40	1.00	6.2
100	14.15	19.56	26.43	4.58	79	0.57	0.20	0.82	6.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	13/11/61	1006 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.36	19.61	25.23	5.63	109	0.11	0.22	0.46	***
10	18.07	19.61	25.60	5.63	105	0.13	0.12	0.42	***
20	15.90	19.60	26.10	4.67	83	0.43	0.36	0.88	2.2
30	15.12	19.59	26.26	4.21	74	0.63	0.08	0.90	4.6
40	14.80	19.59	26.33	4.10	71	0.75	0.18	0.96	5.5
50	14.61	19.59	26.38	4.09	71	0.82	0.18	1.08	5.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	14/11/61	1034 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.59	***	***	5.61	***	0.14	0.16	0.44	***
10	18.37	***	***	5.68	***	0.14	0.08	0.50	***
20	17.20	19.63	25.84	5.12	94	0.19	0.16	0.60	0.3
30	15.65	19.58	26.13	4.15	73	0.84	0.00	0.84	4.0
40	15.09	19.58	26.26	4.15	73	0.69	0.19	0.88	5.9
50	14.95	19.58	26.29	4.18	73	0.67	0.10	0.86	6.4
75	14.35	19.58	26.42	4.21	73	0.74	0.16	0.96	6.0
100	13.95	19.56	26.47	4.42	76	0.73	0.18	0.96	6.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	23/11/61	1030 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	17.87	19.90	24.67	5.01	92	0.49	0.19	0.93	2.8
10	15.25	19.57	26.21	4.02	71	0.70	0.28	1.02	5.7
20	15.10	19.56	26.23	4.04	71	0.76	0.24	1.06	5.7
30	14.11	19.54	26.41	3.87	66	0.86	0.14	1.24	7.4
40	14.45	19.54	26.34	3.93	68	0.76	0.02	1.10	7.3
50	14.35	19.53	26.35	3.65	63	0.79	0.00	1.12	7.4



STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	24/11/61	1115 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	13.60	18.60	24.08	5.58	104	0.39	0.26	0.76	2.3
10	16.30	19.45	25.76	4.30	77	0.62	0.24	0.98	3.9
20	16.20	19.60	26.03	4.30	77	0.55	0.10	0.86	4.2
30	16.20	19.60	26.03	4.27	76	0.58	0.26	0.96	3.9
40	16.00	19.61	26.09	4.22	75	0.68	0.32	1.02	4.5
50	16.30	19.60	26.08	4.10	73	0.53	0.04	0.78	4.6
75	15.30	19.56	26.18	3.36	59	0.79	0.37	1.16	5.1
100	14.20	19.52	26.37	3.70	64	0.89	0.12	1.20	6.4

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	29/11/61	1035 K	34 5 S	151 15 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.25	18.06	23.42	6.30	116	0.21	0.24	0.70	***
10	17.80	18.96	24.77	5.25	96	0.27	0.04	0.46	2.3
20	18.24	19.05	24.78	5.19	96	0.31	0.32	0.72	1.5
30	17.60	19.24	25.15	5.02	92	0.34	0.28	0.68	1.5
40	16.49	19.50	25.83	4.23	76	0.50	0.02	0.54	4.3
50	16.10	19.59	26.04	4.12	74	0.70	0.22	1.04	5.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	30/11/61	1035 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	18.03	18.65	24.29	5.25	97	0.23	0.08	0.60	1.2
10	19.86	19.62	25.16	5.25	101	0.14	0.04	0.28	***
20	19.30	19.36	24.94	5.25	100	0.13	0.10	0.40	***
30	19.30	19.64	25.33	5.25	100	0.18	0.08	0.34	***
40	18.30	19.68	25.64	4.65	87	0.36	0.18	0.54	0.6
50	17.90	19.68	25.74	4.46	83	0.39	0.10	0.52	1.9
75	16.18	19.61	26.05	4.23	76	0.52	0.18	0.72	4.6
100	15.10	19.57	26.24	3.84	67	0.77	0.19	0.96	6.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PCRT HACKING	4/12/61	1017 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.35	19.23	24.72	5.27	100	0.18	0.16	0.60	0.4
10	18.91	19.39	25.08	5.13	97	0.16	0.10	0.36	0.5
20	17.64	19.39	25.40	4.62	85	0.39	0.28	0.67	1.4
30	17.20	19.46	25.63	4.54	83	0.43	0.24	0.67	3.2
40	17.00	19.55	25.76	4.34	79	0.43	0.09	0.67	4.2
50	16.60	19.55	25.82	4.29	78	0.50	0.18	0.78	3.0

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	5/12/61	1100 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.73	19.29	24.74	4.06	78	0.17	0.16	0.42	0.5
10	19.40	19.34	24.89	5.58	106	0.18	0.20	0.46	0.4
20	19.60	19.39	24.91	5.53	106	0.15	***	***	0.0
30	19.28	19.49	25.13	5.25	100	0.17	0.00	0.26	0.0
40	17.91	***	***	4.74	***	0.36	0.26	0.62	2.5
50	17.13	19.55	25.74	4.29	78	0.46	0.08	0.56	4.0
75	15.90	19.61	26.12	4.29	76	0.59	0.22	0.84	6.7
100	14.75	19.56	26.30	4.85	84	0.68	0.22	0.98	7.6

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	12/12/61	1020 K	34 5 S	151 13 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.61	19.02	24.34	5.36	102	0.12	0.03	0.15	0.0
10	19.80	19.04	24.37	5.41	103	0.41	***	***	0.4
20	17.30	19.42	25.52	4.27	78	0.43	***	***	4.1
30	16.25	19.55	25.95	4.06	73	0.58	0.04	0.62	5.6
40	15.78	19.61	26.14	4.17	74	0.58	0.14	0.72	6.0
50	15.55	19.61	26.20	4.00	71	0.70	0.00	0.70	9.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	13/12/61	1030 K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	19.21	19.34	24.94	5.30	100	0.05	0.02	0.10	0.0
10	19.10	19.25	24.84	5.44	103	0.05	0.16	0.26	0.0
20	19.05	19.58	25.16	5.33	102	0.09	0.08	0.24	0.3
30	18.98	19.63	25.89	4.61	84	0.37	0.11	0.48	0.5
40	18.60	19.66	25.98	4.47	81	0.39	0.07	0.46	1.8
50	17.10	19.67	25.92	4.47	82	0.41	0.21	0.62	2.5
75	16.20	19.67	26.13	4.47	80	0.43	0.15	0.58	1.5
100	16.60	19.64	26.00	4.50	81	0.41	0.34	0.82	1.7

STATION	DATE	TIME	LATITUDE	LONGITUDE					
PORT HACKING	28/12/61	K	34 5 S	151 16 E					
DEPTH	TEMP.	CHLORINITY	SIGMA-T	OXYGEN	OXYGEN % SAT.	I.P.	PART P	TOTAL P	NITRATE
0	20.66	19.67	24.96	5.03	99	0.38	0.16	0.64	***
10	20.48	19.69	25.09	5.02	98	0.26	0.10	0.54	***
20	20.25	19.68	25.14	5.05	98	0.32	0.08	0.58	***
30	20.19	19.68	25.15	5.08	98	0.42	0.16	0.64	***
40	20.05	19.67	25.17	5.02	97	0.40	0.18	0.58	***
50	20.35	19.67	25.09	5.13	100	0.36	0.14	0.50	***
75	19.70	19.70	25.31	5.02	96	0.52	0.04	0.64	***
100	19.14	19.62	25.34	4.27	81	1.80	0.24	1.04	***

DATA  
PART 2  
ZOOPLANKTON

## HORIZONTAL TOWS

STATION  
PORT HACKING 100 m

LATITUDE LONGITUDE  
34°05'S. 151°16'E.

DATE	DEPTH	TIME	VOLUME FILTERED (m <sup>3</sup> )	BIOMASS (mg/m <sup>3</sup> )	LARGE ORGANISMS (mg)
4/1/61	0	1100 K	7.2	59.7	
	50	1100 K	7.4	160.9	29.7
	100	1159 K	6.3	28.6	
10/1/61	0	1056 K	8.9	50.6	
	50	1056 K	10.3	51.5	32.0
	100	1128 K	5.7	31.6	
24/1/61	0	1039 K	12.0	33.3	
	50	1039 K	9.9	134.2	
	100	1223 K	11.0	120.0	
31/1/61	0	1040 K	6.5	60.0	
	50	1040 K	8.9	61.8	
	100	1109 K	7.1	91.6	
7/2/61	0	1021 K	8.3	85.6	
	50	1103 K	3.2	196.7	
	100	1048 K	5.5	161.7	
14/2/61	0	1040 K	8.0	66.3	
	50	1040 K	6.2	87.1	
	100	1106 K	5.9	98.3	
21/2/61	0	1058 K	17.6	19.3	
	50	*	*	*	
	100	*	*	*	
28/2/61	0	1110 K	8.1	19.7	
	50	*	*	*	
	100	*	*	*	
7/3/61	0	1107 K	6.9	49.2	
	50	*	*	*	
	100	*	*	*	

\* indicates no data available

## OBLIQUE TOWS

STATION  
PORT HACKING 100 mLATITUDE LONGITUDE  
34°05'S. 151°16'E

DATE	DEPTH (m)	TIME	VOLUME FILTERED (m <sup>3</sup> )	BIOMASS (mg/m <sup>3</sup> )	
				WET	DRY
4/1/61	50-0	1221 K	5.0	282.0	22.75
	100-50	1221 K	4.9	59.1	6.85
	100-0	1242 K	9.2	238.0	*
10/1/61	50-0	1150 K	5.0	92.0	9.90
	100-50	1150 K	6.3	71.5	6.29
	100-0	*	*	*	*
24/1/61	50-0	1158 K	5.4	127.8	*
	100-50	1158 K	5.2	279.0	*
	100-0	1213 K	6.6	360.5	*
31/1/61	50-0	1148 K	2.1	266.2	25.55
	100-50	1148 K	3.7	143.2	16.82
	100-0	1132 K	3.5	125.8	*
7/2/61	50-0	1103 K	3.2	196.7	19.83
	100-50	*	*	*	*
	100-0	1048 K	5.5	161.7	*
14/2/61	50-0	1155 K	5.0	115.9	27.90
	100-50	1155 K	4.3	155.9	17.70
	100-0	1128 K	10.0	1160.0	*
21/2/61	50-0	1144 K	4.0	102.6	12.15
	100-50	*	*	*	*
	100-0	1121 K	9.4	75.6	*
28/2/61	50-0	1202 K	3.1	100.0	13.02
	100-50	*	*	*	*
	100-0	1136 K	7.4	63.6	*
7/3/61	50-0	1130 K	3.8	105.2	9.55
	100-50	*	*	*	*
	100-0	1147 K	5.7	150.8	*

\* indicates no data available

## OCEANOGRAPHICAL STATION LISTS

1. Hydrological and planktological observations by F.R.V. *Warreen* in south-eastern Australian waters, 1938–39
2. Hydrological and planktological observations by F.R.V. *Warreen* in south-eastern Australian waters, 1940–42
3. Hydrological and planktological observations by F.R.V. *Warreen* in south-western Australian waters, 1947–50
4. Onshore hydrological investigations in eastern Australia, 1942–50
5. Estuarine hydrological investigations in eastern Australia, 1940–50. Queensland: Nerang and Coomera Rivers, Moreton Bay and Brisbane River, Logan River, Dunwich Oyster Lease; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Tilligerry Creek, Hawkesbury River
6. Estuarine hydrological investigations in eastern Australia, 1940–50. New South Wales: Middle Harbour and Port Jackson, Georges River–Botany Bay
7. Estuarine hydrological investigations in eastern Australia, 1940–50. New South Wales: Port Hacking, Lake Illawarra, Shoalhaven River, Jervis Bay, Clyde River, Moruya River, Tuross River, Wagonga Inlet; Victoria: Port Phillip; Tasmania: Tamar River, Derwent River, Huon River, D'Entrecasteaux Channel, Pittwater, Lake Dobson (freshwater), Penna Dam (freshwater)
8. Hydrological investigations in south-western Australia, 1944–50
9. Records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1942–50. Queensland: Logan River; New South Wales: Richmond River, Clarence River, Macleay River, Hastings River, Manning River, Port Stephens, Hawkesbury River, Georges River, Port Hacking, Clyde River, Tuross River; Tasmania: Tamar River, Derwent River
10. Records of twenty-four hourly hydrological observations at Shell Point, Georges River, New South Wales, 1942–50
11. Analyses of bottom deposits in eastern Australia, 1946–50
12. Estuarine hydrological investigations in eastern and south-western Australia, 1951
13. Analysis of bottom deposits in eastern and south-western Australia, 1951 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1951
14. Onshore hydrological investigations in eastern and south-western Australia, 1951
15. Estuarine hydrological investigations in eastern and south-western Australia, 1952
16. Analysis of bottom deposits in eastern and south-western Australia, 1952 and records of twenty-four hourly hydrological observations at selected stations in eastern Australian estuarine systems, 1952
17. Onshore hydrological investigations in eastern and south-western Australia, 1952
18. Onshore hydrological investigations in eastern and south-western Australia, 1953
19. Onshore planktological investigations in eastern Australia, 1945–54
20. Surface sampling in the Tasman Sea, 1953
21. Estuarine hydrological investigations in eastern and south-western Australia, 1953
22. Further onshore planktological investigations in eastern Australia, 1945–54
23. Planktological investigations made by F.R.V. *Derwent Hunter* in eastern Australian waters, 1952–54
24. Onshore hydrological investigations in eastern and south-western Australia, 1954
25. Surface sampling in the Tasman Sea, 1954
26. Estuarine hydrological investigations in eastern and south-western Australia, 1954
27. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1955
28. Surface sampling in the Tasman and Coral Seas, 1955
29. Estuarine hydrological investigations in eastern and south-western Australia, 1955
30. Onshore and oceanic hydrological investigations in eastern and south-western Australia, 1956
31. Surface sampling in the Tasman and Coral Seas and the south-eastern Indian Ocean, 1956
32. Estuarine hydrological investigations in eastern and south-western Australia, 1956
33. Coastal hydrological investigations in eastern and south-western Australia, 1957
34. Coastal hydrological investigations at Port Hacking, New South Wales, 1957
35. Coastal hydrological investigations at Eden, New South Wales, 1957



## OCEANOGRAPHICAL STATION LISTS

(Continued)

36. Surface sampling in the Tasman and Coral Seas, 1957
37. Hydrological investigations from F.R.V. *Derwent Hunter*, 1957
38. Coastal hydrological investigations in the New South Wales tuna fishing area, 1958
39. Surface sampling in the Coral and Tasman Seas, 1958
40. Coastal hydrological investigations in south-eastern Australia, 1958
41. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1958
42. Coastal investigations at Port Hacking, New South Wales, 1958
43. Oceanic investigations in eastern Australia, H.M.A. Ships *Queenborough*, *Quickmatch*, and *Warrego*, 1958
44. Oceanic observations in Antarctic waters, M.V. *Magga Dan*, 1959
45. Coastal hydrological investigations in eastern Australia, 1959
46. Coastal hydrological investigations in the New South Wales tuna fishing area, 1959
47. Coastal investigations at Port Hacking, New South Wales, 1959
48. Oceanic investigations in eastern Australian waters, F.R.V. *Derwent Hunter*, 1959
49. Coastal hydrological sampling Rottneest Island, W.A., and Port Moresby, Papua, during the I.G.Y. (1957-58), and surface sampling in the Tasman and Coral Seas, 1959
50. Surface sampling in the Coral and Tasman Seas, 1960
51. Coastal hydrological investigations in eastern Australia, 1960
52. Coastal investigations at Port Hacking, New South Wales, 1960
53. Coastal hydrological investigations in the New South Wales tuna fishing area, 1960
54. Investigations by F.R.V. *Derwent Hunter* on the eastern Australian tuna grounds in 1961
55. Investigations by F.R.V. *Weerutta* on the South Australian tuna grounds in 1961
56. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1961
57. Investigations by F.V. *Estelle Star* in Western Australian waters in 1961
58. Temperature observations from Australian tuna fishing vessels in 1961
59. Investigations by F.R.V. *Derwent Hunter* on the eastern Australian tuna grounds in 1962
60. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1962
61. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1962
62. Investigations by F.V. *Estelle Star* in Western Australian waters in 1962
63. Temperature and salinity observations from Australian tuna fishing vessels in 1962
64. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1963
65. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1963
66. Temperature and salinity observations from Australian tuna fishing vessels in 1963
67. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1964
68. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1964
69. Temperature and salinity observations from Australian tuna fishing vessels in 1964
70. Investigations by F.R.V. *Investigator* on the South Australian tuna grounds in 1965
71. Investigations by F.V. *Estelle Star* in South Australian and New South Wales waters in 1965
72. Investigations by F.R.V. *Marelda* on the eastern Australian tuna grounds in 1965
73. Investigations by F.V. *Degei* in Queensland waters in 1965
74. Temperature and salinity observations from Australian tuna fishing vessels in 1965
75. Investigations by F.V. *Degei* in New South Wales, South, and Western Australian waters in 1966
76. Investigations by F.V. *Estelle Star* in South and Western Australian waters in 1966
77. Temperature and salinity observations from Australian tuna fishing vessels in 1966
78. Drift bottle releases and recoveries in Bass Strait and adjacent waters, 1958-1962
79. Drift bottle releases and recoveries in Western Australia, 1956-1957
80. Investigations by F.R.V. *Lancelin* in Western Australian waters in 1963
81. Coastal investigations off Port Hacking, New South Wales, in 1961
84. Coastal investigations off Port Hacking, New South Wales, in 1964