NITROGEN, PHOSPHORUS AND CHLOROPHYLL A REGIME OF HAMILTON HARBOUR

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ABSTRACT

Seasonal and vertical variations in concentrations of chlorophyll a, nitrate, nitrite, ammonia-nitrogen, total and soluble reactive phosphorus, dissolved oxygen, pH, conductivity, transmission, temperature, Secchi disc transparency, and phytoplankton in six stations in Hamilton Harbour are presented for the period of February 1987 to September 1988. In addition, fifteen aerial surveys of total and toxic unionized ammonia on forty stations in the harbour and within a one kilometer radius of the canal into Lake Ontario are shown. Particular reference is given to winter conditions, seasonal cycles of nutrients and chlorophyll a, phytoplankton composition and dissociation and volatilization of ammonia as the major contaminant in the Hamilton Harbour.

Régime du port de Hamilton en azote, phosphore et chlorophylle a

Résultats de 1987-1988

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RÉSUMÉ

Nous présentons les variations saisonnières et verticales de concentrations de chlorophylle a, de nitrates, de nitrites et d'azote ammoniacal, de phosphore réactif total et soluble, d'oxygène dissous, de pH, de conductivité, de transmission, de température, de transparence au disque de Secchi et de phytoplancton à six stations dans le port de Hamilton pour la période comprise entre février 1987 et septembre 1988. En outre, nous rapportons les résultats de quatorze études de l'ammoniac non ionisé toxique total dans l'air à quarante stations dans le port et dans un périmètre d'un kilomètre à partir du canal dans le lac Ontario. Nous mentionnons tout particulièrement les conditions hivernales, les cycles saisonniers des éléments nutritifs et de la

chlorophylle a, la composition du phytoplancton, de même que la dissociation et la volatilisation de l'ammoniac, le principal contaminant dans le port de Hamilton.

MANAGEMENT PERSPECTIVE

Designation by the IJC of Hamilton Harbour as one of the International Joint Commission (IJC) Areas of Concern warranted the following Remedial Action Plan. This required a closer look at the Hamilton Harbour's nutrient pollution situation, especially ammonia contamination. This report provides the required information and fills the knowledge gaps in the area of the Harbour's winter conditions (not investigated in previous studies), seasonal nutrient and phytoplankton cycling, areal distribution of ammonia, and for the first time, information on ammonia dissociation, toxicity and volatilization. The data will serve as a base for several upcoming specialized papers.

PERSPECTIVE - GESTION

Étant donné que le port de Hamilton a été désigné comme l'un des secteurs de préoccupation de la Commission mixte internationale (CMI) et qu'un plan de mesures correctives a été établi, il a fallu étudier de plus près l'état de la pollution dans le port de Hamilton, notamment la contamination par l'ammoniac. Le présent rapport fournit les données requises et comble les lacunes concernant les conditions qui règnent en hiver dans le port (sujet non abordé dans les études précédentes), les cycles saisonniers des éléments nutritifs et du plancton, la distribution de l'ammoniac dans l'air et, pour la première fois, la dissociation, la toxicité et la volatilisation de l'ammoniac. Les données serviront de base à plusieurs articles spécialisés futurs.

INTRODUCTION

This report presents results of limnological surveys carried out on Hamilton Harbour between February 1987 to September 1988. The objective was to obtain up-to-date information on the state of nutrient pollution of the Hamilton Harbour with particular reference to dissolved nitrogen forms (ammonia, nitrate, and nitrite; NWRI study No 82002) and assess their potential toxicity. Previously, there have been several limnological studies of this kind conducted in this area by Ontario MOE (1974, 1975, 1977, 1986), McMaster University (Harris 1976, Harris et al. 1979a or 1979b, Piccinin 1977, 1980; Sephton 1980, Haffner et al. 1980). In these studies, however, winter conditions have been mostly ignored, periods and intervals of sampling usually insufficient, and the problem of toxic unionized ammonia as a major contaminant overlooked.

Since designation by the IJC of Hamilton Harbour as one of the Great Lakes Areas of Concern and preparation of its Remedial Action Plan (DOE-MOE 1987), there was an acute need to update the existing information and provide an insight into the present state of the Harbour's pollution and reference for estimating remedial efficiency. Particular emphasis was given to winter conditions (not monitored previously), seasonal cycles of nutrients, DO and

chlorophyll a measured at short intervals, vertical and aerial distribution, ammonia speciation and volatilization (measured for the first time) and to a limited extent, the impact of the near-shore areas of Lake Ontario.

This report provides a comprehensive data base for scientific papers to be written up at a later date, and is organized into two major sections: 1. Seasonal and vertical variability and, 2. areal distribution. Summaries of phytoplankton identification, supplied by contract (Ms. B. Piccinin) are available in Fig. 1. Microbiological measurements in the lake sediments will be reported separately (Rao and Jurkovic, in preparation).

STUDY SITES

Water quality parameters for seasonal and vertical variability were measured at six stations in the harbour between February 10 1987 to September 13 1988 in intervals ranging from one week to months, depending on accessibility due to ice conditions in the winter. Frequency of sampling during 1987 was generally higher than during late 1988.

Sampling Program:

1. Winter (1987): 6 stations in the harbour (Fig.1a)
   Feb. 10 to March 10, monthly
2. Weekly: 6 stations in the harbour
   April 1 to July 13/87
3. Bi-weekly: 6 stations as above
   July 13 to December 14/87
   March 1 to June 14/88
4. Monthly: 40 stations, ammonia transects in the Harbour and Lake Ontario, within a one kilometer radius of the canal (see Figure 1b)
5. Winter(1988): 6 stations as above, monthly
   January, February, and March
6. Summer: 6 stations as above, monthly
   July, August, and September, 1988

A total of 35 cruises were carried out during the two years. The following observations were made: water samples collected (1m, 2 at mid-depths, B-1), EBT/XMS cast, conductivity profile, water temperature, dissolved oxygen profile (YSI meter, and/or Winkler method), pH readings at each depth, and Secchi disc readings.

Methods

Water quality parameter determination:

(Samples were filtered or preserved immediately after collection and submitted to the Water Quality Laboratory for analysis. Water samples were filtered through a 0.45 um cellulose acetate filter and analyzed as follows:

Total filtered (dissolved) nitrogen (TFN-N) was determined by an autoclave method using sulfate oxidation of nitrogen to nitrate. Nitrate plus nitrite were determined together after reduction through a coil containing cadmium filings to reduce nitrates present to nitrites. Nitrites were reacted with sulphanilamide to form the diazo-compound.

Total ammonia was determined after reaction with alkaline phenol hypochlorite to form indophenol blue. Unionized ammonia was calculated using computer generated tables from Trussel, 1972 and/or Emerson et al., 1975.

Total phosphorus on the unfiltered acidified samples was digested with a sulphuric acid persulfate mixture to convert P-compounds to orthophosphate. This is then reacted with ammonium molybdate and reduced with stannous chloride to form molybdenum blue. Separate un-digested sample was analyzed as SRP- soluble reactive phosphorus. Chlorophyll a was determined on GF/F filters fluorometrically after acetone reduction (For procedures, see National Water Quality Laboratory analytical manuals; available on request).

Phytoplankton samples (combined 0 to bottom were collected from sites 1-6.

Canal currents

Canal currents were measured, on seventeen occasions, on a bi-monthly schedule using an acoustic current meter. This schedule was interrupted for two sampling periods (June 15 - July 13).

Measurements were taken from the lift bridge at six stations equally spaced across the canal. Current readings were measured at the depths of 2m and 8m at each station. A two week intensive sampling program took place during January 18 to January 29, current measurements and water samples were collected daily.
Some of the flow measurements in the Ship Canal in Barica (1988); the remaining data from the Canal and the tributaries are available from the files of NWRI Technical Operation Group.

RESULTS AND DISCUSSION

The results of field surveys conducted between February 1987 and September 1988 are presented numerically in the annexes in chronological order for all sampling sites and depths. Only a brief discription with minimum interpretation of the data is provided in this report, providing information on the qualitative indicaton of trends, seasonal cycles and temporal and spatial distribution of individual parameters. More detailed interpretation with a specific focus has either been presented in previous publications by the senior author (Barica et al., 1988; Barica, 1988), or will be provided in our upcoming specialized publications (Barica; Barica and Rao; in preparation).

1. Seasonal and vertical distribution of major water quality parameters.

a. Nitrogen Cycle

Due to high loadings of N, mostly ammonia (about 7,000 kg per day; DOE-MOE 1988) from two sewage treatment plants located in two extreme parts of the Bay, and serving about 500,000 inhabitants, (Barica, 1988) the distribution of N- compounds is not uniform in neither temporal nor spatial terms. This situation results in a wide concentration range of ammonia (0.1->10 mg/L NH_3-N), nitrate (<1-2.5 mg/L NO_3-N) and nitrite (0.01-0.2 mg/L NO_2-N) and 1.9-4.1 mg/L TFN-N. Ammonia is the major contaminant in the Harbour (MOE 1985) and conditions for its dissociation into NH_4^+ ion and toxic

NH_3 gas prevail during the warm months of the year (May-September).

Sampling sites Nos.# 5 and 6 (Fig. 1a) appear to be least affected by the concentration fluctuations caused by the input of wastewaters from both sewage treatment plants (STPs) or dilution effect from the the Lake Ontario water intrusion through the canal (site 3), and therefore provide the most representative of seasonal cycles in inorganic N- parameters.

Total ammonia N, which is the major form of nitrogen in the harbour, displays a clear-cut seasonal cycle, with its maximum values in the winter. These maximum persist until April-May (average concentrations 1.4-1.7 mg/L NH_3-N). From June on, the maximum concentrations of ammonia start to decline gradually at an approximate rate of 0.5 mg/L total NH_3-N per month. By mid-July, total ammonia concentrations fall down to about 0.2-0.3 mg/L and continue decreasing at a slower rate (<0.1 mg/month) until November (minima <0.1 mg/L). From then on, ammonia levels increase again to about 1.2 mg/L in January and up to the maximum values of over 1.5 mg/L in March. Site 6 shows a similar trend with NH_3 concentrations about 30% higher due to the ammonia input from Cootes Paradise.

Significant dissociation of total ammonia into NH_4^+ ion and

toxic unionized NH_3 gas starts as early as April with NH_3 levels in excess of 20 ug/L, i.e. the acceptable levels set by the IJC, as a result of elevated water temperatures and pH values. By early May, the levels of un-ionized (toxic) ammonia rise dramatically and for a short period of time (1-2 weeks) exceed LC_{50} levels (300 ug/L- EPA 1984). Permissible levels remain exceeded for most of the summer; by October, they drop again below the 20 ug/L limit and remain there throughout the winter months.

Loss of ammonia from the water column can be explained by algal uptake, bacterial nitrification and volatilization. All of these processes appear to be operating simultaneously. However, corresponding increases of NO_3 concentrations is not proportional to NH_3 decrease, although stoichiometrically, it should be expected to follow a definite inverse relationship. Nitrate concentrations fall rather than increase gradually during the warming period and follow, unexpectedly, the ammonia trend for some time (from about 2.0 mg/L NO_3-N in February down to 1.6-1.8 mg/L in April-June. From then on, they fall again by September to their minima of 1.3-1.4 mg/L NO_3-N. From then on, NO_3-N starts to rise again, reaching the initial levels of about 2.0 mg/L NO_3-N by December. While temporal changes in NO_3-N concentrations are not as substantial as those of ammonia, their vertical distribution was found to be more pronounced. During June, the hypolimnetic concentrations are significantly lower than epilimnetic (about 20-30%) which suggest intensive denitrification processes in the hypolimnion (Klapwijk and Snodgrass, 1982).

Vertical distribution of both forms of ammonia in the water column shows different seasonal patterns: In the winter and early spring, the concentrations of total ammonia are more or less uniform throughout the profile. This uniformity prevails until mid-summer (July), when the concentrations show decreasing values with the depths, with the maxima occurring near the surface. In the later part of the summer, this profile reverses itself and with minimum values near the surface and maxima in the hypolimnion. This reverse pattern prevails until the end of the summer (late September - early October). After the fall turnover, a uniform minimum concentration along the water column persisted. All total NH_3 appears to be exhausted, presumably again through algal uptake, nitrification and volatilization. For the rest of the winter season, vertical distribution remains uniform throughout the whole profile, presumably due to the absence of thermal stratification. However, toxic un-ionized ammonia values do not show this reversal. Their highest values occur always in the top 2 meters of surface.

Nitrite, while present in substantially lower concentrations than NH_3-N and NO_3-N (mostly <0.1 ug/L), responds clearly to the ammonia cycle. It is present only in trace concentrations during the winter months (0.03-0.07 mg/L NO_2-N), however, it increases proportionately with the ammonia decrease to about 0.24 mg/L in September (begining of total ammonia exhaustion) but decreases again to about 0.02 mg/L in early October, together with disappearing total NH_3, and remains low for the rest of the season. Vertical distribution shows patterns somewhat similar to that of

the nitrate.

Total filtered (dissolved) nitrogen (TFN) represents the total pool of dissolved inorganic N (NH_3-N, NO_2-N, NO_3-N) and the organic N converted to inorganic form (as nitrate) by oxidation. Its maximum concentration (about 3.8 - 4.1 mg/L) occur in winter and spring months, but decrease to an average of 2.0 mg/L and less in mid-summer. This substantial reduction corresponds roughly to the loss of its major component, ammonia, and suggests volatilization rather than conversion to NO_3-N through nitrification, in which case the total should remain unchanged.

Nitrogen distribution in sites affected directly by inflow of treated sewage (sites #1, 2 and 6) is governed more by the treated sewage effluent discharges than by seasonal cycles. Sites 1 and 2 (inflow from the Windermere Basin and the Windermere Arm) show total ammonia levels of over 10 or 5 mg/L respectively, and represent the section of the Harbour with highest ammonia loading. However, due to generally lower pH levels compared to the rest of the Harbour (by about 1 pH unit due to sewage imput), concentration and frequency of occurrence of toxic unionized ammonia are not significantly higher than in the main body of the Harbour. Although this part of the Harbour is thermally unstratified, high ammonia concentrations appear always near the surface, in the warmer water entering from the Windermere Basin. NO_3-N concentrations are generally lower than in the main lake, while NO_2-N is higher, indicating denitrification process in the

Windermere arm. Site 6, near the outfall from Burlington STP, presents less pronounced fluctuations (loadings about 10-20% of the Hamilton STP).

Profile 3 - near the Ship Canal - shows extreme fluctuations of all parameters and no seasonal cycle at all, as it is governed by water exchanges with Lake Ontario and regular intrusions of unpolluted water, improving water quality of the Harbour by about 30% (dealt with separately in Barica, 1988).

It can be concluded that the nitrogen cycle in Hamilton Harbour is adversely affected by the excessive loadings of NH_3 which possibly inhibit the nitrification process, particularly the formation of NO_3. The intermediate process, i.e. the production of NO_2-N appears to be more responsive and less inhibited. While concentration of ammonia varies between overload levels to values close to zero, the temporal variability of nitrate concentrations is less pronounced. We assume that algal uptake and volatilization are the major factors governing ammonia regime rather than nitrification, which does not appear to be stoichiometrically proportional to ammonia losses.

b. Phosphorus and chlorophyll a and other parameters

Similar to nitrogen, the phosphorus loadings from two sewage treatment plants serving about 0.5 million inhabitants, are also high (609 kg/day P; DOE/MOE 1987) and warrant development of

hypereutrophic conditions (MOE 1986). Total filtered phosphorus concentrations vary between 0.12 mg/L TFP in the winter and 0.03-0.04 in the summer (the highest algal uptake); soluble reactive phosphorus (SRP) is similarly highest in the winter (up to 60 ug/L) and below detectable levels in the summer (<5 ug/L).

Chlorophyll a values do not reach true bloom conditions (over 50 ug/L). Their occassional surface maxima are 20-30 ug/L SRP. The discrepancy in relationship of chlorophyll a values to P loadings are discussed elsewhere (Barica, 1988). Also, algal composition (Figures 2) indicates summer predominance of Chlorophyta rather than Cyanophyta as would be expected from the high P loadings (Barica, 1988). pH values fluctuate significantly between values over 9 (surface, summer), enabling development of toxic NH_3 and at the same time its volatilization, and the minimum values (<7) occurring in the winter and spring.

Oxygen conditions, which are subject of a separate study (Charlton, in preparation) are generally good in the epilimnion, but become severely depleted (<1.0 mg/L) in the hypolimnion in the late summer (Station #5).

2. Areal distribution of ammonia, conductivity, pH and water temperature.

Due to the size of Hamilton Harbour, various inputs of pollution from different sites and dynamic exchanges of water through the ship canal, the areal distribution of selected

parameters is heterogeneous, showing some clear patterns. Since this heterogeneity was noticable from 6 vertical profiles, a separate program involving 36 to 42 sites (surface only) within the Harbour and near the ship canal outside the Harbour was designed to establish distribution patterns. The data are shown in maps in the Attachment and provide following conclusions:

a) Water exchange zone.

About 80% of the Harbour's surface close to the ship canal is clearly affected with water exchange with Lake Ontario, as seen from both conductivity and areal ammonia distribution. Its extent on this area depends on the magnitude of the exchange and prevailing flow direction (in or out of the Harbour). This phenomenon significantly affects water quality of the Harbour, particularly in the near-canal area through dilution (Barica et al., 1988; Barica, in press).

b) Patchiness

Individual parameters are not always distributed evenly over the whole surface of Hamilton Harbour. While water temperature, conductivity and pH values show some larger pools, ammonia and particularly toxic ammonia occur in relatively small patches. Input of thermal effluents from the steel industry appear to play a significant role in the release of toxic ammonia in affected spots; so do pH fluctuations caused by sewage treatment plants effluents. It is noteworthy that the S-W arm of the Harbour (near Windermere Basin) with the highest total of NH_3 levels (from

Hamilton STP) shows the lowest toxic NH_3 levels due to overall low pH values in that area.

Patchiness and short lasting effect due to volatilization of toxic ammonia (frequently over the LC_{50} levels) explains why fish populations in Hamilton Harbour survive and not suffer from the expected mass mortalities as a result of the high NH_3 levels.

c) Short-circuiting of sewage treatment plant effluents.

The water exchange with Lake Ontario happens to occur in the same area as - or close to -the major wastewater discharges from Hamilton and Burlington sewage treatment plants and the steel industry. This results in frequent "short-circuit" discharges to the lake combined with immediate reductions of pollutant loading effects in the Harbour. The pollutants are able to leave the harbour much faster than they would without the shipping canal. Their residence time and the pathways are substantially shortened. Instead of gradual mixing of the wastewater discharges over the whole area and volume of the harbour, effluent remains near the eastern edge and leave the harbour quickly. Thus, a substantial part of the load remains in less than one third of the harbour and does not usually spread into the western (and recreationally utilized) area.

d) Impact on Western Lake Ontario.

On a number of areal distribution maps, the ammonia plume in Hamilton Harbour can be followed into Lake Ontario. This was

particularly noticable on July/1987 and agrees with the previous conclusions (MOE, 1986). The elevated ammonia levels, however, disappear quickly through dilution and nitrification and the effect does not exceed an area of 2-3 km radius from the ship canal. Effect of Hamilton Harbour on the quality of Lake Ontario can therefore be considered minimal (Barica et al., 1988).

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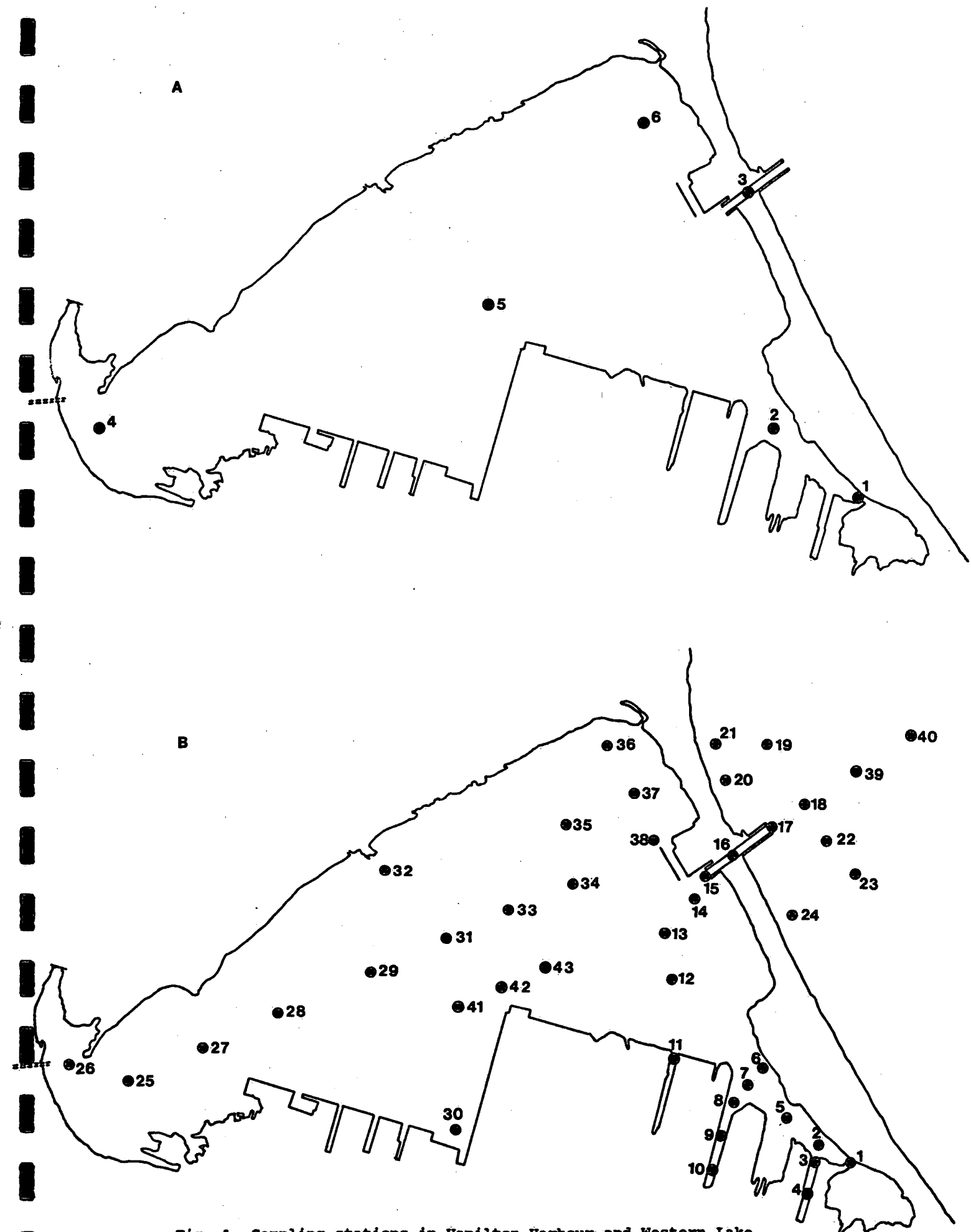

Fig. 1 Sampling stations in Hamilton Harbour and Western Lake Ontario. A - Vertical Profiles, B - Aereal Surveys (surface only).

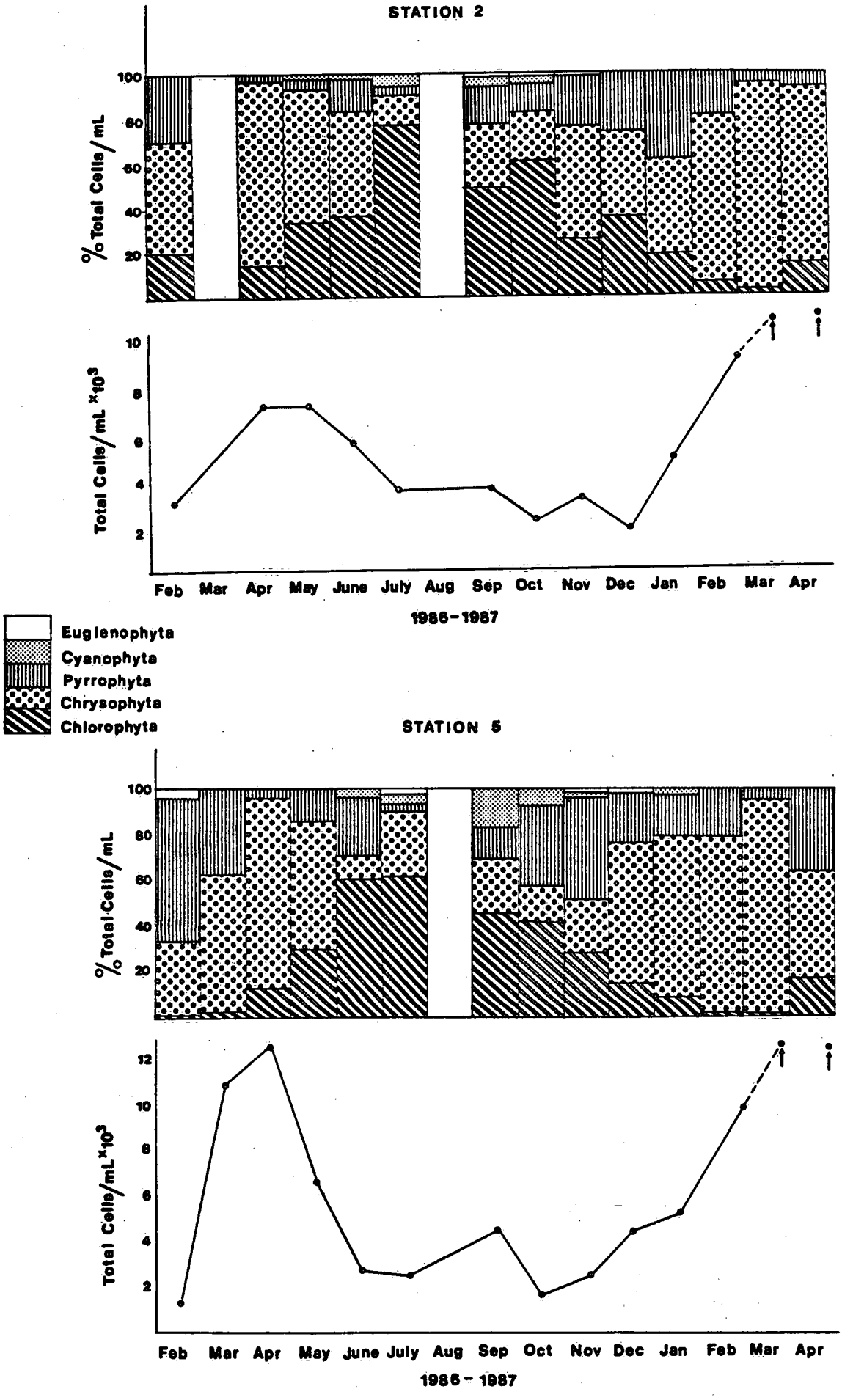

Fig. 2 Phytoplankton Composition (major groups) in two sampling sites of Hamilton Harbour.

Appendix I

Temporal and vertical distribution of water quality parameters at major sampling sites in Hamilton Harbour, 1987-1988.

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 1 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Mar-87	1	1.378	0.1631	1.861	5.016
10-Mar-87	5	1.535	0.1062	1.922	4.333
10-Mar-87	8.5	1.893	0.1104	1.935	4.593
09-Apr-87	1	1.979	0.2148	2.256	5.39
09-Apr-87	5	2.566	0.2066	2.237	7.39
09-Apr-87	8.5	2.599	0.1601	2.018	6.95
14-Apr-87	1	3.805	0.1762	2.243	6.54
14-Apr-87	5	3.568	0.1686	2.065	7.65
14-Apr-87	8.5	2.434	0.1174	1.717	5.37
21-Apr-87	1	4.499	0.1713	1.917	6.794
21-Apr-87	5	5.598	0.2023	1.993	8.09
21-Apr-87	9	4.649	0.171	1.859	6.77
05-May-87	1	8.342	0.1944	1.171	9.83
05-May-87	5	6.695	0.1868	1.353	8.6
05-May-87	9	4.845	0.1347	1.328	6.76
11-May-87	1	9.816	0.2008	1.152	11.82
11-May-87	5	5.639	0.1872	1.478	7.88
11-May-87	8.5	5.871	0.1825	1.351	7.81
21-May-87	1	4.72	0.192	1.547	6.118
21-May-87	5	1.19	0.19	1.525	6.24
21-May-87	8.5	5.27	0.188	1.434	6.654
01-Jun-87	1	8.177	0.2043	1.362	9.388
01-Jun-87	5	10.592	0.1661	1.108	12.121
01-Jun-87	8	4.203	0.1518	1.316	6.211
10-Jun-87	1	2.422	0.291	1.708	5.361
10-Jun-87	5	1.644	0.3125	1.451	4.955
10-Jun-87	8	2.468	0.2105	1.532	5.126
18-Jun-87	1	6.612	0.2104	0.859	8.812
18-Jun-87	5	9.816	0.3137	1.33	11.487
18-Jun-87	7	5.811	0.1956	1.407	7.327
22-Jun-87	1	6.386	0.2245	1.079	8.053
22-Jun-87	5	7.385	0.2538	1.355	9.346
22-Jun-87	7	7.754	0.2137	1.311	9.726
02-Jul-87	1	4.817	0.2314	1.272	7.5
02-Jul-87	5	7.018	0.2068	1.101	8.4
02-Jul-87	8	0	0	0	0
07-Jul-87	1	9.235	1.688	2.379	24.088
07-Jul-87	5	3.629	0.2457	19.396	22.6
07-Jul-87	9	2.028	0.2457	4.448	7.774
16-Jul-87	1	0.463	0.3233	1.954	3.09
16-Jul-87	5	1.402	0.3557	2.083	3.711
16-Jul-87	7	2.393	0.3582	1.849	4.467
28-Jul-87	1	1.665	0.2806	1.667	4.211
28-Jul-87	5	1.228	0.2049	1.487	3.12

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 1

DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
28-Jul-87	7	0.983	0.0999	1.11	2.507
12-Aug-87	1	1.52	0.2869	1.593	3.335
12-Aug-87	5	1.977	0.2681	1.521	3.818
12-Aug-87	8	1.231	0.1957	1.22	2.777
03-Sep-87	1	2.09	0.272	1.297	4.128
03-Sep-87	5	3.03	0.244	1.249	4.588
03-Sep-87	7	3.55	0.2025	1.072	4.925
14-Sep-87	1	6.425	0.2181	0.927	6.523
14-Sep-87	5	6.825	0.2448	1.058	8.624
14-Sep-87	6.5	5.322	0.2463	1.144	6.918
28-Sep-87	1	10.899	0.1232	0.475	11.748
28-Sep-87	5	8.435	0.1341	0.585	10.826
28-Sep-87	7.5	10.678	0.1374	0.669	9.978
19-Oct-87	1	8.786	0.1473	1.082	8.896
19-Oct-87	5	4.961	0.1897	1.683	6.946
19-Oct-87	7	7.541	0.1802	1.51	8.048
10-Nov-87	1	1.855	0.153	1.693	4.796
10-Nov-87	4	2.031	0.173	1.819	4.93
10-Nov-87	6.5	2.81	0.169	1.749	5.549
18-Dec-87	1	1.785	0.101	1.819	4.59
18-Dec-87	5	2.248	0.104	1.807	5.329
18-Dec-87	7.5	2.392	0.104	1.876	5.469
02-Feb-88	1	2.034	0.094	1.483	4.287
02-Feb-88	7	2.366	0.102	1.634	5.32
22-Mar-88	1	2.299	0.097	1.38	4.065
22-Mar-88	5	2.818	0.113	2.351	5.285
22-Mar-88	7	4.948	0.103	1.344	6.587
05-Apr-88	1	6.706	0.155	0.953	8.563
05-Apr-88	5	7.615	0.157	1.07	8.716
05-Apr-88	7.5	7.201	0.144	1.112	8.001
25-Apr-88	1	2.594	0.241	1.221	4.819
25-Apr-88	5	3.24	0.295	1.825	4.906
25-Apr-88	7.5	3.066	0.284	1.849	5.11
17-May-88	1	3.02	0.231	1.722	5.377
17-May-88	5	2.384	0.191	1.204	4.913
17-May-88	7.5	2.178	0.169	1.752	4.539
31-May-88	1	6.373	0.266	1.981	3.771
31-May-88	5	0.005	0.004	0.011	5.5
31-May-88	7.5	0.005	0.004	0.011	6.01
14-Jun-88	1	4.939	0.207	1.532	7.72
14-Jun-88	5	6.352	0.207	1.695	7.96
14-Jun-88	7.5	2.813	0.147	1.893	5.061
18-Aug-88	1	3.307	0.18	1.445	4.903
18-Aug-88	5	0.659	0.117	1.458	2.474
18-Aug-88	8	0.498	0.083	1.296	2.128
13-Sep-88	1	12.986	0.118	0.664	15.525
13-Sep-88	5	5.446	0.108	0.996	9.272
13-Sep-88	7	3.314	0.109	1.109	4.825

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
4.4	0.0925	0.008	n/a	n/a	12.04
5.3	0.107	0.0351	n/a	n/a	11.06
6.8	0.108	0.0452	n/a	n/a	10.2
47	0.1431	0.0391	n/a	8.7	8.29
56	0.2031	0.0882	n/a	7.3	8.68
62	0.1872	0.0881	n/a	9.65	8.84
61	0.5654	0.3517	29	3.5	5.76
61	0.2607	0.2596	48.5	4.1	7.15
46	0.1643	0.1313	47.5	4.6	7.66
27	0.607	0.2746	29.9	9.7	8.05
33	0.1699	0.2685	40	9.2	8.21
26	0.1501	0.2024	53.6	6.2	8.05
583	0.2081	0.0669	28	7.2	n/a
642	0.108	0.0456	42.2	7.85	n/a
301	0.1413	0.0496	23	6.8	n/a
245	0.3233	0.0924	6.1	11	7.59
96	0.0968	0.0461	44.8	8.3	8.38
82	0.0804	0.0494	36.7	7.9	7.9
68	0.1589	0.069	44.3	5.2	n/a
31	0.1395	0.085	54.9	4.7	n/a
17	0.093	0.1703	50.5	3.3	n/a
55	0.8648	0.3821	44.3	2.6	2.75
98	0.3075	0.3997	41	1.7	2.33
87	0.1521	0.1337	22.5	1.1	2.17
68	0.1363	0.0443	52.6	n/a	6.9
31	0.1479	0.0259	36	n/a	5.75
17	0.12	0.041	30	n/a	4.19
55	0.899	0.3216	35.8	4.6	4.11
98	0.4757	0.4236	45	4.6	5.9
87	0.181	0.206	31	4.65	6.05
108	0.4516	0.1598	35.7	n/a	6.21
118	0.3899	0.2257	45	n/a	5.14
116	0.4582	0.3683	31	n/a	5
127	0.5903	0.3459	48	2.5	n/a
91	0.7454	0.4155	42.2	0.85	n/a
	0.398	0	48	0.8	n/a
240	0.7137	0.4813	41.7	3.05	n/a
159	0.2626	0.4457	59.5	2.9	n/a
75	0.1617	0.1394	47.8	0.7	n/a
152	0.0986	0.0024	56	8.45	n/a
263	0.1856	0.0294	48.3	5.6	n/a
437	0.2341	0.0606	43.9	2.3	n/a
649	0.1586	0.0056	42	5.1	n/a
129	0.1292	0.0297	28	0.25	n/a

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
95	0.0986	0.0262	28.6	0.15	n/a
322	0.1375	0.0743	56.5	1.85	n/a
284	0.1683	0.0975	41	1.2	n/a
119	0.1309	0.0556	21	0.2	n/a
52	0.0932	0.0157	61.7	8.6	n/a
38	0.1409	0.0443	38.4	5.9	n/a
32	0.1389	0.0066	48.8	4.6	n/a
103	0.3532	0.1941	68.3	2.55	n/a
88	0.3413	0.2267	73	4.25	n/a
85	0.307	0.1901	68.1	3.7	n/a
163	0.937	0.5058	77.6	2.65	n/a
126	0.689	0.5291	77.7	2.95	n/a
160	0.597	0.4291	76.5	2.8	n/a
22.8	0.748	0.4916	57	3.8	4.21
13.3	0.2349	0.205	57.4	2.65	5.3
30.1	0.4606	0.3477	57.2	2.6	4.34
39.1	0.2078	0.1037	53.3	n/a	7.68
42.8	0.2028	0.1127	53	n/a	8.05
58.7	0.3133	0.1732	39	n/a	7.6
22.3	0.2015	0.0888	49	n/a	6.82
28.7	0.1955	0.1007	47	n/a	7.38
31.5	0.1936	0.0931	36.8	n/a	9.78
18.3	0.1666	0.0729	n/a	n/a	11.68
21.2	0.1846	0.0942	n/a	n/a	11.95
80.4	0.1639	0.0498	44.1	n/a	8.94
97.2	0.1726	0.0486	44.7	n/a	9.67
64.3	0.3649	0.1809	26	n/a	10.77
75	0.5217	0.2927	42	n/a	3.53
82	0.4247	0.2499	49.5	n/a	5.76
73	0.3797	0.2566	53	n/a	6.41
15.3	0.1545	0.0477	20.19	9.54	n/a
20.5	0.1608	0.0614	20.58	9.6	n/a
17	0.1565	0.0504	19.19	9.23	n/a
8	0.3417	0.1606	19.25	4.57	n/a
5	0.1352	0.0764	31.43	7.16	n/a
5	0.1598	0.0538	27.78	6.61	n/a
1	0.878	0.3948	4.5	6.14	n/a
1	0.5116	0.0026	22.6	5.45	n/a
1	0.2607	0.0025	29.1	4.9	n/a
42.4	0.3925	0.1338	11.24	6.62	n/a
34	0.4203	0.2082	26.2	5.25	n/a
56	0.1354	0.094	24.5	4.56	n/a
1.7	0.1385	0.0198	5.88	4.99	n/a
0.2	0.0587	0.0099	6.9	3.31	n/a
0.15	0.054	0.0165	19.6	2.06	n/a
53.2	0.18	0.0424	12.6	3.54	n/a
59.9	0.082	0.0113	18.5	3.97	n/a
34.8	0.0683	0.0065	21.8	4.4	n/a

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	pH	SECCHI (m)
3.6	1369	12.8	7.4	1.1
3.9	505	10.8	7.44	
3.2	639	11.5	7.47	
10.5	450	7.7	8.1	0.75
9.8	600	7	8.13	
7.6	400	9.9	8.15	
11.6	365	3	7.9	0.75
9.1	365	6	8	
7.6	365	7.6	8.1	
16.4	720	6.9	7.3	1
10.8	670	12.4	7.48	
9.2	550	6	7.52	
13	850	15.7	8.55	0.75
11.8	600	16.1	8.7	
11.2	600	27.9	8.5	
17.8	890	13.5	7.9	0.5
11.9	510	15.3	7.85	
9.4	510	9.2	7.85	
14.9	610	14.1	3.5	1
14.6	620	6.8	4.4	
14.3	620	7.4	4.35	
23.5	870	5.7	4.9	1
16.8	700	6.5	5.05	
14.4	500	4.3	5.25	
22	600	8.8	7.8	1
19.3	620	10.3	7.65	
16.65	500	9.4	7.4	
20.9	890	15	7.3	0.5
20.1	650	18.1	7.4	
19.55	550	16.4	7.6	
20.95	491	17.7	7.65	1
20.15	460	14.7	7.6	
19.6	438	13.5	7.55	
21.2	680	9.7	7.8	1
20.3	780	12.8	7.55	
17.5	500	11.8	7.7	
24.05	800	33.8	7.7	0.75
22.25	600	9.6	7.95	
19.6	520	9.4	8	
22.5	395	34.7	9.15	0.75
22.1	325	26.5	8.8	
22	475	11.4	8.7	
26.3	409	25.5	9.3	0.75
16	353	10.7	8.6	

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	pH	SECCHI (m)
14.85	363	10.1	8.6	
21.55	340	8.7	8.8	0.75
20.95	410	6.9	8.6	
17.9	347	6.9	8.5	
20.1	838	11	7.8	1.25
19.9	887	11.7	7.5	
18.9	943	9.2	7.45	
21.6	679	9.8	7.6	1.5
21.4	704	8.7	7.56	
21.2	784	8.9	7.59	
19.4	369	1.4	7.6	1.25
19.4	426	3.1	7.63	
19.1	448	3.1		
14.2	n/a	3.8	7.06	1.25
14.3	n/a	3.5	7.02	
14.3	n/a	5	7.19	
11.5	424	4	7.95	1
11.6	457	4	8	
11.6	568	3.2	7.94	
5.85	555	6.4	7.91	0.75
5.9	563	5.3	7.93	
6.6	623	5	7.85	
1.5	n/a	8.6	8.17	1
1.5	n/a	9.9	8.06	
3.9	451	34.5	8.52	1
3.85	511	35.7	8.49	
4.4	571	29.3	8.19	
9.25	590	14.1	7.78	0.75
8.9	506	9	7.75	
8.6	540	9.9	7.78	
9.68	739	15.5	7.55	0.75
9.58	737	17	7.56	
9.4	732	19.2	7.49	
14.44	755	21.9	6.96	0.5
12.67	668	8.4	7	
12.41	671	9.4	7.01	
21.52	896	n/a	7.23	0.5
18.56	776	n/a	7.27	
14.55	641	n/a	7.24	
21.5	814	10.5	7.31	1
18.578	639	9.4	7.17	
17.03	636	6.9	7.14	
24.13	631	31	6.06	0.75
17.68	468	17.4	6.21	
15.72	428	2.7	6.23	
20.3	829	10.4	7.33	1
19.6	613	10.6	7.44	
18.84	563	11	7.46	

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 1 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Mar-87	1	1.378	0.1631	1.861	5.016
10-Mar-87	5	1.535	0.1062	1.922	4.333
10-Mar-87	8.5	1.893	0.1104	1.935	4.593
09-Apr-87	1	1.979	0.2148	2.256	5.39
09-Apr-87	5	2.566	0.2066	2.237	7.39
09-Apr-87	8.5	2.599	0.1601	2.018	6.95
14-Apr-87	1	3.805	0.1762	2.243	6.54
14-Apr-87	5	3.568	0.1686	2.065	7.65
14-Apr-87	8.5	2.434	0.1174	1.717	5.37
21-Apr-87	1	4.499	0.1713	1.917	6.794
21-Apr-87	5	5.598	0.2023	1.993	8.09
21-Apr-87	9	4.649	0.171	1.859	6.77
05-May-87	1	8.342	0.1944	1.171	9.83
05-May-87	5	6.695	0.1868	1.353	8.6
05-May-87	9	4.845	0.1347	1.328	6.76
11-May-87	1	9.816	0.2008	1.152	11.82
11-May-87	5	5.639	0.1872	1.478	7.88
11-May-87	8.5	5.871	0.1825	1.351	7.81
21-May-87	1	4.72	0.192	1.547	6.118
21-May-87	5	1.19	0.19	1.525	6.24
21-May-87	8.5	5.27	0.188	1.434	6.654
01-Jun-87	1	8.177	0.2043	1.362	9.388
01-Jun-87	5	10.592	0.1661	1.108	12.121
01-Jun-87	8	4.203	0.1518	1.316	6.211
10-Jun-87	1	2.422	0.291	1.708	5.361
10-Jun-87	5	1.644	0.3125	1.451	4.955
10-Jun-87	8	2.468	0.2105	1.532	5.126
18-Jun-87	1	6.612	0.2104	0.859	8.812
18-Jun-87	5	9.816	0.3137	1.33	11.487
18-Jun-87	7	5.811	0.1956	1.407	7.327
22-Jun-87	1	6.386	0.2245	1.079	8.053
22-Jun-87	5	7.385	0.2538	1.355	9.346
22-Jun-87	7	7.754	0.2137	1.311	9.726
02-Jul-87	1	4.817	0.2314	1.272	7.5
02-Jul-87	5	7.018	0.2068	1.101	8.4
02-Jul-87	8	0	0	0	0
07-Jul-87	1	9.235	1.688	2.379	24.088
07-Jul-87	5	3.629	0.2457	19.396	22.6
07-Jul-87	9	2.028	0.2457	4.448	7.774
16-Jul-87	1	0.463	0.3233	1.954	3.09
16-Jul-87	5	1.402	0.3557	2.083	3.711
16-Jul-87	7	2.393	0.3582	1.849	4.467
28-Jul-87	1	1.665	0.2806	1.667	4.211
28-Jul-87	5	1.228	0.2049	1.487	3.12

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 2 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Feb-87	1	1.574	0.0628	3.387	5.949
10-Feb-87	5	1.943	0.0771	16.317	16.833
10-Feb-87	10	1.438	0.0818	1.903	4.973
10-Mar-87	1	1.648	0.0986	1.93	4.182
10-Mar-87	5	1.653	0.097	1.98	4.21
10-Mar-87	8.5	1.627	0.0984	2.072	4.275
09-Apr-87	1	1.89	0.1495	2.034	4.89
09-Apr-87	5	1.965	0.15	2.053	4.63
09-Apr-87	8.5	1.962	0.1265	1.911	4.67
14-Apr-87	1	2.546	0.1257	1.718	4.69
14-Apr-87	5	2.577	0.1165	1.724	5.37
14-Apr-87	9	2.525	0.1129	1.708	5.25
21-Apr-87	1	3.019	0.151	1.807	5.35
21-Apr-87	5	2.349	0.1406	1.783	4.69
21-Apr-87	9.5	2.53	0.1306	1.67	4.5
05-May-87	1	4.188	0.1544	1.55	6.45
05-May-87	5	2.935	0.1347	1.613	5.31
05-May-87	9	2.468	0.1173	1.538	4.84
11-May-87	1	3.056	0.1329	1.522	5.4
11-May-87	5	3.518	0.1426	1.456	5.56
11-May-87	9	3.036	207	1.541	5.26
21-May-87	1	3.92	0.183	1.535	5.93
21-May-87	5	4.91	0.192	1.478	6.68
21-May-87	8.5	2.468	0.192	1.398	6.828
01-Jun-87	1	5.122	0.1884	1.321	6.99
01-Jun-87	5	3.756	0.1735	1.48	6.04
01-Jun-87	9	2.109	0.1401	1.436	4.352
10-Jun-87	1	2.77	0.1997	1.546	5.099
10-Jun-87	5	3.367	0.2071	1.589	5.596
10-Jun-87	8.5	2.337	0.1658	1.408	4.56
18-Jun-87	1	4.334	0.1969	1.486	6.355
18-Jun-87	5	2.84	0.2028	1.664	5.337
18-Jun-87	8	1.887	0.2071	1.59	4.695
22-Jun-87	1	7.438	0.1919	1.27	8.349
22-Jun-87	5	5.188	0.2084	1.5	7.161
22-Jun-87	8	1.547	0.1611	1.75	4.351
02-Jul-87	1	1.216	0.1843	1.857	4.6
02-Jul-87	5	0.763	0.1201	1.957	3.8
02-Jul-87	6.5	0.994	0.0816	1.94	3.4
07-Jul-87	1	0.853	0.2712	2.384	3.653
07-Jul-87	5	1.024	0.2316	2.36	3.643
07-Jul-87	8.5	1.099	0.2316	2.232	3.643
16-Jul-87	1	0.188	0.2973	2.285	2.86
16-Jul-87	6.5	2.159	0.2671	1.721	4.237

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 2 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
16-Jul-87	9	1.98	0.2161	1.552	3.923
28-Jul-87	1	1.29	0.1996	1.357	3.27
28-Jul-87	5	1.016	0.1714	1.522	3.002
28-Jul-87	9	0.617	0.0778	1.179	2.123
12-Aug-87	1	1.901	0.5708	2.16	4.213
12-Aug-87	5	1.241	0.2544	1.597	3.209
12-Aug-87	8.5	0.831	0.1233	1.066	2.216
03-Sep-87	1	1.69	0.282	1.28	2.816
03-Sep-87	5	1.61	0.197	1.197	3.418
03-Sep-87	8	1.23	0.2018	1.136	2.946
14-Sep-87	1	2.129	0.192	1.955	4.505
14-Sep-87	5	1.312	0.2602	1.598	3.461
14-Sep-87	6.5	1.932	0.2562	1.511	4.099
28-Sep-87	1	1.836	0.1933	1.413	3.832
28-Sep-87	5	2.499	0.192	1.277	4.385
28-Sep-87	8	1.006	0.1655	1.386	2.735
19-Oct-87	1	1.995	0.1759	1.909	4.27
19-Oct-87	5	2.047	0.18	1.815	5.025
19-Oct-87	7.5	2.922	0.1662	1.53	5.313
10-Nov-87	1	1.928	0.158	1.814	4.716
10-Nov-87	5	1.814	0.155	1.809	4.463
10-Nov-87	7	1.583	0.143	1.822	4.425
17-Dec-87	1	1.929	0.088	1.708	4.661
17-Dec-87	5	1.955	0.094	1.828	4.973
17-Dec-87	7.5	1.964	0.095	1.838	4.91
22-Jan-88	1	1.426	0.099	1.739	n/a
22-Jan-88	5	1.913	0.099	1.698	n/a
22-Jan-88	7	2.102	0.097	1.667	n/a
02-Feb-88	1	1.946	0.111	1.726	4.818
02-Feb-88	7	1.922	0.126	2.224	5.227
01-Mar-88	1	1.341	0.003	2.17	5.047
01-Mar-88	5	1.621	0.002	1.973	4.058
01-Mar-88	9	1.627	0.002	1.953	3.796
22-Mar-88	1	2.537	0.108	1.574	4.229
22-Mar-88	5	2.03	0.109	1.625	3.652
22-Mar-88	7.5	2.114	0.111	1.699	3.76
05-Apr-88	1	9.376	0.151	1.306	6.934
05-Apr-88	4	4.682	0.146	1.4	6.559
05-Apr-88	6	1.175	0.146	1.391	7.184
25-Apr-88	1	2.791	0.243	1.851	5.007
25-Apr-88	5	2.954	0.251	1.463	5.087
25-Apr-88	8	2.845	0.241	1.836	5.343
17-May-88	1	3.516	0.322	2.177	5.34
17-May-88	5	3.772	0.332	2.2	6.001
17-May-88	8	1.867	0.156	1.839	4.777
31-May-88	1	0.013	0.004	0.032	5.068
31-May-88	5	0.031	0.004	0.039	4.498
31-May-88	8	1.977	0.198	1.839	4.473

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STATION 2 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
14-Jun-88	1	3.015	0.192	1.986	5.133
14-Jun-88	5	2.197	0.156	2.055	4.476
14-Jun-88	8	1.911	0.132	2.011	3.937
18-Aug-88	1	1.625	0.188	1.625	3.654
18-Aug-88	5	0.501	0.109	1.459	2.294
18-Aug-88	11	0.183	0.043	1.456	1.971
13-Sep-88	1	0.97	0.109	1.268	2.431
13-Sep-88	5	0.771	0.109	1.278	2.2345
13-Sep-88	9	0.997	0.109	1.289	2.419

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
31	0.0625	0.0326	52	13.6	12.69
39	0.0617	0.1708	52	13.3	12.87
29	0.0671	0.0312	49	13.1	12.71
36	0.0765	0.0266	n/a	9.9	11.65
18	0.076	0.026	n/a	9.5	11.44
18	0.0777	0.0258	n/a	9.4	11.18
68	0.1031	0.0306	n/a	9.9	9.71
31	0.0992	0.0304	n/a	9.5	9.55
29	0.0959	0.0279	n/a	9.4	9.76
53	0.2664	0.1535	n/a	n/a	8.05
46	0.2077	0.1357	17	n/a	8.4
50	0.1865	0.1053	0	n/a	7.82
66	0.093	0.0792	n/a	11.8	10.66
15	0.107	0.0583	n/a	10.6	9.26
35	0.1567	0.0504	n/a	6.9	6.88
125	0.1073	0.0366	47.8	8.65	n/a
117	0.0946	0.0237	49.9	7.95	n/a
52	0.1152	0.0208	37.5	7.1	n/a
61	0.093	0.0177	44.8	12	9.21
77	0.0947	0.0175	54.5	10	9.29
55	0.0609	0.0094	62	8.5	9.06
172	0.0967	0.062	50.8	6.6	6.6
196	0.1583	0.085	48.5	7	5.77
96	0.123	0.088	33	6.8	5.39
4	0.2805	0.1451	47.5	7.7	8
11	0.0983	0.0754	66.5	6.6	7
1	0.0902	0.027	58	4	4.18
54	0.1346	0.0396	54	n/a	7.35
40	0.1451	0.0479	37	n/a	6.06
26	0.0547	0.0284	65.2	n/a	5.62
61	0.072	0.0986	61.5	7.7	n/a
51	0.0822	0.0694	64	5.49	n/a
57	0.0697	0.0479	62.5	5	n/a
230	0.3695	0.2032	51	n/a	7.19
114	0.19	0.1539	50	n/a	5.73
18	0.0577	0.0519	61	n/a	2.58
16	0.1469	0.0719	58.3	4.8	n/a
24	0.1087	0.0678	43	3.05	n/a
28	0.1012	0.0475	18	1.5	n/a
49	0.0982	0.0175	58.4	7	n/a
26	0.096	0.0262	61.8	5.4	n/a
102	0.1083	0.0518	50	1.3	n/a
77	0.0963	0.0012	55	8.81	n/a
237	0.3954	0.0929	42	3.7	n/a

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
60	0.0962	0.072	42	0.85	n/a
683	0.1261	0.0196	48.3	6.85	n/a
173	0.0585	0.021	68.3	2.1	n/a
104	0.0552	0.0127	44	0.5	n/a
503	0.1656	0.0585	52	4.6	n/a
207	0.1132	0.0503	60.3	2.4	n/a
82	0.1027	0.0261	28	1.2	n/a
54	0.0723	0.0221	61.8	8.5	n/a
19	0.0907	0.029	60.9	5.3	n/a
11	0.0633	0.0167	57.7	3.9	n/a
89	0.095	0.015	75	6.8	n/a
54	0.1021	0.0252	77	4	n/a
52	0.1435	0.0569	75.7	3.5	n/a
53	0.1121	0.0638	63	6.5	n/a
57	0.123	0.0527	63	5.3	n/a
21	0.0664	0.0315	61.8	5.2	n/a
14	0.2061	0.0733	23	5.7	5.84
7	0.1527	0.0899	27.2	5.8	5.44
9	0.1178	0.1025	28.2	5.3	5.44
41	0.1636	0.1052	53.5	n/a	8.32
38	0.1649	0.0975	54	n/a	8.25
33	0.1497	0.0867	60.3	n/a	8.1
27	0.1882	0.077	52	n/a	10.27
27	0.1848	0.0786	49.7	n/a	10.79
27	0.1835	0.0743	41.3	n/a	9.74
21	n/a	0.0654	n/a	n/a	12.85
21	n/a	0.0898	n/a	n/a	12.16
21	n/a	0.0989	n/a	n/a	12.09
16	0.1399	0.0703	n/a	n/a	11.68
16	0.1378	0.0577	n/a	n/a	11.95
11	0.1459	0.022	61.5	n/a	12.92
14	0.1298	0.0523	62.2	n/a	13.4
14	0.1276	0.051	62	n/a	13.08
96	0.1324	0.0599	46	n/a	14.29
77	0.1369	0.0447	47	n/a	14.83
74	0.1437	0.0484	48	n/a	14.22
178	0.2951	0.4531	54.7	n/a	8.68
79	0.2325	0.1381	54.3	n/a	10.4
19	0.2608	0.0271	55	n/a	10.5
6	0.1244	0.0411	15.38	9.01	n/a
5	0.133	0.0553	18.47	9.09	n/a
4	0.1371	0.0498	19.53	8.98	n/a
19	0.3462	0.1746	14.86	6.29	n/a
17	0.3558	0.1988	38.25	8.24	n/a
8	0.0901	0.0515	39.37	8.25	n/a
0	0.1527	0.0026	0.37	10.52	n/a
0	0.0917	0.0113	22.72	9.65	n/a
16	0.1031	0.0449	29.01	8.34	n/a

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
21	0.1884	0.0912	24	7.94	n/a
15	0.1273	0.0581	33.73	6.73	n/a
10	0.1168	0.0548	23.72	4.24	n/a
9.4	0.0996	0.0111	14.7	5.48	n/a
1.5	0.0546	0.008	23.95	4.17	n/a
0.7	0.0368	0.0101	29.14	2.11	n/a
7.2	0.042	0.0009	31.48	6.65	n/a
9.2	0.0396	0.0007	31.51	6.58	n/a
8.9	0.0459	0.0014	26.36	6.08	n/a

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
1.6	n/a	9.8	8.25	1.85
1.6	n/a	7.4	8	
1.7	n/a	7.7	8	
4	639	9.7	8.25	1.2
3.9	569	11.6	8	
3.9	647	7.5	7.98	
9.4	698	10.7	8.25	0.75
8.55	714	7.4	8	
7.1	670	n/a	7.98	
10.3	653	9.3	8.1	1
8.4	619	8.4	8.1	
8.1	639	6.6	8.1	
14	510	14.2	7.74	0.75
9.5	550	12.5	7.65	
8.75	570	8.7	7.52	
13.55	520	14.2	8.2	1.25
11.5	550	20.7	8.25	
10.3	500	22.7	8.1	
14.5	540	13.4	7.85	1
12.9	500	18	7.85	
11.3	500	11	7.8	
15	510	10.9	5.9	1
14.4	600	1.9	5.8	
13.9	590	8.1	5.6	
21.1	700	12.2	6.3	1.5
16.6	545	11.2	5.95	
13.7	500	5.1	6	
26.5	590	12.2	7.5	1
19.1	620	10.9	7.45	
18.35	490	4.5	7.45	
21.5	560	13.8	7.55	1.5
19.65	580	8.6	7.7	
17.9	500	8.7	7.75	
20.8	620	25.2	7.75	1.1
19.55	520	15.9	7.65	
14.4	400	8.4	7.6	
20.7	441	11.7	7.45	1
18.45	400	9.7	7.8	
16.8	310	10.7	7.75	
23.3	455	26.4	8.2	1
21	445	23.5	8.25	
17.2	269	11.1	8.5	
21.85	400	35.9	9.3	0.75
20.95	420	18.7	8.45	

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
16.2	320	24.5	8.5	
26.25	392	24.8	9.3	0.75
15.5	269	10	8.7	
13.55	265	7.1	8.75	
21.9	401	16.6	8.9	1
20.25	378	11	8.7	
15.7	355	7.2	8.6	
20.75	483	12.2	7.9	1
19.2	496	11.3	7.5	
18.65	474	10.8	7.4	
21.35	390	13.9	8.03	1.5
21.05	414	14.1	7.87	
21	415	12.8	7.77	
19.4	358	8.1	7.88	1.25
19	373	7.4	7.8	
18	341	8.1	7.79	
15.2	n/a	7	7.41	1
14.2	n/a	5.2	7.15	
13.9	n/a	4.4	7.15	
11.3	418	5.2	8.06	1
11.3	419	4.3	8.02	
10.8	382	5.3	8	
6.2	543	4.2	7.99	1
6.25	558	8.9	8.01	
6.35	658	4.9	8	
1.8	n/a	7.1	8.17	2
1.8	n/a	6.4	8.1	
1.8	n/a	7.5	8.08	
1.5	n/a	8.6	8.07	n/a
1.5	n/a	9	8.06	
0.5	n/a	10.8	8.1	n/a
0.5	n/a	12.5	8.12	
0.5	n/a	13.9	8.12	
4.1	423	36.5	8.59	1
4.1	431	31.7	8.6	
4	515	29	8.5	
8.5	482	16.6	8.09	1
8.15	440	17.2	8.13	
8.25	462	16	8.05	
10.55	706	17.8	6.94	0.75
9.55	716	20.1	6.98	
8.98	726	19.4	6.94	
14.64	738	20	7.34	0.75
12.77	659	16.6	7.3	
12.36	648	12.1	7.3	
20.03	661	n/a	7.44	0.5
17.38	649	8.7	7.5	
14.36	644	7.3	7.49	

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
21.14	671	10.5	7.49	1.25
18.6	592	9.4	7.35	
14.76	549	6.9	7.33	
23.89	520	26.7	7.14	0.75
16.64	434	28.4	7.16	
14.1	404	6.1	7.24	
19.15	471	10.3	7.29	1.5
19.15	470	12.4	7.46	
18.61	479	11.1	7.45	

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STATION 3

DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TN-N(mg/L)
10-Feb-87	1	0.52	0.0252	1.119	1.924
10-Feb-87	5	0.626	0.0294	1.196	2.123
10-Feb-87	9	0.978	0.0452	1.564	3.116
11-Feb-87	1	0.439	0.0349	1.51	2.367
11-Feb-87	5	0.581	0.0275	1.057	2.013
11-Feb-87	9	1.156	0.0591	1.694	3.302
12-Feb-87	1	0.603	0.0492	2.818	3.762
12-Feb-87	5	0.984	0.0433	1.369	2.538
12-Feb-87	9	0.359	0.0208	0.851	1.492
13-Feb-87	1	1.29	0.0455	2.283	4.158
13-Feb-87	5	1.577	0.0502	1.976	3.874
13-Feb-87	9	1.542	0.0491	2.097	3.789
16-Feb-87	1	1.133	0.09	2.452	5.102
16-Feb-87	5	1.113	0.0668	1.949	3.755
16-Feb-87	9	1.51	0.0683	2.016	3.504
17-Feb-87	1	0.696	0.0473	2.133	3.485
17-Feb-87	5	0.903	0.0426	1.303	2.456
17-Feb-87	9	1.012	0.0471	1.403	2.724
18-Feb-87	1	0.992	0.07	1.966	3.299
18-Feb-87	5	1.251	0.0678	1.728	3.404
18-Feb-87	9	0.953	0.0603	1.6	3.213
19-Feb-87	1	0.36	0.0442	1.438	2.124
19-Feb-87	5	0.534	0.0327	1.01	1.863
19-Feb-87	9	1.154	0.0709	1.803	3.61
20-Feb-87	1	0.098	0.0089	0.53	0.879
20-Feb-87	5	0.605	0.0361	1.085	1.983
20-Feb-87	9	1.206	0.0647	1.676	3.297
23-Feb-87	1	0.863	0.0831	2.151	3.663
23-Feb-87	5	0.985	0.0577	1.639	3.157
23-Feb-87	9	1.254	0.0704	1.882	3.515
24-Feb-87	1	0.211	0.045	0.959	1.613
24-Feb-87	5	0.105	0.0112	0.556	0.916
24-Feb-87	9	0.099	0.011	0.529	0.831
03-Mar-87	1	1.197	0.0861	2.1	4.193
03-Mar-87	5	1.577	0.0732	1.799	3.772
03-Mar-87	9	1.338	0.0747	1.782	3.971
10-Mar-87	1	1.694	0.102	1.956	4.29
10-Mar-87	5	1.715	0.0948	1.912	4.318
10-Mar-87	9	1.757	0.0949	1.949	4.371
13-Mar-87	1	0.212	0.0625	0.66	1.037
13-Mar-87	5	0.751	0.0394	1.112	2.118
13-Mar-87	9	1.435	0.0763	1.781	3.807
16-Mar-87	1	1.444	0.1252	1.948	4.236
16-Mar-87	5	1.506	0.0863	1.885	4.204

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STATION 3 DEPTH

DATE	(m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TN-N(mg/L)
16-Mar-87	9	1.501	0.0863	1.907	4.198
17-Mar-87	1	0.619	0.1672	1.496	2.421
17-Mar-87	5	1.024	0.0636	1.444	3.049
17-Mar-87	9	1.594	0.0855	1.863	4.159
18-Mar-87	1	0.865	0.1519	1.388	2.601
18-Mar-87	5	0.902	0.0469	1.095	2.294
18-Mar-87	9	1.055	0.0625	1.305	2.723
19-Mar-87	1	0.709	0.0466	1.132	2.182
19-Mar-87	5	1.448	0.0842	1.754	3.855
19-Mar-87	9	1.583	0.0893	1.791	4.16
20-Mar-87	1	0.901	0.0588	1.253	2.6
20-Mar-87	5	1.526	0.0893	1.765	4.135
20-Mar-87	9	1.438	0.0886	1.71	3.961
24-Mar-87	1	0.31	0.0566	1.006	1.945
24-Mar-87	5	0.972	0.0621	1.311	2.888
24-Mar-87	9	0.133	0.0111	0.488	0.841
25-Mar-87	1	0.095	0.0737	0.634	1.19
25-Mar-87	5	0.079	0.0086	0.44	0.796
25-Mar-87	9	0.91	0.0464	1.088	n/a
26-Mar-87	1	0.451	0.0392	1.24	n/a
26-Mar-87	5	0.589	0.0319	0.835	n/a
26-Mar-87	9	0.432	0.0253	0.766	n/a
27-Mar-87	1	0.338	0.0441	0.8	0.0268
27-Mar-87	5	1.114	0.0608	1.347	n/a
27-Mar-87	9			n/a	n/a
09-Apr-87	1	1.828	0.125	1.954	4.31
09-Apr-87	5	1.666	0.1086	1.867	4.15
09-Apr-87	10	1.682	0.0968	1.816	4.062
15-Apr-87	1	1.628	0.0874	1.704	4.06
15-Apr-87	5	1.677	0.0849	1.693	4.13
15-Apr-87	9.5	1.676	0.0861	1.723	4.07
21-Apr-87	1	2.381	0.1166	1.636	4.32
21-Apr-87	5	2.065	0.1061	1.627	3.93
21-Apr-87	10	1.686	0.0948	1.638	4.025
21-Apr-87	17	n/a	n/a	n/a	n/a
05-May-87	1	1.544	0.1054	1.66	4.02
05-May-87	5	1.588	0.0964	1.616	4.09
05-May-87	10	1.588	0.0969	1.638	3.99
11-May-87	1	1.633	0.1169	1.614	4.45
11-May-87	5	1.782	0.1127	1.604	4.22
11-May-87	8	0.421	0.0986	1.561	3.71
21-May-87	1	2.25	0.125	1.565	4.95
21-May-87	5	1.7	0.12	1.57	4.44
21-May-87	9	1.54	0.096	1.349	3.63
02-Jun-87	1	1.937	0.1515	1.539	4.291
02-Jun-87	5	1.366	0.1417	1.474	3.641
02-Jun-87	9	0.683	0.0651	0.859	2.162
10-Jun-87	1	1.336	0.1802	1.572	3.945

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 3 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TN-N(mg/L)
10-Jun-87	5	1.666	0.181	1.562	3.892
10-Jun-87	10	0.933	0.102	1.04	2.474
18-Jun-87	1	1.505	0.1897	1.725	4.023
18-Jun-87	5	1.013	0.1898	1.591	3.625
18-Jun-87	8	0.981	0.1227	1.177	4.695
22-Jun-87	1	3.104	0.1864	1.599	5.447
22-Jun-87	5	1.496	0.1748	1.72	4.274
22-Jun-87	8	1.914	0.1451	1.742	4.396
02-Jul-87	1	0.693	0.0675	2.143	3.2
07-Jul-87	1	0.895	0.2224	2.35	3.386
07-Jul-87	5	0.497	0.1215	2.233	3.069
07-Jul-87	9	0.182	0.05	0.723	1.287
16-Jul-87	1	1.167	0.2912	2.083	3.782
16-Jul-87	5	0.369	0.2228	2.072	2.879
16-Jul-87	9.5	0.152	0.1213	1.159	1.681
28-Jul-87	1	0.483	0.153	1.632	2.505
28-Jul-87	5	0.288	0.1086	1.329	2.062
28-Jul-87	9	0.146	0.0449	0.706	1.369
12-Aug-87	1	0.495	0.203	1.28	2.072
12-Aug-87	5	0.471	0.1533	1.243	2.024
12-Aug-87	9	0.417	0.1667	1.273	2.032
03-Sep-87	1	0.688	0.167	1.297	2.496
03-Sep-87	5	0.423	0.139	0.898	1.755
03-Sep-87	9	0.107	0.0336	0.468	1.115
14-Sep-87	1	0.811	0.2251	1.531	2.735
14-Sep-87	5	0.442	0.2068	1.293	2.171
14-Sep-87	8	0.201	0.0862	0.557	1.075
28-Sep-87	1	0.238	0.0489	0.492	0.964
28-Sep-87	5	0.335	0.0524	0.51	0.996
28-Sep-87	8.5	0.159	0.0655	0.621	0.89
19-Oct-87	1	0.711	0.1425	1.994	2.947
19-Oct-87	5	0.318	0.0695	1.188	1.691
19-Oct-87	9	0.0253	0.0253	0.712	1.027
10-Nov-87	1	0.6	0.092	1.748	2.798
10-Nov-87	5	0.18	0.039	0.944	1.449
10-Nov-87	8	0.08	0.019	0.625	0.959
17-Dec-87	1	1.13	0.055	1.891	3.545
17-Dec-87	5	1.043	0.05	1.992	3.498
17-Dec-87	8.5	0.96	0.05	1.908	3.474
12-Jan-88	1	1.016	0.008	2.054	4.312
12-Jan-88	5	1.137	0.048	1.796	3.581
12-Jan-88	9	1.124	0.061	1.65	3.467
18-Jan-88	1	0.391	0.006	0.953	n/a
18-Jan-88	5	0.411	0.016	0.807	n/a
18-Jan-88	9	0.658	0.027	0.982	n/a
20-Jan-88	1				n/a
20-Jan-88	5	0.117	0.016	0.535	0.862
20-Jan-88	9	0.121	0.011	0.506	0.861

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 3 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TN-N(mg/L)
21-Jan-88	1	0.937	0.064	1.459	3.229
21-Jan-88	5	1.3	0.084	1.61	3.656
21-Jan-88	9	1.254	0.085	1.698	3.757
22-Jan-88	1	0.568	0.027	0.724	1.617
22-Jan-88	5	1.004	0.057	1.187	2.893
22-Jan-88	9	0.875	0.046	0.998	0.0979
25-Jan-88	1	0.021	0.008	0.435	0.972
25-Jan-88	5	0.07	0.007	0.445	0.891
25-Jan-88	9	0.123	0.008	0.471	0.94
26-Jan-88	1	2.128	0.096	1.697	4.679
26-Jan-88	5	1.887	0.097	1.695	4.497
26-Jan-88	9	1.847	0.097	1.696	4.563
27-Jan-88	1	0.368	0.023	0.7	1.442
27-Jan-88	5	0.684	0.039	0.908	2.05
27-Jan-88	9	1.102	0.062	1.257	3.108
28-Jan-88	1	0.832	0.037	0.96	2.231
28-Jan-88	5	1.067	0.058	1.315	2.956
28-Jan-88	9	1.095	0.072	1.543	3.413
29-Jan-88	1	0.069	0.019	0.474	0.907
29-Jan-88	5	0.172	0.013	0.548	0.885
29-Jan-88	9	1.027	0.052	1.239	2.514
01-Mar-88	1	0.523	0.002	0.831	1.516
01-Mar-88	5	1.097	0.003	1.466	2.944
01-Mar-88	9	1.431	0.003	1.88	4.176
22-Mar-88	1	0.482	0.025	0.679	1.274
22-Mar-88	5	0.519	0.019	0.749	1.375
22-Mar-88	9	1.422	0.081	1.46	3.089
05-Apr-88	1	1.344	0.044	0.719	2.351
05-Apr-88	5	0.366	0.018	0.524	0.997
05-Apr-88	9	0.809	0.043	0.821	1.652
25-Apr-88	1	2.19	0.19	1.758	4.596
25-Apr-88	5	1.969	0.172	1.764	4.409
25-Apr-88	15	1.807	0.131	1.638	3.857
17-May-88	1	1.459	0.178	1.698	3.566
17-May-88	5	1.28	0.148	1.533	3.406
17-May-88	8.5	0.943	0.085	1.033	1.864
31-May-88	1	1.528	0.186	1.803	3.735
31-May-88	5	1.161	0.176	1.567	3.386
31-May-88	9	0.478	0.069	0.823	1.623
14-Jun-88	1	1.495	0.163	2.215	3.747
14-Jun-88	5	1.256	0.14	2.047	3.614
14-Jun-88	9	0.34	0.037	0.794	1.211
18-Aug-88	1	0.432	0.15	1.814	2.605
18-Aug-88	5	0.228	0.096	1.304	1.87
18-Aug-88	9	0.155	0.07	1.283	1.76
13-Sep-88	1	0.559	0.107	1.323	2.148
13-Sep-88	5	0.108	0.019	0.603	1.101
13-Sep-88	9	0.188	0.033	0.689	1.232

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	%TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
n/a	0.0248	0.0163	66	n/a	13.23
n/a	0.0351	0.017	5.9	n/a	12.86
n/a	0.0485	0.0231	58	n/a	11.71
n/a	0.0227	0.0119	n/a	n/a	12.87
n/a	0.0309	0.0148	n/a	n/a	13.22
n/a	0.0547	0.0234	n/a	n/a	13.23
n/a	0.0345	0.003	n/a	n/a	13.17
n/a	0.0247	0.0146	n/a	n/a	13.2
n/a	0.0484	0.0007	n/a	n/a	12.98
n/a	0.0706	0.0171	n/a	n/a	13.41
n/a	0.067	0.0298	n/a	n/a	12.63
n/a	0.0675	0.0298	n/a	n/a	12.54
n/a	0.603	0.0037	n/a	n/a	12.92
n/a	0.0608	0.017	n/a	n/a	12.49
n/a	0.0623	0.0203	n/a	n/a	12.45
n/a	0.0375	0.0015	n/a	n/a	13.77
n/a	0.0417	0.0137	n/a	n/a	13.37
n/a	0.0461	0.0166	n/a	n/a	13.02
n/a	0.0473	0.0112	n/a	n/a	13.35
n/a	0.0592	0.0232	n/a	n/a	12.81
n/a	0.0545	0.0212	n/a	n/a	13.11
n/a	0.022	0.0016	n/a	n/a	14.49
n/a	0.0323	0.002	n/a	n/a	13.99
n/a	0.0581	0.0097	n/a	n/a	12.69
n/a	0.0159	0.0008	n/a	n/a	14.97
n/a	0.0396	0.001	n/a	n/a	13.09
n/a	0.0602	0.0191	n/a	n/a	12.97
n/a	0.0385	0.0056	n/a	n/a	13.81
n/a	0.0508	0.0146	n/a	n/a	12.68
n/a	0.0591	0.0192	n/a	n/a	11.08
n/a	0.0179	0.0011	n/a	n/a	14.34
n/a	0.0153	0.0007	n/a	n/a	14.38
n/a	0.0158	0.0003	n/a	n/a	14.34
n/a	0.0735	0.0124	n/a	n/a	12.93
n/a	0.0704	0.0202	n/a	n/a	12.85
n/a	0.0743	0.0231	n/a	n/a	12.82
5.4	0.2298	0.0305	n/a	n/a	11.03
5.8	0.09	0.0339	n/a	n/a	11.29
5.8	0.2298	0.0353	n/a	n/a	11.39
0.6	0.1382	0.0029	n/a	n/a	15.07
2.1	0.0835	0.0068	n/a	n/a	14.36
4.3	0.1382	0.0235	n/a	n/a	13.08
16	0.1121	0.0227	n/a	n/a	13.63
17.3	0.1075	0.0284	n/a	n/a	13.56

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	%TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
17.4	0.1111	0.0288	n/a	n/a	13.58
6	0.0397	0.0073	n/a	n/a	14.82
8.3	0.0656	0.0184	n/a	n/a	13.91
4.9	0.0854	0.0284	n/a	n/a	13.25
9.6	0.0517	0.0048	n/a	n/a	14.22
10.1	0.0482	0.0094	n/a	n/a	14.63
11.7	0.0539	0.01	n/a	n/a	14.34
7.3	0.0402	0.004	n/a	n/a	14.37
14.7	0.0702	0.0167	n/a	n/a	13.04
16.3	0.0738	0.0203	n/a	n/a	13.04
8.6	0.045	0.0049	n/a	n/a	13.68
14.6	0.072	0.0194	n/a	n/a	12.88
15.8	0.1188	0.011	n/a	n/a	12.84
3.9	0.0259	0.0019	n/a	n/a	15.25
11.8	0.0517	0.0054	n/a	n/a	13.38
1.5	0.0388	0.0016	n/a	n/a	12.79
1.9	0.0195	0.0024	n/a	n/a	14.61
1.6	0.018	0.0014	n/a	n/a	14.49
19.1	n/a	0.0049	n/a	n/a	14.34
8.1	n/a	0.0013	n/a	n/a	13.72
10.6	n/a	0.0038	n/a	n/a	13.74
8.2	0.0268	0.0005	n/a	n/a	13.45
6.2	0.0269	0.0006	n/a	n/a	13.53
20.6	0.0557	0.0008	n/a	n/a	13.56
0	n/a	n/a	n/a	n/a	13.67
27	0.086	0.0253	n/a	11.1	10.45
31	0.0701	0.0232	n/a	10.8	10.36
45	0.0679	0.0204	n/a	11.3	10.82
45	0.0706	0.028	62	n/a	10.03
45	0.0754	0.0271	62.9	n/a	9.46
56	0.076	0.0261	61	n/a	9.65
83	0.0754	0.0432	34.1	14.4	11.64
37	0.086	0.0302	43	11.9	10.87
27	0.078	0.027	57	10.3	10.49
n/a	n/a	n/a	57	10.3	n/a
293	0.0975	0.0107	51.7		n/a
254	0.0883	0.0096	54		n/a
206	0.0812	0.0096	55.5		n/a
36	0.0913	0.0093	60.2	11.5	9.83
48	0.0922	0.008	60.4	11.5	8.9
12	0.0677	0.009	60.2	10	9.66
n/a	0.0768	0.0275	67.5	7.4	7.45
n/a	0.0789	0.0244	64	7.3	7.45
n/a	0.0502	0.0184	48.5	7.05	9.12
79	0.1028	0.0915	57	11	10.67
26	0.0776	0.0111	72	10.8	10.67
1	0.0338	0.003	76.2	11.99	12.22
18	0.0922	0.013	56.7	n/a	8.46

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	%TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
23	0.0748	0.0139	72	n/a	8.92
9	0.0287	0.0038	76.4	n/a	12.11
49	n/a	0.0074	60	8.8	n/a
27	0.0395	0.0053	65.8	7.4	n/a
20	0.0697	0.008	74	10.4	n/a
71	0.0535	0.0618	64	n/a	7.49
25	0.0535	0.0385	66.4	n/a	6.03
21	0.0552	0.0546	63	n/a	3.7
n/a	0.0658	0.036	n/a	n/a	n/a
38	0.068	0.0568	58	8.8	n/a
25	0.0505	0.0636	75	7.4	n/a
9.4	0.021	0.0309	80.3	9.6	n/a
355	0.0716	0.0282	53.5	9.25	n/a
53	0.0588	0.0023	64.8	4.9	n/a
23	0.0189	0.0011	78.8	9.3	n/a
338	0.0504	0.0055	57.2	9.1	n/a
196	0.0326	0.0043	69.1	9.1	n/a
74	0.0181	0.002	70.9	9.55	n/a
121	0.0574	0.0092	63	3.4	n/a
136	0.0575	0.0039	63.2	2.8	n/a
102	0.0532	0.0116	61.5	0.9	n/a
138	0.0556	0.0078	68.7	9.3	n/a
6	0.0351	0.0038	71	3.4	n/a
1	0.0234	0.008	79.4	2.9	n/a
63	0.0625	0.0155	63	8.9	n/a
33	0.0467	0.0067	65.7	8.1	n/a
15	0.0286	0.0037	76.2	7.85	n/a
19	0.0219	0.0148	76.3	7.6	n/a
26	0.0209	0.0146	75	n/a	n/a
10	0.0312	0.0037	74.8	n/a	n/a
7	0.0338	0.0333	47.5	6.6	7.53
3	0.0365	0.016	58	n/a	9.93
1	0.032	0.0047	64.3	n/a	11.29
13	0.0501	0.044	69.5	n/a	9.91
6	0.0243	0.016	69	n/a	11.97
3	0.0185	0.009	68.7	n/a	12.73
17	0.1203	0.0794	75.9	n/a	12.58
13	0.1196	0.0801	75.9	n/a	10.67
12	0.1159	0.0761	76	n/a	12.21
9.1	0.1086	0.0745	n/a	n/a	13.7
10.1	0.1166	0.0706	n/a	n/a	14.25
10.1	0.1071	0.07	n/a	n/a	14.21
4.3	n/a	0.0394	n/a	n/a	13.7
4.5	n/a	0.0285	n/a	n/a	13.7
7.2	n/a	0.035	n/a	n/a	13.64
n/a	n/a	n/a	n/a	n/a	n/a
1.2	0.0244	0.0077	n/a	n/a	13.57
1.3	0.0337	0.0096	n/a	n/a	13.51

TOXIC NH3-N (ug/L)	TP-P(mg/L)	SRP(mg/L)	%TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
8.4	0.1178	0.0517	n/a	n/a	12.5
11.7	0.1196	0.0577	n/a	n/a	12.82
11.3	0.1183	0.0624	r/a	n/a	12.58
6.5	0.0317	0.0205	n/a	n/a	13.36
11	2.341	0.0496	n/a	n/a	12.88
9.2	0.0649	0.0417	n/a	n/a	13.17
2.1	0.0195	0.003	n/a	n/a	13.55
2	0.0198	0.0015	n/a	n/a	13.63
3.4	0.0196	0.0021	n/a	n/a	13.6
25.5	0.1336	0.0889	n/a	n/a	12.54
22.6	0.1334	0.0746	n/a	n/a	12.68
22.1	0.1365	0.0696	n/a	n/a	12.36
4.5	0.0333	0.0081	n/a	n/a	13.68
8.1	0.0865	0.0175	n/a	n/a	12.96
13	0.1007	0.0427	n/a	n/a	12.85
9.1	0.0514	0.0382	n/a	n/a	13.72
11.7	0.0928	0.052	n/a	n/a	13.31
12	0.1139	0.0503	n/a	n/a	13.91
1.3	0.0233	0.0021	n/a	n/a	13.79
3.2	0.0249	0.0068	n/a	n/a	13.79
18.4	0.0939	0.052	n/a	n/a	13.74
4.7	0.0353	0.018	71.9	n/a	13.91
9.8	0.1064	0.0518	63.8	n/a	12.89
12.8	0.1336	0.0506	63.8	n/a	13.36
14.4	0.025	0.0017	73.5	n/a	14.06
15.8	0.0427	0.0021	67.4	n/a	14.88
46.2	0.1188	0.03	46.5	n/a	14.18
62	0.0271	0.0285	73.2	9.7	n/a
17	0.025	0.0049	72.2	9.92	n/a
31	0.0531	0.0139	65.5	9.37	n/a
6	0.0905	0.0386	28.4	10.62	n/a
5	0.0946	0.0389	28.3	10.32	n/a
4	0.083	0.032	29.6	10.29	n/a
7	0.0708	0.0374	42.45	9.99	n/a
6	0.0642	0.02	44.68	9.98	n/a
4	0.0362	0.0108	55.5	10.74	n/a
29	0.1343	0.0177	11.44	12.55	n/a
22	0.2188	0.005	15.66	12.17	n/a
5	0.0653	0.0007	43.1	12.94	n/a
41	0.1294	0.0387	28.89	9.58	n/a
28	0.0949	0.0375	38.23	8.84	n/a
3	0.0292	0.0016	61.56	10.16	n/a
2	0.0507	0.0033	22.8	7.54	n/a
0.7	0.039	0.0031	31.5	5.65	n/a
0.5	0.0337	0.0045	33	4.5	n/a
55.3	0.0163	0.0016	33.95	7.92	n/a
10.5	0.0198	0.0009	35.87	7.29	n/a
8.6	0.0398	0.0008	51.61	7.84	n/a

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
1.6	n/a	3.4	n/a	2.8
1.3	n/a	3.7	n/a	
1.2	n/a	6	n/a	
1.6	n/a	2.3	n/a	n/a
1.6	n/a	2.8	n/a	
1.6	n/a	3.6	n/a	
1.7	n/a	3.6	n/a	n/a
1.7	n/a	3.6	n/a	
1.7	n/a	4.6	n/a	
2	n/a	4.8	n/a	n/a
2	n/a	4.4	n/a	
2	n/a	4.5	n/a	
1.25	n/a	7.9	n/a	n/a
1.25	n/a	6.6	n/a	
1.25	n/a	5.4	n/a	
1	n/a	3.3	n/a	n/a
1	n/a	4.3	n/a	
1	n/a	5.2	n/a	
1.1	n/a	4.8	n/a	n/a
1.7	n/a	5.7	n/a	
1.9	n/a	6.2	n/a	
0.37	n/a	3.7	n/a	n/a
0.93	n/a	4.6	n/a	
1.33	n/a	3.8	n/a	
0.2	n/a	2.6	n/a	n/a
0.2	n/a	5.1	n/a	
0.2	n/a	6.9	n/a	
0.6	n/a	6.4	n/a	n/a
0.6	n/a	6.6	n/a	
0.6	n/a	7.2	n/a	
0.75	n/a	2.6	n/a	n/a
0.75	n/a	n/a	n/a	
0.75	n/a	3.2	n/a	
1.7	n/a	7	n/a	n/a
1.8	n/a	9.5	n/a	
1.8	n/a	10.4	n/a	
2.6	563	1.9	7.51	1.2
3.5	642	9.9	7.43	
3.5	564	10.4	7.4	
2	356	7.5	7.39	n/a
2	434	7.9	7.42	
2	604	9.8	7.43	
3.4	612	6.6	8.02	n/a
3.4	616	8.9	8.11	

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
3.4	611	12.4	8.13	
3.5	363	5.8	7.81	n/a
3	436	6.8	7.71	
2.3	530	10.2	7.64	
3	427	9.7	8.08	n/a
3	427	9.8	8.07	
3	488	9.2	8.06	
3.3	401	7.7	7.95	n/a
3.5	572	10.2	7.86	
3.8	597	13.7	7.86	
3.8	483	8.9	7.92	n/a
3.8	614	10.7	7.92	
3.8	628	12.3	7.89	
5.5	487	4.3	8.18	n/a
5.5	507	10.6	8.07	
5.5	585	19.5	7.96	
5	311	2.5	8.35	n/a
5	312	3.2	8.37	
5	320	6.6	8.35	
5	513	7.9	8.19	n/a
5	505	5.2	8.18	
5	427	8.4	8.28	
7	363	10.4	8.19	n/a
7	451	12.8	8.18	
7	341	13.6	8.28	
9.15	584	7.5	7.99	0.75
7.3	589	17.9	8.12	
6.15	591	9.9	8.31	
6.8	539	6.6	8.3	1.5
6.45	547	7.4	8.3	
6.45	550	12.6	8.4	
12.8	540	19.2	8.23	1
9.7	547	11.3	8.01	
8.3	560	9.2	7.98	
n/a	n/a	n/a	7.85	
10.9	699	23.7	9.2	1.5
10.3	710	25	9.1	
10	715	21.7	8.9	
12.5	672	23	8	1.5
12.45	673	9.6	8.1	
12.4	673	13.9	8.15	
14.1	633	6.4	n/a	1.75
13.7	613	5.6	n/a	
12.1	529	3.6	n/a	
20.5	653	32.7	n/a	1.5
13	464	16.9	n/a	
8.1	435	6.6	n/a	
18.15	363	15.7	n/a	1.25

TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
12.65	234	11.6	n/a	
9.65	252	5.4	n/a	
21.3	565	23.5	7.95	1.9
18.6	579	17.9	7.85	
10.2	455	9.2	7.85	
19.25	559	19.4	7.8	1.9
18.85	553	12.3	7.7	
15.75	498	11.3	7.6	
n/a	n/a	11	7.85	
21.85	333	24.4	8.05	1
19.3	290	15.2	8.35	
18.3	268	4.4	8.4	
21.35	407	46.2	9	1
18	364	25.9	8.7	
12.05	287	9.5	8.95	
24.55	382	15.8	9.7	1.5
16.8	315	10.9	9.3	
12.4	285	5.6	9.25	
20.3	211	16.3	8.9	1.5
20.25	315	11.3	9	
17.7	330	9	9.1	
18.8	519	13.4	7.85	1.75
16.05	531	13.4	7.7	
12.45	583	3.8	7.85	
20.5	376	24.4	8.32	2
20.1	346	20.3	8.31	
19.3	290	7.4	8.35	
18	264	8.4	8.42	2
18	276	8	8.43	
18	300	8	8.32	
13.9	n/a	7.5	7.56	2
9.5	n/a	6.3	7.74	
7.4	n/a	3.9	7.84	
9.5	373	5	8.16	2.5
7.25	311	5.6	8.36	
7	321	5	8.43	
5	463	6.1	8.09	1.5
5	478	6.6	7.91	
5	487	5.3	8.02	
1.1	n/a	6.9	8.2	n/a
1.1	n/a	5.8	8.19	
1.1	n/a	6.2	8.17	
2.3	n/a	2.4	8.39	n/a
2.3	n/a	2.9	8.37	
2.3	n/a	3.8	8.29	
2.3	n/a	4.6	7.44	n/a
2.3	n/a	5	8.24	
2.3	n/a	28.7	8.31	

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 4 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Mar-87	1	1.084	0.0675	1.861	3.589
10-Mar-87	6	1.144	0.064	1.871	3.58
09-Apr-87	1	0.851	0.0493	1.829	3.19
09-Apr-87	5	0.973	0.0531	1.788	3.23
09-Apr-87	7.5	1.087	0.0598	1.754	3.22
14-Apr-87	1	1.271	0.0804	1.623	3.65
14-Apr-87	6.5	1.226	0.0712	1.613	3.33
21-Apr-87	1	1.225	0.0766	1.506	3.36
21-Apr-87	5	1.401	0.0785	1.555	3.44
21-Apr-87	8	1.521	0.0857	1.623	3.72
29-Apr-87	1	2.893	0.0936	1.069	5.09
29-Apr-87	5	1.619	0.0834	1.471	3.77
29-Apr-87	9	1.479	0.0752	1.393	3.94
05-May-87	1	8.342	0.1944	1.171	9.83
05-May-87	5	6.695	0.1868	1.353	8.6
05-May-87	7	4.854	0.1347	1.328	6.76
11-May-87	1	1.414	0.094	1.633	3.72
11-May-87	5	1.423	0.0957	1.651	3.83
11-May-87	9.5	1.412	0.1005	1.522	3.9
21-May-87	1	1.34	0.1	1.466	3.67
21-May-87	5	1.45	0.109	1.597	3.89
21-May-87	7.5	1.36	0.105	1.571	3.64
01-Jun-87	1	4.473	0.1281	1.22	6.382
01-Jun-87	5	2.449	0.1375	1.495	4.649
01-Jun-87	8	1.68	0.1347	1.579	4.093
10-Jun-87	1	0.863	0.1032	1.109	2.477
10-Jun-87	5	1.603	0.1362	1.371	2.934
10-Jun-87	8.5	1.137	0.1418	1.411	3.258
18-Jun-87	1	0.803	0.1267	1.239	2.584
18-Jun-87	5	0.997	0.1659	1.546	3.131
18-Jun-87	7	0.907	0.1529	1.47	2.948
22-Jun-87	1	1.02	0.169	1.705	3.351
22-Jun-87	5	1.055	0.1767	1.64	3.442
22-Jun-87	7	0.936	0.1615	1.526	3.202
02-Jul-87	1	0.75	0.0629	2.019	2.9
02-Jul-87	5	0.524	0.0461	2.034	2.9
02-Jul-87	7	0.448	0.0405	1.96	2.8
07-Jul-87	1	0.78	0.2054	2.203	3.329
07-Jul-87	5	0.47	0.168	2.309	3.198
07-Jul-87	7.5	0.524	0.1685	2.271	3.09
16-Jul-87	1	0.073	0.1931	1.639	2.113
16-Jul-87	5	0.037	0.2296	2.089	2.55
16-Jul-87	7	0.036	0.2435	2.238	2.716
28-Jul-87	1	0.096	0.1154	1.362	1.916

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 4 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
28-Jul-87	5	0.168	0.1473	1.692	2.286
28-Jul-87	8	0.268	0.1557	1.816	2.133
12-Aug-87	1	0.231	0.1411	1.374	2.035
12-Aug-87	5	0.145	0.139	1.39	1.97
12-Aug-87	7	0.141	0.1439	1.425	1.967
03-Sep-87	1	0.276	0.2026	1.221	1.0184
03-Sep-87	5	0.273	0.2033	1.245	1.0417
03-Sep-87	7	0.264	0.2044	1.248	1.0436
14-Sep-87	1	0.454	0.1474	1.451	1.075
14-Sep-87	5	0.147	0.0796	1.482	2.347
14-Sep-87	6.5	0.105	0.0473	1.557	2.106
28-Sep-87	1	0.099	0.1042	1.334	1.763
28-Sep-87	5	0.086	0.1088	1.496	1.821
28-Sep-87	8	0.063	0.1022	1.451	1.692
19-Oct-87	1	0.059	0.0273	1.525	1.779
19-Oct-87	4	0.031	0.0284	1.708	1.971
19-Oct-87	6.5	0.023	0.0262	1.736	1.954
10-Nov-87	1	0.056	0.035	1.821	2.225
10-Nov-87	5	0.042	0.033	2.955	2.327
10-Nov-87	7	0.032	0.033	2.985	2.402
17-Dec-87	1	0.794	0.038	2.015	3.223
17-Dec-87	5	0.724	0.036	2.02	3.087
17-Dec-87	7	0.702	0.036	2.018	
06-Apr-88	1	1.311	0.088	1.568	3.443
06-Apr-88	5	1.443	0.083	1.55	3.45
06-Apr-88	9	1.327	0.086	1.57	3.459
25-Apr-88	1	1.65	0.11	1.645	3.796
25-Apr-88	5	1.614	0.109	1.684	3.787
25-Apr-88	7	1.64	0.111	1.687	3.826
17-May-88	1	1.277	0.14	1.582	3.134
17-May-88	5	1.165	0.154	1.723	3.093
17-May-88	7	1.439	0.162	1.79	3.52
31-May-88	1	1.2	0.156	1.604	3.047
31-May-88	5	1.265	0.173	1.78	3.548
31-May-88	7	1.336	0.17	1.849	3.742
14-Jun-88	1	1.041	0.068	1.814	1.814
14-Jun-88	5	1.036	0.082	2.205	2.205
14-Jun-88	7	1.031	0.078	2.163	2.163
18-Aug-88	1	0.432	0.15	1.814	2.605
18-Aug-88	5	0.228	0.096	1.304	1.87
18-Aug-88	9	0.155	0.07	1.283	1.76
13-Sep-88	1	0.559	0.107	1.323	2.148
13-Sep-88	5	0.108	0.019	0.603	1.202
13-Sep-88	9	0.188	0.033	0.689	1.232

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
3	0.0975	0.0218	44	n/a	12.46
3	0.0917	0.0245	56.5	n/a	12.43
12	0.0653	0.0154	n/a	11.8	11.2
12	0.067	0.0159	n/a	12.1	11.37
13	0.06	0.0173	n/a	12.3	11.45
52	0.0736	0.0168	22	5.8	9.02
60	0.0668	0.0158	71.5	5.91	9.95
90	0.0538	0.0136	6	15	14.03
22	0.0561	0.014	54.3	14.1	10.63
23	0.064	0.0131	53.9	12.7	8.78
115	0.0557	0.0041	54	n/a	n/a
64	0.0588	0.0119	55.3	n/a	n/a
59	0.0598	0.0119	40	n/a	n/a
3169	0.2081	0.0669	33.9	10.6	n/a
2075	0.108	0.0456	34.6	10	n/a
1747	0.1413	0.0496	33.9	10	n/a
183	0.0635	0.0039	58	10.6	9.52
170	0.0625	0.001	57.9	10	9.6
113	0.0694	0.0025	68	8.8	8.98
n/a	0.0866	0.0205	53.6	8.3	8.71
n/a	0.0898	0.0222	52	8.1	7.95
n/a	0.0658	0.0192	44	7.9	7.29
n/a	0.0761	0.1313	33	10.9	9.67
n/a	0.0764	0.0488	69.5	8.5	8.34
n/a	0.0678	0.0245	70.9	7.2	7.42
18.9	0.0694	0.0018	62.3	n/a	10.12
36.8	0.0916	0.0041	63.6	n/a	9.73
23.1	0.0659	0.0033	48	n/a	9.06
52	0.0608	0.0035	57.3	9.75	n/a
77	0.0712	0.0039	53.5	9	n/a
70	0.079	0.0032	53	8.6	n/a
89	0.0696	0.0146	43.9	n/a	7.85
22	0.0654	0.0062	8	n/a	8.05
24	0.0918	0.007	2	n/a	7.62
78	0.0787	0.0308	37.3	3.2	n/a
87	0.0637	0.0222	35.7	0.8	n/a
6	0.0607	0.0202	25	1.4	n/a
191	0.0706	0.0167	45.8	9.8	n/a
48	0.0802	0.0183	62	1.5	n/a
34	0.0762	0.0277	63.5	1.4	n/a
51	0.0768	0.001	50.25	12.8	n/a
24	0.09	0.0013	46.25	11.4	n/a
22	0.0901	0.0015	34	11.4	n/a
57	0.0481	0.0013	60	6.9	8.82

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
53	0.053	0.0015	63.9	3.7	5.64
45	0.0533	0.002	64	2.5	2.95
140	0.0792	0.0103	48	5.9	n/a
102	0.0721	0.0055	46	5.75	n/a
90	0.0751	0.0053	52	5.75	n/a
18	0.0349	0.0029	69	10.8	10.25
15	0.0406	0.0026	66	7.2	10.19
14	0.0429	0.0028	64	7.3	9.91
8.5	0.0286	0.0068	49	9.5	7.75
1.6	0.0488	0.0011	69.5	3.85	4.72
0.6	0.0344	0.0021	71.3	3.25	3.21
5.7	0.0373	0.003	71.7	9.8	8.58
4.4	0.0333	0.0024	67.9	6.3	7.82
4.2	0.034	0.0016	65.7	5.6	8.6
0	0.0157	0.0084	37	6.3	7.93
0	0.0307	0.0072	37.3	5.2	7.53
0	0.0593	0.0069	36.5	4.4	7.07
1	0.0399	0.0203	64.9	n/a	9.28
1	0.0429	0.0207	64.2	n/a	9.21
1	0.0403	0.0182	65	n/a	9.45
8	0.1109	0.065	64.3	n/a	12
8	0.1138	0.0679	59	n/a	12.79
8	n/a	0.058	50.9	n/a	12.42
367	0.0809	0.026	48.4	n/a	13.45
53	0.0842	0.0148	48.1	n/a	13.43
48	0.0869	0.0253	50.4	n/a	12.6
13.7	0.0816	0.0241	32.45	10.76	n/a
4	0.0856	0.0236	32.09	10.85	n/a
10	0.0875	0.0269	29.67	10.78	n/a
n/a	0.2582	0.0362	n/a	n/a	n/a
n/a	0.2628	0.0159	n/a	n/a	n/a
n/a	0.1254	0.015	n/a	n/a	n/a
35	0.0709	0.008	7.68	15.64	n/a
39	0.0559	0.0148	35.9	12.51	n/a
29.3	0.0637	0.0178	29.5	11.27	n/a
16.6	0.0756	2.882	0.068	6.61	n/a
12.4	0.0719	3.376	0.082	5.56	n/a
11.5	0.0733	3.382	0.078	4.84	n/a
0.1	0.0507	0.0033	22.8	7.54	n/a
0.3	0.039	0.0031	31.5	5.65	n/a
0.2	0.0337	0.0045	33	4.5	n/a
0.4	0.0163	0.0016	33.95	7.92	n/a
0.4	0.0198	0.0009	35.87	7.29	n/a
0.4	0.0398	0.0008	51.61	7.84	n/a
					n/a

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
2.2	511	10.5	7.36	0.9
2.1	507	7.5	7.34	
7.95	476	8.1	7.73	0.25
6.1	501	10.4	7.75	
5.8	505	6.7	7.72	
9	533	13.9	8.3	0.25
8.3	543	13	8.5	
14.5	424	34.2	8.4	0.5
8.4	463	14	7.95	
7.65	477	11	7.75	
9.3	545	10.6	8.3	1.75
9.5	542	12.4	8.3	
9.15	547	9.3	8.3	
10.9	692	29.6	9.49	1
10.8	694	21.8	9.4	
10.8	694	31.1	9.45	
12.6	648	16.9	8.85	1.25
12.25	668	12.5	8.8	
11.35	698	7.1	8.65	
14.8	650	12.9	n/a	1
14.5	662	12.7	n/a	
14.4	670	11	n/a	
18.35	618	20.5	n/a	1.25
16.6	645	10.2	n/a	
15.85	658	7.1	n/a	
18.9	575	11.9	7.8	1.5
18	600	19.3	7.85	
17.5	607	23.3	7.7	
21.5	540	17.3	8.2	1
21	552	17	8.35	
20.95	558	19.9	8.35	
21.2	544	14.5	7.3	1
20.9	548	15.7	7.7	
20.7	551	22.3	7.8	
20.95	421	11.4	7.45	0.75
20.95	394	7.4	7.6	
20.95	384	7.8	7.5	
23.45	450	24.1	8.85	0.75
18.85	449	17.1	8.5	
18.25	446	10	8.3	
23.15	411	41.9	9.7	1
22.75	420	59.5	9.65	
22.55	427	47.1	9.6	
22.4	349	25.9	9.5	1.5

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
21.5	339	24.4	9.1	
20.75	335	26.9	8.7	
23	344	n/a	9.5	0.75
22.8	356	34	9.7	
22.6	368	32.7	9.6	
18.9	494	13.6	8.3	2
18.75	504	15.3	8.2	
18.7	514	20.5	8.2	
19.5	396	7.4	8.22	1.5
18.55	394	14	7.81	
18.4	386	16	7.63	
19	269	8	8.21	2
18.2	310	15.2	8.1	
18.2	327	17.8	8.16	
13	n/a	8.1	7.74	1.75
12.8	n/a	9.2	7.73	
12.7	n/a	7.1	7.65	
10.3	370	10.5	8.07	2
9.8	378	7	8.06	
9.8	381	5.5	8.06	
3.1	478	5.7	8	1.5
4.2	490	5.3	8.04	
4.1	521	5.3	8.09	
5.8	343	26.6	9.41	1
5.75	372	23.1	8.64	
5.6	405	22.9	8.65	
8.26	627	20.1	7.71	0.5
8.23	628	16.7	7.21	
7.83	630	18	7.06	
n/a	n/a	64.7	n/a	0.75
n/a	n/a	52.9	n/a	
n/a	n/a	73.8	n/a	
19.27	648	11.6	7.86	0.5
17.09	642	10.6	8	
15.43	659	9.1	7.89	
17.7	599	6.9	7.66	1.5
16.77	589	5.1	7.62	
15.74	584	4.6	7.6	
21.04	486	28.1	7.15	1.25
16.49	426	19.6	7.17	
15.74	410	23	7.23	
18.54	460	12.9	8.56	1.5
16.94	450	6.5	8.59	
7.66	320	6.3	8.4	

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 5 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Feb-87	1	1.157	0.0705	2.213	4.551
10-Feb-87	5	1.551	0.074	2.207	4.665
10-Feb-87	10	1.078	0.0714	2.137	4.164
10-Feb-87	15	1.027	0.0712	2.2	4.361
10-Feb-87	20	1.128	0.076	2.235	4.423
10-Feb-87	22	1.492	0.0742	2.435	4.477
10-Mar-87	1	1.446	0.0745	1.899	3.571
10-Mar-87	5	1.544	0.0765	1.988	4.015
10-Mar-87	10	1.461	0.0759	1.909	3.908
10-Mar-87	15	1.492	0.0766	1.9	3.964
10-Mar-87	20	1.472	0.0784	1.907	3.975
09-Apr-87	1	1.492	0.0801	1.692	3.74
09-Apr-87	5	1.417	0.0805	1.697	3.73
09-Apr-87	10	1.525	0.0799	1.688	3.7
09-Apr-87	15	1.53	0.0802	1.693	3.63
09-Apr-87	20	1.483	0.0804	1.686	n/a
09-Apr-87	21.5	1.483	0.0813	1.694	3.72
14-Apr-87	1	1.528	0.0948	1.753	3.98
14-Apr-87	5	1.527	0.0949	1.764	3.94
14-Apr-87	10	1.729	0.093	1.668	3.8
14-Apr-87	15	1.507	0.0872	1.738	3.94
14-Apr-87	20	1.537	0.0802	1.71	3.82
14-Apr-87	23	1.477	0.079	1.707	3.74
21-Apr-87	1	1.494	0.0882	1.614	3.73
21-Apr-87	5	1.484	0.0909	1.622	3.66
21-Apr-87	10	1.604	0.0884	1.641	3.81
21-Apr-87	15	1.723	0.0898	1.627	3.94
21-Apr-87	20	1.782	0.0861	1.613	4.17
29-Apr-87	1	1.416	0.0764	1.404	3.92
29-Apr-87	5	1.484	0.0898	1.617	3.75
29-Apr-87	10	1.23	0.075	1.348	3.73
29-Apr-87	15	1.328	0.0771	1.404	3.71
29-Apr-87	20	1.328	0.0689	1.292	3.73
29-Apr-87	22	1.531	0.0747	1.359	3.81
05-May-87	1	1.241	0.0937	1.651	3.79
05-May-87	5	1.237	0.0978	1.71	3.77
05-May-87	10	1.406	0.0952	2.651	3.77
05-May-87	15	1.45	0.0954	1.653	3.84
05-May-87	20	1.322	0.095	1.641	3.78
11-May-87	1	1.443	0.0959	1.643	3.68
11-May-87	5	1.396	0.0994	2.665	3.69
11-May-87	10	1.363	0.098	2.655	3.96
11-May-87	15	1.436	0.098	1.653	3.77
11-May-87	20	1.396	0.098	1.648	3.79

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 5 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
11-May-87	22	1.567	0.0957	1.62	3.89
21-May-87	1	1.53	0.113	1.678	4.03
21-May-87	5	1.52	0.114	1.682	4.088
21-May-87	10	1.49	0.112	1.684	3.972
21-May-87	15	1.53	0.099	1.561	3.831
21-May-87	20	1.54	0.094	1.52	3.66
21-May-87	23	1.55	0.09	1.436	3.732
01-Jun-87	1	1.414	0.1376	1.661	3.921
01-Jun-87	5	1.347	0.1376	1.662	3.819
01-Jun-87	10	2.528	0.1235	1.61	3.5
01-Jun-87	15	1.616	0.1084	1.54	3.917
01-Jun-87	20	2.642	0.0945	1.353	3.798
01-Jun-87	23	1.522	0.0766	1.126	3.392
10-Jun-87	1	1.063	0.1362	1.371	2.934
10-Jun-87	5	1.258	0.1734	1.589	3.643
10-Jun-87	10	1.299	0.1537	1.487	3.5
10-Jun-87	15	1.307	0.1234	1.301	3.343
10-Jun-87	20	1.303	0.0969	1.144	3.088
10-Jun-87	22	1.307	0.0782	0.994	2.891
18-Jun-87	1	1.024	0.1876	1.711	3.44
18-Jun-87	5	1.097	0.1913	1.721	3.539
18-Jun-87	10	0.983	0.1566	1.639	3.358
18-Jun-87	15	1.022	0.1202	1.577	3.21
18-Jun-87	20	1.058	0.0926	1.402	2.953
18-Jun-87	22	1.043	0.0719	1.258	2.694
22-Jun-87	1	1.49	0.1917	1.759	4.019
22-Jun-87	5	1.133	0.1963	1.734	3.71
22-Jun-87	10	0.1093	0.837	1.859	3.277
22-Jun-87	15	0.0928	0.665	1.857	3.042
22-Jun-87	20	0.0828	0.66	1.672	2.803
22-Jun-87	23	0.0783	0.838	1.446	2.769
02-Jul-87	1	1.128	0.1234	1.958	3.6
02-Jul-87	5	0.96	0.1163	1.985	3.4
02-Jul-87	10	0.0691	0.499	2.034	2.9
02-Jul-87	15	0.1359	0.669	1.666	2.6
02-Jul-87	20	0.054	0.558	1.338	2.4
02-Jul-87	22	0.458	0.044	1.109	1.9
07-Jul-87	1	0.337	0.1063	1.527	2.29
07-Jul-87	5	0.535	0.1487	1.995	2.957
07-Jul-87	10	0.483	0.1011	1.914	2.761
07-Jul-87	15	0.436	0.0624	1.686	2.462
07-Jul-87	20	0.567	0.0764	1.439	2.382
07-Jul-87	22.5	0.572	0.0662	1.22	2.161
16-Jul-87	1	0.033	0.2725	2.452	2.802
16-Jul-87	5	0.063	0.243	1.767	2.862
16-Jul-87	10	0.084	0.2124	2.087	2.48
16-Jul-87	15	0.34	0.1352	1.572	2.23
16-Jul-87	20	0.589	0.1347	1.372	2.275

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 5 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
16-Jul-87	22	0.708	0.1019	1.051	2.802
28-Jul-87	1	0.255	0.1756	1.9	2.133
28-Jul-87	5	0.241	0.1671	1.893	2.325
28-Jul-87	10	0.224	0.0973	2.624	2.275
28-Jul-87	15	0.375	0.0852	1.292	1.842
28-Jul-87	20	0.486	0.0828	1.059	1.755
28-Jul-87	22	0.599	0.0609	0.741	1.552
12-Aug-87	1	0.236	0.1653	1.482	2.107
12-Aug-87	5	0.249	0.1641	1.529	2.155
12-Aug-87	10	0.264	0.1145	1.323	1.944
12-Aug-87	15	0.626	0.0261	0.607	1.587
12-Aug-87	21	0.801	0.0138	0.434	1.538
03-Sep-87	1	0.316	0.245	1.286	2.073
03-Sep-87	5	0.339	0.253	1.286	2.076
03-Sep-87	10	0.385	0.241	1.174	1.991
03-Sep-87	15	0.478	0.0937	0.676	1.528
03-Sep-87	20.5	0.951	0.009	0.073	1.325
14-Sep-87	1	0.151	0.2159	1.34	1.89
14-Sep-87	5	0.143	0.1987	1.408	1.936
14-Sep-87	10	0.092	0.0439	1.295	1.778
14-Sep-87	15	0.295	0.0897	0.96	1.629
14-Sep-87	20.5	0.901	0.0213	0.155	1.657
28-Sep-87	1	0.19	0.1373	1.502	1.859
28-Sep-87	5	0.266	0.1385	1.484	1.84
28-Sep-87	10	0.148	0.1158	1.527	1.83
28-Sep-87	15	0.265	0.0701	1.204	1.607
28-Sep-87	21	1.324	0.0266	0.147	1.495
19-Oct-87	1	0.017	0.0278	1.85	2.059
19-Oct-87	5	0.011	0.0196	1.853	2.111
19-Oct-87	10	0.01	0.0158	1.866	2.042
19-Oct-87	15	0.01	0.016	1.835	2.225
19-Oct-87	20	0.035	0.0271	1.537	1.764
10-Nov-87	1	0.04	0.038	1.96	2.427
10-Nov-87	5	0.042	0.04	1.991	2.367
10-Nov-87	10	0.044	0.04	1.976	2.535
10-Nov-87	15	0.039	0.038	1.967	2.458
10-Nov-87	20	0.04	0.039	1.982	2.381
17-Dec-87	1	0.783	0.042	2.12	n/a
17-Dec-87	5	0.815	0.04	2.082	n/a
17-Dec-87	10	0.813	0.039	2.03	n/a
17-Dec-87	15	0.806	0.039	2.007	n/a
17-Dec-87	21	0.817	0.038	2.018	n/a
22-Jan-88	1	0.983	0.079	1.701	3.551
22-Jan-88	5	1.224	0.086	1.796	3.815
22-Jan-88	10	1.137	0.087	1.803	3.855
22-Jan-88	15	1.133	0.088	1.815	3.88
22-Jan-88	21	1.241	0.088	1.796	3.935
02-Feb-88	1	1.335	0.095	1.751	4.155

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 5 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
02-Feb-88	21	1.359	0.092	1.719	4.114
01-Mar-88	1	1.632	0.002	1.9	4.1
01-Mar-88	5	1.275	0.003	1.902	3.81
01-Mar-88	10	1.266	0.003	1.938	3.733
01-Mar-88	15	1.025	0.005	1.901	3.946
01-Mar-88	20	1.686	0.003	1.936	3.939
22-Mar-88	1	1.51	0.093	1.674	3.475
22-Mar-88	5	1.504	0.095	1.706	3.539
22-Mar-88	10	1.58	0.095	1.716	3.518
22-Mar-88	15	1.566	0.095	1.758	3.517
22-Mar-88	21	1.544	0.094	1.748	3.661
05-Apr-88	1	1.49	0.084	1.476	3.192
05-Apr-88	5	1.552	0.095	1.62	3.584
05-Apr-88	10	1.678	0.096	1.645	3.478
05-Apr-88	15	1.448	0.096	1.645	3.376
05-Apr-88	21	1.525	0.097	1.65	3.873
25-Apr-88	1	1.728	0.113	1.682	3.891
25-Apr-88	5	1.676	0.112	1.677	3.851
25-Apr-88	10	1.691	0.11	1.684	3.866
25-Apr-88	15	1.686	0.108	1.684	3.893
25-Apr-88	20	1.675	0.11	1.684	3.78
17-May-88	1	1.322	0.183	1.822	3.775
17-May-88	5	1.479	0.179	1.807	0.959
17-May-88	10	1.51	0.168	1.789	3.72
17-May-88	15	1.678	0.146	1.719	4.14
17-May-88	20	1.833	0.136	1.659	4.138
31-May-88	1	1.22	0.184	1.866	3.752
31-May-88	5	1.164	0.188	1.851	3.512
31-May-88	10	0.989	0.16	1.866	3.482
31-May-88	15	1.259	0.089	1.706	3.427
31-May-88	21	1.158	0.048	1.742	3.732
14-Jun-88	1	1.024	0.085	2.174	3.467
14-Jun-88	5	1.084	0.082	2.175	3.395
14-Jun-88	10	0.959	0.067	2.058	3.344
14-Jun-88	15	0.664	0.063	2.292	3.175
14-Jun-88	22	1.014	0.113	2.162	3.28
18-Aug-88	1	0.082	0.156	1.88	2.284
18-Aug-88	5	0.081	0.162	1.784	2.216
18-Aug-88	10	0.038	0.093	1.585	1.878
18-Aug-88	15	0.118	0.033	1.15	2.122
18-Aug-88	22	0.397	0.052	0.859	2.092
13-Sep-88	1	0.377	0.093	1.297	1.934
13-Sep-88	5	0.285	0.086	1.324	1.933
13-Sep-88	10	0.224	0.079	1.295	1.858
13-Sep-88	15	0.22	0.005	0.992	1.507
13-Sep-88	20	0.415	0.01	0.664	1.301
13-Sep-88	23	0.522	0.002	0.497	1.307

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
4	0.0655	0.03	54	13.7	12.63
5	0.0624	0.0299	54	13.2	12.5
3	0.0629	0.0288	55	13.1	12.73
3	0.0604	0.0296	56.6	13	12.34
4	0.0645	0.0293	54.4	12.9	12.14
5	0.1279	0.0257	53.9	n/a	12.03
3	0.0913	0.0213	n/a	n/a	12.14
4	0.0843	0.0217	n/a	n/a	10.29
4	0.0926	0.0216	n/a	n/a	11.69
4	0.0927	0.0215	n/a	n/a	12.41
4	0.0961	0.0217	n/a	n/a	11.65
63	0.0565	0.0133	n/a	12.9	12.46
49	0.0569	0.0136	n/a	12.79	12.13
53	0.0516	0.0132	n/a	12.4	11.7
53	0.0526	0.0128	n/a	12.45	11.61
52	0.0523	0.0137	n/a	12.3	11.61
52	0.054	0.0143	n/a	12.3	11.89
30	0.0781	0.021	90.3	n/a	10.36
30	0.0772	0.0231	88.3	n/a	10.42
34	0.0739	0.0178	90.1	n/a	10.37
27	0.0696	0.0184	92	n/a	8.54
21	0.0657	0.0201	93.7	n/a	10.12
21	0.0656	0.0206	94.3	n/a	10.25
36	0.0587	0.0126	61.9	n/a	12.88
19	0.0668	0.0116	86.9	n/a	11.35
21	0.0666	0.0141	92.5	n/a	10.47
12	0.07	0.0232	94	n/a	10.63
9	0.0723	0.0248	72.5	n/a	9.37
3	0.0569	0.0125	50.5	n/a	10.26
3	0.068	0.0061	50.5	n/a	10.11
2	0.0693	0.0041	50.7	n/a	10.04
2	0.0579	0.0062	50.7	n/a	9.79
2	0.0698	0.0096	57.9	n/a	9.63
1	0.0753	0.0153	60	n/a	9.24
477	0.0692	0.0014	53.6	9.9	11.21
309	0.0723	0.0012	53.2	9.1	10.11
534	0.0747	0.0025	53.9	8.9	9.95
304	0.0673	0.0046	53.6	8.8	10.3
237	0.0655	0.0062	55	8.31	10.3
591	0.0696	0.0051	75	10.7	9.6
251	0.0611	0.0064	73.8	10.6	9.65
204	0.0578	0.0057	73.5	10.5	9.94
201	0.0565	0.0059	72.8	10	9.45
111	0.0575	0.0017	72.4	9.7	8.52

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
110	0.0604	0.0087	72.3	8.3	6.83
59	0.0744	0.0231	72	7.8	8.51
59	0.07	0.0249	79	7.4	7.9
59	0.0628	0.0236	79	7.4	7.52
55	0.0564	0.0256	84.2	6.6	7.45
51	0.0497	0.0244	82.9	5.3	5.96
51	0.0506	0.02	74.5	4.7	9.12
80	0.0727	0.0037	51.6	11.6	10.09
63	0.0636	0.0059	68.8	8.5	7.84
66	0.0646	0.0112	72	6.4	6.59
58	0.0605	0.019	68.3	5.3	5.09
56	0.0621	0.0179	68.3	3.25	3.67
49	0.0485	0.0157	68	6.1	6
53	0.0916	0.0041	61.5	n/a	10.63
36	0.0655	0.0319	71.7	n/a	8.09
11	0.0545	0.0098	79.2	n/a	6.74
4	0.0466	0.0206	73.9	n/a	4.98
4	0.0476	0.011	74.3	n/a	4.85
4	0.0444	0.0082	71	n/a	4.34
112	0.0555	0.0015	n/a	9.85	10.11
44	0.0517	0.0027	n/a	7.7	8.24
9	0.0415	0.0073	n/a	3.8	4.37
7	0.0415	0.0117	n/a	3.4	3.98
3	0.0321	0.0122	n/a	3.58	3.91
7	0.0347	0.0094	n/a	3.58	3.28
59.6	0.0611	0.0286	62	n/a	8.5
35.1	0.0496	0.0082	64.7	n/a	8.55
2.2	0.0429	0.0132	71.4	n/a	2.65
1	0.0371	0.0151	71	n/a	0.78
1	0.0345	0.0131	70	n/a	0.6
1	0.0406	0.0125	70.3	n/a	1.04
17	0.0796	0.0457	n/a	6.35	6.75
14	0.0786	0.028	n/a	6.25	7.62
1	0.0468	0.0214	n/a	0.4	0.73
1	0.0464	0.019	n/a	0.3	0.83
1	0.0361	0.0079	n/a	3.2	2.95
1	0.0355	0.0078	n/a	3.6	5.17
74	0.0649	0.0174	55.2	11.2	12.27
96	0.0743	0.0396	60.2	6.9	8.75
24	0.0467	0.0377	73	1.01	1.58
17	0.0388	0.0291	75	0.11	0.93
17	0.0409	0.0253	71.5	0.1	0.73
13	0.0362	0.021	70.7	0.1	1.37
18	0.0665	0.0015	55	10.4	10.39
19	0.0673	0.0013	54.6	7.6	7.34
9	0.0308	0.0011	79.2	4.45	4.91
20	0.0366	0.0017	83.9	0.17	1.01
25	0.0439	0.0022	75.8	0.15	0.51

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
29	0.0485	0.0046	74	0.1	0.73
173	0.0533	0.0023	63.7	7.8	9.63
44	0.0548	0.0021	69.5	2.3	3.21
26	0.0232	0.0021	81.7	2.1	1.94
33	0.0302	0.0049	80	0.35	0.72
48	0.0302	0.0031	62	0.85	1.97
49	0.0342	0.0012	51.8	0.3	1.51
146	0.0552	0.0013	64.5	n/a	9.65
122	0.0526	0.0013	65	n/a	9.12
42	0.0473	0.002	70	n/a	1.64
54	0.0554	0.0079	73.1	n/a	0.83
79	0.07	0.0098	53.7	n/a	1
17	0.0366	0.002	70.2	10.6	9.56
12	0.0427	0.0018	71	6.5	8.94
2	0.0319	0.0028	73.9	4.1	3.75
2	0.0413	0.0048	72	4.2	2.3
3	0.0755	0.0045	44	3.2	0.82
17	0.0416	0.0016	62.2	9.3	10.23
12.6	0.0429	0.0012	65.2	6.8	9.78
1	0.0279	0.002	75.8	1.65	1.54
2	0.0288	0.0029	75.2	1.2	1.42
6	0.0756	0.0143	52.7	n/a	0.9
12	0.0444	0.003	69.7	9.6	9.23
88	0.0476	0.006	73	6.5	8.15
29	0.0323	0.0051	77.2	5	6.47
3	0.037	0.0061	63.8	2.5	2.49
13	0.1538	0.0094	28	n/a	0.94
1	0.041	0.012	51	7.8	7.9
1	0.038	0.0103	48.8	6.3	7.51
1	0.0363	0.0106	48.7	4.7	7.55
1	n/a	0.0102	50	3.9	7.25
1	0.036	0.0065	17	n/a	4.9
1	0.0428	0.0202	67.8	n/a	11.4
1	0.0409	0.0215	67.5	n/a	11.46
1	0.0433	0.0203	67.7	n/a	11.45
1	0.0414	0.0203	67	n/a	11.42
1	0.0414	0.0204	67	n/a	11.45
9	n/a	0.0705	83.5	n/a	12.73
12	n/a	0.068	83.5	n/a	14.15
6	n/a	0.0693	83.5	n/a	12.58
8	n/a	0.0665	83.5	n/a	13.04
10	n/a	0.063	83.5	n/a	12.54
3	0.123	0.0601	n/a	n/a	13.57
12	0.1295	0.0732	n/a	n/a	13.55
11	0.123	0.0671	n/a	n/a	13.22
11	0.1211	0.0603	n/a	n/a	13.08
11	0.1225	0.0636	n/a	n/a	12.86
13	0.1265	0.0644	n/a	n/a	13.02

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
13	0.1394	0.0686	n/a	n/a	13.04
14.5	0.1261	0.063	64	n/a	13.95
11	0.1293	0.0481	65	n/a	13
11	0.1283	0.0529	61	n/a	13.68
9	0.1295	0.0368	63	n/a	13.89
15	0.1276	0.0617	61	n/a	13.6
138	0.1221	0.0392	50.5	n/a	15.08
54	0.1205	0.035	51	n/a	14.98
52	0.1251	0.0439	51	n/a	14.86
51	0.1249	0.0484	51	n/a	14.57
50.9	0.1255	0.0406	51.3	n/a	13.29
32.7	0.1013	0.0301	58.4	12.01	n/a
74	0.1003	0.0284	57	12.34	n/a
79	0.0984	0.0327	58	11.3	n/a
66	0.0964	0.0357	58.2	10.73	n/a
72	0.0933	0.0355	56.1	10.24	n/a
14.6	0.0773	0.032	33.12	11.19	n/a
12	0.0851	0.0293	33.4	11.16	n/a
10.1	0.0784	0.0312	34.51	10.5	n/a
10.1	0.0852	0.0348	35.79	10.22	n/a
10	0.0813	0.0297	35.84	10.12	n/a
13.2	0.0818	0.0269	26.75	11.18	n/a
14.3	0.0835	0.022	31.99	11.26	n/a
13.6	0.0636	0.0245	49.66	10.31	n/a
14.9	0.0656	0.0346	49.3	8.92	n/a
13.5	0.0659	0.0301	40.68	7.67	n/a
20.3	0.0927	0.007	27.59	12.3	n/a
18	0.0717	0.0043	29.09	12.28	n/a
12.8	0.0656	0.0215	42.68	8.95	n/a
13.2	0.0673	0.0209	42.52	7.15	n/a
11.9	0.0746	0.0356	32.56	5.22	n/a
17.4	0.0831	0.0303	39.96	8.23	n/a
16.2	0.0756	0.0351	43.77	7.26	n/a
10.2	0.0749	0.0353	40.57	4.29	n/a
6	0.0755	0.0284	45.44	1.55	n/a
8	0.0654	0.0227	31.28	0.46	n/a
0.9	0.0449	0.0023	26.75	7.89	n/a
1.4	0.0468	0.0027	28.28	7.72	n/a
0.4	0.0362	0.0042	39.1	3.51	n/a
1.7	0.0282	0.009	36.98	0.68	n/a
6	0.0343	0.0085	28.56	0.17	n/a
1.3	0.0403	0.0007	28.12	7.13	n/a
1.5	0.0396	0.0011	29.26	7.03	n/a
1	0.0276	0.001	39.32	5.41	n/a
1.1	0.0324	0.0013	33.95	1.41	n/a
2	0.0369	0.0009	18.5	0.3	n/a
0	0.0448	0.0007	0.57	0.18	n/a

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
1.6	n/a	6.6	7.5	1.5
1.5	n/a	5.6	7.5	
1.65	n/a	5.9	7.5	
1.8	n/a	6.2	7.5	
2.2	n/a	5.7	7.5	
2.2	n/a	n/a	7.5	
1.8	540	9.7	7.32	1.9
2.2	607	8.9	7.33	
2.4	534	8.8	7.42	
2.4	540	10.5	7.52	
2.4	550	10.2	7.37	
6.1	510	16.9	8.52	1.5
5.6	512	14.6	8.1	
5.5	527	14.1	8.4	
5.5	533	14	8.38	
5.5	533	14.4	8.4	
5.5	552	13.9	8.35	
7.55	535	5.7	8.19	1.25
7.5	532	7.2	8.15	
7.4	536	8.5	8.16	
7	537	8.1	8.15	
6.6	541	6.3	8.23	
6.5	547	8.3	8.25	
13.5	431	24.3	8.01	1.5
8.9	432	18.2	7.81	
8.3	442	10.8	7.73	
7.95	443	11.3	7.65	
7.05	438	9.4	7.58	
10.1	639	22.9	7.1	
10.1	658	20.4	7.1	1.5
10.05	665	22.8	6.95	
10	672	12	6.9	
9	660	10.7	6.7	
8.75	685	3.1	6.5	
10.9	692	21.3	9.5	1.5
10.55	694	22.5	9.2	
10.55	695	23.9	9.5	
10.4	696	23.8	9.2	
10.3	701	19.8	9.25	
12.4	673	15.9	9.8	1.75
12.35	694	9.7	9	
12.1	723	11.5	8.8	
11.9	711	10	8.8	
11.8	707	7.1	8.6	

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
11.3	692	9.4	8.6	
14.3	658	9	n/a	2
14.1	653	5	n/a	
14.1	656	6.5	n/a	
13.2	660	4.6	n/a	
12.2	657	2.4	n/a	
12	648	10.2	n/a	
19.5	596	24.4	n/a	1.5
17	627	12.1	n/a	
13.9	648	3.6	n/a	
12.9	661	6.9	n/a	
12.2	601	5	n/a	
11.55	598	4.4	n/a	
19.5	589	19.5	8.1	1.5
17.9	600	12.8	7.8	
15.35	595	6.7	7.45	
13.15	602	1.7	7.2	
12.75	614	1.6	7.15	
12.55	564	1	7.15	
20.7	573	15.3	8.45	1.8
20.2	569	10.2	8.15	
14.9	608	6.7	7.55	
12.8	607	4	7.4	
12.4	579	6.7	7.15	
12.3	554	3.4	7.5	
20.7	551	26.4	8	1.6
20.2	557	17.3	8	
14.9	534	7.7	7.85	
12.8	537	3.1	7.05	
12.4	516	4.4	7.3	
12.2	518	3.6	7.3	
20.3	467	14.6	7.65	1
20.3	467	14.9	7.65	
14.4	423	7.6	7.4	
13	426	4.4	7.4	
11.9	375	5	7.3	
11.65	384	4.3	7.35	
22.5	465	20.5	8.75	1
21.9	460	18.4	8.6	
15	431	3.9	8.25	
13.1	426	4.5	8.1	
12.4	421	3.9	8.05	
11.6	402	4.8	8	
22.55	343	46.3	9.4	1
21.6	377	39.7	9.1	
14.65	333	14.2	8.7	
13.1	373	5.7	8.45	
12.1	372	4.7	8.35	

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
12	373	4.8	8.3	
24.45	354	25.7	9.6	1.5
21.2	392	19.1	8.8	
14.65	384	7.2	8.7	
13.25	359	4.9	8.65	
12.35	340	4.6	8.7	
12.15	337	3.4	8.65	
22.3	367	31.2	9.5	1.5
21.9	369	27.7	9.4	
16.4	367	13.3	8.7	
13	361	7.3	8.65	
12.5	358	7.9	8.7	
18.8	819	19.4	8.2	2
18.6	811	17.9	8	
16.35	882	12.2	7.3	
13.5	923	8.2	7.2	
12.6	932	12.2	7.25	
20	392	21	8.52	1.5
19.75	393	11.5	8.45	
15.9	372	7.8	7.55	
14.1	380	4.4	7.5	
12.8	389	4	7.47	
18.4	359	n/a	8.32	2
18	358	n/a	8.03	
17.55	362	n/a	7.88	
16.5	366	n/a	7.64	
13.5	349	n/a	7.6	
14	352	6.5	7.66	2.5
13.2	355	8.3	7.64	
13.2	355	8	7.72	
13.15	356	8.5	7.7	
11.4	371	6.9	7.53	
9.9	375	6.5	8	2
9.9	377	5.3	8.04	
9.9	378	5.6	8.03	
9.9	381	5.5	8.01	
9.9	387	4.9	8.03	
5.2	477	4.8	7.99	
5.2	491	4.4	7.81	3
5.45	490	5.6	7.81	
5.25	496	6	7.93	
5.3	498	4.8	7.94	
1.8	n/a	5.9	7.54	2
1.8	n/a	7.1	8.09	
1.8	n/a	6	8.15	
1.8	n/a	5.1	8.15	
1.8	n/a	5.1	8.11	
1.5	n/a	8	8.14	2

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
1.5	n/a n/a	8.8	8.14	
0.6	521	10.1	8.2	2
0.7	533	11.4	8.2	
0.9	535	6.9	8.19	
1.05	540	9.3	8.17	
1.1	544	10.1	8.15	
2.2	527	33.5	9.24	1.25
2.2	536	33.5	8.78	
2.2	544	35	8.64	
2.2	548	30	8.62	
2.4	551	30.4	8.62	
5.4	892	23.3	9.32	1.25
4.9	925	24.7	8.69	
4.8	937	23.1	8.61	
4.75	945	25.6	8.6	
4.7	957	24.1	8.58	
8.66	632	18.8	7.72	n/a
8.23	639	17.8	7.69	
7.65	645	18.5	7.61	
7.62	646	17	7.57	
7.6	645	16	7.54	
13.81	647	37.2	7.63	0.75
13.32	646	29.4	7.67	
11.88	650	19.6	7.67	
11.22	638	8.4	7.61	
9.8	653	5	7.56	
18.07	638	10.6	7.7	0.5
16.87	636	24.4	7.78	
14.12	640	9.2	7.74	
11.76	613	6.5	7.69	
10.88	648	4.3	7.7	
18.5	600	9.2	7.74	1.75
16.81	600	5.9	7.68	
14.87	581	4.5	7.59	
12.44	567	5.1	7.67	
11.4	584	4.8	7.7	
22.05	474	28.2	7.38	1.25
21.9	474	31.2	7.61	
15.72	433	11.5	7.62	
13.11	414	4.8	7.8	
12.7	419	4.4	7.85	
18.21	440	14.6	7.07	1.8
18.15	441	19.4	7.24	
16.14	411	19	7.18	
14.19	402	9.9	7.24	
13.32	403	6.1	7.31	
12.55	748	8.7	4.75	

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 6 DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
10-Feb-87	1	1.341	0.0673	1.989	3.959
10-Feb-87	4	1.426	0.0729	2.124	4.262
10-Feb-87	10	1.343	0.0701	2.037	4.088
10-Mar-87	1	1.446	0.0732	1.925	3.904
10-Mar-87	5	1.446	0.0727	1.916	3.795
10-Mar-87		1.4	0.0734	1.904	3.545
09-Apr-87	1	1.679	0.1122	1.844	4.12
09-Apr-87	5	2.889	0.1856	1.898	5.1
14-Apr-87	1	1.674	0.0968	1.726	3.96
14-Apr-87	5	1.684	0.0996	1.737	4.11
14-Apr-87	8.5	1.664	0.0902	1.709	4.1
21-Apr-87	1	1.593	0.0892	1.63	4.15
21-Apr-87	4	2.449	0.1031	1.582	4.82
21-Apr-87	7	2.427	0.1052	1.575	4.91
05-May-87	1	1.387	0.0947	1.637	3.76
05-May-87	5	1.447	0.095	1.634	3.83
05-May-87	7	1.428	0.0926	1.617	3.87
11-May-87	1	1.567	0.0965	1.62	3.91
11-May-87	5	1.549	0.0999	1.641	3.9
11-May-87	7	1.486	0.102	1.665	10.25
21-May-87	1	1.71	0.1	1.555	4.059
21-May-87	5	1.55	0.103	1.611	4.042
21-May-87	7.5	1.73	0.099	1.555	3.962
01-Jun-87	1	0.89	0.0998	1.223	2.745
01-Jun-87	5	1.166	0.135	1.522	3.477
01-Jun-87	7.5	1.639	0.1277	1.501	3.924
10-Jun-87	1	1.487	0.1317	1.298	3.436
10-Jun-87	5	1.571	0.1642	1.51	3.823
10-Jun-87	7.5	1.552	0.1508	1.438	3.726
18-Jun-87	1	1	0.132	1.492	3.074
18-Jun-87	5	1.016	0.1689	1.598	3.517
18-Jun-87	7	1.304	0.1595	1.529	3.567
22-Jun-87	1	1.282	0.1722	1.576	3.869
22-Jun-87	5	1.651	0.1687	1.608	4.299
22-Jun-87	7	1.574	0.1595	1.564	4.236
02-Jul-87	1	0.679	0.0899	1.899	3
02-Jul-87	5	0.753	0.1074	1.921	3.1
07-Jul-87	1	0.464	0.1562	2.209	3.1
07-Jul-87	5	0.81	0.1662	2.109	3.234
07-Jul-87	6.5	0.949	0.1838	2.134	3.27
16-Jul-87	1	0.42	0.2058	1.707	2.585
16-Jul-87	5	0.263	0.2151	2.057	2.724
16-Jul-87	7.5	0.48	0.175	1.777	2.611
28-Jul-87	1	0.175	0.1614	1.733	2.083

HAMILTON HARBOUR-FEB.87-SEPT.88

STATION 6

DATE	DEPTH (m)	NH3-N(mg/L)	NO2-N(mg/L)	NO3-NO2-N(mg/L)	TFN-N(mg/L)
28-Jul-87	5	1.114	0.0922	1.068	2.397
28-Jul-87	7	0.957	0.0831	1.257	n/a
12-Aug-87	1	0.38	0.1508	1.436	2.075
12-Aug-87	5	0.861	0.1589	1.443	2.574
12-Aug-87	7	0.698	0.1451	1.388	2.376
03-Sep-87	1	0.758	0.243	1.31	2.543
03-Sep-87	5	0.68	0.196	1.298	2.459
03-Sep-87	7	0.728	0.223	1.284	2.452
14-Sep-87	1	0.131	0.2418	1.48	1.986
14-Sep-87	4	0.23	0.2462	1.5	2.188
14-Sep-87	6	0.234	0.2368	1.454	1.788
28-Sep-87	1	0.545	0.1826	1.469	2.184
28-Sep-87	5	0.628	0.1942	1.504	2.274
28-Sep-87	7	0.907	0.1654	1.411	2.404
19-Oct-87	1	0.939	0.373	2.111	3.193
19-Oct-87	5	0.403	0.191	2.007	2.62
19-Oct-87	6.5	0.358	0.1997	2.02	2.604
10-Nov-87	1	0.069	0.054	1.96	2.398
10-Nov-87	5	0.072	0.02	1.986	2.456
10-Nov-87	6.5	0.101	0.058	1.968	2.388
17-Dec-87	1	0.841	0.04	1.952	n/a
17-Dec-87	5	0.883	0.046	1.944	n/a
17-Dec-87	6.5	0.952	0.056	2.066	n/a
22-Mar-88	1	1.611	0.096	1.753	3.623
22-Mar-88	5	1.524	0.097	1.766	3.447
22-Mar-88	7	1.972	0.118	2.01	4.105
05-Apr-88	1	1.684	0.098	1.622	3.368
05-Apr-88	5	1.586	0.096	1.625	3.41
05-Apr-88	7	1.667	0.098	1.647	4.041
25-Apr-88	1	2.639	0.116	1.661	3.813
25-Apr-88	5	1.743	0.111	1.667	3.84
25-Apr-88	8	1.711	0.118	1.693	3.757
17-May-88	1	2.088	0.185	1.763	4.165
17-May-88	5	1.922	0.163	1.698	5.032
17-May-88	7	1.512	0.152	1.659	4.288
31-May-88	1	2.401	0.119	1.69	4.754
31-May-88	5	1.778	0.148	1.792	4.075
31-May-88	7.5	1.563	0.176	1.835	3.818
14-Jun-88	1	1.24	0.184	2.033	3.734
14-Jun-88	5	1.382	0.147	2.044	3.797
14-Jun-88	6.5	2.003	0.14	2.139	5.045
18-Aug-88	1	0.787	0.139	1.525	2.532
18-Aug-88	5	0.099	0.106	1.69	1.985
18-Aug-88	7	0.254	0.077	1.482	1.987
13-Sep-88	1	0.668	0.124	1.374	2.31
13-Sep-88	5	0.655	0.113	1.382	2.201
13-Sep-88	8	0.74	0.123	1.361	2.465

TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
3	0.0655	0.0287	56	n/a	11.94
3	0.0645	0.0306	55	n/a	12.02
3	0.067	0.0309	50.5	n/a	12.09
2	0.1001	0.0199	94	n/a	12.77
2	0.0993	0.0202	94	n/a	12.51
3	0.0986	0.0202	94	n/a	12.95
27	0.0811	0.0208	76.2	11.4	10.5
46	0.2443	0.1056	65	11.2	9.95
39	0.088	0.0281	33.3	n/a	10.11
49	0.0866	0.0286	34	n/a	9.79
46	0.0753	0.0265	38.8	n/a	10.07
151	0.071	0.0142	32	16.9	12.1
81	0.2037	0.0596	55.9	12	10.74
6.5	0.0969	0.0557	58.7	11.4	11.44
305	0.0654	0.0044	53	10.1	n/a
289	0.0868	0.0024	47.4	9.8	n/a
242	0.0927	0.0087	43	9.4	n/a
172	0.1003	0.0123	66.1	10.4	11
127	0.0666	0.0122	74.5	10.1	9.6
120	0.0666	0.0101	71	9.9	9.68
71	0.0876	0.0286	84.7	9.5	9.04
60	0.4826	0.0246	87.5	9.1	8.1
62	0.1605	0.0299	66.1	8	8.65
57	0.0937	0.0046	56	10.5	11.25
61	0.0975	0.0059	53.1	9.9	10.89
70	0.0984	0.0167	64.2	5.6	5.17
36	0.0948	0.0165	61.6	n/a	9.43
34	0.0971	0.0144	59	n/a	9.47
15	0.0741	0.011	40	n/a	8.46
160	0.0846	0.0067	56	10.4	12.56
22	0.069	0.0088	67	5.6	6.99
16	0.0846	0.0182	55.5	2.8	5.25
12	0.0937	0.0135	29.3	n/a	7.39
15	0.1213	0.0265	2.2	n/a	6.13
94	0.1327	0.03	40	n/a	4.64
34	0.0829	0.0156	37.4	7.6	n/a
30	0.084	0.0133	35.8	7.6	n/a
176	0.0752	0.0099	52.1	13	n/a
141	0.0911	0.0139	61	5.4	n/a
86	0.084	0.031	59.8	2.75	n/a
277	0.0695	0.0028	57.5	12.6	n/a
43	0.0541	0.0018	48.3	3	n/a
48	0.0999	0.0132	40.3	0.3	n/a
122	0.0515	0.0009	56.7	8.7	n/a

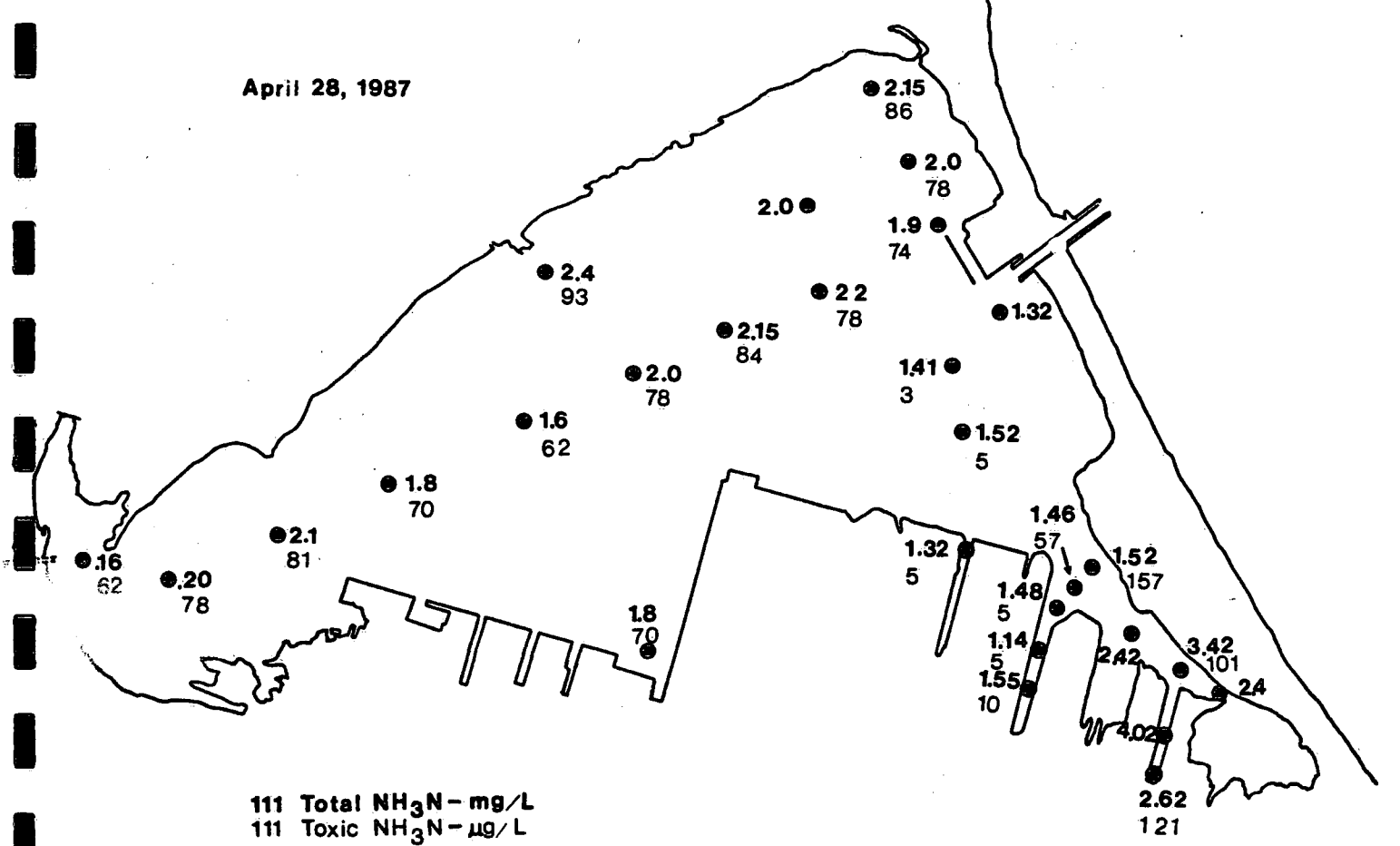
TOXIC NH3 (ug/L)	TP-P(mg/L)	SRP(mg/L)	% TRANS	DO(mg/L)PROBE	DO(mg/L)WINKLER
189	0.1211	0.0131	63.5	1.15	n/a
143	0.0683	0.0158	61.3	0.3	n/a
71	0.0618	0.0042	61.5	4.85	n/a
182	0.0837	0.0052	56.7	2.6	n/a
376	0.0875	0.0144	51.8	0.45	n/a
28	0.0529	0.0093	69	9.5	n/a
14	0.0642	0.0112	58.8	6.5	n/a
12	0.069	0.0144	51.5	5.7	n/a
14.7	0.0548	0.0013	61	8.1	n/a
26	0.0591	0.0025	58.7	5.5	n/a
25	0.0576	0.0024	46.7	5.25	n/a
23.9	0.053	0.014	n/a	8.5	n/a
21.9	0.0545	0.0152	n/a	5.6	n/a
20.8	0.0549	0.0159	n/a	5.4	n/a
7	0.135	0.0065	44	7.5	n/a
4	0.0602	0.0532	37	4	n/a
3	0.059	0.0237	37.2	3.4	n/a
1	0.044	0.0207	68.1	n/a	10.56
1	0.0453	0.0227	67.7	n/a	11.15
1	0.0449	0.0201	66	n/a	11.35
17	n/a	0.064	81.8	n/a	11.95
16	n/a	0.0659	82.3	n/a	12.42
10	n/a	0.0621	82.3	n/a	12.24
50	0.1273	0.0417	48	n/a	12.57
48	0.1283	0.0383	47.9	n/a	15.49
57	0.2062	0.0742	48	n/a	10.6
88	0.1046	0.0297	56.7	n/a	14.18
76	0.1075	0.0369	53.7	n/a	13.37
53	0.117	0.0433	49	n/a	13.49
n/a	0.0832	0.0317	n/a	10.99	n/a
n/a	0.0788	0.0381	n/a	10.93	n/a
n/a	0.0773	0.0374	n/a	10.67	n/a
8	0.1641	0.056	18.39	9.32	n/a
6	0.0712	0.0339	25.68	9.67	n/a
4	0.0702	0.029	35.9	9.71	n/a
26	0.2329	0.068	22.22	9.72	n/a
20	0.0819	0.0438	36.12	8.88	n/a
16	0.0869	0.0209	34.68	8.14	n/a
10	0.1079	0.0398	36.21	9.84	n/a
10	0.1229	0.039	29.28	9.07	n/a
3	0.2238	0.0619	23.39	8.13	n/a
4	0.0682	0.0185	25.11	5.74	n/a
0.2	0.0392	0.0041	38.96	4.12	n/a
1.2	0.0519	0.0085	39.04	3.98	n/a
3.2	0.0725	0.0014	18.5	8.47	n/a
4.9	0.073	0.0014	16.41	8.45	n/a
4.1	0.0858	0.0016	13.66	8.17	n/a

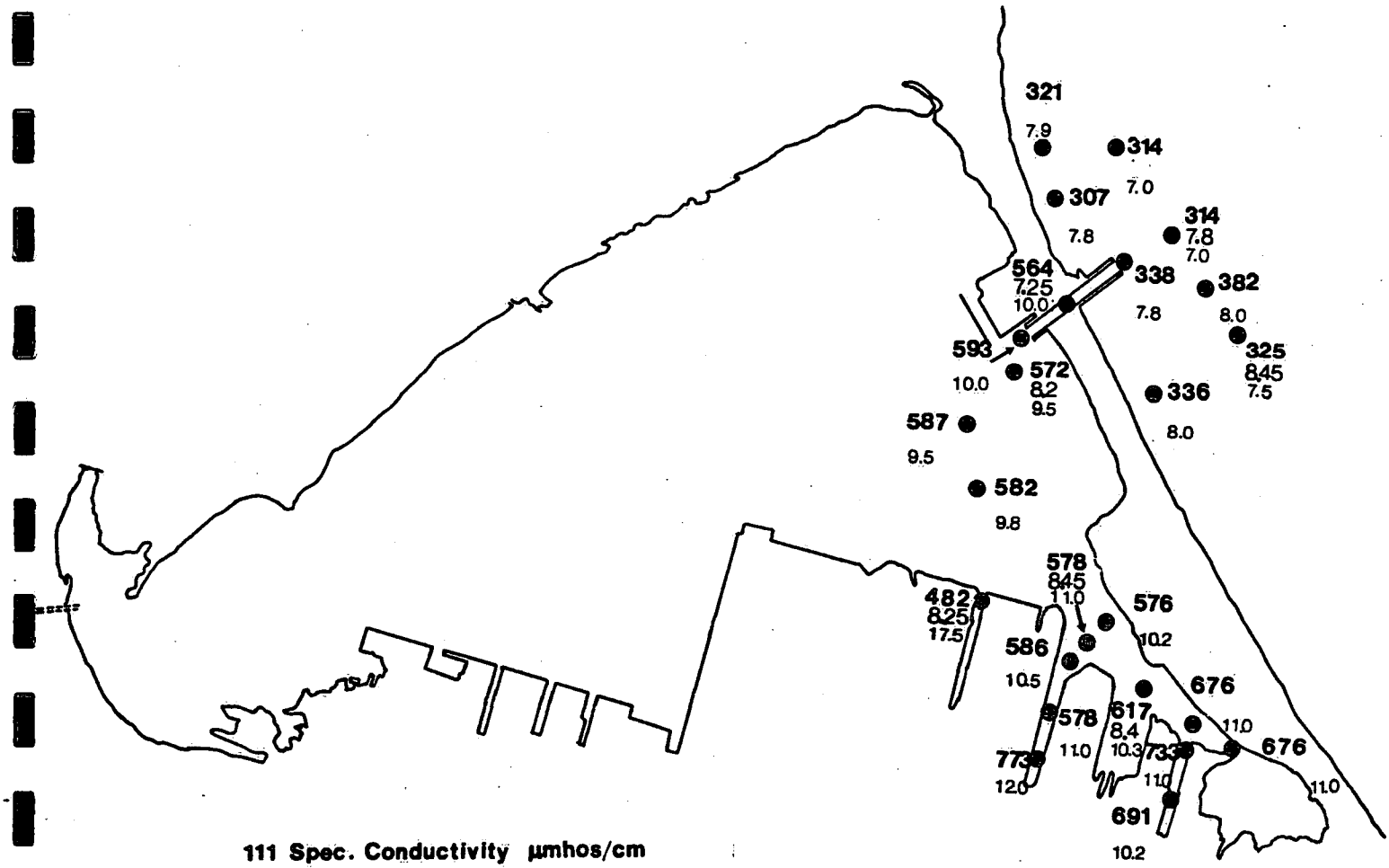
TEMP(C)	SPEC. COND (umhos/cm)	Chla-Unc.(ug/L)	PH	SECCHI (m)
1.6	n/a	9.8	8.25	1.85
1.6	n/a	7.4	8	
1.7	n/a	7.7	8	
4	639	9.7	8.25	1.2
3.9	569	11.6	8	
3.9	647	7.5	7.98	
9.4	698	10.7	8.25	0.75
8.55	714	7.4	8	
7.1	670	n/a	7.98	
10.3	653	9.3	8.1	1
8.4	619	8.4	8.1	
8.1	639	6.6	8.1	
14	510	14.2	7.74	0.75
9.5	550	12.5	7.65	
8.75	570	8.7	7.52	
13.55	520	14.2	8.2	1.25
11.5	550	20.7	8.25	
10.3	500	22.7	8.1	
14.5	540	13.4	7.85	1
12.9	500	18	7.85	
11.3	500	11	7.8	
15	510	10.9	5.9	1
14.4	600	1.9	5.8	
13.9	590	8.1	5.6	
21.1	700	12.2	6.3	1.5
16.6	545	11.2	5.95	
13.7	500	5.1	6	
26.5	590	12.2	7.5	1
19.1	620	10.9	7.45	
18.35	490	4.5	7.45	
21.5	560	13.8	7.55	1.5
19.65	580	8.6	7.7	
17.9	500	8.7	7.75	
20.8	620	25.2	7.75	1.1
19.55	520	15.9	7.65	
14.4	400	8.4	7.6	
20.7	441	11.7	7.45	1
18.45	400	9.7	7.8	
16.8	310	10.7	7.75	
23.3	455	26.4	8.2	1
21	445	23.5	8.25	
17.2	269	11.1	8.5	
21.85	400	35.9	9.3	0.75
20.95	420	18.7	8.45	

TEMP(C)	SPEC. COND umhos/cm	Chla-Unc.(ug/L)	PH	SECCHI (m)
20.3	350	12.6	8.7	
18.15	339	8.2	8.7	
22	331	29.6	8.7	1.25
20.95	361	27.9	8.85	
19.3	353	18.3	9.5	
19.6	480	11.7	8.05	1.5
18.25	491	18	7.8	
18.15	515	19.1	7.7	
20.1	329	26.6	8.5	1.75
20	341	28.9	8.51	
19.3	353	24.9	8.53	
18.9	346	n/a	8.1	2
18.8	351	n/a	8.04	
18.2	398	n/a	7.81	
14.3	n/a	6.3	7.55	2
13.5	n/a	11.8	7.67	
13.4	n/a	10.6	7.73	
9.8	379	6.2	7.41	2
9.7	395	5.9	7.82	
9.6	402	5.9	7.96	
5	n/a	5.4	8.16	2
4.95	n/a	7	8.14	
4.9	n/a	4.2	7.94	
2.55	n/a	29.6	8.55	1.25
2.6	n/a	31.9	8.67	
3.4	n/a	24.5	8.38	
6.1	n/a	24.8	8.63	1.25
5.2	n/a	19.8	8.6	
5.8	n/a	24.9	8.46	
8.53	n/a	14.8	n/a	n/a
7.95	638	18.5	n/a	
7.66	639	12.8	n/a	
13.41	739	11.6	7.17	1
12.87	664	12.3	7.06	
12.34	624	10.8	7.04	
16.64	635	6.4	7.62	n/a
15.09	637	4.1	7.65	
14.19	634	9.9	7.62	
19.99	593	5.8	7.31	1.75
19.57	628	7.2	7.29	
17.37	592	7.8	6.54	
20.24	478	10.4	7.07	1.25
16.01	416	12.4	7.17	
15.61	413	9.9	7.18	
19.41	467	19	7.11	1
19.36	468	22.1	7.28	
18.54	459	13.3	7.14	

Appendix II

Aerial distribution of selected water quality parameters in Hamilton Harbour (surface); 1987–1988


April 28, 1987
2.15
86
2.0
78
2.0
1.9
74
2.4
93
2 2
78
1.32
2.15
84
2.0
78
1.41
3
1.6
62
1.52
5
1.8
70
2.1
81
.16
62
.20
78
1.8
70
1.46
57
1.32
5
1.52
157
1.48
5
1.14
5
1.55
10
2.42
3.42
101
24
4.02
2.62
121
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L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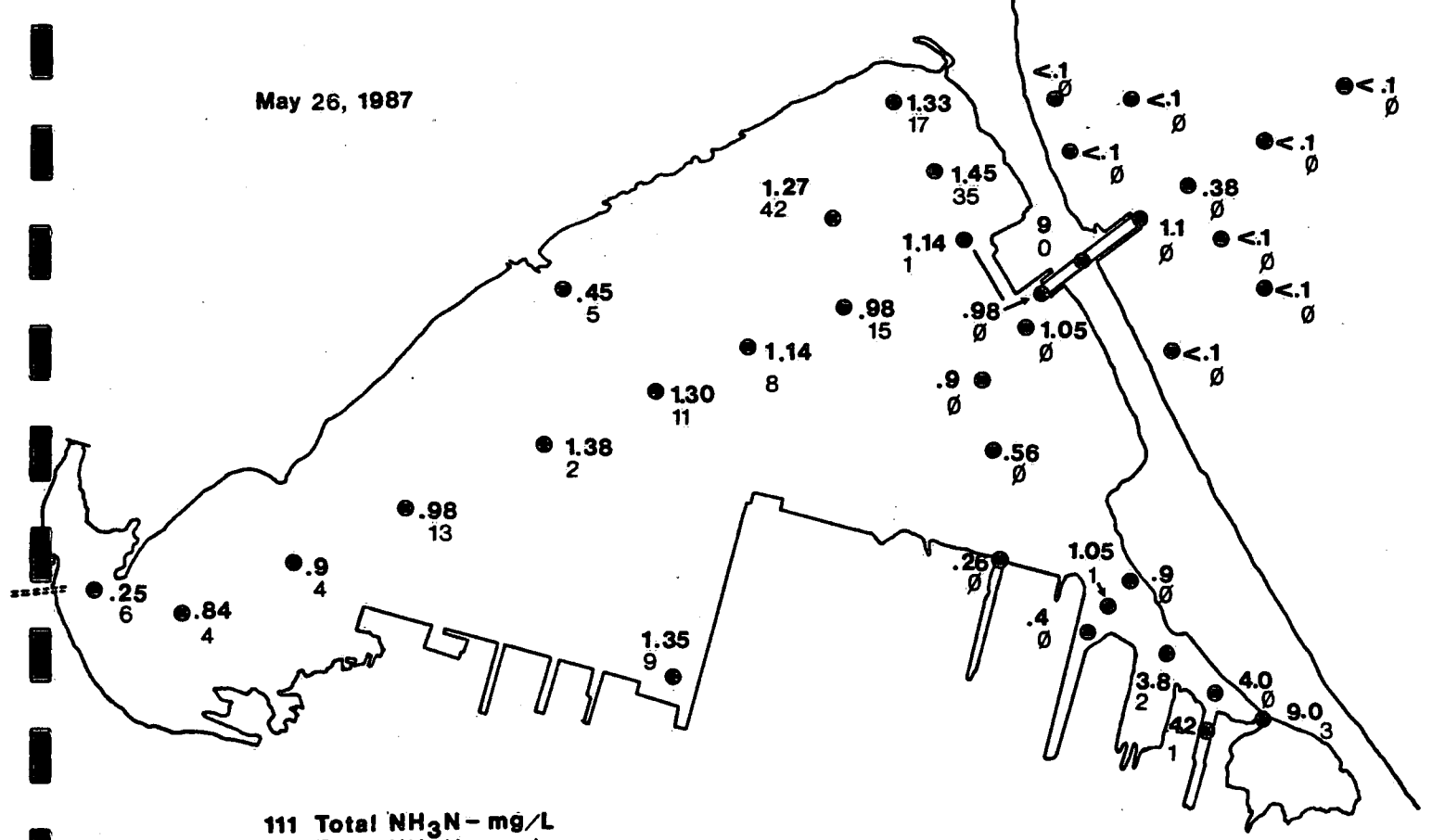
314
7.0
307
7.8
314
7.8
7.0
564
7.25
10.0
338
7.8
382
8.0
593
10.0
572
8.2
9.5
325
8.45
7.5
336
8.0
587
9.5
582
9.8
578
8.45
11.0
482
8.25
17.5
576
10.2
586
10.5
676
578
11.0
617
8.4
10.3
676
11.0
773
12.0
733
11.0
11.0
691
10.2
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature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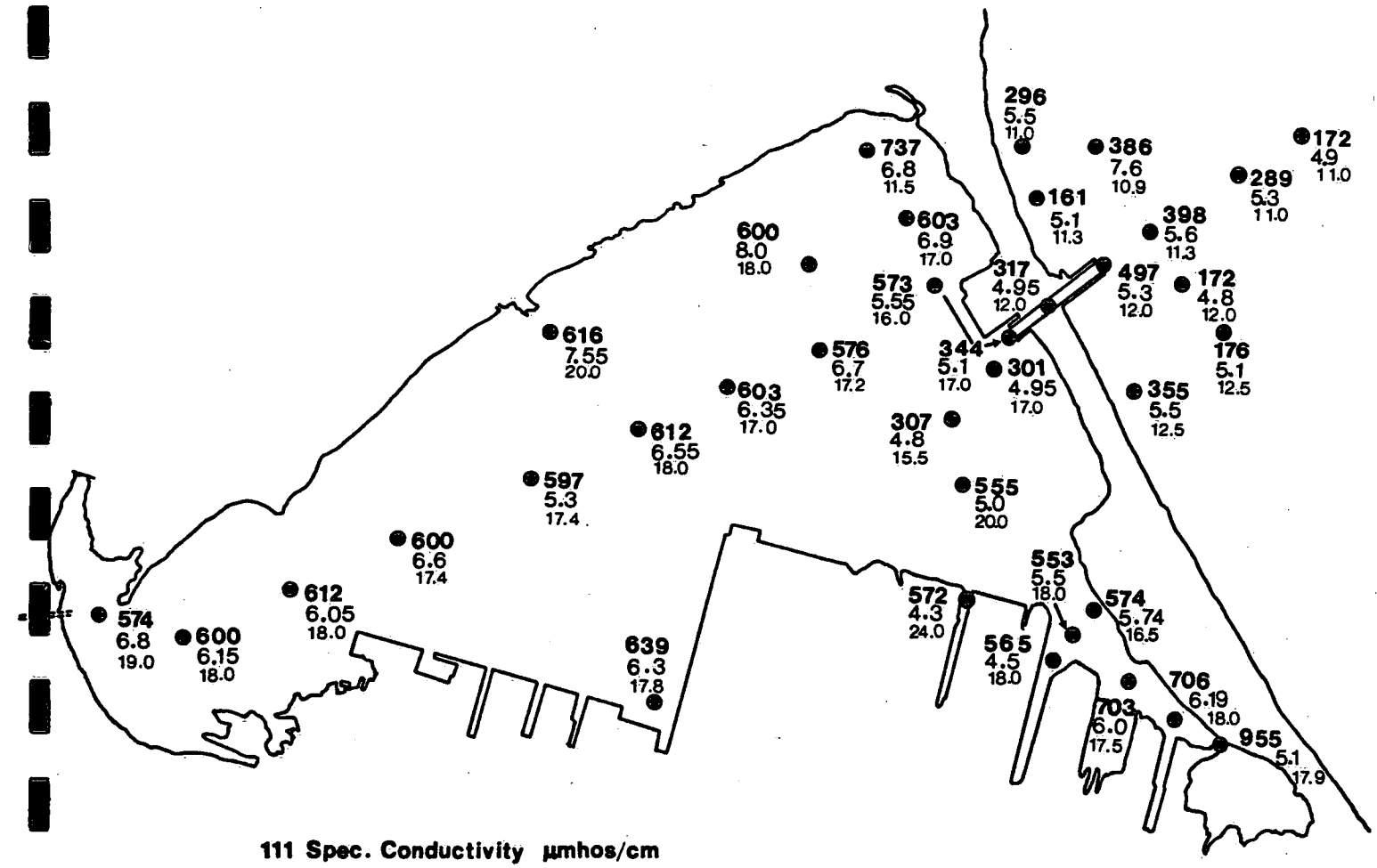
17
1.27
42
1.45
35
1.14
1
9
0
1.1
.45
5
.98
15
.98
1.05
1.14
8
.9
1.30
11
1.38
2
.56
.98
13
.9
4
.25
6
.84
4
1.35
9
.26
1.05
1
.9
.4
3.8
2
4.0
9.0
3
42
1
<.1
.38
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L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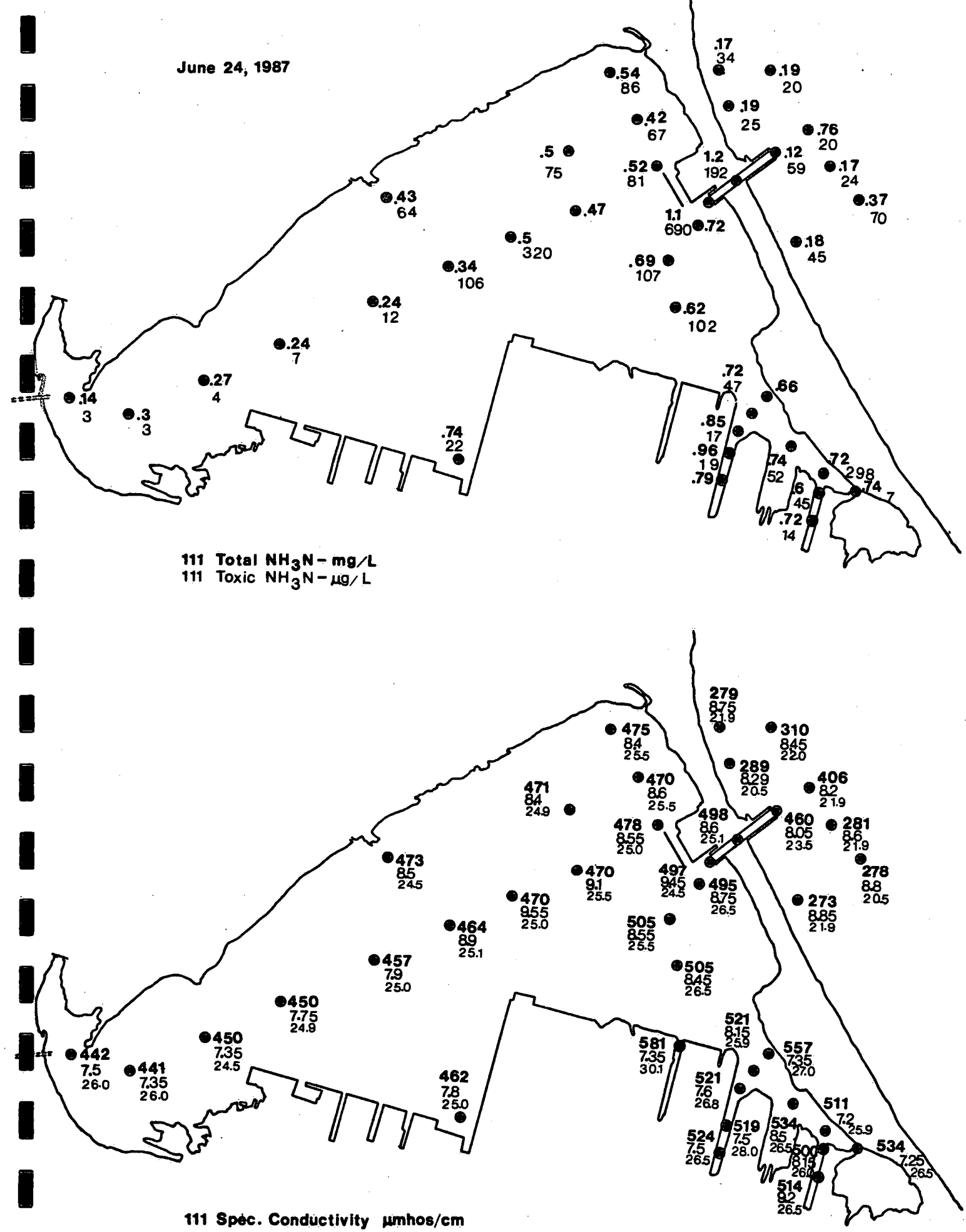
11.0
737
6.8
11.5
386
7.6
10.9
172
4.9
11.0
289
5.3
11.0
161
5.1
11.3
603
6.9
17.0
600
8.0
18.0
398
5.6
11.3
573
5.55
16.0
317
4.95
12.0
497
5.3
12.0
172
4.8
12.0
616
7.55
20.0
576
6.7
17.2
344
5.1
17.0
301
4.95
17.0
176
5.1
12.5
603
6.35
17.0
355
5.5
12.5
307
4.8
15.5
612
6.55
18.0
597
5.3
17.4
555
5.0
20.0
600
6.6
17.4
553
5.5
18.0
612
6.05
18.0
572
4.3
24.0
574
5.74
16.5
574
6.8
19.0
600
6.15
18.0
639
6.3
17.8
565
4.5
18.0
706
6.19
18.0
703
6.0
17.5
955
5.1
17.9
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature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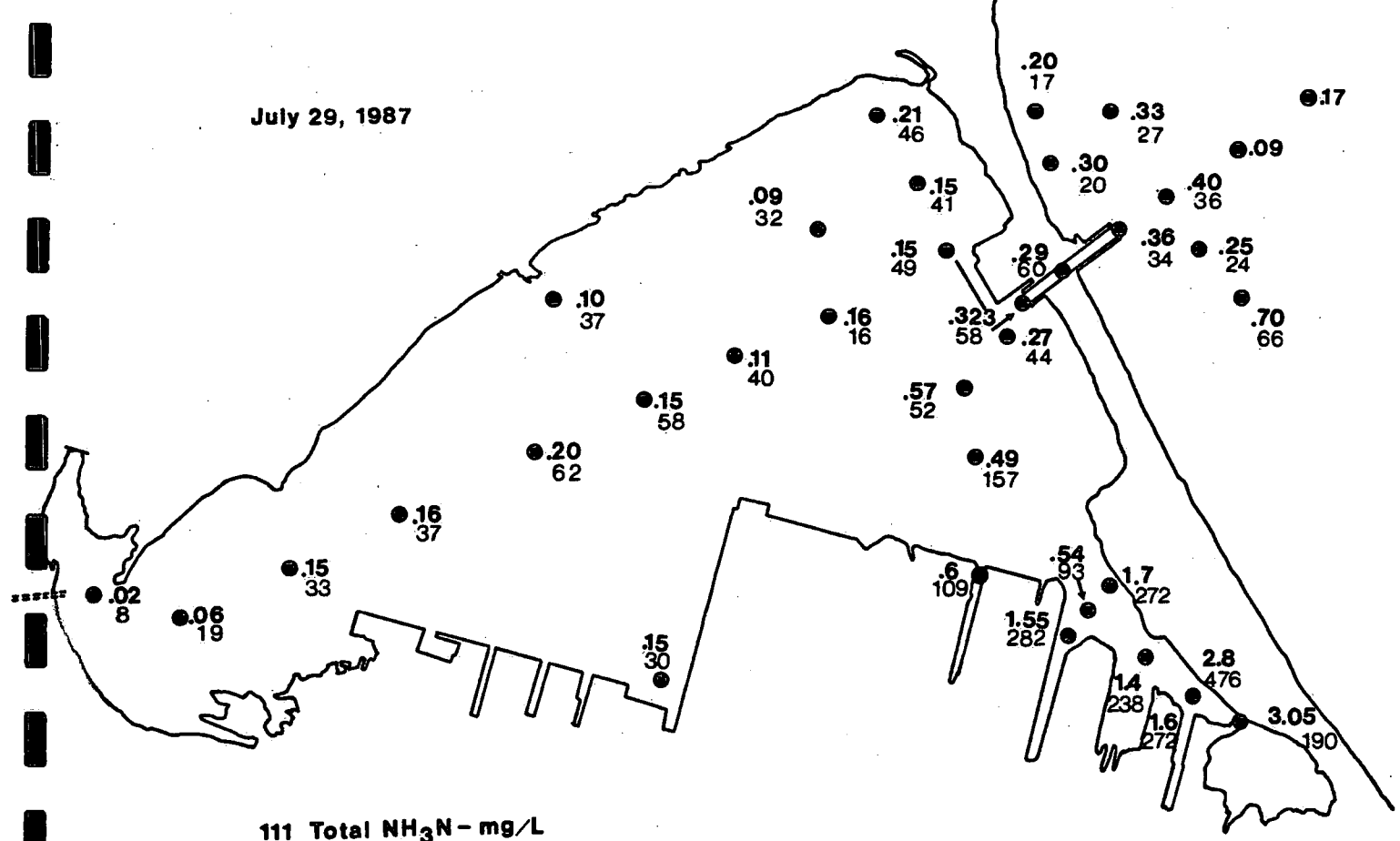
34
.54
86
.19
20
.19
25
.42
67
.76
20
.5
75
.52
81
1.2
192
.12
59
.17
24
.43
64
.47
1.1
690
.72
.37
70
.5
320
.18
45
.34
106
.69
107
.24
12
.62
102
.24
7
.27
4
.14
3
.3
3
.74
22
.72
47
.66
.85
17
.96
19
.79
.74
52
.72
298
.74
.6
45
.72
14
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L
279
8.75
21.9
475
8.4
25.5
310
8.45
22.0
289
8.29
20.5
406
8.2
21.9
471
8.4
24.9
470
8.6
25.5
498
8.6
25.1
460
8.05
23.5
281
8.6
21.9
478
8.55
25.0
473
8.5
24.5
470
9.1
25.5
497
9.45
24.5
495
8.75
26.5
278
8.8
20.5
470
9.55
25.0
273
8.85
21.9
505
8.55
25.5
464
8.9
25.1
457
7.9
25.0
505
8.45
26.5
450
7.75
24.9
521
8.15
25.9
450
7.35
24.5
581
7.35
30.1
557
7.35
27.0
442
7.5
26.0
441
7.35
26.0
462
7.8
25.0
521
7.6
26.8
511
7.2
25.9
519
7.5
28.0
534
8.5
26.5
524
7.5
26.5
500
8.15
26.4
534
7.25
26.5
514
8.2
26.5
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature


July 29, 1987
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.21
46
.33
27
.09
.30
20
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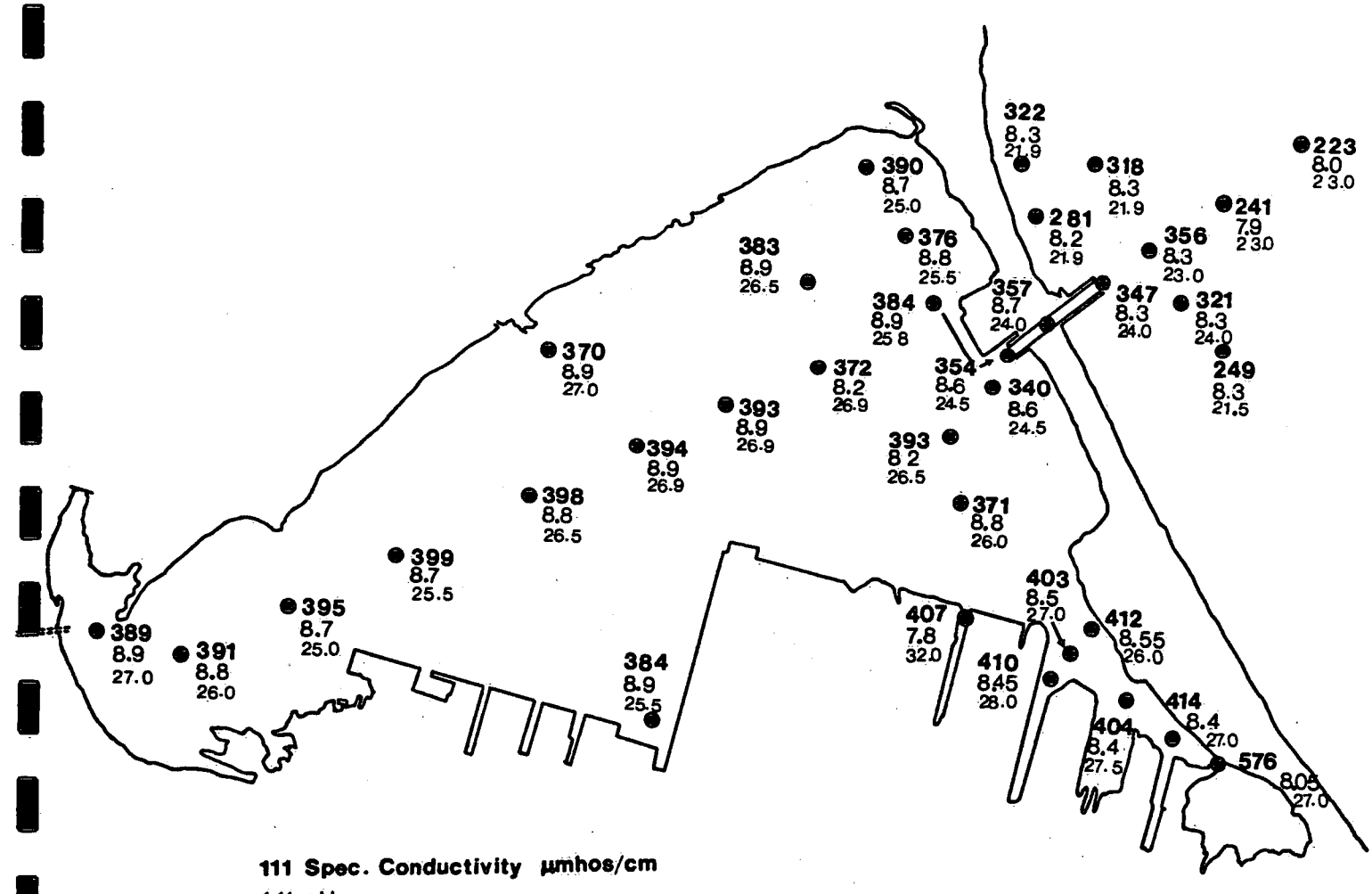
36
.09
32
.15
41
.15
49
.29
60
.36
34
.25
24
.10
37
.16
16
.323
58
.27
44
.70
66
.11
40
.57
52
.15
58
.20
62
.49
157
.16
37
.15
33
.54
93
.6
109
1.7
272
.02
8
.06
19
1.55
282
.15
30
2.8
476
1.4
238
1.6
272
3.05
190
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L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223
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390
8.7
25.0
318
8.3
21.9
241
7.9
23.0
281
8.2
21.9
376
8.8
25.5
383
8.9
26.5
356
8.3
23.0
357
8.7
24.0
347
8.3
24.0
321
8.3
24.0
384
8.9
25.8
370
8.9
27.0
372
8.2
26.9
354
8.6
24.5
340
8.6
24.5
249
8.3
21.5
393
8.9
26.9
394
8.9
26.9
393
8.2
26.5
398
8.8
26.5
371
8.8
26.0
399
8.7
25.5
403
8.5
27.0
395
8.7
25.0
407
7.8
32.0
412
8.55
26.0
389
8.9
27.0
391
8.8
26.0
384
8.9
25.5
410
8.45
28.0
414
8.4
27.0
404
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27.5
576
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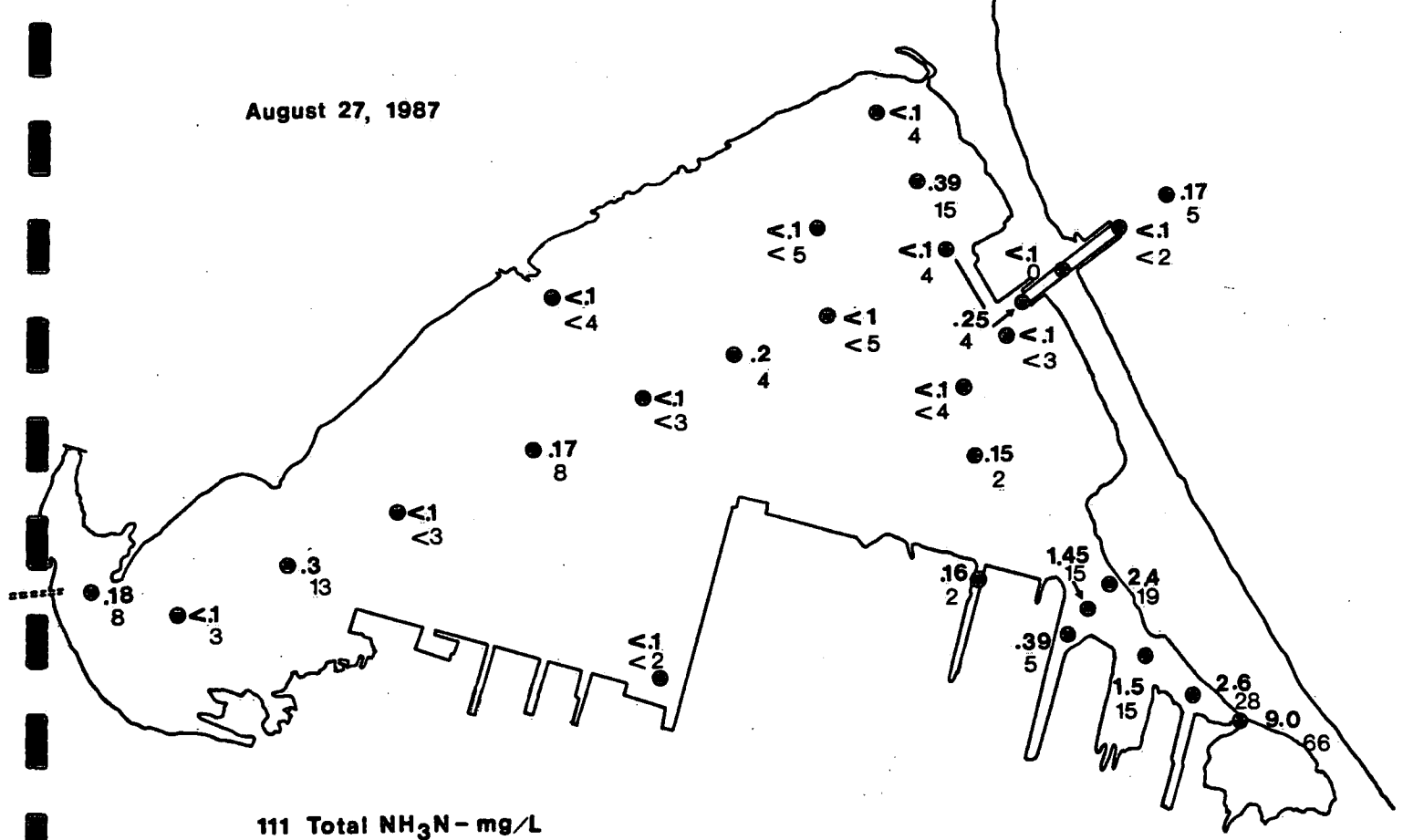
27.0
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature


August 27, 1987
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.17
5
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<2
<.1
<4
<1
<5
.25
4
<.1
<3
.2
4
<.1
<3
<.1
<4
.17
8
.15
2
<.1
<3
.3
13
.18
8
<.1
3
.16
2
1.45
15
2.4
19
.39
5
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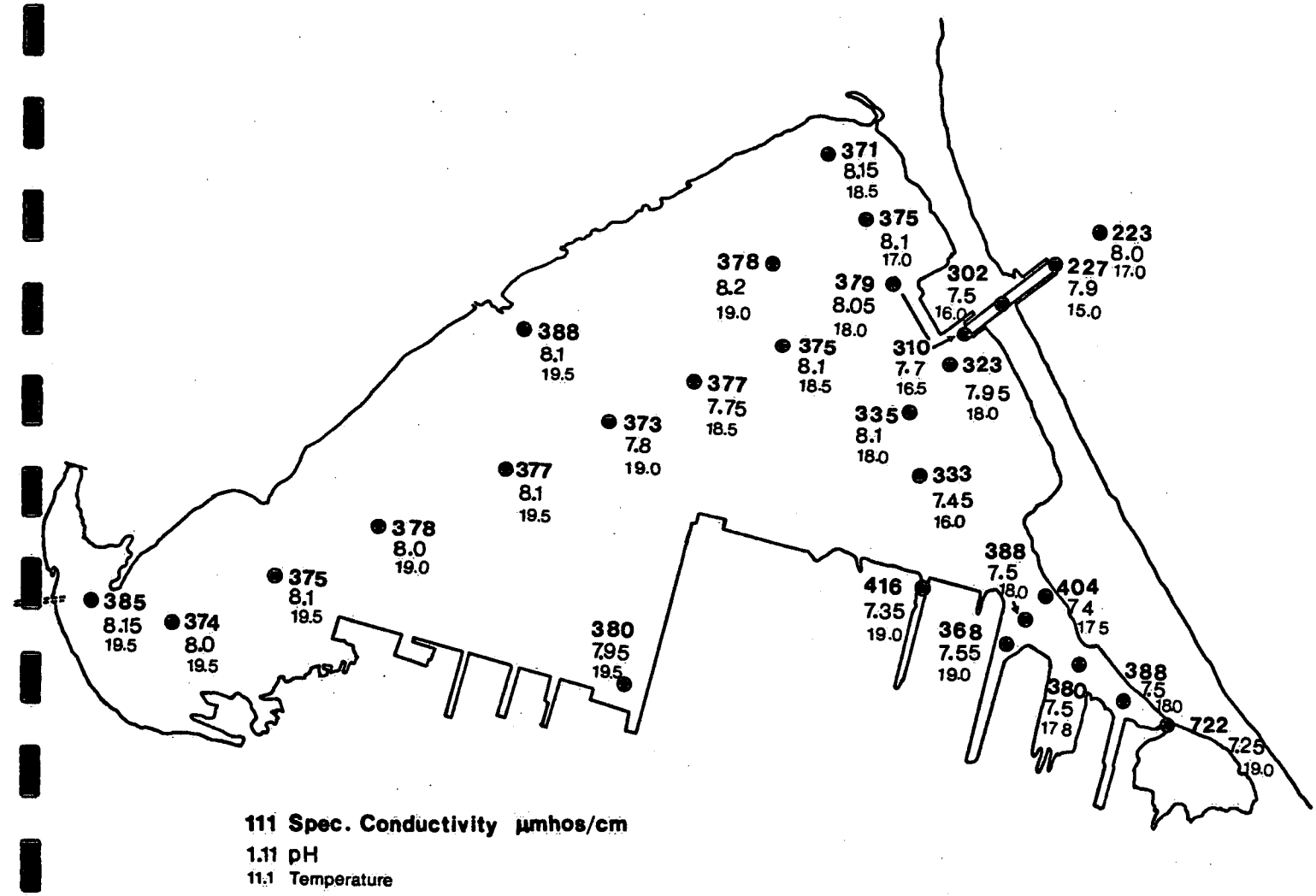
1.5
15
2.6
28
9.0
66
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L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223
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17.0
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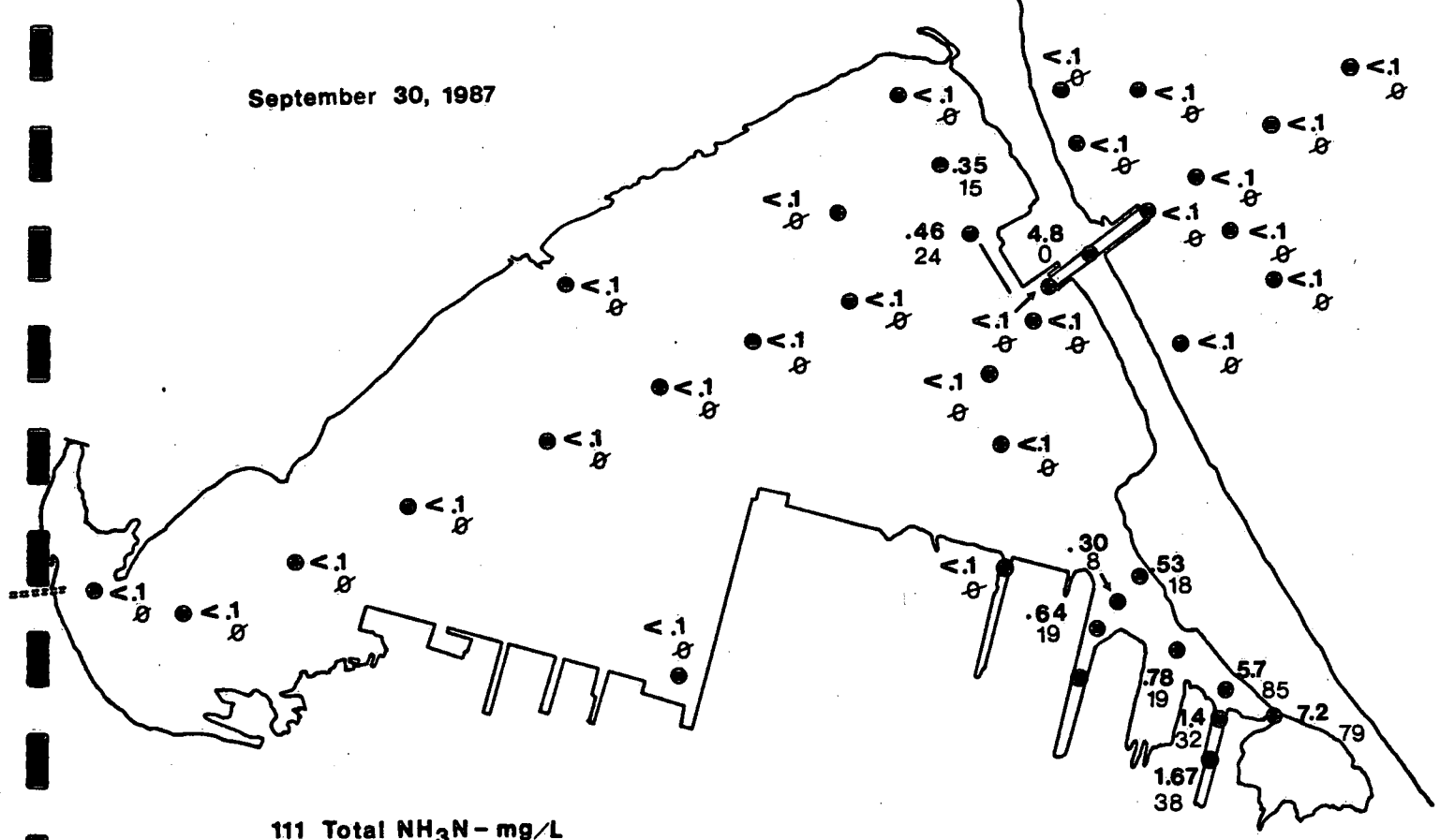
19.0
379
8.05
18.0
302
7.5
16.0
227
7.9
15.0
388
8.1
19.5
375
8.1
18.5
310
7.7
16.5
323
7.95
18.0
377
7.75
18.5
335
8.1
18.0
373
7.8
19.0
377
8.1
19.5
333
7.45
16.0
378
8.0
19.0
388
7.5
18.0
375
8.1
19.5
416
7.35
19.0
404
7.4
17.5
385
8.15
19.5
374
8.0
19.5
380
7.95
19.5
368
7.55
19.0
388
7.5
18.0
380
7.5
17.8
722
7.25
19.0
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature


September 30, 1987
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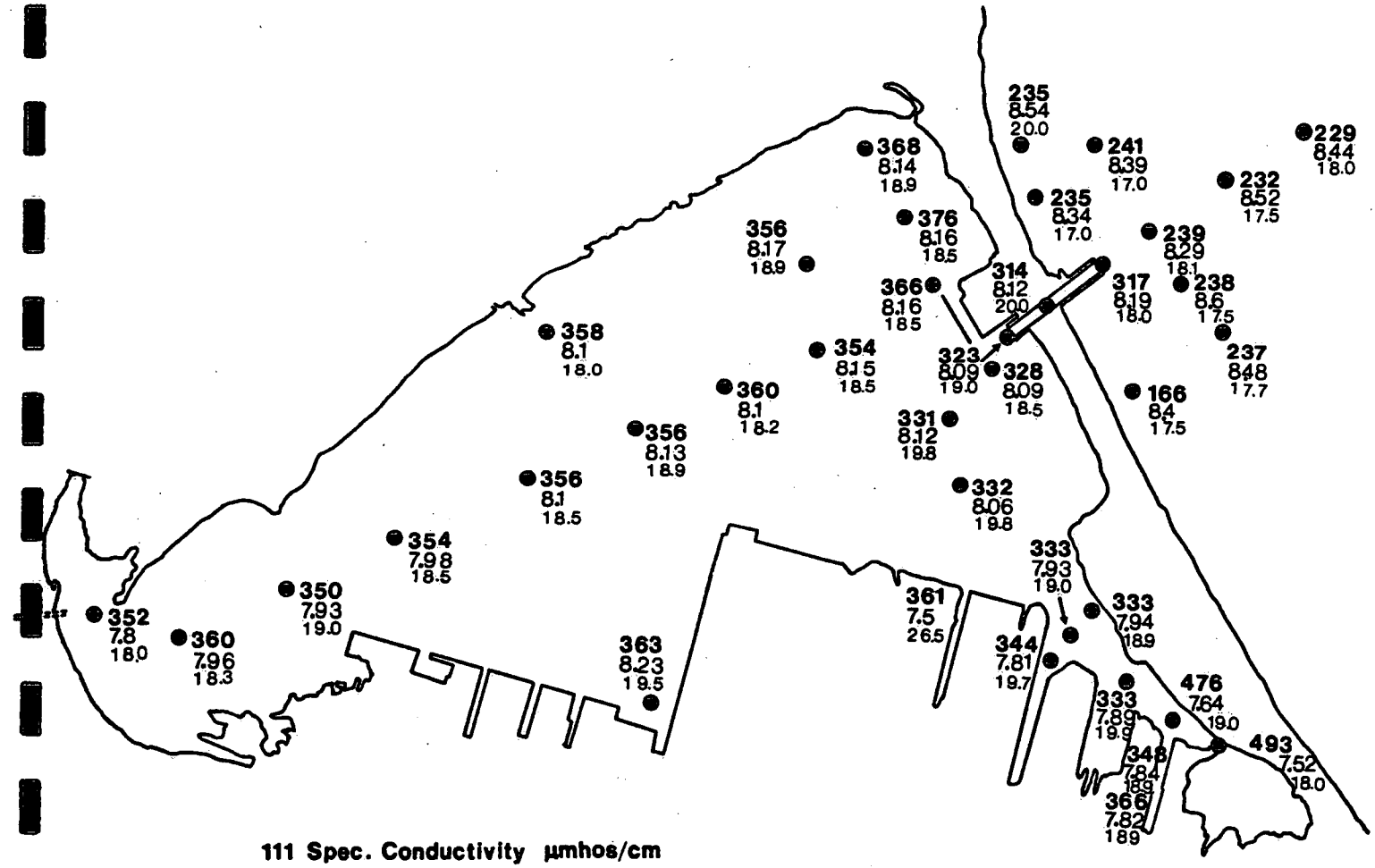
.46
24
4.8
0
.30
8
53
18
.64
19
.78
19
5.7
85
7.2
79
1.4
32
1.67
38
111 Total NH_3N - mg/L
111 Toxic NH_3N - µg/L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17.0
229
8.44
18.0
368
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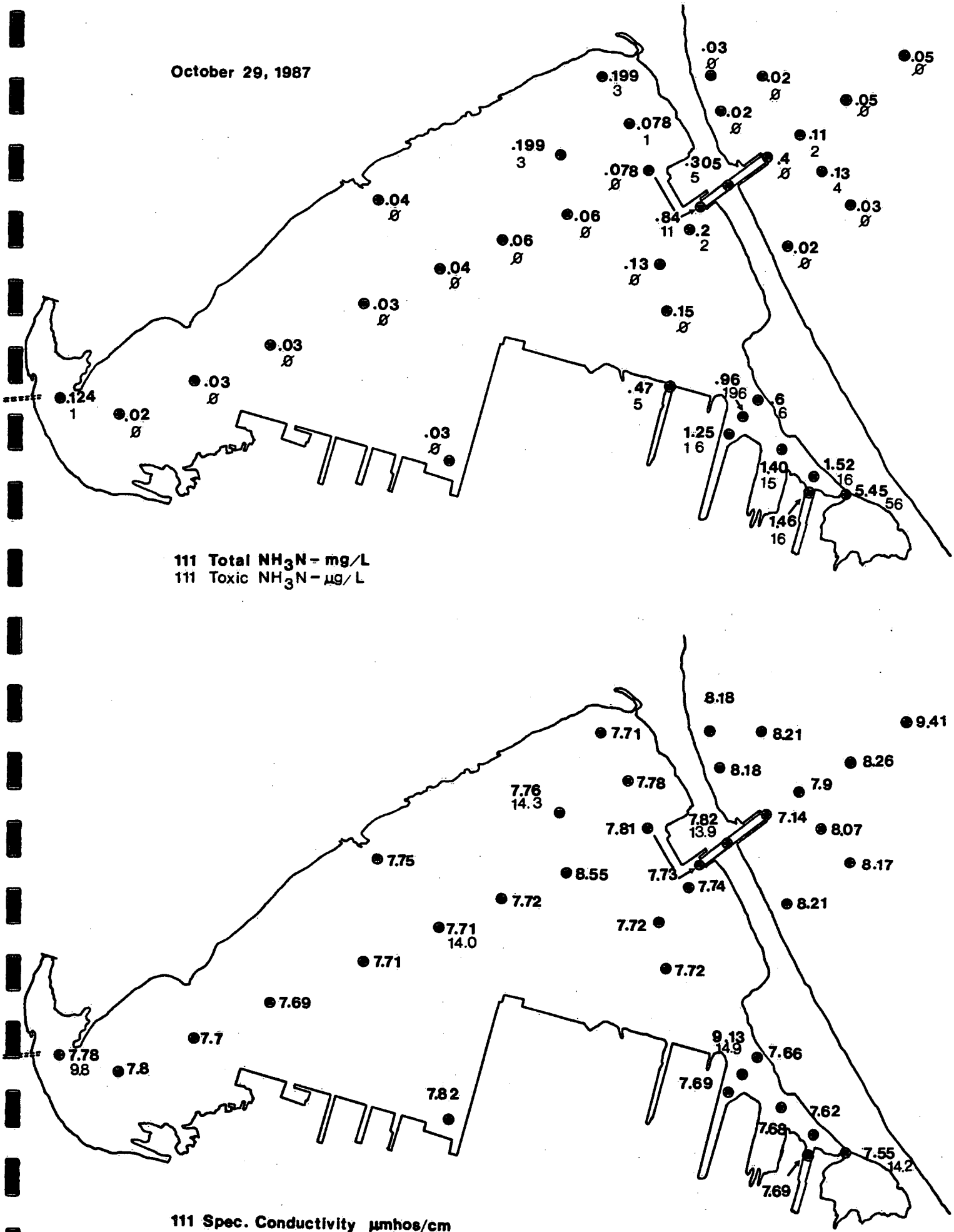
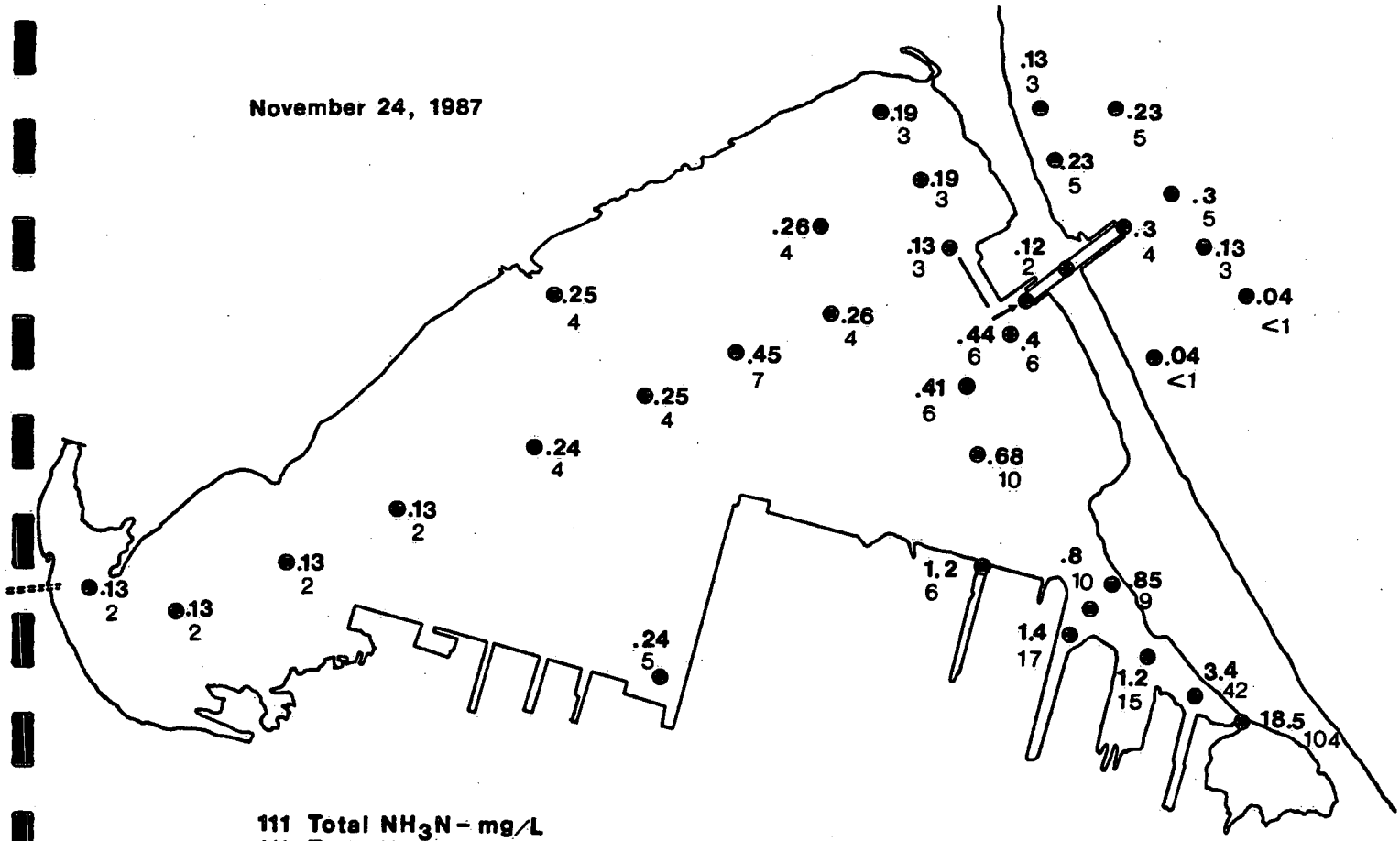
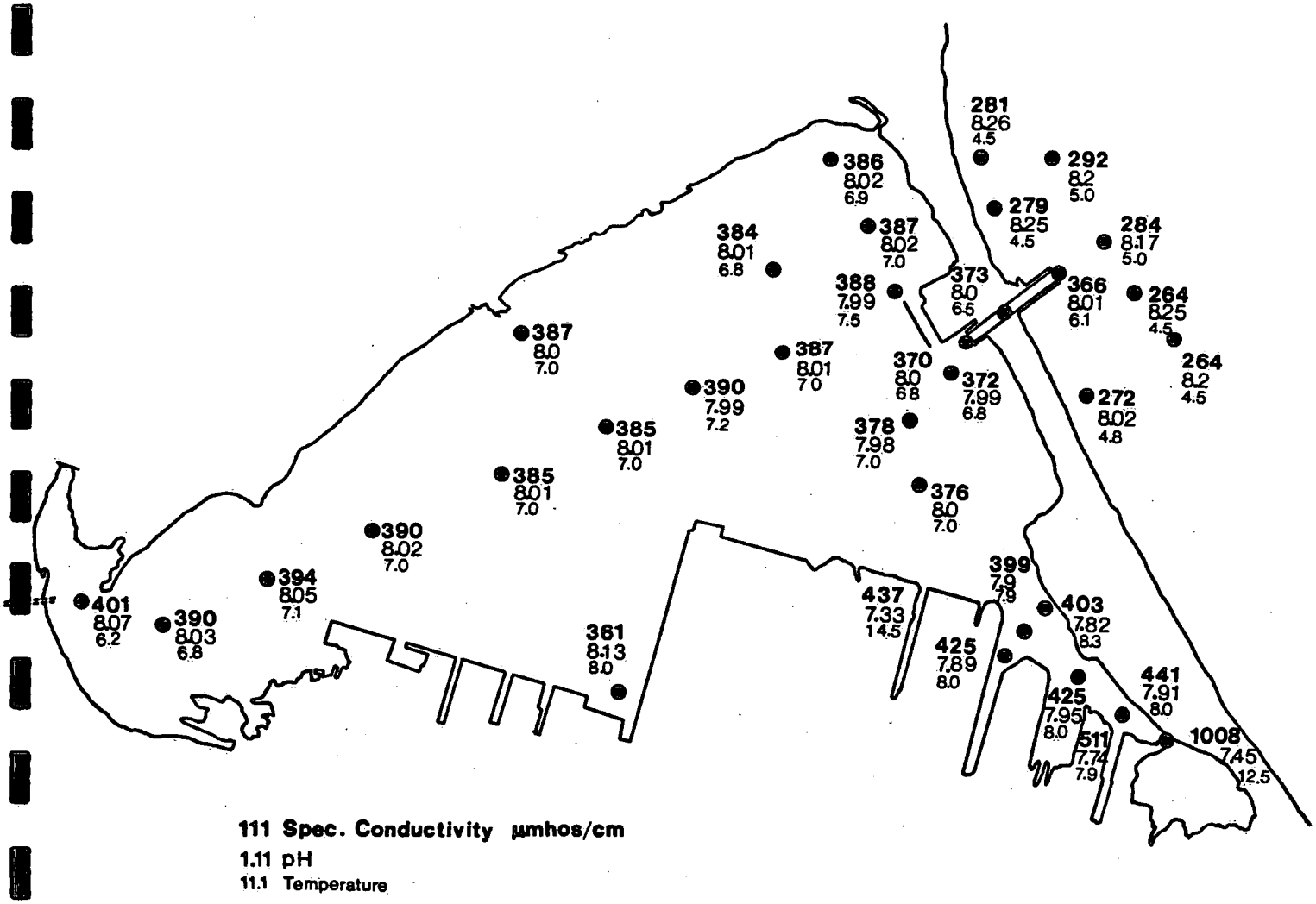
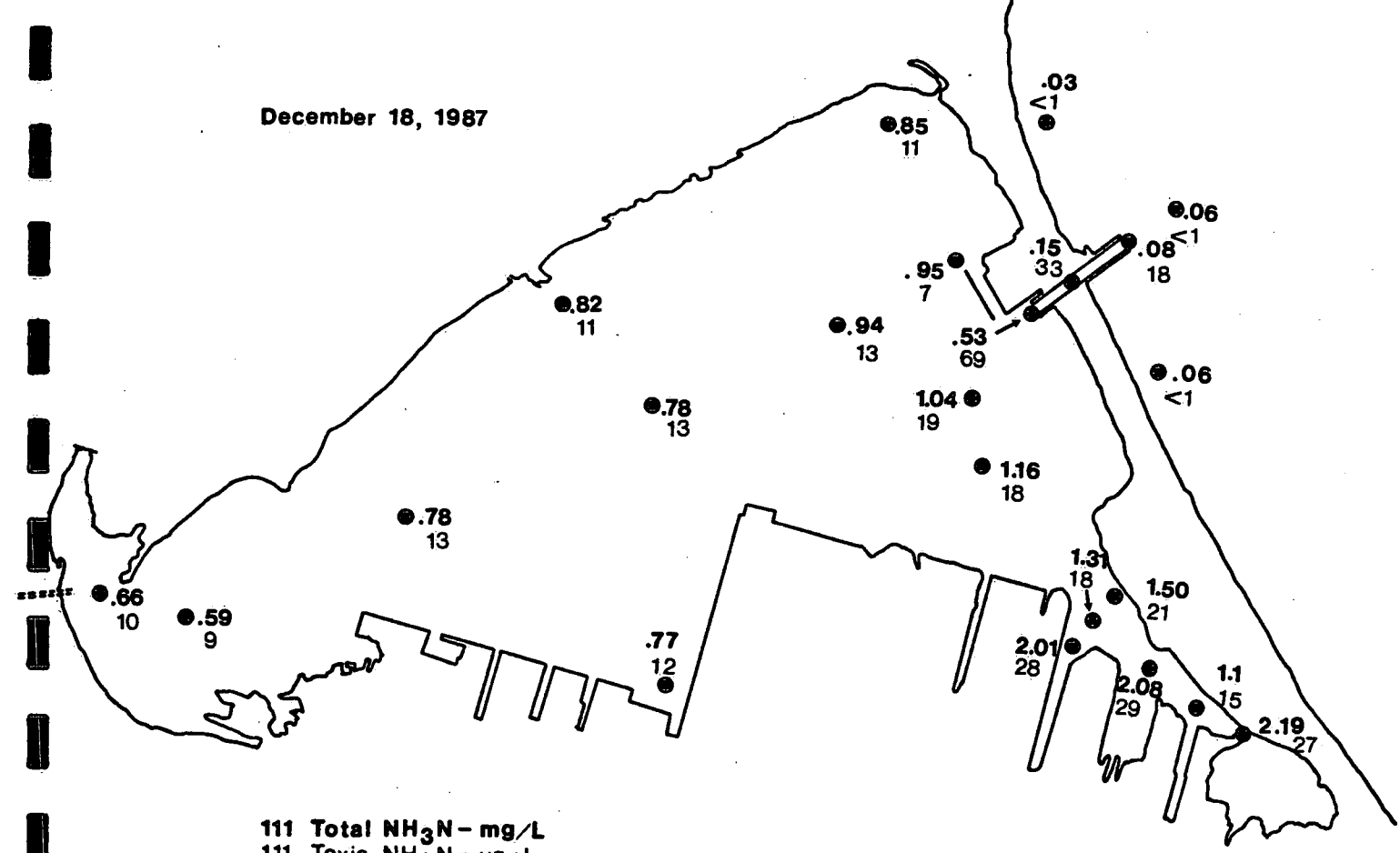
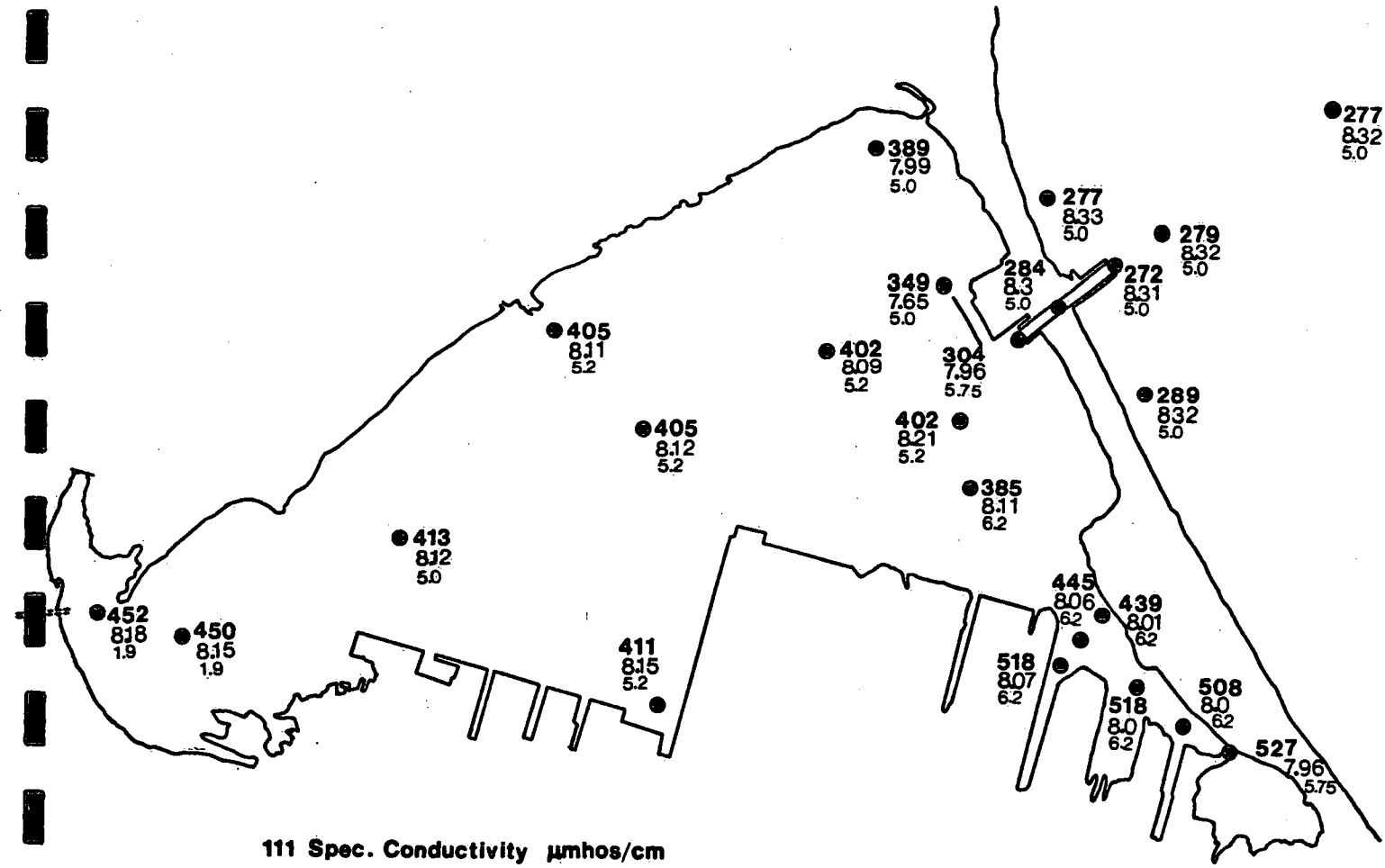
18.9
232
8.52
17.5
376
8.16
18.5
235
8.34
17.0
239
8.29
18.1
356
8.17
18.9
314
8.12
20.0
317
8.19
18.0
238
8.6
17.5
366
8.16
18.5
358
8.1
18.0
354
8.15
18.5
323
8.09
19.0
328
8.09
18.5
237
8.48
17.7
360
8.1
18.2
166
8.4
17.5
331
8.12
19.8
356
8.13
18.9
356
8.1
18.5
332
8.06
19.8
354
7.98
18.5
333
7.93
19.0
350
7.93
19.0
361
7.5
26.5
333
7.94
18.9
352
7.8
18.0
360
7.96
18.3
363
8.23
19.5
344
7.81
19.7
476
7.64
19.0
493
7.52
18.0
348
7.84
18.9
366
7.82
18.9
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

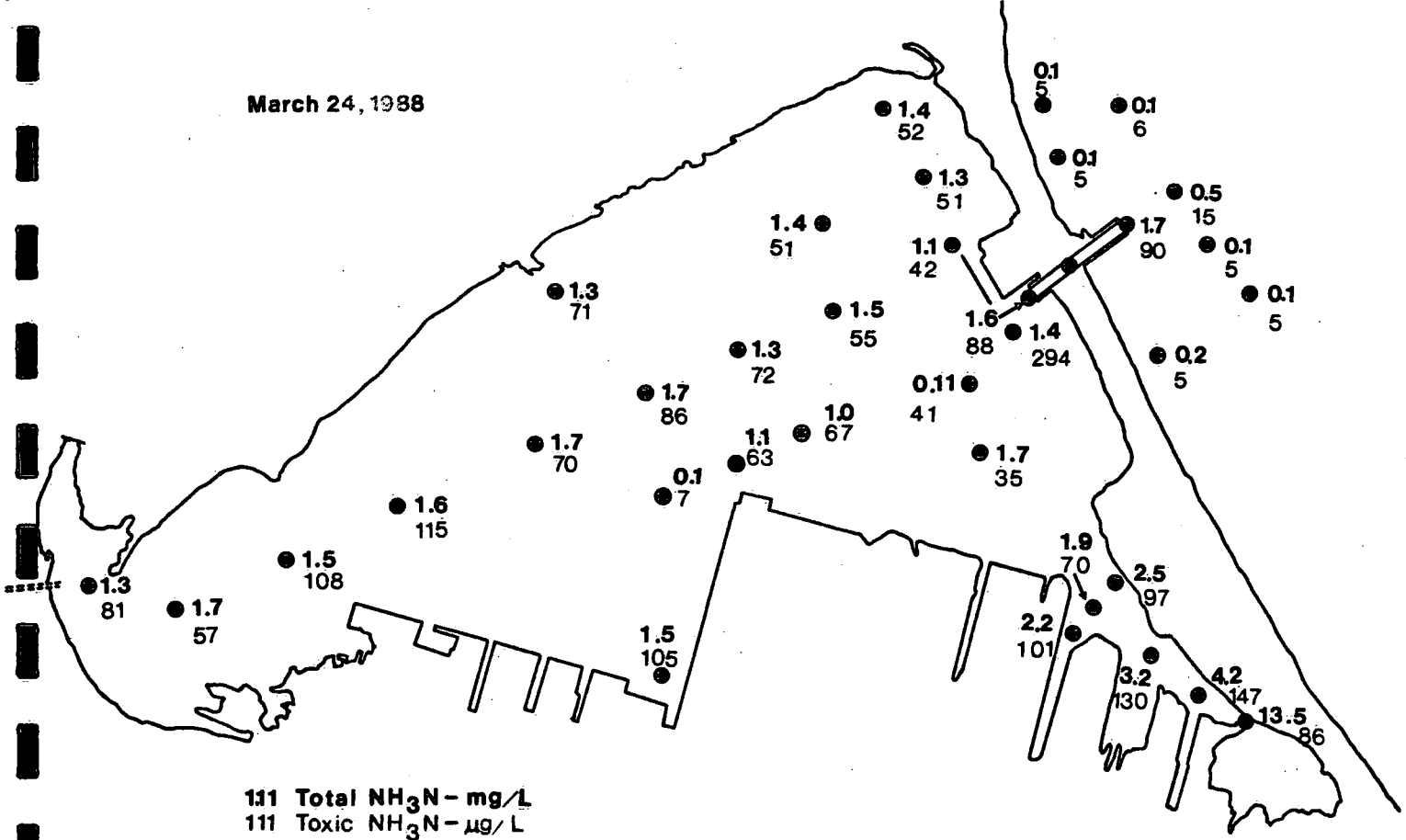

October 29, 1987
.199
3
.078
1
.199
3
.078
Ø
.305
5
.03
Ø
.02
Ø
.02
Ø
.05
Ø
.05
Ø
.11
2
.4
Ø
.13
4
.03
Ø
.84
11
.2
2
.02
Ø
.04
Ø
.06
Ø
.06
Ø
.04
Ø
.13
Ø
.03
Ø
.15
Ø
.03
Ø
.03
Ø
.124
1
.02
Ø
.03
Ø
.47
5
.96
196
.6
6
1.25
16
.03
Ø
1.40
15
1.52
16
5.45
56
146
16
111 Total NH_3N - mg/L
111 Toxic NH_3N - µg/L
8.18
9.41
7.71
8.21
8.26
8.18
7.78
7.9
7.76
14.3
7.81
7.82
13.9
7.14
8.07
7.75
8.55
7.73
7.74
8.17
7.72
8.21
7.72
7.71
14.0
7.71
7.72
7.69
7.7
9.13
14.9
7.66
7.78
9.8
7.8
7.69
7.82
7.62
7.68
7.55
14.2
7.69
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

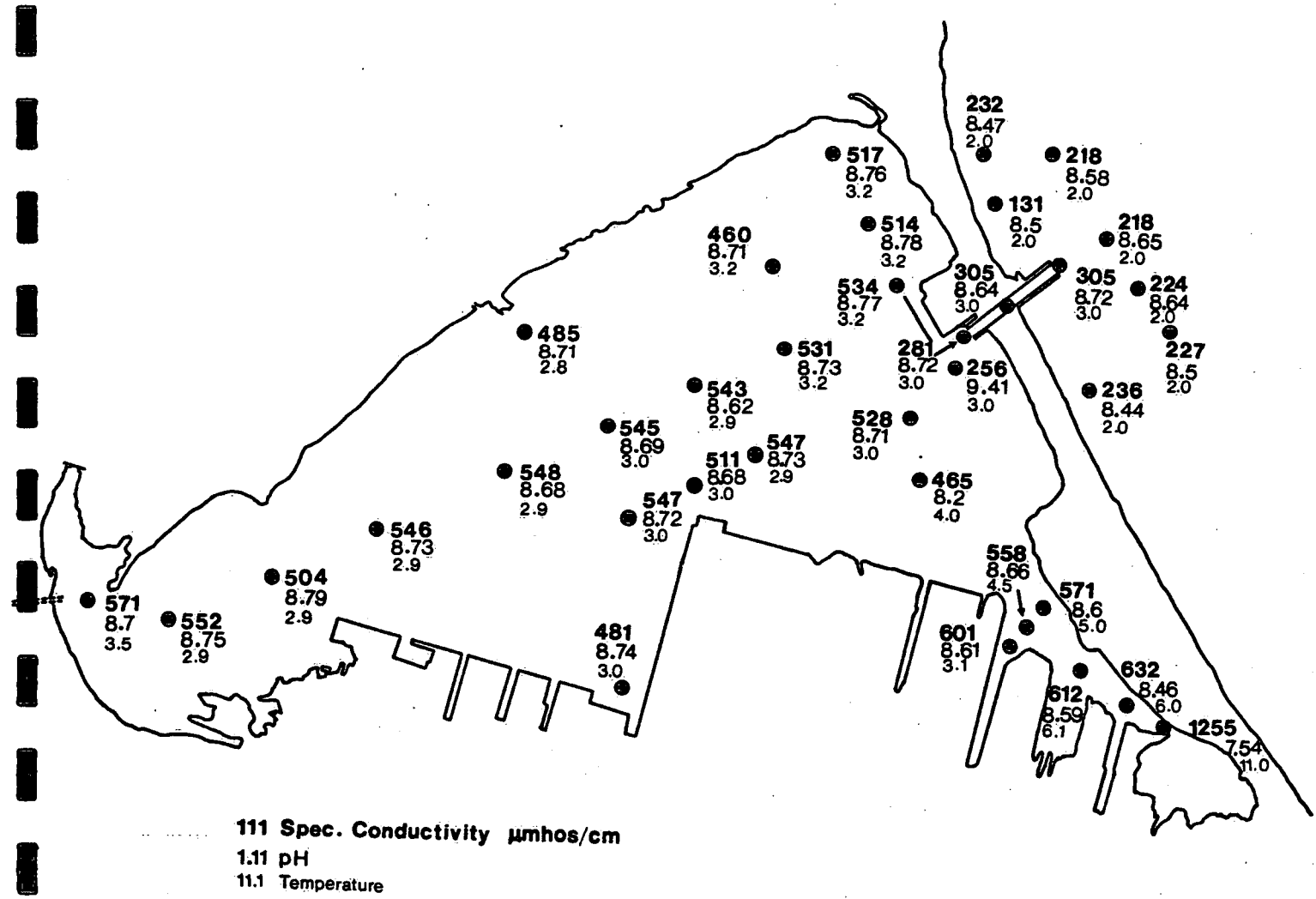

November 24, 1987
.13
3
.19
3
.23
5
.23
5
.19
3
.3
5
.26
4
.13
3
.12
2
.3
4
.13
3
.25
4
.26
4
.04
<1
.44
6
.4
6
.45
7
.04
<1
.41
6
.25
4
.24
4
.68
10
.13
2
.13
2
.13
2
.13
2
1.2
6
.8
10
.85
9
1.4
17
.24
5
1.2
15
3.4
42
18.5
104
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L


281
8.26
4.5
386
8.02
6.9
292
8.2
5.0
279
8.25
4.5
387
8.02
7.0
384
8.01
6.8
284
8.17
5.0
373
8.0
6.5
388
7.99
7.5
366
8.01
6.1
264
8.25
4.5
387
8.0
7.0
387
8.01
7.0
370
8.0
6.8
372
7.99
6.8
264
8.2
4.5
390
7.99
7.2
272
8.02
4.8
385
8.01
7.0
378
7.98
7.0
385
8.01
7.0
376
8.0
7.0
390
8.02
7.0
399
7.9
7.9
394
8.05
7.1
437
7.33
14.5
403
7.82
8.3
401
8.07
6.2
390
8.03
6.8
361
8.13
8.0
425
7.89
8.0
441
7.91
8.0
425
7.95
8.0
511
7.74
7.9
1008
7.45
12.5
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

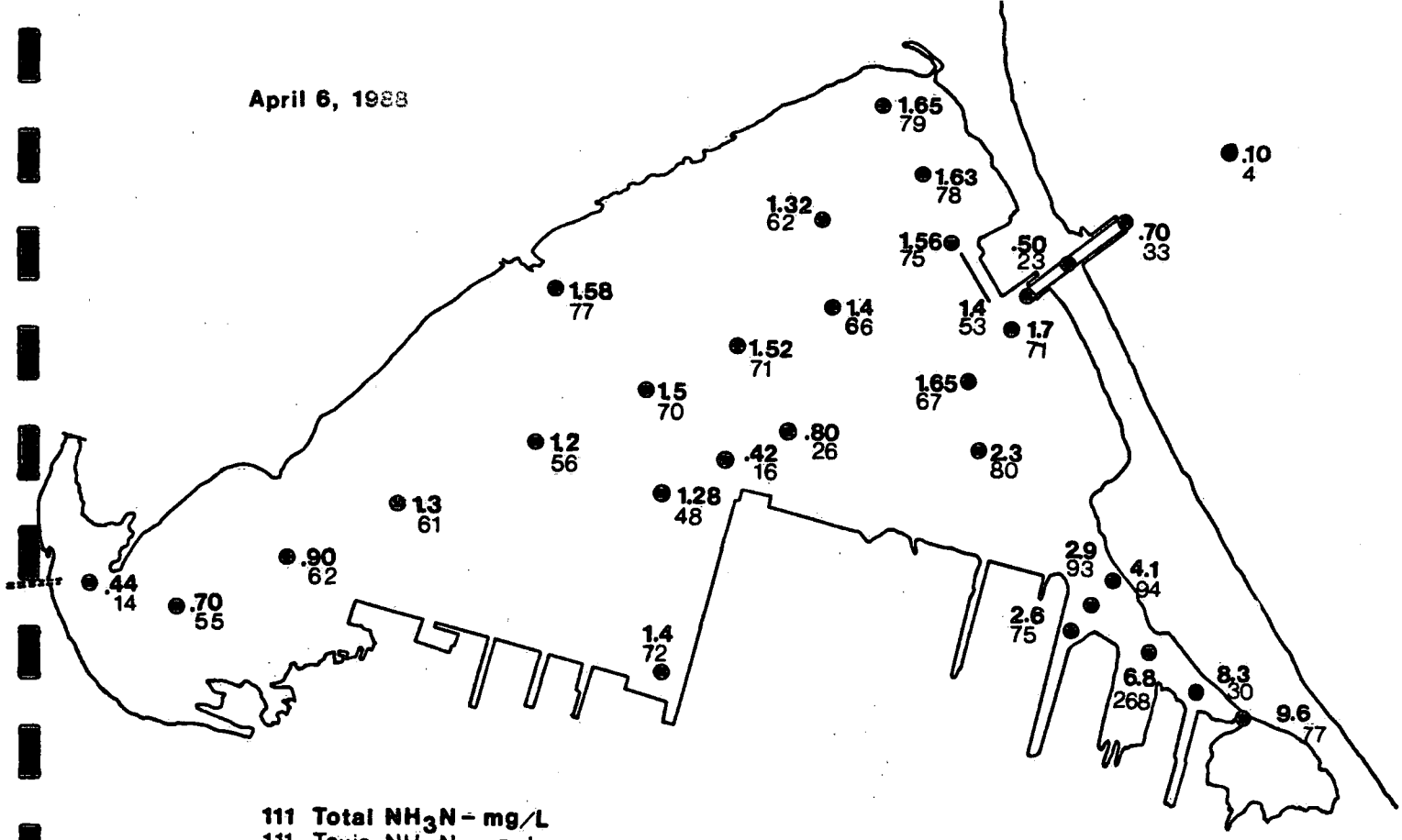

December 18, 1987
.03
<1
.85
11
.06
<1
.08
18
.15
33
.95
7
.82
11
.94
13
.53
69
.06
<1
1.04
19
.78
13
1.16
18
.78
13
1.31
18
1.50
21
.66
10
.59
9
.77
12
2.01
28
2.08
29
1.1
15
2.19
27
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L


277
8.32
5.0
389
7.99
5.0
277
8.33
5.0
279
8.32
5.0
284
8.3
5.0
272
8.31
5.0
349
7.65
5.0
405
8.11
5.2
402
8.09
5.2
304
7.96
5.75
289
8.32
5.0
405
8.12
5.2
402
8.21
5.2
385
8.11
6.2
413
8.12
5.0
445
8.06
6.2
439
8.01
6.2
452
8.18
1.9
450
8.15
1.9
411
8.15
5.2
518
8.07
6.2
508
8.0
6.2
518
8.0
6.2
527
7.96
5.75
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

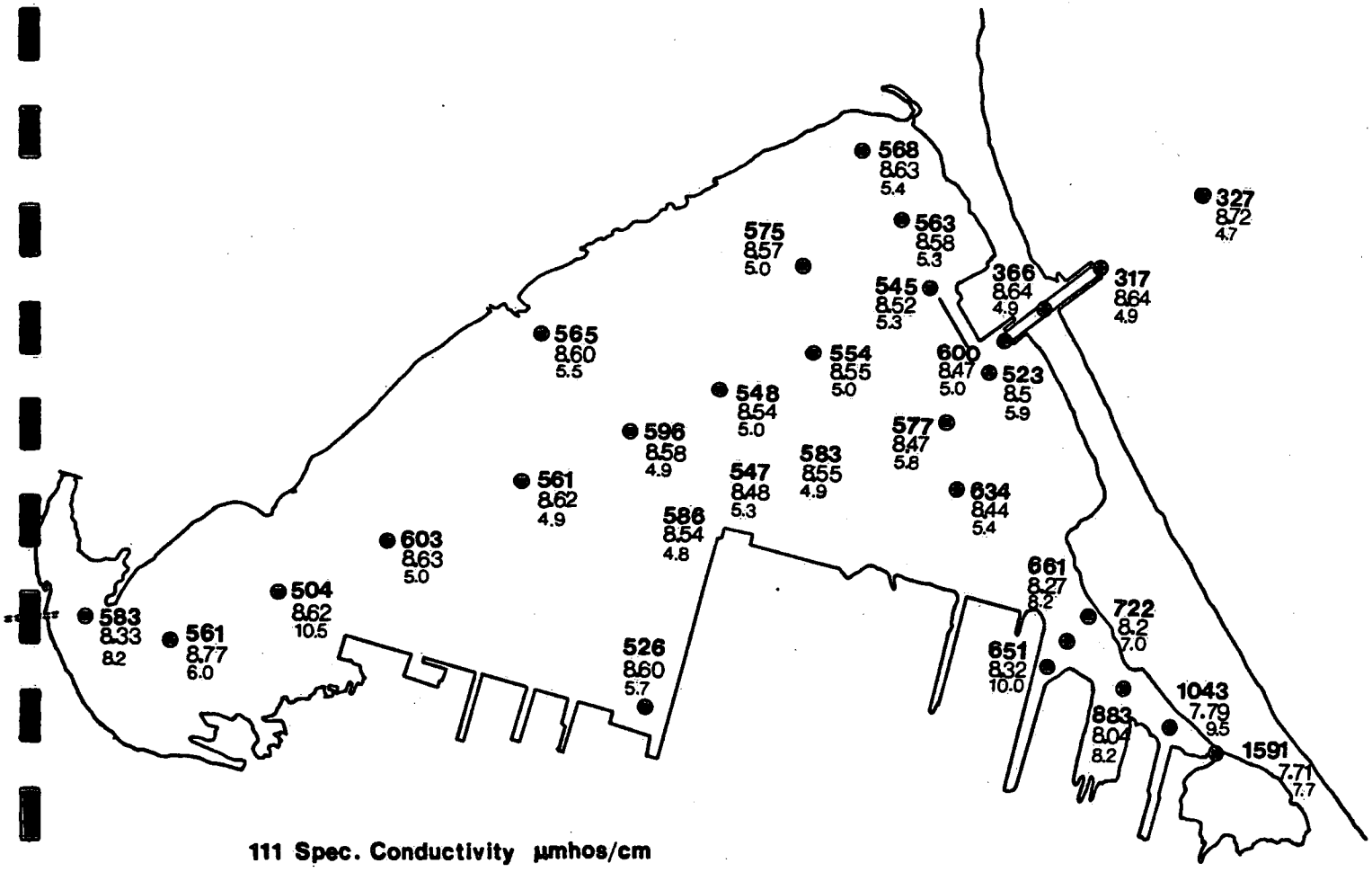

March 24, 1988
0.1
5
0.1
6
1.4
52
0.1
5
1.3
51
0.5
15
1.4
51
1.1
42
1.7
90
0.1
5
0.1
5
1.3
71
1.5
55
1.6
88
1.4
294
0.2
5
1.3
72
0.11
41
1.7
86
1.0
67
1.7
70
1.1
63
1.7
35
0.1
7
1.6
115
1.5
108
1.9
70
2.5
97
1.3
81
1.7
57
2.2
101
1.5
105
3.2
130
4.2
147
13.5
86
111 Total NH_3N - mg/L
111 Toxic NH_3N - µg/L


232
8.47
2.0
517
8.76
3.2
218
8.58
2.0
131
8.5
2.0
514
8.78
3.2
218
8.65
2.0
460
8.71
3.2
305
8.64
3.0
305
8.72
3.0
224
8.64
2.0
534
8.77
3.2
485
8.71
2.8
531
8.73
3.2
281
8.72
3.0
256
9.41
3.0
227
8.5
2.0
543
8.62
2.9
236
8.44
2.0
528
8.71
3.0
545
8.69
3.0
547
8.73
2.9
511
8.68
3.0
548
8.68
2.9
465
8.2
4.0
547
8.72
3.0
546
8.73
2.9
558
8.66
4.5
504
8.79
2.9
571
8.6
5.0
571
8.7
3.5
552
8.75
2.9
481
8.74
3.0
601
8.61
3.1
632
8.46
6.0
612
8.59
6.1
1255
7.54
11.0
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

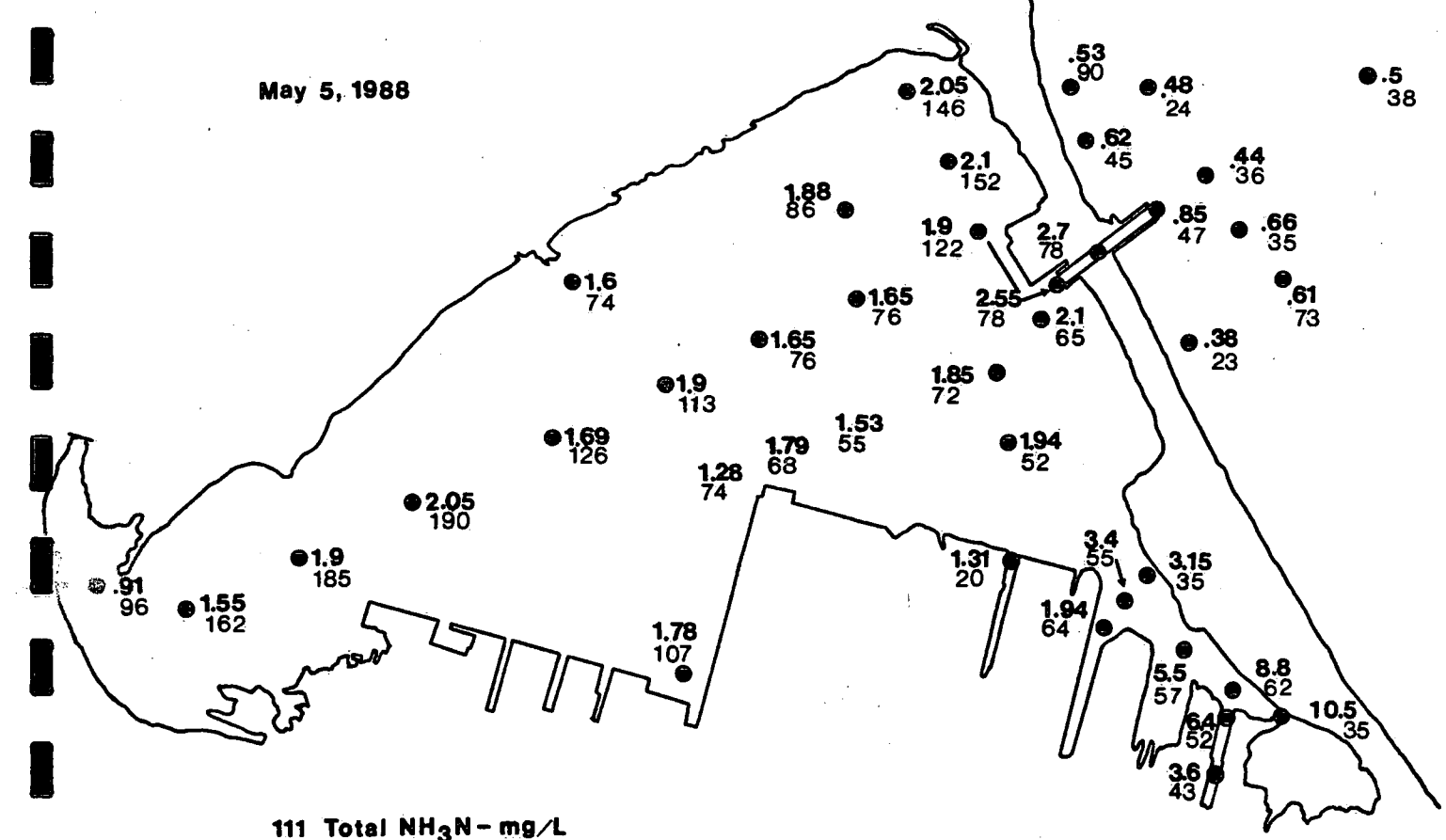
April 6, 1988

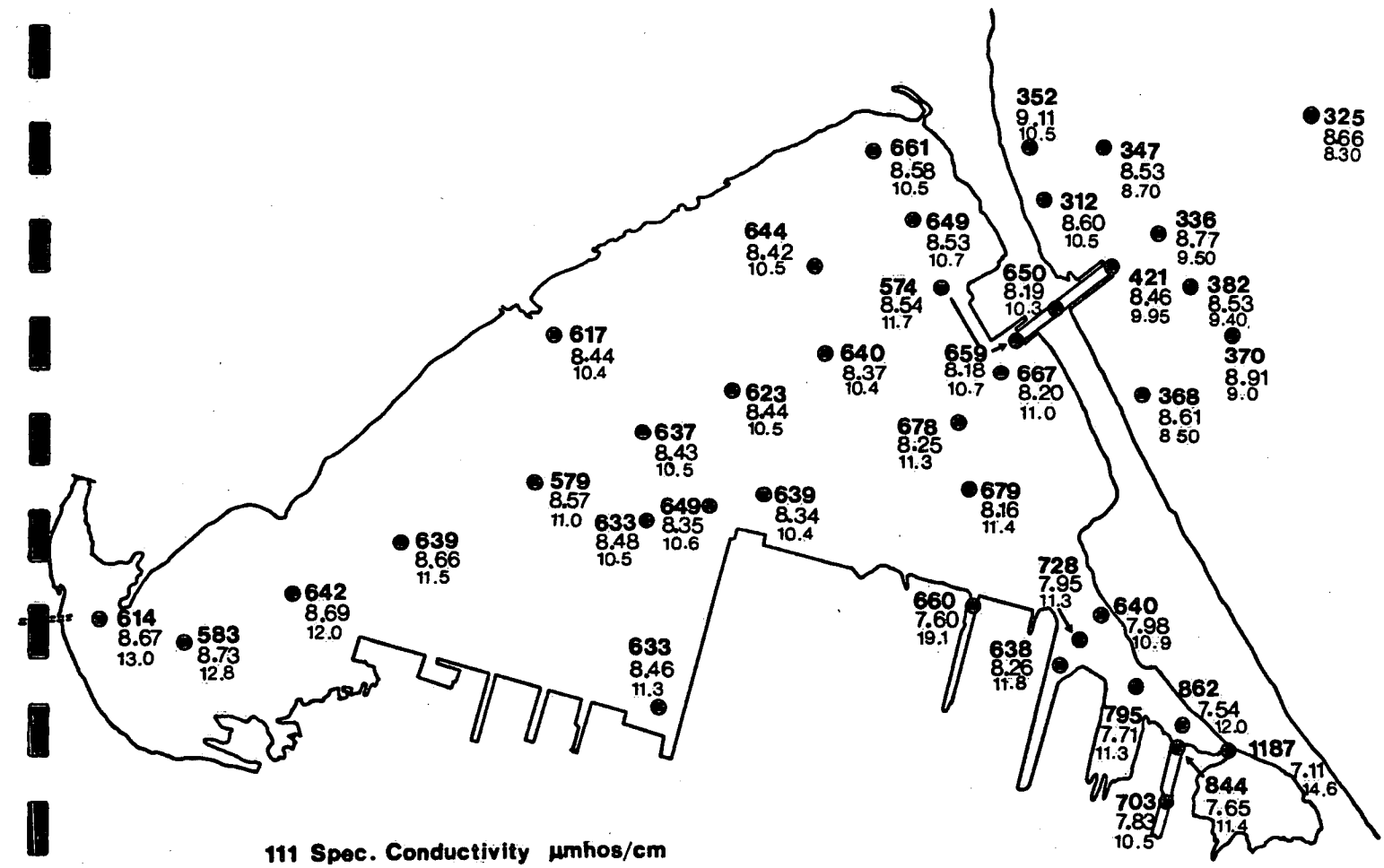


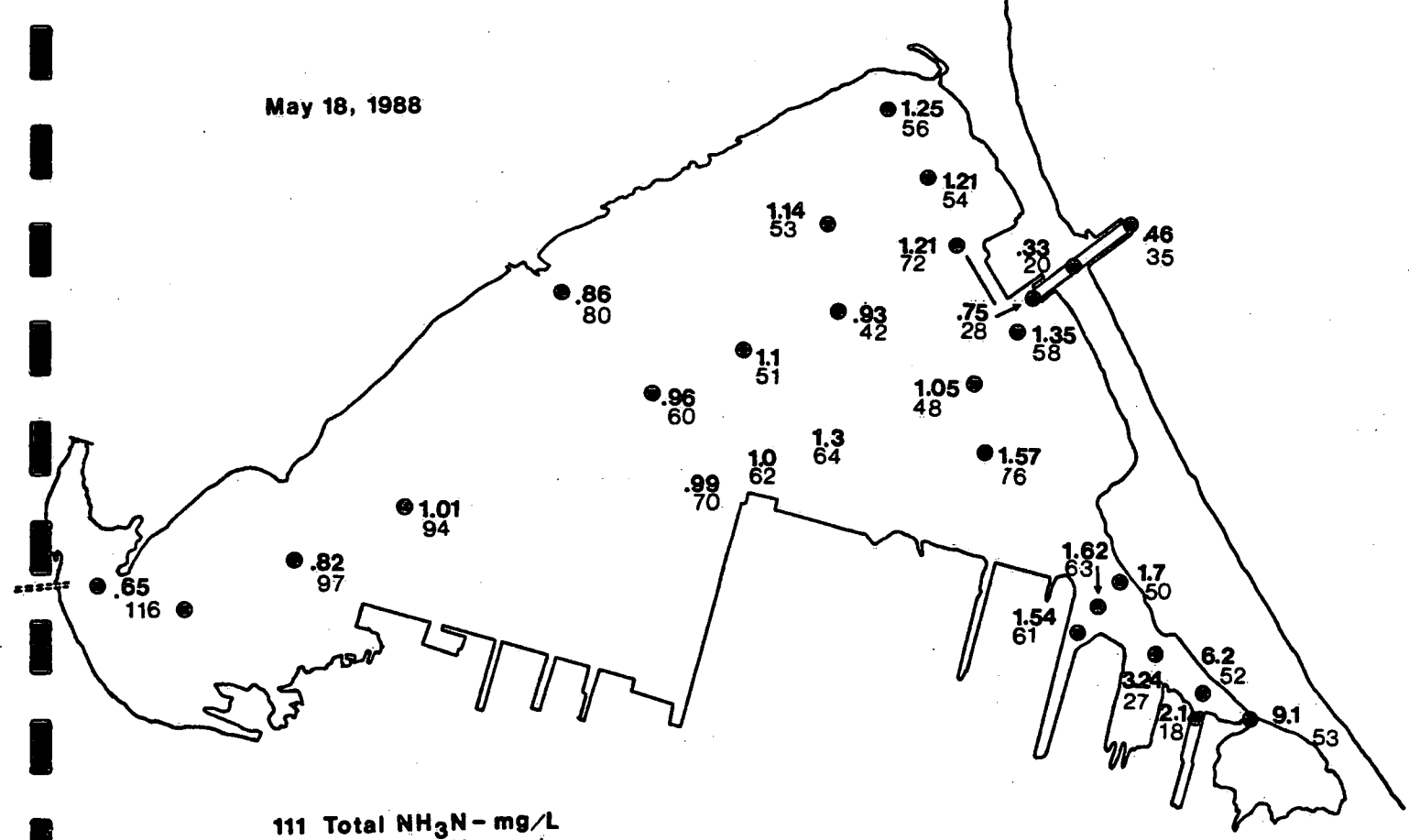
111 Total NH_3N – mg/L
111 Toxic NH_3N – µg/L

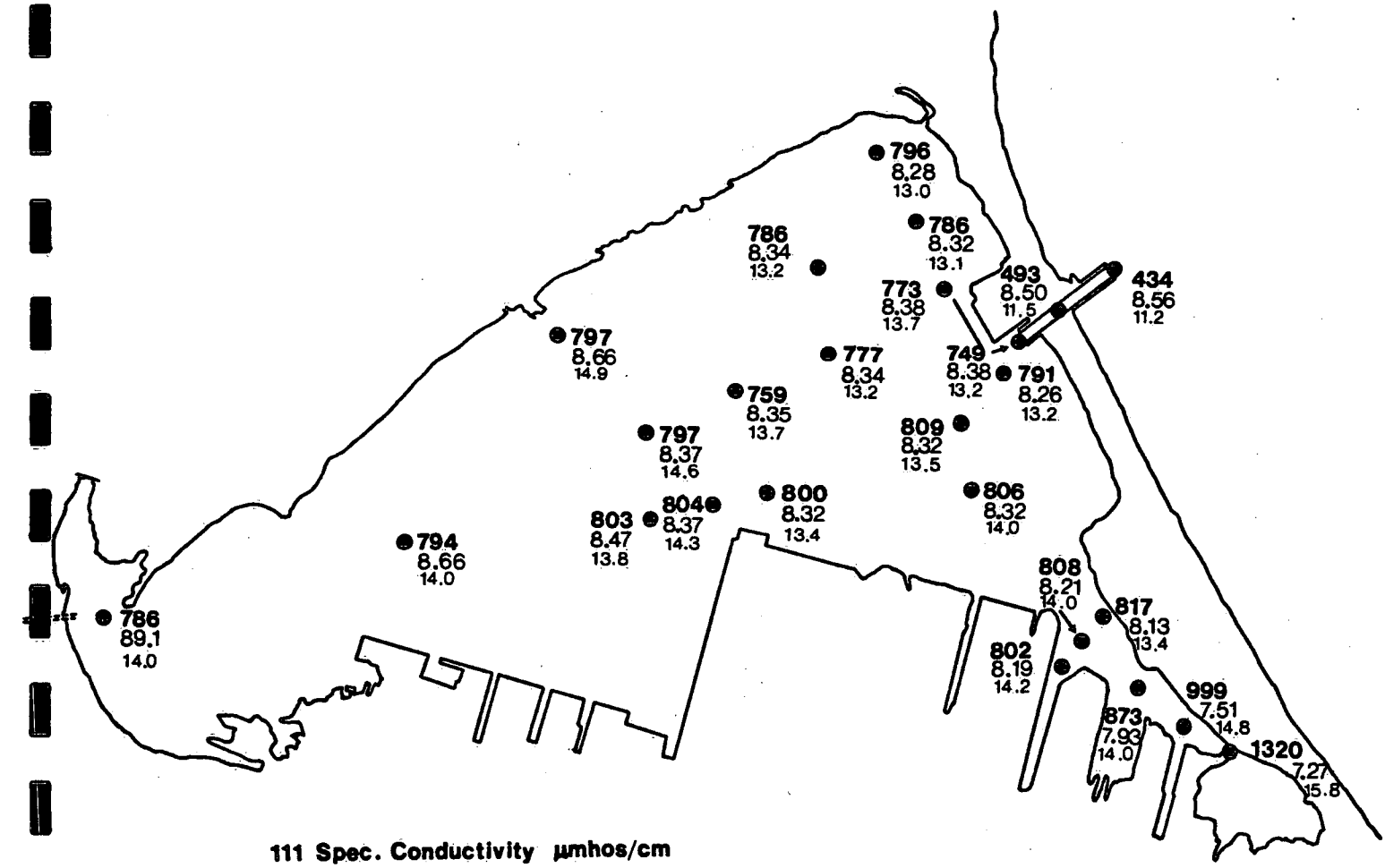


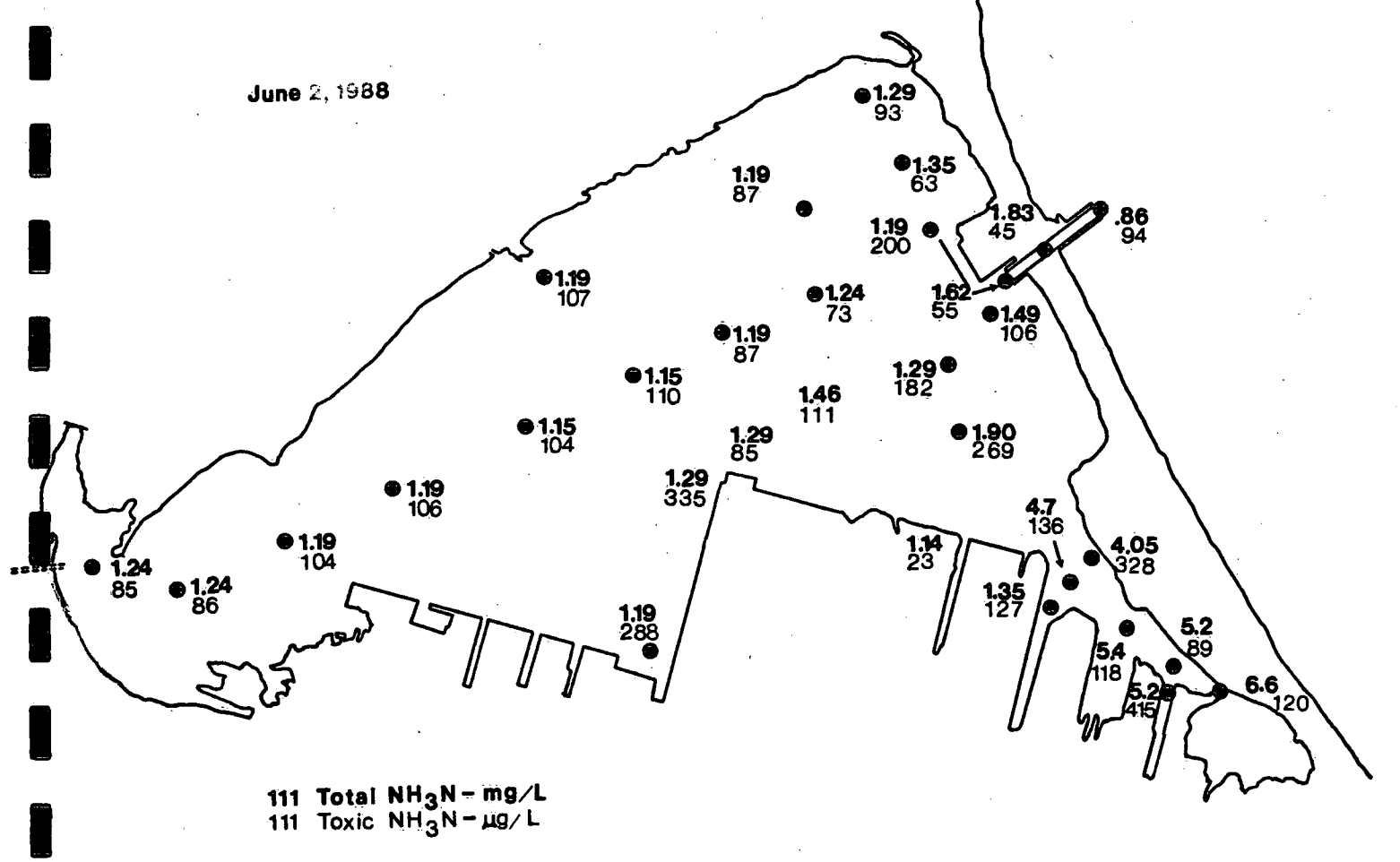
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

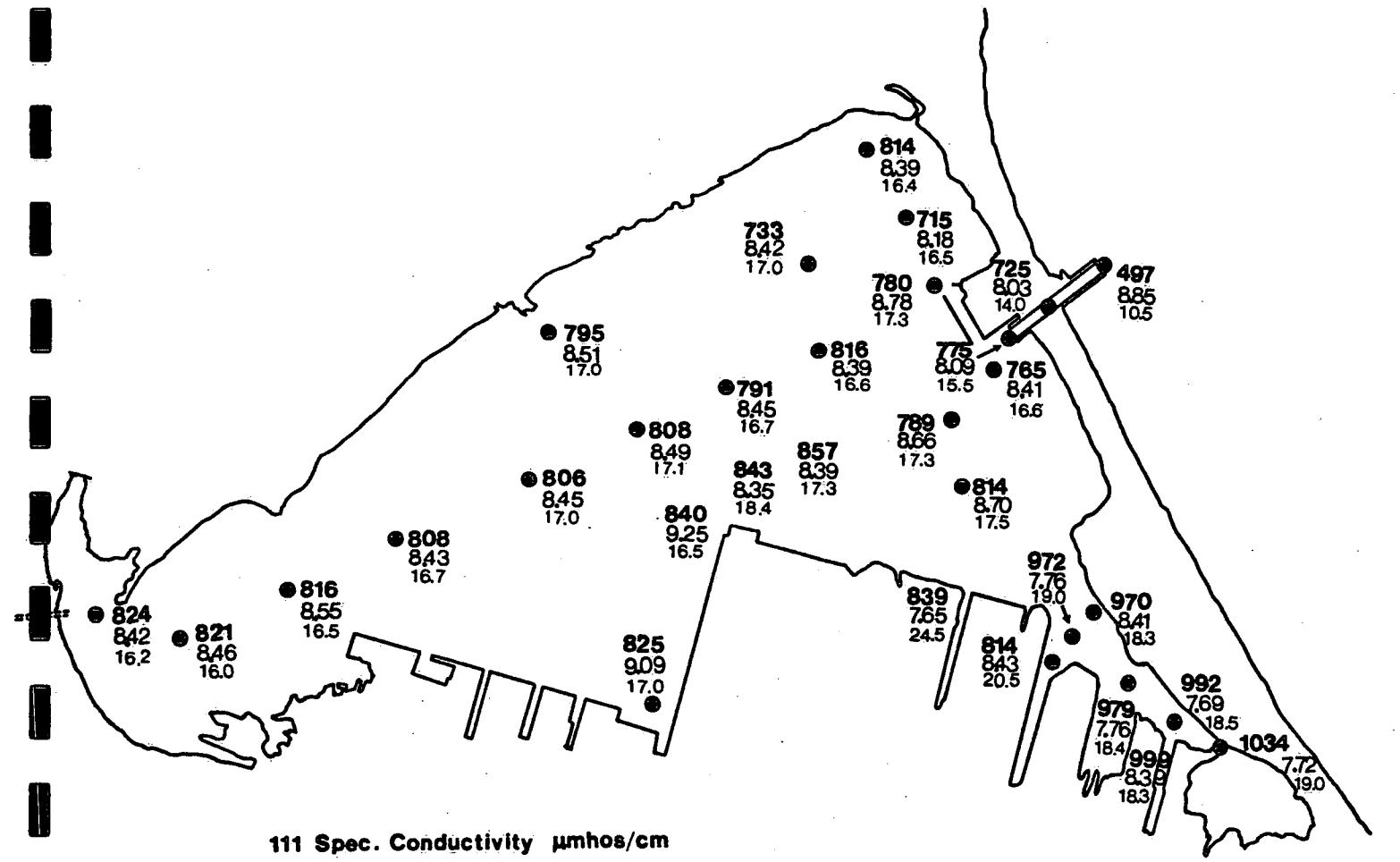

May 5, 1988
.53
90
.48
24
.5
38
2.05
146
.62
45
.44
36
2.1
152
1.88
86
1.9
122
2.7
78
.85
47
.66
35
1.6
74
1.65
76
2.55
78
2.1
65
.61
73
1.65
76
.38
23
1.85
72
1.9
113
1.53
55
1.69
126
1.79
68
1.94
52
1.28
74
2.05
190
1.9
185
3.4
55
1.31
20
3.15
35
.91
96
1.55
162
1.94
64
1.78
107
5.5
57
8.8
62
10.5
35
64
52
3.6
43
111 Total NH_3N - mg/L
111 Toxic NH_3N - µg/L

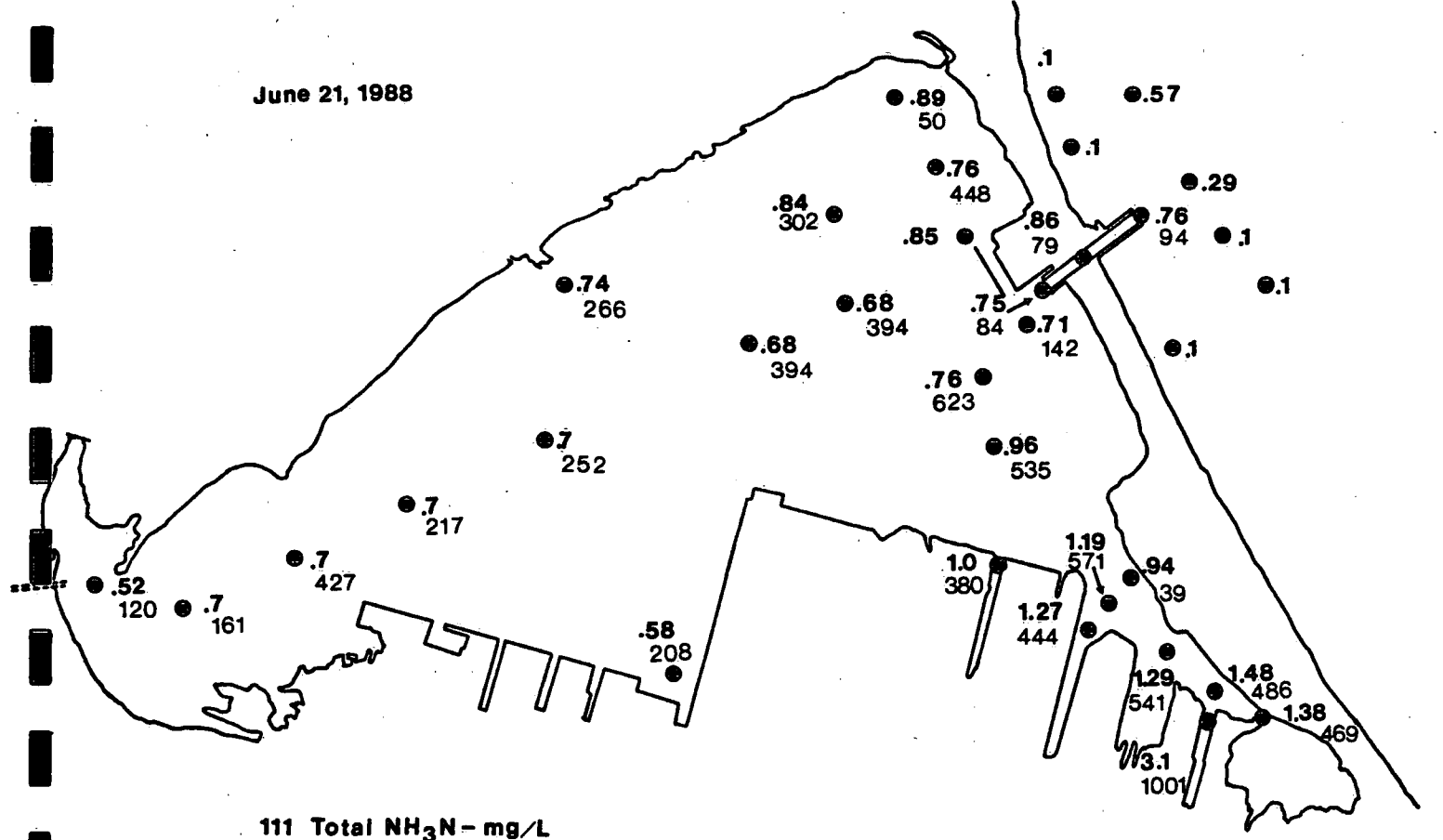

352
9.11
10.5
325
8.66
8.30
661
8.58
10.5
347
8.53
8.70
312
8.60
10.5
649
8.53
10.7
336
8.77
9.50
644
8.42
10.5
650
8.19
10.3
421
8.46
9.95
382
8.53
9.40
574
8.54
11.7
617
8.44
10.4
640
8.37
10.4
659
8.18
10.7
667
8.20
11.0
370
8.91
9.0
623
8.44
10.5
368
8.61
8 50
637
8.43
10.5
678
8.25
11.3
579
8.57
11.0
633
8.48
10.5
649
8.35
10.6
639
8.34
10.4
679
8.16
11.4
639
8.66
11.5
728
7.95
11.3
642
8.69
12.0
660
7.60
19.1
640
7.98
10.9
614
8.67
13.0
583
8.73
12.8
638
8.26
11.8
862
7.54
12.0
633
8.46
11.3
795
7.71
11.3
1187
7.11
14.6
844
7.65
11.4
703
7.83
10.5
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature

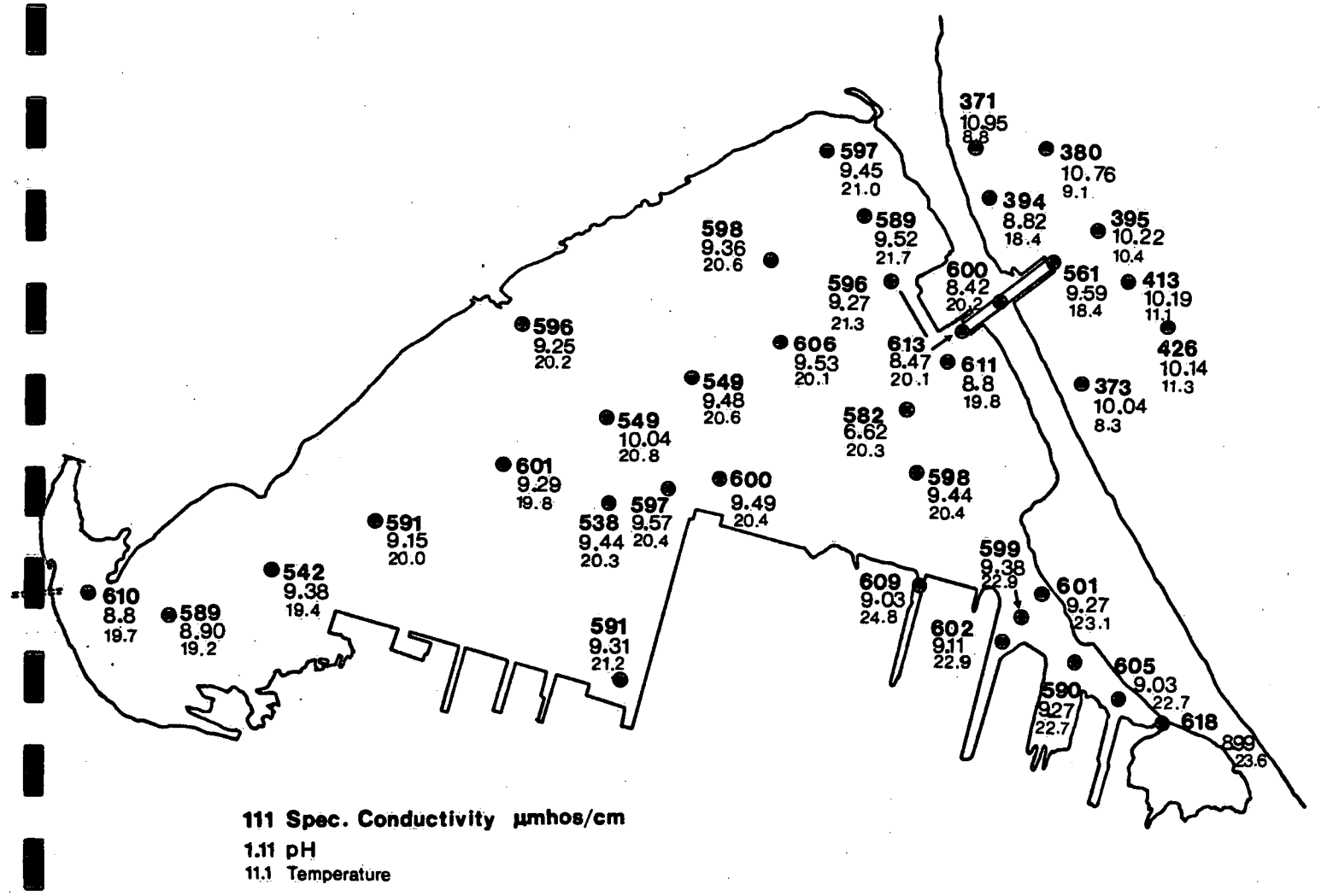

May 18, 1988
1.25
56
1.21
54
1.14
53
1.21
72
.33
20
46
35
.86
80
.93
42
.75
28
1.35
58
1.1
51
1.05
48
.96
60
1.3
64
1.0
62
1.57
76
.99
70
1.01
94
.82
97
.65
116
1.62
63
1.7
50
1.54
61
6.2
52
3.24
27
2.1
18
9.1
53
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L


796
8.28
13.0
786
8.34
13.2
786
8.32
13.1
493
8.50
11.5
434
8.56
11.2
773
8.38
13.7
797
8.66
14.9
777
8.34
13.2
749
8.38
13.2
791
8.26
13.2
759
8.35
13.7
809
8.32
13.5
797
8.37
14.6
800
8.32
13.4
806
8.32
14.0
804
8.37
14.3
803
8.47
13.8
794
8.66
14.0
808
8.21
14.0
817
8.13
13.4
786
89.1
14.0
802
8.19
14.2
999
7.51
14.8
873
7.93
14.0
1320
7.27
15.8
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature


June 2, 1988
1.29
93
1.35
63
1.19
87
1.19
200
1.83
45
.86
94
1.19
107
1.24
73
1.62
55
1.49
106
1.19
87
1.15
110
1.29
182
1.46
111
1.15
104
1.29
85
1.90
269
1.29
335
1.19
106
4.7
136
1.19
104
1.14
23
4.05
328
1.24
85
1.24
86
1.35
127
1.19
288
5.2
89
5.4
118
5.28
415
6.6
120
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L


814
8.39
16.4
715
8.18
16.5
733
8.42
17.0
725
8.03
14.0
497
8.85
10.5
780
8.78
17.3
795
8.51
17.0
816
8.39
16.6
775
8.09
15.5
765
8.41
16.6
791
8.45
16.7
808
8.49
17.1
789
8.66
17.3
857
8.39
17.3
843
8.35
18.4
806
8.45
17.0
814
8.70
17.5
840
9.25
16.5
808
8.43
16.7
816
8.55
16.5
972
7.76
19.0
970
8.41
18.3
824
8.42
16.2
821
8.46
16.0
839
7.65
24.5
825
9.09
17.0
814
8.43
20.5
992
7.69
18.5
979
7.76
18.4
1034
7.72
19.0
999
8.39
18.3
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature


June 21, 1988
.89
50
.1
.57
.1
.76
448
.29
.84
302
.85
.86
79
.76
94
.1
.74
266
.68
394
.75
84
.71
142
.1
.1
.68
394
.76
623
.7
252
.96
535
.7
217
.7
427
.52
120
.7
161
.58
208
1.0
380
1.19
571
.94
39
1.27
444
1.29
541
1.48
486
1.38
469
3.1
1001
111 Total NH3N - mg/L
111 Toxic NH3N - µg/L


371
10.95
8.8
597
9.45
21.0
380
10.76
9.1
394
8.82
18.4
589
9.52
21.7
395
10.22
10.4
598
9.36
20.6
600
8.42
20.2
561
9.59
18.4
413
10.19
11.1
596
9.27
21.3
596
9.25
20.2
606
9.53
20.1
613
8.47
20.1
611
8.8
19.8
426
10.14
11.3
549
9.48
20.6
373
10.04
8.3
549
10.04
20.8
582
6.62
20.3
601
9.29
19.8
600
9.49
20.4
598
9.44
20.4
597
9.57
20.4
538
9.44
20.3
591
9.15
20.0
599
9.38
22.9
542
9.38
19.4
609
9.03
24.8
601
9.27
23.1
610
8.8
19.7
589
8.90
19.2
591
9.31
21.2
602
9.11
22.9
605
9.03
22.7
590
9.27
22.7
618
899
23.6
111 Spec. Conductivity µmhos/cm
1.11 pH
11.1 Temperature