THE EFFECTS OF RELEASES FROM LOSTOCK DAM ON SALINITY IN THE LOWER PATERSON RIVER

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INTRODUCTION

The Paterson River is located in the Hunter Valley northwest of Newcastle. The river rises in the southern escarpment of the Barrington Tops and flows in a generally southerly direction discharging to the Hunter River at Morpeth (Figure 1). The Paterson River Catchment to Gostwyck is 966 km^2.

Lostock Dam (20 000 ML capacity) is located in the headwaters of the Paterson River. This dam has a catchment area of 277 km^2 and is operated to maintain discharges for irrigation down to Gostwyck Bridge.

The Paterson River is tidal up to about the Paterson Railway Bridge. Officially the tidal limit has been set at Gostwyck Bridge. Upstream of this bridge the river comes under the administration of the Water Resources Commission. The tidal section of the river comes under the administration of the Department of Public Works. The area irrigated along the tidal section of the river is about 2930 hectares.

Water users from the lower Paterson River in late September, 1980, requested that water be released from Lostock Dam for the purpose of reducing salinity levels in the tidal section of the Paterson River.

The Water Resources Commission agreed to conduct an experiment in which discharges from Lostock Dam would be increased for a short period to determine if salinity reduction could be achieved and if so how effective this salinity reduction could be. Increased releases were commenced on November 6th, 1980, with the aim of providing flows at Gostwyck of 100 ML/day for 4 days and 65 ML/day for a further 14 days.

This report presents, describes and discusses results obtained from the investigation of the effects on salinity, in the tidal section of the Paterson River, of increased discharges from Lostock Dam.

METHODS

Eight monitoring sites were selected (Figure 1) along the Paterson River between Gostwyck Bridge and Hinton Bridge for measurement of salinity. Salinity monitoring was undertaken from 1 to 8 times daily at the times and dates listed in Table 3 between the 6th November, and the 26th November, 1980. This was done by measuring electrical conductivity in situ from either a bridge or a boat with a portable conductivity meter incorporating a conductivity cell with a 10 m cable. Both surface and bottom conductivity measurements were taken each time to determine the extent of "salt-wedging" along the river. The conductivity meter and cell were calibrated every morning using standard potassium chloride solutions.

River height data were collected from two continuous recorders operated by the Department of Public Works at Woodville and Hinton Bridges. Additional gauge boards were installed at the Gostwyck and Paterson Bridges so that river heights could be recorded each time salinity was measured. Flows at Gostwyck were calculated using data from the continuous recorder operated by the Water Resources Commission.

Tide behaviour for Fort Denison over the period 6th November, to 27th November, 1980 is shown at Figure 3, and river height behaviour in the Paterson River (as measured by continuous recorders) at Figure 4. Salinity variations in the Paterson River are shown at Figure 5. This data was examined to determine the extent of tide variations in the river compared to the ocean, and whether there was any relationship between the Fort Denison tide height and those in the river.

At least once each day when electrical conductivity was measured at each of the 4 bridges a 500 mL water sample was collected and sent to the Water Resources Commission Arncliffe Laboratory for conductivity measurement. This was done to check the conductivities measured in the field. Differences between conductivities measured in the field and laboratory were of the order of one percent.

RESULTS

Regulated Discharges at Gostwyck

Normally, releases of water from Lostock Dam are regulated to maintain an average flow at Gostwyck Gauge of about 25 ML/day. Table 1 summarises the Lostock Dam and Gostwyck 9 a.m. discharges for the period 1st November, to 28th November, 1980. Lostock discharges were increased from 55 ML/day at 9 a.m. on the 6th November, 1980 to 140 ML/day.

It takes about two days for a change in release from Lostock Dam to be experienced at the Gostwyck Gauge. The effect of the increased discharge from Lostock Dam on the 6th November, 1980 was expected to increase the discharge at Gostwyck Gauge on the 8th November, 1980.

The variation in the Lostock Dam discharges and their effects on flows at Gostwyck are shown in Figure 2. In general the planned programme of 100 ML/day for 4 days and 65 ML/day for another 14 days was achieved.

Figure 2 shows the Gostwyck hydrograph was similar in form to that for Lostock Dam and as expected is out of phase by about 2 days (the time of travel between Lostock and Gostwyck).

TABLE I

Lostock Dam and Gostwyck 9 a.m.
Discharges during November, 1980.

Date	Lostock Dam Release (ML/day) at 9 a.m.	Gostwyck Gauge Flow (ML/day) at 9 a.m.
1.11.80	50	15
2.11.80	50	17
3.11.80	60	17
4.11.80	60	20
5.11.80	55	26
6.11.80	55	26
7.11.80	140	5
8.11.80	120	30
9.11.80	79	160
10.11.80	90	108
11.11.80	90	102
12.11.80	80	78
13.11.80	80	60
14.11.80	90	47
15.11.80	110	53
16.11.80	105	69
17.11.80	105	78
18.11.80	100	78
19.11.80	95	78
20.11.80	90	53
21.11.80	100	47
22.11.80	110	43
23.11.80	110	84
24.11.80	30	90
25.11.80	43	61
26.11.80	63	17
27.11.80	70	11
28.11.80	70	39

A large discharge peak (Figure 2) occurred at Gostwyck on the 8th November, 1980. This discharge peak was a result of storm runoff on top of releases from Lostock Dam. It has been calculated that from the 8th November, to 9th November, 1980 a total of 335 ML of water passed the Gostwyck Gauge. This represents approximately 3.3 times the planned volume for that day.

The total volume of water planned to pass the Gostwyck Gauge between the 8th November, and 24th November, 1980 was 1180 ML (100 ML/day x 4 days + 65 ML/day x 12 days). The actual volume of water which flowed passed Gostwyck during this period was 1400 ML. Table I shows the 9 a.m. flows at Gostwyck on the 10th and 11th November, 1980, were within 8% and 2% of the planned flows. If it is assumed that on the 9th November, 1980, the planned discharge of 100 ML at Gostwyck was achieved by regulated discharges from Lostock Dam, then the extra flow (235 ML) can be concluded to have resulted from the storm runoff. Subtracting this 235 ML caused by the storm on the 8th November, 1980, gives a total volume of 1165 ML resulting from Lostock Dam regulated discharges, which closely approximates the planned figure of 1180 ML.

The storm discharge of 235 ML represents an additional 20% of the total flow planned for the period of the 8th November, to 24th November, 1980.

Overall Salinity Trends

The salinity results from the eight monitoring sites are given in Table 3. It was found that there was no difference in salinity between the surface and bottom which indicates that there was no stratification or salt wedging and the water in the river was mixed from top to bottom.

To show the overall maximum and minimum salinity trends with time and the differences between maximum and minimum salinities, high and low water salinities were plotted (Figure 6) for the five sites from Gostwyck to Woodville Bridge. The high and low water salinities were found to correspond to the daily maximum and minimum salinities for all sites except Gostwyck which is not tide affected. The data for the remaining sites although showing the same salinity trends with time are not shown, to preserve clarity.

High and low water salinity values at the beginning and end of the study period for those sample sites not included in Figure 6 are shown in Table 2.

TABLE 2

Sample Site	Beginning of Study		End of Study	
	low water salinity	high water salinity	low water salinity	high water salinity
B	4 400	6 000	2 400	10 000
A	4 800	9 000	3 500	13 500
Hinton Bridge	7 000	14 000	7 300	18 500

(Note: salinity units in $\mu S\ cm^{-1}$)

Figure 6 shows four trends in the salinities with time during the course of this investigation.

(1) low water salinities at the tidal monitoring sites decreased with time from the 8th November, 1980 and approached a nearly constant value from about the 12th November, 1980.

(2) the high water salinities fell from the 9th November, to 11th November, 1980 then increased up to the 13th November, 1980 after which they appeared to vary with river height. The significant drop in high water salinity values between the 9th November, and 11th November, 1980 would be due to the flood peak resulting from the localised storm which added 235 ML of water to the river over a period of one day.

(3) the magnitude of the difference between high and low water salinities is a function of distance downstream of the upper tidal limit; the greater the distance from the tidal limit the greater was the difference between high and low tide salinities.

(4) during the middle of the study period, corresponding to the 18th November, to 20th November, 1980, the difference between high and low water salinities was at a minimum. This trend is discussed below in relation to tide and salinity relationships.

Daily Salinity Trends

Individual salinity readings were plotted against time (Figure 5) for the six monitoring sites from Gostwyck to Site B. The remaining sites were excluded to preserve graphical clarity.

Figure 5 shows that during any one day period salinities rose and fell sharply. Salinity maxima and minima (Figure 5) were found to correspond to high and low tides (Figure 4) respectively.

Figure 6 and 7 shows that the salinity maxima are related to the position of the monitoring site on the river. The further upstream the site, the lower is the high water salinity. Figure 6 also shows that the low water salinity value is a function of distance from the tidal limit.

It can be concluded from the data presented in Figures 5 and 6 that the increased discharges at Gostwyck have caused a depression of both high and low water salinity values, with the low water salinities being decreased to a constant value which appear to be independent of tide heights. Also the high water salinity values although seemingly depressed by the increased discharges at Gostwyck are significantly affected by the height of the tides, especially spring tides (see below, salinity and tides).

Tide Trends (Theoretical)

Fort Dension high and low tide heights were plotted against time (Figure 3) to show the expected variations in tide phases and amplitudes for the lower Paterson River. It has been stated by persons living in the East Maitland area that tides in the Paterson River are about 3 hours out of phase with the Fort Dension tides. Figures 3 and 4 shows that the tidal peaks and troughs for the Paterson River were out of phase with the Fort Dension tidal peaks and troughs by about 3-3/4 hours. Since the salinity peaks and troughs correspond to river height and the tides in the Paterson River are out of phase with the Fort Denison tides by a constant time, then the time of occurrence of salinity maxima and minima can be determined using readily available tide height charts.

The tide data presented in Figure 3 show that at the beginning of the study there was little variation in the heights of the low tides; there was some variation in heights of the high tides. The height of the low tides increased from 0.3 m to 0.4 m and 0.6 m, beginning on the 9th November, 1980. Corresponding to this was a drop in the heights of the high tides. The range between the high and low tides (lines A and B, Figure 3) was at a minimum between about 13th November, and 16th November, 1980. Because of this, the extent of tidal intrusion to the river and longitudinal mixing would be minimised and the residence time of the input waters would be at a maximum. Consequently, an input of fresh water at this time would be expected to have greatest overall effect in reducing the river water's salinity.

A spring tide period commenced on the 17th November, 1980 and continued to the end of the study period. Figure 3 shows that the height of the high tides increased while the heights of the low tides decreased. Such a large range between tides (lines C and D, Figure 3) would result in maximum tidal intrusion into the river. During the period when tide ranges were greatest, the residence times of input fresh waters would be at their shortest and longitudinal mixing of water would be greatest, consequently a constant inflow of fresh water would have minimal effect on reducing salinity.

Based on the above it would be expected that a constant input of fresh water would have had greatest beneficial effect on high water salinities between 13th November, and 16th November, 1980, and least effect on salinities between the 20th November, and 25th November, 1980.

The data presented in Figures 5 and 6, although not covering the entire study period, show that these theoretically expected high tide - salinity trends occurred. The expected low tide - salinity trends were not observed. During the spring tide period the low water salinities were the same as those for the neap tide period. This is discussed further below in relation to the actual fluctuations in river heights.

River Heights and Tide Variations (actual)

Daily high and low river levels for Hinton Bridge were plotted against time (Figure 4). The recorder at Woodville (Dunmore) Bridge is operated by compressed air and it was found when examining the recorded data that the air supply began to run low on the 12th November, 1980. As a result of the lower than required air pressure in the recording instrument the river heights recorded at Woodville Bridge from the 12th November, 1980 are incorrect, although the times of occurrence of high and low water given by the recorder appear to be correct from the river height data recorded in the field when salinity measurements were taken. Comparison of the river height data from both Woodville and Hinton Bridges recorded prior to the 12th November, showed that the heights of high and low water were identical at both sites and that the tidal peaks and troughs occurred simultaneously at both sites. In other words there was no time lag between sampling sites with respect to tide heights.

Figures 3 and 4 show that the amplitudes of and variations between the high tides that occurred in the Paterson River were similar to those of the Fort Denison high tides. The amplitudes of and variations between low tides at Hinton Bridge were substantially different to those at Fort Denison. The fact that the Paterson River's low tides were not of the same order as those experienced at Fort Denison could be due to two factors. Firstly, at low tide the waters discharging down the river from the non tidal reaches could have maintained higher river levels. Such discharges would be more noticeable at low tides when their volumes would make up a proportionally higher fraction of the total flow. Secondly, as water levels in the river fall the velocity of the outflowing waters would decrease; consequently the level of the water in the river would not fall as quickly as would the water level in the ocean or in an unobstructed estuary. Since the Paterson River discharges to the Hunter River some 45 km upstream of the latters point of discharge to the ocean it would be expected that low tide water levels in the Paterson River would not vary as greatly as those at the ocean. This trend is in fact shown in Figure 4 in that the low tide river levels do not vary as much as those on the coast as shown in Figure 3.

Factors Controlling River Water Salinity

With the less than expected fluctuation in low tide river heights, low tide salinities, given a constant input of fresh water, would be expected to show little variation since the volume of the salt water remaining in the river at low tides was found to be constant. The trend of constant low water salinities has been observed in the data presented in Figures 5 and 6.

Figure 7 shows a few longitudinal high water salinity profiles for the Paterson River between the Gostwyck and Hinton Bridges. Only a few profiles are presented to preserve clarity.

The high water salinity profile of the 8th November, 1980 has the form of an exponential curve with a bulge between the points corresponding to the Paterson and Woodville Bridges. This bulge indicates that an intrusion of saline water had moved up the river as far as the Paterson Bridge.

The high water salinities over the length of the river were lower on the 9th November, 1980 compared to the previous day and the bulge in the salinity profile of the 9th November, 1980 was also substantially smaller than that of 8th November, 1980. The high water salinity profile of the 11th November, 1980 did not exhibit the bulge that was apparent in the profiles of the 8th and 9th November, 1980. This indicates that by the 11th November, 1980 the salinity intrusion in the middle reaches of the river had been reduced.

The high water salinity profile for the 12th November, 1980 shows that salinity levels over the length of the river between the Paterson and Hinton Bridges had risen between 11th and 12th November, 1980. The salinities over the length of the river between site C and Hinton Bridge were found to increase progressively with time from the 12th November, 1980 as a spring tide cycle was entered.

During the period of the investigation, the lowest "high tide" salinities were recorded on the 11th November, 1980 and resulted from the dilution of salt concentrations by the storm that occurred on the 8th November 1980.

The salinity profiles representing the data of the 19th and 20th November, 1980 are typical of those that occurred during the spring tide cycle. As the height of the spring tides increased the river salinities downstream of Woodville Bridge rose proportionally. It was found that although the salinities along the river downstream of Woodville Bridge increased as a function of tide height the salinities upstream of Woodville Bridge remained essentially constant. It appears that the river downstream of Woodville Bridge is subjected to a high degree of tidal intrusion and mixing, while upstream of Woodville Bridge the tidal influence and mixing is restricted.

It can be concluded that the river salinities downstream of Woodville Bridge are highly dependent on the height of the tides and the influence of the tide on salinity levels in this lower section of the river masked dilution caused by the regulated release from Lostock Dam.

The salinity levels noted between the Paterson and Woodville Bridges after being reduced by the flows of fresh water, did not increase during the remaining period of the investigation.

SUMMARY

In summary, only one reach of the river experienced a significant lowering of salinity due to increased discharges of fresh water. This was the section of the river between the Paterson Bridge and the Woodville Bridge. Over this section of the river the high water salinity levels at Paterson Bridge and site D were initially less than 2000 $\mu S\,cm^{-1}$ and did not pose a threat to irrigation. The initial salinity at site C was 4000 $\mu S\,cm^{-1}$; waters of this salinity are normally considered as unsuitable for irrigation. The salinities at site C were reduced to 2000 $\mu S\,cm^{-1}$ as a result of releases of water from Lostock Dam in conjunction with storm runoff. This drop in the river's salinity at site C would greatly increase the possibility of successful irrigation at this site.

The high water salinity levels at Woodville Bridge at the beginning of the investigation were too high for this water to be considered safe for irrigation uses. Although the releases of additional water from Lostock Dam reduced the river's high water salinities at Woodville Bridge from 5000 $\mu S\,cm^{-1}$ to about 3700 $\mu S\,cm^{-1}$, the salinity depression was not sufficiently great to yield waters that could be considered suitable for regular irrigation use.

The river's salinity downstream of Woodville Bridge, although depressed by releases from Lostock Dam, remained much too high for safe irrigation.

The only section of the river at high tides that changed from unsuitable to suitable or marginally suitable for irrigation, as a result of the increased flows from Lostock Dam, was the 5 km section at and downstream of site C (Figure 7 between 15 and 20 km points). This represents about 27% of the tidal section of the river.

Low water salinities have been shown to be lower than the high water salinities and as a result an averaged daily salinity (i.e. an integral of high and low water salinities) would be expected to be lower than the salinities recorded at high tides. This being the case the suitability of the Paterson River's water for irrigation would be somewhat better than indicated by the high water salinity values. Examination of the low water salinities recorded at Woodville Bridge (Table 2) shows that even at low tides the salinities are too high to allow the water to be safely used for regular irrigation.

When high and low water salinities are integrated to give averaged salinities along the river, it is found that only about a 2 km section of the river changed from unsuitable to suitable or marginally suitable for irrigation, due to the increased flows from Lostock Dam; this being the section between the 18 km and 20 km points shown in Figure 7.

Although the increased flows from Lostock Dam reduced salinity levels in the tidal section of the Paterson River between the Paterson and Hinton Bridges, only about 10% of this section of the river experienced sufficient lowering of salinity to change from unsuitable to suitable or marginally suitable for irrigation. About 45% of this tidal section of the river remained too saline for safe irrigation.

TABLE 3

SAMPLING	LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
GOSTWYCK	BRIDGE	80 11 06	1448	295.	183.
GOSTWYCK	BRIDGE	80 11 06	1530	300.	186.
GOSTWYCK	BRIDGE	80 11 07	1430	300.	186.
GOSTWYCK	BRIDGE	80 11 07	1620	320.	198.
GOSTWYCK	BRIDGE	80 11 07	1840	320.	198.
GOSTWYCK	BRIDGE	80 11 08	1109	320.	198.
GOSTWYCK	BRIDGE	80 11 08	1454	330.	205.
GOSTWYCK	BRIDGE	80 11 08	1844	320.	198.
GOSTWYCK	BRIDGE	80 11 09	1000	280.	174.
GOSTWYCK	BRIDGE	80 11 09	1306	290.	180.
GOSTWYCK	BRIDGE	80 11 09	1600	320.	198.
GOSTWYCK	BRIDGE	80 11 09	1834	280.	174.
GOSTWYCK	BRIDGE	80 11 10	1056	290.	180.
GOSTWYCK	BRIDGE	80 11 10	1220	290.	180.
GOSTWYCK	BRIDGE	80 11 11	1022	290.	180.
GOSTWYCK	BRIDGE	80 11 11	1457	290.	180.
GOSTWYCK	BRIDGE	80 11 11	1714	290.	180.
GOSTWYCK	BRIDGE	80 11 12	0915	290.	180.
GOSTWYCK	BRIDGE	80 11 12	1421	235.	146.
GOSTWYCK	BRIDGE	80 11 12	1625	240.	149.
GOSTWYCK	BRIDGE	80 11 12	1815	260.	161.
GOSTWYCK	BRIDGE	80 11 13	0905	290.	180.
GOSTWYCK	BRIDGE	80 11 13	1130	260.	161.
GOSTWYCK	BRIDGE	80 11 13	1353	240.	149.
GOSTWYCK	BRIDGE	80 11 13	1713	330.	205.
GOSTWYCK	BRIDGE	80 11 14	0946	300.	186.
GOSTWYCK	BRIDGE	80 11 14	1218	280.	174.
GOSTWYCK	BRIDGE	80 11 18	1330	260.	161.
GOSTWYCK	BRIDGE	80 11 18	1650	290.	180.
GOSTWYCK	BRIDGE	80 11 19	1000	285.	177.
GOSTWYCK	BRIDGE	80 11 19	1230	295.	183.
GOSTWYCK	BRIDGE	80 11 19	1525	300.	186.
GOSTWYCK	BRIDGE	80 11 19	1810	320.	198.
GOSTWYCK	BRIDGE	80 11 20	0925	295.	183.
GOSTWYCK	BRIDGE	80 11 20	1230	295.	183.
GOSTWYCK	BRIDGE	80 11 20	1505	300.	186.
GOSTWYCK	BRIDGE	80 11 24	0935	270.	167.
GOSTWYCK	BRIDGE	80 11 24	1205	290.	180.
GOSTWYCK	BRIDGE	80 11 24	1450	300.	186.
GOSTWYCK	BRIDGE	80 11 24	1655	320.	198.

TABLE 3

SAMPLING LOCATION		DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
GOSTWYCK	BRIDGE	80 11 25	0910	275.	171.
GOSTWYCK	BRIDGE	80 11 25	1205	275.	171.
GOSTWYCK	BRIDGE	80 11 25	1510	275.	171.
GOSTWYCK	BRIDGE	80 11 25	1720	310.	192.
GOSTWYCK	BRIDGE	80 11 26	0910	295.	183.
GOSTWYCK	BRIDGE	80 11 26	1200	280.	174.
GOSTWYCK	BRIDGE	80 11 26	1500	290.	180.
GOSTWYCK	BRIDGE	80 11 26	1700	295.	183.
PATERSON	BRIDGE	80 11 06	1324	720.	446.
PATERSON	BRIDGE	80 11 06	1536	625.	388.
PATERSON	BRIDGE	80 11 07	1330	830.	515.
PATERSON	BRIDGE	80 11 07	1550	705.	437.
PATERSON	BRIDGE	80 11 07	1800	605.	375.
PATERSON	BRIDGE	80 11 08	1042	610.	378.
PATERSON	BRIDGE	80 11 08	1432	770.	477.
PATERSON	BRIDGE	80 11 08	1516	690.	428.
PATERSON	BRIDGE	80 11 08	1814	580.	360.
PATERSON	BRIDGE	80 11 09	0936	440.	273.
PATERSON	BRIDGE	80 11 09	1036	420.	260.
PATERSON	BRIDGE	80 11 09	1223	540.	335.
PATERSON	BRIDGE	80 11 09	1329	570.	353.
PATERSON	BRIDGE	80 11 09	1543	580.	360.
PATERSON	BRIDGE	80 11 09	1615	490.	304.
PATERSON	BRIDGE	80 11 09	1806	500.	310.
PATERSON	BRIDGE	80 11 10	1021	380.	236.
PATERSON	BRIDGE	80 11 10	1206	410.	254.
PATERSON	BRIDGE	80 11 10	1651	440.	273.
PATERSON	BRIDGE	80 11 10	1706	410.	254.
PATERSON	BRIDGE	80 11 11	1028	310.	192.
PATERSON	BRIDGE	80 11 11	1058	300.	186.
PATERSON	BRIDGE	80 11 11	1333	350.	217.
PATERSON	BRIDGE	80 11 11	1516	440.	273.
PATERSON	BRIDGE	80 11 11	1650	400.	248.
PATERSON	BRIDGE	80 11 11	1700	400.	248.
PATERSON	BRIDGE	80 11 12	0936	300.	186.
PATERSON	BRIDGE	80 11 12	1319	0.	0.
PATERSON	BRIDGE	80 11 12	1440	370.	229.
PATERSON	BRIDGE	80 11 12	1608	430.	267.
PATERSON	BRIDGE	80 11 12	1651	420.	260.
PATERSON	BRIDGE	80 11 12	1800	400.	248.

TABLE 3

SAMPLING LOCATION		DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
PATERSON	BRIDGE	80 11 12	1806	400.	248.
PATERSON	BRIDGE	80 11 13	0856	340.	211.
PATERSON	BRIDGE	80 11 13	0950	300.	186.
PATERSON	BRIDGE	80 11 13	1115	300.	186.
PATERSON	BRIDGE	80 11 13	1220	305.	189.
PATERSON	BRIDGE	80 11 13	1334	350.	217.
PATERSON	BRIDGE	80 11 13	1439	380.	236.
PATERSON	BRIDGE	80 11 13	1638	430.	267.
PATERSON	BRIDGE	80 11 13	1702	430.	267.
PATERSON	BRIDGE	80 11 14	0952	300.	186.
PATERSON	BRIDGE	80 11 14	1014	310.	192.
PATERSON	BRIDGE	80 11 14	1139	315.	195.
PATERSON	BRIDGE	80 11 14	1205	300.	186.
PATERSON	BRIDGE	80 11 18	1337	305.	189.
PATERSON	BRIDGE	80 11 18	1443	300.	186.
PATERSON	BRIDGE	80 11 18	1620	310.	192.
PATERSON	BRIDGE	80 11 18	1723	310.	192.
PATERSON	BRIDGE	80 11 19	0919	370.	229.
PATERSON	BRIDGE	80 11 19	1032	375.	233.
PATERSON	BRIDGE	80 11 19	1209	370.	229.
PATERSON	BRIDGE	80 11 19	1256	355.	220.
PATERSON	BRIDGE	80 11 19	1506	330.	205.
PATERSON	BRIDGE	80 11 19	1550	335.	208.
PATERSON	BRIDGE	80 11 19	1751	340.	211.
PATERSON	BRIDGE	80 11 19	1804	345.	214.
PATERSON	BRIDGE	80 11 20	0932	330.	205.
PATERSON	BRIDGE	80 11 20	1006	345.	214.
PATERSON	BRIDGE	80 11 20	1203	360.	223.
PATERSON	BRIDGE	80 11 20	1335	345.	214.
PATERSON	BRIDGE	80 11 20	1451	330.	205.
PATERSON	BRIDGE	80 11 20	1807	300.	186.
PATERSON	BRIDGE	80 11 24	0923	320.	198.
PATERSON	BRIDGE	80 11 24	1000	305.	189.
PATERSON	BRIDGE	80 11 24	1135	355.	220.
PATERSON	BRIDGE	80 11 24	1311	375.	233.
PATERSON	BRIDGE	80 11 24	1433	430.	267.
PATERSON	BRIDGE	80 11 24	1523	440.	273.
PATERSON	BRIDGE	80 11 24	1636	400.	248.
PATERSON	BRIDGE	80 11 24	1644	410.	254.
PATERSON	BRIDGE	80 11 25	1031	310.	192.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY US/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
PATERSON BRIDGE	80 11 25	1211	320.	198.
PATERSON BRIDGE	80 11 25	1313	340.	211.
PATERSON BRIDGE	80 11 25	1503	370.	229.
PATERSON BRIDGE	80 11 25	1556	385.	239.
PATERSON BRIDGE	80 11 25	1705	365.	226.
PATERSON BRIDGE	80 11 25	1721	360.	223.
PATERSON BRIDGE	80 11 26	0922	305.	189.
PATERSON BRIDGE	80 11 26	0945	300.	186.
PATERSON BRIDGE	80 11 26	1145	290.	180.
PATERSON BRIDGE	80 11 26	1314	290.	180.
PATERSON BRIDGE	80 11 26	1443	325.	202.
PATERSON BRIDGE	80 11 26	1527	340.	211.
PATERSON BRIDGE	80 11 26	1643	365.	226.
PATERSON BRIDGE	80 11 26	1655	355.	220.
SITE D	80 11 08	1032	1000.	620.
SITE D	80 11 08	1514	1900.	1178.
SITE D	80 11 08	1526	1200.	744.
SITE D	80 11 08	1800	1000.	620.
SITE D	80 11 09	0926	680.	422.
SITE D	80 11 09	1212	960.	595.
SITE D	80 11 09	1338	1200.	744.
SITE D	80 11 09	1532	1100.	682.
SITE D	80 11 09	1625	1000.	620.
SITE D	80 11 09	1757	780.	484.
SITE D	80 11 10	1643	760.	471.
SITE D	80 11 10	1712	730.	453.
SITE D	80 11 11	1020	490.	304.
SITE D	80 11 11	1113	520.	322.
SITE D	80 11 11	1324	640.	397.
SITE D	80 11 11	1521	820.	508.
SITE D	80 11 11	1643	720.	446.
SITE D	80 11 11	1710	710.	440.
SITE D	80 11 12	0928	430.	267.
SITE D	80 11 12	1040	440.	273.
SITE D	80 11 12	1311	585.	363.
SITE D	80 11 12	1447	740.	459.
SITE D	80 11 12	1603	800.	496.
SITE D	80 11 12	1656	760.	471.
SITE D	80 11 12	1751	710.	440.
SITE D	80 11 12	1812	680.	422.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE D	80 11 13	0844	510.	316.
SITE D	80 11 13	0959	430.	267.
SITE D	80 11 13	1107	420.	260.
SITE D	80 11 13	1226	500.	310.
SITE D	80 11 13	1328	530.	329.
SITE D	80 11 13	1445	640.	397.
SITE D	80 11 13	1632	760.	471.
SITE D	80 11 13	1708	750.	465.
SITE D	80 11 14	0945	445.	276.
SITE D	80 11 14	1024	455.	282.
SITE D	80 11 14	1131	445.	276.
SITE D	80 11 14	1213	440.	273.
SITE D	80 11 18	1329	420.	260.
SITE D	80 11 18	1451	395.	245.
SITE D	80 11 18	1608	395.	245.
SITE D	80 11 18	1730	435.	270.
SITE D	80 11 19	0911	550.	341.
SITE D	80 11 19	1048	605.	375.
SITE D	80 11 19	1202	570.	353.
SITE D	80 11 19	1345	500.	310.
SITE D	80 11 19	1500	455.	282.
SITE D	80 11 19	1556	455.	282.
SITE D	80 11 19	1715	430.	267.
SITE D	80 11 19	1812	445.	276.
SITE D	80 11 20	0911	450.	279.
SITE D	80 11 20	1017	510.	316.
SITE D	80 11 20	1147	590.	366.
SITE D	80 11 20	1344	470.	291.
SITE D	80 11 20	1445	450.	279.
SITE D	80 11 20	1812	390.	242.
SITE D	80 11 24	0911	405.	251.
SITE D	80 11 24	1016	405.	251.
SITE D	80 11 24	1129	460.	285.
SITE D	80 11 24	1317	590.	366.
SITE D	80 11 24	1424	675.	419.
SITE D	80 11 24	1528	730.	453.
SITE D	80 11 24	1628	655.	406.
SITE D	80 11 24	1650	625.	388.
SITE D	80 11 25	1040	390.	242.
SITE D	80 11 25	1205	410.	254.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE D	80 11 25	1322	485.	301.
SITE D	80 11 25	1453	585.	363.
SITE D	80 11 25	1604	620.	384.
SITE D	80 11 25	1700	565.	350.
SITE D	80 11 25	1728	535.	332.
SITE D	80 11 26	0912	380.	236.
SITE D	80 11 26	1000	370.	229.
SITE D	80 11 26	1137	365.	226.
SITE D	80 11 26	1326	400.	248.
SITE D	80 11 26	1435	500.	310.
SITE D	80 11 26	1535	545.	338.
SITE D	80 11 26	1636	580.	360.
SITE D	80 11 26	1702	565.	350.
SITE C	80 11 08	1018	2300.	1426.
SITE C	80 11 08	1410	4000.	2480.
SITE C	80 11 08	1536	2800.	1736.
SITE C	80 11 08	1745	2300.	1426.
SITE C	80 11 09	0918	1500.	930.
SITE C	80 11 09	1203	2500.	1550.
SITE C	80 11 09	1347	3000.	1860.
SITE C	80 11 09	1522	2700.	1674.
SITE C	80 11 09	1634	2300.	1426.
SITE C	80 11 09	1747	2000.	1240.
SITE C	80 11 10	1637	1900.	1178.
SITE C	80 11 10	1720	1700.	1054.
SITE C	80 11 11	1010	1100.	682.
SITE C	80 11 11	1120	1100.	682.
SITE C	80 11 11	1340	1700.	1054.
SITE C	80 11 11	1527	1900.	1178.
SITE C	80 11 11	1636	2000.	1240.
SITE C	80 11 11	1721	1700.	1054.
SITE C	80 11 12	0917	910.	564.
SITE C	80 11 12	1051	1000.	620.
SITE C	80 11 12	1305	1400.	868.
SITE C	80 11 12	1455	2200.	1364.
SITE C	80 11 12	1702	2000.	1240.
SITE C	80 11 12	1744	1800.	1116.
SITE C	80 11 12	1818	1600.	992.
SITE C	80 11 13	0835	1100.	682.
SITE C	80 11 13	1005	890.	552.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE C	80 11 13	1100	1000.	620.
SITE C	80 11 13	1233	1150.	713.
SITE C	80 11 13	1320	1300.	806.
SITE C	80 11 13	1452	1800.	1116.
SITE C	80 11 13	1623	2200.	1364.
SITE C	80 11 13	1713	2100.	1302.
SITE C	80 11 14	0938	950.	589.
SITE C	80 11 14	1032	1000.	620.
SITE C	80 11 14	1124	900.	558.
SITE C	80 11 14	1220	930.	577.
SITE C	80 11 18	1320	920.	570.
SITE C	80 11 18	1458	840.	521.
SITE C	80 11 18	1557	785.	487.
SITE C	80 11 18	1740	970.	601.
SITE C	80 11 19	0903	1450.	899.
SITE C	80 11 19	1056	1800.	1116.
SITE C	80 11 19	1154	1650.	1023.
SITE C	80 11 19	1355	1150.	713.
SITE C	80 11 19	1446	1000.	620.
SITE C	80 11 19	1604	900.	558.
SITE C	80 11 19	1708	845.	524.
SITE C	80 11 19	1821	965.	598.
SITE C	80 11 20	0903	1100.	682.
SITE C	80 11 20	1026	1600.	992.
SITE C	80 11 20	1138	1700.	1054.
SITE C	80 11 20	1350	1200.	744.
SITE C	80 11 20	1437	1050.	651.
SITE C	80 11 20	1821	730.	453.
SITE C	80 11 24	0904	720.	446.
SITE C	80 11 24	1023	835.	518.
SITE C	80 11 24	1118	1050.	651.
SITE C	80 11 24	1324	1900.	1178.
SITE C	80 11 24	1417	2050.	1271.
SITE C	80 11 24	1535	2200.	1364.
SITE C	80 11 24	1617	1950.	1209.
SITE C	80 11 24	1658	1750.	1085.
SITE C	80 11 25	1047	750.	465.
SITE C	80 11 25	1157	940.	583.
SITE C	80 11 25	1329	1150.	713.
SITE C	80 11 25	1446	1850.	1147.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE C	80 11 25	1610	1950.	1209.
SITE C	80 11 25	1653	1700.	1054.
SITE C	80 11 25	1736	1400.	868.
SITE C	80 11 26	0857	675.	419.
SITE C	80 11 26	1018	670.	415.
SITE C	80 11 26	1126	710.	440.
SITE C	80 11 26	1334	1050.	651.
SITE C	80 11 26	1428	1400.	868.
SITE C	80 11 26	1542	1750.	1085.
SITE C	80 11 26	1630	1850.	1147.
SITE C	80 11 26	1710	1750.	1085.
WOODVILLE	80 11 06	1700	2800.	1736.
WOODVILLE	80 11 07	1248	4600.	2852.
WOODVILLE	80 11 07	1530	4400.	2728.
WOODVILLE	80 11 07	1735	4000.	2480.
WOODVILLE	80 11 08	1002	3900.	2418.
WOODVILLE	80 11 08	1354	5000.	3100.
WOODVILLE	80 11 08	1546	4400.	2728.
WOODVILLE	80 11 08	1727	4000.	2480.
WOODVILLE	80 11 09	0903	3200.	1984.
WOODVILLE	80 11 09	1150	4100.	2542.
WOODVILLE	80 11 09	1356	4700.	2914.
WOODVILLE	80 11 09	1508	4500.	2790.
WOODVILLE	80 11 09	1646	4100.	2542.
WOODVILLE	80 11 09	1734	3800.	2356.
WOODVILLE	80 11 10	0958	2900.	1798.
WOODVILLE	80 11 10	1149	3500.	2170.
WOODVILLE	80 11 10	1622	3900.	2418.
WOODVILLE	80 11 10	1728	3500.	2170.
WOODVILLE	80 11 11	1000	2500.	1550.
WOODVILLE	80 11 11	1131	2900.	1798.
WOODVILLE	80 11 11	1258	3300.	2046.
WOODVILLE	80 11 11	1536	3800.	2356.
WOODVILLE	80 11 11	1627	3800.	2356.
WOODVILLE	80 11 11	1729	3500.	2170.
WOODVILLE	80 11 12	0856	2200.	1364.
WOODVILLE	80 11 12	1100	2500.	1550.
WOODVILLE	80 11 12	1257	3200.	1984.
WOODVILLE	80 11 12	1504	4000.	2480.
WOODVILLE	80 11 12	1546	4100.	2542.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
WOODVILLE	80 11 12	1709	3800.	2356.
WOODVILLE	80 11 12	1735	3700.	2294.
WOODVILLE	80 11 12	1626	3400.	2108.
WOODVILLE	80 11 13	0827	2600.	1612.
WOODVILLE	80 11 13	1015	2200.	1364.
WOODVILLE	80 11 13	1053	2250.	1395.
WOODVILLE	80 11 13	1242	2750.	1705.
WOODVILLE	80 11 13	1311	2800.	1736.
WOODVILLE	80 11 13	1500	3700.	2294.
WOODVILLE	80 11 13	1600	4000.	2480.
WOODVILLE	80 11 13	1723	3900.	2418.
WOODVILLE	80 11 14	0930	2300.	1426.
WOODVILLE	80 11 14	1041	2150.	1333.
WOODVILLE	80 11 14	1114	2100.	1302.
WOODVILLE	80 11 14	1230	2500.	1550.
WOODVILLE	80 11 18	1311	2500.	1550.
WOODVILLE	80 11 18	1507	2200.	1364.
WOODVILLE	80 11 18	1549	1900.	1178.
WOODVILLE	80 11 18	1750	2650.	1643.
WOODVILLE	80 11 19	0853	3500.	2170.
WOODVILLE	80 11 19	1105	4050.	2511.
WOODVILLE	80 11 19	1145	3700.	2294.
WOODVILLE	80 11 19	1407	2700.	1674.
WOODVILLE	80 11 19	1439	2500.	1550.
WOODVILLE	80 11 19	1617	2300.	1426.
WOODVILLE	80 11 19	1700	2100.	1302.
WOODVILLE	80 11 19	1830	2700.	1674.
WOODVILLE	80 11 20	0851	2800.	1736.
WOODVILLE	80 11 20	1035	3900.	2418.
WOODVILLE	80 11 20	1126	3900.	2418.
WOODVILLE	80 11 20	1359	2750.	1705.
WOODVILLE	80 11 20	1431	2700.	1674.
WOODVILLE	80 11 20	1828	2000.	1240.
WOODVILLE	80 11 24	0856	1900.	1178.
WOODVILLE	80 11 24	1032	2400.	1488.
WOODVILLE	80 11 24	1110	2700.	1674.
WOODVILLE	80 11 24	1333	5850.	3627.
WOODVILLE	80 11 24	1410	7050.	4371.
WOODVILLE	80 11 24	1543	6800.	4216.
WOODVILLE	80 11 24	1612	6300.	3906.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
WOODVILLE	80 11 24	1706	4750.	2945.
WOODVILLE	80 11 25	1055	2250.	1395.
WOODVILLE	80 11 25	1149	2600.	1612.
WOODVILLE	80 11 25	1340	4200.	2604.
WOODVILLE	80 11 25	1420	5200.	3224.
WOODVILLE	80 11 25	1618	5600.	3472.
WOODVILLE	80 11 25	1646	5050.	3131.
WOODVILLE	80 11 25	1743	4000.	2480.
WOODVILLE	80 11 26	0844	1950.	1209.
WOODVILLE	80 11 26	1030	1750.	1085.
WOODVILLE	80 11 26	1109	1850.	1147.
WOODVILLE	80 11 26	1344	3150.	1953.
WOODVILLE	80 11 26	1416	3750.	2325.
WOODVILLE	80 11 26	1550	5550.	3441.
WOODVILLE	80 11 26	1622	5600.	3472.
WOODVILLE	80 11 26	1715	5300.	3286.
SITE B	80 11 08	0954	4400.	2728.
SITE B	80 11 08	1345	6000.	3720.
SITE B	80 11 08	1556	4800.	2976.
SITE B	80 11 08	1718	4400.	2728.
SITE B	80 11 09	0857	3800.	2356.
SITE B	80 11 09	1142	4400.	2728.
SITE B	80 11 09	1404	5700.	3534.
SITE B	80 11 09	1500	5300.	3286.
SITE B	80 11 09	1652	4500.	2790.
SITE B	80 11 09	1728	4300.	2666.
SITE B	80 11 10	1617	4300.	2666.
SITE B	30 11 10	1737	4000.	2480.
SITE B	80 11 11	0954	3100.	1922.
SITE B	80 11 11	1139	3700.	2294.
SITE B	80 11 11	1244	3700.	2294.
SITE B	80 11 11	1543	4900.	3038.
SITE B	80 11 11	1620	4400.	2728.
SITE B	80 11 11	1735	4000.	2480.
SITE B	80 11 12	0828	2600.	1612.
SITE B	80 11 12	1116	3300.	2046.
SITE B	80 11 12	1252	3800.	2356.
SITE B	80 11 12	1511	5400.	3348.
SITE B	80 11 12	1541	5200.	3224.
SITE B	80 11 12	1713	4700.	2914.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE B	80 11 12	1732	4400.	2728.
SITE B	80 11 12	1832	4100.	2542.
SITE B	80 11 13	0821	3100.	1922.
SITE B	80 11 13	1021	2750.	1705.
SITE B	80 11 13	1048	2900.	1798.
SITE B	80 11 13	1246	3450.	2139.
SITE B	80 11 13	1307	3600.	2232.
SITE B	80 11 13	1508	4900.	3038.
SITE B	80 11 13	1555	5400.	3348.
SITE B	80 11 13	1728	4800.	2976.
SITE B	80 11 14	0925	3000.	1860.
SITE B	80 11 14	1049	2700.	1674.
SITE B	80 11 14	1111	2700.	1674.
SITE B	80 11 14	1235	3100.	1922.
SITE B	80 11 18	1306	3250.	2015.
SITE B	80 11 18	1518	2650.	1643.
SITE B	80 11 18	1543	2600.	1612.
SITE B	80 11 18	1755	3500.	2170.
SITE B	80 11 19	0846	5000.	3100.
SITE B	80 11 19	1114	6500.	4030.
SITE B	80 11 19	1141	5700.	3534.
SITE B	80 11 19	1411	3550.	2201.
SITE B	80 11 19	1434	3300.	2046.
SITE B	80 11 19	1623	2850.	1767.
SITE B	80 11 19	1654	2800.	1736.
SITE B	80 11 19	1837	3550.	2201.
SITE B	80 11 20	0846	3800.	2356.
SITE B	80 11 20	1042	6700.	4154.
SITE B	80 11 20	1120	6800.	4216.
SITE B	80 11 20	1404	3800.	2356.
SITE B	80 11 20	1426	3650.	2263.
SITE B	80 11 20	1833	2650.	1643.
SITE B	80 11 24	0850	2600.	1612.
SITE B	80 11 24	1041	3600.	2232.
SITE B	80 11 24	1106	3950.	2449.
SITE B	80 11 24	1337	10500.	6510.
SITE B	80 11 24	1405	11000.	6820.
SITE B	80 11 24	1546	11000.	6820.
SITE B	80 11 24	1607	10500.	6510.
SITE B	80 11 24	1711	8450.	5239.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY μS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE B	80 11 25	1102	3250.	2015.
SITE B	80 11 25	1145	3650.	2263.
SITE B	80 11 25	1347	8500.	5270.
SITE B	80 11 25	1417	9650.	5983.
SITE B	80 11 25	1623	11000.	6820.
SITE B	80 11 25	1640	9900.	6138.
SITE B	80 11 25	1748	6700.	4154.
SITE B	80 11 26	0840	2700.	1674.
SITE B	80 11 26	1036	2400.	1488.
SITE B	80 11 26	1104	2600.	1612.
SITE B	80 11 26	1347	5800.	3596.
SITE B	80 11 26	1412	6900.	4278.
SITE B	80 11 26	1555	10000.	6200.
SITE B	80 11 26	1617	10000.	6200.
SITE B	80 11 26	1720	9300.	5766.
SITE A	80 11 08	0948	4800.	2976.
SITE A	80 11 08	1341	9000.	5580.
SITE A	80 11 08	1602	6000.	3720.
SITE A	80 11 08	1711	4900.	3038.
SITE A	80 11 09	0851	4300.	2666.
SITE A	80 11 09	1133	6000.	3720.
SITE A	80 11 09	1410	8100.	5022.
SITE A	80 11 09	1454	7600.	4712.
SITE A	80 11 09	1657	5400.	3348.
SITE A	80 11 09	1721	5000.	3100.
SITE A	80 11 10	1611	5600.	3472.
SITE A	80 11 10	1742	4700.	2914.
SITE A	80 11 11	0947	3700.	2294.
SITE A	80 11 11	1151	4200.	2604.
SITE A	80 11 11	1211	4600.	2852.
SITE A	80 11 11	1548	6500.	4030.
SITE A	80 11 11	1616	6200.	3844.
SITE A	80 11 11	1739	5200.	3224.
SITE A	80 11 12	0818	3600.	2232.
SITE A	80 11 12	1116	3900.	2418.
SITE A	80 11 12	1248	4700.	2914.
SITE A	80 11 12	1515	7000.	4340.
SITE A	80 11 12	1536	7000.	4340.
SITE A	80 11 12	1718	6200.	3844.
SITE A	80 11 12	1729	6000.	3720.

TABLE 3

SAMPLING LOCATION	DATE	TIME HOURS	CONDUCTIVITY US/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE A	80 11 12	1837	5200.	3224.
SITE A	80 11 13	0815	4000.	2480.
SITE A	80 11 13	1026	3500.	2170.
SITE A	80 11 13	1044	3500.	2170.
SITE A	80 11 13	1251	4300.	2666.
SITE A	80 11 13	1301	4450.	2759.
SITE A	80 11 13	1512	7000.	4340.
SITE A	80 11 13	1547	7100.	4402.
SITE A	80 11 13	1733	6600.	4092.
SITE A	80 11 14	0921	3700.	2294.
SITE A	80 11 14	1053	3150.	1953.
SITE A	80 11 14	1107	3400.	2108.
SITE A	80 11 14	1239	3850.	2387.
SITE A	80 11 18	1302	4350.	2697.
SITE A	80 11 18	1522	3450.	2139.
SITE A	80 11 18	1538	3300.	2046.
SITE A	80 11 18	1800	4700.	2914.
SITE A	80 11 19	0840	7800.	4836.
SITE A	80 11 19	1119	8900.	5518.
SITE A	80 11 19	1136	8750.	5425.
SITE A	80 11 19	1418	5050.	3131.
SITE A	80 11 19	1430	4800.	2976.
SITE A	80 11 19	1628	3750.	2325.
SITE A	80 11 19	1640	3650.	2263.
SITE A	80 11 19	1842	4800.	2976.
SITE A	80 11 20	0840	5900.	3658.
SITE A	80 11 20	1046	9700.	6014.
SITE A	80 11 20	1116	9700.	6014.
SITE A	80 11 20	1407	6300.	3906.
SITE A	80 11 24	0845	3650.	2263.
SITE A	80 11 24	1047	6200.	3844.
SITE A	80 11 24	1102	6650.	4123.
SITE A	80 11 24	1341	13500.	8370.
SITE A	80 11 24	1400	13500.	8370.
SITE A	80 11 24	1552	14000.	8680.
SITE A	80 11 24	1603	13500.	8370.
SITE A	80 11 24	1715	11000.	6820.
SITE A	80 11 25	0831	3650.	2263.
SITE A	80 11 25	1107	5150.	3193.
SITE A	80 11 25	1140	6200.	3844.

TABLE 3

SAMPLING LOCATION		DATE	TIME HOURS	CONDUCTIVITY µS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
SITE A		80 11 25	1351	12500.	7750.
SITE A		80 11 25	1412	13500.	8370.
SITE A		80 11 25	1627	14000.	8680.
SITE A		80 11 25	1637	13500.	8370.
SITE A		80 11 25	1754	12000.	7440.
SITE A		80 11 26	0832	3750.	2325.
SITE A		80 11 26	1040	3500.	2170.
SITE A		80 11 26	1058	3700.	2294.
SITE A		80 11 26	1351	10100.	6262.
SITE A		80 11 26	1407	11000.	6820.
SITE A		80 11 26	1600	13500.	8370.
SITE A		80 11 26	1612	13500.	8370.
SITE A		80 11 26	1728	13000.	8060.
HINTON	BRIDGE	80 11 06	1720	3890.	2412.
HINTON	BRIDGE	80 11 07	1205	13000.	8060.
HINTON	BRIDGE	80 11 07	1500	10000.	6200.
HINTON	BRIDGE	80 11 07	1700	7000.	4340.
HINTON	BRIDGE	80 11 08	0935	7000.	4340.
HINTON	BRIDGE	80 11 08	1330	14000.	8680.
HINTON	BRIDGE	80 11 08	1611	8500.	5270.
HINTON	BRIDGE	80 11 08	1700	7400.	4588.
HINTON	BRIDGE	80 11 09	0841	5000.	3100.
HINTON	BRIDGE	80 11 09	1125	10000.	6200.
HINTON	BRIDGE	80 11 09	1418	13000.	8060.
HINTON	BRIDGE	80 11 09	1445	12000.	7440.
HINTON	BRIDGE	80 11 09	1705	7800.	4836.
HINTON	BRIDGE	80 11 10	0935	5100.	3162.
HINTON	BRIDGE	80 11 10	1126	7100.	4402.
HINTON	BRIDGE	80 11 10	1605	8200.	5084.
HINTON	BRIDGE	80 11 10	1747	7000.	4340.
HINTON	BRIDGE	80 11 11	0940	4500.	2790.
HINTON	BRIDGE	80 11 11	1203	6700.	4154.
HINTON	BRIDGE	80 11 11	1608	9300.	5766.
HINTON	BRIDGE	80 11 11	1746	7200.	4464.
HINTON	BRIDGE	80 11 12	0800	4600.	2852.
HINTON	BRIDGE	80 11 12	1123	5800.	3596.
HINTON	BRIDGE	80 11 12	1236	7000.	4340.
HINTON	BRIDGE	80 11 12	1523	11000.	6820.
HINTON	BRIDGE	80 11 12	1724	8600.	5332.
HINTON	BRIDGE	80 11 12	1843	7300.	4526.

TABLE 3

SAMPLING	LOCATION	DATE	TIME HOURS	CONDUCTIVITY μS/CM AT 25 DEGREES C	SALINITY CALCULATED (PPM)
HINTON	BRIDGE	80 11 13	0807	5600.	3472.
HINTON	BRIDGE	80 11 13	1032	4600.	2852.
HINTON	BRIDGE	80 11 13	1256	6600.	4092.
HINTON	BRIDGE	80 11 13	1540	10500.	6510.
HINTON	BRIDGE	80 11 13	1737	9500.	5890.
HINTON	BRIDGE	80 11 14	1058	4600.	2852.
HINTON	BRIDGE	80 11 14	1244	5950.	3689.
HINTON	BRIDGE	80 11 14	0912	5400.	3348.
HINTON	BRIDGE	80 11 18	1250	7600.	4712.
HINTON	BRIDGE	80 11 18	1530	5200.	3224.
HINTON	BRIDGE	80 11 18	1807	8400.	5208.
HINTON	BRIDGE	80 11 19	0830	11000.	6820.
HINTON	BRIDGE	80 11 19	1125	14000.	8680.
HINTON	BRIDGE	80 11 19	1425	8200.	5084.
HINTON	BRIDGE	80 11 19	1635	6350.	3937.
HINTON	BRIDGE	80 11 19	1848	9000.	5580.
HINTON	BRIDGE	80 11 20	0830	9900.	6138.
HINTON	BRIDGE	80 11 20	1054	15000.	9300.
HINTON	BRIDGE	80 11 20	1413	10000.	6200.
HINTON	BRIDGE	80 11 20	1843	6400.	3968.
HINTON	BRIDGE	80 11 24	0834	7200.	4464.
HINTON	BRIDGE	80 11 24	1051	11500.	7130.
HINTON	BRIDGE	80 11 24	1347	19500.	12090.
HINTON	BRIDGE	80 11 24	1558	19000.	11780.
HINTON	BRIDGE	80 11 24	1720	16000.	9920.
HINTON	BRIDGE	80 11 25	0825	7300.	4526.
HINTON	BRIDGE	80 11 25	1113	11500.	7130.
HINTON	BRIDGE	80 11 25	1133	14000.	8680.
HINTON	BRIDGE	80 11 25	1401	17000.	10540.
HINTON	BRIDGE	80 11 25	1631	18500.	11470.
HINTON	BRIDGE	80 11 25	1800	16000.	9920.
HINTON	BRIDGE	80 11 26	0825	7900.	4898.
HINTON	BRIDGE	80 11 26	1045	8550.	5301.
HINTON	BRIDGE	80 11 26	1402	15000.	9300.
HINTON	BRIDGE	80 11 26	1607	18500.	11470.
HINTON	BRIDGE	80 11 26	1735	17000.	10540.

Fig. 1.

LOCATION DIAGRAM
SALINITY MONITORING SITES—PATERSON RIVER

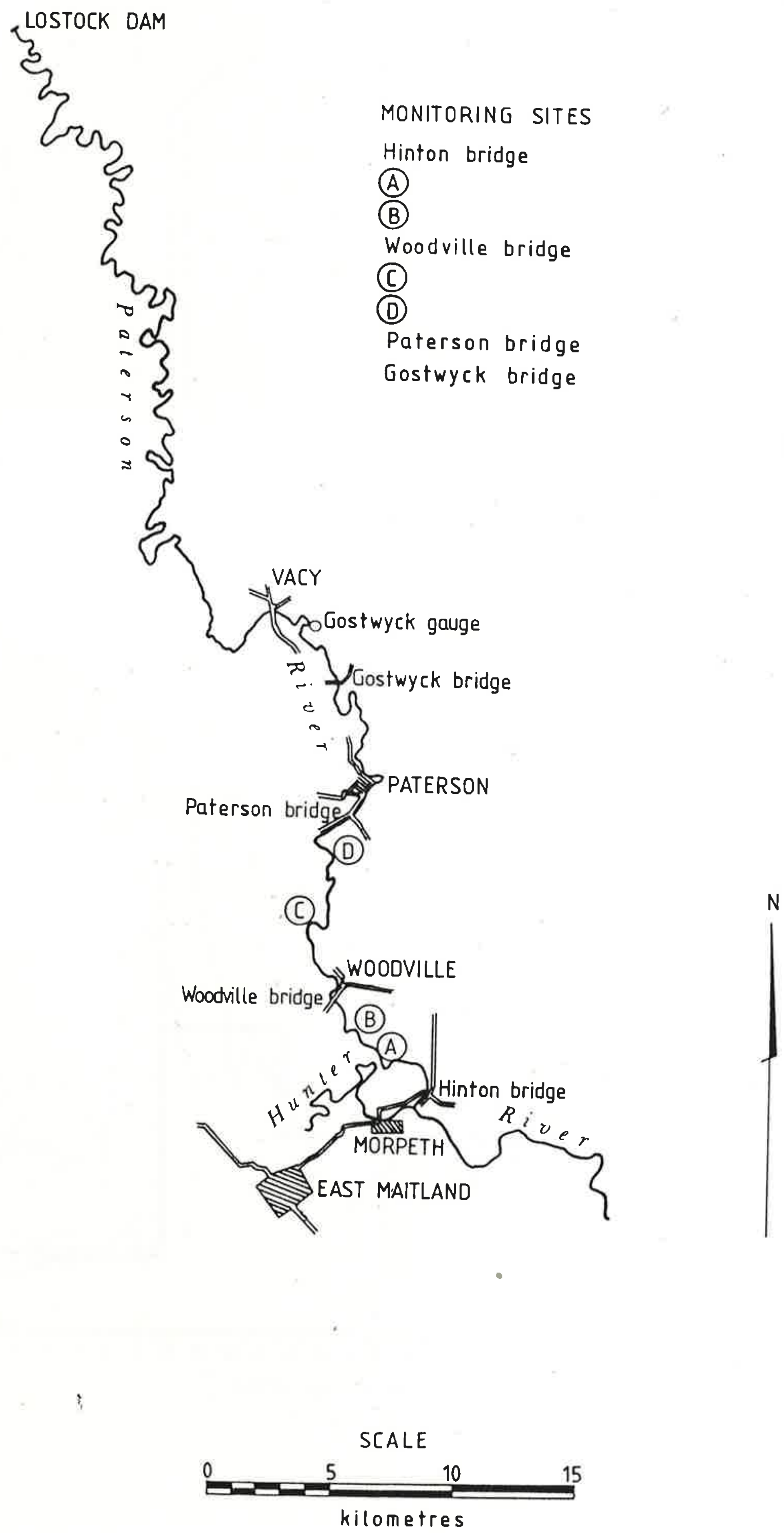
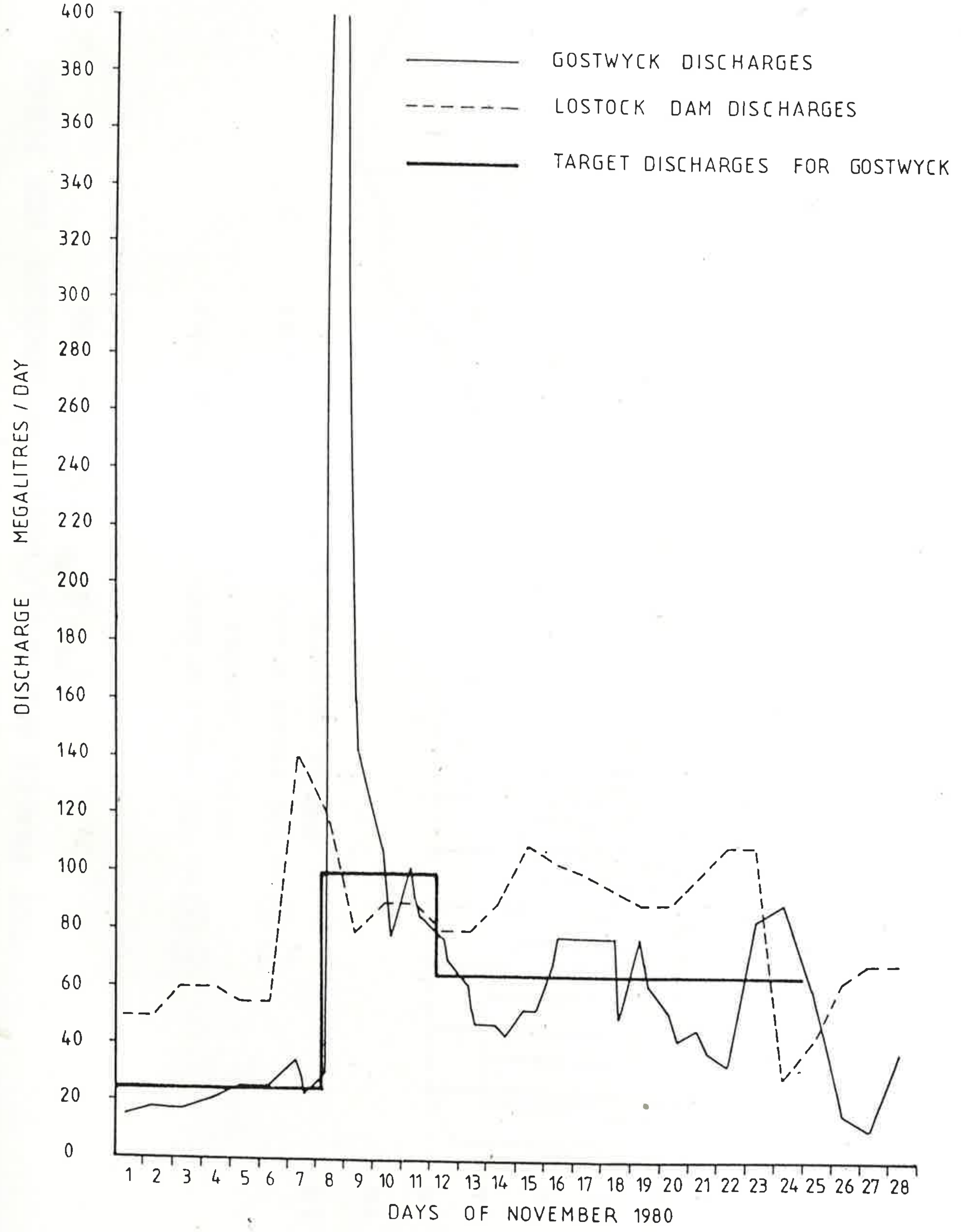


Fig. 2

LOSTOCK DAM AND GOSTWYCK DISCHARGES FOR NOVEMBER 1980



TIDE PHASES AND AMPLITUDES (FORT DENISON) FOR PERIOD 6th — 27th NOVEMBER 1980

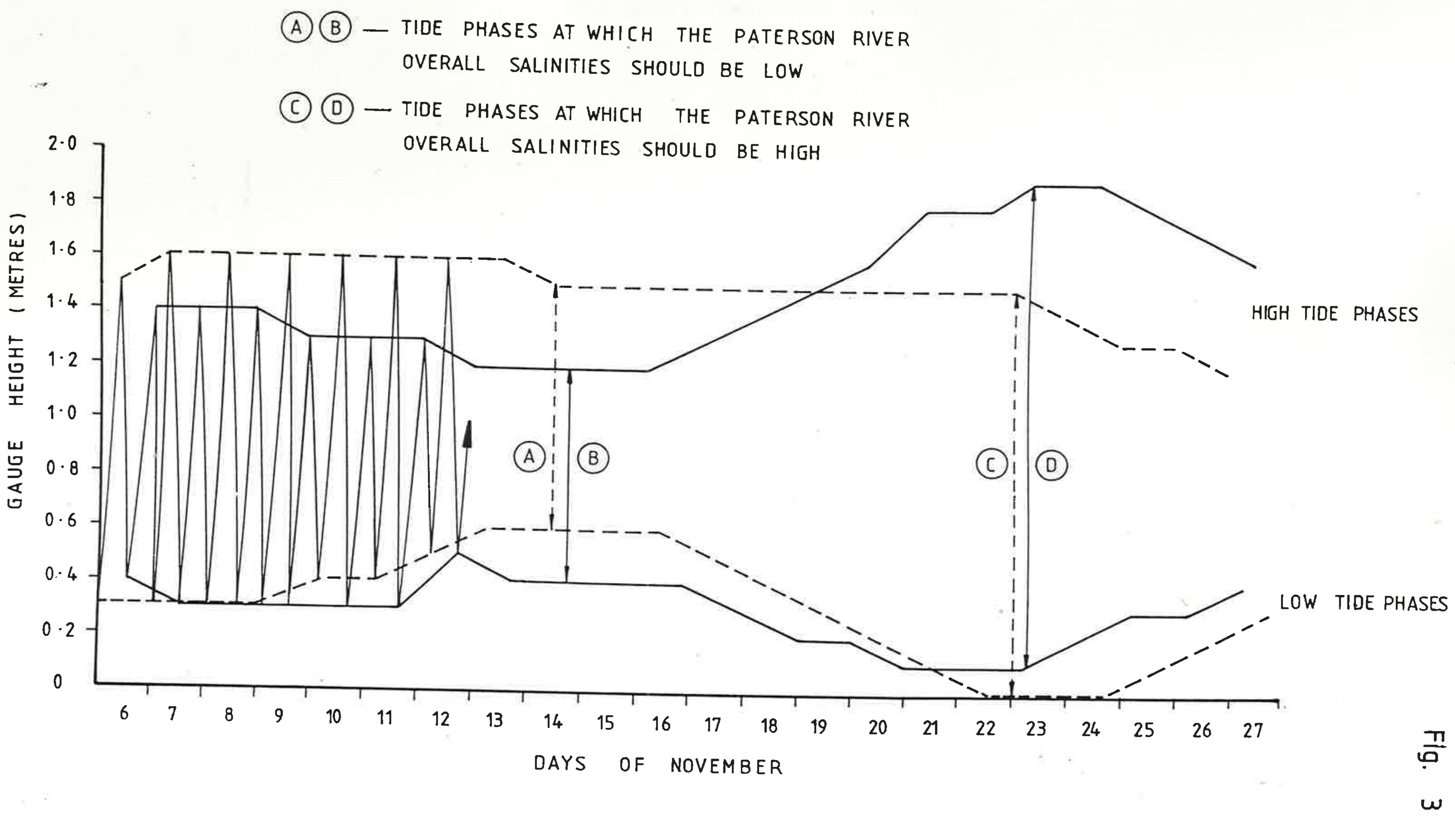


Fig. 3

PATERSON RIVER — TIDE PHASES AND AMPLITUDES AT HINTON BRIDGE

DATA SOURCE – P.W.D. GAUGE READINGS

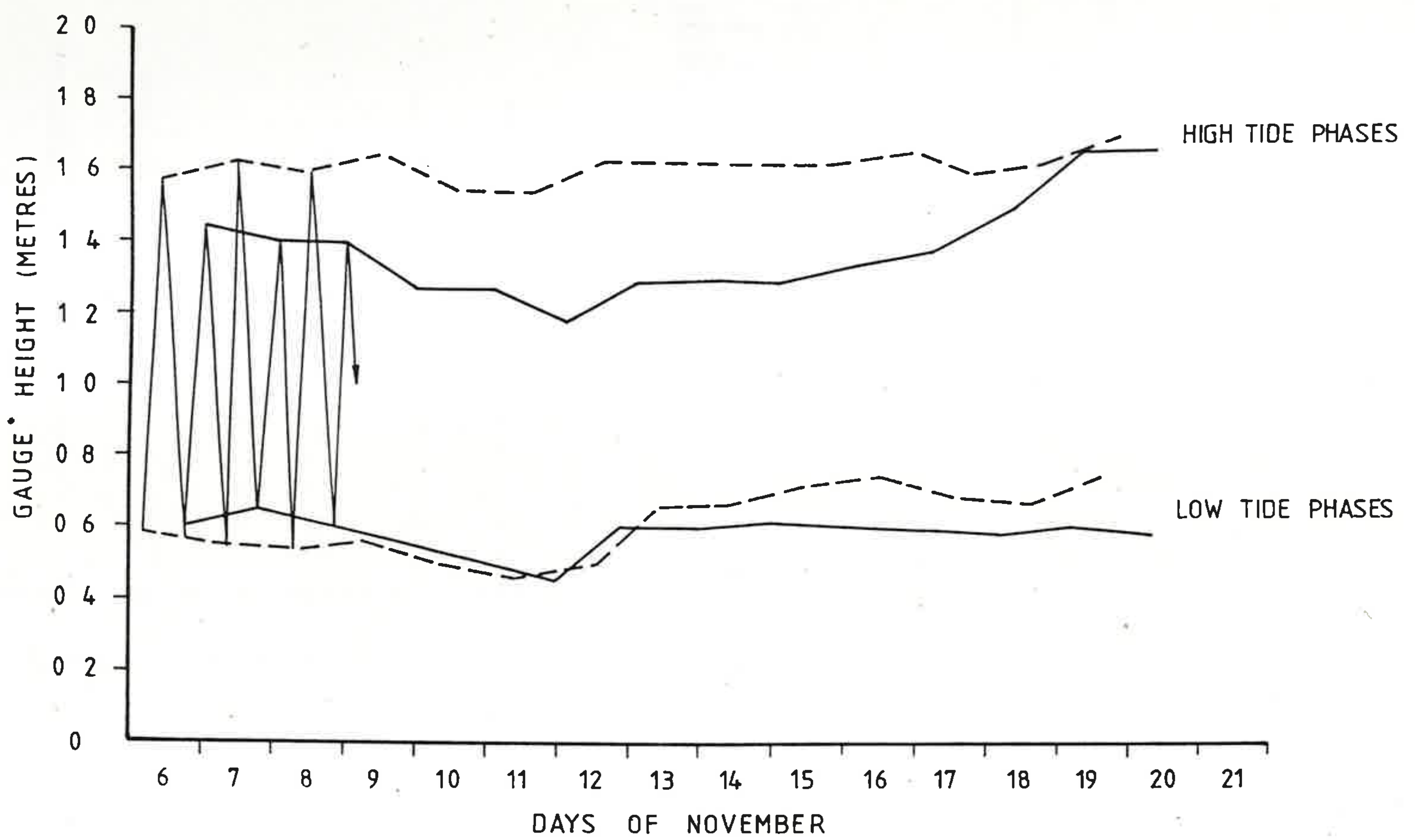
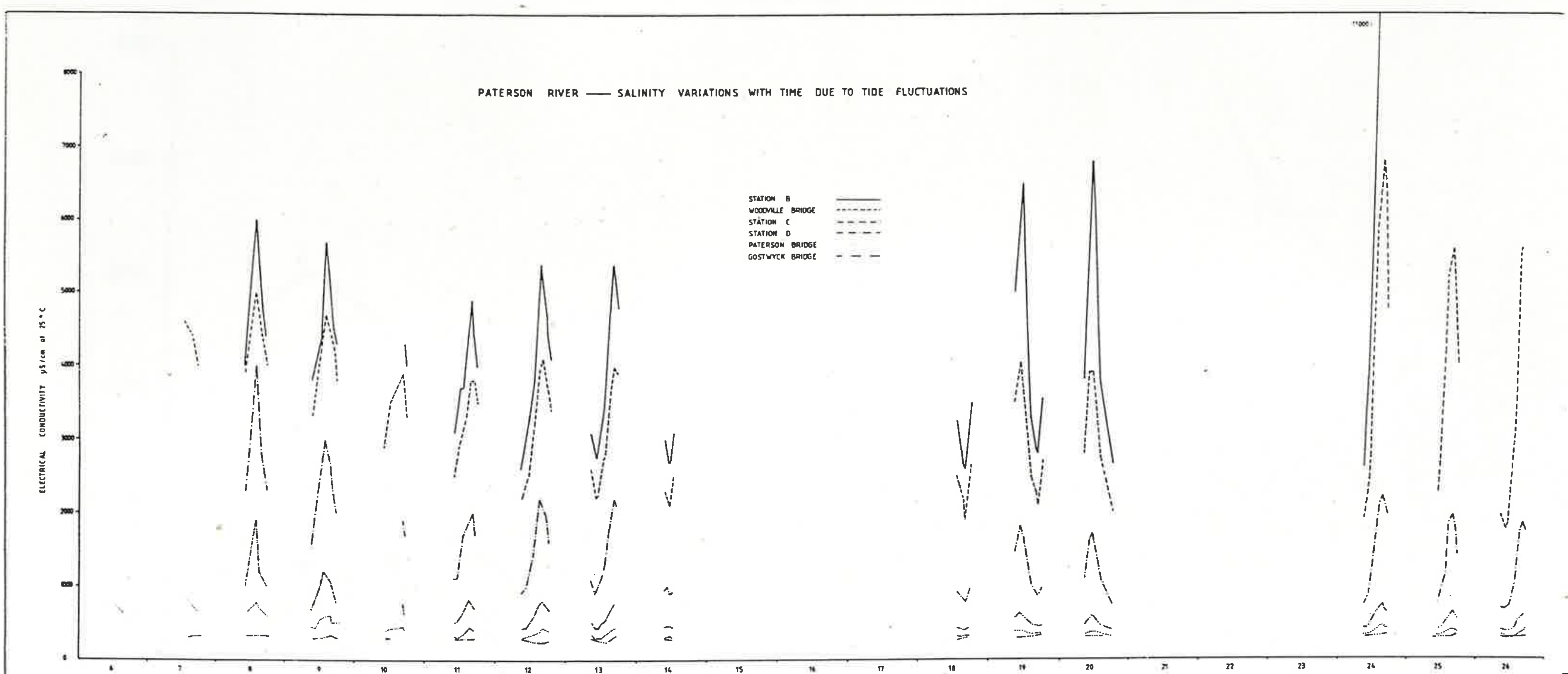


Fig. 4



PATERSON RIVER —— SALINITY VARIATIONS WITH TIME DUE TO TIDE FLUCTUATIONS
STATION B
WOODVILLE BRIDGE
STATION C
STATION D
PATERSON BRIDGE
GOSTWYCK BRIDGE
ELECTRICAL CONDUCTIVITY µS/cm at 25°C
DAYS OF NOVEMBER

Fig. 5.

SALINITY RANGES FOR THE MONITORING SITES ON THE PATERSON RIVER

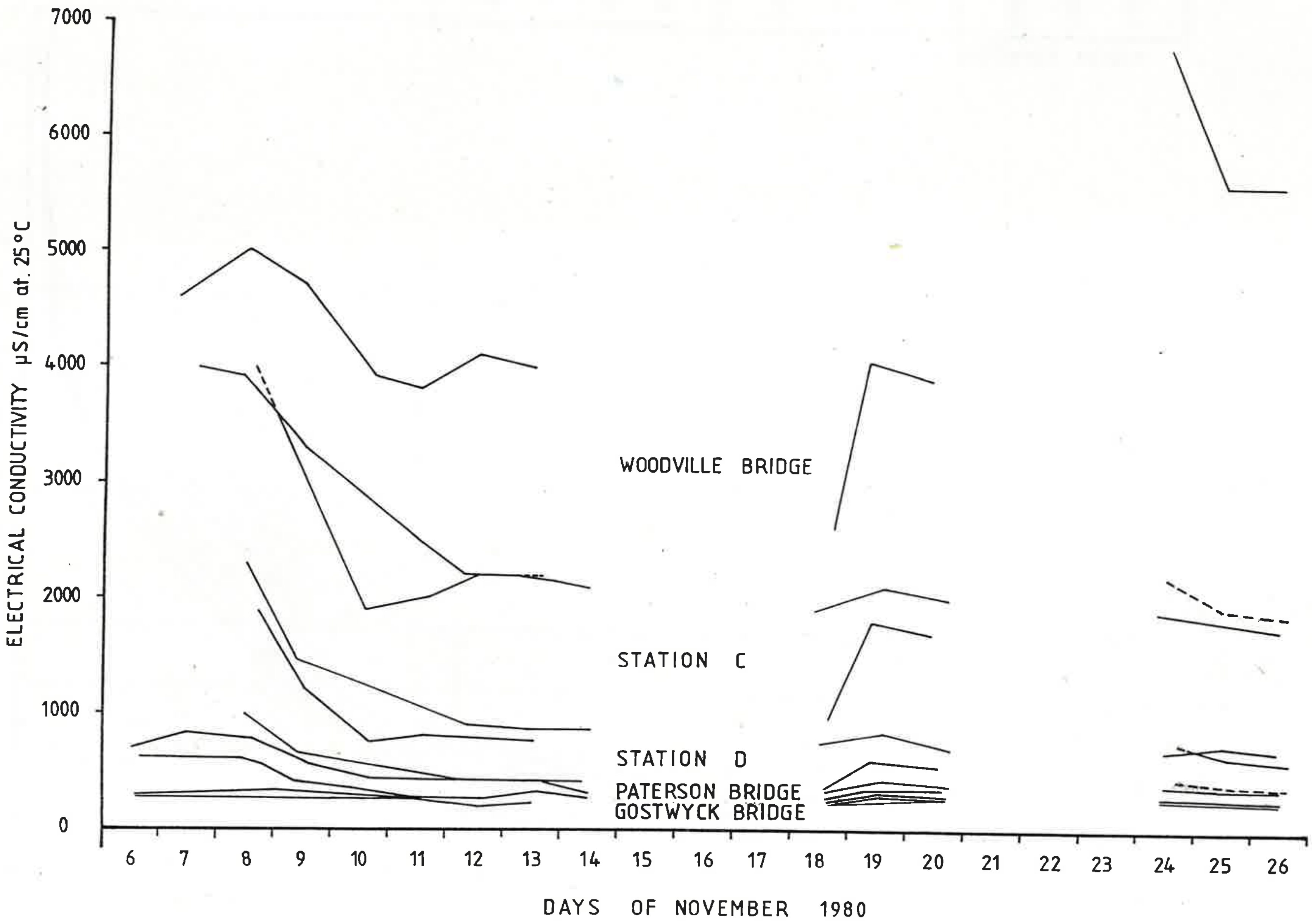


Fig. 6

Fig. 7.

PATERSON RIVER — HIGH TIDE

SALINITY VARIATIONS WITH DISTANCE FROM GOSTWYCK BRIDGE