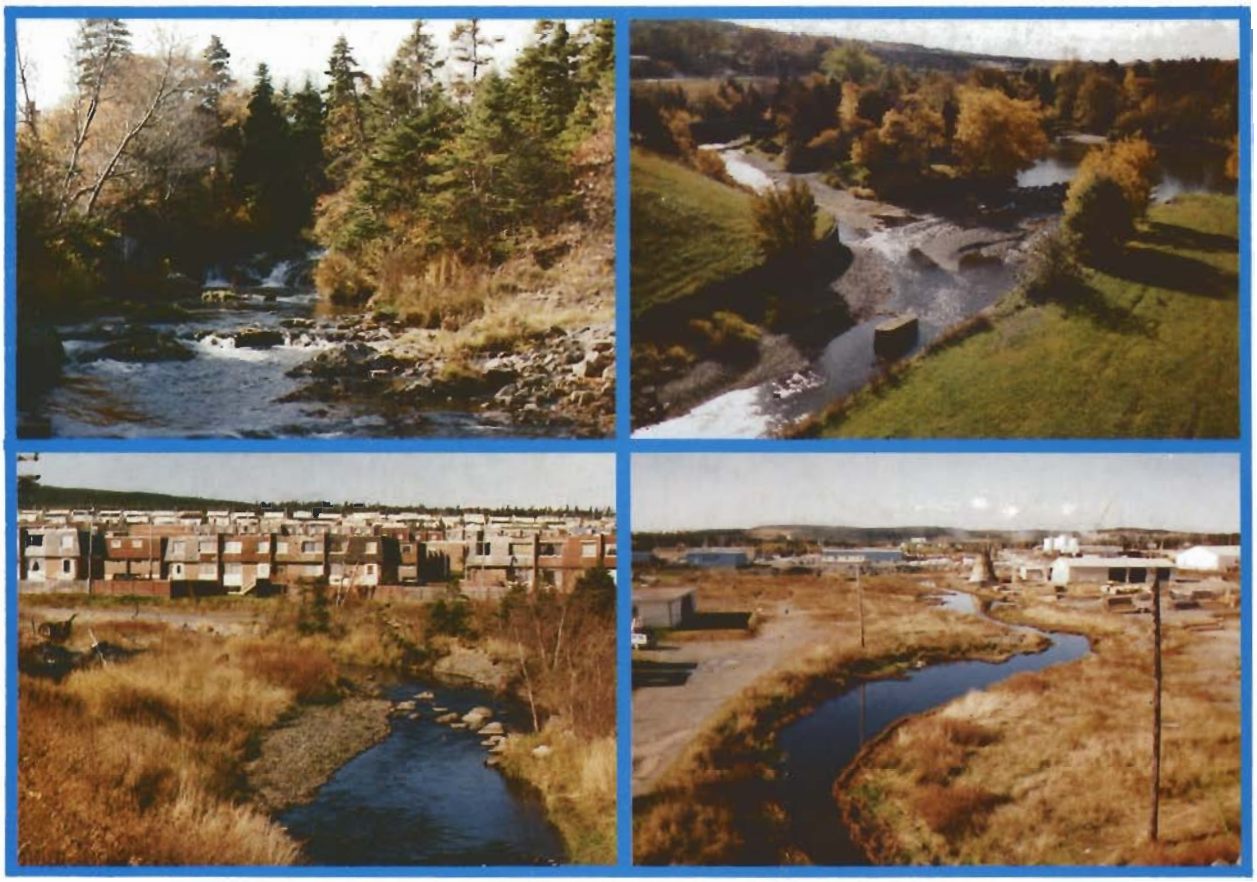
Government of Newfoundland and Labrador
Department of Environment
Water Resources Division
St. John's, Newfoundland

Government of Canada
Environment Canada
Inland Waters Directorate
Dartmouth, Nova Scotia

National Water Research Institute
Burlington, Ontario

DATA SUMMARY REPORT
VOL.1



Urban Hydrology Study of the Waterford River Basin

TECHNICAL REPORT No.
UHS-WRB 1.9

WATERFORD RIVER BASIN URBAN HYDROLOGY STUDY

DATA SUMMARY REPORT

A REPORT COMPILED AND PREPARED BY W.A. BRIMLEY,

WATER RESOURCES BRANCH, INLAND WATERS DIRECTORATE (ATLANTIC),

ENVIRONMENT CANADA,

FOR THE HYDROMETRIC TASKS SUB-COMMITTEE

March, 1987

Volume 1 of 2

Environment Canada | Environnement Canada
Conservation and Protection | Conservation et Protection

i

Water Resources Branch,
Inland Waters and Lands,
4th Floor, Queen Square,
45 Alderney Drive,
Dartmouth, Nova Scotia
B2Y 2N6

March 12, 1987

Your file *Votre référence*

Our file *Notre référence*

5100-15

Dr. Wasi Ullah, Chairman,
Technical Committee,
Waterford River Basin Urban Hydrology Study,
Newfoundland Department of the Environment,
P. O. Box 4750,
St. John's, Newfoundland
A1C 5T7

Dear Dr. Ullah:

I am pleased to enclose a copy of the final report of the Hydrometric Tasks Sub-Committee entitled "Waterford River Basin Urban Hydrology Study - Data Summary Report."

Yours truly,

D.K. Randall, Chairman
Hydrometric Tasks Sub-Committee

WAB/sl

Encl.

Canada

ABSTRACT

All data collected under the direction of the "Sub-Committee on Hydrometric Tasks for the Waterford River Basin Urban Hydrology Study" has been assembled and reproduced for use by any follow-up studies on the subject. Data in the summary include Precipitation, Temperature, Snowfall accumulation, Discharge, Water levels and Suspended Sediment

RESUME

Le sous-comité chargé des aspects de l'hydrometrie pour l'Etude sur l'hydrologie urbaine du bassin de la rivière Waterford a compilé et imprimé toutes les données collectionnées sous sa direction afin de les mettre à la disposition d'études ultérieures. Les données incluses dans cette compilation comprènnent la précipitation, la température, l'accumulation nivale, l'écoulement, les niveaux d'eau et les sédiments en suspension.

PREFACE

The Waterford River Basin Urban Hydrology Study, developed as a co-operative effort between the Governments of Canada and the Province of Newfoundland, was proposed by the Newfoundland Department of Environment in response to watershed management problems that had resulted from urbanization of the Waterford River Basin. Among such problems, negative effects of urbanization on both water quality and quantity were found so serious that the Newfoundland Department of Environment identified the Waterford River Basin as a high priority area.

The five-year study begun in 1980 was completed in March, 1985. Primary objectives of the study were to develop environmentally acceptable criteria for urban development in Newfoundland and to utilize the study results directly in the urban planning process in the Province. The specific objectives of the study, as outlined in the report "Waterford River Basin - Urban Hydrology Study Plan" were as follows:

(1) To examine the processes leading to changes in the hydrologic regime of the Waterford River watershed. This should include evaluation and monitoring of major hydrologic changes caused by urbanization, the study of precipitation-runoff processes, and the study of various forms of pollution originating in the urban areas of the watershed.

(2) To provide a hierarchy of mathematical models describing hydrologic processes in the watershed. Such models should deal with both water quantity and quality, and should be capable of simulating the impact of urbanization on the water resources in the studied basin.

(3) To recommend solutions to specific water management problems in the studied basin and to develop guidelines for implementation of similar solutions elsewhere in Newfoundland. Furthermore, planning and management criteria should be developed for those aspects of the urban development which related to the environmental protection of the affected water resources.

The complexity of the study called for a comprehensive approach which included hydrometric surveys, hydrological modelling, groundwater studies, biological surveys, water quality assessment, investigations of flooding, and land use and socio-economic analyses.

The study was administered by a Steering Committee appointed by the governments of Newfoundland and Canada. To implement the study plan, a Technical Committee consisting of two representatives of each government was established. Subsequently, the Technical Committee appointed sub-committees and working groups to prepare and carry out the workplans for the various components of the Study.

The Report that follows - deals with one such component - the hydrometric tasks.

ACKNOWLEDGEMENTS

The data assembled in this report are the results of the work performed by many dedicated people. It is not possible to name all of the people involved. However, the efforts of the following organizations are hereby acknowledged for their contributions.

1) Atmospheric Environment Service, Environment Canada, St. John's, Newfoundland.

2) Water Resources Division, Department of Environment, Government of Newfoundland and Labrador, St. John's, Newfoundland.

3) Water Survey of Canada Division, Water Resources Branch, Inland Waters Directorate, Environment Canada, St. John's, Newfoundland.

4) Hydraulics Division, National Water Research Institute, Environment Canada, Burlington, Ontario.

5) Water Planning and Management Branch, Inland Waters Directorate, Environment Canada, Dartmouth, Nova Scotia.

6) Water Resources Branch, Inland Waters Directorate, Environment Canada, Dartmouth, Nova Scotia.

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GLOSSARY OF AGENCY ABBREVIATIONS

AES	-	Atmospheric Environment Service, Environment Canada
IWD	-	Inland Waters Directorate, Environment Canada
NDOE	-	Newfoundland, Department of Environment
NWRI	-	National Water Research Institute, IWD
WPM	-	Water Planning and Management Branch, IWD
WQB	-	Water Quality Branch, IWD
WRB	-	Water Resources Branch, IWD
WSC	-	Water Survey of Canada Division, WRB

1.0 INTRODUCTION

The Waterford River Basin is a 76.7 square kilometre urbanizing watershed located in the Avalon Peninsula of the Province of Newfoundland as shown in Figure 1.0 The Waterford River flows northeast into the City of St. John's where it discharges into St. John's Harbour. Although the basin is small it is characterized by a diverse landscape varying from flat pastural lands in the upper reaches to the steeply sloped hills that flank the north and south boundaries of the basin. Two major waterfalls are noted on the main stem with numerous reaches containing rapids.

Due to the lack of knowledge of the effects of urbanization on streams in the Newfoundland environs the Governments of Newfoundland and Canada agreed to undertake a five year study of the hydrology of the Waterford River Basin on a cost/work shared basis. A major component of this project was the data collection networks.

To supervise the collection of data the Technical Committee for the project appointed a Subcommittee on hydrometric tasks. The membership of the Subcommittee was made up as follows:

Mr. R.D. McBride, Chairman, 1981/82	IWD, Dartmouth
Mr. D.K. Randall, Chairman, 1983/85	IWD, Dartmouth
Mr. D.G. Snow	IWD, St. John's
Mr. W.A. Brimley	IWD, Dartmouth
Dr. W. Ullah	NDOE, St. John's
Mr. D. Hansen	NDOE, St. John's
Mr. J. Bursey	AES, St. John's

The Subcommittee met with all parties involved in the project and agreed to provide the following services.

1) The establishment of two additional hydrometric stations on the main stem of the Waterford River, one in the Town of

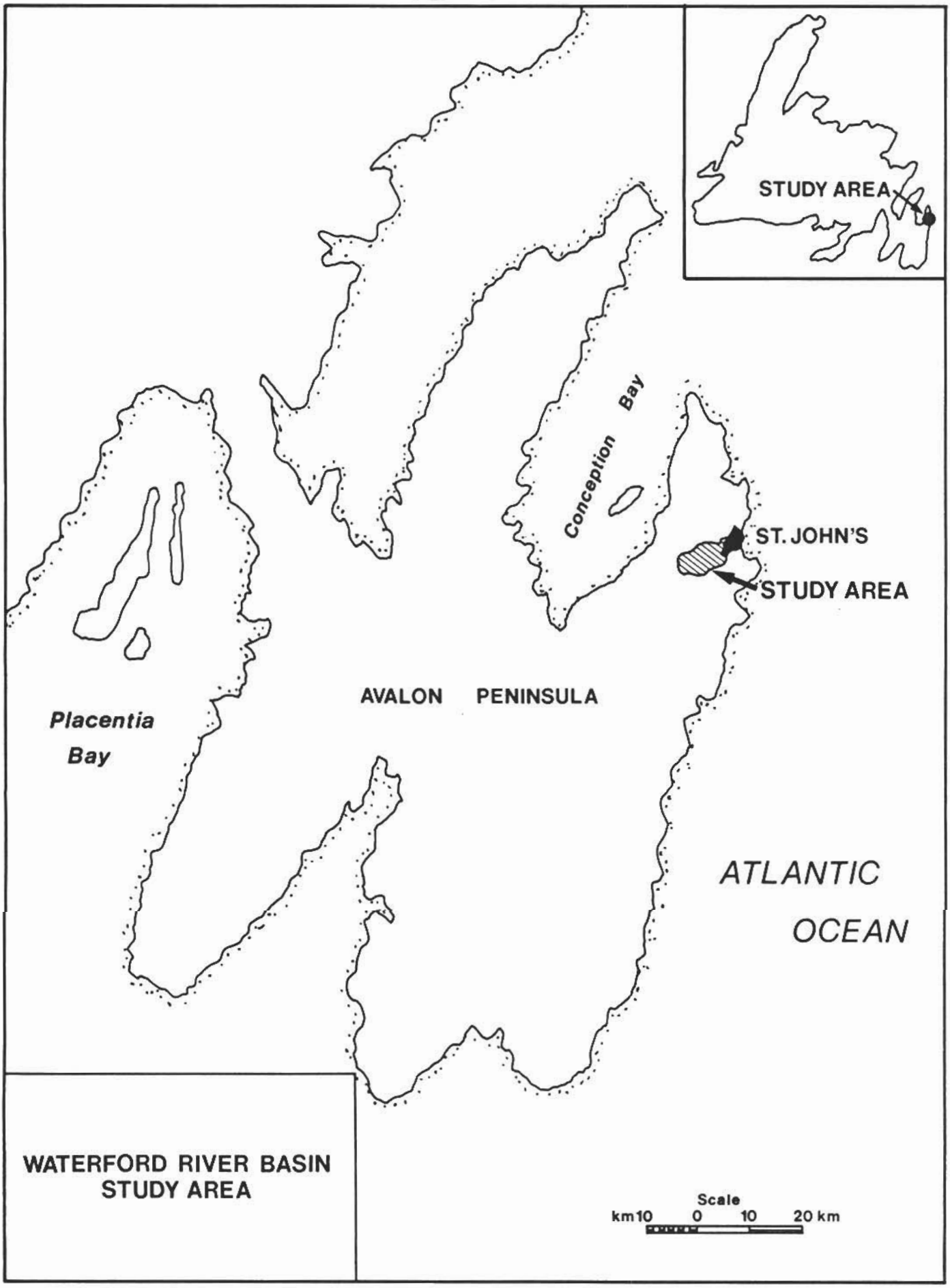

STUDY AREA
Conception Bay
ST. JOHN'S
STUDY AREA
AVALON PENINSULA
Placentia Bay
ATLANTIC OCEAN
WATERFORD RIVER BASIN STUDY AREA
Scale
km 10 0 10 20 km

Figure 1.0

Mount Pearl and the other near the industrial park at Donovans.

2) The establishment of staff gauges and the development of stage discharge curves at three water quality sites where discharges could not be estimated from the three hydrometric stations mentioned in (1).

3) The establishment of a hydrometric station on a weir box structure at the outfall of a storm water sewer from a small urban catchment.

4) The establishment of crest gauges in the basin for the purpose of determining the high water level from storm events.

5) The establishment of an automatic suspended sediment sampler which would be used to provide samples for water quality analyses and suspended sediment concentration analyses.

6) The establishment of sites for the collection of meteorological data over that which are already collected by the Atmospheric Environment Service.

The data base established as a result of these networks are summarized in the following three volumes of this report. As a summary, the following paragraphs outline the contents of this report.

The four major components of the data collection network are; meteorological data, discharge data, water level data and suspended sediment data.

Daily mean discharges are compiled from three hydrometric stations along the Waterford River; 02ZM011, Donovans; 02ZM010, Mount Pearl; 02ZM008, Kilbride. Selected discharges are compiled from a hydrometric station 02ZM012 located on a storm

sewer outfall in Newtown. Note, these data are available on computer tape by request to: Chief, Water Resources Branch, Inland Waters Direct orate, Environment Canada, 4th Floor, Queen Square, 45 Alderney Drive, Dartmouth, Nova Scotia B2Y 2N6

Three staff gauges; South Brook at Old Bay Bulls Road, 01ZM013; South Brook at Ruby Line, 02ZM015; and the Unnamed Tributary at the Agriculture Farm, 02ZM014, were used to obtain flows for monitoring water levels at the time of water sampling.

Water level data are compiled from three reaches within the Waterford Basin, (1) above the Kilbride hydrometric station, (2) below the Mount Pearl hydrometric station, and (3) above the Donovans hydrometric station. Water level data was obtained by the following ways; the nearby hydrometric stations, cork filled crest gauges, and staked profiles during flooding.

Suspended sediment data are obtained from an automatic sampler housed at the Kilbride hydrometric station. Hydrographs of sediment concentration, load and discharge are produced.

Meteorological data are broken down into the four components of: mean daily precipitation, precipitation event data, air temperature, and snow survey data.

Mean daily precipitation data are obtained from the established climatological station 8493600, St. John;s Westm CDA, and the standard rain gauge network in the Waterford Valley.

Precipitation event data are obtained from selected rainfall events at St. John's West and the Newtown stormwater catchment. Both sites have tipping bucket raingauges.

Temperature data such as daily mean, maximum and minimum, are obtained from St. John's West, CDA.

Snow surveys were conducted during the winters of 81-82 and 82-83. Samples were taken with the Mount Rose Snow Sampler. Five courses were conducted in 81-82 and six in 82-83.

For the Hydrologic Simulation Program - Fortran (HSPF), a data base has been created for future studies of the Waterford River Basin and contains hourly temperature, wind speed, precipitation, solar radiation, daily class A pan evaporation and hourly stream flow at Kilbride.

Additional data collected during the course of this study included groundwater, biological, land use and water quality are presented in other reports completed during this study.

2.0 DISCHARGE DATA

Streamflow data were collected by members of the Water Survey of Canada (WSC), St. John's area office. One hydrometric station (02ZM008 - Waterford River at Kilbride) had been operating since 1974. In addition, two hydrometric stations were added to the main stem of the Waterford River; 02ZM010 - Waterford River at Mount Pearl and 02ZM011 - Waterford River below Donovans Industrial Park. These stations were operated on a continuous basis to produce discharge data throughout the study. Changes in the stage-discharge relationship (rating curves) are noted for all sites. These shifts are normal where natural controls are used. The streamflow measurement program monitors these changes and adjusts the curves to reduce any errors which would otherwise be introduced to the relationship. The data were processed by the regional office of the Water Survey of Canada, Dartmouth, Nova Scotia. Data was collected and analysed under Water Survey procedures and standards.

A fourth station was installed at the outfall of a "storm sewer" from a 40 ha urban catchment, 02ZM012 - Waterford River Storm Sewer Outfall. This station was operated continuously and the recorder charts were sent to Mr. J. Marsalek at the National Water Research Institute in Burlington where the desired runoff events were selected and processed. These data were not processed by Water Survey of Canada nor stored on their master files.

Three staff gauges were installed at water quality sampling sites where flow data could not be estimated from the established gauge network. Stage discharge curves were developed for these sites as a means of providing discharges from the water level values recorded at the times a water samples were taken.

The locations of these sites were dictated by the sampling locations. Consequently the sites are not first class in that their controls were constantly changing as can be noted by the number of stage discharge curves developed. The fact that so many streamflow measurements were taken does reduce the level of error to an acceptable limit required for the purpose of quantifying the water quality sample. The locations of these gauges are shown on Figure 2.0

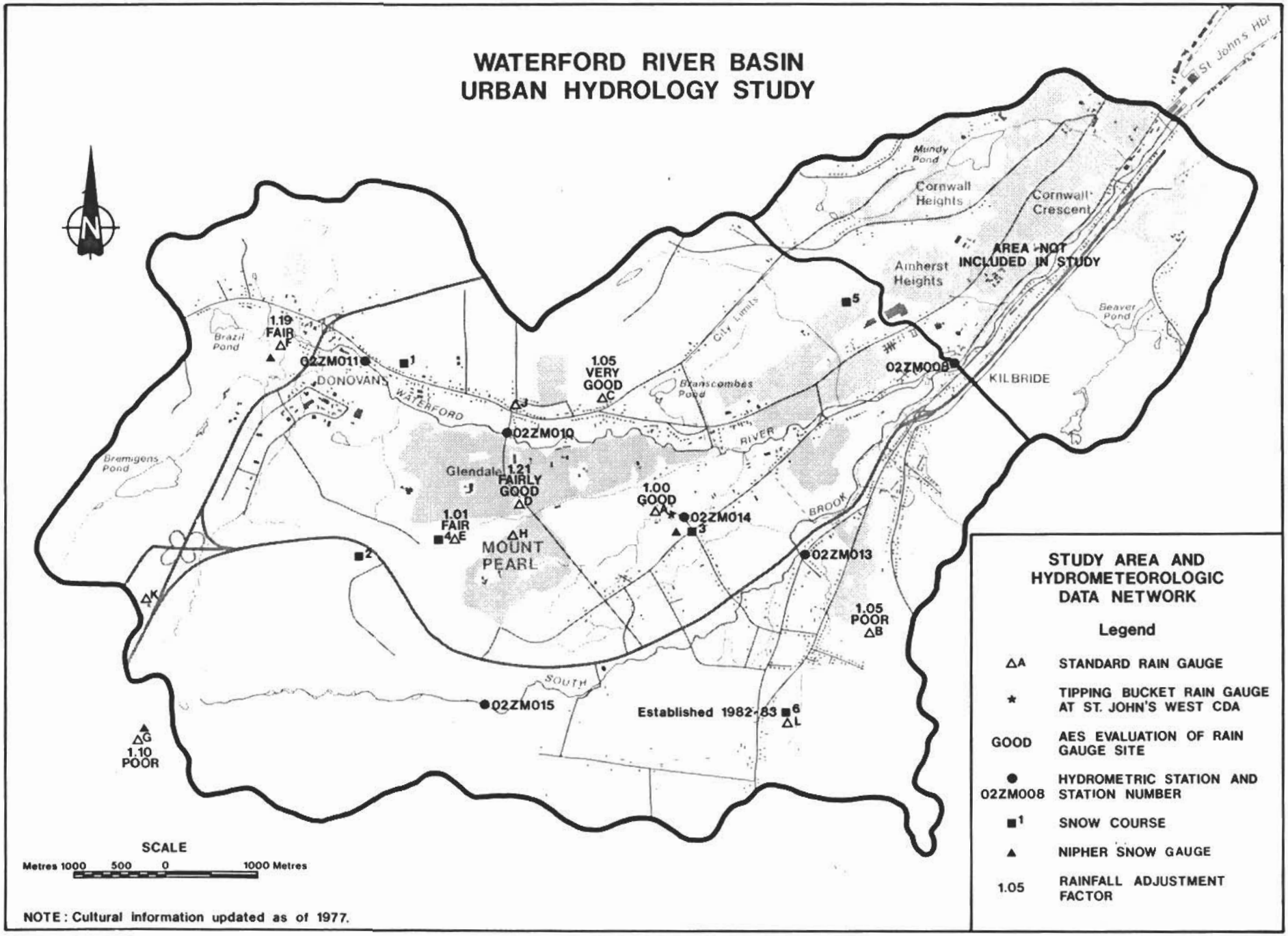

WATERFORD RIVER BASIN
URBAN HYDROLOGY STUDY
St. John's Hbr
Mundy Pond
Cornwall Heights
Cornwall Crescent
AREA NOT INCLUDED IN STUDY
Amherst Heights
Beaver Pond
Brazil Pond
1.19 FAIR ΔF
02ZM011
DONOVANS
WATERFORD
City Limits
1.05 VERY GOOD ΔC
Branscombes Pond
02ZM008
KILBRIDE
02ZM010
RIVER
Bremigens Pond
Glendale
1.21 FAIRLY GOOD ΔD
1.00 GOOD ΔA
02ZM014
1.01 FAIR ΔE
ΔH
MOUNT PEARL
BROOK
02ZM013
1.05 POOR ΔB
SOUTH
02ZM015
Established 1982-83
ΔL
ΔG 1.10 POOR
SCALE
Metres 1000 500 0 1000 Metres
NOTE : Cultural information updated as of 1977.
STUDY AREA AND HYDROMETEOROLOGIC DATA NETWORK
Legend
ΔA STANDARD RAIN GAUGE
★ TIPPING BUCKET RAIN GAUGE AT ST. JOHN'S WEST CDA
GOOD AES EVALUATION OF RAIN GAUGE SITE
02ZM008 HYDROMETRIC STATION AND STATION NUMBER
SNOW COURSE
NIPHER SNOW GAUGE
1.05 RAINFALL ADJUSTMENT FACTOR

Figure 2.0

2.1 Daily Mean Discharge Data

Daily mean discharge data were produced and published by Water Resources Branch, Inland Waters Directorate, Environment Canada, for the following stations in the basin:

a) 02ZM008 - Waterford River at Kilbride
b) 02ZM010 - Waterford River at Mount Pearl
c) 02ZM011 - Waterford River near Donovans Industrial Park

2.1.1 Waterford River at Kilbride (02ZM008)

This station is situated at the outlet of the study portion of the basin on the left bank (looking downstream) directly downstream of the bridge at Kilbride (a suburb of metropolitan St. John's) and monitors an area of 52.7 Km^2. The control at the station comprised of large cobbles and gravels that become movable at extreme flows. Consequently a shift change was noted during the study after the November 26, 1981 flood event which scoured the channel under the bridge. A graph of the stage discharge curves is shown in Figure 2.1.

Following the stage discharge curves, the mean daily discharges are presented as printouts and hydrographs for the period 1980 through 1984.

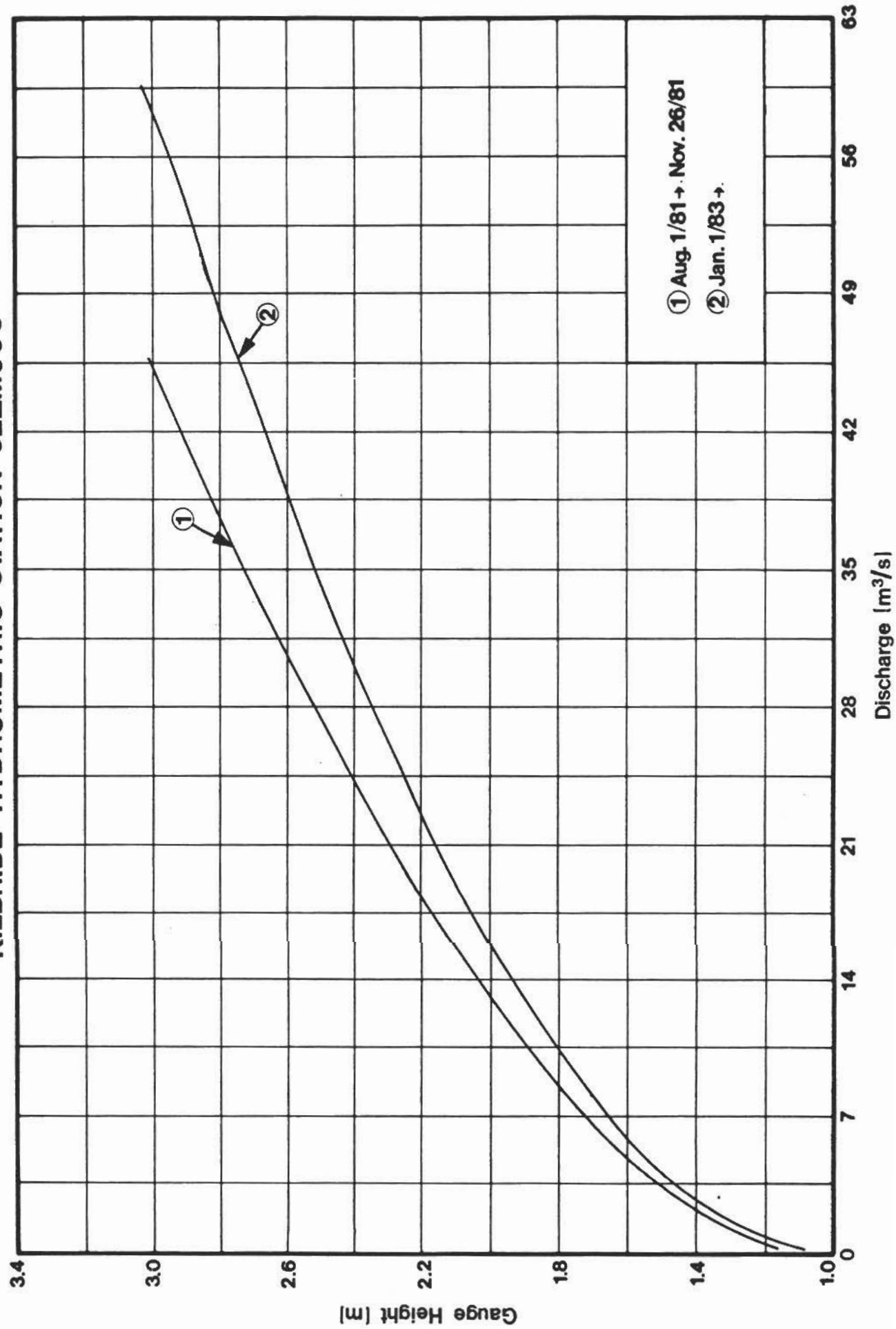

RATING CURVE FOR WATERFORD RIVER AT
KILBRIDE-HYDROMETRIC STATION 02ZM008
Gauge Height (m)
3.4
3.0
2.6
2.2
1.8
1.4
1.0
Discharge (m³/s)
0
7
14
21
28
35
42
49
56
63
① Aug. 1/81→ Nov. 26/81
② Jan. 1/83→.
①
②

Figure 2.1

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 1
HALIFAX, N. S.

WATERFORD RIVER AT KILBRIDE

STATION NO. 02ZM006

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1980

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	2.02	0.527	4.61	2.52	2.24	0.986	0.948	0.605	0.857	0.920	1.36	6.16	1
2	1.69	0.470	3.82	2.22	1.80	0.971	1.10	0.571	0.811	0.766	1.38	3.29	2
3	3.68	0.402	2.35	2.17	1.53	0.995	0.787	1.36	0.942	5.33	1.21	2.33	3
4	5.55	0.371	1.66	2.33	1.93	0.950	0.818	2.19	0.729	2.99	0.947	1.92	4
5	2.39	0.354B	1.47	2.49	14.6	0.950	1.84	1.82	0.519	1.90	1.02	2.25	5
6	1.99	0.334B	1.74	4.65	14.6	0.893	1.13	1.99	0.425	2.54	9.32	2.07	6
7	1.55	0.311B	7.04	6.01	6.15	2.34	2.99	1.44	0.644	13.1	4.00	2.00	7
8	1.86	0.297B	4.56	3.91	4.21	2.02	1.54	1.07	1.16	8.84	2.56	2.63	8
9	2.48	0.283B	9.57	3.49	3.26	3.05	0.885	0.975	1.14	3.84	3.64	2.20	9
10	1.73	0.272B	12.9	3.97	2.84	2.77	1.03	0.785	0.684	3.92	4.44	2.53	10
11	1.19 B	0.258B	6.56	3.41	3.74	1.64	1.26	0.690	0.517	2.24	3.18	1.58	11
12	0.991B	0.249B	5.31	3.07	2.65	1.25	0.856	0.679	0.469	1.54	2.77	0.965	12
13	0.850B	0.241B	4.36	4.50	2.08	1.03	0.700	1.89	0.420	2.38	2.33	0.736B	13
14	0.736B	0.235B	2.79	4.99	2.44	0.821	0.632	2.93	0.341	4.12	2.97	0.657B	14
15	0.661	0.227B	5.39	4.12	3.99	0.839	0.545	1.82	0.644	4.54	3.02	0.620B	15
16	0.634	0.311	7.48	5.19	3.15	1.48	0.464	7.09	2.80	2.89	2.15	0.595B	16
17	0.537	1.72	4.16	12.5	2.09	1.37	0.434	14.5	1.27	2.09	1.77	4.21	17
18	0.486	6.65	2.65	9.65	1.61	0.971	0.392	6.02	0.676	1.93	1.93	4.92	18
19	1.91	4.62	2.04	5.31	1.35	0.756	0.408	2.83	0.679	2.25	3.79	2.16	19
20	0.566B	3.14	1.79	4.06	1.38	2.41	0.404	1.81	3.73	2.42	14.4	3.28	20
21	0.510B	2.12	1.65	3.04	1.19	2.53	0.474	1.67	3.03	1.73	6.92	1.52	21
22	2.22	1.44	1.55	2.79	0.983	1.42	0.917	1.21	8.93	1.39	3.89	1.02	22
23	1.32	1.91	3.20	3.00	8.72	0.964	0.983	0.787	4.49	2.54	2.98	0.844	23
24	1.15	1.05	9.17	3.50	6.31	0.830	1.64	1.27	3.37	9.43	3.52	0.728	24
25	1.54	0.961	13.0	4.45	3.75	0.920	0.988	1.11	2.33	5.34	4.13	7.50	25
26	1.12	0.873	13.7	4.46	2.87	0.707	4.32	0.897	1.66	2.95	7.56	9.07	26
27	0.875	1.42	8.63	4.95	2.13	0.583	2.57	0.830	3.04	5.59	10.2	2.88	27
28	0.755	2.02	4.75	4.08	1.74	2.17	1.38	1.87	2.18	3.35	5.34	1.54	28
29	0.668	2.75	3.21	2.85	1.54	1.74	0.955	2.67	1.43	2.69	3.59	1.44	29
30	0.623		2.65	2.39	1.30	0.885	0.773	1.55	1.12	1.95	6.06	1.65	30
31	0.579		2.91		1.18		0.673	0.990		1.55		14.8	31
TOTAL	44.861	35.816	156.67	126.07	109.353	41.241	34.836	67.919	51.037	109.056	122.377	90.095	TOTAL
MEAN	1.45	1.24	5.05	4.20	3.53	1.37	1.12	2.19	1.70	3.52	4.08	2.91	MEAN
MAX	5.55	6.65	13.7	12.5	14.6	3.05	4.32	14.5	8.93	13.1	14.4	14.8	MAX
MIN	0.486	0.227	1.47	2.17	0.983	0.583	0.392	0.571	0.341	0.766	0.947	0.595	MIN

SUMMARY FOR THE YEAR 1980

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 2.70
MAXIMUM DAILY, 14.8 ON DEC 31
MINIMUM DAILY, 0.227B ON FEB 15
MAXIMUM INSTANTANEOUS,
22.7 AT 19:49 NST ON OCT 7

B - ICE CONDITIONS

MONTHLY TOTAL DISCHARGE
IN CUBIC DECAMETRES

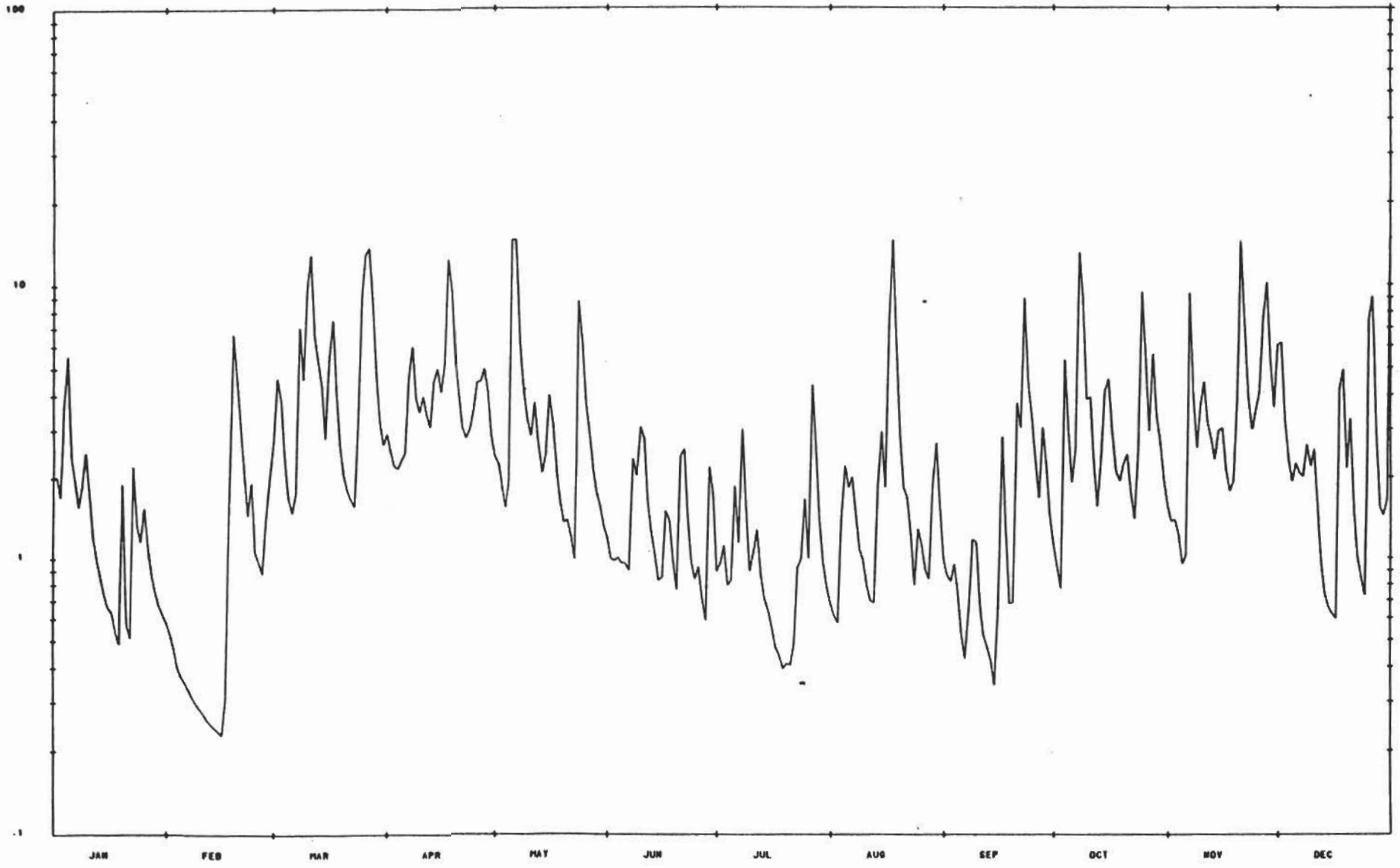
JAN	3 880	JUL	3 010
FEB	3 090	AUG	5 870
MAR	13 500	SEP	4 410
APR	10 900	OCT	9 420
MAY	9 450	NOV	10 600
JUN	3 580	DEC	7 780

TOTAL DISCHARGE, 85 500 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM008

DISCHARGE HYDROGRAPH FOR 1980



WATERFORD RIVER AT KILBRIDE

AUG 21 1984

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 2
HALIFAX, N.S.

WATERFORD RIVER AT KILBRIDE

STATION NO. 02ZM008

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1981

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	4.13	1.44 E	8.20E	4.53	1.89	0.656	0.726	0.552	0.452	1.70	2.35	1.93	1
2	2.28	1.38 E	4.51E	2.43	2.22	0.717	0.565	0.537	0.435	1.41	2.18	1.69	2
3	2.04	1.15 E	2.87A	3.75	1.81	0.518	0.478	0.472A	0.406	1.28	2.11	1.49	3
4	1.72	1.50 E	3.84	3.44	1.85	0.482	0.395	0.478	0.391	3.45	2.03	1.44	4
5	3.54	2.20 E	6.12	3.15	2.36	0.429	1.02	0.745	0.363	3.95	1.77	1.40	5
6	2.46	1.50 E	6.40	3.50	1.92	0.356	1.02	0.560	0.367	2.11	1.66	2.50	6
7	1.68	1.20 E	5.65	3.60	1.60	0.490	1.70	1.00	0.886	1.72	2.66	3.22	7
8	3.26	1.00 E	3.03	2.61	1.48	3.61	1.15	0.743	1.36	2.82	13.1	2.38	8
9	7.84	7.60 E	2.21	1.99	1.20	1.64	7.93	0.626	0.794	2.81	4.43	2.18	9
10	3.17	11.0 E	1.82	1.81	1.05	2.43	4.60	0.567	0.633	18.6	3.02	3.01	10
11	10.8	3.43 E	1.55	1.83	1.04	5.51	2.00	0.485	0.740	10.1	2.55	3.27	11
12	6.49	4.00 E	1.29	1.68	0.950	3.39	2.27	0.482	5.28	19.1	2.37	2.44	12
13	4.25A	5.95 E	1.22	1.59	0.834	2.34	2.78	0.595	2.44	6.66	2.19	1.88	13
14	3.70E	3.40 E	1.12	1.50	0.754	1.65	1.52	1.46	1.98	4.20	2.03	1.61	14
15	3.20E	2.60 E	5.70	2.55	0.719	1.21	4.20	0.725	1.57	3.23	1.99	1.43	15
16	3.00E	2.10 E	5.88	3.73	0.628	1.10	4.50	0.542	1.30	2.98	2.46	4.15	16
17	3.60E	1.80 E	2.75	1.93	0.598	0.919	2.08	0.502	3.69	16.8	3.22	4.60	17
18	3.30E	1.60 E	10.6	1.57	0.644	0.905	1.32	2.55	2.24	11.2	2.92	2.23	18
19	4.20E	1.35 E	4.97	1.37	0.503	0.999	0.987	2.44	1.61	5.66	6.02	1.99	19
20	3.18E	1.20 E	2.95	1.33	0.512	0.927	0.842	1.53	3.52	3.89	4.21	2.26	20
21	2.20E	1.05 E	2.46	1.38	0.477	0.743	0.777	1.19	2.20	3.11	3.17	1.76	21
22	1.60E	0.970E	2.04	2.84	0.464	1.45	0.667	0.866	1.58	2.65	5.63	1.45	22
23	1.30E	0.880E	1.80	3.62	0.465	1.83	0.628	0.709	1.35	2.42	4.36	1.54	23
24	1.35E	0.810E	1.56	3.86	1.06	1.21	0.522	0.703	4.94	2.24	3.14	1.29	24
25	1.20E	0.740E	1.34	6.11	1.30	0.892	0.447	1.21	8.10	2.06	2.63	1.13	25
26	1.05E	0.680E	1.26	4.58	1.13	0.757	0.456	0.935	3.78	1.98	27.8	0.900B	26
27	1.30E	0.709E	1.35	2.96	0.799	0.588	0.412	0.710	2.38	2.32	13.0	0.820B	27
28	2.50E	11.8 E	1.42	2.20	0.624	0.631	0.365	0.586	1.80	4.48	4.46	0.730B	28
29	3.00E		1.24	1.86	0.575	0.783	0.462A	0.534	1.71	6.61	2.90	0.660B	29
30	2.00E		1.59	1.69	0.547	0.869	0.770E	0.452	2.27	3.46	2.28	0.600B	30
31	1.62E		2.94		0.570		1.31 A	0.448		2.57		0.880	31
TOTAL	96.96	75.039	101.68	80.99	32.573	40.031	48.899	26.034	60.567	157.57	134.64	58.860	TOTAL
MEAN	3.13	2.68	3.28	2.70	1.05	1.33	1.58	0.840	2.02	5.08	4.49	1.90	MEAN
MAX	10.8	11.8	10.6	6.11	2.36	5.51	7.93	2.55	8.10	19.1	27.8	4.60	MAX
MIN	1.05	0.680	1.12	1.33	0.464	0.356	0.365	0.448	0.363	1.28	1.66	0.600	MIN

SUMMARY FOR THE YEAR 1981

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 2.50
MAXIMUM DAILY, 27.8 ON NOV 26
MINIMUM DAILY, 0.356 ON JUN 6
MAXIMUM INSTANTANEOUS,
66.1 AT 16:37 NST ON NOV 26

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

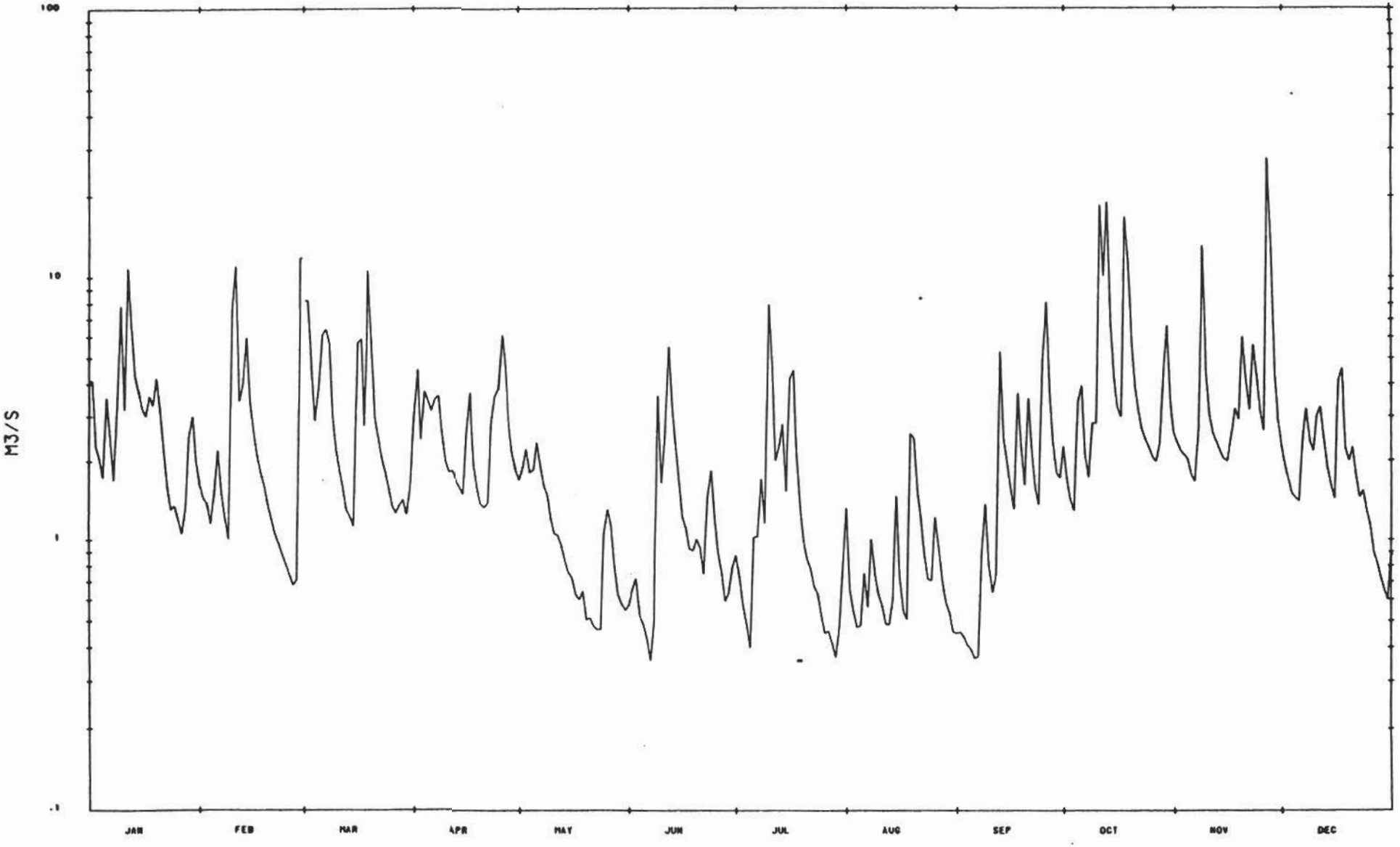
JAN	8 380	JUL	4 220
FEB	6 480	AUG	2 250
MAR	8 790	SEP	5 230
APR	7 000	OCT	13 600
MAY	2 810	NOV	11 600
JUN	3 460	DEC	5 090

TOTAL DISCHARGE, 78 900 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM008

DISCHARGE HYDROGRAPH FOR 1981



WATERFORD RIVER AT KILBRIDE

AUG 21 1984

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 3
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WATERFORD RIVER AT KILBRIDE

STATION NO. 02ZM003

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.949	1.02	1.37	1.66	3.40	0.790	6.41	0.380	0.687	1.29	0.567	2.79	1
2	0.902	1.04	1.13 B	4.22	3.27	0.709	2.52	0.317	0.790	8.72	0.537	1.71	2
3	0.897	0.983	1.00 B	3.69	3.37	0.700	1.63	0.321	2.64	21.2	0.478	1.35	3
4	0.919	3.18	0.965B	2.30	3.65	0.724	1.31	0.658	3.20	25.3	0.487	1.77	4
5	0.902	5.36	0.939B	2.18	3.28	0.619	1.12	0.424	2.27	6.75	0.485	2.53	5
6	2.57	3.35	2.45	2.27	2.75	0.550	0.999	0.321	1.32	3.54	0.478	1.62	6
7	1.61	2.52	2.31	3.70	2.49	0.541	0.913	0.287	1.02	2.83	0.457	3.36	7
8	1.23	1.88	12.9	8.40	1.99	0.497	0.943	0.255	0.868	2.28	0.438	2.30	8
9	0.962	1.50 B	17.3	4.69	2.80	0.491	0.816	0.228	0.742	1.85	0.427	1.56	9
10	2.74	1.30 B	7.18	3.43	6.17	0.510	0.805	0.199	0.691	1.86	0.432	3.71	10
11	2.85	1.10 B	3.68	2.91	3.36	0.513	0.684	0.196	0.663	1.63	0.432	1.91	11
12	1.66	0.940B	3.52	2.38	2.39	0.503	0.603	0.186	0.601	1.46	0.408	3.71	12
13	1.25	0.840B	3.46	2.60A	16.9	0.479	0.534	0.164	0.568	1.26	0.399	3.89	13
14	1.10	0.800B	2.44	2.17A	9.95	0.465	0.654	0.210	0.520	1.18	0.529	2.24	14
15	2.00	1.00 B	2.89	8.06E	10.1	0.449	1.17	0.333	0.469	2.25	0.511	1.47	15
16	3.82	0.850B	2.38	4.57A	5.30	4.26	0.854	0.216	0.837	1.86	0.484	1.35	16
17	2.23	0.780B	1.82	5.01	3.94	2.77	0.711	0.182	1.61	2.59	0.445	2.11	17
18	1.79	0.700B	1.54	4.48	3.94	1.39	0.733	0.150	1.67	1.54	0.413	2.97	18
19	1.60 B	0.660B	1.37	6.65	3.93	1.09	0.732	1.26	19.5	1.17	0.381	1.57	19
20	1.30 B	0.640B	1.23	4.99	3.86	3.83	0.591	0.764	3.58	0.998	0.375	8.63	20
21	1.10 B	0.955	1.16	3.93	3.41	16.9	0.478	0.556	3.40	0.906	0.403	9.01	21
22	0.960B	2.27	1.11	10.1	2.23	3.82	0.483	0.427	5.90	0.865	0.387	6.90	22
23	0.900B	1.85	1.05	6.00	1.75	2.27	0.557	0.333	3.22	0.827	0.375	4.40	23
24	0.850B	3.93	0.954	3.58	1.47	2.92	0.560	0.288	9.34	0.763	3.72	2.55	24
25	1.93	3.15	0.973	3.22	1.23	2.59	0.413	1.58	4.23	0.704	3.06	1.94	25
26	1.93	2.59	1.20	3.20	1.15	1.94	0.347	2.60	2.41	0.669	1.32	3.19	26
27	1.41	2.22	4.97	4.20	1.05	1.54	0.366	1.81	1.78	0.608	2.88	3.10	27
28	1.27	1.78	6.78	5.33	0.920	1.49	0.337	1.06	2.23	0.587	1.68	1.87	28
29	1.39		3.16	5.40	0.935	1.18	0.457	1.69	2.07	0.578	1.27	3.46	29
30	1.22		2.08	3.95	0.880	1.45	1.02	1.06	1.36	0.537	7.19	3.38	30
31	1.09		1.62		0.777		0.545	0.766		0.560		2.08	31
TOTAL	47.331	49.188	96.931	129.27	112.642	57.980	30.295	19.221	80.186	99.162	31.448	94.43	TOTAL
MEAN	1.53	1.76	3.13	4.31	3.63	1.93	0.977	0.620	2.67	3.20	1.05	3.05	MEAN
MAX	3.82	5.36	17.3	10.1	16.9	16.9	6.41	2.60	19.5	25.3	7.19	9.01	MAX
MIN	0.850	0.640	0.939	1.66	0.777	0.449	0.337	0.150	0.469	0.537	0.375	1.35	MIN

SUMMARY FOR THE YEAR 1982

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 2.32
MAXIMUM DAILY, 25.3 ON OCT 4
MINIMUM DAILY, 0.150 ON AUG 18
MAXIMUM INSTANTANEOUS,
53.4 AT 01:07 NST ON OCT 4

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

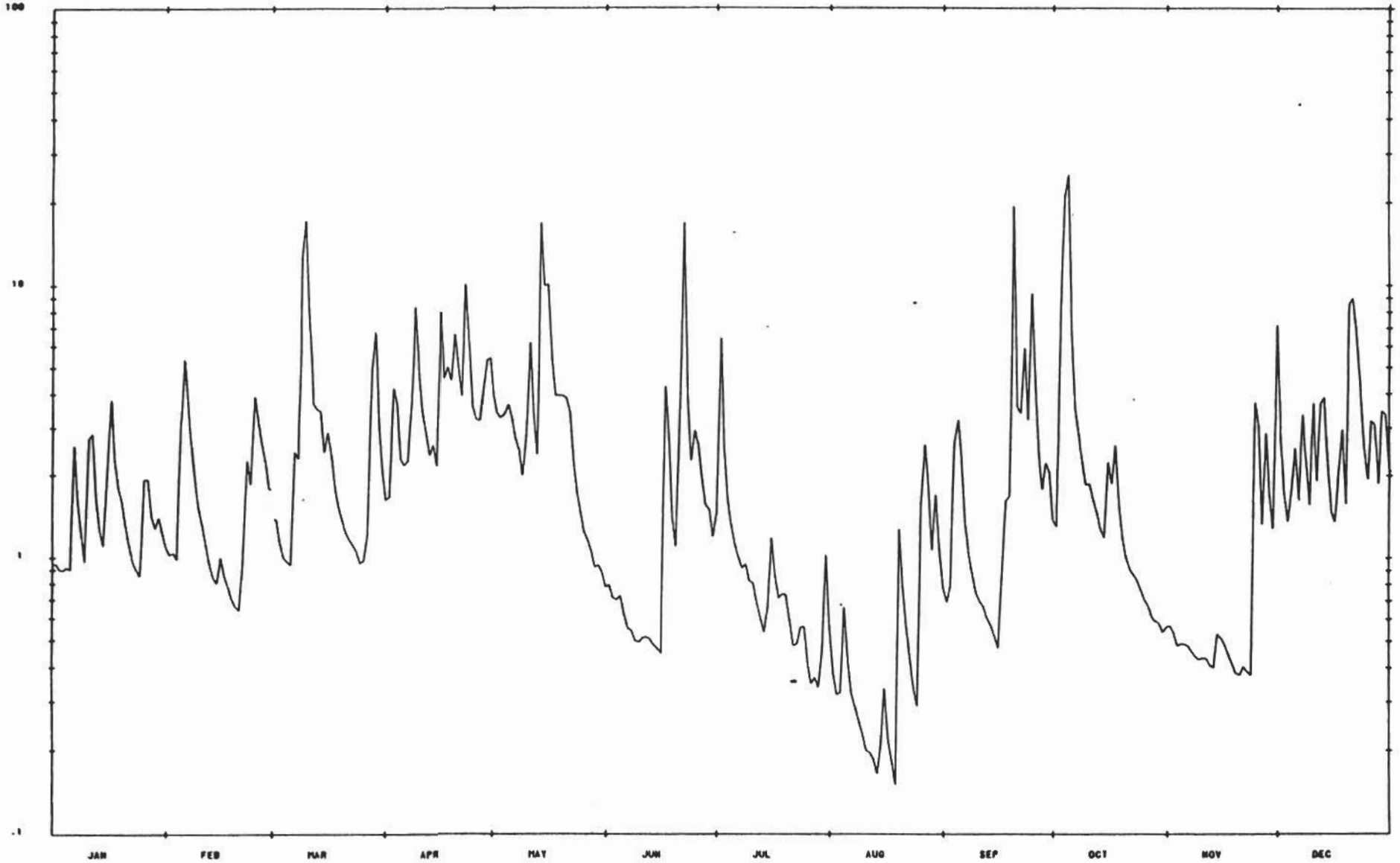
JAN	4 090	JUL	2 620
FEB	4 250	AUG	1 660
MAR	8 370	SEP	6 930
APR	11 200	OCT	8 570
MAY	9 730	NOV	2 720
JUN	5 010	DEC	8 160

TOTAL DISCHARGE, 73 300 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM008

DISCHARGE HYDROGRAPH FOR 1982



WATERFORD RIVER AT KILBRIDE

AUG 21 1984

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 4
HALIFAX, N.S.

WATERFORD RIVER AT KILBRIDE

STATION NO. 02ZM008

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1983

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	1.28	1.17	1.21	1.58	1.07	0.720	0.425	0.574	1.14	0.603	1.84	2.25	1
2	1.12	1.30	1.19	1.57	1.04	1.32	0.409	0.520	12.5	0.594	1.54	1.62	2
3	0.921	0.899	10.5	3.09	1.07	1.79	0.731	0.544	3.91	0.859	1.39	1.36	3
4	0.840B	0.814	15.3	3.08	1.35	1.05	0.614	0.541	3.97	0.686	1.20	1.44	4
5	0.780B	2.03	6.71	2.81	1.13	1.69	0.511	0.640	2.00	0.493	1.08	1.29	5
6	0.980B	4.50	3.79	6.05	1.13	1.58	0.447	0.526	1.32	0.417	0.952	1.05	6
7	9.70	1.74	2.59	3.27	1.14	1.14	0.409	0.501	0.968	0.738	1.78	1.07	7
8	3.67	1.17	2.01	2.25	0.928	1.37	1.41	0.535	0.802	0.533	2.21	3.76	8
9	2.79	3.15	1.70	2.07	1.43	1.38	0.823	0.493	0.673	0.414	1.33	1.97	9
10	1.37	3.16	1.59	1.80	1.76	0.920	0.648	0.521	2.25	0.348	1.32	1.40	10
11	1.23	1.63	1.48	1.52	1.63	3.81	0.764	0.540	2.38	0.334	1.01	1.10 B	11
12	2.61	1.13	2.22	2.20	1.28	3.02	0.627	0.451	1.15	0.297	2.04	0.911	12
13	4.59	0.848	9.20	7.32	1.54	1.66	0.748	1.36	0.797	0.271	2.03	1.04	13
14	6.27	0.725B	8.82	4.74	1.44	1.24	0.601	0.970	1.10	0.266	1.45	1.71	14
15	8.72	0.640B	6.64	2.68	2.63	1.15	0.687	0.660	4.64	1.66	1.14	3.28	15
16	3.35	0.590B	3.44	2.19	2.42	1.04	1.10	0.888	4.59	0.921	0.921	2.65	16
17	6.42	0.540B	2.43	1.96	1.58	0.918	1.27	3.43	1.73	0.624	0.810	2.07	17
18	5.51	0.500B	2.14	2.88	1.43	0.874	1.03	1.24	1.13	0.487	14.6 E	1.53	18
19	3.78	0.465B	2.43	3.82	1.19	0.780	0.649	0.883	0.975	0.663	7.60 E	0.966	19
20	2.46	0.450B	2.72	7.66	0.920	0.793	0.546	2.47	0.806	5.60	2.85	0.816	20
21	1.62	0.430B	11.7	4.08	0.817	0.748	0.481	2.35	0.651	2.08	2.43	0.702	21
22	1.21	0.410B	6.04	2.86	0.845	0.850	0.467	1.71	0.564	1.21	2.13	0.660B	22
23	1.20	0.390B	8.67	2.70	0.878	0.713	2.01	1.19	0.523	6.20	2.30	0.625B	23
24	1.34	0.375B	6.67	2.47	0.883	0.684	0.988	1.01	1.29	5.56	2.03	0.600B	24
25	2.86	0.360B	3.91	2.00	0.750	0.616	1.61	0.824	0.986	2.17	1.64	0.873	25
26	1.75	0.560B	11.4	1.69	0.730	0.735	2.42	0.715	0.685	18.8	2.36	0.845	26
27	1.20	0.979	6.15	1.48	0.666	0.684	1.41	0.689	0.529	9.06	1.97	0.803	27
28	0.952	1.19	3.18	1.50	0.654	0.640	0.986	2.58	0.461	6.37	1.83	0.739	28
29	0.760B		2.42	1.43	1.06	0.557	0.779	1.62	0.403	5.20	1.48	1.98	29
30	0.660B		2.16	1.20	1.05	0.459	0.680	1.09	0.900	3.52	2.51	7.39	30
31	0.600B		1.88		0.785		0.657	0.991		2.38		3.69	31
TOTAL	82.543	32.145	152.29	85.95	37.226	34.931	26.937	33.056	55.843	79.358	69.773	52.190	TOTAL
MEAN	2.66	1.15	4.91	2.87	1.20	1.16	0.869	1.07	1.86	2.56	2.33	1.68	MEAN
MAX	9.70	4.50	15.3	7.66	2.63	3.81	2.42	3.43	12.5	18.8	14.6	7.39	MAX
MIN	0.600	0.360	1.19	1.20	0.654	0.459	0.409	0.451	0.403	0.266	0.810	0.600	MIN

SUMMARY FOR THE YEAR 1983

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 2.03
MAXIMUM DAILY, 18.8 ON OCT 26
MINIMUM DAILY, 0.266 ON OCT 14
MAXIMUM INSTANTANEOUS,
41.7 AT 14:23 NST ON OCT 26

B - ICE CONDITIONS
E - ESTIMATED

MONTHLY TOTAL DISCHARGE
IN CUBIC DECAMETRES

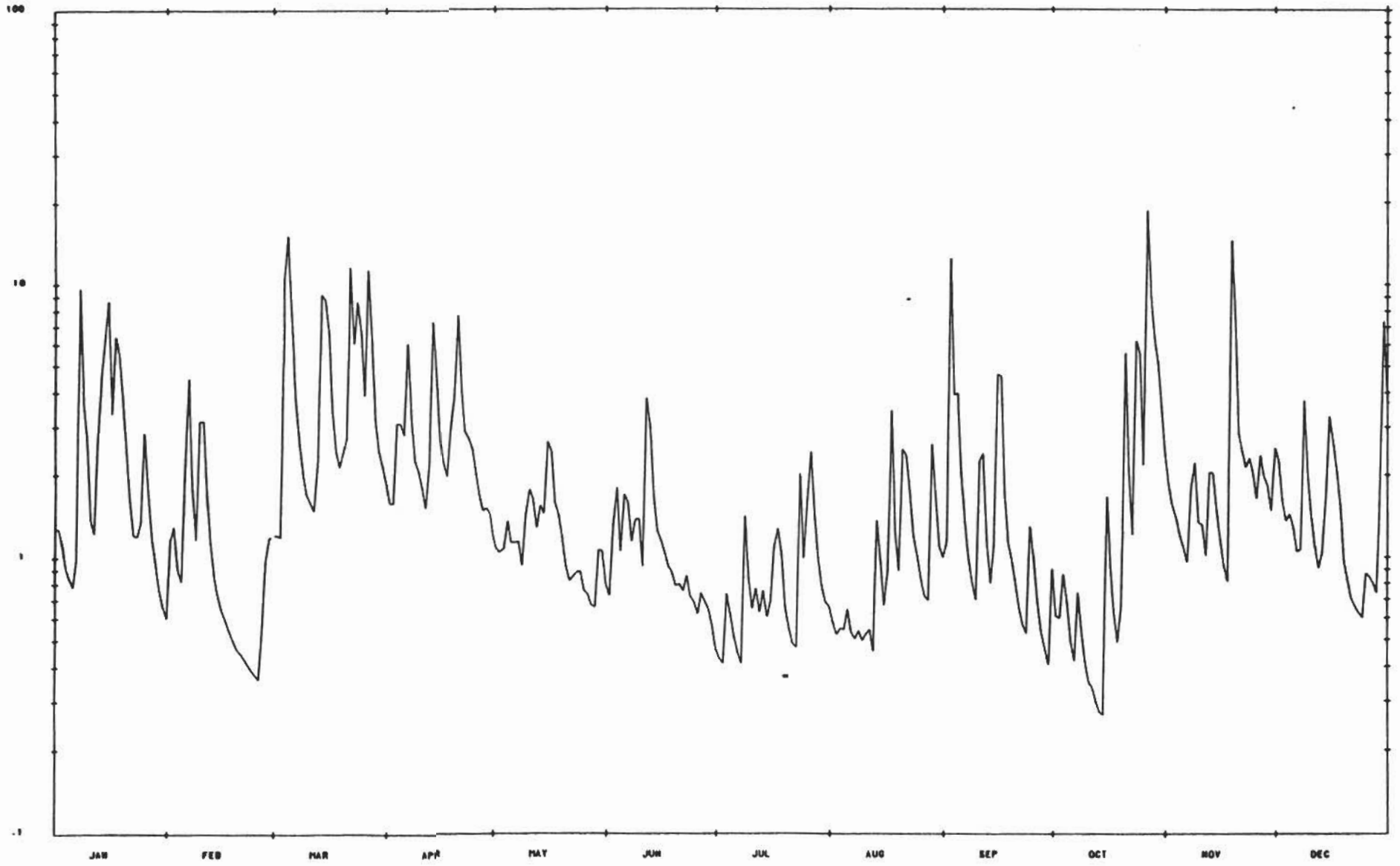
JAN	7 130	JUL	2 330
FEB	2 780	AUG	2 860
MAR	13 200	SEP	4 820
APR	7 430	OCT	6 860
MAY	3 220	NOV	6 030
JUN	3 020	DEC	4 510

TOTAL DISCHARGE, 64 200 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM008

DISCHARGE HYDROGRAPH FOR 1983



WATERFORD RIVER AT KILBRIDE

AUG 21 1984

WATER SURVEY OF CANADA
AUG 23 1985 PAGE 16
HALIFAX, N.S. 08:00

WATERFORD RIVER AT KILBRIDE

STATION NO. 02ZM008

(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1984

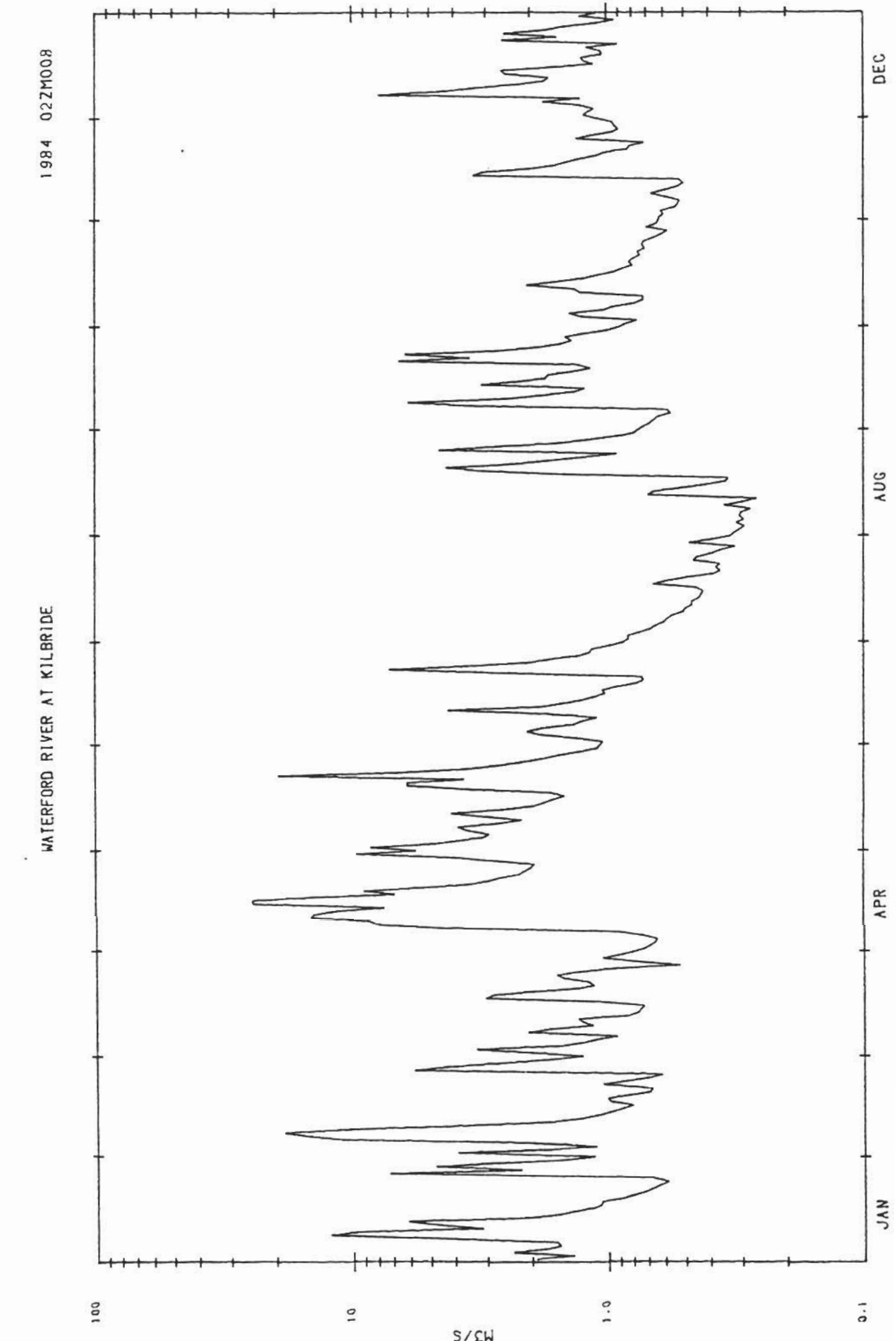
DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	1.91	3.91	2.01	0.720 B	8.47	1.03	0.818	0.316	0.717	0.836	0.618	1.23	1
2	1.36	1.72	3.30	0.680 B	4.89	1.33	0.826	0.301	0.675	0.758	0.594	1.19	2
3	2.37	1.11	1.56	0.650 B	3.86	1.82	0.743	0.289	0.652	1.25	0.611	1.12	3
4	1.77	1.98	1.26	0.640 B	3.08	2.06	0.676	0.312	0.624	1.40	0.536	1.28	4
5	1.54	11.0	1.12	0.740 B	2.90	1.80	0.640	0.291	0.558	1.03	0.524	1.78	5
6	1.60	14.8	0.918	0.900 B	3.54	1.35	0.594	0.303	0.577	0.941	0.515	1.26	6
7	4.04	18.6	2.06	4.63	3.86	1.25	0.576	0.300	3.43	0.776	0.586	7.85	7
8	12.3	10.2	1.67	7.90	2.71	1.09	0.550	0.273	6.03	0.713	0.670	4.41	8
9	9.74	3.34	1.14	8.70	2.15	1.73	0.500	0.347	2.51	0.717	0.593	3.28	9
10	3.11	1.69	1.25	14.5	2.98	4.20	0.491	0.295	1.80	1.27	0.525	2.21	10
11	4.75	1.30 B	1.31	14.0	4.10	1.84	0.462	0.259	1.34	1.34	0.499	1.76	11
12	6.13	1.10 B	0.839	11.5 A	2.56	1.48	0.463	0.690	1.21	2.06	0.520	1.68	12
13	2.08	0.980 B	0.760 B	7.46 A	1.95	1.26	0.432	0.656	3.11	1.60	3.35	2.48	13
14	1.56	0.880 B	0.743	24.3 E	1.76	1.12	0.426	0.512	2.18	1.24	3.08	2.60	14
15	1.37	0.800 B	0.721	24.5 E	1.62	1.01	0.418	0.406	1.73	1.07	2.02	1.57	15
16	1.15	0.980 B	1.05	14.0 E	1.46	1.04	0.450	0.341	1.69	0.928	1.61	1.12	16
17	1.07	1.01	3.03	6.84 A	1.67	0.909	0.659	0.334	1.37	0.863	1.44	1.23	17
18	1.06	0.818	2.83	9.01	3.56	0.771	0.582	1.47	1.15	0.786	1.28	1.26	18
19	0.886	0.684	1.96	5.53	6.06	0.717	0.484	3.10	1.30	0.817	1.09	1.04	19
20	0.800 B	0.670	1.31	3.53	6.09	0.726	0.384	4.28	6.54	0.786	1.01	1.05	20
21	0.720 B	1.05	1.13	2.95	3.63	2.43	0.358	2.34	3.44	0.737	0.821	1.20	21
22	0.670 B	0.864	1.20	2.58	19.4	7.15	0.374	1.69	6.19	0.755	0.811	0.902	22
23	0.625 B	0.697	1.48	2.21	6.55	3.53	0.360	1.24	2.68	0.704	0.709	2.58	23
24	0.580 B	0.612	1.59	2.12	3.53	2.04	0.460	0.909	1.86	0.725	1.32	1.56	24
25	0.680 B	5.78	1.29	2.00	2.68	1.67	0.441	4.55	1.51	0.714	1.15	2.53	25
26	7.24	4.30	0.931	1.92	2.14	1.29	0.387	2.69	1.36	0.654	0.948	1.77	26
27	2.19	2.67	0.521	2.72	1.79	1.16	0.356	1.53	1.45	0.608	0.897	1.46	27
28	4.79	1.68	0.776	4.02	1.53	1.14	0.315	1.19	1.22	0.575	0.932	1.10 B	28
29	2.69	1.25	1.05 B	9.63	1.28	0.970	0.478	0.906	0.990	0.699	0.948	0.930	29
30	1.52		0.900 B	5.60	1.09	0.860	0.389	0.781	0.897	0.636	1.09	1.28	30
31	1.13		0.800 B		1.06		0.329	0.752		0.623		1.10	31
TOTAL	83.431	96.475	42.509	196.480	113.95	50.773	15.421	33.653	60.790	28.611	31.297	57.812	TOTAL
MEAN	2.69	3.33	1.37	6.55	3.68	1.69	0.497	1.09	2.03	0.923	1.04	1.86	MEAN
DAM3	7210	8340	3670	17000	9850	4390	1330	2910	5250	2470	2700	4990	DAM3
MAX	12.3	18.6	3.30	24.5	19.4	7.15	0.826	4.55	6.54	2.06	3.35	7.85	MAX
MIN	0.580	0.612	0.521	0.640	1.06	0.717	0.315	0.259	0.558	0.575	0.499	0.902	MIN

SUMMARY FOR THE YEAR 1984

MEAN DISCHARGE, 2.22 M3/S
TOTAL DISCHARGE, 70100 DAM3
MAXIMUM DAILY DISCHARGE, 24.5 M3/S ON APR 15
MINIMUM DAILY DISCHARGE, 0.259 M3/S ON AUG 11

MAXIMUM INSTANTANEOUS DISCHARGE, M3/S AT ON

A-MANUAL GAUGE
B-ICE CONDITIONS
E-ESTIMATED


1984 02ZM008
WATERFORD RIVER AT KILBRIDE
M3/S
100
10
1.0
0.1
JAN
APR
AUG
DEC

2.1.2 Waterford River at Mount Pearl (02ZM010)

This station was established in March 1981 on the left bank of the Waterford River downstream of the Commonwealth Road bridge in the Town of Mount Pearl. It monitors the streamflow from a 16.6 km^2 area of the upper watershed. The control was established by a constriction of the channel above an area of increased channel slope.

A graph of the stage discharge curves is shown in Figure 2.2.

Following the stage discharge curves, the mean daily discharges are presented as printouts and hydrographs for the period of 1981 through 1984.

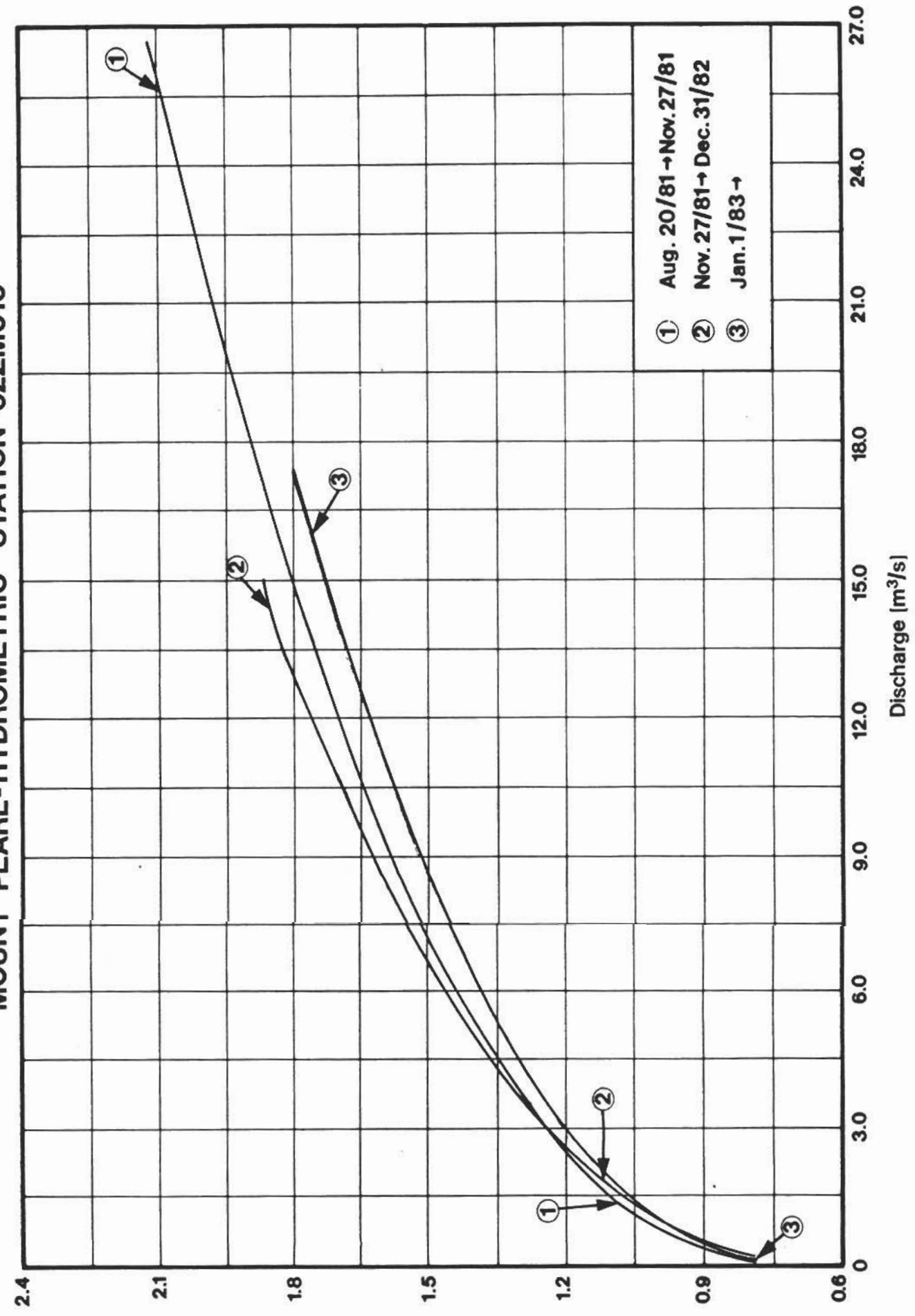

RATING CURVE FOR WATERFORD RIVER AT
MOUNT PEARL-HYDROMETRIC STATION 02ZM010
Gauge Height [m]
Discharge [m³/s]
2.4
2.1
1.8
1.5
1.2
0.9
0.6
0
3.0
6.0
9.0
12.0
15.0
18.0
21.0
24.0
27.0
① Aug. 20/81→Nov. 27/81
② Nov. 27/81→ Dec. 31/82
③ Jan. 1/83→

Figure 2.2

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 1
HALIFAX, N.S.

WATERFORD RIVER AT MOUNT PEARL

STATION NO. 02ZM010

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1981

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	---	---	---	1.07	0.618	0.245E	0.220	0.187	0.183	0.544	0.605	0.403	1
2	---	---	---	0.639	0.673	0.265E	0.189	0.156	0.178	0.431	0.525	0.309	2
3	---	---	---	1.08	0.510	0.230E	0.157	0.139	0.178	0.409	0.479	0.262	3
4	---	---	---	0.920	0.596	0.195E	0.141	0.130	0.167	1.02	0.394	0.229	4
5	---	---	---	0.919	0.660	0.172E	0.371	0.227	0.164	1.31	0.362	0.229	5
6	---	---	1.62 A	0.947	0.506	0.230E	0.343	0.155	0.156	0.712	0.328	0.614	6
7	---	---	1.53	0.931	0.411	0.310E	0.562	0.255	0.377	0.551	0.695	0.913	7
8	---	---	0.829	0.707	0.372	1.34 E	0.386	0.220	0.527	0.764	3.53	0.618	8
9	---	---	0.621	0.525	0.309	0.620E	2.83	0.180	0.325	0.825	1.20	0.543	9
10	---	---	0.486	0.489	0.246	1.10 E	1.42	0.157	0.269	6.40	0.697	0.828	10
11	---	---	0.427	0.473	0.227	2.00 E	0.704	0.152	0.304	3.99	0.515	1.04	11
12	---	---	0.394	0.432	0.202	1.13 A	0.709	0.141	2.52	5.93	0.500	0.703	12
13	---	---	0.356	0.431	0.184	0.576	0.678	0.199	1.03	2.42	0.434	0.455	13
14	---	---	0.313	0.452	0.182	0.387	0.502	0.586	0.863	1.32	0.373	0.347	14
15	---	---	1.71	0.741	0.161	0.342	1.36	0.280	0.627	0.864	0.347	0.274	15
16	---	---	1.32	0.811	0.143	0.308	1.22	0.222	0.517	0.760	0.557	1.10	16
17	---	---	0.741	0.534	0.148	0.260	0.639	0.199	1.51	6.78	0.810	1.24	17
18	---	---	4.49	0.409	0.130	0.293	0.450	0.789	0.979	4.59	0.740	0.577	18
19	---	---	1.29	0.375	0.130	0.308	0.377	0.791	0.658	2.09	1.52	0.437	19
20	---	---	0.813	0.353	0.129	0.253	0.324	0.530	1.36	1.25	1.09	0.528	20
21	---	---	0.629	0.361	0.120	0.234	0.306	0.410	0.904	0.941	0.769	0.399	21
22	---	---	0.535	0.820	0.107	0.617	0.285	0.303	0.569	0.709	1.67	0.294	22
23	---	---	0.458	0.949	0.105	0.505	0.268	0.244	0.440	0.607	1.21	0.303	23
24	---	---	0.405	0.902	0.370	0.334	0.210	0.313	1.84	0.534	0.833	0.237	24
25	---	---	0.371	1.39	0.620E	0.248	0.202	0.608	2.77	0.464	0.652	0.170	25
26	---	---	0.382	1.04	0.450E	0.206	0.194	0.404	1.35	0.441	10.6	0.131	26
27	---	---	0.398	0.684	0.360E	0.189	0.179	0.304	0.814	0.595	4.04	0.108B	27
28	---	---	0.406	0.526	0.300E	0.233	0.182	0.241	0.560	1.71	1.32	0.084B	28
29	---		0.341	0.453	0.250E	0.301	0.186	0.224	0.554	2.68	0.739	0.080B	29
30	---		0.399	0.421	0.210E	0.278	0.169	0.209	0.769	1.14	0.527	0.078B	30
31	---		0.961		0.222E		0.192	0.192		0.726		0.106	31
TOTAL	---	---	---	20.784	9.651	13.709	15.955	9.147	23.462	53.507	38.061	13.639	TOTAL
MEAN	---	---	---	0.693	0.311	0.457	0.515	0.295	0.782	1.73	1.27	0.440	MEAN
MAX	---	---	---	1.39	0.673	2.00	2.83	0.791	2.77	6.78	10.6	1.24	MAX
MIN	---	---	---	0.353	0.105	0.172	0.141	0.130	0.156	0.409	0.328	0.078	MIN

SUMMARY FOR THE YEAR 1981

DISCHARGES IN CUBIC METRES PER SECOND

MAXIMUM INSTANTANEOUS,
26.7 AT 16:11 NST ON NOV 26

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

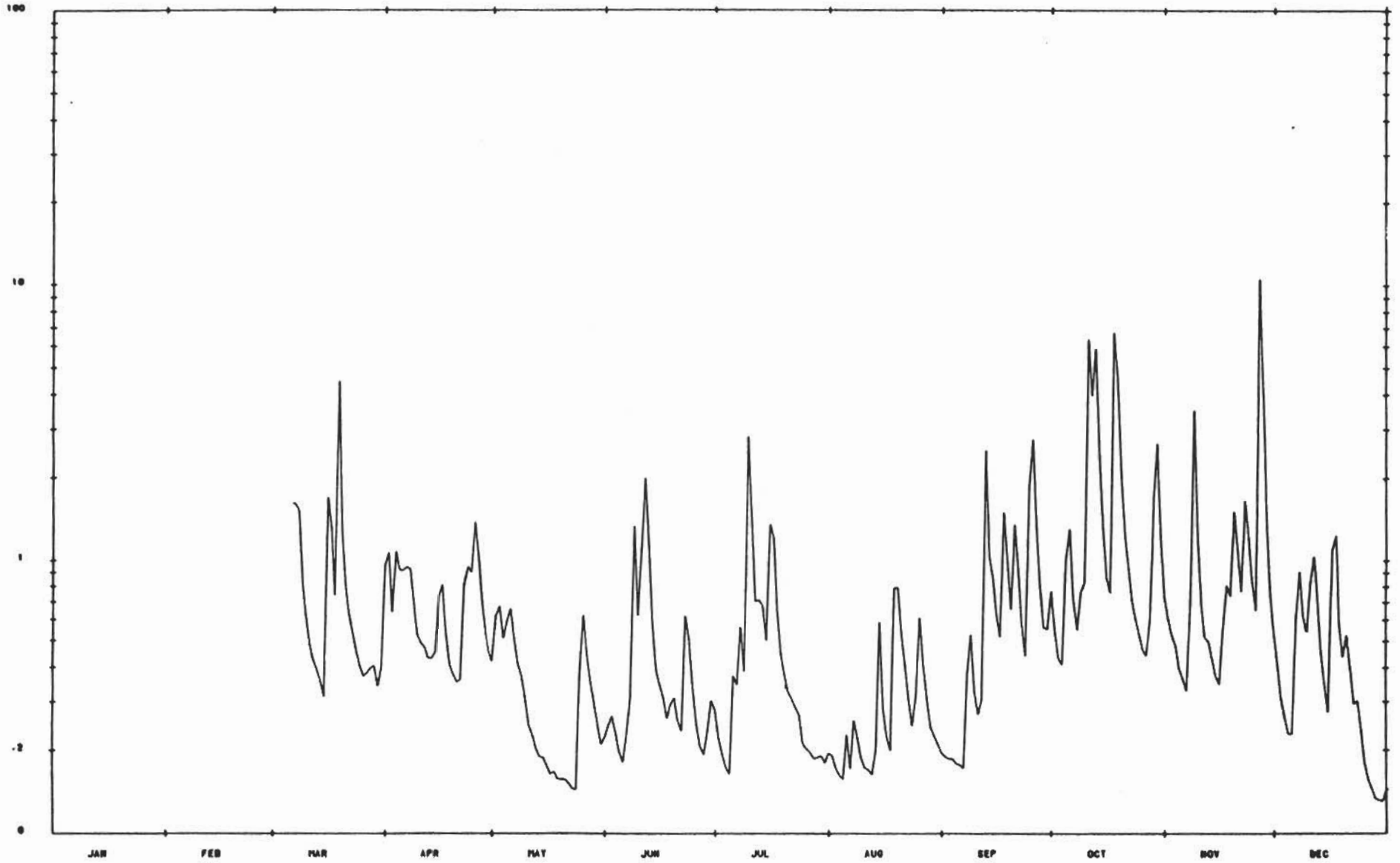
MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

JAN	---	JUL	1 380
FEB	---	AUG	790
MAR	---	SEP	2 030
APR	1 800	OCT	4 620
MAY	834	NOV	3 290
JUN	1 180	DEC	1 180

WATER SURVEY OF CANADA

STATION NO. 02ZM010

DISCHARGE HYDROGRAPH FOR 1981



WATERFORD RIVER AT MOUNT PEARL

AUG 21 1984

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 2
HALIFAX, N.S.

WATERFORD RIVER AT MOUNT PEARL

STATION NO. 02ZM010

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.260	0.273	0.295B	0.651	1.36	0.223	1.78	0.178	0.256	0.423	0.200	0.809	1
2	0.234	0.302	0.275B	1.50	1.26	0.200	0.788	0.160	0.286	1.49	0.195	0.510	2
3	0.230	0.261	0.262B	1.46	1.38	0.209	0.496	0.156	0.904	4.90	0.190	0.446	3
4	0.249	1.19	0.252B	0.990	1.32	0.204	0.375	0.231	1.23	5.90	0.190	0.549	4
5	0.295	1.56	0.245B	0.891	1.11	0.191	0.328	0.189	0.835	1.97	0.191	0.731	5
6	0.633	1.02	1.23	0.921	0.986	0.169	0.293	0.174	0.494	1.09	0.185	0.527	6
7	0.404	0.691	0.734	1.30	0.836	0.159	0.265	0.162	0.389	0.853	0.182	0.994	7
8	0.306	0.501	3.46	2.77	0.685	0.153	0.286	0.146	0.324	0.714	0.173	0.754	8
9	0.275	0.356	4.77	1.67	0.824	0.155	0.250	0.141	0.268	0.577	0.172	0.506	9
10	0.962	0.353	2.28	1.19	1.78	0.158	0.224	0.141	0.255	0.565	0.171	1.05	10
11	0.931	0.315B	1.19	1.01	1.13	0.150	0.203	0.145	0.247	0.534	0.170	0.582	11
12	0.526	0.290B	1.16	0.853	0.907	0.153	0.189	0.138	0.236	0.483	0.214	1.10	12
13	0.347	0.275B	1.15	0.957	5.20	0.149	0.185	0.123	0.198	0.421	0.186	1.20	13
14	0.277	0.702	0.863	0.919	2.91	0.154	0.206	0.152	0.191	0.397	0.180	0.737	14
15	0.740	0.856	0.996	2.67	3.28	0.159	0.364	0.175	0.187	0.559	0.168	0.530	15
16	1.15	0.302	0.854	1.67	1.90	1.18	0.244	0.150	0.289	0.521	0.162	0.455	16
17	0.590B	0.235	0.665	1.70	1.38	0.824	0.222	0.138	0.440	0.709	0.187	0.640	17
18	0.460B	0.211	0.542	1.66	1.35	0.466	0.228	0.129	0.568	0.472	0.180	0.869	18
19	0.390B	0.193	0.485	2.36	1.29	0.372	0.223	0.421	5.35	0.379	0.167	0.519	19
20	0.325B	0.182	0.451	1.82	1.28	1.32	0.183	0.254	1.33	0.330	0.157	1.75	20
21	0.295B	0.350	0.407	1.50	1.17	4.73	0.169	0.214	1.10	0.303	0.158	2.17	21
22	0.275B	0.876	0.391	3.60	0.757	1.26	0.182	0.192	1.66	0.288	0.158	1.76	22
23	0.245B	0.563	0.379	2.34	0.562	0.728	0.179	0.187	1.01	0.293	0.144	1.21	23
24	0.220B	1.33	0.376	1.36	0.460	0.922	0.170	0.157	2.18	0.280	0.724	0.732	24
25	0.753	0.877	0.383	1.20	0.392	0.784	0.151	0.563	1.20	0.266	0.718	0.553	25
26	0.568	0.559	0.480	1.26	0.349	0.589	0.141	0.739	0.726	0.252	0.387	0.813	26
27	0.418	0.440B	1.93	1.66	0.316	0.465	0.169	0.515	0.544	0.230	0.763	0.802	27
28	0.382	0.335B	2.23	2.18	0.270	0.457	0.162	0.366	0.626	0.226	0.533	0.560	28
29	0.487		1.17	2.16	0.256	0.376	0.197	0.545	0.606	0.225	0.396	0.943	29
30	0.335		0.770	1.63	0.251	0.521	0.283	0.356	0.450	0.212	1.53	0.955	30
31	0.301		0.640		0.239		0.200	0.281		0.211		0.625	31
TOTAL	13.873	15.541	31.315	47.852	37.230	17.580	9.335	7.618	24.379	26.073	9.131	26.381	TOTAL
MEAN	0.448	0.555	1.01	1.60	1.20	0.586	0.301	0.246	0.813	0.841	0.304	0.851	MEAN
MAX	1.15	1.56	4.77	3.60	5.20	4.73	1.78	0.739	5.35	5.90	1.53	2.17	MAX
MIN	0.220	0.182	0.245	0.651	0.239	0.149	0.141	0.123	0.187	0.211	0.144	0.446	MIN

SUMMARY FOR THE YEAR 1982

DISCHARGES IN CUBIC METRES PER SECOND

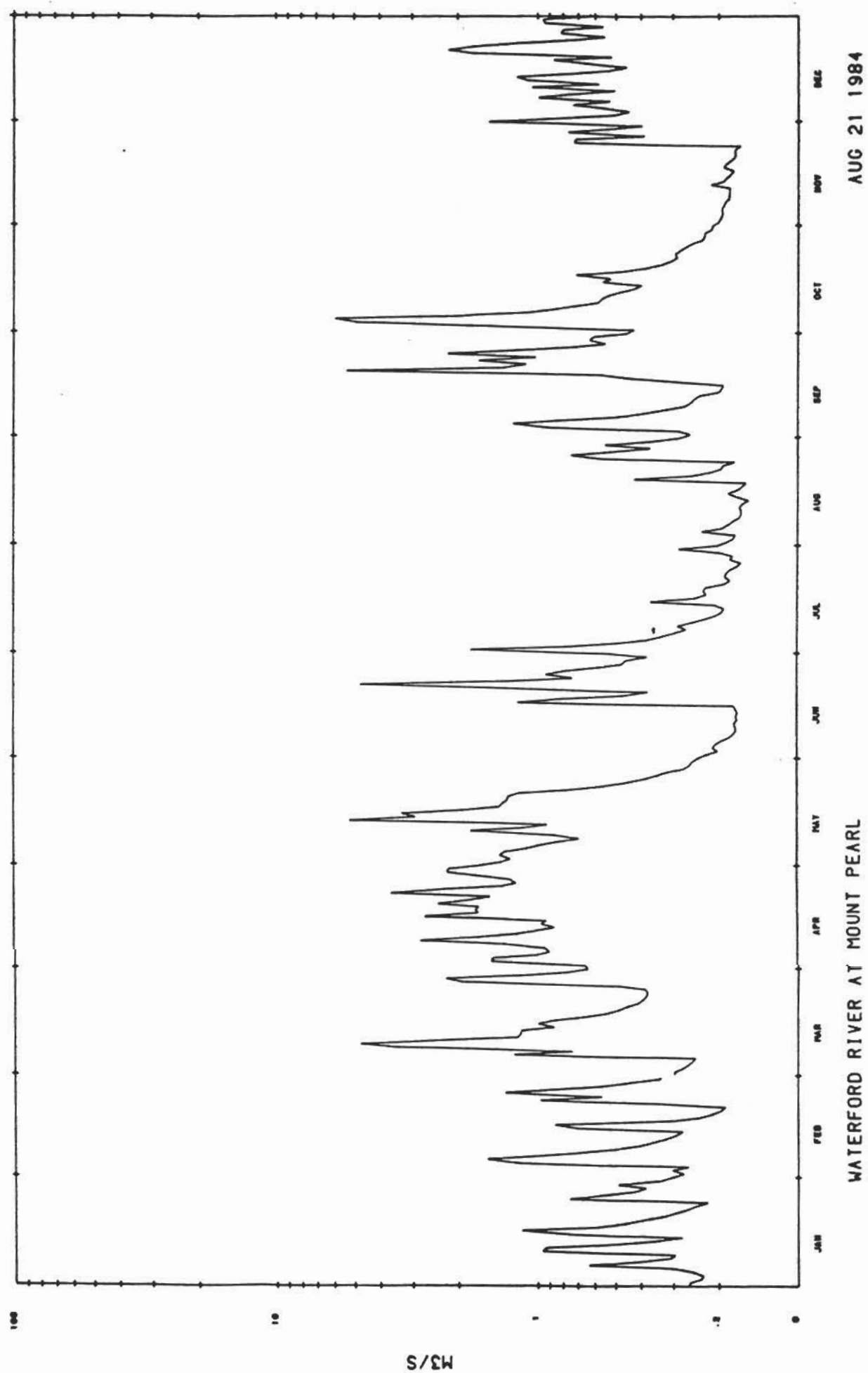
MEAN, 0.730
MAXIMUM DAILY, 5.90 ON OCT 4
MINIMUM DAILY, 0.123 ON AUG 13
MAXIMUM INSTANTANEOUS,
11.0 AT 00:19 NST ON OCT 4

B - ICE CONDITIONS

MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

JAN	1 200	JUL	807
FEB	1 340	AUG	658
MAR	2 710	SEP	2 110
APR	4 130	OCT	2 250
MAY	3 220	NOV	789
JUN	1 520	DEC	2 280

TOTAL DISCHARGE, 23 000 DAM3


WATER SURVEY OF CANADA
DISCHARGE HYDROGRAPH FOR 1982
STATION NO. 02ZM010
M3/S
100
10
1
.1
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
WATERFORD RIVER AT MOUNT PEARL
AUG 21 1984

WATER SURVEY OF CANADA
AUG 21 1984 PAGE 3
HALIFAX, N.S.

WATERFORD RIVER AT MOUNT PEARL

STATION NO. 02ZM010

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR\ 1983

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.350B	0.420	0.270	0.495	0.331	0.211	0.126	0.205	0.480	0.375	0.789	0.748	1
2	0.270B	0.474	0.211	0.480	0.312	0.383	0.116	0.192	4.29	0.349	0.655	0.559	2
3	0.240B	0.260B	3.21	0.835	0.318	0.500	0.251	0.208	1.62	0.474	0.577	0.462	3
4	0.230B	0.230B	4.69	0.815	0.368	0.287	0.202	0.191	1.51	0.451	0.501	0.488	4
5	0.210B	0.672	2.08	0.830	0.332	0.481	0.176	0.223	0.958	0.350	0.442	0.444	5
6	0.290B	1.67	0.992	1.92	0.339	0.473	0.123	0.176	0.701	0.314	0.416	0.389	6
7	3.37	0.694	0.628	1.02	0.289	0.336	0.104	0.161	0.573	0.418	0.623	0.384	7
8	1.36	0.448	0.482	0.701	0.237	0.420	0.534	0.207	0.510	0.346	0.781	1.25	8
9	0.982	1.25	0.420B	0.670	0.401	0.430	0.328	0.173	0.434	0.288	0.544	0.679	9
10	0.501	1.19	0.418	0.597	0.493	0.327	0.248	0.170	0.932	0.280	0.511	0.528	10
11	0.370B	0.566	0.400	0.498	0.423	1.23	0.270	0.181	1.08	0.254	0.409	0.380B	11
12	0.902	0.330B	0.677	0.711	0.332	1.03	0.240	0.159	0.652	0.226	0.683	0.330B	12
13	1.48	0.260B	2.88	2.27	0.376	0.544	0.248	0.446	0.490	0.215	0.713	0.300B	13
14	2.09	0.230B	2.97	1.72	0.367	0.410	0.235	0.326	0.566	0.225	0.536	0.601	14
15	3.27	0.202B	2.39	0.905	0.663	0.351	0.279	0.230	1.50	0.832	0.416	1.17	15
16	1.08 B	0.182B	1.17	0.709	0.634	0.296	0.483	0.307	1.65	0.562	0.375	0.995	16
17	2.02	0.165B	0.755	0.610	0.437	0.277	0.520	0.965	0.831	0.420	0.325	0.775	17
18	2.17	0.152B	0.675	1.06	0.385	0.259	0.321	0.397	0.610	0.355	4.71	0.568	18
19	1.52	0.140B	0.685	1.45	0.340	0.216	0.234	0.309	0.540	0.427	2.66	0.402	19
20	1.04	0.130B	0.819	2.52	0.250	0.215	0.205	1.01	0.480	2.04	1.25	0.301	20
21	0.717	0.122B	3.94	1.61	0.224	0.232	0.220	0.821	0.382	1.11	0.914	0.243	21
22	0.390B	0.114B	2.34	0.976	0.250	0.236	0.192	0.592	0.346	0.685	0.815	0.220B	22
23	0.330B	0.109B	2.94	0.828	0.272	0.196	0.755	0.436	0.323	2.18	0.831	0.215B	23
24	0.370B	0.103B	2.45	0.696	0.257	0.169	0.366	0.392	0.652	2.33	0.794	0.205B	24
25	0.560B	0.100B	1.48	0.593	0.218	0.130	0.648	0.338	0.549	1.19	0.646	0.299	25
26	0.400B	0.219	3.45	0.519	0.211	0.248	0.871	0.284	0.419	7.76	0.831	0.291	26
27	0.320B	0.309	2.36	0.460	0.203	0.229	0.558	0.255	0.339	3.49	0.772	0.253	27
28	0.240B	0.331	1.24	0.456	0.187	0.215	0.421	0.925	0.317	2.48	0.666	0.210B	28
29	0.220B		0.826	0.427	0.257	0.171	0.319	0.666	0.297	2.10	0.532	1.00	29
30	0.210B		0.703	0.378	0.251	0.133	0.307	0.482	0.478	1.48	0.740	2.65	30
31	0.185B		0.599		0.231		0.286	0.427		1.05		1.22	31
TOTAL	27.687	11.072	49.150	27.759	10.188	10.635	10.187	11.854	24.509	35.056	25.457	18.559	TOTAL
MEAN	0.893	0.395	1.59	0.925	0.329	0.355	0.329	0.382	0.817	1.13	0.849	0.599	MEAN
MAX	3.37	1.67	4.69	2.52	0.663	1.23	0.871	1.01	4.29	7.76	4.71	2.65	MAX
MIN	0.185	0.100	0.211	0.378	0.187	0.130	0.104	0.159	0.297	0.215	0.325	0.205	MIN

SUMMARY FOR THE YEAR 1983

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 0.718
MAXIMUM DAILY, 7.76 ON OCT 26
MINIMUM DAILY, 0.100B ON FEB 25
MAXIMUM INSTANTANEOUS,
15.9 AT 13:36 NST ON OCT 26

MONTHLY TOTAL DISCHARGE
IN CUBIC DECAMETRES

JAN	2 370	JUL	880
FEB	957	AUG	1 020
MAR	4 250	SEP	2 120
APR	2 400	OCT	3 030
MAY	880	NOV	2 200
JUN	919	DEC	1 600

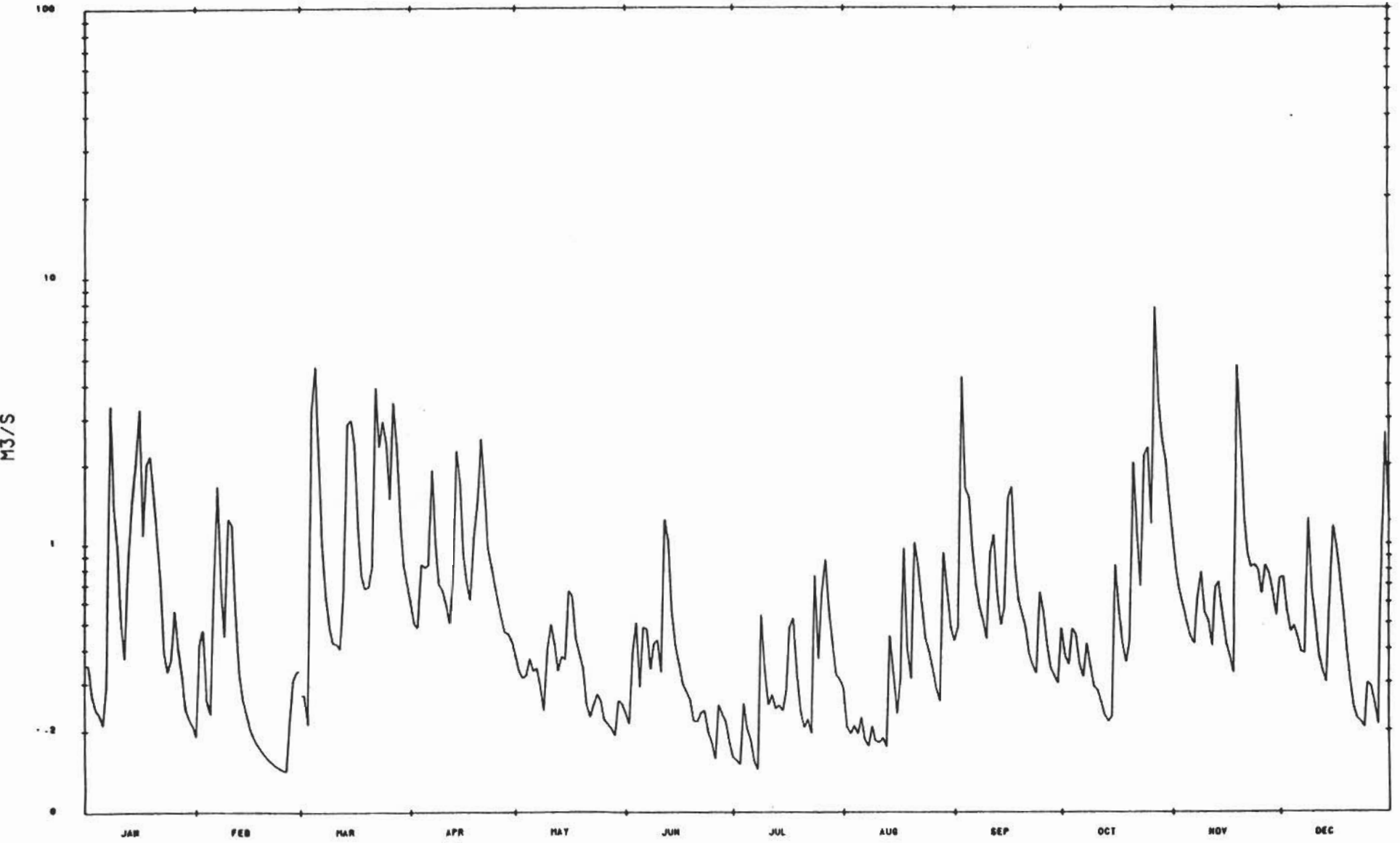
TOTAL DISCHARGE, 22 600 DAM3

B - ICE CONDITIONS

WATER SURVEY OF CANADA

STATION NO. 02ZM010

DISCHARGE HYDROGRAPH FOR 1983



WATERFORD RIVER AT MOUNT PEARL

AUG 21 1984

WATER SURVEY OF CANADA
AUG 23 1985 PAGE 16
HALIFAX, N.S. 08:30

WATERFORD RIVER AT MOUNT PEARL

STATION NO. 02ZM010

(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1984

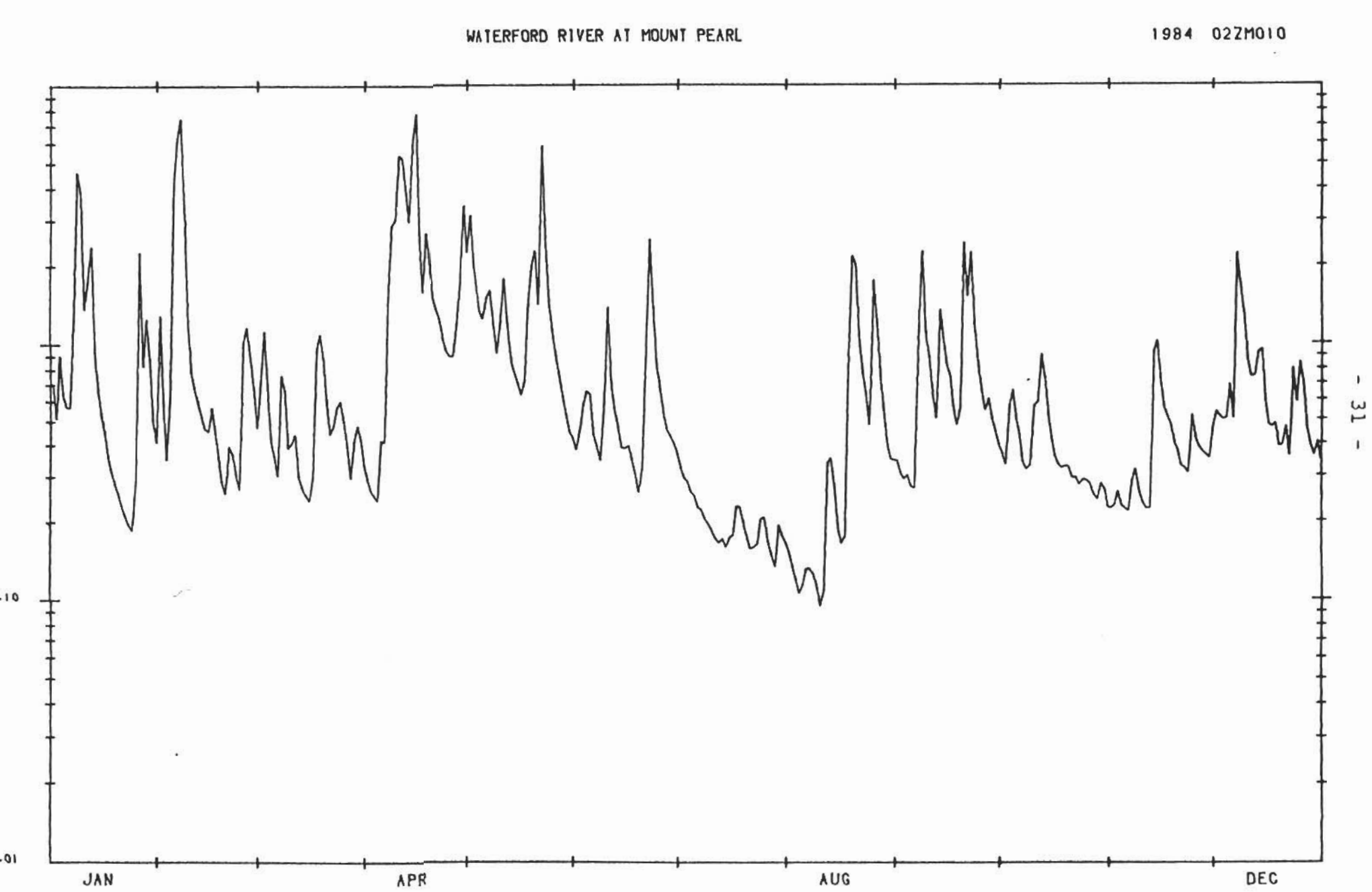
DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.702	1.29	0.720	0.290 B	3.13	0.378	0.322	0.151	0.343	0.366	0.224	0.540	1
2	0.510	0.577	1.12	0.262 B	2.04	0.456	0.293	0.133	0.307	0.330	0.230	0.515	2
3	0.907	0.348	0.669	0.250 B	1.65	0.579	0.285	0.119	0.290	0.566	0.260	0.500	3
4	0.641	0.617	0.420 B	0.240 B	1.34	0.652	0.259	0.105	0.301	0.656	0.229	0.505	4
5	0.570	4.10	0.360 B	0.415	1.24	0.631	0.251	0.113	0.271	0.507	0.224	0.694	5
6	0.565	6.18	0.300 B	0.410	1.50	0.438	0.225	0.131	0.268	0.432	0.218	0.501	6
7	1.24	7.47	0.759	1.51	1.60	0.392	0.222	0.131	1.18	0.339	0.286	2.24	7
8	4.64	3.35	0.656	2.86	1.20	0.343	0.204	0.125	2.28	0.316	0.318	1.68	8
9	3.87	1.31	0.385 B	3.01	0.913	0.592	0.195	0.113	1.09	0.329	0.262	1.31	9
10	1.36	0.786	0.405 B	5.38	1.20	1.38	0.183	0.094	0.879	0.569	0.235	0.871	10
11	1.74	0.671	0.440 B	5.26	1.78	0.695	0.171	0.108	0.624	0.587	0.223	0.738	11
12	2.39	0.590 B	0.300 B	3.97	1.18	0.549	0.164	0.336	0.504	0.907	0.224	0.745	12
13	0.942	0.520 B	0.268 B	2.96	0.863	0.466	0.171	0.351	1.35	0.740	0.927	0.925	13
14	0.660	0.463	0.252 B	5.98 A	0.772	0.385	0.158	0.271	1.04	0.522	1.02	0.947	14
15	0.531	0.451	0.240 B	7.80 E	0.699	0.383	0.173	0.187	0.829	0.415	0.726	0.596	15
16	0.447	0.567	0.300 B	2.50 E	0.627	0.394	0.176	0.163	0.753	0.356	0.561	0.474	16
17	0.360 B	0.453	0.955	1.58 E	0.716	0.346	0.228	0.174	0.568	0.330	0.511	0.463	17
18	0.315 B	0.358	1.09	2.70 A	1.41	0.304	0.228	0.921	0.475	0.321	0.474	0.482	18
19	0.280 B	0.284	0.872	2.16	1.99	0.257	0.197	2.18	0.554	0.325	0.402	0.389	19
20	0.255 B	0.256	0.586	1.52	2.29	0.318	0.174	2.03	2.46	0.325	0.375	0.391	20
21	0.230 B	0.396	0.437	1.36	1.41	0.884	0.156	1.07	1.51	0.292	0.326	0.468	21
22	0.210 B	0.367	0.475	1.24	5.83	2.53	0.158	0.777	2.26	0.294	0.320	0.356	22
23	0.195 B	0.304	0.563	1.04	2.56	1.37	0.163	0.634	1.18	0.275	0.305	0.805	23
24	0.185 B	0.266	0.598	0.935	1.46	0.825	0.204	0.473	0.816	0.289	0.521	0.583	24
25	0.292	1.01	0.496	0.892	1.12	0.669	0.207	1.76	0.648	0.287	0.421	0.849	25
26	2.27	1.16	0.397	0.890	0.886	0.532	0.165	1.19	0.544	0.278	0.386	0.704	26
27	0.819	0.903	0.293	1.19	0.742	0.454	0.147	0.747	0.608	0.253	0.371 B	0.461	27
28	1.25	0.665	0.415	1.69	0.611	0.428	0.133	0.542	0.502	0.242	0.360 B	0.392	28
29	0.865	0.466	0.477	3.41	0.523	0.399	0.193	0.399	0.449	0.279	0.350 B	0.358	29
30	0.505		0.416	2.25	0.446	0.365	0.175	0.347	0.397	0.266	0.466	0.408	30
31	0.408		0.330 B		0.421		0.165	0.344		0.225		0.343	31
TOTAL	30.154	36.178	15.994	65.954	44.149	18.394	6.145	16.219	25.280	12.218	11.755	21.233	TOTAL
MEAN	0.973	1.25	0.516	2.20	1.42	0.613	0.198	0.523	0.843	0.394	0.392	0.685	MEAN
DAM3	2610	3130	1380	5700	3810	1590	531	1400	2180	1060	1020	1830	DAM3
MAX	4.64	7.47	1.12	7.80	5.83	2.53	0.322	2.18	2.46	0.907	1.02	2.24	MAX
MIN	0.185	0.256	0.240	0.240	0.421	0.257	0.133	0.094	0.268	0.225	0.218	0.343	MIN

SUMMARY FOR THE YEAR 1984

MEAN DISCHARGE, 0.830 M3/S
TOTAL DISCHARGE, 26200 DAM3
MAXIMUM DAILY DISCHARGE, 7.80 M3/S ON APR 15
MINIMUM DAILY DISCHARGE, 0.094 M3/S ON AUG 10

MAXIMUM INSTANTANEOUS DISCHARGE, M3/S AT ON

A-MANUAL GAUGE
B-ICE CONDITIONS
E-ESTIMATED


WATERFORD RIVER AT MOUNT PEARL
1984 02ZM010
JAN
APR
AUG
DEC

2.1.3 Waterford River Near Donovans Industrial Park (02ZM011)

This station was established in May 1981 on the downstream end of an abandoned bridge abutment on the right bank of the river. This gauge monitors the outflow from an 11.4 km^2 area of the upper watershed. This gauge was plagued by vandalism which accounts for the greatest loss of record of the three gauges on the Waterford. Much of this loss was due to vandalism of the power meter which consequently cut power to the clock. This problem was eventually overcome through negotiations with the power utility on a blanket rate charge. A graph of the stage discharge curves is shown in Figure 2.3.

Following the stage discharge curves, the mean daily discharge is presented as printouts and hydrographs for the period 1981 through 1984.

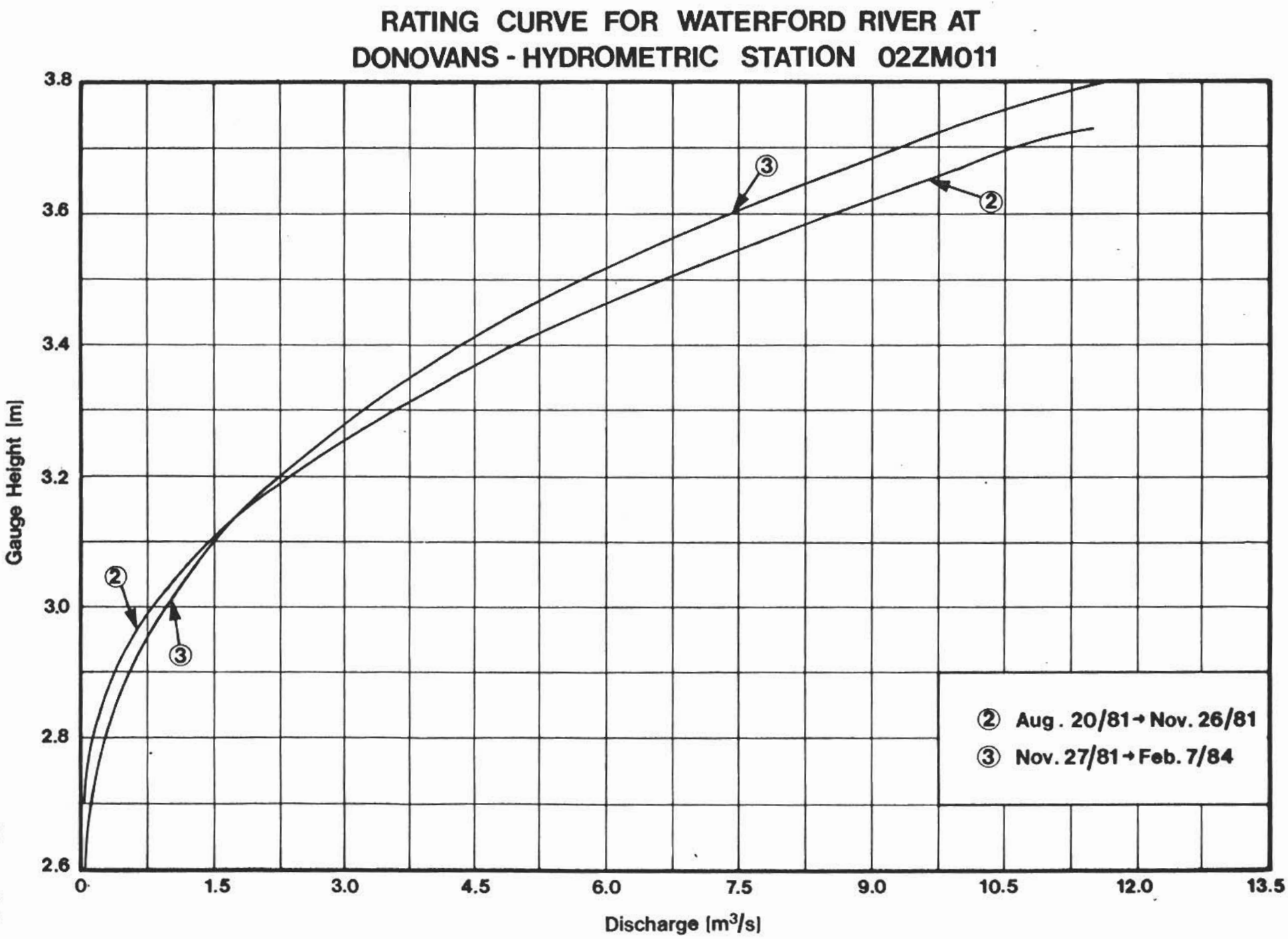

RATING CURVE FOR WATERFORD RIVER AT
DONOVANS - HYDROMETRIC STATION 02ZM011
Gauge Height [m]
3.8
3.6
3.4
3.2
3.0
2.8
2.6
0
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
Discharge [m³/s]
② Aug. 20/81 → Nov. 26/81
③ Nov. 27/81 → Feb. 7/84

Figure 2.2

WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

STATION NO. 02ZM011

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1981

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	---	---	---	---	---	0.047	0.062	0.056	0.097	0.520E	0.222	0.212A	1
2	---	---	---	---	---	0.039	0.038	0.044	0.105	0.370E	0.194	0.163E	2
3	---	---	---	---	---	0.026	0.032	0.036	0.103	0.186E	0.180	0.124E	3
4	---	---	---	---	---	0.020	0.026	0.035	0.103E	0.330E	0.144	0.118E	4
5	---	---	---	---	---	0.018	0.119	0.081	0.102E	0.844A	0.119	0.115E	5
6	---	---	---	---	0.336A	0.017	0.102	0.063	0.100E	0.442	0.101	0.300E	6
7	---	---	---	---	0.156	0.062	0.225	0.106	0.150E	0.350A	0.294	0.860E	7
8	---	---	---	---	0.138	0.537	0.132	0.095	0.500E	0.637A	2.18	0.600E	8
9	---	---	---	---	0.106	0.167	1.90	0.078	0.310E	0.518	0.654	0.460E	9
10	---	---	---	---	0.081	0.487	0.946	0.063	0.250E	4.26	0.282	0.494A	10
11	---	---	---	---	0.067	0.824	0.325	0.055	0.229A	2.79	0.188	0.686	11
12	---	---	---	---	0.056	0.486	0.323	0.047	2.20	4.00	0.181	0.448	12
13	---	---	---	---	0.049	0.219	0.316	0.088	0.884	1.48 A	0.143A	0.249A	13
14	---	---	---	---	0.044	0.209A	0.197	0.352	0.698	0.799	0.096E	0.186E	14
15	---	---	---	---	0.040	0.111	0.834	0.126	0.471	0.539	0.078E	0.260E	15
16	---	---	---	---	0.039	0.106	0.775	0.083	0.396	0.429	0.130E	0.891A	16
17	---	---	---	---	0.032	0.077	0.316	0.076	1.26	4.80	0.223E	0.835	17
18	---	---	---	---	0.029	0.091	0.176	0.484	0.744	3.25	0.170E	0.314	18
19	---	---	---	---	0.029	0.106	0.133	0.551	0.456	1.33	0.340E	0.239	19
20	---	---	---	---	0.023	0.076	0.113	0.358	1.14	0.719	0.270E	0.305	20
21	---	---	---	---	0.019	0.068	0.107	0.259	0.665A	0.456	0.170E	0.214	21
22	---	---	---	---	0.016	0.251	0.099	0.204A	0.294E	0.314	0.440E	0.158	22
23	---	---	---	---	0.014	0.203	0.096	0.165E	0.220E	0.249	0.350E	0.155	23
24	---	---	---	---	0.105	0.106	0.077	0.182A	1.60 E	0.203	0.240E	0.128	24
25	---	---	---	---	0.100	0.063	0.066	0.487	2.16 E	0.174	0.170E	0.107B	25
26	---	---	---	---	0.078	0.043	0.055	0.428	1.10 E	0.159	7.78 E	0.096B	26
27	---	---	---	---	0.053	0.031	0.049	0.199	0.800E	0.221	2.79 A	0.084B	27
28	---	---	---	---	0.041	0.047	0.053	0.152	0.400E	1.00	0.786A	0.075B	28
29	---		---	---	0.031	0.090	0.057	0.127	0.250E	1.75	0.494E	0.067B	29
30	---		---	---	0.025	0.084	0.044	0.112	0.750E	0.613	0.319A	0.062B	30
31	---		---		0.031		0.053	0.103		0.309		0.078B	31
TOTAL	---	---	---	---	---	4.711	7.846	5.295	18.537	34.041	19.728	9.083	TOTAL
MEAN	---	---	---	---	---	0.157	0.253	0.171	0.618	1.10	0.658	0.293	MEAN
MAX	---	---	---	---	---	0.824	1.90	0.551	2.20	4.80	7.78	0.891	MAX
MIN	---	---	---	---	---	0.017	0.026	0.035	0.097	0.159	0.078	0.062	MIN

SUMMARY FOR THE YEAR 1981

DISCHARGES IN CUBIC METRES PER SECOND

MAXIMUM INSTANTANEOUS,
11.3 ON NOV 26

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

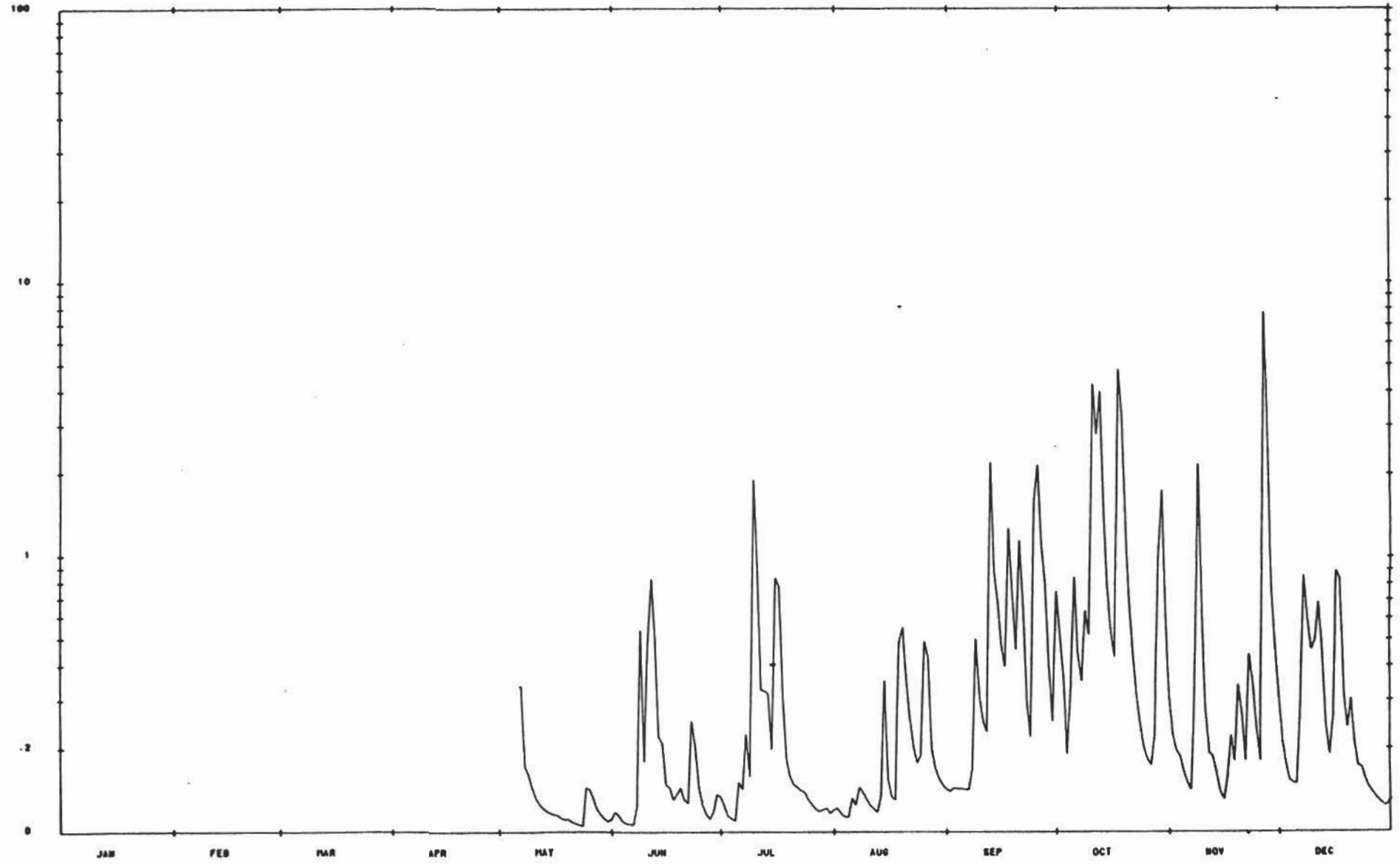
MONTHLY TOTAL DISCHARGE
IN CUBIC DECAMETRES

JAN	---	JUL	678
FEB	---	AUG	457
MAR	---	SEP	1 600
APR	---	OCT	2 940
MAY	---	NOV	1 700
JUN	407	DEC	785

WATER SURVEY OF CANADA

STATION NO. 02ZM011

DISCHARGE HYDROGRAPH FOR 1981



WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

AUG 21 1984

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WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

STATION NO. 02ZM011

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.234	0.265B	0.240B	0.420	1.01	0.185E	1.16	0.105	0.227	0.375	0.163	0.651	1
2	0.160	0.260B	0.210B	0.976	0.910	0.175E	0.549	0.092	0.240	1.08	0.158	0.381	2
3	0.151	0.258B	0.195B	0.959	0.955	0.173E	0.333	0.098	0.775	3.50	0.153	0.324	3
4	0.151	0.901	0.185B	0.578	0.920	0.161A	0.264	0.149	1.12	4.29	0.159	0.409	4
5	0.273A	1.06	0.175B	0.565	0.743	0.138	0.214	0.119	0.837	1.66	0.161	0.583	5
6	0.310E	0.765	0.110B	0.577	0.635	0.124	0.185	0.104	0.468	0.894	0.158	0.408	6
7	0.300E	0.562	1.16	0.819	0.511	0.117	0.173	0.098	0.367	0.704	0.144	0.820	7
8	0.220E	0.380	2.82	1.94	0.414	0.112	0.189	0.092	0.304	0.571	0.147	0.656	8
9	0.180E	0.230B	3.45	1.21	0.505	0.113	0.167	0.090	0.258	0.470	0.143	0.553	9
10	0.700E	0.200B	1.71	0.821	1.21	0.116	0.162	0.086	0.237	0.450	0.139	1.03	10
11	0.600E	0.170B	0.933	0.701	0.748	0.116	0.142	0.086	0.223	0.429	0.129	0.657	11
12	0.470E	0.155B	0.794A	0.570	0.559	0.112	0.129	0.083	0.210	0.405	0.129	0.933	12
13	0.330E	0.145B	0.722	0.664	3.06	0.109	0.122	0.079	0.200	0.345	0.131	1.06	13
14	0.250E	0.175B	0.540	0.657	1.91	0.103	0.147	0.103	0.191	0.325	0.163	0.625	14
15	0.500E	0.340B	0.649	1.95	2.22	0.097	0.273	0.115	0.179	0.460	0.145	0.448	15
16	0.900E	0.220B	0.591	1.14	1.32	0.640	0.182	0.105	0.268	0.457	0.140	0.419	16
17	0.460E	0.185B	0.453	1.16	0.958	0.533	0.152	0.093	0.426	0.616	0.140	0.518	17
18	0.350E	0.170B	0.380	1.15	0.933	0.294	0.157	0.090	0.477	0.410	0.134	0.740	18
19	0.300B	0.159B	0.336	1.63	0.866	0.214	0.165	0.346	4.07	0.316	0.124	0.485	19
20	0.250B	0.150B	0.290	1.31	0.645A	0.713	0.135	0.223	1.16	0.276	0.122	1.22	20
21	0.220B	0.200B	0.274	0.994	0.550E	3.17	0.120	0.181	0.845	0.267A	0.122	1.91	21
22	0.200B	0.900B	0.260	2.44	0.500E	0.954	0.126	0.153	1.39	0.243	0.126	1.56	22
23	0.185B	0.500B	0.259	1.63	0.440E	0.503	0.126	0.142	0.871	0.229	0.128	1.07	23
24	0.175B	1.00 B	0.280	0.934	0.400E	0.597	0.117	0.128	1.69	0.216	0.544	0.613	24
25	0.552	0.700B	0.277	0.764	0.365E	0.547	0.104	0.447	1.04	0.214	0.601	0.454	25
26	0.433	0.500B	0.300	0.824	0.330E	0.425	0.097	0.589	0.621	0.201	0.307	0.622	26
27	0.326	0.400B	1.31	1.14	0.280E	0.322	0.100	0.456	0.469	0.173	0.560	0.680	27
28	0.350B	0.280B	1.54	1.51	0.255E	0.321	0.102	0.309	0.533	0.167	0.411	0.655	28
29	0.400B		0.990	1.59	0.235E	0.266	0.113	0.502	0.539	0.173	0.299	0.716	29
30	0.320B		0.663	1.18	0.215E	0.339	0.188	0.319	0.380	0.161	1.21	0.737	30
31	0.285B		0.431		0.200E		0.132	0.253		0.165		0.539	31
TOTAL	10.535	11.230	22.527	32.803	24.802	11.789	6.325	5.835	20.615	20.242	7.190	22.476	TOTAL
MEAN	0.340	0.401	0.727	1.09	0.800	0.393	0.204	0.188	0.687	0.653	0.240	0.725	MEAN
MAX	0.900	1.06	3.45	2.44	3.06	3.17	1.16	0.589	4.07	4.29	1.21	1.91	MAX
MIN	0.151	0.145	0.110	0.420	0.200	0.097	0.097	0.079	0.179	0.161	0.122	0.324	MIN

SUMMARY FOR THE YEAR 1982

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 0.538
MAXIMUM DAILY, 4.29 ON OCT 4
MINIMUM DAILY, 0.079 ON AUG 13
MAXIMUM INSTANTANEOUS,
6.87 AT 01:01 NST ON OCT 4

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

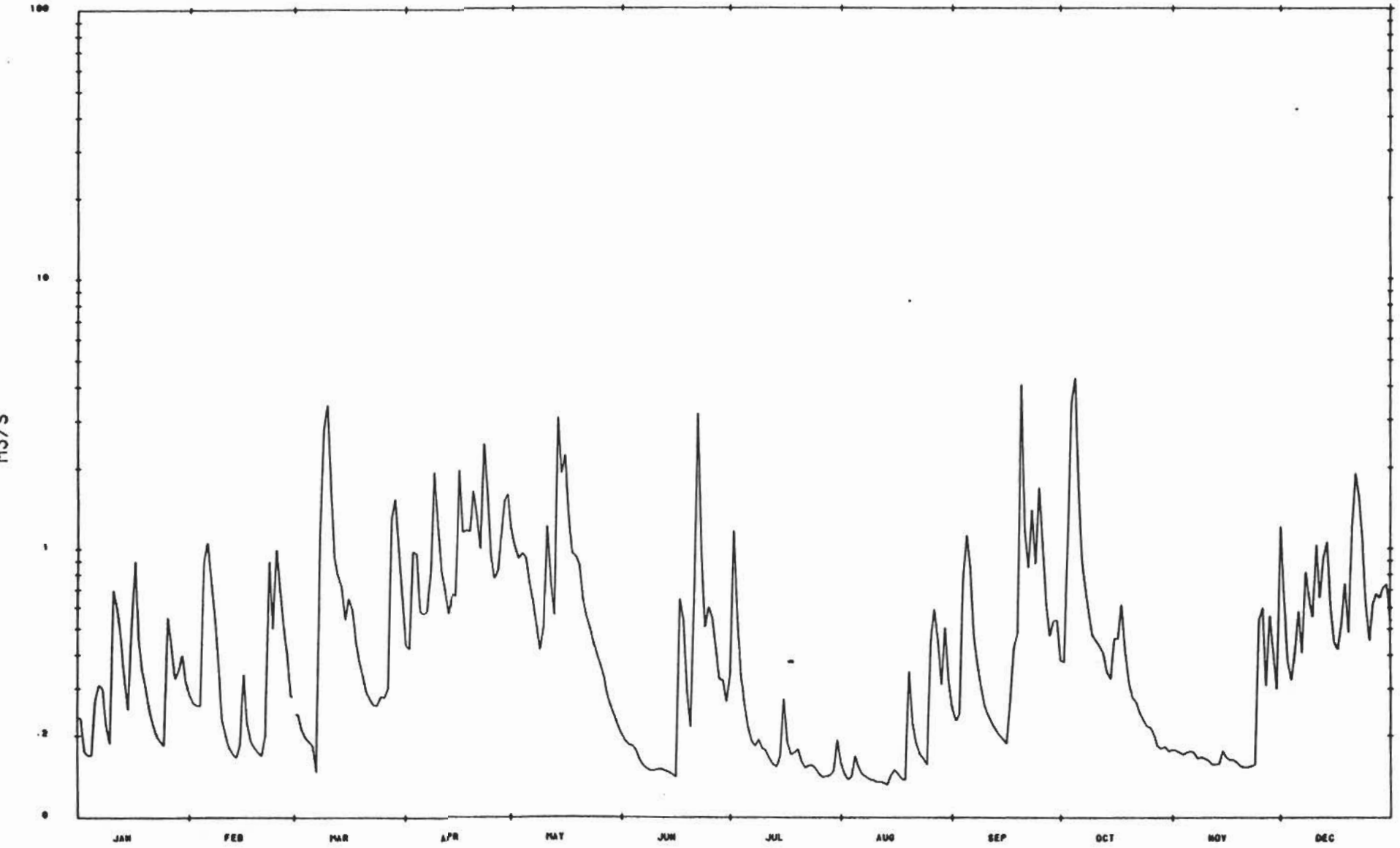
JAN	910	JUL	546
FEB	970	AUG	504
MAR	1 950	SEP	1 780
APR	2 830	OCT	1 750
MAY	2 140	NOV	621
JUN	1 020	DEC	1 940

TOTAL DISCHARGE, 17 000 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM011

DISCHARGE HYDROGRAPH FOR 1982



WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

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WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

STATION NO. 02ZM011

DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1983

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.220B	0.230B	0.160B	0.380E	0.233	0.207	0.098	0.131	0.460	0.270	0.520	0.405	1
2	0.180B	0.320B	0.145B	0.330E	0.226	0.314	0.092	0.115	3.05	0.230	0.460	0.280	2
3	0.163B	0.200B	1.00 B	0.560E	0.220	0.466	0.158	0.118	1.50	0.245	0.410	0.252	3
4	0.152B	0.152B	3.62 A	0.555E	0.263	0.296	0.135	0.122	0.950	0.230	0.350	0.338	4
5	0.142B	0.583	1.50 E	0.580E	0.230	0.417	0.117	0.139	0.700	0.200	0.317	0.225	5
6	0.312	1.07	1.00 E	1.52 A	0.255	0.443	0.100	0.121	0.540	0.145	0.310	0.210	6
7	2.10	0.514	0.760E	0.773	0.225	0.329	0.086	0.111	0.440	0.270	0.370	0.411	7
8	0.767	0.378	0.600E	0.536	0.175	0.389	0.310	0.117	0.350	0.230	0.560	1.08	8
9	0.520B	0.845	0.440E	0.489	0.284	0.409	0.180	0.110	0.300	0.197	0.460	0.627	9
10	0.270B	0.788	0.347	0.431	0.386	0.299	0.142	0.113	0.400	0.182	0.360	0.495	10
11	0.240B	0.456	0.249	0.361	0.338	0.868	0.170	0.118	0.725	0.165	0.280	0.250B	11
12	0.622	0.270B	0.420E	0.454	0.264	0.795	0.160	0.100	0.480	0.152	0.360	0.210B	12
13	1.12	0.200B	1.00 E	1.47	0.300	0.438	0.150	0.305	0.340	0.142	0.500	0.170B	13
14	1.48	0.160B	2.00 E	1.20	0.268	0.339	0.142	0.230	0.460	0.190	0.420	0.460	14
15	2.33	0.135B	1.70 E	0.658	0.423	0.262	0.158	0.160	0.660	0.540	0.350	0.840	15
16	0.957	0.118B	1.10 E	0.503	0.456	0.235	0.190	0.200	1.10	0.390	0.290	0.640	16
17	1.36	0.108B	0.680E	0.468	0.321	0.212	0.280	0.660	0.560	0.300	0.235	0.500	17
18	1.48	0.098B	0.500E	0.773	0.277	0.192	0.220	0.330	0.380	0.235	3.14	0.370	18
19	1.03	0.091B	0.480E	0.998	0.246	0.179	0.175	0.210	0.325	0.360	2.30	0.290	19
20	0.693	0.085B	0.700E	1.78	0.201	0.163	0.145A	0.700	0.280	1.32	1.14	0.230	20
21	0.350B	0.080B	2.65 E	1.09	0.194	0.153	0.120E	0.640	0.240	0.800	0.876	0.175	21
22	0.250B	0.076B	1.70 E	0.700	0.195	0.185	0.102E	0.400	0.225	0.460	0.440	0.142B	22
23	0.222B	0.073B	2.00 E	0.615	0.199	0.170	0.440E	0.320	0.215	1.41	0.480	0.128B	23
24	0.260B	0.070B	1.60 E	0.556	0.192	0.158	0.220E	0.270	0.420	1.59	0.422	0.120B	24
25	0.320B	0.088B	1.00 E	0.465	0.172	0.139	0.350A	0.235	0.360	0.800	0.390	0.145B	25
26	0.250B	0.120B	2.30 E	0.412	0.167	0.160	0.560	0.205	0.310	4.56	0.475	0.200B	26
27	0.182B	0.200B	1.60 E	0.344	0.156	0.153	0.380	0.180	0.240	2.88	0.380	0.165B	27
28	0.163B	0.250B	1.00 E	0.346	0.164	0.145	0.250	0.340	0.212	2.19	0.330	0.135B	28
29	0.145B		0.660E	0.333	0.222	0.134	0.180	0.420	0.197	1.40	0.300	0.873	29
30	0.135B		0.521A	0.272	0.240	0.117	0.153	0.330	0.315	1.00	0.400	2.32	30
31	0.128B		0.420E		0.208		0.145	0.290		0.740		1.18	31
TOTAL	18.743	7.758	33.852	19.952	7.700	8.766	6.108	8.142	16.734	23.823	17.625	13.866	TOTAL
MEAN	0.605	0.277	1.09	0.665	0.248	0.292	0.197	0.263	0.558	0.768	0.588	0.447	MEAN
MAX	2.33	1.07	3.62	1.78	0.456	0.868	0.560	0.700	3.05	4.56	3.14	2.32	MAX
MIN	0.128	0.070	0.145	0.272	0.156	0.117	0.086	0.100	0.197	0.142	0.235	0.120	MIN

SUMMARY FOR THE YEAR 1983

DISCHARGES IN CUBIC METRES PER SECOND

MEAN, 0.502
MAXIMUM DAILY, 4.56 ON OCT 26
MINIMUM DAILY, 0.070B ON FEB 24
MAXIMUM INSTANTANEOUS,
7.79 AT 13:59 NST ON OCT 26

A - MANUAL GAUGE
B - ICE CONDITIONS
E - ESTIMATED

MONTHLY TOTAL DISCHARGE IN CUBIC DECAMETRES

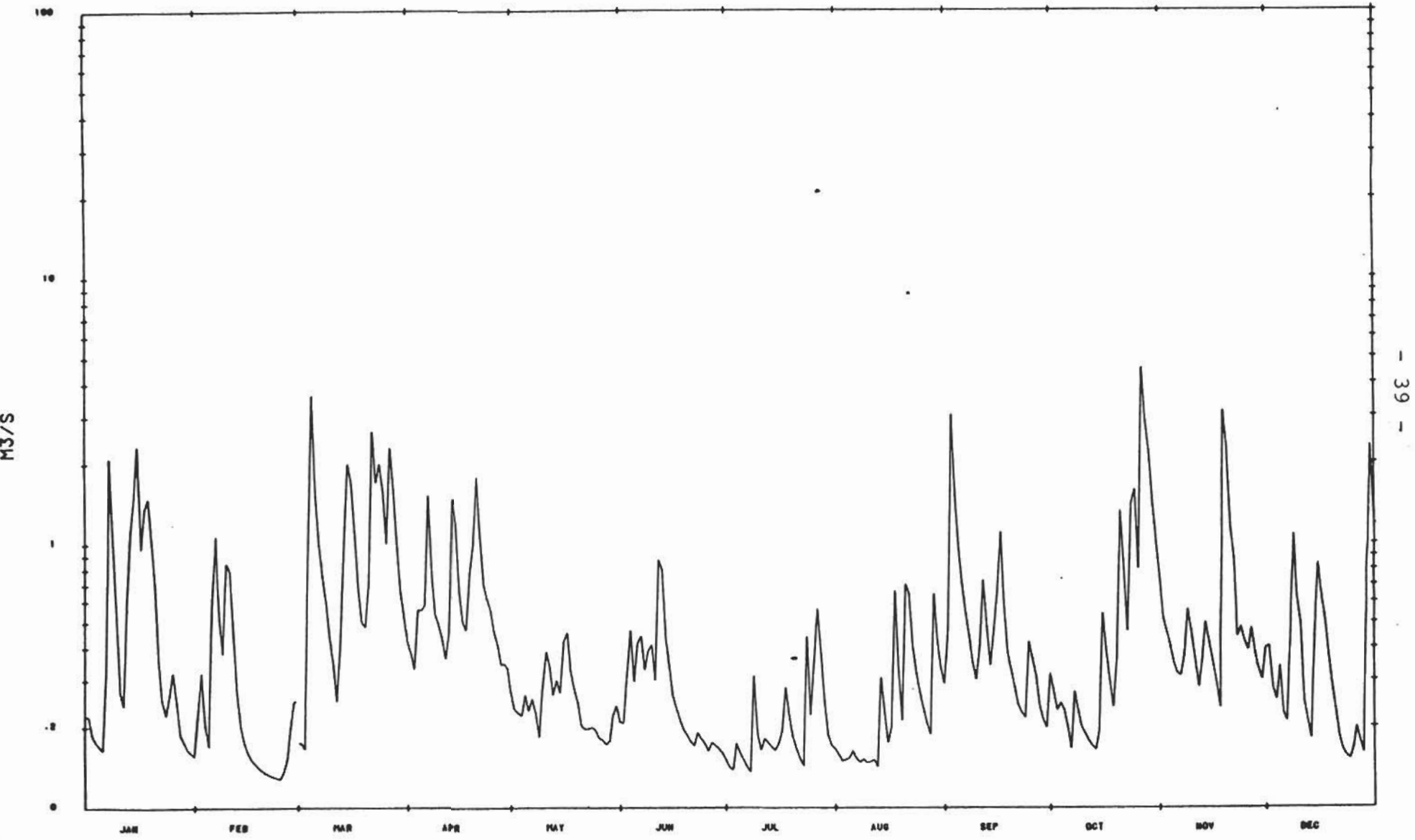
JAN	1 620	JUL	528
FEB	670	AUG	703
MAR	2 920	SEP	1 450
APR	1 720	OCT	2 060
MAY	665	NOV	1 520
JUN	757	DEC	1 200

TOTAL DISCHARGE, 15 800 DAM3

WATER SURVEY OF CANADA

STATION NO. 02ZM011

DISCHARGE HYDROGRAPH FOR 1983



WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

AUG 21 1984

WATER SURVEY OF CANADA
AUG 23 1985 PAGE 11
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WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK

STATION NO. 02ZM011

(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1984

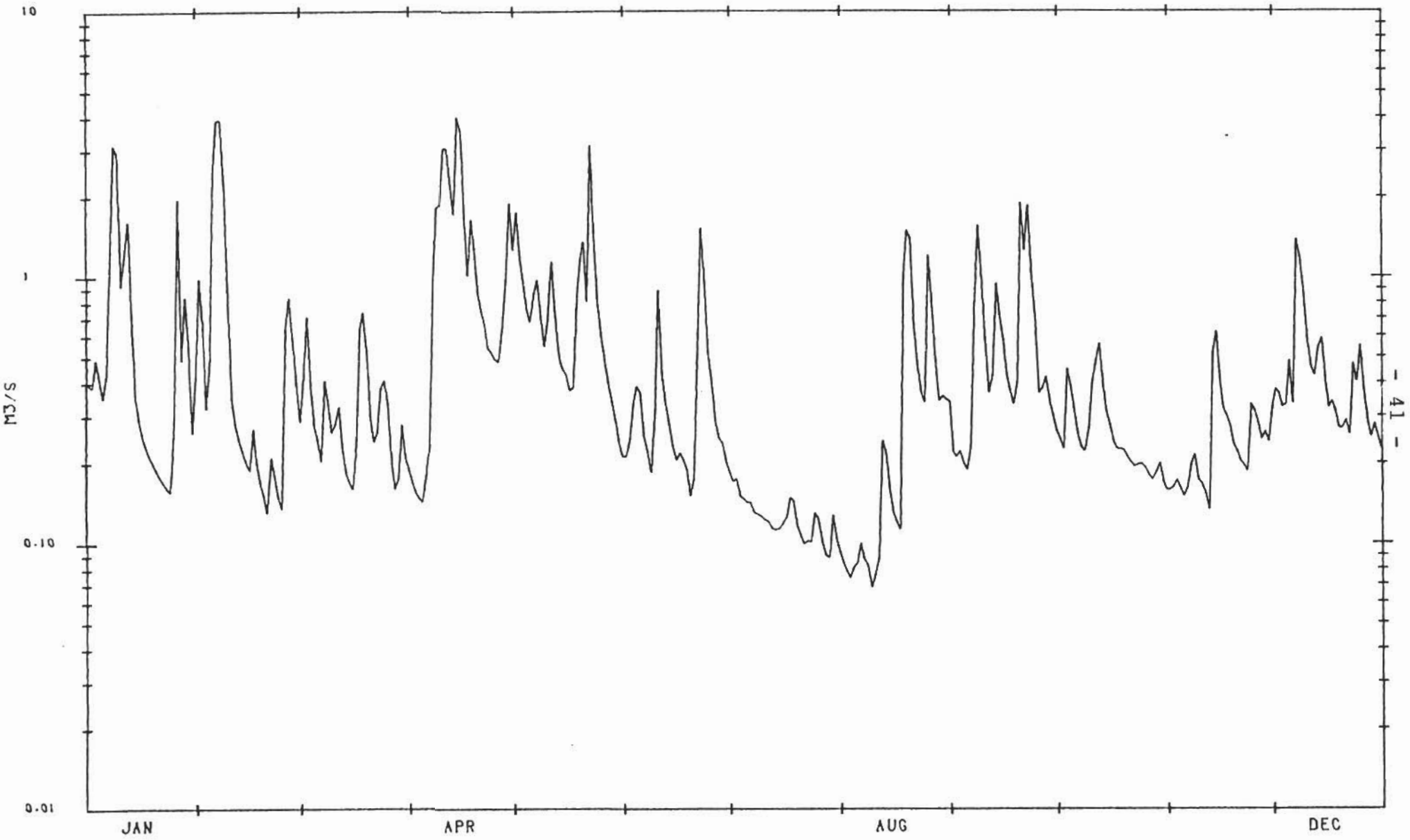
DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.394	0.986	0.431	0.172 B	1.76	0.211	0.170	0.084	0.220	0.245	0.159	0.377	1
2	0.383	0.637	0.711	0.156 B	1.20	0.246	0.175	0.078	0.210	0.225	0.163	0.363	2
3	0.489	0.319	0.395	0.148 B	0.964	0.331	0.150	0.074	0.222	0.450	0.173	0.323	3
4	0.420 B	0.491	0.280	0.143 B	0.768	0.388	0.147	0.081	0.200	0.390	0.160	0.328	4
5	0.350 B	2.48	0.247	0.180 B	0.678	0.367	0.142	0.084	0.188	0.320	0.150	0.483	5
6	0.430 B	3.90	0.203 B	0.230 B	0.861	0.254	0.142	0.100	0.230	0.260	0.163	0.331	6
7	1.25	3.94	0.409	0.864	0.978	0.222	0.130	0.087	0.800	0.230	0.198	1.38	7
8	3.15	2.26	0.330 B	1.81	0.708	0.184	0.128	0.082	1.56	0.220	0.215	1.18	8
9	2.94	0.895	0.260 B	1.86	0.546	0.315	0.126	0.068	1.00	0.270	0.174	0.861	9
10	0.920	0.350 B	0.280 B	3.07	0.715	0.889	0.122	0.076	0.580	0.400	0.167	0.580	10
11	1.20	0.280 B	0.325 B	3.05	1.15	0.434	0.120	0.088	0.365	0.480	0.154	0.461	11
12	1.62	0.245 B	0.230 B	2.27	0.704	0.332	0.113	0.242	0.425	0.560	0.133	0.423	12
13	0.700	0.222 B	0.185 B	1.72	0.501	0.281	0.112	0.220	0.940	0.390	0.511	0.541	13
14	0.360 B	0.200 B	0.170 B	4.02	0.452	0.231	0.113	0.160	0.720	0.310	0.620	0.586	14
15	0.290 B	0.188 B	0.160 B	3.55	0.430	0.205	0.119	0.130	0.580	0.275	0.417	0.414	15
16	0.255 B	0.270 B	0.248	1.67	0.375	0.218	0.125	0.120	0.430	0.240	0.319	0.320 B	16
17	0.230 B	0.200 B	0.627	1.01	0.383	0.205	0.148	0.112	0.375	0.225	0.300	0.340 B	17
18	0.213 B	0.170 B	0.736	1.65	0.784	0.189	0.144	1.00	0.330	0.224	0.275	0.311	18
19	0.200 B	0.152 B	0.516	1.28	1.16	0.151	0.116	1.50	0.400	0.223	0.234	0.270	19
20	0.188 B	0.130 B	0.300 B	0.875	1.36	0.174	0.107	1.40	1.90	0.210	0.221	0.269	20
21	0.178 B	0.210 B	0.240 B	0.748	0.806	0.509	0.099	0.660	1.25	0.200	0.203	0.289	21
22	0.169 B	0.180 B	0.260 B	0.661	3.14	1.53	0.102	0.460	1.86	0.193	0.196	0.255	22
23	0.162 B	0.150 B	0.380	0.540	1.47	0.950	0.101	0.370	1.04	0.197	0.186	0.470	23
24	0.156 B	0.135 B	0.409	0.524	0.827	0.517	0.130	0.335	0.689	0.198	0.331	0.402	24
25	0.300 B	0.631	0.337	0.492	0.616	0.399	0.123	1.20	0.365	0.192	0.314	0.550	25
26	1.97	0.833	0.210 B	0.479	0.484	0.289	0.102	0.800	0.380	0.180	0.282	0.380 B	26
27	0.485 B	0.587	0.160 B	0.640	0.399	0.248	0.090	0.480	0.420	0.173	0.244	0.290 B	27
28	0.840	0.393	0.175 B	0.976	0.337	0.238	0.088	0.340	0.340	0.185	0.262	0.250 B	28
29	0.540 B	0.285	0.280 B	1.90	0.286	0.202	0.127	0.355	0.300	0.200	0.240 B	0.280 B	29
30	0.260 B		0.210 B	1.26	0.236	0.184	0.104	0.345	0.265	0.170	0.321	0.250 B	30
31	0.420 B		0.190 B		0.211		0.093	0.339		0.158		0.225 B	31
TOTAL	21.462	21.719	9.894	37.948	25.289	10.893	3.808	11.470	18.584	8.193	7.485	13.782	TOTAL
MEAN	0.692	0.749	0.319	1.26	0.816	0.363	0.123	0.370	0.619	0.264	0.250	0.445	MEAN
DAM3	1850	1880	855	3280	2180	941	329	991	1610	708	647	1190	DAM3
MAX	3.15	3.94	0.736	4.02	3.14	1.53	0.175	1.50	1.90	0.560	0.620	1.38	MAX
MIN	0.156	0.130	0.160	0.143	0.211	0.151	0.088	0.068	0.188	0.158	0.133	0.225	MIN

SUMMARY FOR THE YEAR 1984

MEAN DISCHARGE, 0.521 M3/S
TOTAL DISCHARGE, 16500 DAM3
MAXIMUM DAILY DISCHARGE, 4.02 M3/S ON APR 14
MINIMUM DAILY DISCHARGE, 0.068 M3/S ON AUG 9

MAXIMUM INSTANTANEOUS DISCHARGE, M3/S AT ON

B-ICE CONDITIONS


WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK
1984 02ZM011
10
1
0.10
0.01
M3/S
JAN
APR
AUG
DEC

2.2 Selected Discharge Data

In some cases the discharge was not required or available on a continuous basis. Discharge data for stormwater runoff were only required on an event basis, as the direct runoff component of the flow was the thrust of the study on the stormwater catchment. At other locations, instantaneous discharges were required when a water quality sample was taken and continuous discharges were unnecessary. To facilitate these requirements, miscellaneous measurement and event measurement stations were established to fulfil this need.

2.2.1 Waterford River Storm Water Sewer Outfall at Mount Pearl (02ZM012)

This station was established at the outlet of a storm water sewer outfall which drains a 40 Ha suburban neighbourhood of Newtown at a location as shown on Figure 2.0. Initial problems with this station included a large number of cross connections with sanitary sewers. Once this was rectified the station was then made operational.

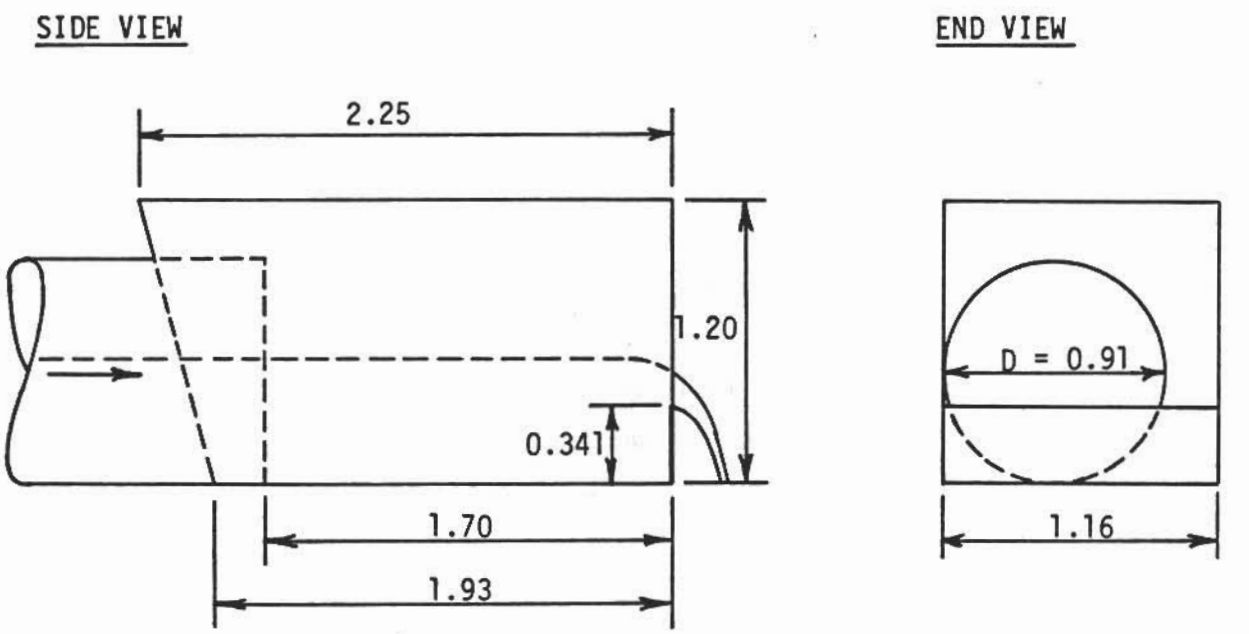
Runoff was monitored continuously at the outfall from the sewer system. For this purpose, a wooden weir box was built at the outfall. In the initial stage, a V-notch weir was used to measure the discharge and later it was replaced by a rectangular weir devised to reduce the rise in the water level at the outlet and the backwater effects in the outlet sewer.

A sketch of the weir box is shown in Figure 2.4. Because this installation of the measuring weir at the outlet is unconventional, it was felt that the standard weir rating equations would not be applicable and the installation should be calibrated. Such a calibration was done using a scale model of the installation in the Hydraulics Laboratory of NWRI.

A model of the Newtown weir was constructed in a scale 1:6.06 and installed in the laboratory. The model weir was then calibrated for a wide range of weir heads which corresponded to the range from 0.06 m to 0.60 m in the prototype. The measured heads and flows were then approximated by the Kindsvatter equation in the following form:

$$Q = \frac{2}{3} C_e \sqrt{2g}\, b_e H_e^{1.5} \qquad (1)$$

where Q is the weir discharge (m^3/s), C_e is the effective coefficient of discharge, b_e is the effective length of the weir



Newtown Measuring Weir Installation

Figure 2.4

crest, H_e weir head (H_e = H + 0.001, where H is the observed weir head in metres), and g is the acceleration due to gravity.

Using the observed weir discharges and weir heads, the following expressions for b_e and C_e were fitted to the experimental data:

b_e = b + 0.0035 H, where b = 1.1571 m is the actual length of the weir crest

C_e = 0.602 + 0.6097 H for H 0.342 m, and

C_e = 0.2791 + 1.5538 H for 0.342 H 0.60m.

Because all the weir heads observed for the Newtown weir were smaller than 0.342 m, only one weir rating curve was used for data processing in the following form:

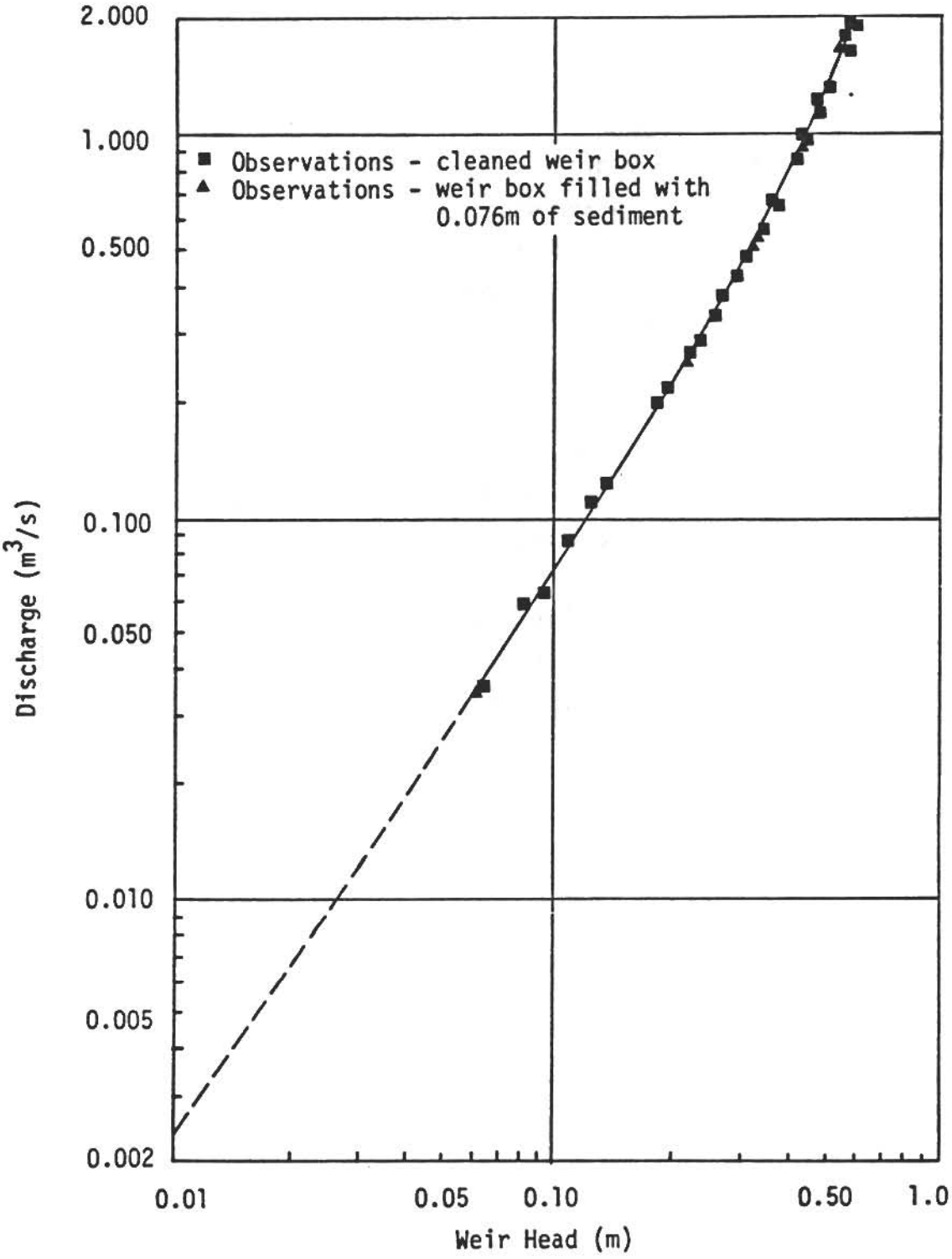
$$Q = 2.953(0.602+0.6097H)(1.1571+0.0035H)(H+0.001)^{1.5} \qquad (2)$$

A somewhat different expression would be obtained for weir heads greater than 0.342 m.

The rating curve for the Newton weir is shown in Figure 2.5 which includes the fitted rating curve as well as the observed points (scaled-up from the model). It was of interest to evaluate the accuracy of the fitted rating curve. For this purpose, the mean absolute value e of the relative deviations of calculated from observed discharges was determined as

$$e = \sum_{i=1}^{N} \left(\frac{Q_{obs_i} - Q_{calc_i}}{Q_{obs_i}} \right) / N \qquad (3)$$

where Q is the discharge, subscripts 'obs' and 'calc' refer to observations and calculations, respectively, N is the total



Newtown Weir Rating Curve
Figure 2.5

number of experimental points, and the subscript i refers to individual points.

For weir heads smaller than 0.324 m, which covers all the measurements taken at the Newtown site so far, the mean value of e was $\pm$ 3.1%. Such an accuracy is quite acceptable. For heads greater than 0.324 m, the error described by eq. (3) increased to $\pm$5.2%, which would be still within the acceptable limits. It was felt that at higher heads and flows, the ability of the weir box to act as a flow control device with a uniquely defined flow rate vs the head relationship was somewhat limited. This led to an increased scatter in experimental data.

The charts from the recorder were sent to Mr. J. Marsalak at National Water Resources Institute (NWRI) in Burlington where the events were selected and the data processed..

The following data represents the discharges for selected events. The data are presented on a varied time increment in order to capture the flashy nature of the flow.

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 9/10/81 TO 16/10/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	0	0	0	0	7	15	22	25	27	32
FLOW(M**3/S)>	0.000	0.000	0.000	0.000	.003	.003	.003	.003	.005	.004
TIME(HR,MIN)>	33	34	37	40	41	44	46	49	49	54
FLOW(M**3/S)>	.008	.010	.012	.006	.009	.011	.016	.021	.016	.027
TIME(HR,MIN)>	54	59	102	103	111	113	114	117	118	120
FLOW(M**3/S)>	.019	.013	.021	.015	.013	.023	.034	.032	.084	.063
TIME(HR,MIN)>	122	123	123	126	127	128	130	133	136	137
FLOW(M**3/S)>	.069	.084	.102	.084	.114	.140	.130	.125	.144	.109
TIME(HR,MIN)>	141	145	146	148	149	153	158	206	210	213
FLOW(M**3/S)>	.077	.063	.063	.063	.058	.053	.069	.054	.043	.044
TIME(HR,MIN)>	216	219	220	223	227	234	260	322	325	334
FLOW(M**3/S)>	.038	.053	.070	.052	.060	.039	.024	.018	.025	.016
TIME(HR,MIN)>	408	449	519	526	530	542	546	550	550	552
FLOW(M**3/S)>	.013	.011	.009	.010	.012	.009	.013	.011	.013	.020
TIME(HR,MIN)>	552	553	554	556	557	559	560	600	606	606
FLOW(M**3/S)>	.038	.053	.066	.047	.062	.052	.035	.042	.044	.036
TIME(HR,MIN)>	609	612	614	615	618	620	621	624	625	628
FLOW(M**3/S)>	.026	.047	.073	.088	.078	.108	.096	.116	.093	.097
TIME(HR,MIN)>	630	634	637	639	641	645	647	649	652	655
FLOW(M**3/S)>	.090	.109	.134	.119	.127	.087	.066	.066	.057	.058
TIME(HR,MIN)>	700	713	715	722	726	750	756	757	760	805
FLOW(M**3/S)>	.046	.037	.037	.030	.031	.022	.021	.024	.021	.020
TIME(HR,MIN)>	810	812	819	824	825	827	830	833	836	847
FLOW(M**3/S)>	.020	.022	.018	.018	.022	.020	.021	.018	.021	.017
TIME(HR,MIN)>	937	1043	1160	1334	1504	1619	1739	1912	0	0
FLOW(M**3/S)>	.013	.010	.009	.007	.006	.005	.004	.004	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 16/10/81 TO 20/10/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	4	28	105	127	143	145	147	149	152	156
FLOW(M**3/S)>	.003	.003	.003	.003	.003	.006	.020	.015	.020	.012
TIME(HR,MIN)>	156	159	160	202	204	206	208	210	212	213
FLOW(M**3/S)>	.016	.012	.022	.013	.009	.007	.020	.011	.007	.008
TIME(HR,MIN)>	215	218	219	222	224	227	230	233	237	237
FLOW(M**3/S)>	.006	.005	.013	.023	.013	.008	.006	.005	.008	.015
TIME(HR,MIN)>	238	239	240	241	244	245	246	248	248	249
FLOW(M**3/S)>	.044	.027	.012	.025	.013	.027	.054	.027	.061	.093
TIME(HR,MIN)>	250	251	253	255	260	304	305	306	307	308
FLOW(M**3/S)>	.066	.081	.053	.033	.023	.017	.035	.059	.039	.087
TIME(HR,MIN)>	311	314	318	321	323	323	324	325	326	329
FLOW(M**3/S)>	.044	.028	.021	.022	.021	.040	.095	.044	.033	.027
TIME(HR,MIN)>	332	333	335	336	337	338	340	342	347	351
FLOW(M**3/S)>	.022	.041	.083	.065	.104	.118	.206	.098	.069	.049
TIME(HR,MIN)>	353	358	401	404	406	415	424	428	429	432
FLOW(M**3/S)>	.055	.043	.036	.038	.032	.026	.021	.023	.027	.021
TIME(HR,MIN)>	441	442	443	446	446	449	450	454	454	455
FLOW(M**3/S)>	.018	.023	.029	.021	.019	.018	.020	.017	.020	.018
TIME(HR,MIN)>	457	458	501	501	505	504	506	508	510	514
FLOW(M**3/S)>	.029	.020	.018	.020	.017	.027	.062	.028	.022	.020
TIME(HR,MIN)>	516	520	522	524	527	533	535	538	543	547
FLOW(M**3/S)>	.037	.024	.020	.023	.012	.018	.019	.018	.023	.021
TIME(HR,MIN)>	551	556	558	601	605	606	608	614	617	621
FLOW(M**3/S)>	.021	.022	.020	.022	.019	.019	.027	.020	.017	.016
TIME(HR,MIN)>	623	630	653	836	946	1026	1134	0	0	0
FLOW(M**3/S)>	.021	.016	.013	.009	.007	.006	.005	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 28/10/81 TO 2/11/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	205	221	229	231	232	235	237	238	238	238
FLOW(M**3/S))	.001	.001	.001	.058	.029	.019	.044	.035	.062	.030
TIME(HR,MIN))	240	243	246	247	256	306	311	311	313	314
FLOW(M**3/S))	.012	.005	.008	.004	.002	.002	.002	.024	.010	.004
TIME(HR,MIN))	317	322	324	327	329	329	330	331	332	333
FLOW(M**3/S))	.002	.002	.012	.127	.041	.028	.033	.020	.014	.036
TIME(HR,MIN))	335	338	340	342	344	346	351	353	354	357
FLOW(M**3/S))	.017	.011	.035	.055	.026	.015	.014	.019	.013	.011
TIME(HR,MIN))	401	404	406	408	411	413	415	416	417	419
FLOW(M**3/S))	.016	.036	.017	.013	.013	.015	.066	.026	.016	.018
TIME(HR,MIN))	422	427	427	432	438	443	450	453	529	627
FLOW(M**3/S))	.014	.011	.021	.012	.011	.009	.012	.010	.007	.004
TIME(HR,MIN))	729	836	949	1119	1254	1434	0	0	0	0
FLOW(M**3/S))	.004	.003	.003	.002	.002	.002	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 7/11/81 TO 11/11/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	315	1003	1409	1453	1520	1555	1639	1651	1721	1741
FLOW(M**3/S)>	.002	.001	.001	.001	.024	.016	.007	.021	.016	.047
TIME(HR,MIN)>	1810	1822	1832	1846	1857	1910	1943	2005	2009	2035
FLOW(M**3/S)>	.027	.047	.078	.049	.071	.049	.037	.024	.099	.058
TIME(HR,MIN)>	2054	2117	2147	2151	2217	2226	2238	2245	2249	2258
FLOW(M**3/S)>	.039	.028	.032	.072	.053	.072	.050	.044	.108	.182
TIME(HR,MIN)>	2307	2314	2319	2328	2354	2343	12	29	58	158
FLOW(M**3/S)>	.137	.207	.125	.086	.127	.081	.065	.114	.062	.041
TIME(HR,MIN)>	239	307	905	2341	907	4	1755	1200	0	0
FLOW(M**3/S)>	.042	.032	.015	.008	.005	.006	.005	.005	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 18/11/81 TO 21/11/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	111	139	157	205	206	212	242	304	304	307
FLOW(M**3/S)>	.003	.002	.002	.002	.004	.002	.002	.003	.014	.007
TIME(HR,MIN)>	309	312	314	316	319	321	325	329	332	333
FLOW(M**3/S)>	.010	.004	.021	.010	.004	.007	.004	.005	.004	.025
TIME(HR,MIN)>	336	337	339	341	344	344	347	350	353	357
FLOW(M**3/S)>	.013	.019	.021	.057	.032	.141	.064	.028	.018	.018
TIME(HR,MIN)>	402	436	513	546	608	612	616	631	636	640
FLOW(M**3/S)>	.013	.008	.007	.006	.006	.008	.007	.009	.013	.010
TIME(HR,MIN)>	644	647	652	654	658	707	707	726	815	903
FLOW(M**3/S)>	.010	.008	.008	.009	.007	.006	.009	.006	.006	.005
TIME(HR,MIN)>	955	0	0	0	0	0	0	0	0	0
FLOW(M**3/S)>	.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 26/11/81 TO 1/12/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	33	344	644	656	733	758	830	924	1004	1038
FLOW(M**3/S))	.003	.002	.002	.004	.004	.007	.011	.031	.029	.056
TIME(HR,MIN))	1104	1147	1200	1219	1251	1304	1351	1413	1432	1451
FLOW(M**3/S))	.053	.070	.060	.071	.119	.103	.164	.149	.229	.199
TIME(HR,MIN))	1510	1522	1602	1620	1715	1717	1812	1831	1908	2014
FLOW(M**3/S))	.246	.214	.253	.219	.254	.218	.315	.282	.300	.217
TIME(HR,MIN))	2148	29	316	744	849	917	1014	1036	1129	55
FLOW(M**3/S))	.125	.059	.030	.019	.017	.020	.017	.020	.016	.008
TIME(HR,MIN))	1555	1203	752	350	0	0	0	0	0	0
FLOW(M**3/S))	.006	.004	.004	.003	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 16/12/81 TO 20/12/81

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	139	553	709	757	816	910	1013	1033	1060	1117
FLOW(M**3/S))	.001	.001	.001	.022	.032	.033	.016	.037	.020	.014
TIME(HR,MIN))	1158	1158	1310	1344	1416	1559	1623	1718	1827	2008
FLOW(M**3/S))	.021	.013	.011	.017	.009	.005	.007	.005	.005	.004
TIME(HR,MIN))	2018	2147	2241	2256	2329	35	116	141	205	253
FLOW(M**3/S))	.006	.005	.005	.007	.005	.004	.011	.011	.014	.008
TIME(HR,MIN))	354	436	730	741	740	742	844	904	929	1227
FLOW(M**3/S))	.008	.006	.005	.020	.002	.031	.014	.019	.010	.007
TIME(HR,MIN))	1435	1508	1559	1942	2120	2147	2303	223	757	1945
FLOW(M**3/S))	.006	.010	.007	.005	.004	.007	.005	.003	.003	.003
TIME(HR,MIN))	1059	240	1027	0	0	0	0	0	0	0
FLOW(M**3/S))	.003	.002	.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 6/ 1/82 TO 7/ 1/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	2201	2215	2225	2242	2251	2256	2259	2304	2308	2316
FLOW(M**3/S)>	.009	.008	.009	.014	.021	.027	.028	.027	.023	.026
TIME(HR,MIN)>	2324	2332	2341	2348	2355	2357	2358	2400	2	5
FLOW(M**3/S)>	.026	.026	.034	.042	.043	.043	.044	.055	.067	.076
TIME(HR,MIN)>	8	12	16	18	23	26	32	38	41	46
FLOW(M**3/S)>	.079	.074	.065	.062	.064	.063	.070	.073	.076	.074
TIME(HR,MIN)>	50	53	59	104	107	114	119	125	132	135
FLOW(M**3/S)>	.070	.070	.087	.101	.108	.111	.113	.122	.132	.136
TIME(HR,MIN)>	142	146	151	159	205	214	223	231	237	242
FLOW(M**3/S)>	.136	.140	.136	.121	.111	.094	.087	.085	.084	.095
TIME(HR,MIN)>	249	252	255	302	318	328	335	346	353	400
FLOW(M**3/S)>	.115	.116	.112	.093	.077	.075	.072	.079	.075	.074
TIME(HR,MIN)>	410	420	429	436	446	457	502	515	533	543
FLOW(M**3/S)>	.063	.057	.056	.057	.055	.054	.051	.048	.047	.046
TIME(HR,MIN)>	558	608	620	634	648	702	714	723	731	740
FLOW(M**3/S)>	.042	.040	.039	.036	.033	.034	.034	.036	.043	.045
TIME(HR,MIN)>	753	760	809	817	826	835	847	901	912	930
FLOW(M**3/S)>	.048	.050	.052	.055	.050	.046	.040	.035	.032	.028
TIME(HR,MIN)>	945	956	1010	1029	1050	1104	1121	1136	0	0
FLOW(M**3/S)>	.028	.028	.027	.025	.026	.024	.025	.025	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 6/ 3/82 TO 11/ 3/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1234	2055	448	651	737	913	959	1138	1359	1542
FLOW(M**3/S)>	.002	.002	.002	.003	.005	.007	.009	.007	.005	.004
TIME(HR,MIN)>	1819	2125	6	144	234	305	328	545	1114	1629
FLOW(M**3/S)>	.015	.047	.096	.134	.143	.154	.153	.119	.069	.035
TIME(HR,MIN)>	247	1445	825	2251	1414	0	0	0	0	0
FLOW(M**3/S)>	.016	.011	.008	.006	.006	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 25/ 3/82 TO 30/ 3/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1416	1943	2256	58	231	407	544	1023	1535	1626
FLOW(M**3/S)>	.001	.002	.002	.005	.008	.008	.007	.005	.004	.010
TIME(HR,MIN)>	1705	1803	1808	1834	1840	1939	2029	2136	2203	2219
FLOW(M**3/S)>	.010	.008	.021	.031	.038	.025	.017	.016	.065	.037
TIME(HR,MIN)>	2241	2335	146	309	341	507	615	626	643	727
FLOW(M**3/S)>	.027	.024	.024	.031	.034	.036	.036	.058	.100	.079
TIME(HR,MIN)>	901	1303	2215	946	2138	1028	2107	935	0	0
FLOW(M**3/S)>	.046	.027	.012	.009	.007	.006	.005	.010	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 6/ 4/82 TO 11/ 4/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1531	2116	416	638	703	720	747	820	907	908
FLOW(M**3/S)>	.007	.007	.006	.007	.027	.035	.042	.052	.039	.068
TIME(HR,MIN)>	933	948	1011	1045	1113	1224	1513	2250	436	802
FLOW(M**3/S)>	.140	.082	.099	.066	.096	.068	.036	.018	.017	.018
TIME(HR,MIN)>	1325	144	1038	2147	1009	2032	0	0	0	0
FLOW(M**3/S)>	.016	.012	.010	.009	.011	.009	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 14/ 4/82 TO 18/ 4/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	1551	2052	33	154	206	314	408	636	1006	1035
FLOW(M**3/S))	.008	.008	.006	.008	.007	.009	.008	.009	.009	.012
TIME(HR,MIN))	1112	1208	1233	1310	1333	1351	1422	1451	1500	1544
FLOW(M**3/S))	.014	.013	.032	.020	.041	.059	.081	.060	.073	.047
TIME(HR,MIN))	2011	13	310	703	1259	2104	318	1220	1940	52
FLOW(M**3/S))	.024	.017	.018	.019	.016	.012	.011	.012	.011	.010

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 20/ 4/82 TO 25/ 4/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1559	2302	509	732	1347	1520	1541	1616	2102	2130
FLOW(M**3/S)>	.011	.010	.010	.012	.011	.011	.016	.012	.011	.011
TIME(HR,MIN)>	2151	2230	2252	2316	2324	2352	14	29	55	112
FLOW(M**3/S)>	.016	.026	.031	.027	.030	.030	.052	.049	.080	.049
TIME(HR,MIN)>	147	208	442	1402	505	2012	1504	530	0	0
FLOW(M**3/S)>	.036	.037	.027	.015	.011	.009	.008	.007	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 11/ 5/82 TO 16/ 5/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR.MIN)>	1549	1840	2121	2252	2259	2323	2333	1	324	1040
FLOW(M**3/S)>	.004	.004	.004	.004	.019	.012	.022	.006	.004	.004
TIME(HR.MIN)>	1050	1106	1141	1156	1210	1235	1252	1312	1334	1346
FLOW(M**3/S)>	.035	.048	.067	.050	.080	.028	.031	.074	.079	.073
TIME(HR.MIN)>	1355	1417	1436	1503	1522	1541	1634	1736	1737	1756
FLOW(M**3/S)>	.103	.116	.093	.127	.155	.096	.061	.050	.094	.051
TIME(HR.MIN)>	1851	1901	1939	2259	520	1140	1400	1450	1456	1457
FLOW(M**3/S)>	.040	.107	.045	.024	.014	.012	.011	.011	.031	.055
TIME(HR.MIN)>	1512	1514	1521	1539	1556	1604	1612	1633	1653	1711
FLOW(M**3/S)>	.042	.081	.040	.063	.030	.040	.036	.043	.026	.024
TIME(HR.MIN)>	1723	1735	1749	1819	1859	2042	2353	119	217	249
FLOW(M**3/S)>	.041	.035	.058	.064	.047	.028	.022	.020	.019	.031
TIME(HR.MIN)>	311	352	435	523	629	734	742	752	854	936
FLOW(M**3/S)>	.030	.031	.038	.030	.027	.028	.031	.028	.035	.030
TIME(HR.MIN)>	948	1014	1052	1232	1233	1317	1456	1640	1724	1841
FLOW(M**3/S)>	.028	.028	.026	.025	.028	.025	.023	.022	.024	.021
TIME(HR.MIN)>	2202	219	1217	2158	450	0	0	0	0	0
FLOW(M**3/S)>	.019	.017	.013	.011	.010	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 20/ 6/82 TO 24/ 6/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	1623	2128	154	425	449	506	528	541	552	611
FLOW(M**3/S))	.003	.003	.003	.003	.003	.012	.012	.025	.036	.030
TIME(HR,MIN))	635	658	713	740	804	829	833	860	916	922
FLOW(M**3/S))	.068	.041	.029	.033	.027	.037	.046	.039	.058	.078
TIME(HR,MIN))	937	1017	1021	1029	1051	1103	1126	1130	1221	1228
FLOW(M**3/S))	.088	.118	.099	.082	.096	.077	.082	.137	.099	.130
TIME(HR,MIN))	1304	1324	1350	1408	1426	1436	1456	1505	1618	1823
FLOW(M**3/S))	.079	.090	.111	.097	.099	.109	.095	.108	.069	.042
TIME(HR,MIN))	2022	2125	2234	2249	2335	1	56	145	719	1432
FLOW(M**3/S))	.029	.026	.031	.028	.031	.027	.026	.021	.015	.013
TIME(HR,MIN))	2228	424	958	0	0	0	0	0	0	0
FLOW(M**3/S))	.010	.008	.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 15/ 6/82 TO 20/ 6/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1457	1636	1731	1806	1829	1847	1913	1946	2009	2049
FLOW(M**3/S)>	.001	.001	.001	.005	.008	.008	.024	.024	.021	.032
TIME(HR,MIN)>	2054	2122	2138	2200	2210	2236	2249	2308	2339	7
FLOW(M**3/S)>	.057	.050	.076	.055	.038	.042	.033	.026	.028	.023
TIME(HR,MIN)>	42	102	138	217	249	345	408	430	439	516
FLOW(M**3/S)>	.028	.026	.034	.032	.047	.025	.034	.038	.046	.040
TIME(HR,MIN)>	550	717	753	833	960	1056	1321	1457	1560	1754
FLOW(M**3/S)>	.027	.020	.028	.021	.019	.015	.016	.013	.013	.010
TIME(HR,MIN)>	2310	633	1340	2207	840	1630	318	1145	0	0
FLOW(M**3/S)>	.008	.006	.005	.004	.005	.004	.004	.004	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 29/ 6/82 TO 2/ 7/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR.MIN)>	1405	1712	1960	2136	2156	2226	2237	2301	2336	2356
FLOW(M**3/S)>	.004	.004	.003	.003	.007	.007	.005	.004	.005	.008
TIME(HR.MIN)>	40	120	158	224	249	312	331	345	405	418
FLOW(M**3/S)>	.008	.005	.004	.014	.009	.009	.025	.016	.013	.014
TIME(HR.MIN)>	444	503	523	654	839	845	917	932	949	1008
FLOW(M**3/S)>	.007	.012	.007	.005	.005	.009	.006	.012	.008	.009
TIME(HR.MIN)>	1031	1110	1114	1137	1148	1215	1242	1317	1322	1339
FLOW(M**3/S)>	.007	.006	.013	.011	.026	.012	.009	.007	.009	.010
TIME(HR.MIN)>	1349	1358	1421	1447	1454	1504	1513	1534	1552	1652
FLOW(M**3/S)>	.051	.135	.061	.053	.167	.125	.085	.097	.046	.027
TIME(HR.MIN)>	1702	1800	1852	2229	517	1455	2008	58	0	0
FLOW(M**3/S)>	.024	.023	.019	.013	.010	.008	.008	.007	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 14/ 8/82 TO 14/ 8/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1801	1809	1817	1819	1819	1820	1821	1822	1822	1824
FLOW(M**3/S)>	0.000	0.000	.000	.000	.007	.019	.023	.023	.023	.069
TIME(HR,MIN)>	1825	1826	1827	1828	1830	1832	1835	1838	1843	1848
FLOW(M**3/S)>	.087	.105	.111	.104	.087	.062	.038	.019	.010	.005
TIME(HR,MIN)>	1851	1902	1910	1919	1930	1937	1945	1958	2008	2024
FLOW(M**3/S)>	.004	.003	.003	.002	.001	.001	.001	.001	.001	.001
TIME(HR,MIN)>	2038	2055	2107	0	0	0	0	0	0	0
FLOW(M**3/S)>	.000	.001	.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 19/ 8/82 TO 19/ 8/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	500	502	506	508	511	514	518	525	532	540
FLOW(M**3/S)>	.000	.001	.003	.006	.009	.010	.009	.008	.007	.007
TIME(HR,MIN)>	544	549	551	552	554	555	556	558	559	601
FLOW(M**3/S)>	.006	.006	.005	.005	.011	.019	.024	.026	.031	.035
TIME(HR,MIN)>	603	606	608	610	612	614	615	617	618	620
FLOW(M**3/S)>	.037	.036	.036	.038	.053	.063	.073	.076	.074	.069
TIME(HR,MIN)>	621	624	626	627	629	630	631	632	632	634
FLOW(M**3/S)>	.059	.051	.048	.048	.054	.062	.074	.087	.093	.095
TIME(HR,MIN)>	636	637	639	641	642	644	646	649	651	653
FLOW(M**3/S)>	.093	.084	.079	.075	.077	.078	.072	.061	.050	.040
TIME(HR,MIN)>	656	660	703	707	712	715	718	722	726	730
FLOW(M**3/S)>	.031	.026	.023	.021	.017	.013	.012	.011	.012	.014
TIME(HR,MIN)>	736	740	741	743	744	748	751	755	759	804
FLOW(M**3/S)>	.013	.012	.012	.017	.020	.020	.020	.019	.018	.016
TIME(HR,MIN)>	809	812	817	820	823	825	826	829	832	834
FLOW(M**3/S)>	.013	.013	.011	.012	.018	.025	.031	.032	.032	.028
TIME(HR,MIN)>	837	839	840	842	844	845	846	848	849	850
FLOW(M**3/S)>	.024	.020	.020	.021	.030	.036	.039	.053	.061	.063
TIME(HR,MIN)>	853	855	859	902	904	908	911	918	926	934
FLOW(M**3/S)>	.060	.057	.058	.057	.050	.039	.030	.019	.012	.008
TIME(HR,MIN)>	942	954	1005	1024	1039	1056	1112	1146	1213	1238
FLOW(M**3/S)>	.006	.005	.005	.004	.003	.003	.002	.002	.002	.001
TIME(HR,MIN)>	1305	1328	0	0	0	0	0	0	0	0
FLOW(M**3/S)>	.001	.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 25/ 8/82 TO 25/ 8/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	347	353	357	357	359	360	401	403	405	406
FLOW(M**3/S))	0.000	0.000	0.000	0.000	.004	.010	.012	.012	.018	.024
TIME(HR,MIN))	407	409	414	420	430	436	445	454	503	510
FLOW(M**3/S))	.026	.024	.021	.014	.008	.005	.004	.004	.002	.001
TIME(HR,MIN))	518	529	530	534	540	543	544	547	552	554
FLOW(M**3/S))	.001	.002	.002	.006	.015	.023	.026	.029	.030	.030
TIME(HR,MIN))	556	557	600	602	604	607	609	613	615	617
FLOW(M**3/S))	.034	.034	.033	.030	.030	.036	.037	.039	.038	.042
TIME(HR,MIN))	619	623	625	628	631	634	636	640	642	645
FLOW(M**3/S))	.043	.042	.038	.033	.032	.032	.030	.033	.037	.065
TIME(HR,MIN))	647	648	650	651	653	653	654	656	657	659
FLOW(M**3/S))	.106	.147	.181	.198	.202	.203	.224	.238	.241	.273
TIME(HR,MIN))	701	702	703	705	707	709	710	713	716	722
FLOW(M**3/S))	.301	.311	.316	.288	.241	.189	.150	.110	.074	.047
TIME(HR,MIN))	728	738	748	757	806	819	830	843	902	920
FLOW(M**3/S))	.033	.023	.016	.014	.013	.010	.009	.008	.007	.007
TIME(HR,MIN))	939	958	1015	1035	1055	1117	0	0	0	0
FLOW(M**3/S))	.006	.005	.005	.005	.005	.005	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 26/ 8/82 TO 26/ 8/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	900	903	904	906	908	908	910	912	913	914
FLOW(M**3/S)>	.001	.001	.001	.006	.012	.015	.016	.021	.025	.026
TIME(HR,MIN)>	915	917	920	922	925	927	929	932	935	938
FLOW(M**3/S)>	.026	.023	.018	.016	.016	.017	.014	.013	.011	.011
TIME(HR,MIN)>	941	946	950	951	956	959	960	1003	1006	1008
FLOW(M**3/S)>	.014	.018	.020	.021	.020	.020	.020	.026	.032	.035
TIME(HR,MIN)>	1011	1013	1015	1018	1022	1024	1027	1030	1035	1038
FLOW(M**3/S)>	.035	.035	.036	.032	.027	.022	.017	.015	.016	.016
TIME(HR,MIN)>	1039	1040	1043	1045	1048	1051	1052	1054	1056	1057
FLOW(M**3/S)>	.016	.018	.020	.019	.018	.016	.016	.019	.022	.030
TIME(HR,MIN)>	1058	1058	1100	1102	1103	1105	1107	1107	1109	1112
FLOW(M**3/S)>	.039	.047	.051	.058	.065	.077	.084	.088	.083	.069
TIME(HR,MIN)>	1113	1115	1116	1118	1119	1121	1123	1124	1126	1129
FLOW(M**3/S)>	.059	.054	.053	.052	.049	.048	.049	.046	.044	.043
TIME(HR,MIN)>	1131	1135	1137	1140	1142	1143	1147	1152	1157	1201
FLOW(M**3/S)>	.047	.050	.053	.054	.052	.052	.051	.050	.045	.041
TIME(HR,MIN)>	1204	1209	1212	1213	1215	1216	1217	1219	1221	1222
FLOW(M**3/S)>	.036	.032	.028	.028	.027	.035	.040	.043	.043	.043
TIME(HR,MIN)>	1224	1226	1227	1228	1229	1230	1232	1232	1235	1240
FLOW(M**3/S)>	.039	.035	.034	.035	.038	.038	.041	.049	.037	.056
TIME(HR,MIN)>	1245	1250	1260	1310	1320	1330	1340	1350	1360	1430
FLOW(M**3/S)>	.046	.034	.027	.021	.018	.018	.018	.016	.012	.010
TIME(HR,MIN)>	1460	0	0	0	0	0	0	0	0	0
FLOW(M**3/S)>	.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 4/ 9/82 TO 4/ 9/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1000	1012	1029	1043	1054	1057	1058	1060	1102	1103
FLOW(M**3/S)>	.002	.003	.003	.003	.003	.003	.004	.013	.030	.058
TIME(HR,MIN)>	1105	1109	1112	1112	1113	1115	1116	1117	1117	1118
FLOW(M**3/S)>	.090	.124	.170	.188	.196	.212	.227	.234	.235	.233
TIME(HR,MIN)>	1119	1120	1124	1126	1128	1131	1134	1140	1142	1148
FLOW(M**3/S)>	.219	.187	.133	.098	.067	.048	.036	.028	.026	.027
TIME(HR,MIN)>	1152	1156	1160	1209	1216	1227	1245	1253	1303	1316
FLOW(M**3/S)>	.026	.023	.019	.016	.014	.012	.010	.010	.009	.009
TIME(HR,MIN)>	1337	1354	1415	1443	1512	1535	1604	0	0	0
FLOW(M**3/S)>	.008	.009	.009	.007	.007	.007	.007	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 18/ 9/82 TO 19/ 9/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR.MIN)>	1900	1906	1913	1923	1925	1931	1935	1939	1944	1950
FLOW(M**3/S)>	.002	.002	.002	.002	.002	.004	.005	.006	.006	.005
TIME(HR.MIN)>	1956	2004	2011	2019	2024	2025	2026	2026	2027	2027
FLOW(M**3/S)>	.003	.003	.003	.003	.003	.004	.009	.018	.025	.028
TIME(HR.MIN)>	2029	2030	2030	2031	2032	2033	2034	2036	2039	2043
FLOW(M**3/S)>	.028	.027	.026	.026	.028	.030	.030	.026	.019	.013
TIME(HR.MIN)>	2048	2051	2056	2058	2059	2102	2106	2109	2112	2113
FLOW(M**3/S)>	.009	.008	.008	.008	.010	.016	.020	.023	.023	.025
TIME(HR.MIN)>	2116	2122	2125	2129	2131	2133	2137	2140	2142	2144
FLOW(M**3/S)>	.026	.027	.028	.029	.029	.026	.025	.024	.024	.028
TIME(HR.MIN)>	2146	2148	2150	2152	2156	2159	2200	2202	2206	2208
FLOW(M**3/S)>	.038	.044	.049	.051	.050	.050	.053	.055	.055	.050
TIME(HR.MIN)>	2210	2211	2211	2212	2213	2214	2217	2218	2220	2221
FLOW(M**3/S)>	.047	.046	.047	.052	.057	.059	.058	.058	.057	.056
TIME(HR.MIN)>	2223	2225	2226	2227	2229	2231	2232	2232	2233	2234
FLOW(M**3/S)>	.057	.081	.116	.171	.223	.288	.315	.329	.338	.350
TIME(HR.MIN)>	2235	2236	2236	2237	2238	2238	2240	2240	2241	2243
FLOW(M**3/S)>	.361	.363	.366	.365	.361	.354	.341	.333	.335	.320
TIME(HR.MIN)>	2244	2244	2245	2246	2247	2249	2251	2252	2254	2255
FLOW(M**3/S)>	.307	.299	.295	.285	.281	.265	.243	.239	.237	.224
TIME(HR.MIN)>	2257	2260	2305	2309	2311	2314	2317	2319	2322	2324
FLOW(M**3/S)>	.208	.193	.176	.153	.137	.122	.112	.103	.092	.093
TIME(HR.MIN)>	2326	2328	2333	2336	2340	2344	2347	2349	2350	2353
FLOW(M**3/S)>	.093	.090	.080	.071	.064	.060	.058	.060	.064	.086
TIME(HR.MIN)>	2359	2	4	8	12	16	19	22	25	28
FLOW(M**3/S)>	.122	.114	.103	.092	.095	.101	.112	.126	.145	.152

TIME(HR,MIN)>	30	33	35	37	39	41	44	48	50	53
FLOW(M**3/S)>	.154	.173	.193	.208	.216	.207	.191	.177	.176	.190
TIME(HR,MIN)>	56	59	101	103	106	109	111	113	116	118
FLOW(M**3/S)>	.208	.222	.226	.215	.193	.178	.180	.191	.209	.218
TIME(HR,MIN)>	120	122	126	130	133	139	141	144	146	148
FLOW(M**3/S)>	.227	.225	.205	.188	.184	.183	.183	.193	.197	.198
TIME(HR,MIN)>	150	154	158	202	206	209	213	216	218	220
FLOW(M**3/S)>	.197	.179	.165	.158	.159	.161	.158	.147	.141	.133
TIME(HR,MIN)>	254	302	310	326	341	352	359	414	427	440
FLOW(M**3/S)>	.104	.100	.093	.082	.076	.074	.068	.063	.060	.055
TIME(HR,MIN)>	455	507	518	532	546	602	614	632	654	715
FLOW(M**3/S)>	.051	.050	.050	.049	.045	.041	.040	.037	.035	.032
TIME(HR,MIN)>	736	754	813	830	860	930	960	1030	1060	1130
FLOW(M**3/S)>	.032	.031	.028	.024	.021	.013	.012	.012	.018	.016
TIME(HR,MIN)>	1160	1230	1260	1330	1360	1430	1460	0	0	0
FLOW(M**3/S)>	.015	.014	.013	.012	.012	.012	.012	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 24/ 9/82 TO 24/ 9/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	403	423	446	457	503	508	512	516	523	531
FLOW(M**3/S))	.007	.007	.007	.007	.010	.016	.023	.025	.020	.019
TIME(HR,MIN))	536	544	553	603	613	623	635	643	652	658
FLOW(M**3/S))	.019	.016	.015	.014	.013	.012	.012	.011	.011	.012
TIME(HR,MIN))	704	712	720	728	732	735	739	743	748	751
FLOW(M**3/S))	.014	.013	.013	.013	.012	.017	.027	.040	.052	.054
TIME(HR,MIN))	753	754	748	751	753	754	755	756	758	758
FLOW(M**3/S))	.053	.051	.052	.054	.053	.051	.052	.059	.071	.075
TIME(HR,MIN))	801	802	804	805	806	807	808	810	812	814
FLOW(M**3/S))	.079	.082	.080	.076	.076	.079	.091	.103	.111	.124
TIME(HR,MIN))	815	816	817	819	821	823	824	825	827	828
FLOW(M**3/S))	.123	.123	.116	.097	.085	.083	.083	.078	.077	.097
TIME(HR,MIN))	829	830	831	832	833	834	835	836	837	838
FLOW(M**3/S))	.114	.128	.131	.134	.137	.157	.212	.267	.324	.372
TIME(HR,MIN))	838	839	839	841	843	845	845	847	849	852
FLOW(M**3/S))	.382	.389	.395	.363	.313	.278	.268	.264	.249	.214
TIME(HR,MIN))	855	859	901	907	913	920	926	938	949	957
FLOW(M**3/S))	.186	.151	.137	.117	.092	.075	.067	.058	.053	.050
TIME(HR,MIN))	1007	1021	1040	1058	1116	1137	1160	1219	1250	1314
FLOW(M**3/S))	.046	.044	.039	.036	.034	.033	.030	.029	.027	.027
TIME(HR,MIN))	1341	1408	1430	1459	1527	1530	1560	1630	1660	1730
FLOW(M**3/S))	.026	.025	.025	.024	.024	.019	.018	.018	.018	.018
TIME(HR,MIN))	1760	1830	1860	1930	1960	2030	2060	2130	2160	2220
FLOW(M**3/S))	.017	.016	.015	.016	.015	.015	.014	.016	.013	.012
TIME(HR,MIN))	2260	2330	2360	0	0	0	0	0	0	0
FLOW(M**3/S))	.012	.012	.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 4/10/82 TO 5/10/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1900	1902	1906	1911	1919	1928	1939	1948	1958	2002
FLOW(M**3/S)>	.020	.022	.022	.026	.029	.034	.042	.045	.047	.047
TIME(HR,MIN)>	2007	2014	2019	2024	2028	2031	2033	2034	2038	2041
FLOW(M**3/S)>	.050	.053	.058	.058	.068	.079	.085	.087	.085	.082
TIME(HR,MIN)>	2044	2046	2049	2051	2056	2058	2103	2106	2109	2111
FLOW(M**3/S)>	.081	.083	.085	.089	.088	.089	.100	.109	.120	.125
TIME(HR,MIN)>	2118	2124	2128	2131	2135	2139	2143	2146	2147	2152
FLOW(M**3/S)>	.124	.123	.124	.128	.128	.127	.134	.142	.146	.145
TIME(HR,MIN)>	2157	2202	2208	2213	2216	2220	2221	2223	2225	2227
FLOW(M**3/S)>	.145	.146	.146	.148	.147	.139	.132	.130	.136	.148
TIME(HR,MIN)>	2229	2234	2237	2241	2246	2248	2251	2255	2301	2305
FLOW(M**3/S)>	.155	.157	.152	.153	.161	.170	.182	.180	.177	.167
TIME(HR,MIN)>	2307	2309	2311	2312	2313	2317	2321	2326	2332	2344
FLOW(M**3/S)>	.164	.171	.186	.188	.190	.177	.156	.142	.134	.130
TIME(HR,MIN)>	2350	1	10	24	36	47	59	114	128	136
FLOW(M**3/S)>	.124	.118	.113	.104	.105	.100	.095	.088	.088	.084
TIME(HR,MIN)>	149	203	215	231	245	259	309	322	334	351
FLOW(M**3/S)>	.080	.080	.074	.071	.068	.067	.065	.060	.060	.055
TIME(HR,MIN)>	406	418	433	447	504	518	529	546	600	618
FLOW(M**3/S)>	.052	.051	.050	.048	.046	.044	.043	.041	.041	.039
TIME(HR,MIN)>	630	660	730	760	830	860	930	960	1030	1060
FLOW(M**3/S)>	.040	.035	.035	.033	.032	.031	.029	.027	.026	.025
TIME(HR,MIN)>	1130	1160	1230	1260	1330	1360	1430	1460	0	0
FLOW(M**3/S)>	.025	.023	.023	.021	.020	.019	.018	.018	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 24/11/82 TO 24/11/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1000	1001	1001	1003	1004	1005	1007	1007	1008	1009
FLOW(M**3/S)>	.001	.001	.002	.009	.017	.020	.020	.021	.027	.029
TIME(HR,MIN)>	1010	1013	1014	1017	1018	1019	1020	1022	1023	1026
FLOW(M**3/S)>	.028	.021	.017	.012	.013	.016	.019	.020	.018	.018
TIME(HR,MIN)>	1027	1030	1035	1037	1043	1046	1049	1050	1053	1055
FLOW(M**3/S)>	.018	.013	.010	.007	.005	.004	.004	.005	.005	.005
TIME(HR,MIN)>	1056	1056	1058	1058	1059	1060	1100	1101	1102	1105
FLOW(M**3/S)>	.017	.039	.049	.051	.050	.047	.048	.049	.049	.037
TIME(HR,MIN)>	1108	1111	1118	1123	1129	1135	1140	1145	1152	1154
FLOW(M**3/S)>	.024	.014	.008	.006	.005	.005	.005	.005	.004	.003
TIME(HR,MIN)>	1157	1158	1160	1201	1203	1204	1205	1206	1207	1210
FLOW(M**3/S)>	.003	.015	.032	.054	.075	.086	.088	.088	.084	.064
TIME(HR,MIN)>	1213	1215	1220	1224	1227	1233	1239	1245	1253	1301
FLOW(M**3/S)>	.047	.042	.042	.041	.036	.025	.021	.016	.011	.008
TIME(HR,MIN)>	1310	1319	1326	1329	1333	1340	1346	1354	1401	1409
FLOW(M**3/S)>	.008	.008	.009	.009	.011	.010	.008	.007	.005	.006
TIME(HR,MIN)>	1416	1421	1422	1423	1424	1425	1427	1428	1431	1434
FLOW(M**3/S)>	.005	.005	.006	.010	.015	.017	.018	.017	.021	.021
TIME(HR,MIN)>	1437	1442	1446	1453	1459	1505	1512	1514	1515	1517
FLOW(M**3/S)>	.020	.017	.015	.013	.011	.009	.007	.007	.010	.015
TIME(HR,MIN)>	1518	1520	1521	1524	1527	1535	1541	1547	1553	1601
FLOW(M**3/S)>	.017	.017	.018	.021	.019	.012	.012	.011	.012	.011
TIME(HR,MIN)>	1607	1615	1621	1627	1632	1636	1638	1642	1644	1645
FLOW(M**3/S)>	.008	.006	.006	.008	.008	.010	.012	.013	.013	.016
TIME(HR,MIN)>	1646	1650	1654	1702	1709	1714	1721	1728	1735	1740
FLOW(M**3/S)>	.018	.015	.014	.011	.010	.009	.008	.008	.007	.010
TIME(HR,MIN)>	1747	1754	1758	1801	1805	1808	1812	1815	1816	1818
FLOW(M**3/S)>	.011	.012	.015	.017	.016	.019	.023	.031	.047	.063
TIME(HR,MIN)>	1820	1821	1822	1824	1825	1827	1831	1837	1845	1854
FLOW(M**3/S)>	.074	.076	.076	.076	.071	.061	.045	.029	.020	.019
TIME(HR,MIN)>	1904	1920	1925	1931	1942	1949	2000	2015	2026	2043
FLOW(M**3/S)>	.017	.017	.017	.018	.016	.015	.012	.009	.008	.008
TIME(HR,MIN)>	2056	2113	2136	2152	2212	2232	2254	0	0	0
FLOW(M**3/S)>	.007	.006	.006	.006	.006	.006	.005	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 20/12/82 TO 20/12/82

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	802	814	819	826	832	839	847	856	903	914
FLOW(M**3/S)>	.002	.002	.003	.005	.005	.006	.007	.010	.012	.018
TIME(HR,MIN)>	919	925	930	933	936	940	944	949	955	960
FLOW(M**3/S)>	.023	.030	.036	.039	.041	.041	.039	.034	.029	.025
TIME(HR,MIN)>	1003	1009	1012	1016	1022	1027	1033	1038	1043	1048
FLOW(M**3/S)>	.025	.027	.030	.034	.040	.038	.039	.040	.042	.047
TIME(HR,MIN)>	1054	1057	1058	1103	1107	1107	1112	1113	1114	1116
FLOW(M**3/S)>	.048	.050	.052	.053	.053	.053	.053	.053	.055	.055
TIME(HR,MIN)>	1118	1119	1123	1127	1133	1137	1144	1149	1155	1201
FLOW(M**3/S)>	.057	.056	.057	.058	.057	.054	.053	.053	.055	.051
TIME(HR,MIN)>	1211	1220	1228	1238	1247	1255	1303	1309	1310	1312
FLOW(M**3/S)>	.044	.035	.030	.026	.028	.031	.041	.049	.051	.051
TIME(HR,MIN)>	1316	1322	1325	1330	1332	1334	1335	1340	1346	1350
FLOW(M**3/S)>	.046	.037	.033	.030	.029	.029	.033	.047	.063	.080
TIME(HR,MIN)>	1353	1356	1357	1400	1403	1408	1412	1417	1423	1431
FLOW(M**3/S)>	.096	.102	.103	.099	.093	.082	.070	.056	.046	.040
TIME(HR,MIN)>	1437	1444	1448	1452	1458	1505	1513	1520	1528	1535
FLOW(M**3/S)>	.037	.036	.036	.039	.040	.035	.032	.028	.026	.026
TIME(HR,MIN)>	1538	1540	1546	1553	1600	1606	1613	1619	1623	1628
FLOW(M**3/S)>	.025	.026	.030	.032	.027	.026	.027	.030	.035	.040
TIME(HR,MIN)>	1632	1633	1636	1638	1639	1641	1642	1643	1645	1646
FLOW(M**3/S)>	.049	.062	.065	.068	.068	.081	.091	.097	.097	.101
TIME(HR,MIN)>	1647	1651	1657	1703	1710	1716	1723	1727	1734	1737
FLOW(M**3/S)>	.099	.088	.075	.065	.059	.052	.051	.050	.046	.043
TIME(HR,MIN)>	1746	1750	1752	1754	1758	1801	1808	1817	1830	1840
FLOW(M**3/S)>	.041	.041	.043	.049	.055	.054	.044	.038	.032	.029
TIME(HR,MIN)>	1852	1907	1921	1937	1952	2012	2026	2042	2058	2112
FLOW(M**3/S)>	.025	.024	.020	.020	.018	.015	.014	.013	.013	.012
TIME(HR,MIN)>	2124	2130	2140	2153	2202	2214	2231	2244	2254	2312
FLOW(M**3/S)>	.013	.015	.014	.014	.012	.012	.011	.011	.011	.010
TIME(HR,MIN)>	2326	2342	0	0	0	0	0	0	0	0
FLOW(M**3/S)>	.010	.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 3/ 3/83 TO 3/ 3/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)?	2	13	30	43	60	110	124	131	135	141
FLOW(M**3/S)?	0.000	0.000	.000	.000	.003	.007	.011	.014	.017	.023
TIME(HR,MIN)?	145	153	200	204	208	215	222	230	239	247
FLOW(M**3/S)?	.025	.024	.032	.036	.041	.042	.043	.044	.044	.046
TIME(HR,MIN)>	256	301	305	310	316	320	324	331	335	338
FLOW(M**3/S)>	.047	.047	.054	.054	.052	.049	.048	.066	.082	.088
TIME(HR,MIN)>	342	345	346	347	351	356	359	401	404	408
FLOW(M**3/S)>	.109	.120	.124	.126	.113	.101	.097	.097	.101	.092
TIME(HR,MIN)>	411	415	417	422	428	431	435	437	441	444
FLOW(M**3/S)>	.084	.084	.082	.072	.065	.063	.060	.058	.064	.066
TIME(HR,MIN)>	449	453	460	505	510	515	519	520	522	524
FLOW(M**3/S)>	.065	.063	.059	.053	.055	.052	.051	.053	.064	.073
TIME(HR,MIN)>	526	527	530	534	541	550	560	609	619	624
FLOW(M**3/S)>	.078	.081	.073	.061	.056	.052	.050	.050	.056	.056
TIME(HR,MIN)>	628	632	637	643	648	654	659	702	706	710
FLOW(M**3/S)>	.056	.058	.062	.062	.059	.057	.059	.065	.067	.083
TIME(HR,MIN)>	713	715	717	718	719	722	727	731	733	734
FLOW(M**3/S)>	.088	.097	.105	.109	.110	.103	.095	.091	.086	.089
TIME(HR,MIN)>	737	738	740	745	751	758	804	812	819	830
FLOW(M**3/S)>	.096	.102	.104	.093	.084	.076	.068	.063	.061	.059
TIME(HR,MIN)>	836	845	853	860	906	911	913	915	919	925
FLOW(M**3/S)>	.055	.052	.050	.050	.052	.049	.056	.061	.060	.054
TIME(HR,MIN)>	933	942	958	1000	0	0	0	0	0	0
FLOW(M**3/S)>	.051	.051	.047	.046	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 21/ 3/83 TO 21/ 3/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR.MIN)>	200	202	204	205	205	206	206	207	207	207
FLOW(M**3/S)>	.017	.017	.018	.017	.018	.024	.035	.036	.037	.033
TIME(HR.MIN)>	208	209	209	210	210	211	211	211	212	212
FLOW(M**3/S)>	.027	.025	.025	.029	.030	.032	.036	.043	.043	.045
TIME(HR.MIN)>	213	213	213	213	214	214	214	214	214	214
FLOW(M**3/S)>	.044	.044	.042	.053	.065	.076	.085	.090	.091	.082
TIME(HR.MIN)>	215	215	215	215	215	215	215	215	216	216
FLOW(M**3/S)>	.072	.067	.068	.072	.081	.087	.103	.105	.105	.100
TIME(HR.MIN)>	216	217	217	218	218	219	219	220	220	220
FLOW(M**3/S)>	.082	.073	.062	.054	.051	.050	.051	.054	.058	.067
TIME(HR.MIN)>	220	221	221	221	222	222	222	223	224	224
FLOW(M**3/S)>	.080	.090	.095	.100	.103	.101	.097	.090	.079	.070
TIME(HR.MIN)>	225	226	227	228	228	229	230	232	233	235
FLOW(M**3/S)>	.062	.062	.057	.053	.052	.049	.046	.045	.043	.040
TIME(HR.MIN)>	237	239	241	243	245	247	249	251	253	254
FLOW(M**3/S)>	.038	.038	.035	.036	.033	.033	.033	.032	.033	.030
TIME(HR.MIN)>	257	260	0	0	0	0	0	0	0	0
FLOW(M**3/S)>	.030	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 25/ 3/83 TO 26/ 3/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	2302	2320	2339	2344	2352	2357	10	20	32	40
FLOW(M**3/S))	.010	.010	.011	.013	.016	.018	.016	.016	.016	.015
TIME(HR,MIN))	58	107	115	120	124	126	130	132	135	138
FLOW(M**3/S))	.018	.021	.026	.034	.038	.038	.034	.034	.037	.038
TIME(HR,MIN))	144	148	151	153	156	159	204	206	209	212
FLOW(M**3/S))	.038	.038	.046	.052	.057	.054	.051	.052	.057	.060
TIME(HR,MIN))	216	219	221	224	226	227	229	230	231	234
FLOW(M**3/S))	.062	.067	.076	.090	.096	.100	.112	.119	.121	.116
TIME(HR,MIN))	237	240	245	253	301	309	320	330	336	343
FLOW(M**3/S))	.110	.093	.075	.061	.052	.047	.044	.041	.042	.038
TIME(HR,MIN))	352	405	416	430	445	456	508	522	532	539
FLOW(M**3/S))	.032	.030	.030	.030	.030	.031	.029	.032	.031	.029
TIME(HR,MIN))	553	603	610	623	631	641	650	700	712	723
FLOW(M**3/S))	.027	.028	.030	.032	.032	.028	.026	.032	.035	.034
TIME(HR,MIN))	734	747	800	814	830	848	905	921	936	955
FLOW(M**3/S))	.031	.027	.027	.023	.024	.021	.023	.020	.020	.020

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 20/ 4/83 TO 20/ 4/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	201	210	217	223	229	237	243	250	251	254
FLOW(M**3/S))	.004	.003	.003	.005	.006	.005	.005	.004	.005	.005
TIME(HR,MIN))	259	304	312	315	318	322	328	332	336	341
FLOW(M**3/S))	.008	.011	.013	.013	.013	.016	.015	.013	.012	.014
TIME(HR,MIN))	344	348	352	356	358	360	401	403	405	407
FLOW(M**3/S))	.014	.016	.016	.017	.017	.018	.020	.022	.022	.024
TIME(HR,MIN))	412	414	418	422	426	430	431	432	436	438
FLOW(M**3/S))	.029	.033	.032	.024	.021	.019	.018	.019	.024	.027
TIME(HR,MIN))	441	442	444	448	452	455	458	501	504	507
FLOW(M**3/S))	.035	.037	.036	.029	.027	.026	.025	.031	.041	.053
TIME(HR,MIN))	508	509	511	514	514	517	518	521	526	527
FLOW(M**3/S))	.062	.069	.072	.072	.074	.081	.079	.077	.076	.076
TIME(HR,MIN))	529	530	531	535	538	542	546	549	554	558
FLOW(M**3/S))	.082	.083	.079	.063	.049	.042	.040	.036	.031	.028
TIME(HR,MIN))	601	604	610	615	620	625	612	633	639	647
FLOW(M**3/S))	.028	.029	.030	.032	.033	.034	.034	.031	.030	.027
TIME(HR,MIN))	657	704	713	725	736	757	815	834	851	910
FLOW(M**3/S))	.022	.023	.021	.019	.019	.019	.018	.016	.016	.015
TIME(HR,MIN))	928	0	0	0	0	0	0	0	0	0
FLOW(M**3/S))	.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 11/ 6/83 TO 11/ 6/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	401	407	412	414	417	421	428	432	440	445
FLOW(M**3/S))	.004	.003	.004	.005	.007	.006	.009	.010	.013	.013
TIME(HR,MIN))	450	458	505	512	520	528	537	544	549	559
FLOW(M**3/S))	.013	.014	.013	.011	.010	.009	.010	.011	.011	.011
TIME(HR,MIN))	609	620	631	643	658	708	717	729	738	741
FLOW(M**3/S))	.012	.012	.011	.015	.014	.012	.012	.013	.011	.013
TIME(HR,MIN))	746	753	800	808	813	819	828	834	841	847
FLOW(M**3/S))	.016	.018	.015	.015	.019	.023	.023	.024	.028	.028
TIME(HR,MIN))	852	859	902	910	913	918	923	928	933	937
FLOW(M**3/S))	.027	.030	.029	.030	.035	.036	.046	.050	.046	.045
TIME(HR,MIN))	943	946	950	953	957	1002	1008	1015	1023	1027
FLOW(M**3/S))	.048	.049	.056	.063	.059	.049	.046	.039	.037	.040
TIME(HR,MIN))	1029	1034	1040	1049	1055	1102	1108	1114	1119	1125
FLOW(M**3/S))	.041	.039	.033	.027	.028	.029	.030	.033	.037	.033
TIME(HR,MIN))	1135	1142	1149	1155	1159	1203	1204	1207	1209	1212
FLOW(M**3/S))	.023	.022	.022	.032	.037	.045	.052	.057	.063	.075
TIME(HR,MIN))	1215	1217	1218	1220	1221	1224	1229	1239	1245	1249
FLOW(M**3/S))	.084	.089	.090	.091	.092	.084	.070	.054	.052	.047
TIME(HR,MIN))	1255	1300	1307	1312	1313	1315	1320	1324	1330	1337
FLOW(M**3/S))	.042	.037	.035	.036	.035	.040	.048	.047	.041	.035
TIME(HR,MIN))	1344	1350	1359	1407	1408	1409	1415	1419	1423	1432
FLOW(M**3/S))	.033	.028	.027	.025	.027	.033	.035	.037	.033	.027
TIME(HR,MIN))	1439	1447	1455	1503	1514	1520	1527	1532	1543	1553
FLOW(M**3/S))	.029	.029	.028	.026	.025	.025	.029	.029	.026	.025
TIME(HR,MIN))	1602	1616	1627	1639	1652	1710	1725	1737	1752	1760
FLOW(M**3/S))	.023	.021	.022	.021	.044	.020	.018	.019	.018	.016
TIME(HR,MIN))	1860	1960	2060	2160	2260	0	0	0	0	0
FLOW(M**3/S))	.015	.013	.012	.012	.012	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 16/ 7/83 TO 16/ 7/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	101	108	112	118	120	122	127	133	139	145
FLOW(M**3/S))	.002	.002	.003	.005	.005	.007	.006	.005	.005	.004
TIME(HR,MIN))	146	147	147	148	149	150	150	151	152	152
FLOW(M**3/S))	.004	.021	.052	.082	.090	.086	.079	.078	.080	.081
TIME(HR,MIN))	154	156	159	203	209	212	213	214	215	216
FLOW(M**3/S))	.073	.050	.034	.018	.011	.009	.009	.012	.015	.017
TIME(HR,MIN))	218	220	221	223	224	228	233	236	241	244
FLOW(M**3/S))	.017	.018	.019	.020	.019	.014	.011	.008	.007	.007
TIME(HR,MIN))	246	247	248	248	249	249	250	251	251	252
FLOW(M**3/S))	.007	.006	.013	.031	.049	.065	.079	.084	.084	.083
TIME(HR,MIN))	253	254	254	255	257	259	302	305	312	319
FLOW(M**3/S))	.092	.099	.106	.109	.102	.082	.061	.044	.028	.020
TIME(HR,MIN))	333	344	358	419	440	460	524	544	603	0
FLOW(M**3/S))	.010	.009	.007	.006	.005	.005	.005	.005	.005	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 3/ 7/83 TO 3/ 7/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	301	305	308	309	311	315	317	318	320	322
FLOW(M**3/S))	.005	.005	.005	.008	.011	.010	.010	.011	.013	.014
TIME(HR,MIN))	325	330	337	343	351	357	406	414	427	433
FLOW(M**3/S))	.012	.011	.011	.012	.010	.009	.009	.007	.007	.007
TIME(HR,MIN))	435	438	440	441	442	443	444	445	446	448
FLOW(M**3/S))	.006	.013	.024	.045	.066	.074	.078	.077	.075	.060
TIME(HR,MIN))	451	456	504	513	521	533	547	602	622	646
FLOW(M**3/S))	.043	.026	.016	.010	.009	.008	.008	.007	.006	.006
TIME(HR,MIN))	710	730	749	815	0	0	0	0	0	0
FLOW(M**3/S))	.006	.006	.006	.006	0.000	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 17/ 7/83 TO 17/ 7/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	701	714	729	735	736	737	738	740	741	742
FLOW(M**3/S))	.004	.003	.004	.003	.003	.012	.024	.028	.029	.035
TIME(HR,MIN))	743	744	746	750	755	802	812	823	835	853
FLOW(M**3/S))	.040	.042	.037	.025	.014	.008	.006	.005	.005	.004
TIME(HR,MIN))	909	914	916	919	920	921	922	923	924	925
FLOW(M**3/S))	.005	.004	.005	.011	.016	.038	.066	.086	.092	.087
TIME(HR,MIN))	927	929	930	931	932	932	933	935	936	937
FLOW(M**3/S))	.081	.069	.065	.065	.075	.080	.083	.082	.083	.092
TIME(HR,MIN))	938	938	939	939	940	941	944	946	947	951
FLOW(M**3/S))	.125	.152	.181	.189	.193	.177	.149	.108	.080	.053
TIME(HR,MIN))	955	1003	1011	1015	1017	1018	1019	1021	1023	1025
FLOW(M**3/S))	.034	.023	.018	.015	.024	.029	.032	.038	.041	.040
TIME(HR,MIN))	1030	1040	1052	1106	1123	1138	1153	1219	1245	1307
FLOW(M**3/S))	.031	.016	.012	.010	.009	.009	.008	.008	.007	.008
TIME(HR,MIN))	1331	1359	1427	1451	1515	0	0	0	0	0
FLOW(M**3/S))	.007	.007	.007	.006	.006	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 22/ 7/83 TO 23/ 7/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	2302	2316	2326	2334	2337	2342	2351	2356	2	6
FLOW(M**3/S))	.003	.003	.003	.005	.008	.012	.013	.013	.017	.023
TIME(HR,MIN))	11	21	24	27	31	34	36	37	39	40
FLOW(M**3/S))	.027	.027	.027	.030	.035	.045	.052	.054	.062	.065
TIME(HR,MIN))	41	43	45	47	49	51	52	54	57	60
FLOW(M**3/S))	.067	.071	.085	.097	.105	.108	.110	.103	.091	.081
TIME(HR,MIN))	101	103	104	106	112	117	119	122	124	128
FLOW(M**3/S))	.080	.080	.080	.071	.054	.041	.038	.039	.042	.042
TIME(HR,MIN))	130	131	133	136	138	141	143	146	147	149
FLOW(M**3/S))	.041	.048	.054	.058	.063	.069	.070	.066	.062	.067
TIME(HR,MIN))	151	152	154	155	157	201	205	210	215	216
FLOW(M**3/S))	.073	.076	.077	.078	.070	.058	.046	.036	.031	.034
TIME(HR,MIN))	220	221	223	224	226	231	237	246	300	313
FLOW(M**3/S))	.034	.033	.034	.039	.040	.037	.029	.019	.014	.012
TIME(HR,MIN))	328	344	359	417	440	452	0	0	0	0
FLOW(M**3/S))	.010	.009	.008	.007	.007	.007	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 25/ 7/83 TO 26/ 7/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN))	1603	1623	1628	1638	1642	1645	1650	1654	1702	1711
FLOW(M**3/S))	.004	.005	.004	.006	.005	.007	.008	.010	.008	.006
TIME(HR,MIN))	1718	1722	1724	1725	1728	1730	1732	1733	1737	1740
FLOW(M**3/S))	.005	.005	.010	.012	.015	.016	.023	.028	.036	.039
TIME(HR,MIN))	1743	1746	1748	1749	1750	1752	1753	1755	1759	1001
FLOW(M**3/S))	.038	.034	.033	.035	.046	.052	.056	.058	.056	.057
TIME(HR,MIN))	1802	1804	1804	1805	1807	1808	1810	1811	1811	1813
FLOW(M**3/S))	.059	.073	.094	.153	.231	.265	.285	.293	.294	.277
TIME(HR,MIN))	1816	1819	1822	1825	1829	1833	1843	1858	1917	1937
FLOW(M**3/S))	.247	.219	.167	.128	.082	.059	.036	.022	.016	.012
TIME(HR,MIN))	1958	2027	2100	2130	2208	2240	2316	2350	17	17
FLOW(M**3/S))	.010	.008	.007	.007	.006	.005	.004	.004	.004	.004

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 27/ 8/83 TO 28/ 8/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	2100	2144	2145	2145	2149	2150	2152	2153	2154	2157
FLOW(M**3/S)>	.009	.009	.014	.011	.010	.012	.018	.019	.020	.020
TIME(HR,MIN)>	2160	2202	2205	2209	2212	2215	2222	2225	2230	2232
FLOW(M**3/S)>	.018	.017	.016	.016	.018	.019	.023	.023	.019	.018
TIME(HR,MIN)>	2242	2255	2260	2301	2302	2305	2310	2315	2321	2327
FLOW(M**3/S)>	.012	.008	.008	.008	.011	.015	.019	.020	.020	.018
TIME(HR,MIN)>	2330	2360	5	12	30	60	107	112	117	120
FLOW(M**3/S)>	.016	.009	.009	.013	.011	.007	.007	.008	.012	.013
TIME(HR,MIN)>	122	127	140	160	220	223	232	240	252	260
FLOW(M**3/S)>	.013	.013	.010	.007	.005	.006	.012	.012	.007	.008
TIME(HR,MIN)>	310	335	347	412	552	560	610	620	625	630
FLOW(M**3/S)>	.007	.006	.011	.006	.003	.005	.007	.007	.011	.012
TIME(HR,MIN)>	635	636	637	640	641	643	645	646	648	650
FLOW(M**3/S)>	.012	.013	.018	.040	.042	.053	.073	.077	.081	.077
TIME(HR,MIN)>	658	660	701	703	705	708	712	730	750	808
FLOW(M**3/S)>	.049	.042	.040	.040	.042	.045	.044	.019	.016	.014
TIME(HR,MIN)>	830	860	960	1060	1160	0	0	0	0	0
FLOW(M**3/S)>	.010	.008	.006	.006	.005	0.000	0.000	0.000	0.000	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 1/ 9/83 TO 2/ 9/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1400	1449	1521	1539	1612	1645	1751	1824	1848	2003
FLOW(M**3/S)>	.000	.001	.001	.005	.003	.003	.002	.002	.003	.003
TIME(HR,MIN)>	2056	2109	2111	2131	2142	2145	2150	2155	2205	2217
FLOW(M**3/S)>	.002	.011	.012	.009	.012	.018	.024	.025	.019	.026
TIME(HR,MIN)>	2256	2310	2315	2321	2323	2329	2332	2350	2357	2
FLOW(M**3/S)>	.012	.019	.021	.023	.026	.036	.043	.070	.067	.073
TIME(HR,MIN)>	6	10	16	21	27	30	38	40	41	46
FLOW(M**3/S)>	.083	.091	.113	.101	.082	.082	.097	.115	.116	.113
TIME(HR,MIN)>	52	60	102	107	113	114	119	124	131	138
FLOW(M**3/S)>	.095	.110	.110	.126	.145	.145	.135	.135	.123	.154
TIME(HR,MIN)>	141	144	149	152	157	206	215	228	240	244
FLOW(M**3/S)>	.158	.161	.174	.172	.169	.133	.098	.075	.071	.073
TIME(HR,MIN)>	251	255	301	303	309	312	323	334	345	407
FLOW(M**3/S)>	.080	.097	.142	.172	.191	.181	.132	.100	.095	.064
TIME(HR,MIN)>	451	515	557	630	736	842	948	1054	1160	0
FLOW(M**3/S)>	.053	.053	.040	.035	.028	.024	.021	.018	.016	0.000

NEWTOWN CATCHMENT, NFLD.

STORM DATE FROM 10/ 9/83 TO 10/ 9/83

FLOW RATE
(SELECTED TIME INTERVAL)

TIME(HR,MIN)>	1200	1215	1230	1247	1303	1322	1335	1343	1345	1346
FLOW(M**3/S)>	.001	.001	.003	.004	.009	.008	.013	.013	.029	.029
TIME(HR,MIN)>	1350	1352	1357	1401	1411	1414	1420	1422	1427	1433
FLOW(M**3/S)>	.031	.030	.023	.019	.034	.034	.039	.039	.034	.041
TIME(HR,MIN)>	1437	1440	1445	1450	1451	1457	1502	1503	1505	1512
FLOW(M**3/S)>	.044	.044	.039	.040	.040	.035	.027	.027	.035	.055
TIME(HR,MIN)>	1514	1521	1523	1526	1530	1535	1538	1542	1550	1554
FLOW(M**3/S)>	.056	.052	.063	.064	.053	.038	.034	.034	.040	.039
TIME(HR,MIN)>	1607	1612	1615	1618	1643	1650	1658	1720	1732	1748
FLOW(M**3/S)>	.026	.033	.037	.037	.019	.023	.031	.017	.013	.013
TIME(HR,MIN)>	1760	1860	1960	2060	0	0	0	0	0	0
FLOW(M**3/S)>	.012	.007	.006	.005	0.000	0.000	0.000	0.000	0.000	0.000

2.2.2. Stage discharge curves - South Brook at Old Bay Bulls Road (02ZM013)

A staff gauge was fastened to the downstream abutment of the bridge on the Old Bay Bulls Road, which spans a tributary of South Brook as shown on Figure 2.0. This location was a water quality monitoring site where the water discharge was required at the time the sample was taken. The need for discharge data was fulfilled by the establishment of stage discharge relationships at the water quality sampling sites. This task was performed by the erection of a staff gauge at the sampling site and the measurement of the discharge at various stages until a relationship could be produced. The variability of the curves is due to the gravel that builds up at the bridge culvert section and is washed down during high flows. The selection of this site was restricted by the placement of the sampling site. However, sufficient discharge measurements were made to maintain a good stage discharge relationship. These curves are shown in Figures 2.6 through 2.9.

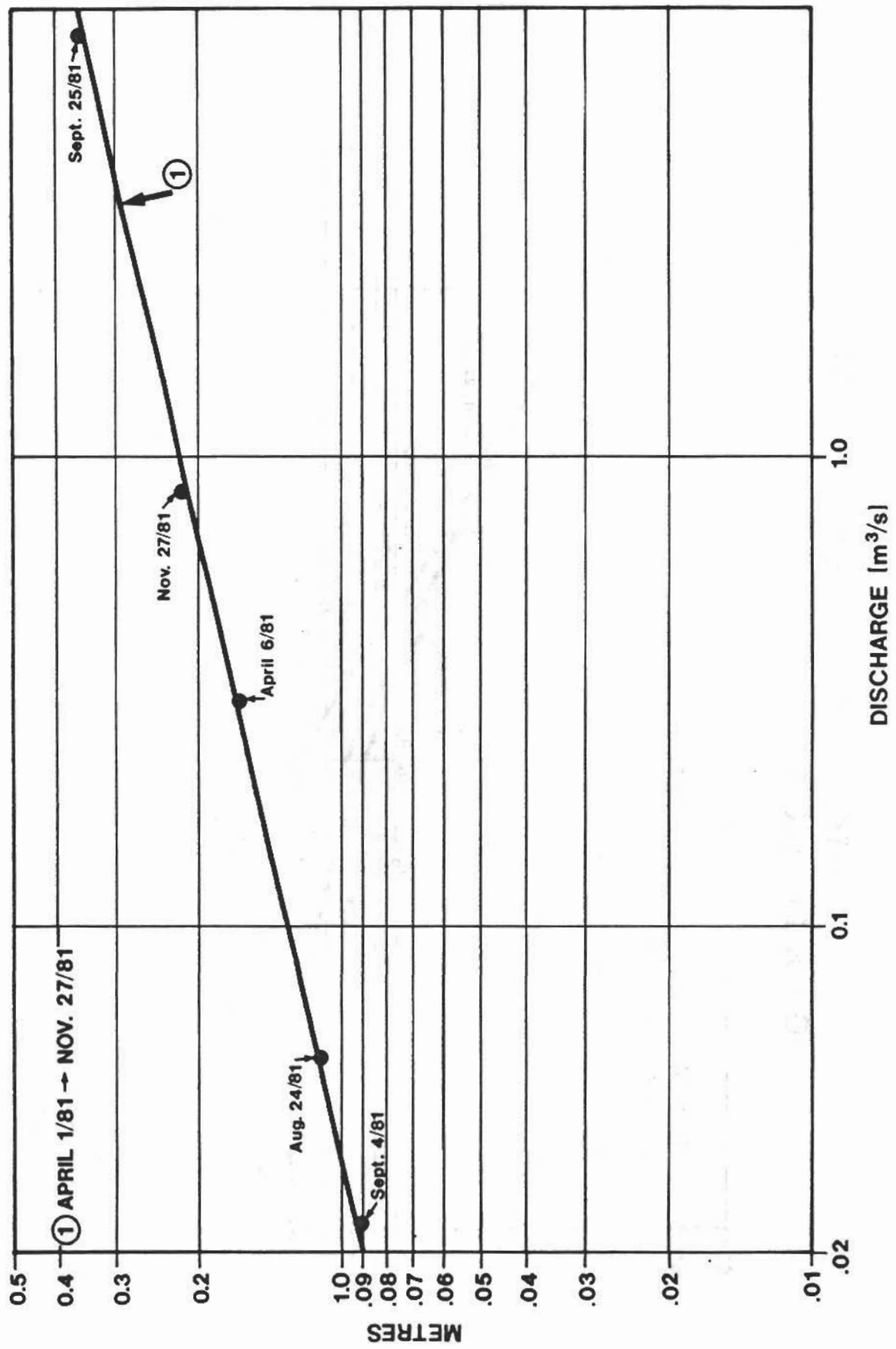

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT OLD BAY BULLS ROAD-02ZM013
① APRIL 1/81 → NOV. 27/81
Sept. 25/81
Nov. 27/81
April 6/81
Aug. 24/81
Sept. 4/81
METRES
0.5
0.4
0.3
0.2
1.0
.09
.08
.07
.06
.05
.04
.03
.02
.01
.02
0.1
1.0
DISCHARGE (m³/s)

Figure 2.6

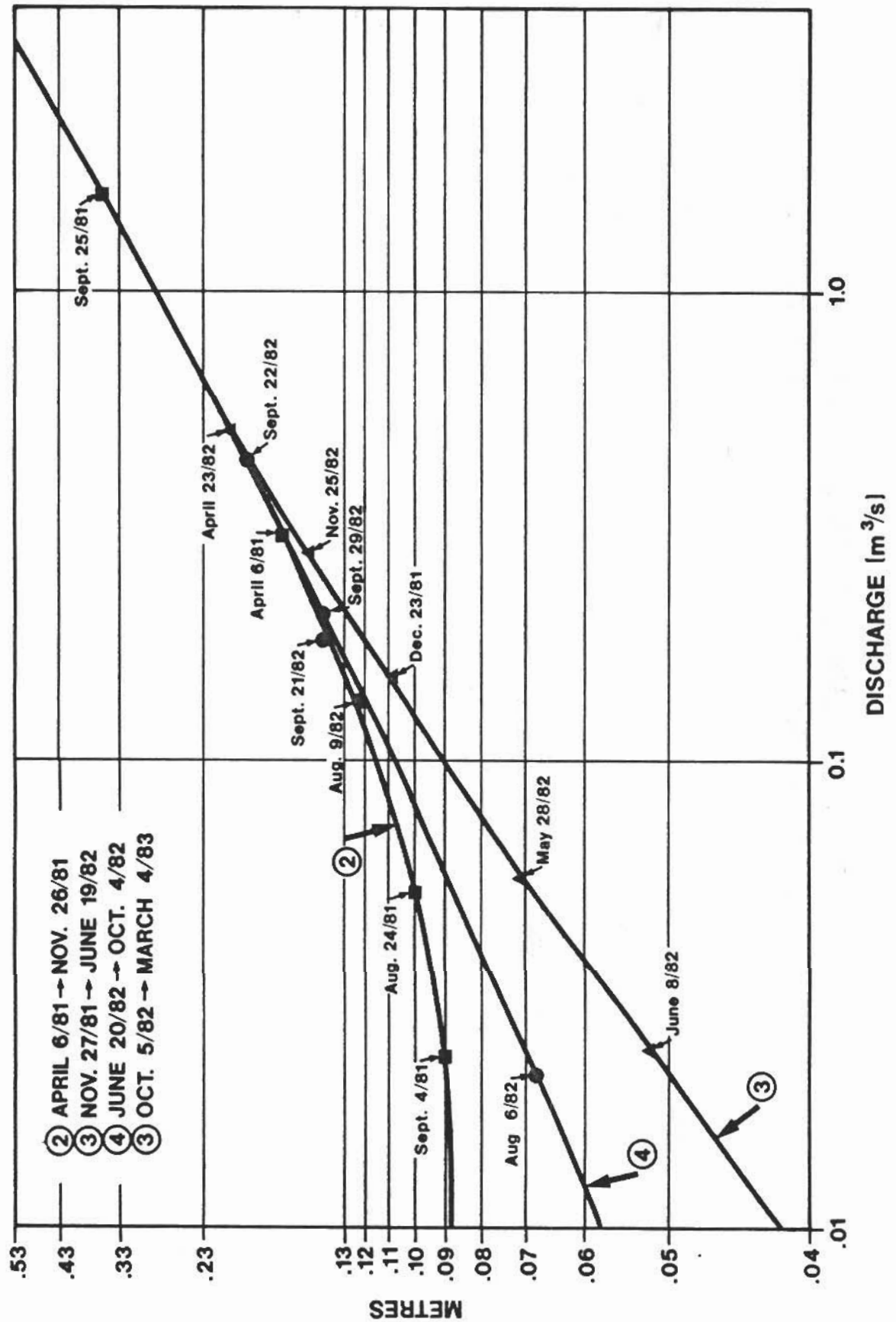

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT OLD BAY BULLS ROAD-02ZM013
② APRIL 6/81 → NOV. 26/81
③ NOV. 27/81 → JUNE 19/82
④ JUNE 20/82 → OCT. 4/82
③ OCT. 5/82 → MARCH 4/83
METRES
DISCHARGE (m³/s)
.53
.43
.33
.23
.13
.12
.11
.10
.09
.08
.07
.06
.05
.04
.01
0.1
1.0
Sept. 25/81
April 23/82
Sept. 22/82
April 6/81
Nov. 25/82
Sept. 29/82
Sept. 21/82
Dec. 23/81
Aug. 9/82
Aug. 24/81
May 28/82
Sept. 4/81
Aug 6/82
June 8/82

Figure 2.7

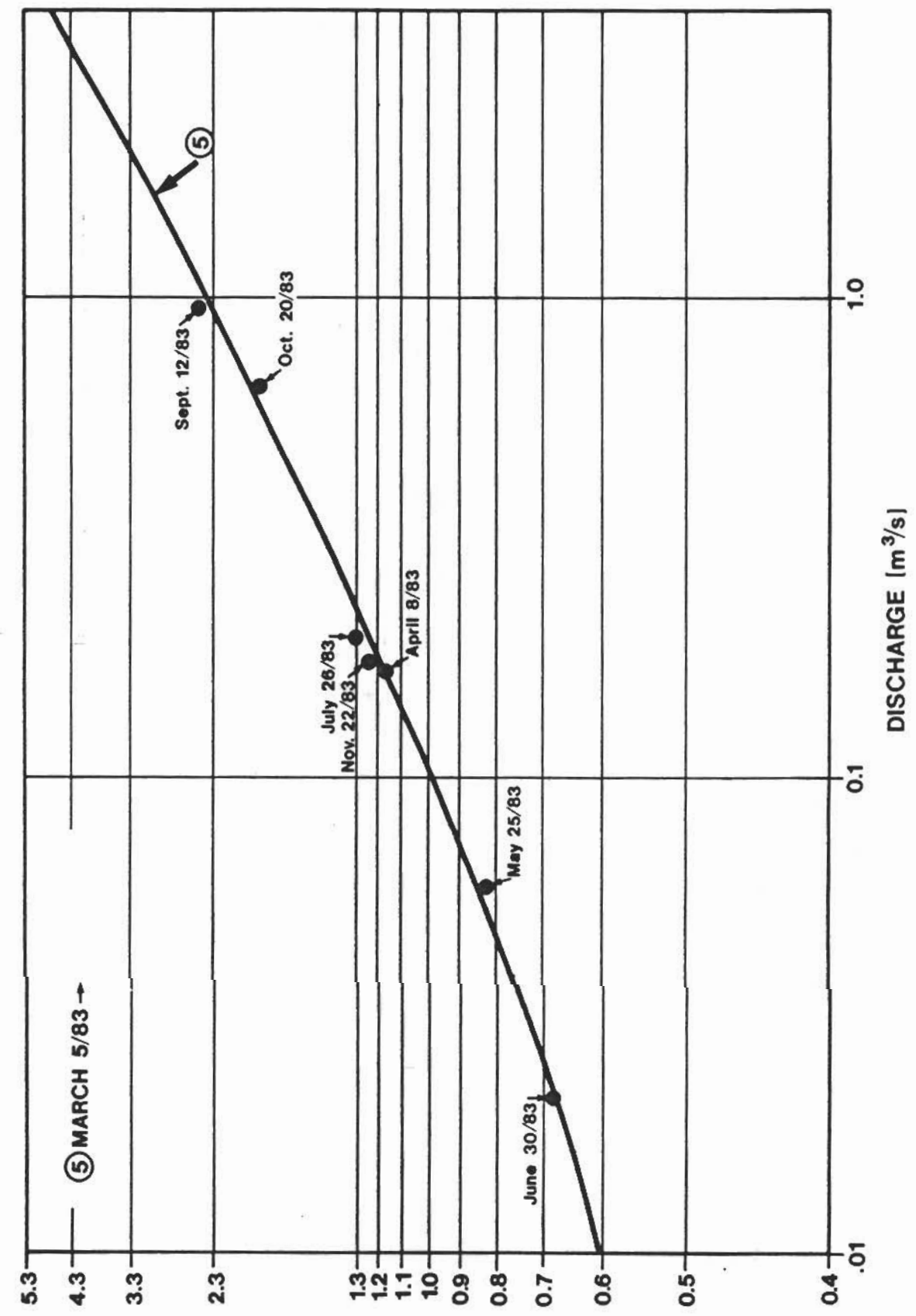

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT OLD BAY BULLS ROAD-02ZM013
⑤ MARCH 5/83 →
⑤
Sept. 12/83
Oct. 20/83
July 26/83
Nov. 22/83
April 8/83
May 25/83
June 30/83
METRES
5.3
4.3
3.3
2.3
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
.01
0.1
1.0
DISCHARGE [m³/s]

Figure 2.8

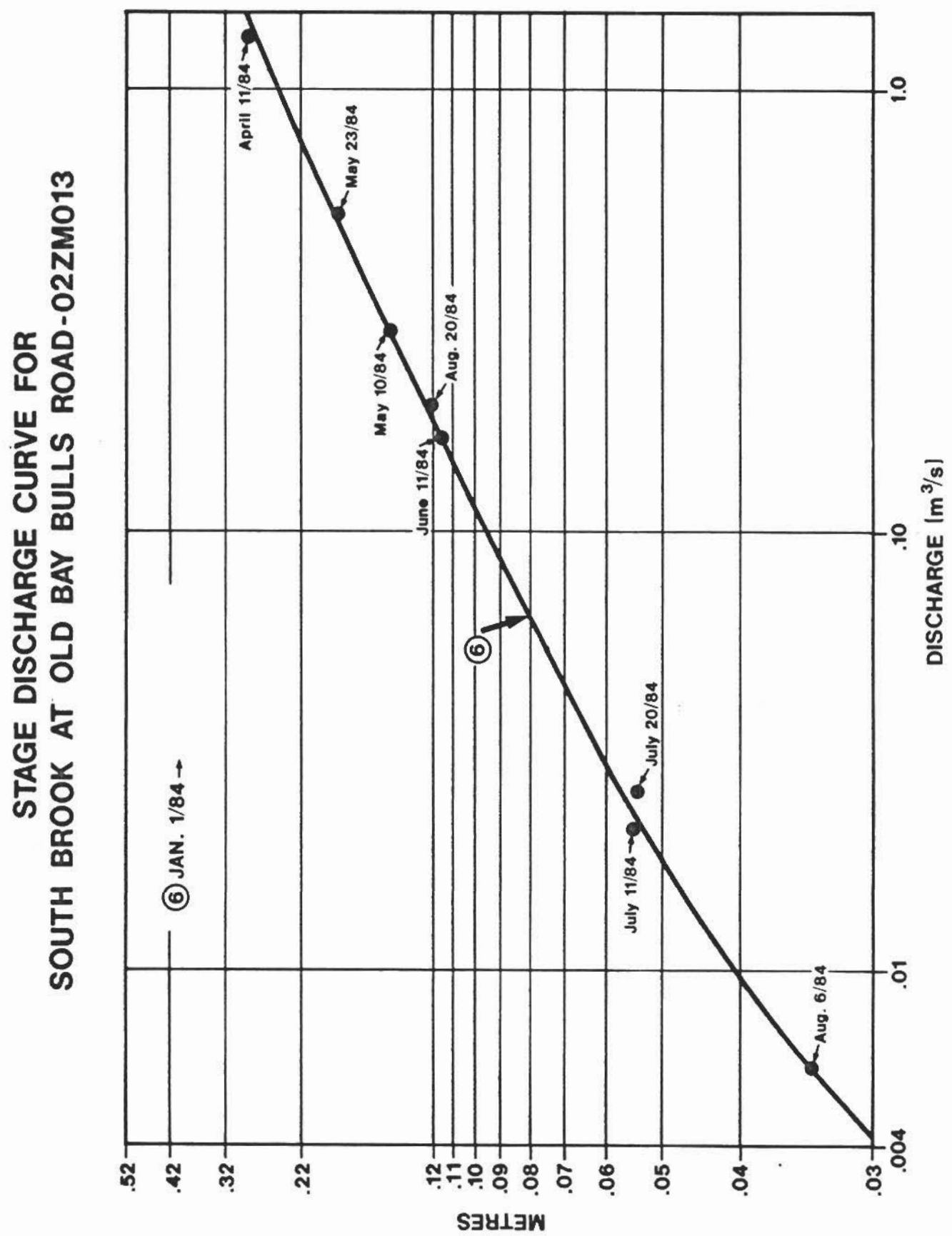

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT OLD BAY BULLS ROAD-02ZM013
⑥ JAN. 1/84
April 11/84
May 23/84
May 10/84
June 11/84
Aug. 20/84
July 20/84
July 11/84
Aug. 6/84
⑥
METRES
.52
.42
.32
.22
.12
.11
.10
.09
.08
.07
.06
.05
.04
.03
.004
.01
.10
1.0
DISCHARGE (m³/s)

Figure 2.9

2.2.3 Stage discharge curves - South Brook at Ruby Line (02ZM015)

A staff gauge was fastened to the downstream end of circular culvert passing under Ruby Line near the Harbour Arterial interchange at Ruby Line as shown on Figure 2.0. This location was selected as a water quality sampling site and as such discharges were required at the time of the sampling. The need for discharge data was fulfilled by the establishment of stage discharge relationships at the water quality sampling site and the measurement of the discharge at various stages until a stable relationship could be produced.

The control was formed by gravels scoured at the culvert outlet and built up approximately 15m downstream. This control was subject to change after major runoff events. Problems also occurred when children using the pool for swimming placed rocks on the control to raise the water levels in the pool. The selection of this site was restricted by the location of the sampling site. However, sufficient measurements were taken to maintain a good stage discharge relationship.

Figures 2.8 and 2.9 represent the stage discharge relationships developed at the sight over the period of the study.

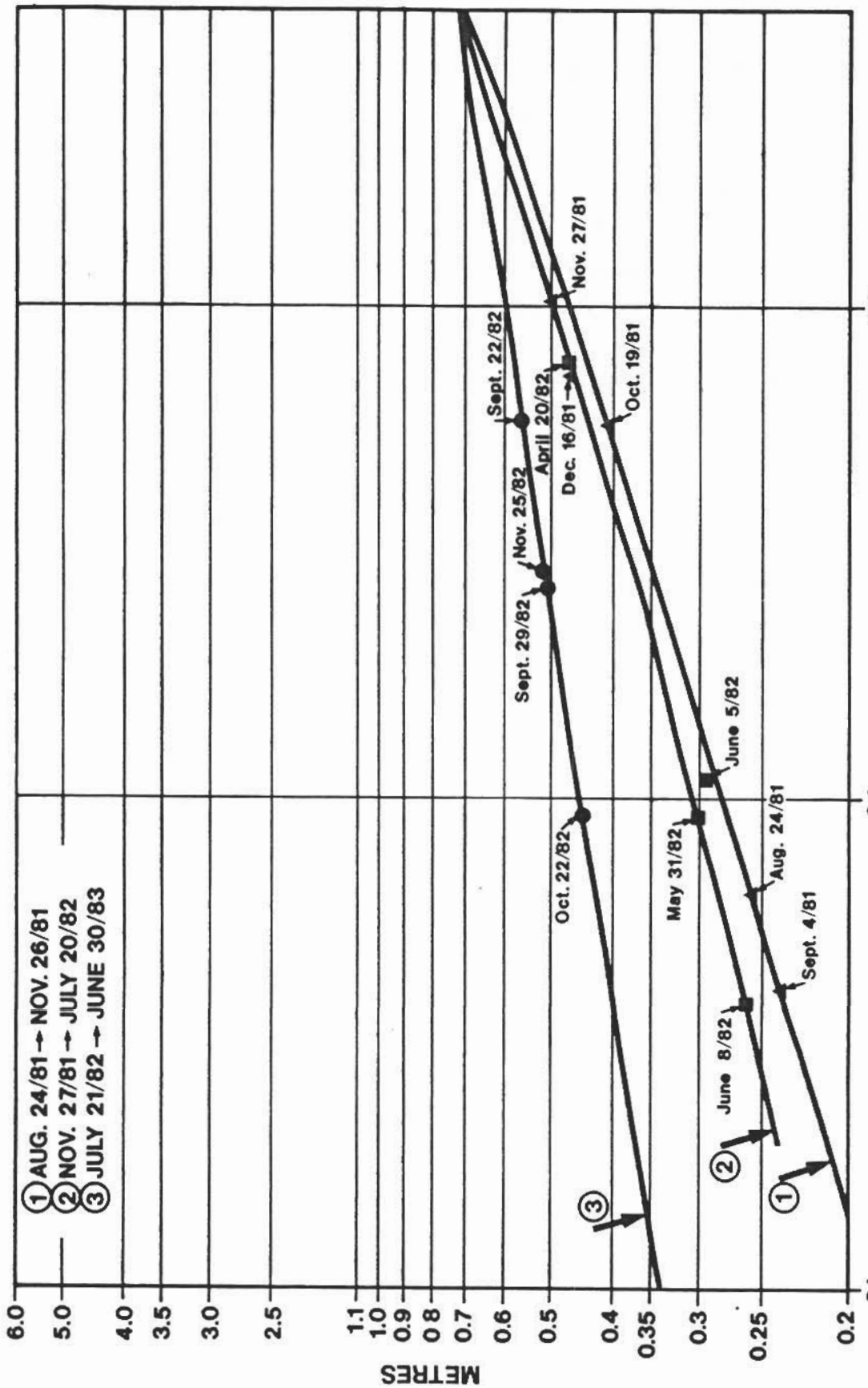

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT RUBY LINE-02ZM015
① AUG. 24/81 → NOV. 26/81
② NOV. 27/81 → JULY 20/82
③ JULY 21/82 → JUNE 30/83
METRES
DISCHARGE (m³/s)
6.0
5.0
4.0
3.5
3.0
2.5
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.35
0.3
0.25
0.2
.01
0.1
1.0
Sept. 22/82
Nov. 25/82
Sept. 29/82
April 20/82
Dec. 16/81
Nov. 27/81
Oct. 19/81
Oct. 22/82
May 31/82
June 5/82
Aug. 24/81
Sept. 4/81
June 8/82

Figure 2.10

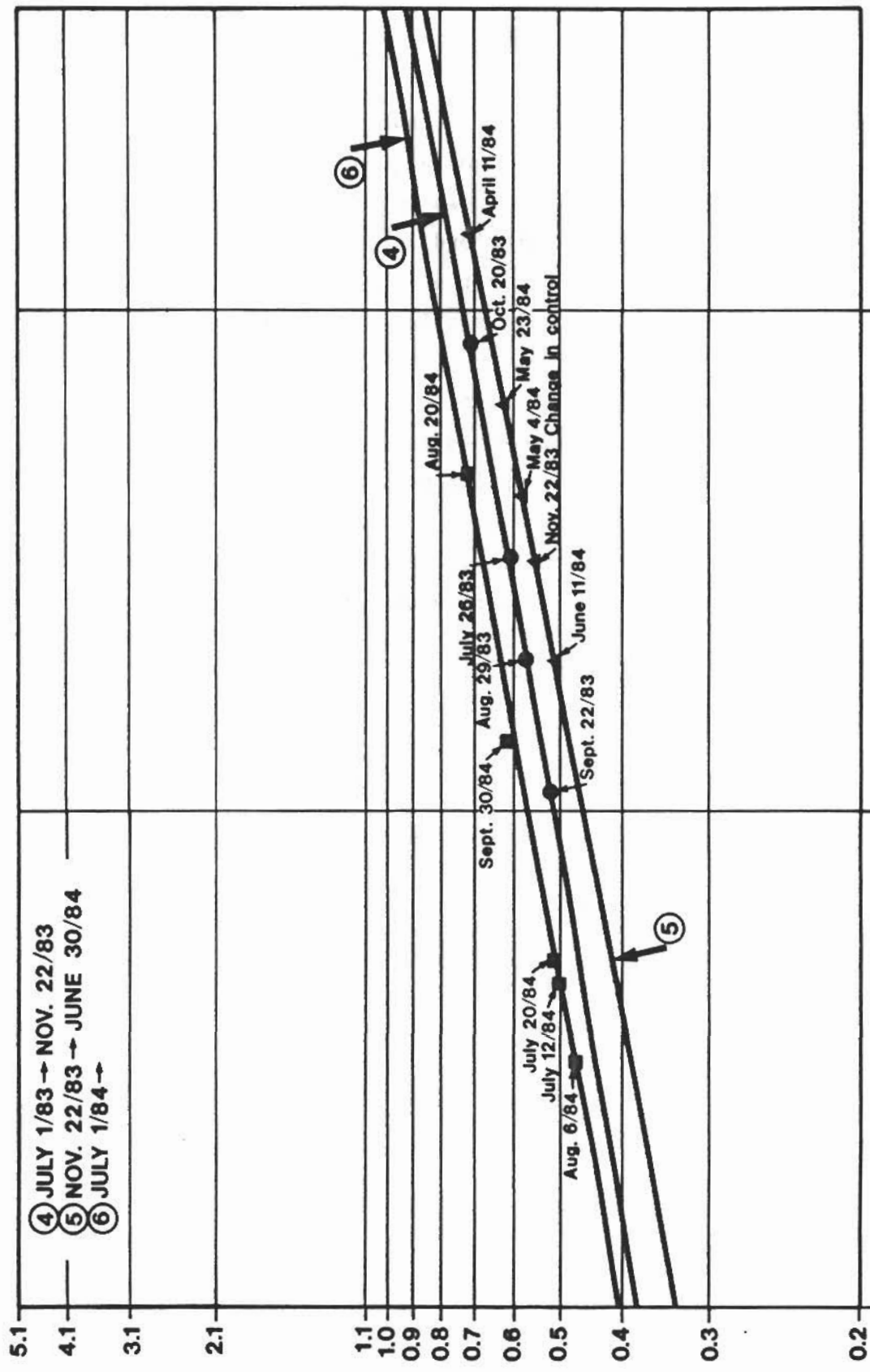

STAGE DISCHARGE CURVE FOR
SOUTH BROOK AT RUBY LINE-02ZM015
④ JULY 1/83 → NOV. 22/83
⑤ NOV. 22/83 → JUNE 30/84
⑥ JULY 1/84 →
METRES
DISCHARGE [m³/s]
5.1
4.1
3.1
2.1
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
.01
0.1
1.0
Aug. 20/84
July 26/83
Aug. 29/83
Sept. 30/84
July 20/84
July 12/84
Aug. 6/84
Sept. 22/83
June 11/84
Nov. 22/83 Change in control
May 4/84
May 23/84
Oct. 20/83
April 11/84

Figure 2.11

2.2.4 Stage discharge curves - Unnamed Tributary at Agriculture Farm (02ZM014)

A staff gauge was fastened upstream of the bridge on the main entrance road to the Canada Department of Agriculture Experimental Farm as shown on Figure 2.0. The stream is a minor tributary of the Waterford River and the site is a water quality sampling point. While the control was not particularly ideal the channel was quite stable with large boulders used to prevent erosion. The selection of this site was restricted by the placement of the sampling site. The stage discharge relationships established provided a good estimate of the discharge during sampling period.

Figures 2.10 and 2.11 represent the stage discharge relationships at this site over the study period.

STAGE DISCHARGE CURVE FOR UNNAMED TRIBUTARY OF WATERFORD RIVER, AGRICULTURE FARM-02ZM014

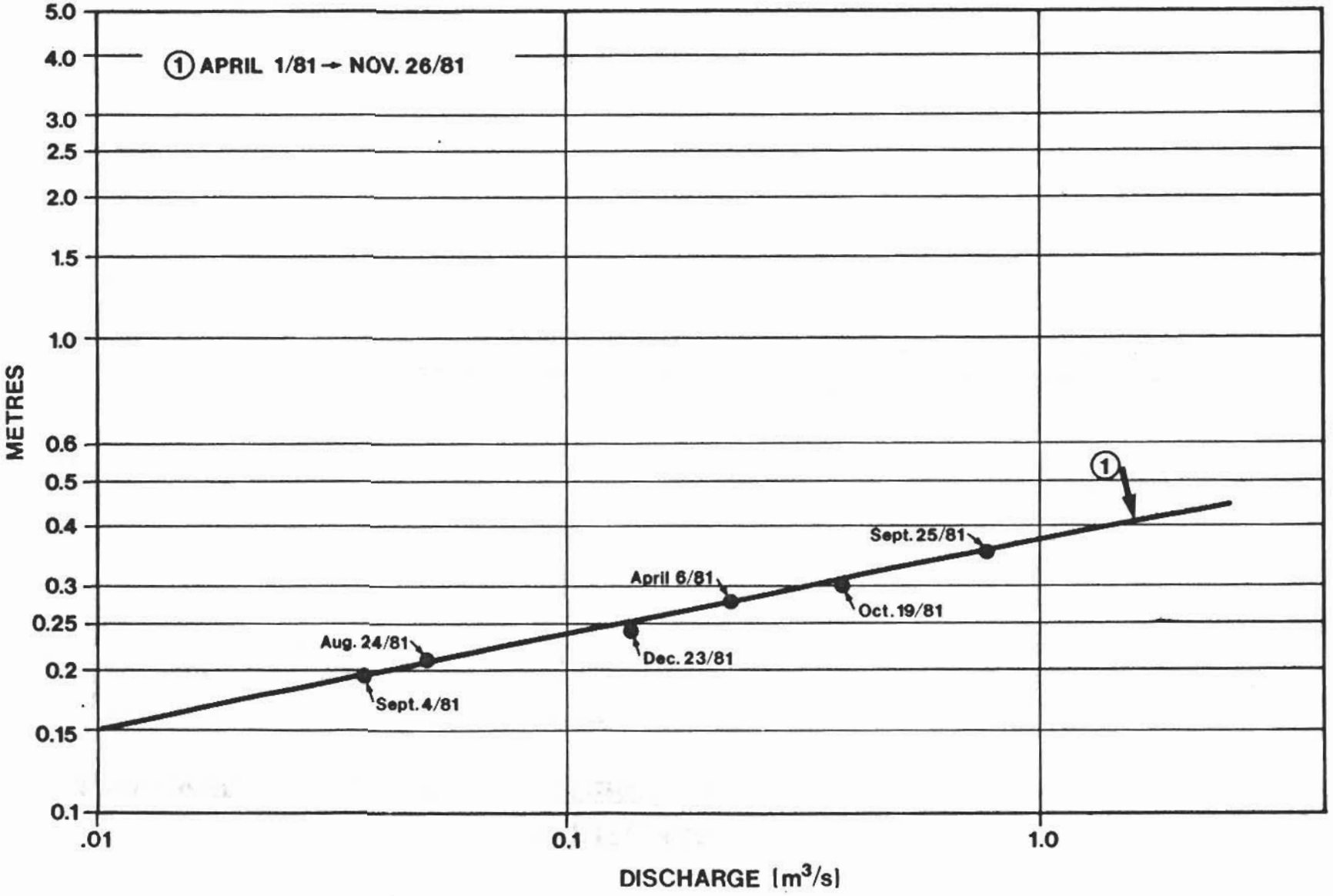


Figure 2.12

STAGE DISCHARGE CURVE FOR UNNAMED TRIBUTARY OF WATERFORD RIVER, AGRICULTURE FARM-02ZM014

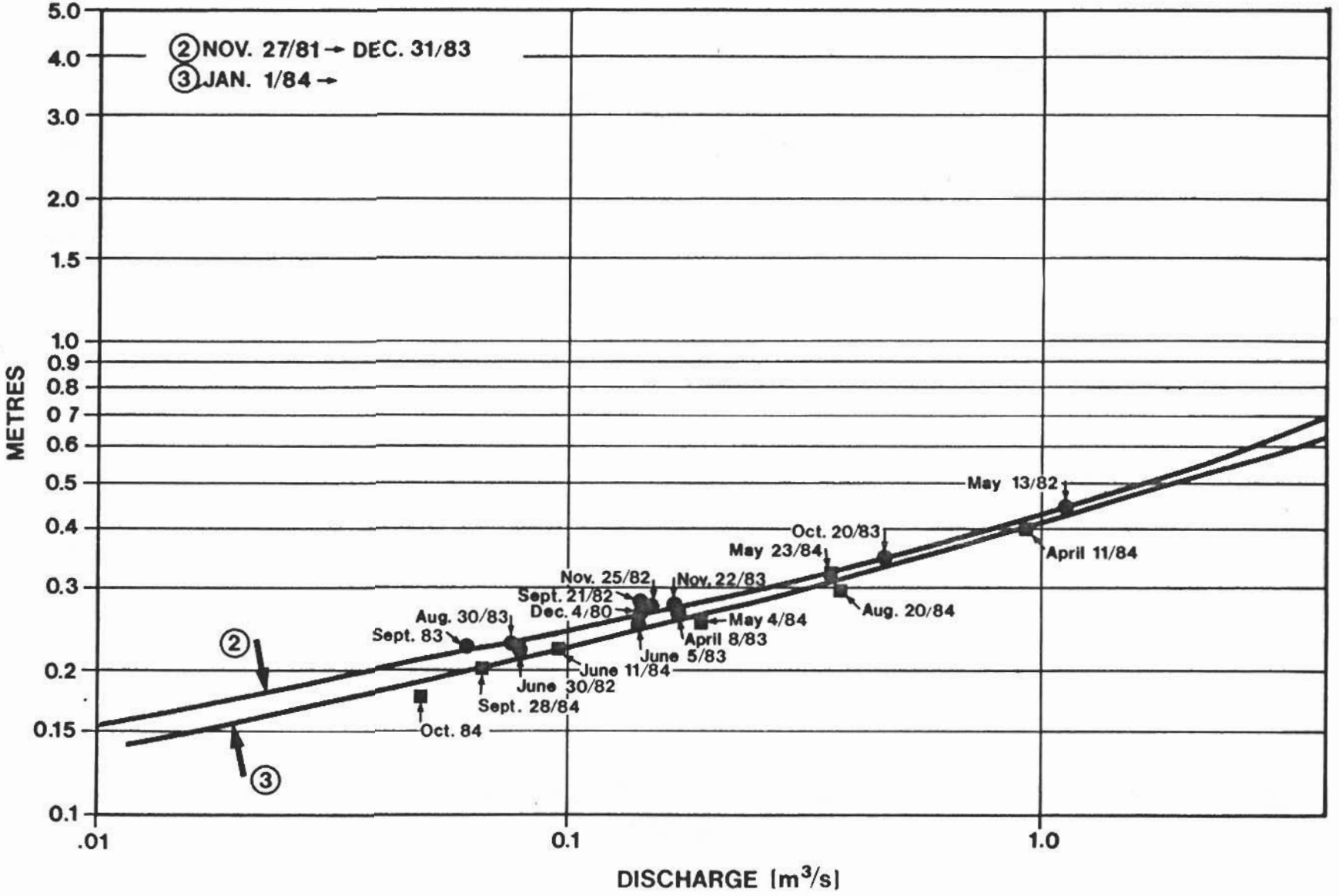


Figure 2.13

3.0 WATER LEVEL DATA

Water level data were collected at peak flows for use in the flood profile modelling of the following three reaches on the main stem of the Waterford River:

1. Above Kilbride hydrometric gauge (02ZM008)
2. Below Mount Pearl hydrometric gauge (02ZM010)
3. Above Donovans hydrometric gauge (02ZM011)

The approximate locations of these reaches and the gauges are shown on Figure 3.0.

Three methods were used to collect water level data:

1) The recorder at the gauge hydrometric station located in the study reach.

2) Crest gauges located at selected locations along the reach.

3) Staking a flood profile during high flows and surveying.

While the hydrometric station provides the best means of capturing the peak, it only provides one point on the profile of the reach. The staking of the flood profile provides the best data, but it requires manpower, warning and a readiness to respond. This is usually performed when a major event is expected. The crest gauge as shown in Figure 3.1 is a simple device that can record a water level peak and mark it for measurement at a later time. Unfortunately, these devices are subject to vandalism and consequently the loss of data. The locations of the crest gauges, hydrometric station and cross-sections where profile staking were performed are shown on Figures 3.2, 3.3, and 3.4

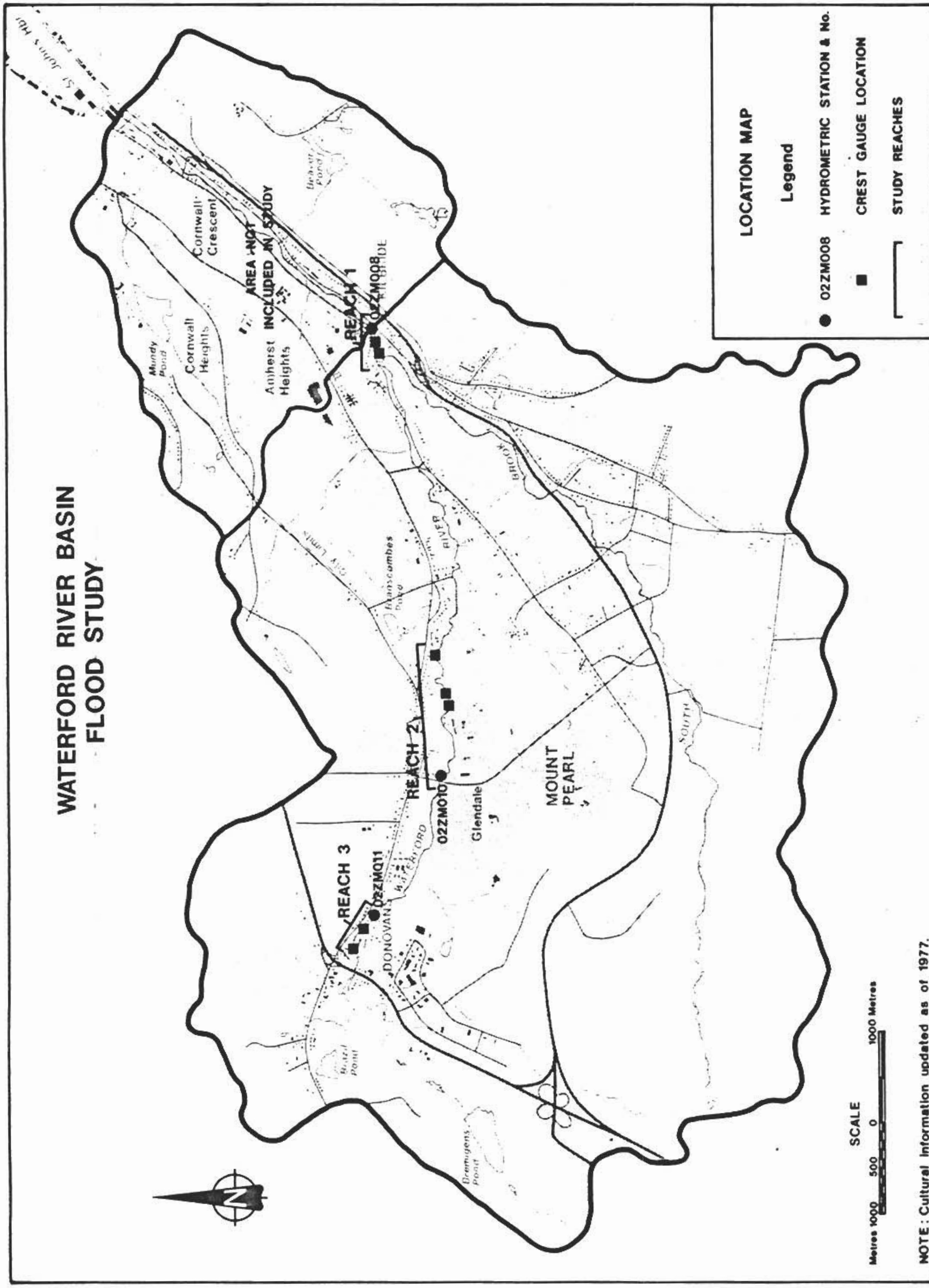
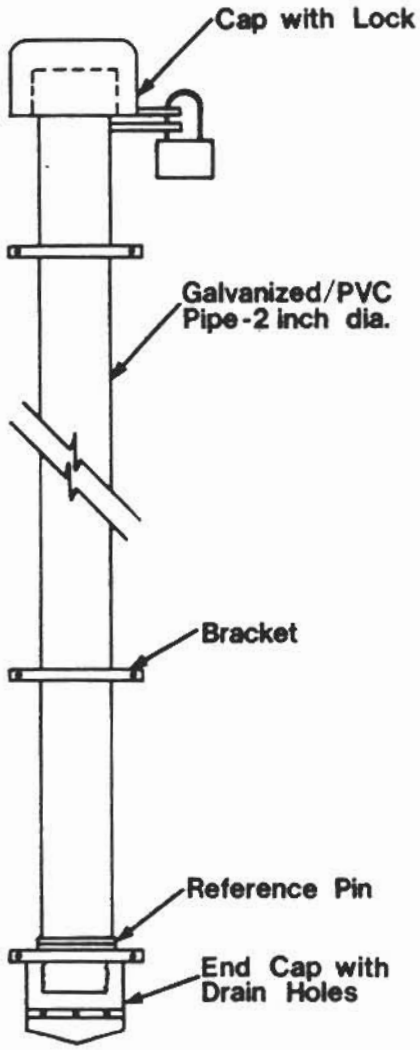
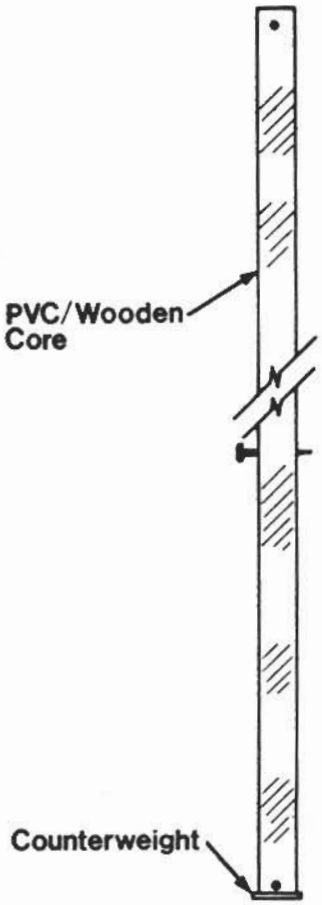

WATERFORD RIVER BASIN
FLOOD STUDY
LOCATION MAP
Legend
02ZM008 HYDROMETRIC STATION & No.
CREST GAUGE LOCATION
STUDY REACHES
REACH 1
02ZM008
KILBRIDE
AREA NOT INCLUDED IN STUDY
Cornwall Crescent
Cornwall Heights
Mundy Pond
Amherst Heights
REACH 2
02ZM010
Glendale
MOUNT PEARL
REACH 3
02ZM011
DONOVAN
SCALE
Metres 1000
500
0
1000 Metres
NOTE: Cultural Information updated as of 1977.

Figure 3.0

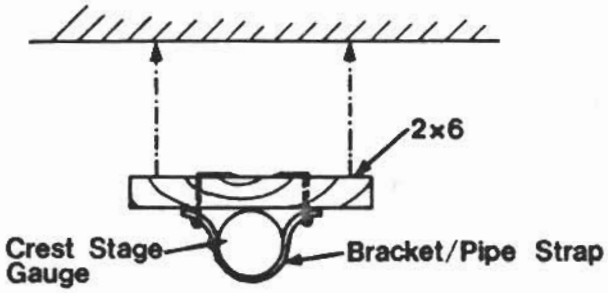
CREST-STAGE GAUGE



ELEVATION
CREST GAUGE



ELEVATION
INNER CORE



PLAN VIEW
FASTENING METHOD

PLAN VIEW
INNER CORE

Figure 3.1

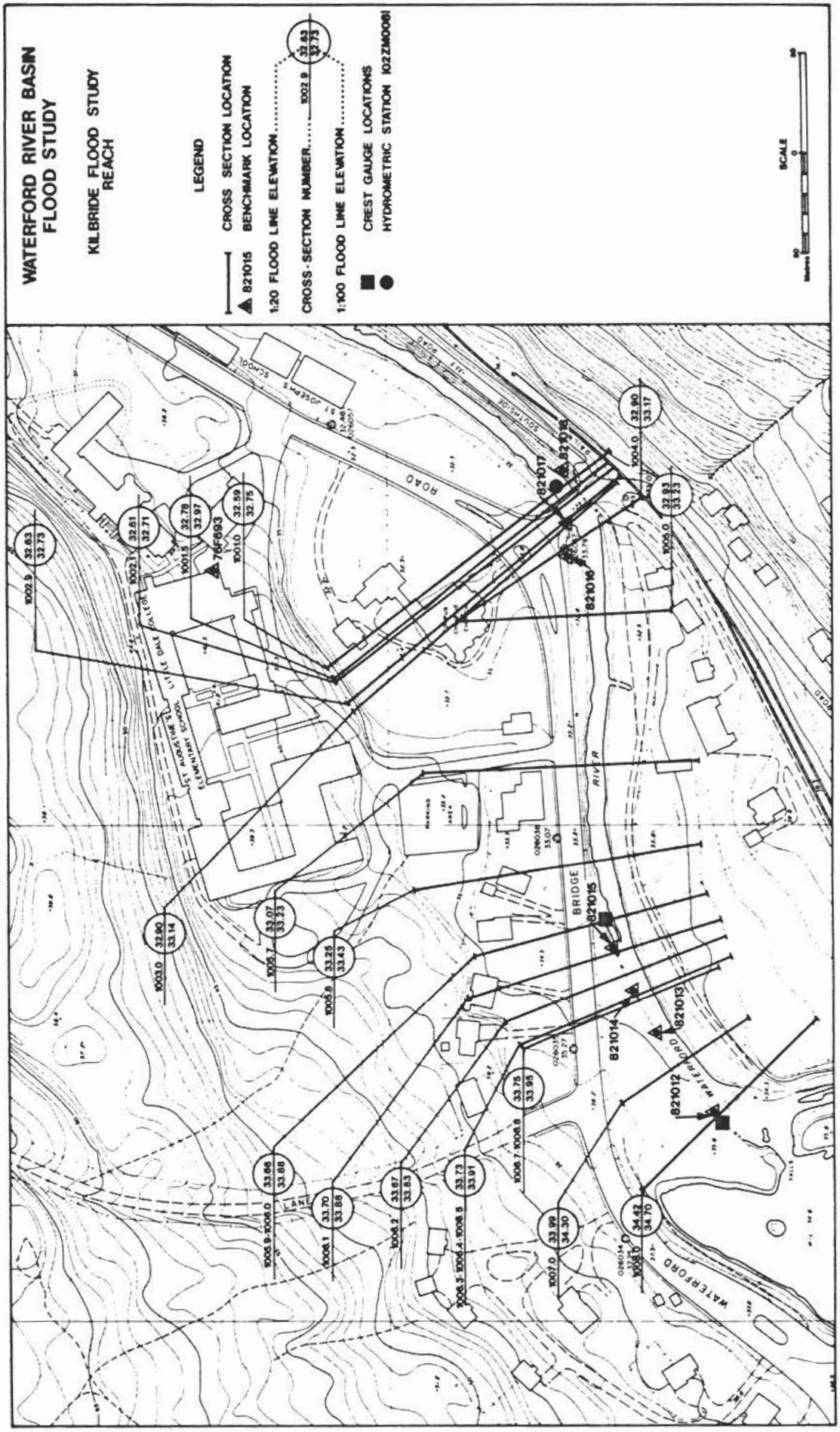

WATERFORD RIVER BASIN
FLOOD STUDY
KILBRIDE FLOOD STUDY
REACH
LEGEND
CROSS SECTION LOCATION
821015 BENCHMARK LOCATION
1:20 FLOOD LINE ELEVATION
CROSS-SECTION NUMBER
1:100 FLOOD LINE ELEVATION
CREST GAUGE LOCATIONS
HYDROMETRIC STATION 1022M0081
SCALE
ROAD
BRIDGE
RIVER
WATERFORD
821012
821013
821014
821015
821016
821017
821018
76F093

Figure 3.2

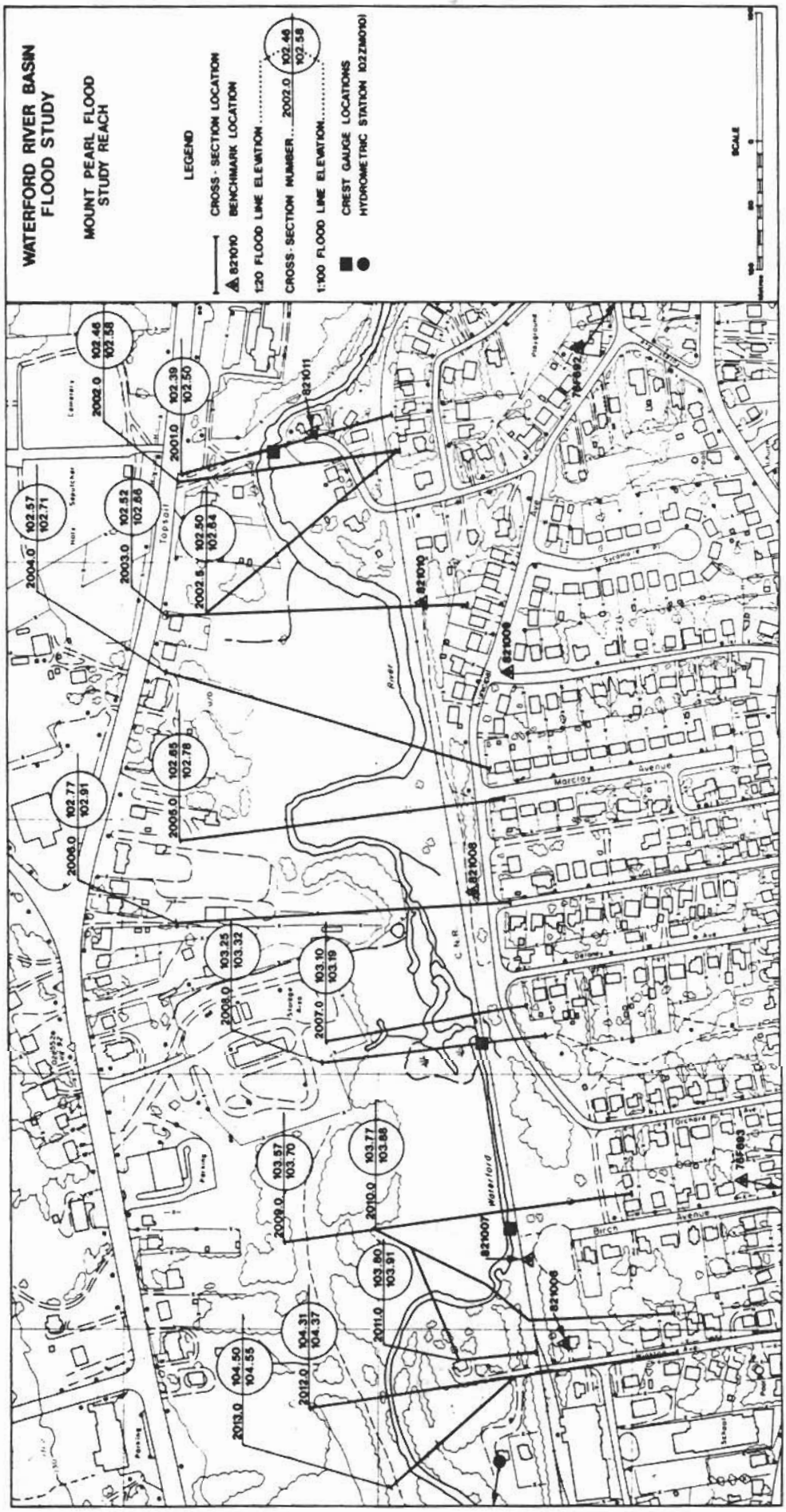

WATERFORD RIVER BASIN
FLOOD STUDY
MOUNT PEARL FLOOD
STUDY REACH
LEGEND
CROSS - SECTION LOCATION
821010 BENCHMARK LOCATION
1:20 FLOOD LINE ELEVATION
CROSS - SECTION NUMBER... 2002.0 102.46 102.58
1:100 FLOOD LINE ELEVATION
CREST GAUGE LOCATIONS
HYDROMETRIC STATION 02ZH010
SCALE
River
Topsoil
Marclay Avenue
Sycamore St
Orchard Ave
Birch Avenue
Waterford
C.N.R.
Playground
School
Parking

Figure 3.3

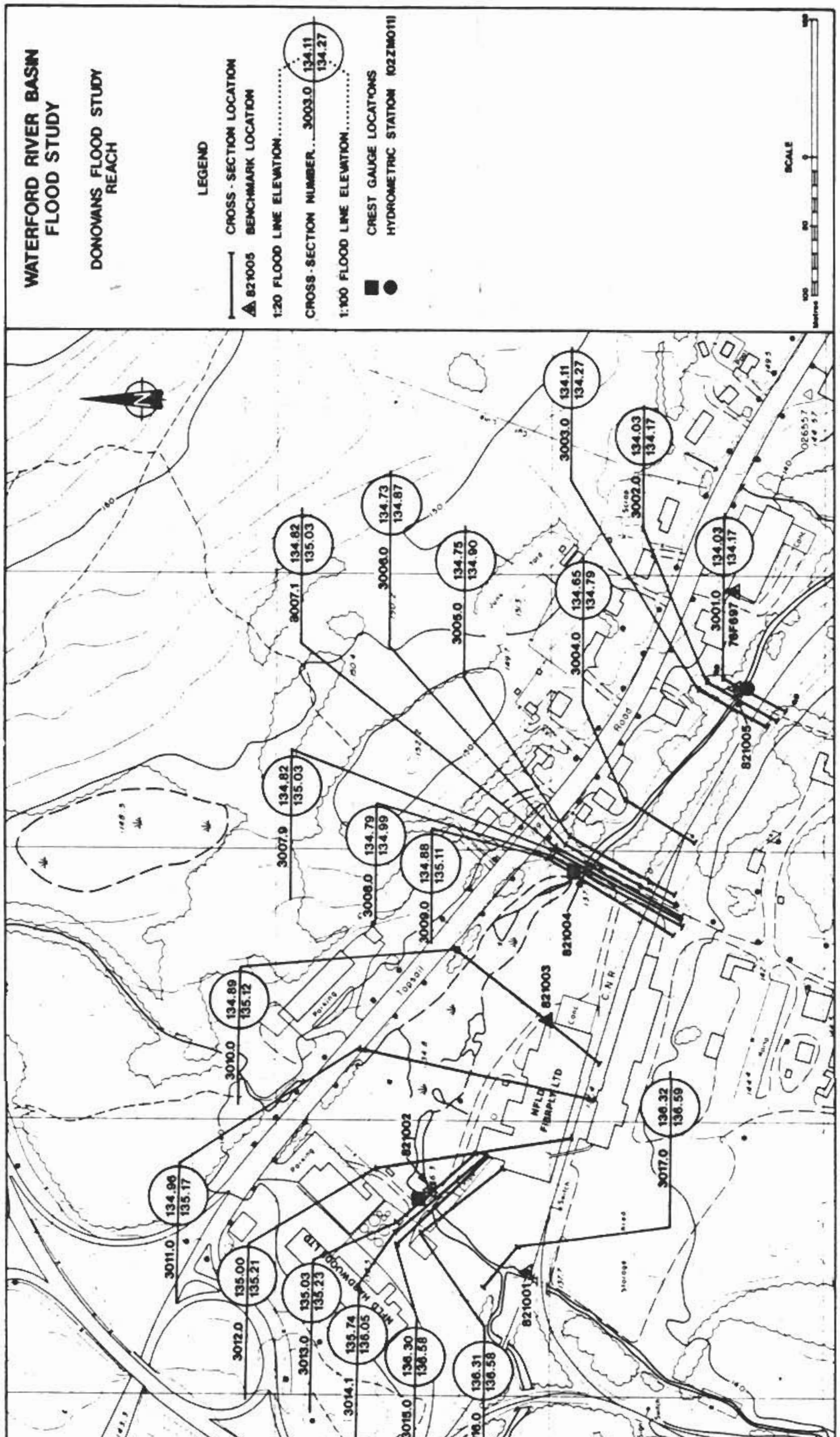

WATERFORD RIVER BASIN
FLOOD STUDY
DONOVANS FLOOD STUDY
REACH
LEGEND
CROSS - SECTION LOCATION
821005 BENCHMARK LOCATION
1:20 FLOOD LINE ELEVATION
CROSS - SECTION NUMBER
1:100 FLOOD LINE ELEVATION
CREST GAUGE LOCATIONS
HYDROMETRIC STATION
SCALE
Topsail
Road
C.N.R.
NFLD. FIBREPLY LTD
NFLD HARDWOOD LTD
Parking
821001
821002
821003
821004
821005

Figure 3.4

The staked and crest gauge data recorded for the study reaches are presented here. Staked profiles show the time of the measurement so that they may be combined with the recorded measurement at the hydrometric station. The timing of the crest gauge marking can be estimated by noting the time of the peak flow at the hydrometric station. However, this is not essential.

3.1 Kilbride Flood Study Reach

KILBRIDE

Data Source: Staked Profile
Date: November 26, 1981
Flow: 47.2 m^3/s*

Cross Section Number	Measured Water Surface Elevation (m)	Measured Time	Comments
1001	32.40	20:51	
1001.5			
1002.1			
1002.9			
1003	32.53	20:55	
1004	32.49	20:57	
1005	32.84	20:59	Datum error suspected
1005.7			
1005.8			
1005.9			
1006	33.30	21:04	
1006.1			
1006.2			
1006.3	33.39		
1006.4			
1006.5	33.27	21:07	
1006.7			
1006.8			
1007	33.79	21:21	
1008	33.98	21:23	

* Representative flow for time of profile measurement.

KILBRIDE

Data Source: Staked Profile
Date: September 2, 1983
Flow: 18.5 m^3/s*

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
1001	31.84	8:10	
1001.5			
1002.1	31.74		
1002.9			
1003	31.76	8:10	
1004	31.74		
1005	32.24	8:20	Suspected datum error
1005.7	32.20	8:20	14 m.d/s of 1005.7
1005.8	32.57	8:22	25 m.d/s of 1005.8
1005.9			
1006	32.85	8:22	
1006.1			
1006.2			
1006.3			
1006.4			
1006.5	32.76	8:24	
1006.7			
1006.8			
1007	33.05	8:24	
1008	33.14	8:25	

* Representative flow for time of profile measurement.

KILBRIDE

Data Source: Staked Profile
Date: October 26, 1983
Flow: 39.3 m^3/s*

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
1001	32.47	15:00	
1001.5	32.35	15:03	
1002.1			
1002.9			
1003	32.42	15:05	
1004			
1005	32.52	15:06	Datum error suspected
1005.7	32.94	15:08	
1005.8			
1005.9			
1006	33.36	15:10	
1006.1			
1006.2			
1006.3			
1006.4			
1006.5	33.22	15:13	
1006.7			
1006.8			
1007	33.69	15:14	
1008	33.80	15:15	

* Representative flow for time of profile measurement.

KILBRIDE

Data Source: Crest Gauges
Date: September 15, 1983
Peak Flow: 10.2 m^3/s

Cross Section Number	Measured Water Surface Elevation (m)
1001	31.52
1001.5	
1002.1	
1002.9	
1003	
1004	
1005	
1005.7	
1005.8	
1005.9	
1006	32.62
1006.1	
1006.2	
1006.3	
1006.4	
1006.5	
1006.7	
1006.8	
1007	
1008	32.82

3.2 Mount Pearl Flood Study Reach

MOUNT PEARL

Data Source: Staked Profile
Date: June 20, 1982
Flow: 8.67 m^3/s*

Cross Section Number	Measured Water Surface Elevation (m)	Measured Time	Comments
2001	101.91		
2002	101.96	14:22	
2002.5			
2003	102.11	14:19	
2004	102.11	14:39	15 m downstream
2005			
2006	102.33	14:15	
2007	102.57	14:14	
2008			
2009	103.10	14:11	
2010			
2011	103.56	14:06	
2012	103.98	14:03	
2013	104.21	14:01	

* Representative flow for time of profile measurement.

MOUNT PEARL

Event: Calibration (staked)
Date: October 26, 1983
Flow: 12.0 m^3/s*

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
2001	102.18		
2002			
2002.5			
2003	102.30	16:55	
2004	102.34	16:52	
2005			
2006	102.53	16:46	
2007	102.68	16:42	
2008	103.00	16:38	measurement error suspected
2009	103.63	16:35	
2010	103.54	16:30	not at section
2011	103.75	16:24	
2012	104.07	16:20	
2013	104.39	16:16	

* Representative flow for time of profile measurement.

MOUNT PEARL

Data Source: Crest Gauges
Date: June 21, 1982
Peak Flow: 8.54 m^3/s

Cross Section Number	Measured Water Surface Elevation (m)
2001	102.06
2002	
2002.5	
2003	
2004	
2005	
2006	
2007	
2008	102.84
2009	
2010	
2011	
2012	
2013	

* Representative flow for time of profile measurement.

MOUNT PEARL

Data Source: Crest Gauges
Date: October 4, 1982
Peak Flow: 11.1 m^3/s

Cross Section Number	Measured Water Surface Elevation (m)
2001	102.20
2002	
2002.5	
2003	
2004	
2005	
2006	
2007	
2008	103.00
2009	
2010	
2011	
2012	
2013	

3.3 Donovans Flood Study Reach

DONOVANS

Data Source: Staked Profile
Date: September 2, 1983
Peak Flow: 4.45 m^3/s*
Head Loss at Section 3014.9 = 0.25 m

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
3001	133.52		
3001.9			
3002	133.56	9:52	
3003	133.54	9:51	
3004	134.00	9:46	
3005	134.13	9:39	
3006			
3007.1			
3007.9			
3008	134.15	9:37	Approximate, wind blowing tape
3009	134.18	9:35	
3010	134.31	9:23	
3011	134.43	9:14	
3012	134.52	9:10	2.4 m upstream
3013	134.59	9:05	
3014.1			
3014.7			
3014.8			
3014.9			
3015	134.98	9:03	
3016	134.99	9:00	
3017			

* Representative flow for time of profile measurement.

DONOVANS

Data Source: Staked Profile
Date: June 20, 1982
Flow: 4.47 m^3/s*
Head Loss at Section 3014.9 = 0.25 m

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
3001	133.54		
3001.9			
3002	133.58	14:01	
3003	133.60	14:01	
3004	134.06	14:36	
3005			
3006	134.15	14:30	
3007.1			
3007.9			
3008	134.22	14:29	
3009			
3010	134.22	14:20	Stake 5 m. downstream
3011			
3012	134.33	14:14	
3013			
3014.1			
3014.7			
3014.8			
3014.9			
3015	135.26	14:10	
3016	135.26	14:10	
3017	135.27	14:08	

* Representative flow for time of profile measurement.

DONOVANS

Data Source: Staked Profile
Date: October 26, 1983
Flow: 6.72 m^3/s*
Head Loss at Section 3014.9 = 0.41 m

Cross Section Number	Measured Water Surface Elevation (m)	Time	Comments
3001	133.67	16:01	
3001.9			
3002			
3003	133.77	16:11	2 m upstream
3004	134.03	16:18	21 m downstream
3005			
3006	134.36	16:29	
3007.1			
3007.9			
3008	134.46	16:36	
3009			
3010	134.49	16:52	3 m upstream
3011	134.53	16:57	14 m downstream
3012	134.64	17:04	
3013	134.64	17:06	
3014.1			
3014.7			
3014.8			
3014.9			
3015	135.39	17:15	4 m upstream
3016	135.40	17:17	
3017	135.48	17:24	2 m upstream

DONOVANS

Data Source: Crest Gauges
Date: October 4, 1982
Peak Flow: 6.89 m^3/s*
Head Loss at Section 3014.9 = 0.40 m

Cross Section Number	Measured Water Surface Elevation
3001	133.68
3001.9	
3002	
3003	
3004	
3005	
3006	
3007.1	134.41
3007.9	
3008	
3009	
3010	
3011	
3012	
3013	
3014.1	134.67
3014.7	
3014.8	
3014.9	
3015	
3016	
3017	

* Representative flow for time of profile measurement.

4.0 SUSPENDED SEDIMENT DATA

Suspended sediment was sampled at the gauge at Kilbride (02ZM008) using an automatic sampler. This sampler was programmed to take samples periodically throughout the low flow period but on a rising stage would take samples at a decreased time interval. These samples were shared between the water quality and the suspended sediment monitoring programs.

Suspended sediment data as concentrations and as daily load (concentration times discharge) are presented in printout and graphical form for the period 1980 to 1984.

4.1 Suspended Sediment Concentration Mg/L

Waterford River at Kilbride - 02ZM008

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1980 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1980 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	18.00	29.00	70.00	82.00	37.00	34.00	31.00	36.00	32.00	12.00	6.00	17.00	8.00	6.00	4.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
6.00	9.00	9.00	34.00	73.00	69.00	45.00	29.00	21.00	29.00	20.00	13.00	11.00	10.00	11.00	12.00
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	9.00	7.00	6.00	4.00	2.00	2.00	2.00	1.00	1.00	1.00	7.00	34.00	33.00	24.00	19.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
15.00	37.00	58.00	15.00	8.00	8.00	9.00	19.00	8.00	6.00	7.00	8.00	5.00	3.00		
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	16.00	13.00	12.00	11.00	9.00	27.00	79.00	35.00	113	45.00	1.00	8.00	10.00	6.00	32.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
48.00	38.00	26.00	12.00	5.00	5.00	6.00	17.00	29.00	42.00	51.00	38.00	29.00	25.00	23.00	19.00
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	17.00	15.00	19.00	20.00	18.00	17.00	19.00	19.00	13.00	11.00	12.00	11.00	11.00	15.00	18.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
22.00	60.00	28.00	7.00	5.00	5.00	6.00	7.00	11.00	14.00	15.00	12.00	9.00	9.00	9.00	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	8.00	6.00	5.00	10.00	63.00	63.00	18.00	16.00	16.00	13.00	16.00	14.00	12.00	15.00	25.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
27.00	24.00	22.00	20.00	14.00	5.00	2.00	13.00	11.00	12.00	12.00	12.00	12.00	11.00	7.00	6.00
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	7.00	7.00	4.00	3.00	3.00	5.00	6.00	9.00	14.00	15.00	14.00	13.00	12.00	11.00	11.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
9.00	7.00	9.00	8.00	12.00	9.00	3.00	4.00	5.00	6.00	7.00	8.00	12.00	14.00	10.00	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1980 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1980 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	7.00	7.00	7.00	10.00	16.00	12.00	16.00	10.00	7.00	6.00	9.00	7.00	6.00	7.00	11.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	9.00	9.00	9.00	7.00	6.00	5.00	7.00	9.00	9.00	8.00	10.00	12.00	14.00	14.00	12.00	12.00
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	12.00	13.00	13.00	16.00	16.00	18.00	22.00	23.00	25.00	31.00	37.00	42.00	45.00	39.00	17.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	43.00	81.00	22.00	7.00	6.00	6.00	4.00	3.00	5.00	4.00	4.00	2.00	5.00	9.00	6.00	2.00
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3.00	2.00	3.00	4.00	4.00	4.00	5.00	7.00	5.00	3.00	2.00	2.00	3.00	3.00	4.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	11.00	15.00	15.00	14.00	15.00	24.00	51.00	30.00	26.00	23.00	20.00	15.00	15.00	13.00	7.00	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3.00	4.00	11.00	9.00	6.00	8.00	54.00	11.00	4.00	8.00	9.00	9.00	12.00	13.00	17.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	14.00	11.00	9.00	8.00	8.00	9.00	6.00	11.00	48.00	44.00	45.00	49.00	43.00	28.00	16.00	6.00
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3.00	3.00	3.00	3.00	7.00	50.00	13.00	5.00	13.00	2.00	10.00	2.00	11.00	22.00	21.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	27	30	
	16.00	9.00	8.00	9.00	25.00	29.00	22.00	20.00	28.00	34.00	43.00	51.00	46.00	42.00	40.00	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	42.00	34.00	17.00	8.00	7.00	6.00	6.00	6.00	6.00	8.00	8.00	5.00	1.00	5.00	10.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	16.00	45.00	53.00	42.00	33.00	20.00	18.00	15.00	13.00	60.00	93.00	47.00	48.00	77.00	116	63.00

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1981 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1981 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	10.00	8.00	6.00	4.00	6.00	4.00	3.00	7.00	15.00	2.00	19.00	14.00	5.00	5.00	5.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	6.00	6.00	11.00	37.00	27.00	21.00	17.00	12.00	8.00	6.00	10.00	40.00	34.00	25.00	21.00	16.00
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	11.00	8.00	21.00	46.00	48.00	31.00	20.00	28.00	152	167	51.00	49.00	77.00	28.00	11.00
	16	17	18	19	20	21	22	23	24	25	26	27	28			
	7.00	6.00	5.00	3.00	12.00	32.00	17.00	8.00	3.00	3.00	2.00	16.00	105			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	64.00	31.00	13.00	12.00	16.00	14.00	14.00	10.00	8.00	7.00	7.00	7.00	7.00	6.00	18.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	15.00	6.00	26.00	12.00	3.00	3.00	3.00	3.00	3.00	2.00	2.00	4.00	5.00	5.00	5.00	9.00
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	16.00	13.00	14.00	12.00	7.00	5.00	4.00	5.00	5.00	6.00	6.00	7.00	7.00	12.00	19.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	22.00	18.00	16.00	13.00	12.00	12.00	16.00	17.00	15.00	21.00	18.00	15.00	12.00	9.00	8.00	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	9.00	12.00	12.00	13.00	17.00	18.00	17.00	16.00	16.00	16.00	16.00	15.00	14.00	13.00	12.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	11.00	9.00	8.00	6.00	5.00	3.00	3.00	3.00	7.00	8.00	7.00	7.00	7.00	7.00	7.00	7.00
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	8.00	8.00	7.00	6.00	4.00	3.00	5.00	13.00	9.00	11.00	11.00	7.00	7.00	6.00	6.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	6.00	6.00	5.00	5.00	5.00	4.00	7.00	10.00	9.00	8.00	8.00	8.00	7.00	7.00	7.00	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1981 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1981 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	7.00	6.00	6.00	6.00	8.00	4.00	6.00	3.00	21.00	8.00	2.00	5.00	7.00	3.00	13.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	13.00	4.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	4.00	5.00	7.00
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	8.00	7.00	7.00	7.00	9.00	7.00	6.00	6.00	6.00	6.00	5.00	5.00	12.00	22.00	16.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	11.00	9.00	215	229	131	90.00	64.00	40.00	18.00	25.00	22.00	16.00	14.00	12.00	10.00	9.00
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	9.00	8.00	7.00	7.00	7.00	6.00	15.00	13.00	9.00	6.00	26.00	54.00	8.00	7.00	8.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	7.00	56.00	14.00	7.00	30.00	9.00	11.00	43.00	98.00	40.00	24.00	22.00	22.00	29.00	29.00
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	25.00	22.00	20.00	33.00	12.00	10.00	11.00	30.00	27.00	89.00	28.00	100	72.00	60.00	48.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	45.00	140	17.00	30.00	49.00	48.00	44.00	14.00	12.00	14.00	10.00	25.00	198	100	77.00	25.00
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	9.00	11.00	18.00	16.00	16.00	40.00	46.00	185	63.00	45.00	32.00	22.00	12.00	12.00	13.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	19.00	44.00	46.00	107	45.00	13.00	33.00	27.00	48.00	48.00	145	77.00	23.00	8.00	7.00
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	7.00	4.00	3.00	5.00	5.00	20.00	15.00	14.00	13.00	21.00	33.00	23.00	9.00	2.00	1.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	68.00	57.00	15.00	17.00	14.00	13.00	12.00	9.00	5.00	4.00	3.00	2.00	2.00	3.00	4.00	5.00

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1982 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1982 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	6.00	5.00	4.00	4.00	3.00	5.00	3.00	3.00	2.00	7.00	8.00	6.00	5.00	3.00	9.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
10.00	4.00	4.00	4.00	3.00	3.00	3.00	3.00	3.00	6.00	5.00	5.00	4.00	5.00	4.00	4.00
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.00	3.00	3.00	17.00	23.00	9.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00	1.00	8.00
16	17	18	19	20	21	22	23	24	25	26	27	28			
5.00	2.00	2.00	2.00	2.00	4.00	10.00	4.00	7.00	5.00	4.00	3.00	7.00			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	5.00	5.00	4.00	3.00	2.00	11.00	8.00	17.00	37.00	24.00	14.00	8.00	7.00	4.00	3.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	4.00	9.00	16.00	10.00	8.00	6.00
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	4.00	22.00	20.00	10.00	9.00	9.00	12.00	19.00	12.00	10.00	9.00	7.00	6.00	6.00	19.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
8.00	6.00	5.00	6.00	6.00	5.00	11.00	6.00	2.00	3.00	3.00	6.00	16.00	15.00	14.00	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	13.00	12.00	14.00	13.00	8.00	5.00	3.00	2.00	7.00	20.00	16.00	11.00	41.00	45.00	45.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
32.00	22.00	17.00	17.00	22.00	3.00	2.00	3.00	1.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.00	3.00	3.00	4.00	4.00	3.00	8.00	10.00	9.00	7.00	6.00	5.00	5.00	6.00	9.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
20.00	11.00	9.00	8.00	39.00	70.00	6.00	5.00	25.00	8.00	5.00	5.00	4.00	3.00	7.00	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1982 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1982 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	19.00	11.00	11.00	11.00	11.00	9.00	8.00	8.00	6.00	6.00	5.00	5.00	4.00	4.00	8.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	8.00	6.00
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	6.00	5.00	5.00	5.00	4.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00	2.00	3.00	4.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	4.00	4.00	4.00	39.00	21.00	11.00	7.00	6.00	7.00	43.00	38.00	13.00	9.00	14.00	2.00	4.00
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.00	11.00	26.00	21.00	12.00	11.00	8.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	11.00	13.00	17.00	94.00	19.00	15.00	10.00	6.00	39.00	13.00	6.00	5.00	7.00	5.00	4.00	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.00	25.00	40.00	37.00	28.00	27.00	26.00	26.00	26.00	25.00	26.00	25.00	25.00	25.00	31.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	8.00	8.00	7.00	4.00	3.00	5.00	5.00	5.00	4.00	4.00	9.00	8.00	7.00	6.00	5.00	4.00
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	5.00	5.00	5.00	7.00	7.00	5.00	5.00	6.00	4.00	3.00	3.00	4.00	4.00	9.00	10.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	5.00	5.00	5.00	3.00	6.00	3.00	2.00	3.00	26.00	8.00	4.00	10.00	4.00	6.00	29.00	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	6.00	5.00	5.00	6.00	5.00	5.00	9.00	5.00	4.00	12.00	7.00	12.00	10.00	7.00	7.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	7.00	12.00	9.00	8.00	31.00	11.00	12.00	6.00	5.00	6.00	7.00	4.00	3.00	8.00	6.00	6.00

SEDIMENT SURVEY SECTION
OTTAWA,ONTARIO.
DATE NOV 7 1985

1983 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1983 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	6.00	5.00	5.00	6.00	15.00	9.00	33.00	11.00	8.00	6.00	5.00	18.00	15.00	23.00	25.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	10.00	21.00	9.00	7.00	5.00	4.00	5.00	4.00	6.00	14.00	3.00	3.00	2.00	2.00	2.00	1.00
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	12.00	9.00	4.00	2.00	17.00	18.00	2.00	2.00	15.00	12.00	3.00	2.00	6.00	6.00	2.00
	16	17	18	19	20	21	22	23	24	25	26	27	28			
	2.00	1.00	1.00	2.00	2.00	12.00	3.00	3.00	2.00	7.00	4.00	5.00	4.00			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.00	10.00	46.00	20.00	5.00	4.00	3.00	5.00	5.00	2.00	1.00	9.00	36.00	10.00	11.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	6.00	4.00	5.00	5.00	8.00	49.00	17.00	24.00	13.00	7.00	32.00	11.00	7.00	6.00	5.00	4.00
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.00	3.00	10.00	10.00	9.00	13.00	6.00	3.00	4.00	4.00	4.00	9.00	14.00	9.00	8.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	10.00	11.00	19.00	23.00	41.00	38.00	30.00	18.00	21.00	19.00	14.00	13.00	10.00	5.00	14.00	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	17.00	13.00	14.00	15.00	12.00	10.00	10.00	5.00	10.00	8.00	8.00	8.00	14.00	14.00	19.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	16.00	11.00	11.00	12.00	13.00	14.00	16.00	18.00	18.00	15.00	10.00	8.00	6.00	11.00	8.00	3.00
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3.00	29.00	12.00	6.00	15.00	9.00	9.00	10.00	9.00	5.00	49.00	42.00	25.00	8.00	3.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	3.00	3.00	5.00	8.00	15.00	19.00	16.00	15.00	9.00	6.00	9.00	9.00	9.00	9.00	9.00	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE NOV 7 1985

1983 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1983 DATA FOR JUL TO DEC - INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	8.00	8.00	10.00	6.00	6.00	6.00	5.00	14.00	8.00	6.00	7.00	9.00	9.00	9.00	10.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	11.00	12.00	6.00	7.00	7.00	8.00	10.00	35.00	21.00	24.00	34.00	24.00	20.00	18.00	17.00	16.00
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	19.00	20.00	19.00	19.00	20.00	16.00	15.00	24.00	23.00	22.00	15.00	5.00	31.00	27.00	23.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	26.00	45.00	25.00	21.00	37.00	25.00	8.00	8.00	7.00	6.00	5.00	6.00	33.00	14.00	9.00	8.00
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	20.00	44.00	16.00	15.00	11.00	10.00	8.00	8.00	7.00	17.00	15.00	13.00	10.00	11.00	18.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	5.00	5.00	5.00	5.00	5.00	5.00	5.00	6.00	27.00	9.00	7.00	7.00	7.00	7.00	18.00	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	15.00	14.00	14.00	13.00	12.00	11.00	19.00	15.00	13.00	13.00	12.00	12.00	11.00	11.00	22.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	16.00	13.00	12.00	12.00	29.00	14.00	12.00	42.00	26.00	11.00	49.00	11.00	18.00	12.00	9.00	8.00
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	7.00	7.00	6.00	5.00	5.00	4.00	9.00	8.00	6.00	7.00	6.00	19.00	20.00	18.00	14.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	12.00	11.00	46.00	19.00	15.00	12.00	11.00	10.00	9.00	9.00	13.00	14.00	14.00	15.00	23.00	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	23.00	19.00	18.00	16.00	8.00	6.00	7.00	29.00	14.00	12.00	14.00	14.00	13.00	15.00	23.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	21.00	19.00	18.00	12.00	8.00	8.00	8.00	8.00	8.00	7.00	7.00	7.00	6.00	36.00	25.00	14.00

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE NOV 7 1985

1984 WATERFORD RIVER AT KILLERIDE - 02ZM008

SUSPENDED SEDIMENT IN MG/L STATION 02ZM008 YEAR 1984 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	13.00	11.00	16.00	13.00	10.00	5.00	16.00	29.00	26.00	5.00	16.00	14.00	10.00	7.00	6.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
5.00	4.00	3.00	3.00	2.00	2.00	13.00	8.00	5.00	6.00	26.00	13.00	15.00	9.00	8.00	9.00
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	18.00	14.00	13.00	17.00	34.00	23.00	43.00	24.00	15.00	13.00	12.00	9.00	8.00	9.00	7.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
8.00	6.00	7.00	7.00	7.00	9.00	10.00	9.00	5.00	23.00	9.00	2.00	1.00	1.00		
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	7.00	8.00	3.00	3.00	2.00	4.00	9.00	5.00	3.00	7.00	13.00	11.00	10.00	7.00	3.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
5.00	14.00	10.00	10.00	9.00	7.00	6.00	5.00	5.00	5.00	6.00	6.00	13.00	13.00	4.00	5.00
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	5.00	7.00	12.00	12.00	11.00	10.00	36.00	20.00	18.00	32.00	13.00	10.00	12.00	49.00	24.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
8.00	5.00	9.00	6.00	5.00	4.00	3.00	3.00	4.00	2.00	3.00	8.00	14.00	20.00	13.00	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	12.00	3.00	2.00	1.00	4.00	10.00	15.00	10.00	7.00	19.00	19.00	15.00	12.00	11.00	10.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
8.00	7.00	23.00	31.00	6.00	10.00	39.00	9.00	6.00	6.00	6.00	6.00	5.00	4.00	4.00	5.00
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	4.00	7.00	6.00	10.00	6.00	5.00	3.00	3.00	9.00	21.00	8.00	12.00	11.00	10.00	10.00
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
8.00	7.00	5.00	5.00	6.00	15.00	30.00	16.00	17.00	17.00	16.00	16.00	15.00	15.00	13.00	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE NOV 7 1985

1984 WATERFORD RIVER AT KILBRIDE - 02ZM006

SUSPENDED SEDIMENT IN MG/L STATION 02ZM006 YEAR 1984 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	12.00	11.00	8.00	6.00	4.00	3.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1.00	5.00	7.00	5.00	3.00	3.00	2.00	2.00	4.00	3.00	2.00	1.00	1.00	5.00	4.00	3.00
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	4.00	2.00	2.00	8.00	6.00	5.00	4.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	2.00	2.00	16.00	13.00	12.00	7.00	6.00	6.00	6.00	29.00	10.00	6.00	5.00	5.00	5.00	5.00
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.00	3.00	3.00	3.00	3.00	3.00	23.00	19.00	7.00	6.00	5.00	5.00	11.00	3.00	3.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	6.00	4.00	2.00	5.00	24.00	11.00	13.00	4.00	4.00	4.00	4.00	3.00	1.00	1.00	1.00	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1.00	1.00	4.00	3.00	2.00	5.00	4.00	3.00	3.00	6.00	4.00	8.00	6.00	5.00	4.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	4.00	3.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	20.00	6.00	5.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	5.00	4.00	4.00	2.00	1.00	1.00	1.00	1.00	6.00	5.00	4.00	4.00	3.00	2.00	2.00	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2.00	2.00	2.00	3.00	9.00	6.00	75.00	16.00	9.00	5.00	5.00	4.00	8.00	6.00	5.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	3.00	1.00	2.00	1.00	2.00	3.00	2.00	10.00	6.00	4.00	2.00	3.00	2.00	2.00	2.00	1.00

4.2 Daily Suspended Sediment Load (Tonnes)

Waterford River at Kilbride - 02ZM008

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO
DATE AUG 21 1984

1980 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1980 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.14	4.23	22.30	39.30	7.64	5.85	4.15	5.79	6.86	1.79	.617	1.46	.588	.382	.228
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.329	.418	.378	5.61	3.57	3.04	8.63	3.31	2.09	3.86	1.94	.983	.718	.577	.592	.600
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.410	.284	.208	.128	.061	.058	.054	.026	.024	.024	.156	.731	.687	.487	.373
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
.403	5.50	33.30	5.99	2.17	1.47	1.12	3.14	.726	.498	.528	.982	.873	.713		
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	6.37	4.29	2.44	1.58	1.14	4.06	48.10	13.80	93.40	50.20	.567	3.67	3.77	1.45	14.70
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
31.00	13.70	5.95	2.12	.773	.713	.804	4.70	23.00	47.20	60.40	28.30	11.90	6.93	5.27	4.78
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.70	2.88	3.56	4.03	3.87	6.83	9.87	6.42	3.92	3.77	3.54	2.92	4.28	6.47	6.41
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
9.87	64.80	23.30	3.21	1.75	1.31	1.45	1.81	3.33	5.38	5.78	5.13	3.17	2.22	1.86	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.55	.933	.661	1.67	79.50	79.50	9.56	5.82	4.51	3.19	5.17	3.21	2.16	3.16	8.62
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
7.35	4.33	3.06	2.33	1.67	.514	.170	9.79	6.00	3.89	2.98	2.21	1.80	1.46	.786	.612
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.596	.587	.344	.246	.246	.386	1.21	1.57	3.69	3.59	1.98	1.40	1.07	.780	.797
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1.15	.829	.755	.523	2.50	1.97	.368	.333	.359	.477	.428	.403	2.25	2.10	.765	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1980 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1980 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.573	.665	.476	.707	2.54	1.17	4.13	1.33	.535	.534	.980	.518	.363	.382	.518
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.361	.337	.305	.247	.209	.205	.555	.764	1.28	.683	3.73	2.66	1.67	1.16	.801	.698
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.627	.641	1.53	3.03	2.52	3.09	2.74	2.13	2.11	2.10	2.21	2.46	7.35	9.87	2.67
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	26.30	.101	11.40	1.71	.938	.866	.418	.204	.549	.384	.310	.143	.808	2.08	.804	.171
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.222	.140	.244	.252	.179	.147	.278	.702	.492	.177	.089	.081	.109	.088	.223
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	2.66	1.65	.876	.821	4.83	6.28	39.30	11.60	7.57	4.63	2.87	3.94	2.83	1.61	.677
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.238	.265	5.07	2.33	.985	1.76	61.10	8.40	1.33	2.71	1.74	1.20	2.47	4.63	6.67
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	3.50	1.99	1.50	1.56	1.67	1.35	.721	2.41	39.10	20.30	11.50	23.70	12.40	6.51	2.70	.804
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.353	.358	.314	.245	.617	40.30	4.49	1.11	4.09	.767	2.75	.479	2.21	5.65	5.48
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	2.97	1.38	1.33	2.95	31.10	17.30	7.39	5.15	8.52	12.10	28.10	44.90	21.20	13.00	20.90
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	22.40	9.66	3.42	1.33	1.36	1.07	1.04	1.36	1.14	1.75	1.09	.417	.064	.284	.536
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.823	16.40	22.50	7.84	9.35	2.63	1.59	1.09	.818	38.90	72.90	11.70	6.39	9.58	16.50	80.60

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1981 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1981 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.57	1.58	1.06	.594	1.84	.850	.435	1.97	10.20	.548	17.70	7.85	1.84	1.60	1.38
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1.56	1.87	3.14	13.40	7.42	3.99	2.35	1.35	.933	.622	.907	4.49	7.34	6.48	3.63	2.24
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.37	.954	2.09	5.96	9.12	4.02	2.07	2.42	99.80	159	15.10	16.90	39.60	8.23	2.47
16	17	18	19	20	21	22	23	24	25	26	27	28			
1.27	.933	.691	.350	1.24	2.90	1.42	.608	.210	.192	.118	.980	107			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	45.30	12.10	3.22	3.98	8.46	7.74	6.83	2.62	1.53	1.10	.937	.780	.738	.581	8.86
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
7.62	1.43	23.80	5.15	.765	.638	.529	.467	.404	.232	.218	.467	.613	.536	.687	2.29
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	6.26	2.73	4.54	3.57	1.91	1.51	1.24	1.13	.860	.938	.949	1.02	.962	1.56	4.19
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
7.09	3.00	2.17	1.54	1.38	1.43	3.93	5.32	5.00	11.10	7.12	3.84	2.28	1.45	1.17	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.47	2.30	1.88	2.08	3.47	2.99	2.35	2.05	1.66	1.45	1.44	1.23	1.01	.847	.745
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.597	.465	.445	.261	.221	.124	.120	.121	.641	.899	.683	.483	.377	.348	.331	.345
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.453	.496	.313	.250	.148	.092	.212	4.05	1.28	2.31	5.24	2.05	1.42	.855	.627
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
.570	.476	.391	.432	.400	.257	.877	1.58	.941	.617	.523	.406	.382	.474	.526	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1981 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1981 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.439	.293	.248	.205	.705	.353	.881	.298	14.40	3.18	.346	.981	1.68	.394	4.72
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	5.05	.719	.228	.171	.145	.134	.115	.109	.090	.077	.079	.107	.095	.160	.333	.792
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.451	.325	.285	.289	.579	.339	.518	.385	.325	.294	.210	.208	.617	2.78	1.00
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.515	.390	47.40	48.30	17.30	9.25	4.79	2.45	1.09	2.61	1.78	.982	.709	.554	.391	.348
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.351	.301	.246	.236	.220	.190	1.15	1.53	.617	.328	1.66	24.60	1.69	1.20	1.09
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	.786	17.90	2.71	.974	9.12	1.71	1.50	5.02	41.80	28.00	7.84	4.52	3.42	4.28	5.69
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	3.67	2.68	2.21	9.84	4.10	1.82	1.63	7.31	6.56	.143	24.40	.165	41.40	21.80	13.40
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	11.60	.203	16.50	14.70	16.50	12.70	10.10	2.93	2.32	2.49	1.71	5.01	76.60	57.10	29.00	5.55
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1.83	2.07	3.28	2.81	2.45	5.74	10.60	.209	24.10	11.70	7.05	4.50	2.27	2.10	2.24
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	4.04	12.20	11.60	55.70	16.40	3.56	16.10	10.20	13.00	10.90	.348	86.50	8.86	2.00	1.38
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1.17	.584	.386	.622	.605	4.32	4.17	2.88	2.45	5.46	9.32	4.85	1.46	.278	.124
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	24.40	22.70	2.89	2.92	2.73	1.98	1.50	1.20	.557	.391	.233	.142	.126	.171	.207	.380

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO
DATE AUG 21 1984

1982 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1982 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.492	.390	.310	.318	.234	1.11	.417	.319	.166	1.66	1.97	.861	.540	.285	1.56
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
3.30	.771	.619	.553	.337	.285	.249	.233	.220	1.00	.834	.609	.439	.600	.422	.377
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.264	.270	.255	4.67	10.70	2.60	1.52	.975	.648	.449	.285	.162	.073	.069	.691
16	17	18	19	20	21	22	23	24	25	26	27	28			
.367	.135	.121	.114	.111	.330	1.96	.639	2.38	1.36	.895	.575	1.08			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.592	.488	.346	.250	.162	2.33	1.60	18.90	55.30	14.90	4.45	2.43	2.09	.843	.749
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.617	.314	.266	.237	.213	.200	.192	.181	.165	.252	.415	3.86	9.37	2.73	1.44	.840
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.574	8.02	6.38	1.99	1.70	1.77	3.84	13.80	4.86	2.96	2.26	1.44	1.35	1.12	13.20
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
3.16	2.60	1.94	3.45	2.59	1.70	9.60	3.11	.619	.835	.829	2.18	7.37	7.00	4.78	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	3.82	3.39	4.08	4.10	2.27	1.19	.645	.344	1.69	10.70	4.64	2.27	59.90	38.70	39.30
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
14.70	7.49	5.79	5.77	7.34	.884	.385	.454	.508	.213	.298	.272	.238	.242	.228	.201
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.205	.184	.181	.250	.214	.143	.374	.429	.382	.308	.266	.217	.207	.241	.349
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
7.36	2.63	1.08	.753	12.90	.102	1.98	.981	6.31	1.79	.838	.665	.515	.306	.877	

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE AUG 21 1984

1982 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED SEDIMENT IN TONNES STATION 02ZM008 YEAR 1982 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	10.50	2.40	1.55	1.25	1.06	.777	.631	.652	.423	.417	.295	.260	.185	.226	.809
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.295	.184	.190	.190	.153	.124	.125	.144	.145	.107	.090	.095	.087	.118	.705	.283
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.197	.137	.139	.284	.147	.083	.074	.066	.039	.034	.034	.032	.028	.054	.115
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.075	.063	.052	4.25	1.39	.528	.258	.173	.174	5.87	8.54	2.03	.824	2.04	.183	.265
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.237	.751	5.93	5.81	2.35	1.25	.705	.525	.449	.418	.401	.363	.344	.314	.284
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	.795	1.81	2.45	158	5.88	4.41	5.10	1.67	31.50	4.75	1.25	.769	1.35	.894	.470	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.446	18.80	73.30	80.90	16.30	8.26	6.36	5.12	4.16	4.02	3.66	3.15	2.72	2.55	6.03
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1.29	1.79	.931	.404	.259	.391	.374	.357	.264	.243	.520	.420	.355	.300	.232	.194
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.245	.232	.206	.295	.293	.206	.197	.227	.148	.112	.112	.141	.138	.411	.442
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	.209	.192	.178	.099	.194	.104	.067	.097	8.36	2.12	.456	2.49	.581	.658	18.00	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.45	.739	.583	.918	1.09	.700	2.61	.994	.539	3.85	1.16	3.85	3.36	1.35	.889
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	.816	2.19	2.31	1.09	23.10	8.56	7.15	2.28	1.10	1.01	1.93	1.07	.485	2.39	1.75	1.08

SEDIMENT SURVEY SECTION
OTTAWA, ONTARIO.
DATE NOV 7 1985

1983 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED LOAD IN TONNES STATION 02ZM008 YEAR 1983 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.664	.464	.398	.435	1.01	.762	27.70	3.49	1.93	.710	.531	4.06	5.95	12.50	18.80
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2.89	11.60	4.26	2.29	1.06	.560	.523	.415	.695	3.46	.454	.311	.165	.131	.114	.052
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.21	1.01	.311	.141	2.98	7.00	.301	.202	4.08	3.28	.422	.195	.440	.376	.111
16	17	18	19	20	21	22	23	24	25	26	27	28			
.102	.047	.043	.080	.078	.446	.106	.101	.065	.218	.194	.423	.411			
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.418	1.03	41.70	26.40	2.90	1.31	.671	.668	.734	.275	.128	1.73	28.60	7.62	6.31
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1.78	.840	.924	1.05	1.88	49.50	8.87	18.00	7.49	2.36	31.50	5.84	1.92	1.25	.933	.650
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.546	.407	2.67	2.66	2.19	6.80	1.70	.583	.715	.622	.525	1.71	8.85	3.69	1.85
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1.89	1.86	4.73	7.59	27.10	13.40	7.41	4.20	4.48	3.28	2.04	1.66	1.30	.618	1.45	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.57	1.17	1.29	1.75	1.17	.976	.985	.722	1.24	1.22	1.13	.885	1.86	1.74	4.32
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
3.35	1.50	1.26	1.23	1.03	.988	1.17	1.37	1.37	.972	.631	.460	.339	1.01	.726	.203
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.187	3.31	1.86	.544	2.19	1.23	.886	1.18	1.07	.397	16.10	11.00	3.59	.857	.298
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
.270	.238	.378	.539	1.03	1.23	1.18	.924	.532	.319	.572	.532	.498	.433	.357	

SEDIMENT SURVEY SECTION
OTTAWA,ONTARIO.
DATE NOV 7 1985

1983 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED LOAD IN TONNES STATION 02ZM008 YEAR 1983 DATA FOR JUL TO DEC INCLUSIVE

JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.294	.283	.632	.318	.265	.232	.177	1.71	.569	.336	.462	.488	.582	.467	.594
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1.05	1.32	.712	.393	.330	.332	.403	6.08	1.79	3.34	7.11	2.52	1.70	1.21	.999	.908
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.942	.899	.893	.888	1.11	.727	.649	1.11	.980	.990	.700	.195	3.64	2.26	1.31
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1.99	13.30	2.68	1.60	7.90	5.08	1.18	.823	.611	.427	.309	.357	7.36	1.96	.848	.685
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1.97	47.50	5.41	5.15	1.90	1.14	.669	.554	.419	3.30	3.08	1.29	.689	1.05	7.22
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	1.98	.747	.488	.421	.348	.281	.244	.271	3.01	.767	.414	.320	.279	.244	1.40	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	.781	.719	1.04	.771	.511	.396	1.21	.691	.465	.391	.346	.308	.258	.253	3.16
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	1.27	.701	.505	.687	14.00	2.52	1.25	22.50	12.50	2.06	79.60	8.61	9.91	5.39	2.74	1.65
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1.11	.931	.721	.516	.467	.329	1.38	1.53	.689	.798	.524	3.35	3.51	2.26	1.38
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
	.955	.770	58.00	12.50	3.69	2.52	2.02	1.59	1.58	1.28	2.65	2.38	2.21	1.92	4.99	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	4.47	2.66	2.12	1.99	.892	.544	.647	9.42	2.38	1.45	1.33	1.10	1.17	2.22	6.52
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	4.81	3.40	2.38	1.00	.564	.485	.456	.432	.415	.528	.511	.486	.383	6.16	16.00	4.46

SEDIMENT SURVEY SECTION
OTTAWA,ONTARIO.
DATE NOV 7 1985

1984 WATERFORD RIVER AT KILBRIDE - 02ZM008

SUSPENDED LOAD IN TONNES STATION 02ZM008 YEAR 1984 DATA FOR JAN TO JUN INCLUSIVE

JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	2.15	1.25	3.28	1.99	1.33	.691	6.28	30.80	21.90	1.34	6.57	7.41	1.80	.943	.710
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.497	.370	.275	.230	.138	.124	.753	.432	.251	.470	16.30	2.46	6.21	2.09	1.05	.879
FEB	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	6.06	2.08	1.25	2.91	32.30	29.40	69.10	21.20	4.33	1.90	1.35	.855	.677	.684	.484
16	17	18	19	20	21	22	23	24	25	26	27	28	29		
.677	.698	.495	.414	.405	.816	.746	.542	.476	11.50	3.34	.461	.145	.108		
MAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	1.22	2.28	.404	.327	.194	.317	1.60	.721	.295	.756	1.47	.797	.657	.449	.187
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.454	3.67	2.45	1.69	1.02	.683	.622	.639	.687	.557	.483	.270	.872	1.18	.311	.346
APR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.311	.411	.674	.664	.703	.778	14.40	13.70	13.50	40.10	15.70	9.94	7.73	103	50.80
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
9.68	2.95	7.01	2.87	1.52	1.02	.669	.573	.733	.346	.498	1.88	4.66	16.60	6.29	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	8.78	1.27	.667	.266	1.00	3.06	5.00	2.34	1.30	4.89	6.73	3.32	2.02	1.67	1.40
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1.01	1.01	7.07	16.20	3.16	3.14	66.40	5.09	2.44	1.39	1.11	.928	.661	.442	.377	.458
JUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.356	.804	.943	1.78	.933	.583	.324	.283	1.35	7.62	1.27	1.53	1.20	.968	.873
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
.719	.550	.333	.310	.376	3.15	18.50	5.49	3.00	2.45	1.78	1.60	1.48	1.26	.966	

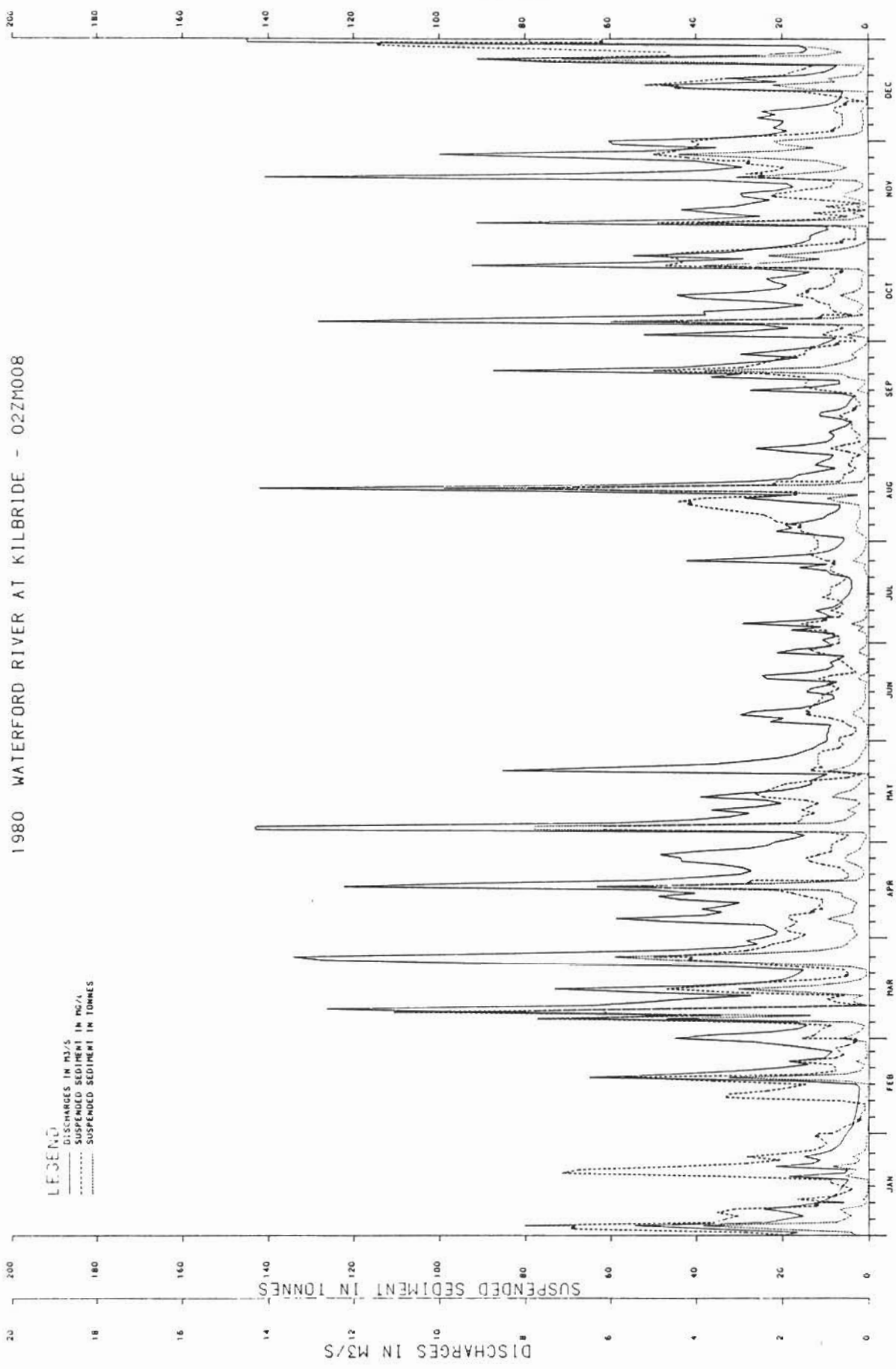
SEDIMENT SURVEY SECTION
OTTAWA,ONTARIO.
DATE NOV 7 1985

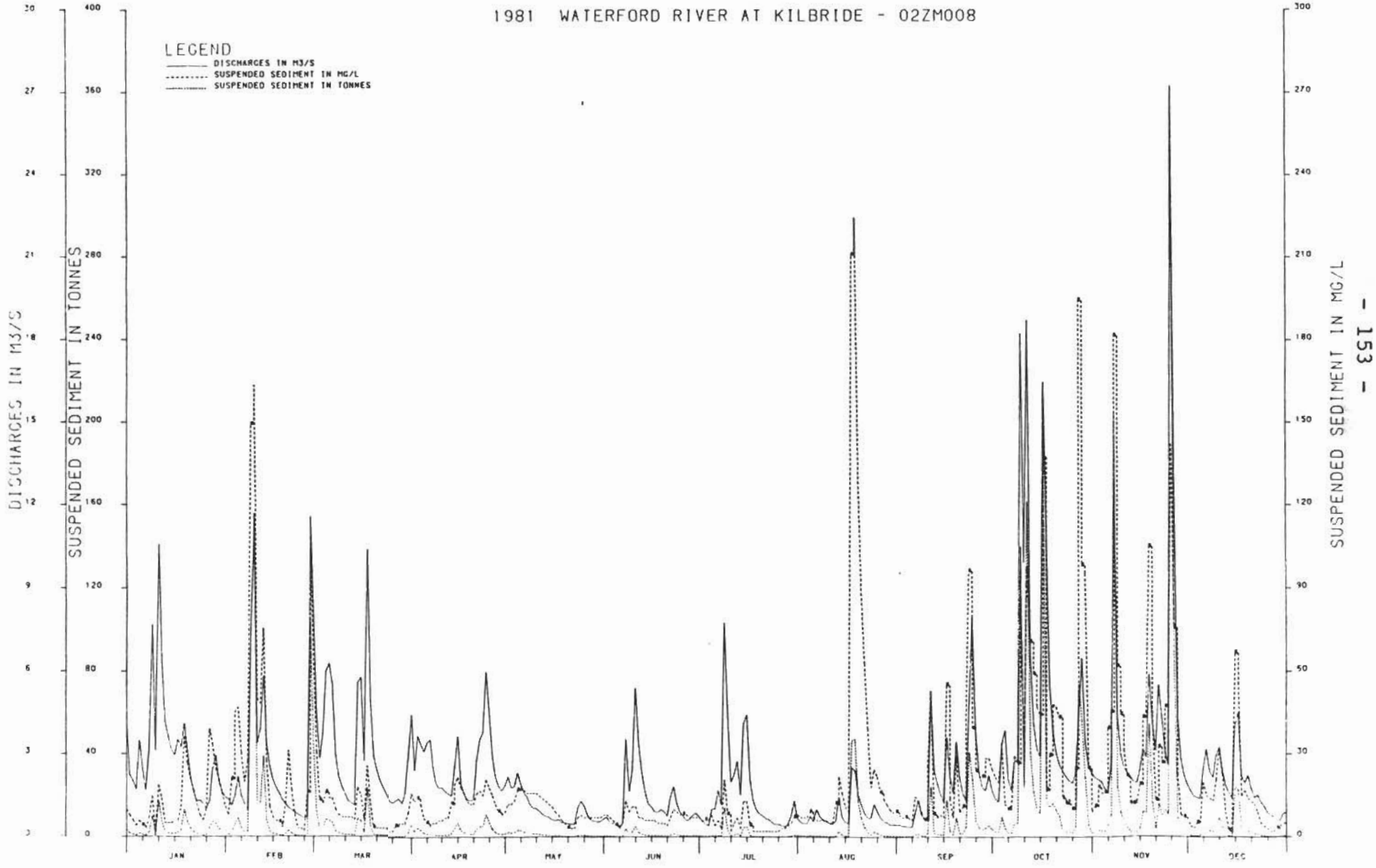
1984 WATERFORD RIVER AT KILBRIDE - 02ZM008

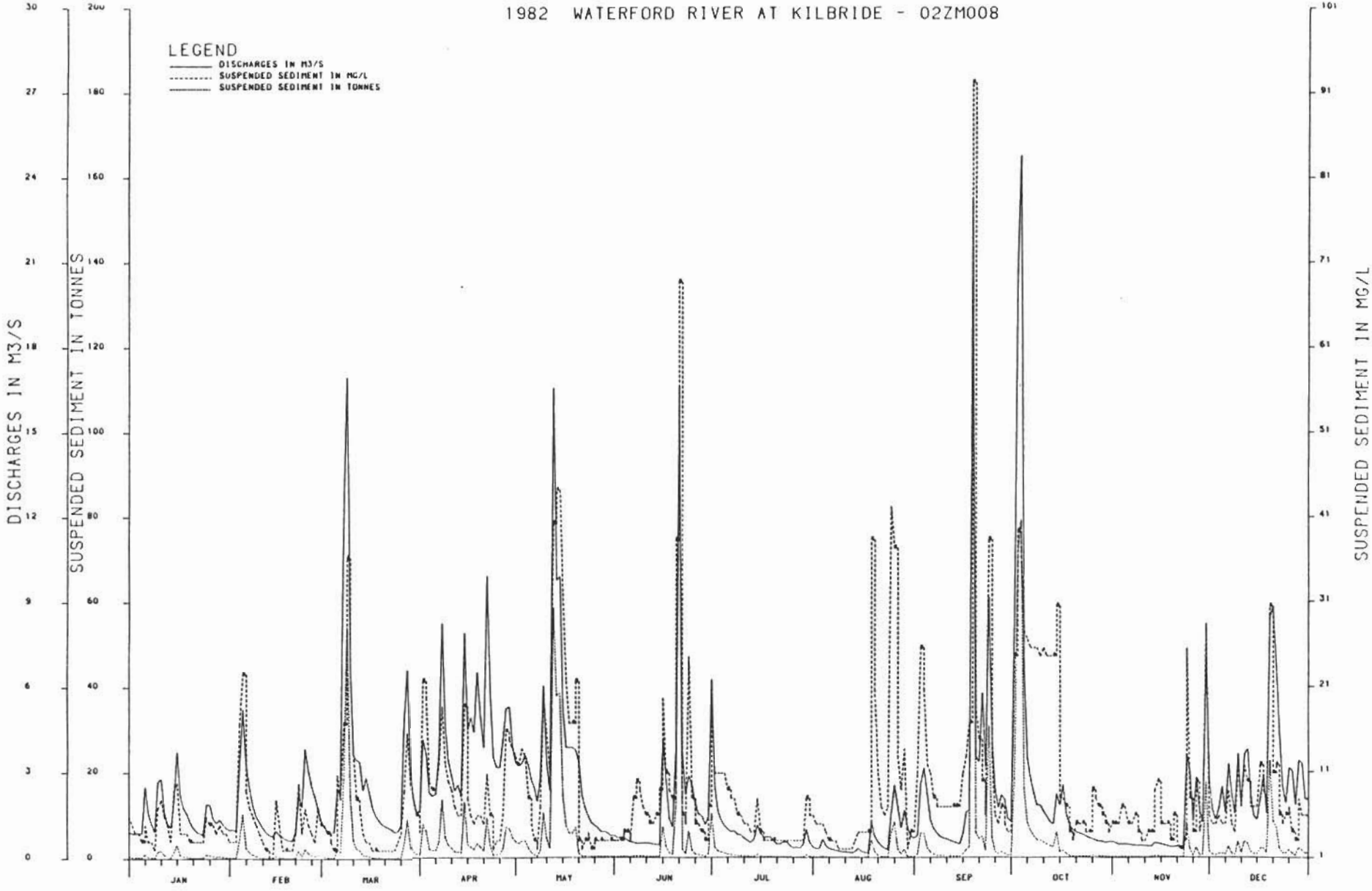
SUSPENDED LOAD IN TONNES STATION 02ZM008 YEAR 1984 DATA FOR JUL TO DEC INCLUSIVE

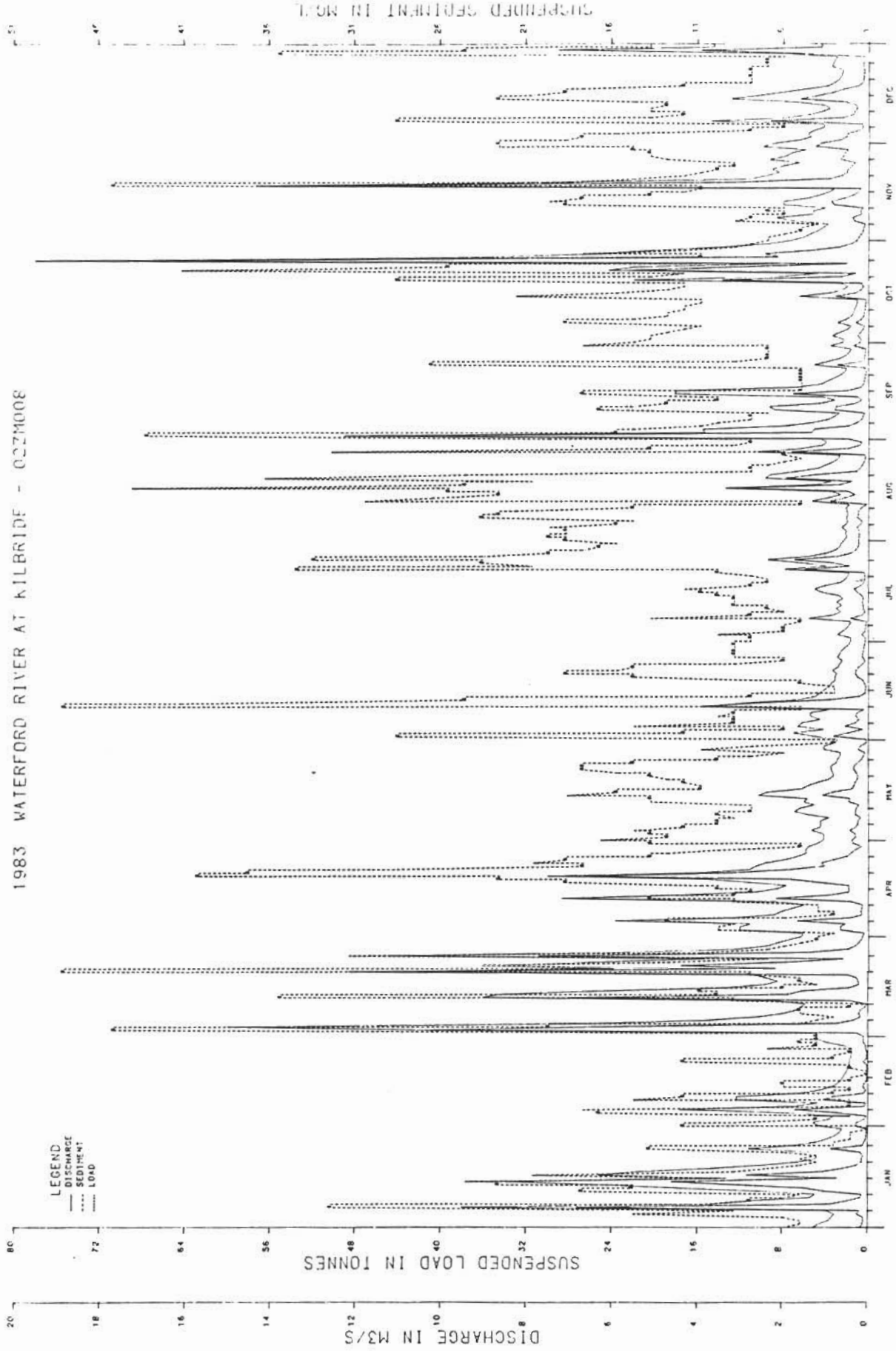
JUL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.848	.785	.514	.350	.221	.154	.100	.095	.086	.042	.040	.040	.037	.037	.036
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.039	.285	.352	.209	.100	.093	.065	.062	.159	.114	.067	.031	.027	.206	.134	.085
AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.055	.052	.050	.054	.025	.026	.026	.024	.120	.051	.045	.477	.340	.221	.140
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.059	.058	2.03	3.48	4.44	1.42	.876	.643	.471	11.40	2.32	.793	.514	.351	.337	.325
SEP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.248	.175	.169	.162	.145	.150	6.82	9.90	1.52	.933	.579	.523	2.96	.565	.448
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
.876	.473	.199	.562	12.60	3.27	6.95	.926	.643	.522	.470	.376	.105	.086	.078	
OCT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.072	.065	.432	.363	.178	.407	.268	.185	.186	.658	.463	1.42	.829	.536	.370
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.321	.224	.204	.212	.204	.127	.130	.122	.125	.062	.057	.053	.050	.121	.110	.108
NOV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.107	.103	.106	.046	.045	.044	.051	.058	.051	.045	.043	.045	5.79	1.60	.873
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
.696	.498	.442	.188	.067	.071	.070	.061	.684	.497	.328	.310	.242	.164	.188	
DEC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	.213	.206	.194	.332	1.38	.653	50.90	6.10	2.55	.955	.760	.581	1.71	1.35	.678
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
.190	.108	.218	.090	.181	.311	.156	2.23	.809	.874	.306	.378	.190	.161	.221	.095

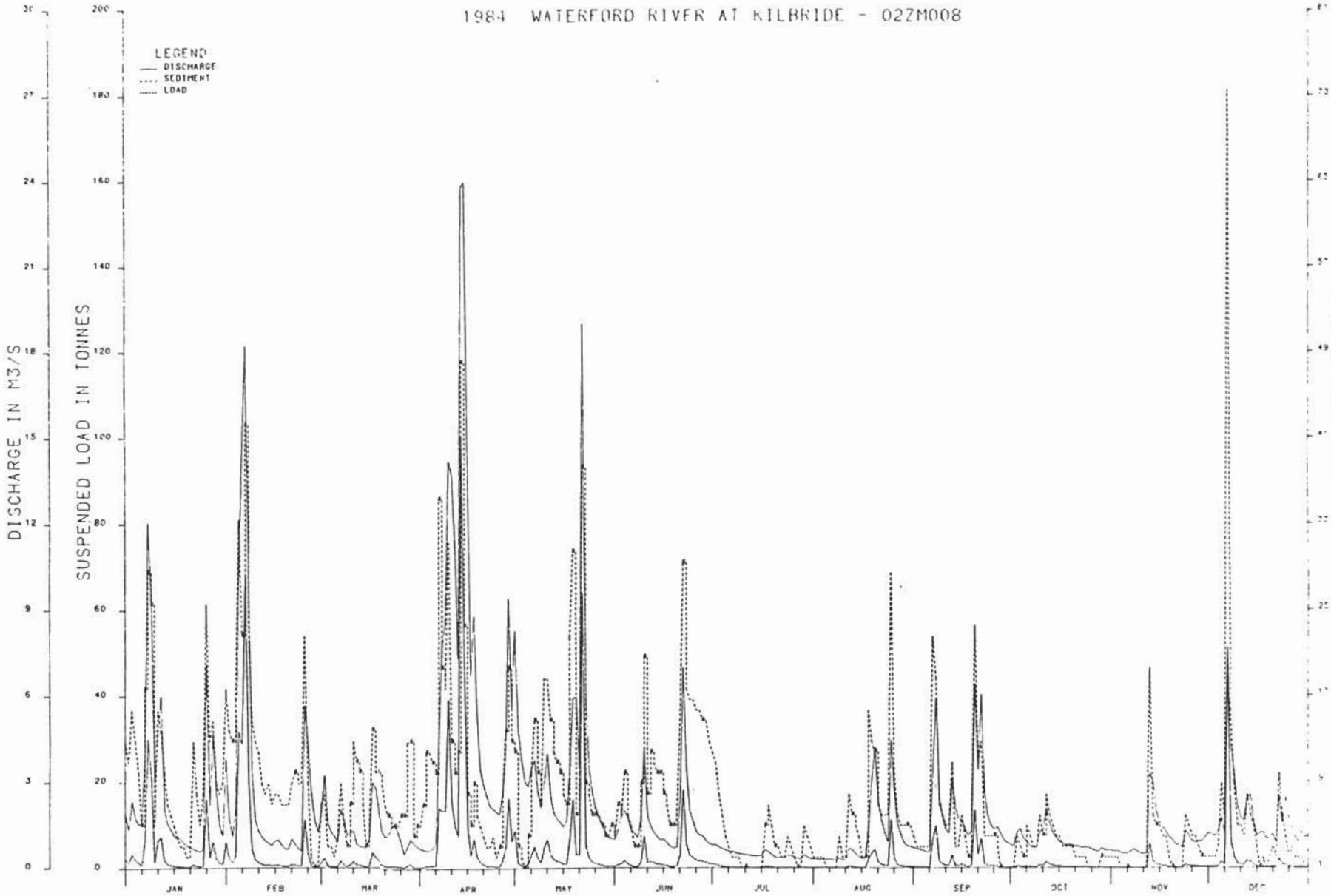
4.3 Combined Sediment Concentration, Load and Discharge Hydrographs Waterford River at Kilbride - 02ZM008


1980 WATERFORD RIVER AT KILBRIDE - 02ZM008
LEGEND
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN MG/L
SUSPENDED SEDIMENT IN TONNES
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN TONNES
SUSPENDED SEDIMENT IN MG/L
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


1981 WATERFORD RIVER AT KILBRIDE - 02ZM008
LEGEND
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN MG/L
SUSPENDED SEDIMENT IN TONNES
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN TONNES
SUSPENDED SEDIMENT IN MG/L
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


1982 WATERFORD RIVER AT KILBRIDE - 02ZM008
LEGEND
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN MG/L
SUSPENDED SEDIMENT IN TONNES
DISCHARGES IN M3/S
SUSPENDED SEDIMENT IN TONNES
SUSPENDED SEDIMENT IN MG/L
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


1983 WATERFORD RIVER AT KILBRIDE - 02ZM008
LEGEND
DISCHARGE
SEDIMENT
LOAD
DISCHARGE IN M3/S
SUSPENDED LOAD IN TONNES
SUSPENDED SEDIMENT IN MG/L
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


1984 WATERFORD RIVER AT KILBRIDE - 02ZM008
LEGEND
DISCHARGE
SEDIMENT
LOAD
DISCHARGE IN M3/S
SUSPENDED LOAD IN TONNES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

5.0 METEOROLOGICAL DATA

Meteorological data was gathered by numerous agencies and individuals in an attempt to provide a good picture of the spatial variation and timing of climatic conditions in the basin. Rainfall, snowfall, snow accumulation and air temperature were monitored at various places in the basin as shown on Figure 2.0.

Central to the project was the climate station at 8403600 - St. John's West, CDA operated by Agriculture Canada and Atmospheric Environment Service, Environment Canada. In addition to this station, tipping bucket rain gauges were set up at; a) St. John's West, CDA, and b) the hydrometric station 02ZM012 - Waterford River Storm Water Sewer Outfall.

Standard rain gauges and nipher snow gauges were established at various locations in the basin. These gauges were monitored by part time observers.

5.1 Mean Daily Precipitation

The locations of the precipitation gauges are shown on Figure 2.0. Precipitation data is tabulated here on a daily basis for the period of record. Event data as selected for use in the modelling was processed for smaller time intervals from the tipping bucket gauges.

5.1.1 Total daily precipitation - St. John's West, CDA

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 012 FOR 1980 AUG 22, 1984 PAGE 1

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL PRECIPITATION (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	0.4	3.2	0.0	0.0	6.6	0.0	0.0	0.0	4.3	0.2
2	0.0	0.0	6.6	0.6	0.0	2.2	0.4	1.4	6.4	32.4	0.0	0.2
3	25.0	4.4	1.4	0.0	0.0	0.2	0.0	20.7	0.0	1.0	0.0	0.0
4	2.0	0.0	12.0	0.0	50.2	0.4	11.2	8.6	0.6	2.9	0.0	4.4
5	3.4	0.0	0.0	13.0	34.2	0.8	0.0	4.6	0.0	2.4	41.2	1.8
6	0.0	3.4	7.4	0.0	0.2	16.4	18.8	0.0	7.0	30.0	0.0	4.2
7	3.2	0.0	0.0	0.0	2.1	2.2	0.0	2.4	8.0	30.4	0.0	7.8
8	12.6	0.0	15.6	0.0	0.0	13.6	1.0	0.0	3.4	0.8	2.4	1.6
9	3.0	0.0	8.6	0.0	0.0	4.0	5.0	0.8	1.4	10.0	16.4	7.8
10	0.0	0.0	0.0	0.0	10.8	1.6	2.6	2.0	1.6	2.0	1.8	0.0
11	0.0	39.0	16.8	3.2	0.0	0.0	0.4	0.3	1.6	0.0	1.8	0.8
12	4.4	0.0	0.0	2.9	0.0	2.6	0.6	7.2	1.1	1.6	2.2	0.2
13	1.0	1.0	0.0	1.5	4.0	0.0	0.6	17.8	0.0	12.8	6.2	0.0
14	0.0	12.0	29.6	3.5	12.6	0.0	0.0	3.6	0.0	13.8	6.2	8.2
15	0.0	0.0	3.0	0.0	4.2	13.1	1.2	10.4	23.4	5.6	0.0	4.6
16	0.0	7.4	0.0	16.2	0.0	4.4	0.4	53.3	0.0	0.0	0.0	17.2
17	0.0	28.2	0.0	4.0	0.0	0.0	2.0	4.4	0.0	0.0	0.0	0.8
18	15.8	0.6	0.0	0.0	0.0	2.8	1.4	0.0	0.0	6.2	10.2	0.0
19	9.8	0.0	19.2	0.0	0.0	16.2	0.0	0.0	25.0	4.2	0.4	12.2
20	9.6	0.0	4.6	0.0	0.0	0.4	3.0	5.0	0.4	0.0	3.4	0.4
21	0.0	5.4	1.7	0.0	0.0	2.8	10.6	0.0	23.0	0.8	0.0	0.0
22	0.0	1.1	3.4	0.0	42.6	0.0	0.2	0.0	2.8	1.2	0.4	0.6
23	21.4	18.6	17.2	0.8	7.2	0.0	11.6	3.2	5.2	39.8	0.0	0.0
24	13.6	0.0	19.1	1.0	2.0	0.0	0.0	8.2	0.0	6.8	0.0	7.4
25	1.2	0.0	12.0	0.0	5.2	0.0	30.0	2.0	0.0	0.0	1.2	24.0
26	1.0	16.0	0.0	6.2	0.0	0.0	0.0	3.6	14.6	10.0	23.6	24.1
27	0.0	34.0	0.0	2.2	0.8	21.8	0.0	0.0	0.0	2.2	7.2	0.0
28	3.2	11.0	0.0	2.0	0.6	0.0	0.0	17.2	0.0	0.0	0.0	0.0
29	5.0	15.6	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0	6.5	0.0
30	1.0		0.9	0.0	0.0	3.8	0.0	1.6	0.0	0.0	20.8	46.2
31	0.0		2.2		0.0		0.0	2.2		0.0		0.0

366 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 012 FOR 1981 AUG 22, 1984 PAGE 2

8403600 ST JOHN'S WEST COA, NFLD. ELEMENT: TOTAL PRECIPITATION (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10.0	0.0	3.8	0.0	10.6	0.2	0.3	0.0	0.6	0.0	1.2	0.0
2	4.4	0.0	3.2	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
3	0.3	0.0	6.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.4	0.0
4	20.8	2.8	15.2	0.0	8.8	0.5	0.0	11.0	0.4	29.0	0.0	1.5
5	0.0	0.0	5.2	0.0	1.2	0.0	26.2	0.2	0.0	0.0	0.0	0.0
6	0.0	0.0	8.0	0.0	0.0	0.0	14.6	10.6	5.2	3.2	0.0	14.2
7	0.0	7.1	0.0	0.0	3.8	34.6	0.8	1.4	24.1	0.0	26.2	2.8
8	33.2	12.4	0.0	0.0	0.0	0.0	33.4	5.2	0.0	10.6	0.0	3.4
9	0.0	18.0	0.0	0.0	0.0	0.0	14.4	1.2	0.8	13.8	0.0	0.4
10	7.2	0.0	0.0	0.0	0.0	30.6	0.0	0.0	4.2	47.7	0.0	7.0
11	11.6	0.0	0.0	0.8	0.0	5.2	8.8	6.6	31.1	42.8	1.0	1.4
12	9.2	0.0	0.0	8.6	0.0	0.2	9.0	2.6	3.6	4.4	1.4	1.2
13	13.2	0.0	0.0	0.0	0.0	0.0	0.0	13.6	3.8	0.0	0.0	0.0
14	1.2	0.0	18.6	0.0	0.0	0.0	15.6	0.0	4.4	0.0	0.0	0.0
15	0.4	6.0	27.5	14.6	0.0	3.6	10.2	0.0	0.6	0.3	6.6	15.0
16	14.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	21.4	31.3	0.2	12.4
17	18.4	0.0	27.2	0.0	1.8	0.2	0.0	10.2	4.2	33.8	4.8	0.4
18	15.6	0.0	3.0	0.6	0.0	7.0	0.0	33.0	0.4	0.2	21.6	3.0
19	2.4	0.0	5.6	1.7	0.0	0.0	0.0	4.6	15.2	0.0	3.0	3.4
20	5.0	0.0	0.0	1.0	0.0	0.0	0.8	1.0	4.0	0.0	2.2	1.4
21	0.6	0.0	4.8	11.0	0.0	7.4	0.0	0.0	1.4	0.0	14.2	0.0
22	0.0	0.0	0.0	13.0	0.0	9.2	1.4	0.0	0.0	0.0	2.8	3.6
23	14.8	0.0	0.0	0.0	7.8	0.2	0.0	0.0	15.6	0.0	0.0	0.2
24	0.0	0.0	4.0	12.4	11.6	0.0	0.0	7.4	35.2	0.0	0.2	0.2
25	0.4	0.0	4.0	5.8	6.8	0.6	0.0	1.6	5.2	0.0	11.8	1.0
26	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.2	7.8	76.2	0.0
27	0.3	44.6	0.6	0.0	0.0	2.2	0.0	0.0	0.0	10.0	0.0	0.0
28	0.0	10.5	0.0	0.0	0.0	6.7	3.6	0.0	0.0	25.2	0.0	0.0
29	11.2		0.6	0.0	0.0	3.8	0.0	0.0	10.1	0.0	0.0	12.0
30	0.0		3.0	1.4	1.0	0.2	4.4	0.0	0.2	0.0	0.0	20.6
31	0.0		16.2		4.8		2.0	0.0		0.8		3.0

365 DAYS WERE SELECTED

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL PRECIPITATION (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	M.0	15.8	0.0	1.0	0.0	0.0	0.0	0.0	1.2	2.8	[illegible]	0.0
2	0.4	0.0	32.0	0.0	0.0	0.4	0.0	0.0	17.8	30.6	0.0	1.0
3	0.0	5.2	4.0	0.0	8.7	1.8	0.0	0.0	10.1	48.1	1.2	0.0
4	0.0	0.0	0.0	0.0	0.8	0.0	0.0	2.2	11.0	0.2	0.0	5.7
5	11.2	6.0	22.6	0.0	2.0	0.0	0.0	0.0	0.0	5.8	6.6	0.0
6	0.0	8.2	0.0	0.0	0.0	0.0	1.0	0.0	0.0	3.0	0.0	9.0
7	0.0	3.8	5.8	39.6	0.0	0.0	3.2	1.0	1.6	3.9	4.6	3.0
8	6.9	2.6	0.0	0.0	7.4	0.0	0.2	0.0	0.0	0.4	1.0	0.0
9	0.0	0.0	3.0	6.0	15.8	0.0	2.6	0.0	0.0	0.5	2.2	15.2
10	15.4	14.4	0.0	7.2	2.6	0.0	0.0	1.0	0.0	2.8	0.4	1.0
11	6.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	11.0
12	0.0	11.0	4.4	11.0	47.8	0.0	0.0	0.0	0.0	0.4	0.0	13.2
13	0.0	0.0	0.5	0.0	4.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
14	37.0	36.2	3.0	14.2	33.0	0.0	14.6	4.8	0.0	5.0	1.6	2.6
15	8.4	0.0	0.0	0.0	7.5	28.6	1.6	1.0	0.0	7.8	0.8	0.0
16	2.2	3.0	2.0	0.0	1.0	29.2	0.2	0.0	9.0	16.0	1.2	0.0
17	23.4	0.0	1.0	0.0	12.4	0.0	0.2	0.0	7.6	0.0	0.4	1.0
18	5.4	0.0	1.0	0.0	7.4	1.2	5.0	16.0	63.2	0.8	0.0	0.0
19	9.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	2.9
20	0.0	0.0	0.6	0.0	13.8	59.0	0.0	1.6	0.0	0.0	0.0	30.8
21	12.0	18.4	1.0	3.4	0.0	4.6	1.6	0.4	22.8	1.6	0.0	2.8
22	4.8	6.0	3.0	11.0	0.0	1.2	1.2	0.0	5.6	1.0	0.0	0.4
23	0.0	27.4	10.0	0.0	0.0	6.0	3.6	0.0	23.6	0.0	16.3	2.0
24	34.0	1.0	0.0	0.0	0.0	7.4	0.0	22.2	0.6	0.0	29.2	0.0
25	1.4	2.0	0.0	0.0	0.0	1.6	0.0	0.6	0.0	0.0	0.0	2.1
26	11.0	7.5	11.2	0.0	0.0	0.0	1.6	24.2	0.0	0.0	17.2	3.3
27	38.2	0.0	5.4	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.4	0.0
28	9.6	0.0	3.0	0.0	0.0	0.2	0.0	12.8	11.6	2.0	3.0	7.6
29	2.2		1.0	0.0	0.8	0.0	17.2	0.4	0.0	0.0	28.2	3.0
30	0.0		0.0	0.8	0.0	35.0	0.0	0.0	2.2	1.7	1.0	0.0
31	4.4		0.0		0.0		0.0	0.2		0.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 012 FOR 1983 AUG 22, 1984 PAGE 4

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL PRECIPITATION (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	5.5	3.0	0.0	0.4	0.8	4.6	0.0	0.0	47.8	3.8	0.6	2.6
2	0.0	0.0	44.0	12.9	0.0	12.2	6.8	3.2	2.4	3.6	0.0	0.0
3	7.4	0.0	22.8	5.8	9.2	0.0	6.8	1.6	12.8	3.8	6.4	7.6
4	0.0	1.0	3.2	2.7	0.2	0.0	0.0	6.2	0.0	1.2	0.4	1.4
5	0.0	11.6	1.0	18.0	3.8	15.4	0.0	0.0	3.2	0.4	0.2	0.0
6	36.4	0.0	3.1	0.4	1.2	0.2	0.0	0.0	0.0	0.0	1.0	0.0
7	2.0	0.0	4.4	0.0	0.0	7.0	18.6	3.0	0.0	3.8	14.4	14.0
8	8.4	0.8	0.2	0.8	0.0	5.8	3.7	0.0	0.2	0.0	3.4	1.4
9	0.0	12.6	3.0	2.4	13.6	0.0	0.3	0.0	2.7	0.0	4.4	0.0
10	0.0	0.0	0.0	0.0	4.4	6.5	6.2	4.8	22.0	2.4	0.4	4.9
11	0.0	0.8	0.0	0.0	0.0	24.7	3.8	0.4	0.8	0.0	8.2	0.0
12	7.0	21.6	28.1	29.2	7.0	0.0	5.6	15.4	0.0	0.0	4.7	0.0
13	5.6	13.4	1.5	12.4	0.0	0.0	0.4	7.6	2.8	0.0	1.3	7.4
14	29.1	0.0	17.0	0.0	7.2	0.0	6.0	0.0	9.6	19.9	2.5	14.6
15	7.6	0.4	0.8	1.0	12.4	0.0	5.4	0.0	28.6	2.2	1.0	0.4
16	8.4	0.6	0.6	0.0	0.8	0.0	0.0	33.0	0.0	3.2	0.0	4.4
17	6.6	0.0	0.0	3.0	0.0	1.6	5.8	0.0	0.0	0.0	30.3	0.0
18	0.6	0.0	0.0	13.0	1.0	0.0	0.0	1.0	1.6	8.8	24.9	0.0
19	5.2	0.0	0.0	19.8	0.0	0.0	0.0	7.6	0.9	28.0	0.0	0.0
20	0.2	0.0	17.0	0.8	0.0	2.6	0.0	9.8	0.0	3.2	1.0	0.4
21	0.8	0.0	0.0	0.0	1.4	4.0	0.0	2.2	0.0	0.0	1.0	9.0
22	0.0	0.8	6.6	5.0	2.8	0.4	20.8	0.0	0.4	13.2	4.0	0.2
23	0.0	0.0	10.9	3.5	2.4	0.0	1.2	1.6	10.4	24.2	2.0	12.0
24	8.6	18.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.8	0.2	14.4
25	0.0	4.8	24.6	0.4	0.0	6.4	22.8	0.0	1.6	22.8	0.4	1.8
26	0.0	7.2	5.6	0.4	0.4	1.3	2.8	0.0	0.0	44.4	7.7	2.0
27	1.2	8.2	0.0	3.2	0.9	1.6	0.0	20.8	0.6	2.2	5.0	0.0
28	0.0	0.0	0.0	3.0	6.8	1.0	0.4	4.2	1.0	13.6	4.2	0.0
29	4.7		1.6	0.0	6.6	0.0	0.0	0.0	12.2	5.2	4.8	15.8
30	0.6		3.0	0.0	0.0	0.0	2.0	2.8	2.0	1.4	4.2	13.7
31	8.8		0.0		2.4		0.2	0.0		1.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GPP212 MONTH/DAY MATRIX OF ELEMENT C12 FOR 1964 AUG 26, 1965 PAGE 1

8403603 ST JOHNS WEST CDA, AFLD. ELEMENT: TOTAL PRECIPITATION (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.8	0.0	6.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	6.6	2.8
2	39.9	2.0	0.0	0.0	0.5	16.2	6.2	6.0	1.1	0.0	3.6	2.4
3	2.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	2.2	13.4	0.0	0.4
4	1.0	0.2	0.0	1.0	0.0	10.4	0.0	0.0	0.0	1.3	0.0	6.6
5	1.0	37.0	1.0	0.0	0.2	0.2	1.2	0.0	1.6	1.3	0.6	1.5
6	1.8	5.2	15.9	0.8	11.4	3.6	0.0	0.0	20.3	2.0	2.0	14.6
7	10.3	43.6	3.0	23.4	2.6	0.0	0.0	0.0	36.2	0.0	5.2	17.8
8	31.2	1.0	0.0	17.2	0.2	1.0	0.0	4.0	0.0	2.8	0.0	5.9
9	3.0	1.5	7.4	11.6	1.4	24.2	0.0	0.0	3.6	6.2	0.0	0.4
10	1.0	1.0	12.6	44.0	16.6	0.2	0.0	0.0	0.0	9.2	0.0	0.0
11	15.2	0.0	0.0	4.0	0.0	0.8	0.5	16.4	0.0	10.0	0.0	2.0
12	1.0	0.0	13.0	0.2	0.0	2.6	0.0	11.0	19.4	4.0	1.2	0.8
13	0.0	0.0	0.0	40.6	0.0	0.0	0.0	3.2	3.8	0.6	30.6	11.9
14	0.8	0.0	0.0	21.8	1.0	0.4	0.0	0.0	3.6	0.0	6.6	0.0
15	0.2	1.0	0.0	1.4	0.0	2.8	3.8	0.0	5.8	0.0	1.2	0.0
16	3.0	0.6	0.0	0.0	5.2	2.4	0.0	0.0	1.2	0.0	4.2	0.0
17	0.0	0.0	0.0	14.0	15.8	0.0	12.8	0.0	0.0	0.4	0.4	0.2
18	0.0	0.0	0.0	0.0	12.8	0.0	0.0	34.2	0.0	1.6	1.6	0.0
19	14.2	0.0	0.0	0.0	10.4	0.0	0.6	33.0	33.0	1.0	2.4	0.0
20	3.2	0.6	0.0	0.0	9.0	14.0	0.0	1.6	0.2	0.0	0.0	5.2
21	4.6	0.6	0.0	11.0	48.0	26.6	0.0	0.6	24.2	4.2	2.0	0.6
22	0.0	5.6	0.0	2.6	15.2	16.4	3.2	3.8	1.4	0.6	0.0	17.8
23	2.0	0.0	1.5	0.0	0.0	0.4	0.3	0.0	0.4	2.2	7.6	0.0
24	0.0	1.3	0.0	0.0	1.6	3.6	6.6	10.8	0.0	0.8	1.3	0.0
25	20.2	32.7	0.0	3.0	0.4	0.0	0.0	10.4	0.0	1.8	4.8	11.6
26	7.0	5.2	2.0	9.6	0.0	0.0	0.0	0.0	5.2	0.0	0.0	9.2
27	0.0	2.0	37.0	1.7	0.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0
28	19.4	0.0	4.5	18.2	0.0	0.0	6.8	0.0	0.0	4.2	0.0	0.0
29	2.0	3.0	2.4	1.0	0.0	0.0	0.6	0.0	0.0	1.0	0.2	4.8
30	0.0		6.8	14.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8	5.0
31	16.4		11.7		0.0		0.0	0.0		0.0		0.0

366 DAYS WERE SELECTED

5.1.2 Total daily rainfall - St. John's West, CDA

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 010 FOR 1980 AUG 22, 1984 PAGE 1

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL RAINFALL (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.6	0.0	6.4	4.3	0.6
2	0.0	0.6	0.0	0.0	0.0	2.2	0.4	1.4	6.4	32.4	0.0	0.0
3	22.0	0.0	0.0	0.0	0.0	0.2	0.0	20.7	0.0	1.0	0.0	0.0
4	0.0	0.0	0.0	0.0	50.2	0.4	11.2	8.6	0.6	2.9	0.0	4.4
5	0.0	0.6	0.0	13.0	34.2	0.6	0.0	4.6	0.0	2.4	41.2	1.8
6	0.0	0.0	7.4	0.0	0.2	16.4	16.8	0.0	7.0	30.0	0.0	4.2
7	0.0	0.0	0.0	0.0	2.1	2.2	0.0	2.4	8.0	30.4	0.0	7.8
8	5.6	0.0	14.6	0.0	0.0	13.6	1.0	0.0	3.4	0.8	2.4	2.6
9	0.0	0.0	8.6	0.0	0.0	4.0	0.0	0.8	1.4	19.0	16.4	5.8
10	0.0	0.0	0.0	0.0	10.8	1.6	2.6	2.0	1.6	2.0	1.8	0.0
11	0.0	0.0	8.8	3.2	0.0	0.0	0.4	0.3	1.6	0.0	1.8	0.0
12	0.0	0.0	0.0	2.9	0.0	2.6	0.6	7.2	1.1	1.0	0.2	0.0
13	0.0	0.0	0.0	0.0	4.6	0.0	0.6	17.8	0.0	19.8	0.2	0.0
14	0.0	0.0	29.6	3.5	12.6	0.0	0.0	3.6	0.0	13.8	8.2	8.0
15	0.0	0.0	3.0	0.0	0.0	13.1	1.2	10.4	23.4	5.6	0.6	1.0
16	0.0	5.0	0.0	16.2	0.0	4.4	0.4	53.3	0.0	0.0	0.0	14.2
17	0.0	28.2	0.0	4.0	0.0	0.0	2.0	4.4	0.0	5.0	0.0	0.8
18	15.8	0.0	0.0	0.0	0.0	2.8	1.4	0.0	0.0	0.2	0.0	0.0
19	9.8	0.0	0.0	0.0	0.0	16.2	0.0	0.0	25.0	4.2	49.4	12.2
20	9.6	0.0	0.0	0.0	0.0	5.4	3.0	5.0	0.4	0.0	3.4	0.0
21	0.0	0.0	1.7	0.0	0.0	2.8	10.6	0.0	28.0	0.8	0.0	0.0
22	0.0	0.0	3.4	0.0	42.2	0.0	0.2	0.0	2.8	1.2	0.0	0.0
23	0.0	5.9	17.2	0.8	7.2	0.6	11.6	3.2	5.2	33.3	0.0	0.0
24	12.6	0.0	16.1	1.0	2.0	6.5	0.0	8.2	0.0	8.8	0.0	0.0
25	0.0	0.0	12.0	0.0	5.2	0.0	30.0	2.0	0.0	0.0	1.2	22.3
26	0.0	0.0	0.0	6.2	0.0	0.0	0.5	3.6	14.6	16.0	23.6	23.4
27	0.0	20.0	0.0	2.2	0.8	21.8	0.0	0.0	0.0	2.2	7.2	0.0
28	0.0	11.0	0.0	0.0	0.6	0.0	0.0	17.2	0.0	5.0	0.0	0.0
29	0.0	15.6	0.0	0.0	0.0	0.0	0.0	4.4	0.6	0.0	0.5	0.4
30	0.0		0.0	0.0	0.0	3.8	0.0	1.6	0.0	0.0	16.8	46.2
31	0.0		0.0		0.0		0.0	2.2		0.5		0.0

366 DAYS WERE SELECTED

PROGRAM = GRP212 — MONTH/DAY MATRIX OF ELEMENT 010 FOR 1981 — AUG 22, 1994 — PAGE 2

8403600 ST JOHN'S WEST CDA, NFLD. — ELEMENT: TOTAL RAINFALL (MM) — RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	3.8	0.0	10.6	6.2	0.3	0.6	0.0	0.0	1.2	0.0
2	0.0	0.0	0.2	5.6	0.0	0.6	0.0	0.0	0.0	0.0	0.4	0.2
3	0.0	0.0	6.2	0.0	0.6	2.0	0.0	0.0	0.0	0.0	0.4	0.2
4	11.8	0.0	15.2	0.0	8.8	0.5	0.0	11.0	0.4	29.0	0.6	1.5
5	0.0	0.0	3.2	0.0	1.2	0.0	20.2	0.2	0.0	0.0	0.0	3.0
6	0.0	0.0	8.0	0.0	0.0	0.0	14.6	10.6	5.2	3.2	0.0	14.2
7	0.0	0.0	0.0	0.0	3.8	34.6	0.8	1.4	24.1	0.0	20.5	2.0
8	33.2	16.5	0.0	0.2	0.0	0.0	33.4	5.2	0.6	16.6	0.0	3.4
9	0.0	18.0	0.0	0.0	0.0	0.0	14.4	1.2	0.8	13.8	0.0	0.4
10	7.2	0.0	0.0	0.0	0.0	30.6	0.0	0.0	4.2	47.7	0.0	7.2
11	11.6	0.0	0.0	0.0	0.0	5.2	8.8	0.0	31.1	42.8	1.0	1.4
12	3.2	0.0	0.0	0.0	0.0	0.2	9.0	5.6	3.6	4.4	1.4	1.2
13	13.2	0.0	0.0	0.0	0.0	0.0	0.0	13.6	3.8	0.0	0.0	0.0
14	0.0	0.0	14.8	0.0	0.0	0.0	15.6	0.0	4.4	0.0	0.0	0.0
15	0.0	0.0	27.5	14.0	0.0	3.0	10.2	0.0	0.6	0.2	0.6	15.4
16	6.0	0.0	9.0	0.0	0.0	0.2	0.0	0.0	21.4	31.3	0.6	12.6
17	13.4	0.0	27.2	0.0	1.8	0.2	0.0	10.2	4.2	33.8	4.8	0.2
18	13.4	0.0	0.0	0.0	0.0	7.0	0.0	33.0	0.4	0.2	21.6	2.0
19	0.0	0.0	0.0	1.7	0.0	0.0	0.0	4.6	15.2	0.0	3.0	3.4
20	0.0	0.0	0.0	1.0	0.0	0.0	0.8	1.0	4.0	0.0	2.2	0.6
21	0.0	0.0	0.0	11.0	0.0	7.4	0.0	0.0	1.4	0.0	14.2	0.0
22	0.0	0.0	0.0	0.0	0.0	9.2	1.0	0.0	0.0	0.0	9.8	3.6
23	0.0	0.0	0.0	0.0	7.8	0.2	0.0	0.0	15.8	0.0	0.0	0.0
24	0.0	0.0	0.0	12.4	11.8	0.0	0.0	7.4	35.2	0.0	0.2	0.0
25	0.0	0.0	0.0	5.8	6.8	0.0	0.0	1.0	5.2	0.2	11.8	2.0
26	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.2	7.5	76.2	0.0
27	0.3	49.6	0.0	0.0	0.0	2.2	0.0	0.0	1.0	16.0	0.2	0.0
28	0.0	10.5	0.0	0.0	0.0	6.7	3.6	0.0	0.0	25.2	0.0	0.0
29	0.0		0.0	0.0	0.4	3.8	0.0	0.6	10.0	0.4	0.0	0.0
30	0.0		0.0	1.4	1.0	0.2	4.4	0.0	0.2	0.0	0.0	6.0
31	0.0		14.2		4.8		2.0	0.0		0.8		3.6

365 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 010 FOR 1982 AUG 22, 1984 PAGE 3

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL RAINFALL (MM) RANGE: -1499.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	9.3	0.0	1.0	0.0	0.0	0.0	0.0	1.2	2.8	[illegible]	[illegible]
2	0.4	0.0	8.0	0.0	0.0	0.4	0.0	0.0	17.8	50.6	0.0	0.0
3	0.0	5.2	0.0	0.0	8.7	1.8	0.0	9.0	10.1	4d.1	1.2	0.0
4	0.0	0.0	0.0	0.0	0.8	0.0	0.0	2.2	11.0	0.2	0.0	4.7
5	11.2	0.0	22.6	0.0	2.0	0.0	0.0	0.0	0.2	0.8	[illegible]	[illegible]
6	0.0	4.0	3.0	0.0	0.0	0.0	1.0	0.0	0.0	3.0	0.0	0.0
7	0.0	0.0	5.8	39.6	0.0	0.0	3.2	1.0	1.6	3.9	0.0	3.0
8	2.3	0.0	3.0	0.0	7.4	0.0	0.2	0.0	0.0	0.4	1.0	[illegible]
9	0.0	0.0	0.0	2.8	15.8	0.0	2.6	0.0	0.0	6.2	2.2	15.2
10	13.9	0.0	0.0	5.2	2.6	0.0	0.0	1.0	0.0	2.8	0.0	0.0
11	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	[illegible]
12	0.0	0.0	0.0	0.0	47.8	0.0	0.0	0.0	0.0	0.4	0.0	13.2
13	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	3.0	5.0
14	18.0	3.8	3.0	14.2	33.0	0.0	14.6	4.6	0.0	5.6	1.6	0.0
15	8.4	0.0	0.0	0.0	7.2	28.6	1.6	1.0	9.6	7.8	0.0	0.0
16	0.0	0.0	0.0	0.0	1.0	29.2	0.2	0.0	9.0	10.0	1.2	0.0
17	13.4	0.0	0.0	0.0	12.4	0.0	0.2	0.0	7.6	0.0	0.4	1.8
18	0.0	0.0	0.0	0.0	7.4	1.2	5.6	16.0	63.2	0.8	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	2.0
20	0.0	0.0	0.0	0.0	13.8	59.0	0.0	1.6	0.0	0.0	0.0	31.8
21	0.0	18.4	0.0	3.4	0.0	4.6	1.6	0.4	22.8	1.6	0.0	2.8
22	0.0	4.0	0.0	11.0	0.0	1.2	1.2	0.0	5.6	1.6	0.0	0.4
23	0.0	27.4	0.0	0.0	0.0	0.0	3.6	0.0	23.6	0.0	10.3	0.0
24	34.0	0.0	0.0	0.0	0.0	7.4	0.0	22.2	0.6	0.0	29.2	0.0
25	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.6	0.0	0.0	[illegible]	[illegible]
26	0.0	0.0	11.2	0.0	0.0	0.0	1.6	24.2	0.0	0.0	17.2	3.3
27	27.2	0.0	5.4	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.2	0.0	12.8	11.6	2.0	0.0	5.8
29	1.8		0.0	0.2	0.8	0.0	17.2	0.4	0.0	0.0	26.2	[illegible]
30	0.0		0.0	0.8	0.0	35.0	0.0	0.0	2.2	1.7	1.0	0.0
31	4.4		0.0		0.0		0.0	0.2		0.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GFP212 MONTH/DAY MATRIX OF ELEMENT 010 FOR 1983 AUG 22, 1984 PAGE 4

8403600 ST JOHN'S WEST COA, NFLD. ELEMENT: TOTAL RAINFALL (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	3.0	0.0	0.4	0.4	4.6	0.0	4.0	47.4	4.4	4.6	3.4
2	0.0	0.0	44.0	12.9	0.0	12.2	6.8	3.2	2.4	5.6	0.0	0.0
3	0.0	0.0	22.8	5.8	9.2	0.0	6.8	1.6	12.6	3.8	0.4	1.8
4	0.0	1.6	2.4	2.7	0.2	0.0	0.0	6.2	0.0	1.2	0.4	0.0
5	0.0	11.6	0.0	18.0	3.8	12.4	0.0	0.0	4.2	0.4	4.6	2.0
6	36.4	0.0	0.0	0.4	1.2	0.2	0.0	0.0	0.0	5.0	1.0	0.0
7	2.0	0.0	3.0	0.0	0.0	7.0	18.6	3.4	0.0	3.8	14.4	14.0
8	8.4	0.8	0.0	4.8	0.0	5.8	3.7	0.6	3.2	4.0	3.4	4.4
9	0.0	12.6	0.0	0.0	13.6	0.0	0.3	0.0	2.7	1.0	4.4	0.0
10	0.0	0.0	0.0	0.0	4.4	6.5	8.2	4.8	22.0	2.4	0.4	4.6
11	0.0	0.0	0.0	0.0	0.0	24.7	3.8	0.4	0.8	0.0	6.2	0.0
12	7.0	0.0	28.1	29.2	7.0	0.0	5.6	15.4	0.6	0.0	4.7	3.4
13	5.6	0.0	1.5	12.4	0.0	0.0	0.4	7.6	2.8	0.0	1.3	7.2
14	17.3	0.0	17.0	0.0	7.2	0.0	6.0	0.0	9.6	19.4	0.0	14.8
15	5.2	0.0	0.8	1.4	15.4	0.0	5.4	0.0	28.6	2.2	1.8	0.4
16	8.4	0.0	0.6	0.0	0.8	0.0	0.0	33.0	0.0	3.2	0.0	4.4
17	6.6	0.0	0.0	3.0	0.0	1.8	5.8	0.0	2.0	0.0	30.2	0.0
18	0.6	0.0	0.0	13.0	1.0	0.0	0.0	1.0	1.6	8.8	24.9	0.0
19	2.2	0.0	0.0	19.8	0.0	0.0	0.0	7.6	2.9	28.0	0.6	0.0
20	0.0	0.0	17.0	0.8	0.0	2.6	0.0	9.8	0.0	3.2	0.8	0.0
21	0.0	0.0	0.0	0.0	1.4	4.0	0.0	2.2	0.0	0.0	1.0	0.0
22	0.0	0.0	0.6	2.0	2.6	0.4	20.8	0.0	0.4	13.2	4.0	0.4
23	0.0	0.0	10.9	3.5	2.4	0.0	1.2	1.6	10.4	24.2	2.0	0.0
24	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.8	0.0	10.4
25	0.0	4.8	24.6	0.4	0.0	6.4	22.8	0.0	1.6	22.8	6.4	0.0
26	0.0	0.0	5.6	0.4	0.4	1.3	2.8	0.0	0.0	44.4	7.7	0.0
27	0.0	3.8	0.0	3.2	0.0	1.6	0.0	20.8	0.6	2.2	5.0	0.0
28	0.0	0.0	0.0	3.0	6.8	1.0	0.4	4.2	1.0	13.6	4.2	0.0
29	0.0		1.6	0.0	0.6	0.4	0.0	0.0	12.2	5.2	4.8	15.8
30	0.0		0.0	0.0	0.0	0.0	2.0	2.8	2.0	1.4	4.2	13.7
31	7.8		0.0		2.4		0.2	0.0		1.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GAP212 MONTH/DAY MATRIX OF ELEMENT 010 FOR 1984 AUG 26, 1985 PAGE 1

8403600 ST JOHNS WEST CDA, NFLD. ELEMENT: TOTAL RAINFALL (MM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	0.0	8.6	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	2.6
2	34.6	0.0	0.0	0.0	0.5	10.2	0.2	0.0	1.1	0.0	3.6	2.0
3	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	2.2	13.4	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	10.4	0.0	0.0	0.0	1.8	0.0	4.4
5	1.0	39.6	0.0	0.0	0.0	0.2	1.2	1.0	1.6	1.3	0.8	0.0
6	1.8	5.2	15.5	0.8	1.4	3.6	0.0	0.0	20.0	2.0	2.0	16.6
7	10.3	43.6	0.0	23.4	2.6	0.0	0.0	0.0	38.2	0.0	5.2	17.8
8	31.2	0.0	0.0	17.2	0.2	1.0	0.0	4.0	0.0	2.8	0.0	5.9
9	0.0	0.0	4.2	11.6	1.4	24.2	0.0	0.0	3.6	6.2	0.0	0.4
10	0.0	0.0	12.6	11.0	16.6	0.2	0.0	0.0	0.0	9.2	0.0	0.0
11	15.2	0.0	0.0	4.0	0.0	0.6	0.8	14.4	0.0	10.8	0.0	2.6
12	0.0	0.0	0.0	8.2	0.0	2.8	0.0	11.2	19.4	4.0	1.2	0.6
13	0.0	0.0	0.0	40.6	0.0	0.0	0.0	3.2	3.8	6.8	36.6	11.9
14	0.0	0.0	0.0	21.6	0.0	0.4	0.0	0.0	3.6	0.0	0.8	0.0
15	0.0	1.0	0.0	4.9	0.0	2.8	3.8	0.0	5.8	0.0	1.2	0.0
16	0.0	0.6	0.6	0.0	5.2	2.4	0.0	0.0	1.2	0.0	4.2	0.0
17	0.0	0.0	0.0	10.0	15.8	0.0	12.8	0.0	0.0	0.4	0.4	0.2
18	0.0	0.0	0.0	0.0	12.8	0.0	0.0	34.2	0.0	1.6	1.6	0.0
19	3.6	0.0	0.0	0.0	16.4	0.2	0.6	33.0	33.0	1.0	2.4	0.0
20	0.0	0.6	0.0	0.0	0.0	14.0	0.0	1.6	0.2	0.0	0.0	4.2
21	0.0	5.6	0.0	5.0	43.0	26.6	0.0	0.6	24.2	2.2	0.0	0.0
22	0.0	1.8	0.0	0.0	15.2	16.4	3.2	3.8	1.4	0.6	0.0	14.8
23	0.0	0.0	1.5	0.0	0.0	0.4	0.0	0.0	0.4	2.2	7.0	0.0
24	0.0	1.3	0.6	0.0	1.8	3.6	6.6	16.6	0.0	0.8	1.3	0.0
25	20.2	32.7	0.0	0.0	0.4	0.0	0.0	16.4	0.0	1.8	3.8	11.6
26	0.0	2.2	0.0	7.6	0.0	0.0	0.0	1.0	5.2	0.0	0.0	0.0
27	0.0	0.0	0.0	1.7	0.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0
28	14.4	0.0	0.0	18.2	0.0	0.0	0.8	0.0	0.0	4.2	0.0	0.0
29	0.0	3.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.2	4.2
30	0.0		0.0	14.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0
31	16.4		0.0		0.0		0.0	0.0		0.0		0.0

366 DAYS WERE SELECTED

5.1.3 Total daily snowfall - St. John's West, CDA

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 011 FOR 1980 AUG 22, 1994 PAGE 1

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL SNOWFALL (CM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	6.0	1.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	3.0	7.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	2.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	7.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	31.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0
12	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	1.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
20	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	13.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	1.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.8	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
27	0.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	7.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0		2.0		0.0		0.0	0.0		0.0		0.0

366 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 011 FOR 1981 AUG 22, 1984 PAGE 2

8403600 ST JOHN'S WEST COAST, NFLD. ELEMENT: TOTAL SNOWFALL (CM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	[illegible]	[illegible]	0.0
2	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	9.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	6.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	2.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2.2	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
19	3.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	14.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	[illegible]	[illegible]	1.0
26	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	11.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0
30	0.0		3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0
31	0.0		2.0		0.0		0.0	0.0		0.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 011 FOR 1982 AUG 22, 1984 PAGE 3

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL SNOWFALL (CM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
3	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	4.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.6	3.4	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	3.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1.5	17.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0
11	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	11.0	4.4	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
13	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
14	19.0	32.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	2.2	2.4	2.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	10.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	6.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	14.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	4.8	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
23	0.0	0.0	10.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
24	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	2.0	2.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	11.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
28	9.6	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
29	0.4		1.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0		0.0		0.0		0.0	0.0		0.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 011 FOR 1983 AUG 22, 1984 PAGE 4

8403600 ST JOHN'S WEST CDA, NFLD. ELEMENT: TOTAL SNOWFALL (CM) RANGE: -1999.9 TO 1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0
15	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
26	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	2.0		2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	1.0		0.0		0.0		0.0	0.0		0.0		0.0

365 DAYS WERE SELECTED

PROGRAM = GRP212 MONTH/DAY MATRIX OF ELEMENT 011 FOR 1964 AUG 28, 1985 PAGE 1

8403600 ST JOHNS WEST CDA, NFLD. ELEMENT: TOTAL SNOWFALL (CM) RANGE: -1999.9 TO -1999.9

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	4.4	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	16.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
7	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	3.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	1.0	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	1.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
21	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	4.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
23	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
26	7.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
27	0.0	2.0	44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0		6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.0		9.3		0.0		0.0	0.0		0.0		0.0

366 DAYS WERE SELECTED

5.1.4 Standard rain gauge network - Waterford River Basin

A network consisting of four to six type "B" standard rainfall gauges was established by Newfoundland Department of the Environment. In order to protect the gauges from human interference, sites had to be established in safe locations in the backyards of the observers. It is realized that due to their locations, in backyards, close to buildings, fences or trees, these gauges may sometimes be subject to undercatch. The locations and subjective statements on the quality of the locations are shown on Figure 2.0. Since the data is too voluminous to include here, a sample is provided for reference. The full database is available from Newfoundland Department of Environment, Water Resources Division, St. John's, Newfoundland. In order to interpret the information in the database, a brief explanation is provided with the sample as follows.

1.

Abbreviations	Word(s)	Intended Meaning
ACTL	Actual	Value recorded by observer in the field. Recorded on the same day as the reading was taken.
C.D.A.	Canada Dept. of Agriculture	Location of the tipping bucket and standard rain gauges referred to in the T.B.R.G. and St. R. B. columns of the data sheets.
CRTD	Corrected	The value of precipitation for the day; i.e., between 8:00 a.m. NST on a given day and 8:00 a.m. NST the next day.
N.D.T.	Nfld. Daylight (Savings) Time	-
N.S.T.	Nfld. Standard Time	
R	'ratio'	The ratio between the sum of the observer's values for specified days of the month and the sum of the CDA values for those same days. Then for any given day: R x CDA 'FOR DAY' = CRTD 'Observer' where an R is shown.*

1. Abbreviations	Word(s)	Intended Meaning
St. R. G.	Standard Rain Gauge	The standard rain gauge at CDA.
T.B.R.G.	Tipping Bucket Rain Gauge	The tipping bucket rain gauge located at the CDA farm.

*For example, R is shown as 0.5568 for the 10th to the 14th of January 1981 for observer Butler:

$$R = \frac{\text{Observer total, 10th to 14th}}{\text{CDA 'FOR DAY' total, 10th to 14th}}$$

Then for the 10th: CRTD = R x CDA 'FOR DAY'
4.01 = 0.5568 x 7.2 etc.

2. An example of what the CDA 'FOR DAY' value represents is as follows:

CDA (ST. R.G.)

Jan. 13, 1981 3.8 mm, read at 4 PM
9.4 mm, read at 8 AM

13.2 mm, the 'FOR DAY' value
which is attributed to Jan. 13

Hence 'FOR DAY' precipitation values at CDA represent the rain which fell between 8 AM on one day and 8 AM on the following (not the previous) day. This is only true for the CDA standard rain gauge, and does not apply to any other standard rain gauge.

3. The time at which field observers other than Gerry Boyles at CDA took their observations is written in pencil next to the observers name. As described for ACTL in Item 1, the precipitation value recorded by the observer represents the amount of rain which fell in the 24 hours prior to the observation. Observers other than Gerry Boyles attribute such an observation to the day on which the observation was taken.

4. Caution should be exercised when lifting numbers from the data sheets for application purposes. The reason for the caution is this: in the case of CDA, the date intended for application purposes is bracketed (under the 'FOR DAY' column). However, the data intended for application purposes from other observers is not bracketed (under the CRTD columns).

5. Newfoundland Daylight Savings Time is in effect from midnight of the last Saturday in April to midnight of the last Saturday in October. It is therefore necessary to subtract one hour from 'watch time' between the end of April and the end of October in order to maintain Newfoundland Standard Time year round. In adjusting the daily data from the CDA standard rain gauge, the following method was used. The tipping bucket rain gauge charts were examined individually to see if rain was recorded between the hours of 8 AM NDT and 9 AM NDT. If so, this same precipitation amount was shifted in the 'FOR DAY' column of the standard rain gauge. For example, 2.0 mm of rain was recorded by the tipping bucket rain gauge between 8 AM NDT and 9 AM NDT on July 9, 1981. This 2.0 mm then changed the standard rain gauge 'FOR DAY' values as follows:

	'FOR DAY'	
	NDT	NST
July 8	33.4 mm	35.4
July 9	14.4 mm	12.4

These NST values were then used to obtain the adjusted 'CRTD' values for all the other observers, as per the explanation of 'R' in Item #1. Hence, NST was maintained year round, even though Gerry Boyles and all other observers use NDT between the end of April and the end of October. This shifting of small amounts of rain from one day to a previous day in order to preserve NST over-rides Item #2.

6. Snow is not included in the standard rain gauge precipitation data. The tipping bucket rain gauge does include melted snow, since this gauge has a heated funnel during the winter.

7. As you will note, the data sheets occasionally show some pencilled hand calculations. For example, between August 7 and August 19, 1981, observer Butler was on holidays. In addition, the quantity shown on August 20 does not even come close to the volume of rain shown by other observers for that period. (In general, observers are asked to record accumulations of rain which are read at the end of a period of

absence, but in some cases, this evidently was not done.) The procedure then used to estimate the readings for the missed days was as follows:

(a) Average the R factors that <u>are</u> shown for that observer for that month.

(b) Take the resulting average R and apply it to the days for which there is a CDA 'FOR DAY' value, as is normally done by the computer program.

Where the above procedure was applied will be evident because <u>both</u> the CRTD and R value will be in pencil with no ACTL value generally shown in between.

Another reason why CRTD values are occasionally shown in pencil is that the observer recorded a value whereas CDA did not. The quantities are usually small and are often recorded by observer Dooley. These quantities are moved, as is, to the CRTD column and are shown in pencil (For example, Aug. 11, 15, 22, 1981, Dooley).

In order to cross reference the rain gauge reader's names as used on the following printouts, and the approximate gauge location as denoted on the map by a triangle with an accompanying letter, the following list is provided:

LOCATION	GAUGE READER
A	CDA(T.B.R.G.), CDA (ST.R.G.)
B	DUNPHY
C	DOOLEY
D	BUTLER
E	COURTNEY, SIMMS, FINCH, GREENE, HOOD, RYAN,
F	REID
G	HARDING
H	MELAMED
J	ALCOCK
K	GREEN
L	DUGGAN, KELLAND

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* DEC 1983 *
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DATE	CDA (T.B.R.G.) 8AM-8AM	R	CDA (St.R.G.) 8 AM	FOR DAY	4 PM	C. GREENE 5:30 PM CRTD	ACTL	R	S. KELLAND 4 PM CRTD	ACTL	R	REMARKS
1	0.4			( )			(1.2)			( )		SNOW FLURRIES
2				( )			(1.3)			( )		--
3	5.4	3 3700		(1.6)		0.80	(0.6)	0.5000	1.80	( )	1.1250	RAIN & SNOW
4	0.8		1.6	( )			(0.2)	0.5000		( )	1.1250	WET SNOW
5				( )			(0.8)			( )	1.1250	LIGHT FLURRIES
6				( )			(0.1)			( )	1.1250	--
7	11.0	0.7800		(14.0)		11.90	(0.8)	0.8497	15.75	( )	1.1250	--
8			14.0	(0.4)		0.34	(14.8)	0.8497	0.45	(18.0)	1.1250	--
9			0.4	( )			(0.6)	0.8497		( )		--
10	3.8	0.7700		(4.9)		4.16	(0.2)	0.8497		( )		--
11			4.9	( )			( )			( )		--
12				( )			[4.1]			( )		--
13	2.8	0.3700		(7.4)		5.45	(0.1)	0.7370	8.32	( )	1.1250	--
14	7.0	0.4700	7.4	(14.8)		10.91	(14.1)	0.7370	16.65	( )	1.1250	--
15			14.8	(0.4)		0.29	(0.2)	0.7370	0.45	( )	1.1250	--
16	3.2	0.7200	0.4	(4.4)	4.4	3.24	(5.2)	0.7370	4.95	(5.4)	1.1250	--
17				( )			(0.3)	0.7370		( )		--
18				( )			( )			( )		--
19				( )			(0.1)			( )		--
20				( )			(0.2)			( )		--
21	2.4			( )			( )			( )		SNOW FLURRIES
22				( )			( )			( )		SNOW FLURRIES
23	2.6	0.4300		(6.0)		1.94	( )	0.3232	6.32	( )	1.0540	--
24	7.0	0.6700	6.0	(10.4)	10.4	3.36	(4.8)	0.3232	10.96	( )	1.0540	--
25	0.8			( )			(0.5)	0.3232		( )		--
26				( )			( )			( )		SNOW FLURRIES
27				( )			( )			( )		--
28				( )			( )			( )		--
29	11.8	0.7400		(15.8)	0.2	11.64	( )	0.7370	13.53	(14.0)	0.9831	--
30	11.6	0.8400	7.6	(13.7)	9.2	10.10	( )	0.7370	13.47	(15.0)	0.9831	--
31			4.5	( )			( )			( )		--
1			0.0									

This value too isolated to be considered. Probably melted snow.

TIMES ARE N S T