CANADA - NEWFOUNDLAND

FLOOD DAMAGE REDUCTION PROGRAM

ENVIRONMENT CANADA DEPARTMENT OF ENVIRONMENT

RUSHOON FLOOD STUDY REPORT

VOLUME 2 of 2

APPENDICES

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Report # SMR-22-85

RUSHOON FLOOD STUDY REPORT

VOLUME 2 OF 2

APPENDICES

TABLE OF CONTENTS

IN VOLUME I

APPENDIX I

FLOOD DESCRIPTIONS

APPENDIX 1 - FLOOD DESCRIPTIONS

(from "Terms of Reference for a Hydrotechnical Study of the Rushoon Area, Canada - Newfoundland Flood Damage Reduction Program)

Recent Flooding Events

(i) February 1973

During the period of February 2 - 5, 1973, rain, mild temperatures and an ice jam in the Rushoon Brook caused flooding. It was reported that two bridges and several outbuildings were destroyed and that a number of houses were damaged. No estimate of damage was reported.

(ii) March 1975

Then from March 22 - 23, 1975 similar conditions caused the river to overflow its banks. Four families were evacuated at this time. It was reported that the river tends to overflow its banks every spring.

(iii) March 1983

The sequence of events as described by various persons and by investigation during the site visit as documented in a Department of Environment Report * dated 1983.

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* Newfoundland Department of Environment Water Resources Division
"Report on Flooding of Rushoon"
St. John's, Newfoundland 1983

Recent Flooding Events (Cont'd.)

- At 6:30 p.m. on March 3, 1983, the ice cover on the Rushoon River broke. Shattered pieces of ice flowed downstream and a blockage occurred at the constriction in the channel near the harbour. Ice backed up about 100 metres behind this jam.

- Flooding started almost immediately as water started to flow under, through and around the retaining wall constructed along the river. The wall did prevent pieces of ice from entering the town and causing serious damage.

- About eight houses were flooded at this time and four of these were evacuated as a precautionary measure. Fear was expressed that the retaining wall would collapse.

- The flows peaked overnight and on the morning of March 4 water levels had dropped slightly. Officials from various government departments and agencies arrived during the day and at approximately 6:30 p.m. a meeting was held by the Town Council to discuss the problem. A decision was taken to blast the jam.

- The weather turned colder overnight and on the morning of March 5 flows had reduced significantly.

- The blasting team arrived in Rushoon at 8:30 a.m. on March 5.

- Blasting started early in the afternoon and continued while light was sufficient. The small explosions, which were necessary due to the close proximity of buildings, had only a slight effect on the ice jam which was 2.4 to 3.6 metres thick.

Recent Flooding Events (Cont'd.)

- On March 8, a D-8 dozer and a large tracked backhoe were brought in by the Department of Transportation. This equipment was successful in opening a 10 metre wide channel through the ice jam.

- Property damage was limited to flooding in the basements* of seven houses and the Parish Hall. Damage was estimated to be about $25,000. In addition, seven families were forced to leave their homes for three days.

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* Only one house in the flooded zone has a basement. It was flooded. Water reached the ground floor of one house and damaged underfloor insulation in two/three houses. See Field Report.

APPENDIX II

REGRESSION ANALYSIS

APPENDIX II - REGRESSION ANALYSIS

II.I Background

Regression analyses were carried out to develop a relationship for peak flows on Rattle Brook which could then be transposed to Rushoon Brook. These analyses tested sixteen sets of data relating both instantaneous and daily peak floods from Garnish, Pipes Hole and Come-by-Chance Rivers with corresponding peak flows on Rattle Brook.

Comparisons between instantaneous and daily peak flows were also made for Rattle Brook, Garnish and Pipers Hole Rivers.

The results are compiled under sections II.2 and II.3 which follow.

II.2 Analysis

(i) Selection of High Flow Events

The daily flow records for Rattle Brook were examined to identify high flow events for use in the regression analysis (see Figures II-1, II-2 and II-3). The corresponding instantaneous flows on Rattle River and the corresponding flows on Garnish River, Piper's River and Come-by-Chance River were then obtained. The initial requests for instantaneous flow data revealed a lack of information for instantaneous flows on a daily basis. The best source of data was found to be the preliminary computation sheets, termed the 'four-month sheets' which are produced by the Inland Waters Directorate, but not generally issued to the public. These sheets contain the maximum instantaneous flow for each month, in addition to the daily average flows. The four month sheets were obtained for the period of record on Rattle River, (1981 to 1984) for the above mentioned rivers.

The instantaneous flows obtained are summarized in Table II-1. The instantaneous flows are not available for every event, due to backwater conditions or gauge failure, but a sufficient number of events are available for the regression analysis to yield significant results.

(ii) Multiple Regression Analysis

The peak flood events were subjected to a multiple regression analysis using both linear and non linear comparisons. A total of 16 comparisons were made, the results are shown on Table II-2. The selected formulae were those with the highest regression coefficient (R^2).

(iii) Results

The selected formulae are:

$$Q\ Rattle = [0.0368Q'p + 0.3580Q'G + 0.6161]$$

and

$$Q\ Rattle = [0.0217Q'p + 0.5066QG - 0.1685]$$

Where:

Q Rattle = Instantaneous peak flow on Rattle Brook

Q'p = Instantaneous peak flow on Pipers Hole River

Q'G = Instantaneous peak flow on Garnish River

Qp = Mean daily flow on Pipers Hole River

QG = Mean daily flow on Garnish River

- all flows in m^3/s -

Data and results of regression analyses are summarized in Tables II-1 to II-3.

II.3 Comparison of Instantaneous Peak and Daily Peak Flows

Comparisons of instantaneous and daily peak flows on Garnish, Pipers Hole River and Rattle Brook were carried out to provide a method for estimating instantaneous peak flows from daily peak flows, if required. Data and results of these comparisons are compiled in Tables II-4 to II-6 and Figures II-1 to II-7.

TABLES

TABLE II-1

Rushoon Instantaneous Peak Flow Comparison

Month	Date	Rattle	Piper's	Garnish	C by C (3)
Apr	81-04-24	1.56	----	----	2.64
May	81-05-02	9.01	----	----	10.80
Jun	81-06-08	4.65	----	----	----
Jul	81-07-15	26.40	191.00	30.20	11.60
Aug	81-08-18	7.36	54.40	8.14	7.55
Sep	81-09-20	22.40	85.30	----	7.17
Oct	81-10-16	20.90	195.00	46.30	18.70
Nov	81-11-22	9.47	61.60	19.50	----
Dec	81-12-17	10.80	76.50	----	7.66
Apr	82-04-20	16.70	----	39.50	23.80
Jun	82-06-29	9.33	33.40	24.90	5.16
Sep	82-09-08	6.02	41.90	15.80	5.39
Oct	82-10-02	3.16	46.00	9.89	5.36
Nov	82-11-23	17.30	92.00	20.60	15.80
Dec	82-12-12	9.50	----	----	9.30
Jan	83-01-13	24.80	300.00	41.90	34.10
Feb	83-02-06	6.57	50.50	----	----
Apr	83-04-13	8.89	----	----	10.00
May	83-05-14	9.24	----	17.20	----
Jun	83-06-02	20.30	57.70	32.60	17.40
Jul	83-07-26	6.44	20.00	12.20	1.52
Aug	83-08-14	6.19	----	14.30	----
Sep	83-09-08	7.15	88.30	20.60	----
Oct	83-10-28	3.21	----	----	3.63
Nov	83-11-18	38.00	119.00	32.10	32.20
Feb	84-02-04	32.70	395.00	51.60	----
Mar	84-03-01	11.60	110.00	20.50	5.89
Apr	84-04-07	18.50	114.00	31.40	16.30
May	84-05-18	11.30	88.30	33.30	10.60
Jun	84-06-04	3.91	30.20	8.52	----
Aug	84-08-25	2.67	61.10	----	----
Sep	84-09-18	13.10	111.00	----	----
Oct	84-10-10	1.93	28.80	6.75	1.74
Dec	84-12-05	36.90	93.40	----	16.70

(1) All flows in m3/s

(2) Used in Analyses 1 to 7

(3) Come-by-Chance River

TABLE II-2

COMPARISON OF MULTIPLE REGRESSION ANALYSIS RESULTS

Linear Regression Analysis: Qr = (A*Qp)+(B*Qg)+(C*Qc)+D

	Pipers (A)	Garnish (B)	Come by Chance (C)	Constant (D)	Data Points	R^2	S.E.
1			0.8249	4.2596	24	0.5607	6.743
2	0.0785			6.7629	25	0.4141	8.151
3		0.6128		-0.9487	22	0.6497	5.829
4	-0.0008	0.1994	0.7438	1.5221	15	0.7813	5.305
5	-0.0003		0.9043	5.5113	18	0.5988	7.198
6		0.1341	0.6915	2.3674	16	0.7338	5.384
* 7	0.0368	0.3580		+0.6161	18	0.8426	3.778

Based on Instantaneous Flows

Non-Linear Regression Analysis: Qr = (Qp^A)*(Qg^B)*(Qc^C)*D

	Pipers (A)	Garnish (B)	Come by Chance (C)	Constant (D)	Data Points	R^2	S.E.
8			0.8363	1.2583	24	0.6754	1.237
9	0.8482			0.2744	25	0.5447	1.745
10		1.1657		0.3120	22	0.7902	1.426
11	0.0240	0.6956	0.3933	0.5205	15	0.8364	1.459
12	0.1969		0.6496	1.2753	18	0.6889	1.621
13		0.6758	0.3875	0.6047	16	0.8198	1.443
14	0.2483	0.8752		0.2493	18	0.8394	1.398

Based on Instantaneous Flows

Linear Regression Analysis: Qr = (A*Qp)+(B*Qg)+(C*Qc)+D
Other comparisons

	Pipers (A)	Garnish (B)	Constant (D)	Data Points	R^2	S.E.
*15	0.0217	0.5066	-0.1685	18	0.8419	3.7870
16	0.0126	0.3626	0.2532	18	0.8739	2.2741

15 = Mean Daily Flows on Pipers and Garnish, Instantaneous Flows on Rattle

16 = Mean Daily Flows on Pipers, Garnish and Rattle

* Selected formulae

TABLE II-3

Comparison of Mean Daily and Instantaneous Flows
for Garnish River

Month	Date	Inst. Garnish	Daily Garnish	Ratio
Jul	81-07-15	30.20	29.40	1.027
Aug	81-08-18	8.14	8.06	1.010
Oct	81-10-16	46.30	44.60	1.038
Nov	81-11-22	19.50	19.10	1.021
Jun	82-06-29	24.90	16.40	1.518
Sep	82-09-08	15.80	15.70	1.006
Oct	82-10-02	9.89	9.86	1.003
Nov	82-11-23	20.60	20.30	1.015
Jan	83-01-13	41.90	39.10	1.072
Jun	83-06-02	32.60	31.80	1.025
Jul	83-07-26	12.20	11.80	1.034
Sep	83-09-08	20.60	16.70	1.234
Nov	83-11-18	32.10	30.70	1.046
Feb	84-02-04	51.60	47.10	1.096
Mar	84-03-01	20.50	20.30	1.010
Apr	84-04-07	31.40	31.30	1.003
May	84-05-18	33.30	29.40	1.133
Jun	84-06-04	8.52	7.40	1.151
Oct	84-10-10	6.75	6.37	1.060
Max		51.60	47.10	1.151
			Average=	1.079
			Std. Deviation=	0.119
			Variance=	0.014

TABLE II-4

Comparison of Instantaneous and Mean Daily Flows
For Rattle Brook

Month	Date	Inst. Rattle	Daily Rattle	Ratio
Jul	81-07-15	26.40	18.70	1.412
Aug	81-08-18	7.36	5.90	1.247
Oct	81-10-16	20.90	16.40	1.274
Nov	81-11-22	9.47	7.43	1.275
Jun	82-06-29	9.33	7.66	1.218
Sep	82-09-08	6.02	5.57	1.081
Oct	82-10-02	3.16	2.64	1.197
Nov	82-11-23	17.30	10.70	1.617
Jan	83-01-13	24.80	18.90	1.312
Jun	83-06-02	20.30	13.30	1.526
Jul	83-07-26	6.44	4.35	1.480
Sep	83-09-08	7.15	4.64	1.541
Nov	83-11-18	38.00	28.30	1.343
Feb	84-02-04	32.70	21.50	1.521
Mar	84-03-01	11.60	8.35	1.389
Apr	84-04-07	18.50	11.40	1.623
May	84-05-18	11.30	9.82	1.151
Jun	84-06-04	3.91	3.43	1.140
Oct	84-10-10	1.93	1.77	1.090
Max		32.70	21.50	1.623
			Average=	1.339
			Std. Deviation=	0.170
			Variance=	0.029

TABLE II-5

Comparison of Instantaneous and Mean Daily Flows
For Pipers Hole River

Month	Date	Inst. Piper's	Daily Piper's	Ratio
Jul	81-07-15	191.00	108.00	1.769
Aug	81-08-18	54.40	45.00	1.209
Oct	81-10-16	195.00	178.00	1.096
Nov	81-11-22	61.60	58.00	1.062
Jun	82-06-29	33.40	31.00	1.077
Sep	82-09-08	41.90	38.20	1.097
Oct	82-10-02	46.00	42.60	1.080
Nov	82-11-23	92.00	76.90	1.196
Jan	83-01-13	300.00	263.00	1.141
Jun	83-06-02	57.70	51.60	1.118
Jul	83-07-26	20.00	16.80	1.190
Sep	83-09-08	88.30	61.30	1.440
Nov	83-11-18	119.00	89.10	1.336
Feb	84-02-04	395.00	385.00	1.026
Mar	84-03-01	110.00	84.50	1.302
Apr	84-04-07	114.00	109.00	1.046
May	84-05-18	88.30	78.20	1.129
Jun	84-06-04	30.20	29.80	1.013
Oct	84-10-10	28.80	28.60	1.007
Max		395.00	385.00	1.302
			Average=	1.175
			Std. Deviation=	0.179
			Variance=	0.032

FIGURES

Figure II-1 Rushoon Hydrotechnical Study

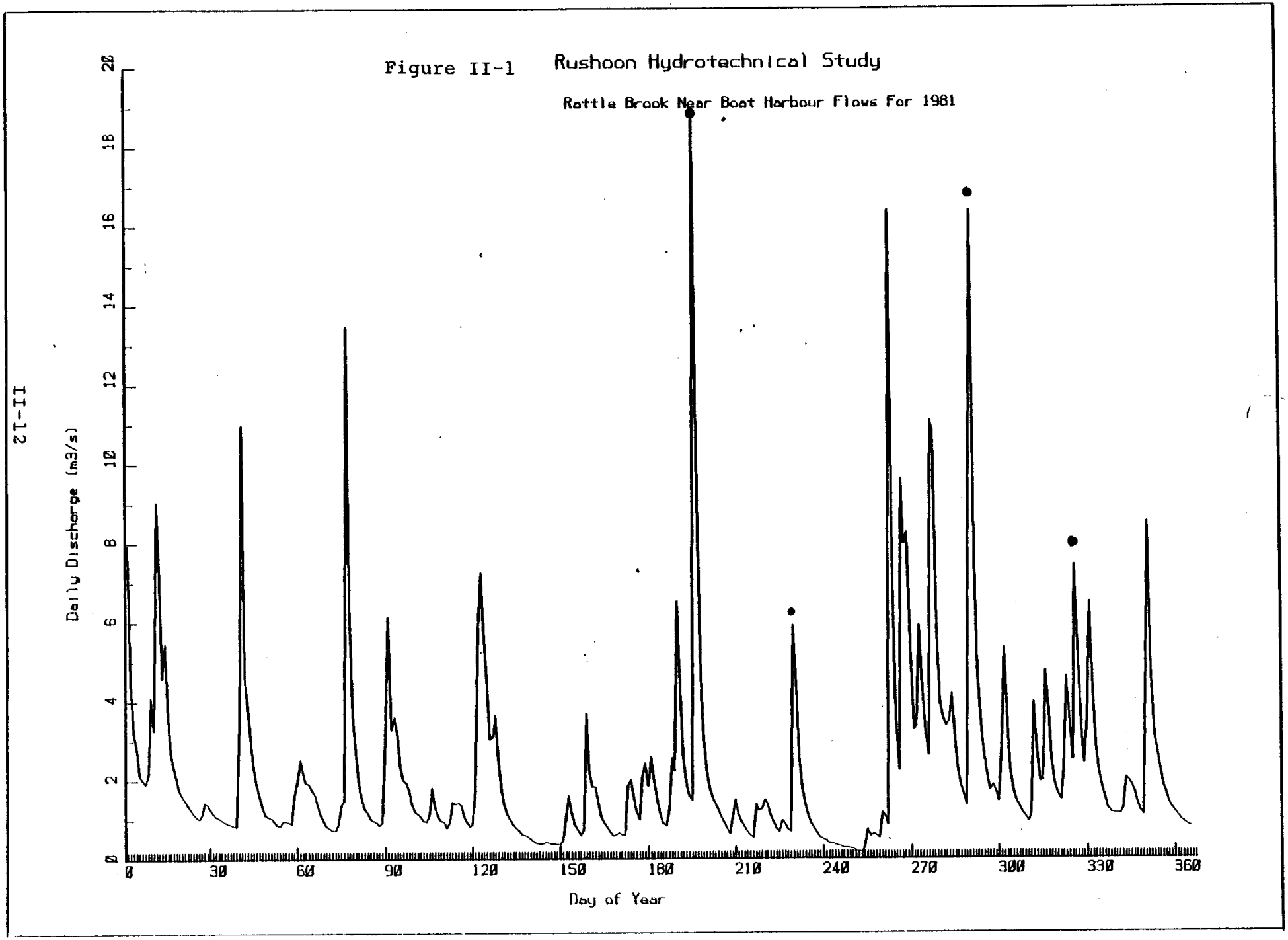
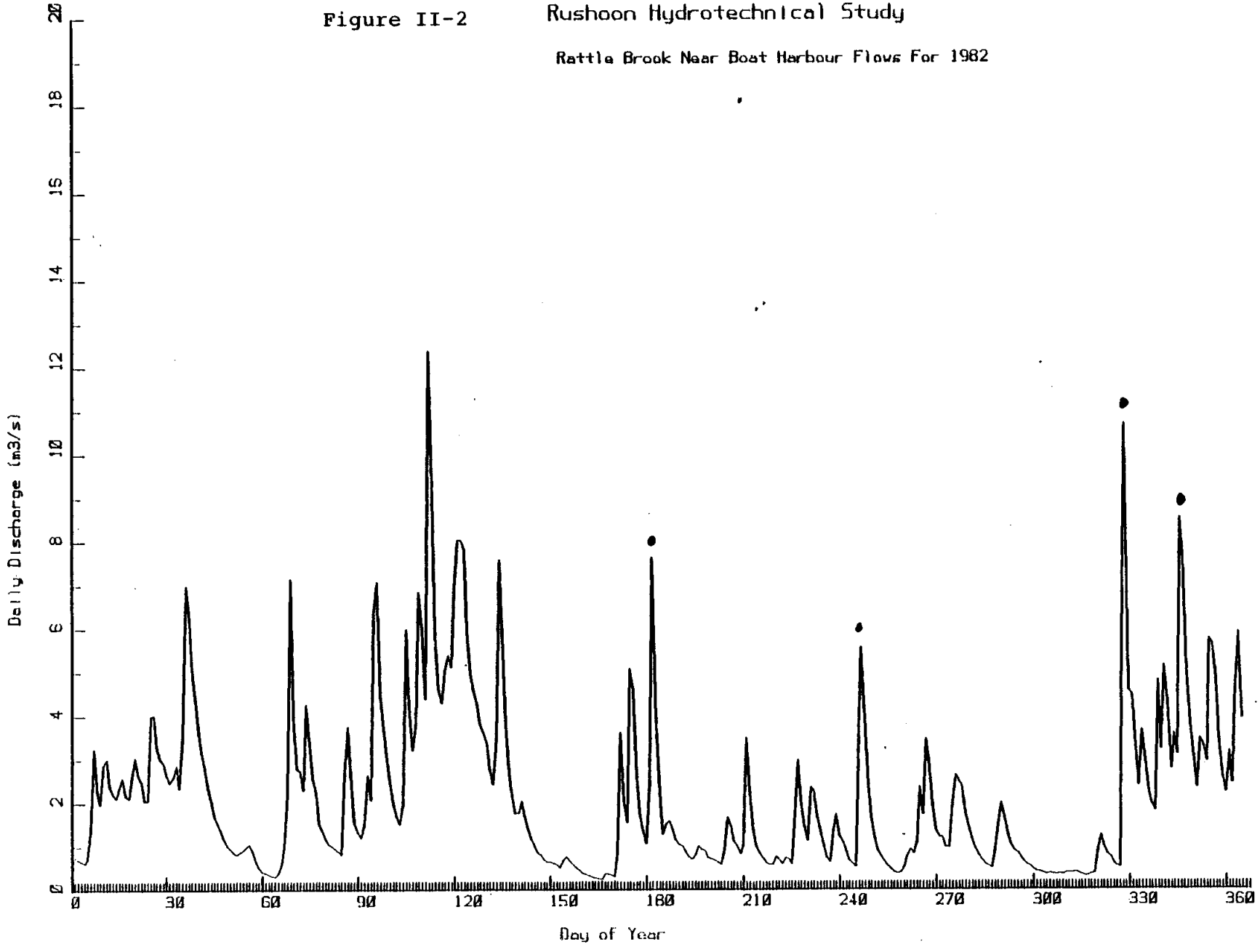


Figure II-2 Rushoon Hydrotechnical Study

Rattle Brook Near Boat Harbour Flows For 1982



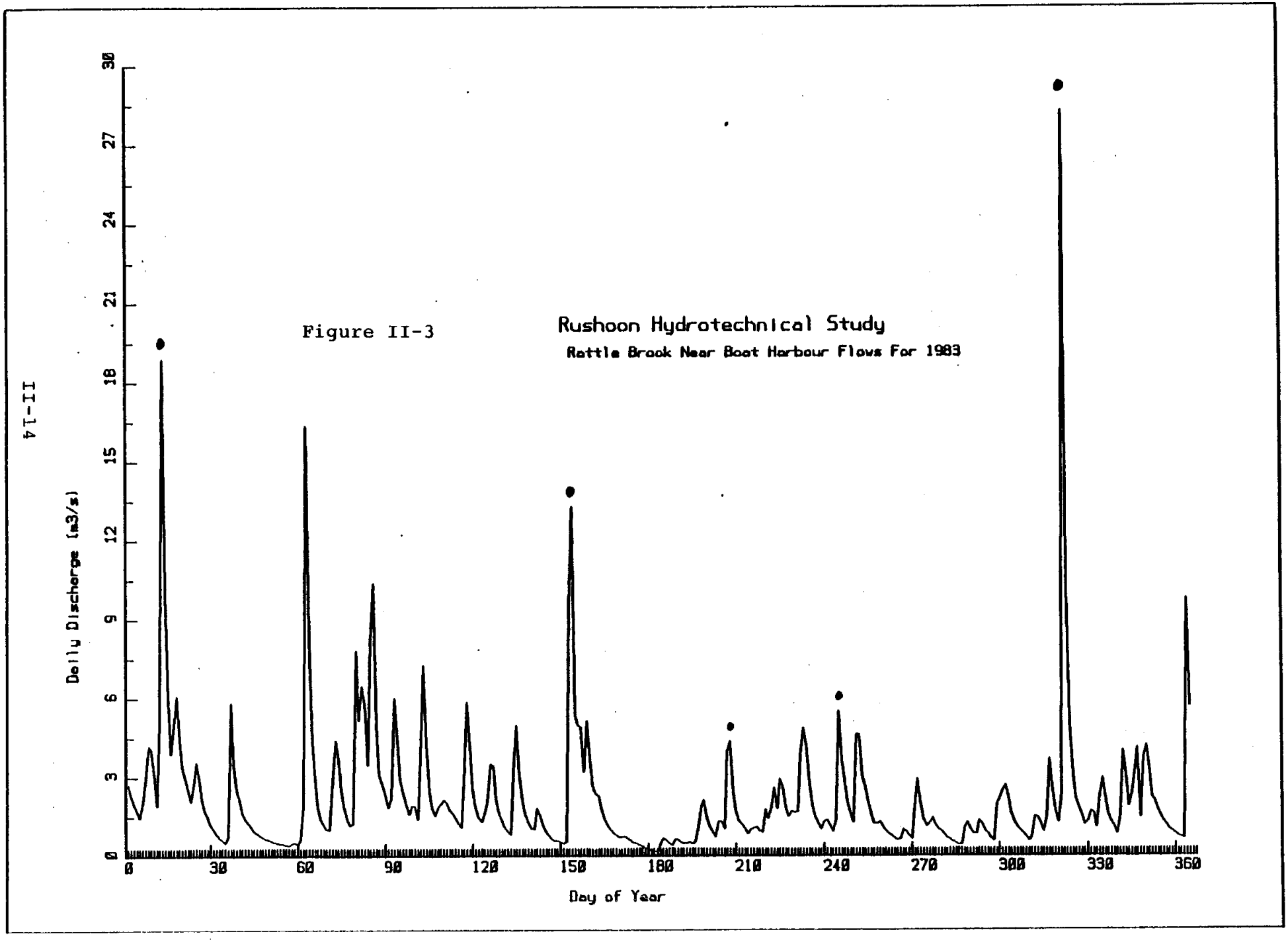


Figure II-3
Rushoon Hydrotechnical Study
Rattle Brook Near Boat Harbour Flows For 1983
Daily Discharge (m3/s)
0
3
6
9
12
15
18
21
24
27
30
0
30
60
90
120
150
180
210
240
270
300
330
360
Day of Year

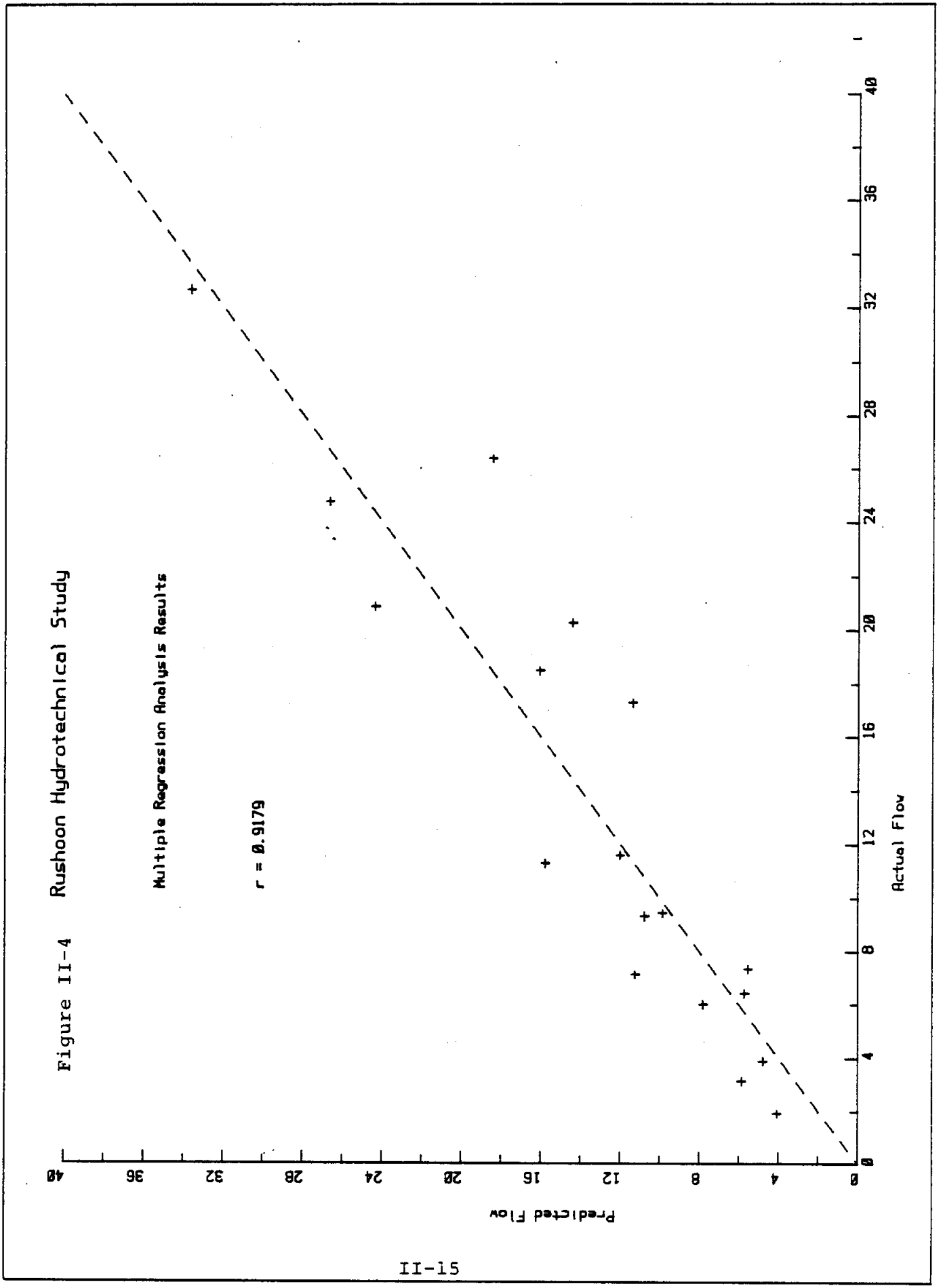


Figure II-4 Rushoon Hydrotechnical Study
Multiple Regression Analysis Results
r = 0.9179
Predicted Flow
Actual Flow
0
4
8
12
16
20
24
28
32
36
40

Figure II-5

Rushoon Hydrotechnical Study

Comparison of Maximum Instantaneous and Mean Daily Flows

Rattle Brook Near Boat Harbour

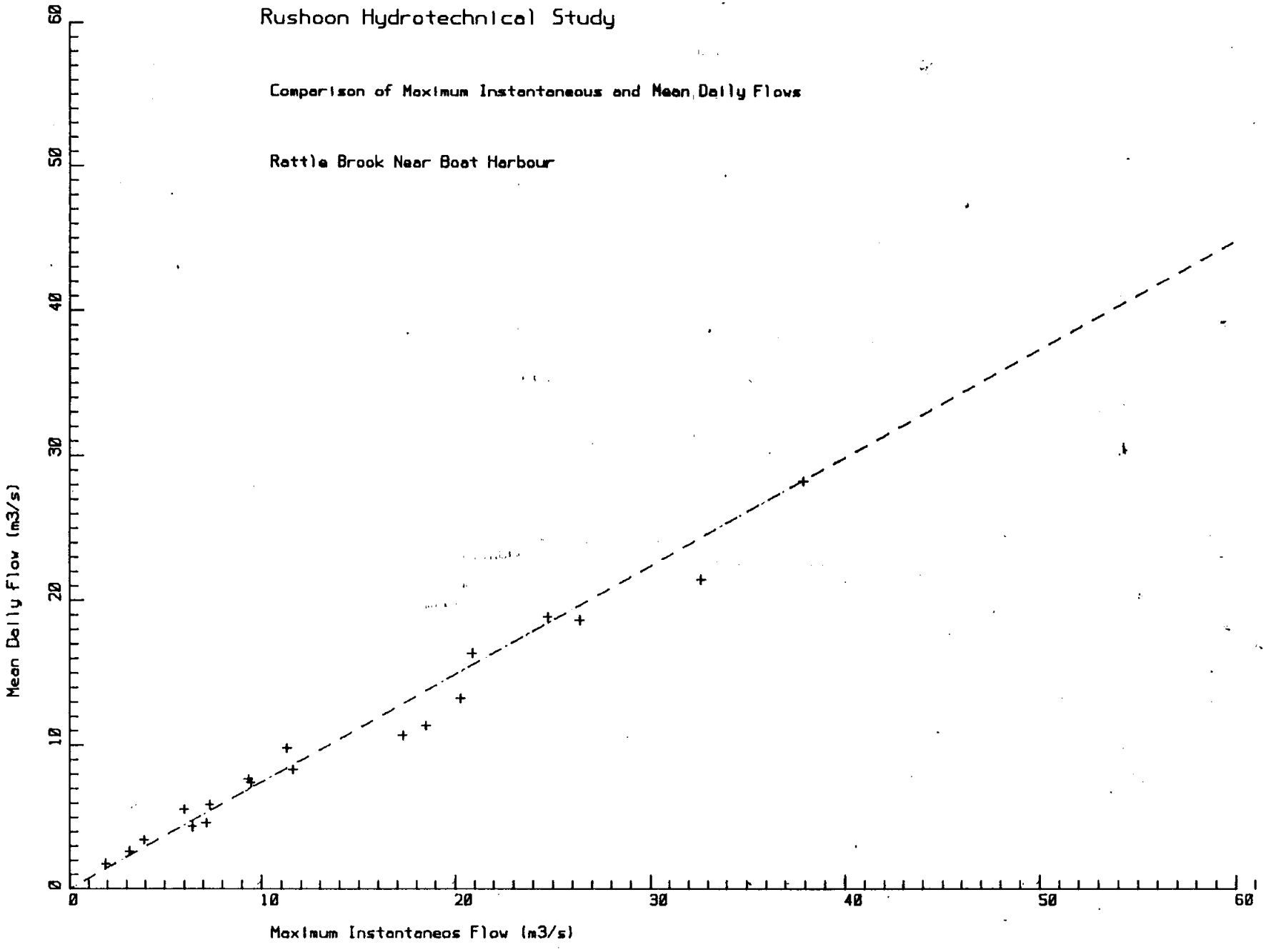


Figure II-6
Rushoon Hydrotechnical Study

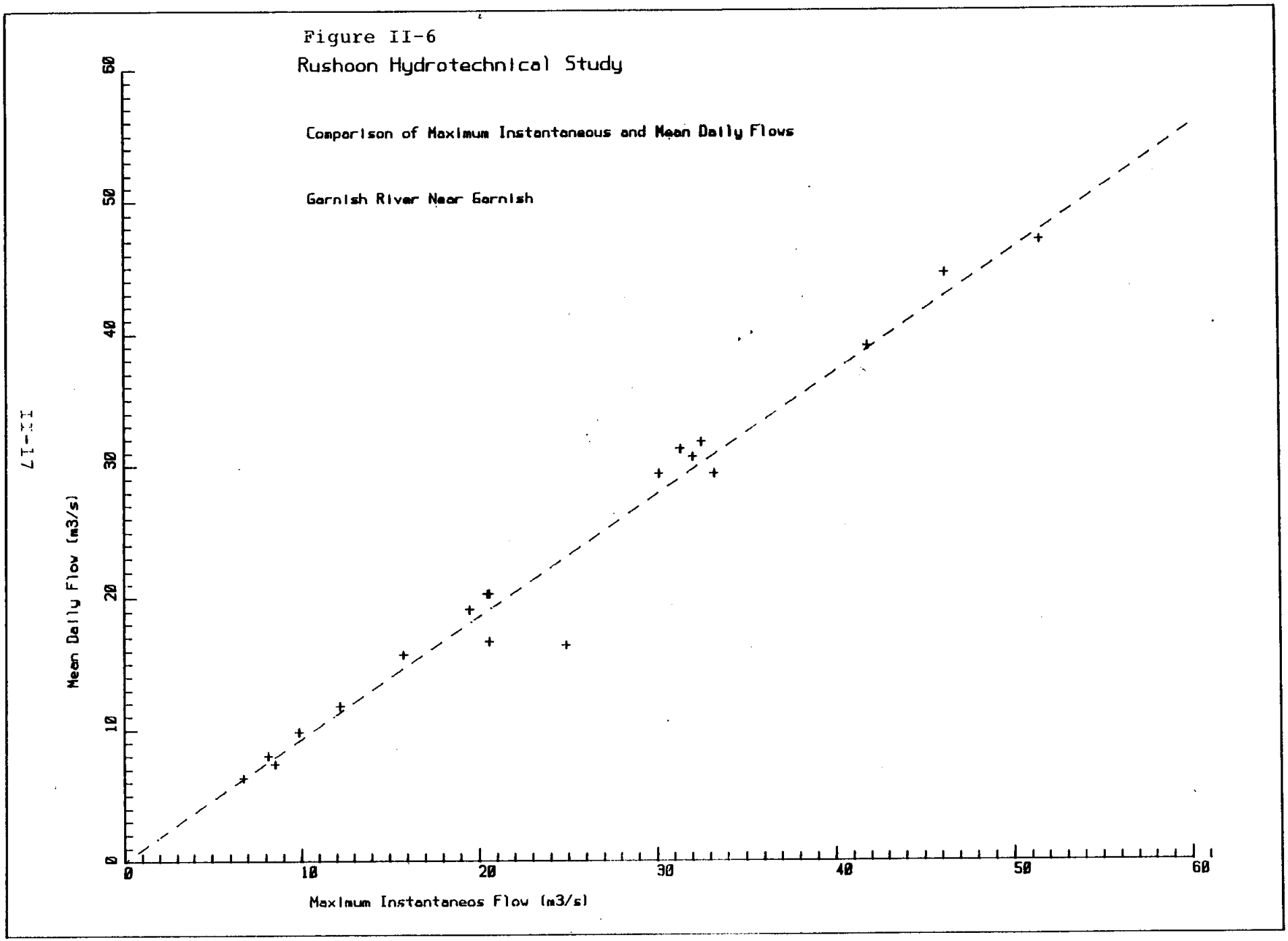
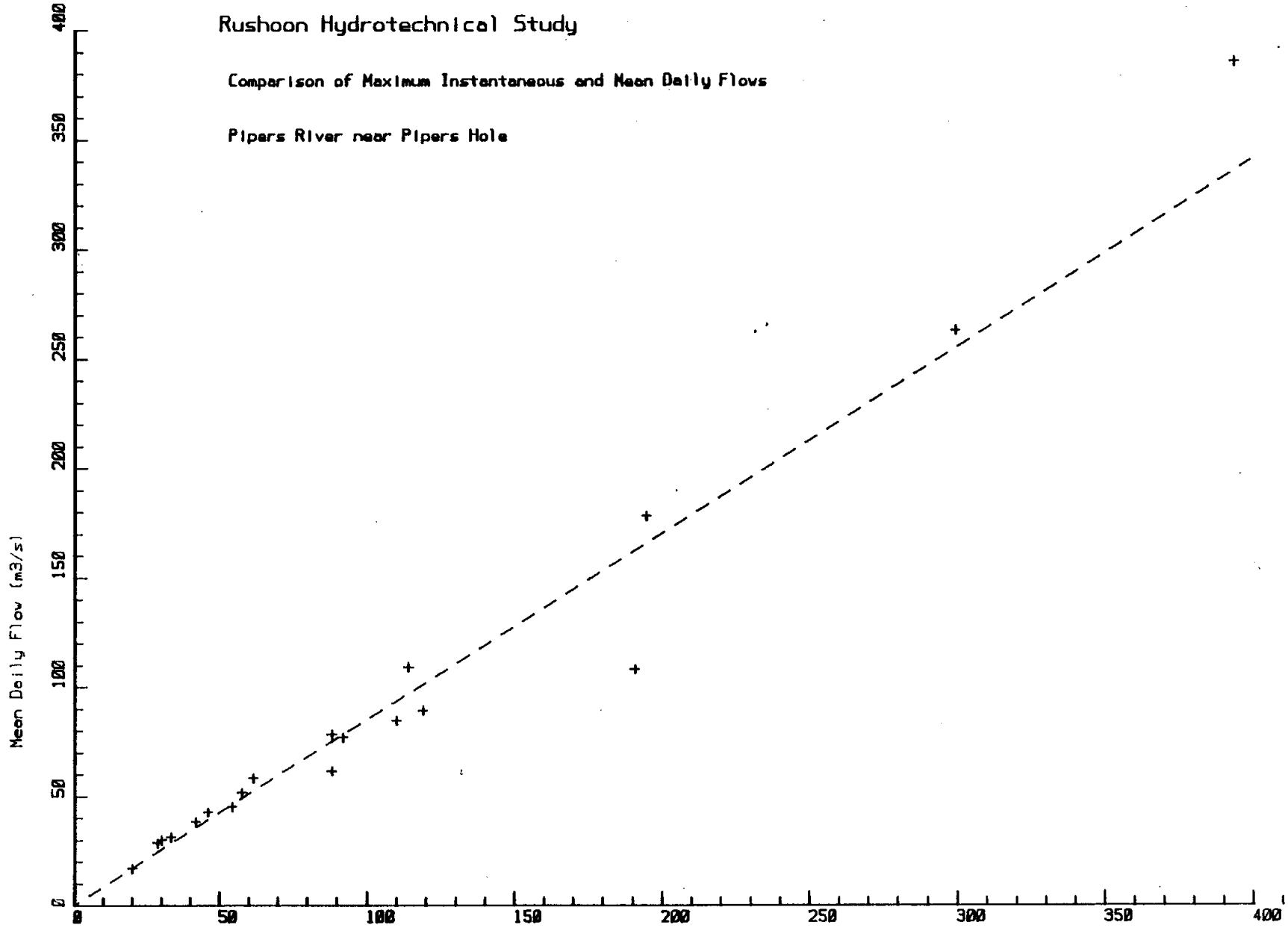


Figure II-7

Rushoon Hydrotechnical Study

Comparison of Maximum Instantaneous and Mean Daily Flows

Pipers River near Pipers Hole



APPENDIX III

ICE SEASON DELINEATION PROCEDURES: TEST APPLICATIONS

Background

A key element in the ice season delineation procedures is a means of predicting ice conditions in Rushoon Brook. Ideally, this could be accomplished by a complete accounting for all thermal energy inputs and outputs to the system. However, this type of accounting is rarely feasible in practice unless supported by an elaborate (and expensive) data collection system. An alternative approach depends on correlating the process of ice/growth decay to more easily observable data (temperature, flow, hours of sunshine, etc) by means of multiple regression analysis to produce a stochastic model of the process. This method, while less elaborate, also depends on the availability of a substantial amount of data, preferably a minimum of 10 years of observations! Evidently neither of these approachs could be applied in the present study for want of background data.

Since the only data available were degree day statistics at St. Lawrence and Come-by-Chance and for nearby Boat Harbour since Dec. 1982 it was necessary to develop a less elaborate procedure for assessing ice conditions in the river.

The subjects of ice growth* and ice decay** are treated at considerable length in texts on ice engineering, which eventually

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* Michel, B "Ice Mechanics"
Les Presses de l'Universite Laval (1978)

Shulyakovskii, L.G. "Manual of Forecasting Ice Formation for Rivers and Lakes"
Israel Program for Scientific Translations (1966)

conclude that for practical purposes ice growth and decay are best related to cumulative degree days of freezing ($S = \Sigma - T$, $T \leq 0^{o}C$) and cumulative degree days of thawing ($D = \Sigma + T$, $T > 0^{o}C$). Specifically the two following types of relationships are recommended:

(i) for ice growth $t = A\sqrt{S}$

and

(ii) for ice decay $t = B.D$

Where: $S = {}^{o}C.$ days, below $0^{o}C$

$D = {}^{o}C.$ days, below $0^{o}C$

t = ice thickness in cm

Values for the coefficients A and B are cited in the ice engineering literature based on site specific observations collected in mainly nordic environments. In deriving these coefficients it is usually assumed that ice growth is the result of a prolonged period of sub-freezing temperatures, while decay is the result of a continuous period of above freezing temperatures; in other words, interruptions to either process are ignored. While these assumptions may be acceptable for nordic climates, they are certainly incorrect for a maritime climate such as experienced on the Burin Peninsula where a pattern of alternating periods of freezing and thawing weather is the norm.

In order to represent this process a unified formula is proposed:

$$t = A\sqrt{S} + B.D$$

Two formulations were derived and tested:

(i) a formula in which coefficients A and B were estimated in the conventional fashion (A = 2.4, B = 1.4);

(ii) a formula in which coefficients A and B were determined by solving the above equation using actual ice depth and degree day data collected during the winter of 1984/85 on Rushoon Brook (A = 4.5, B = 4.8).

From:

Period - Dec. 28, 1984 to March 27, 1984:
t = 50 cm, S = 478°C., days, frost, D = 10°C. days, thaw

Period - Dec. 28, 1984 to April 6, 1984:
t= 30 cm, S= 495.5°C., days, frost, D= 14.5°C. day, thaw

t was measured at Tidal Pool in cm.

Both formulae were tested for the winters of 1972/73 and 1982/83 for which some evidence (mainly photographs) of ice thickness is available. The results are shown in Figure III.1 and III.2. Both formulae represent conditions on the river in a realistic pattern; however, it was felt that the second formula:

$$t = 4.5\sqrt{S} + 4.8D$$

was more appropriate for use on Rushoon Brook, since it was derived from actual on-site observations.

FIGURES

FIGURE III - 1

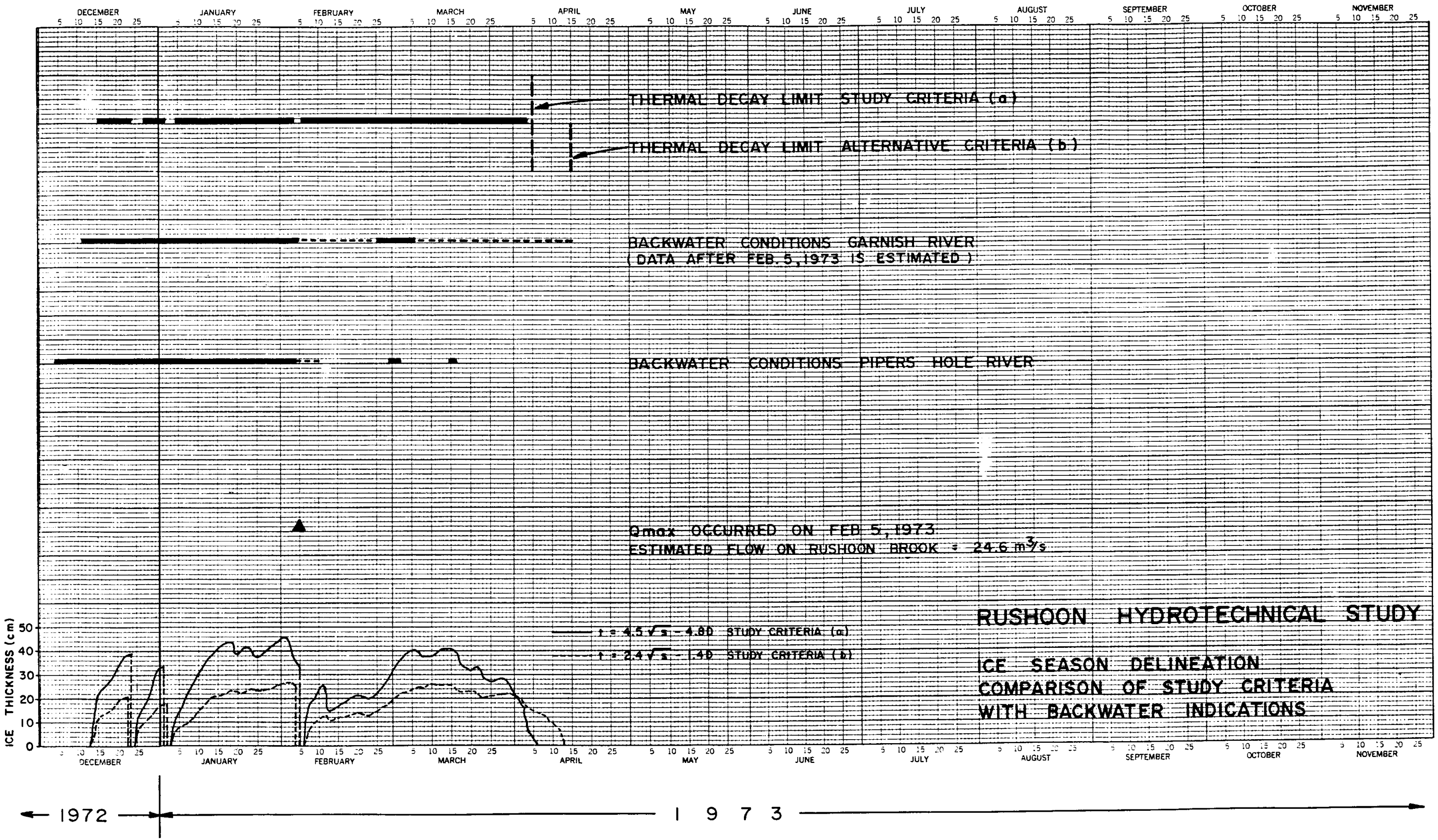
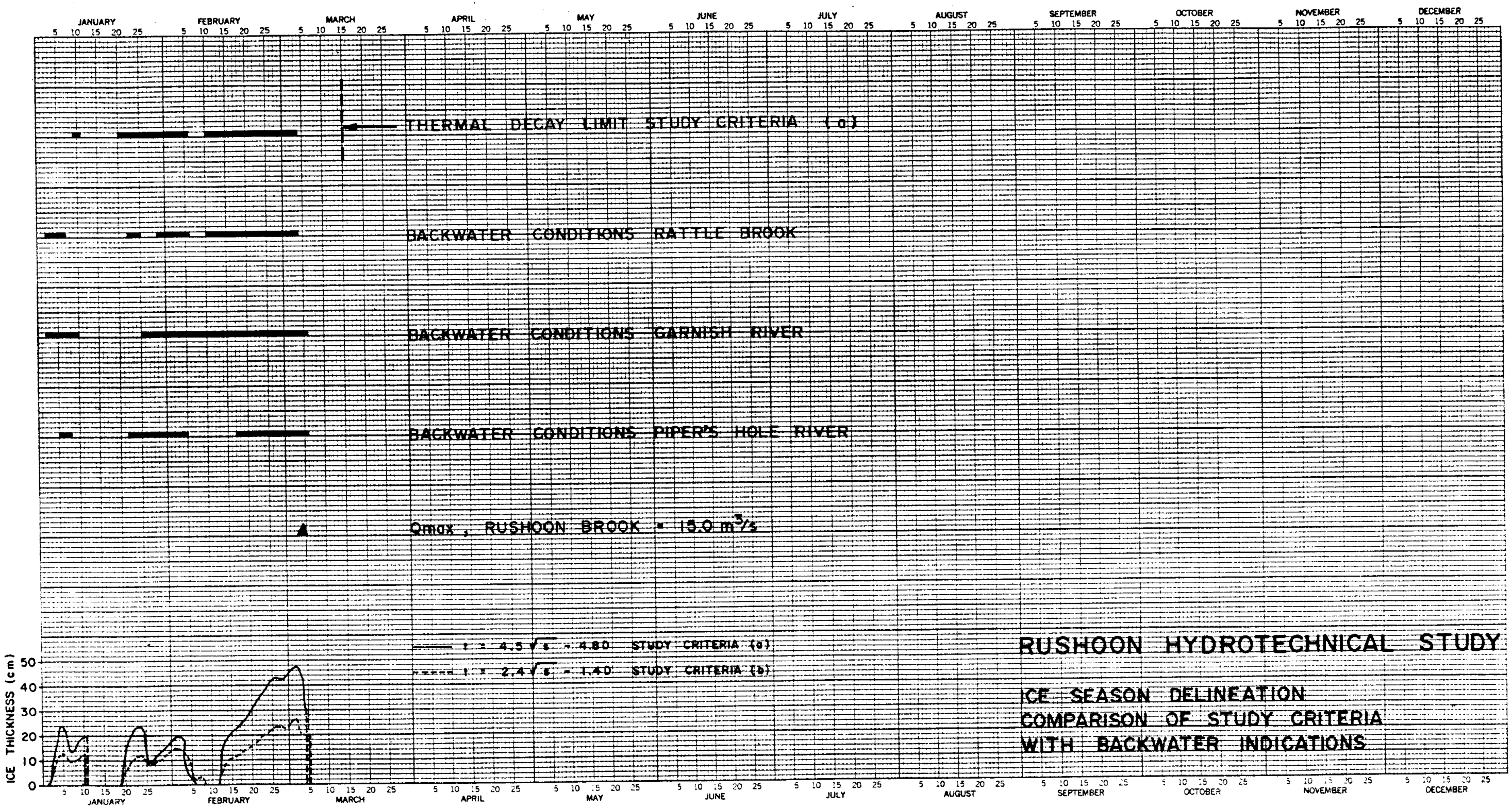

DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
5 10 15 20 25
THERMAL DECAY LIMIT STUDY CRITERIA (a)
THERMAL DECAY LIMIT ALTERNATIVE CRITERIA (b)
BACKWATER CONDITIONS GARNISH RIVER
(DATA AFTER FEB. 5, 1973 IS ESTIMATED)
BACKWATER CONDITIONS PIPERS HOLE RIVER
Qmax OCCURRED ON FEB 5, 1973
ESTIMATED FLOW ON RUSHOON BROOK = 24.6 m³/s
ICE THICKNESS (cm)
0
10
20
30
40
50
t = 4.5 √s - 4.8D STUDY CRITERIA (a)
t = 2.4 √s - 1.4D STUDY CRITERIA (b)
RUSHOON HYDROTECHNICAL STUDY
ICE SEASON DELINEATION
COMPARISON OF STUDY CRITERIA
WITH BACKWATER INDICATIONS
1972
1973

FIGURE III - 2



RUSHOON HYDROTECHNICAL STUDY

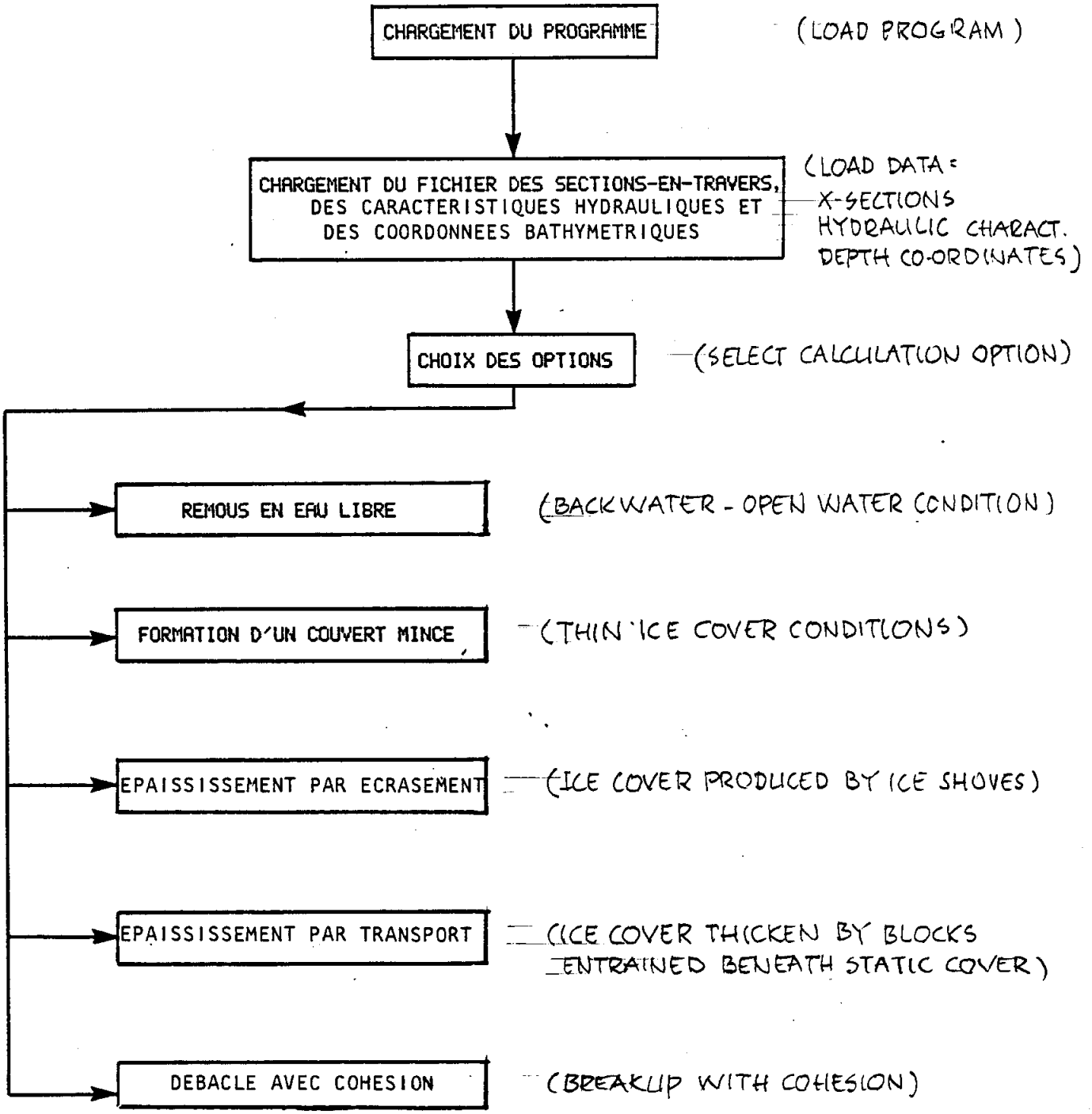
ICE SEASON DELINEATION
COMPARISON OF STUDY CRITERIA
WITH BACKWATER INDICATIONS

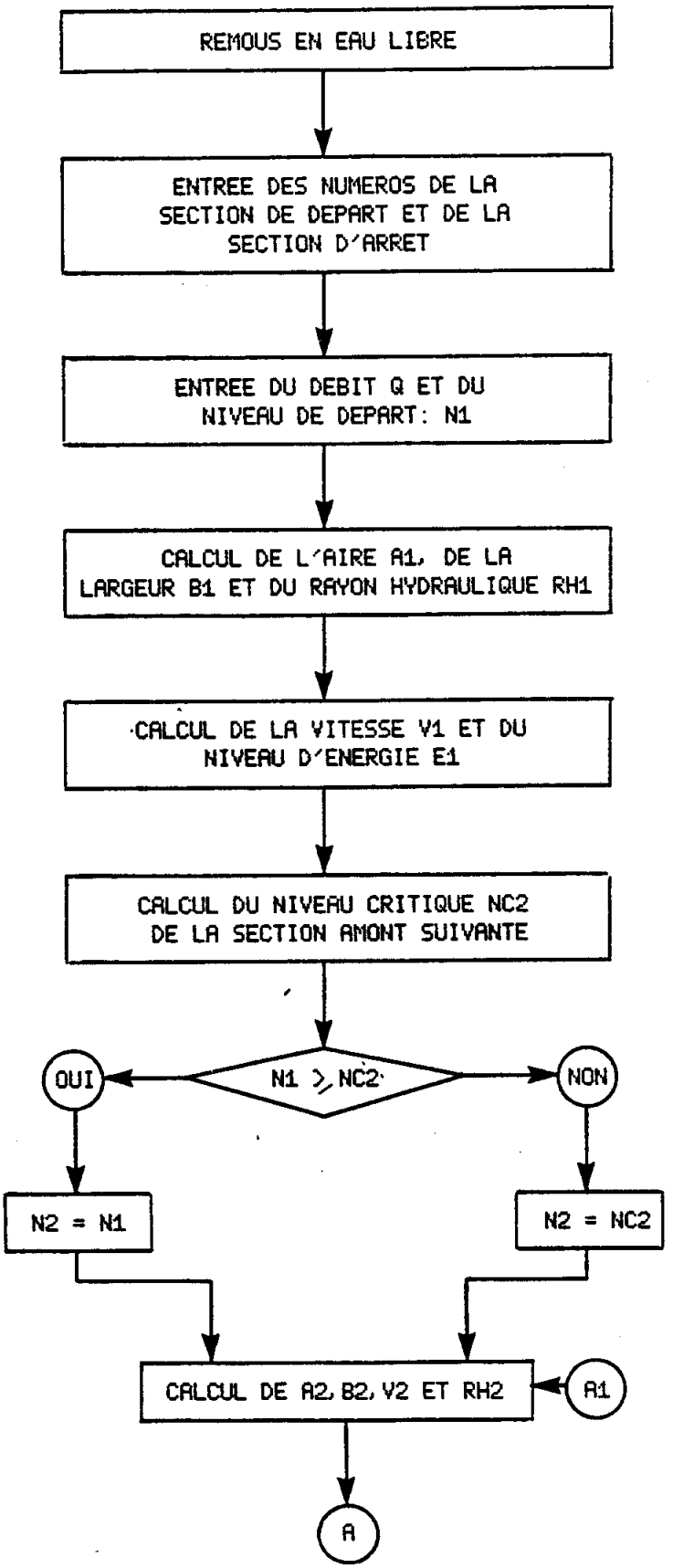
1983

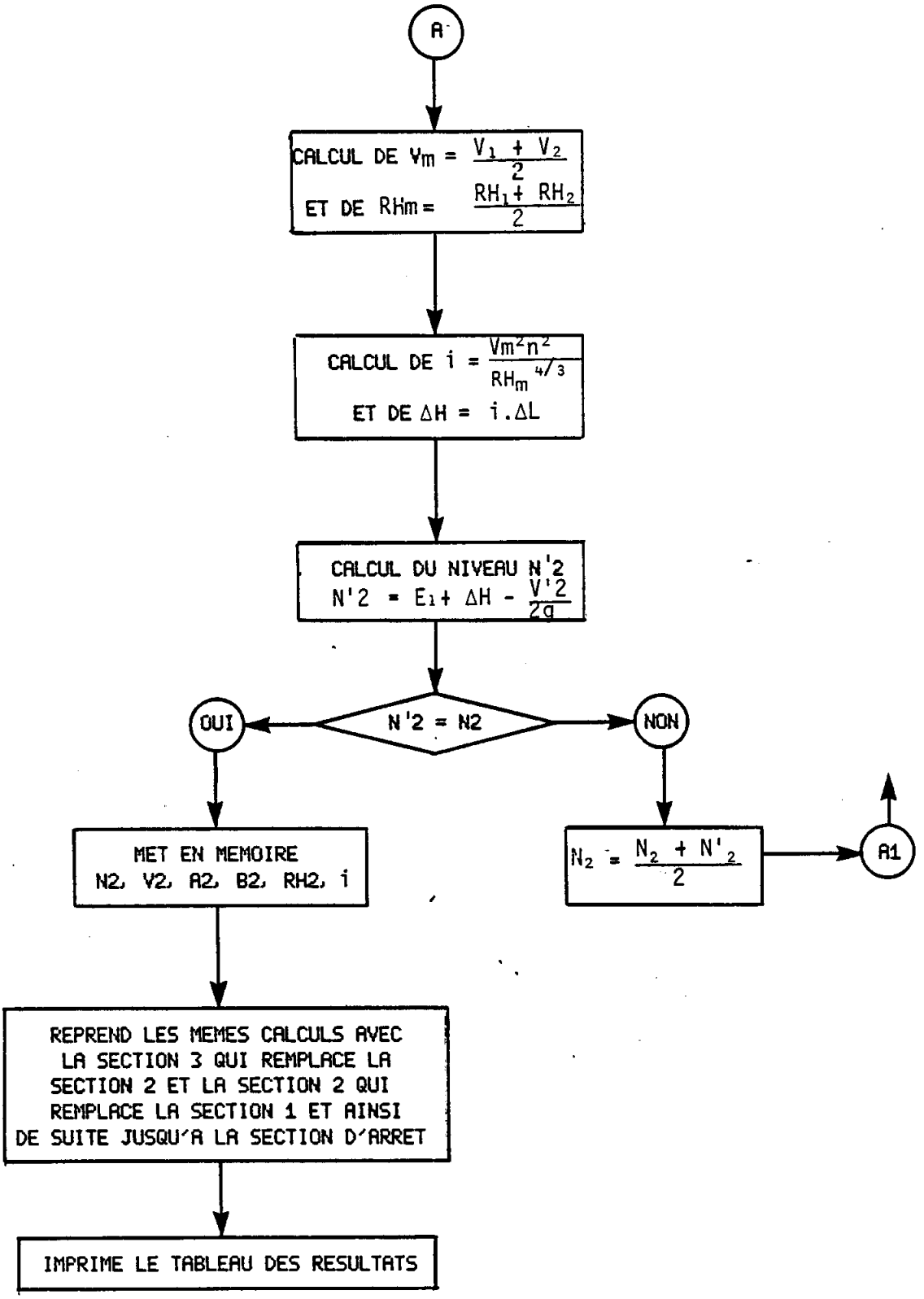
APPENDIX IV

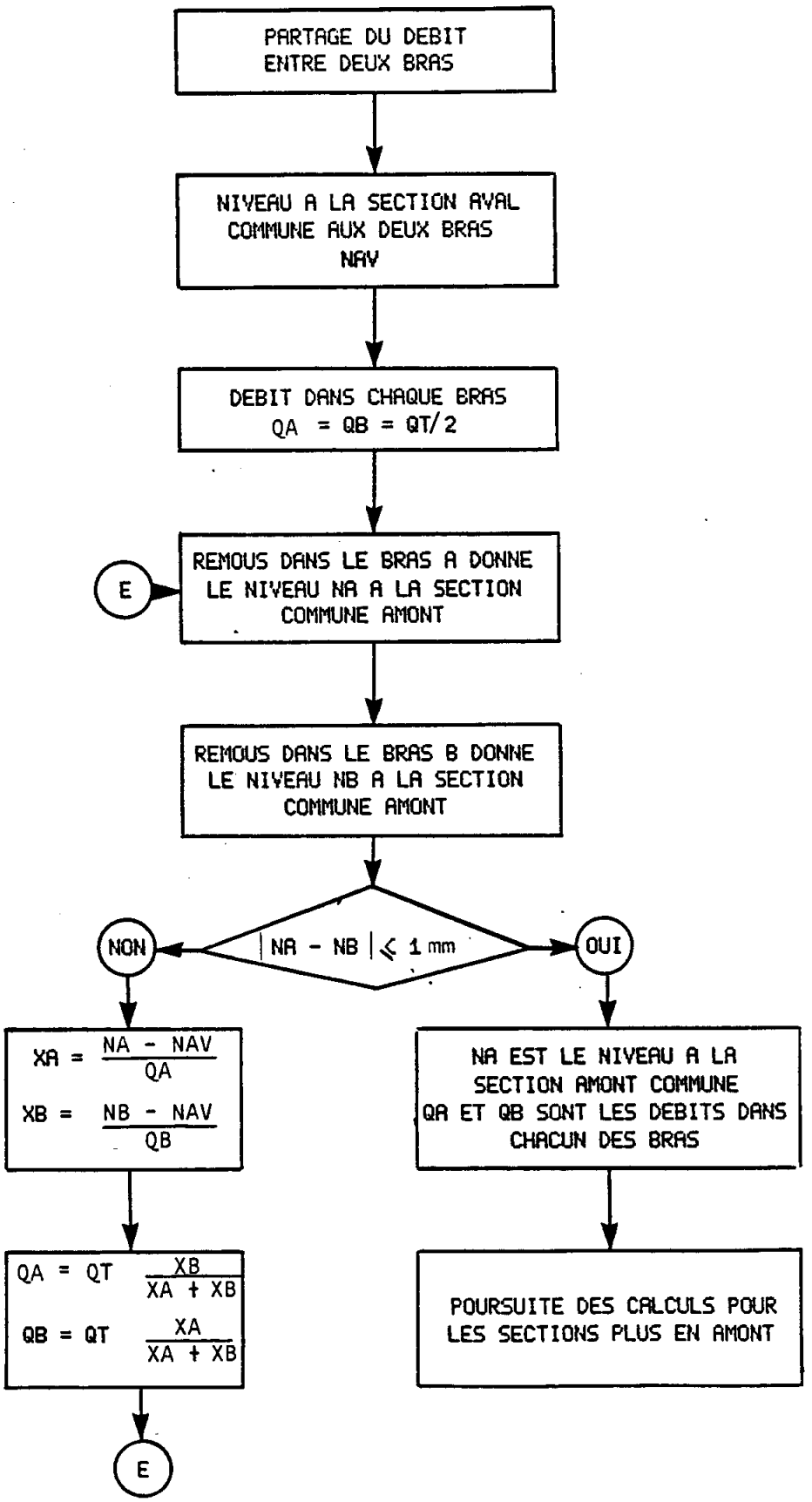
ICE MODEL FLOW CHARTS

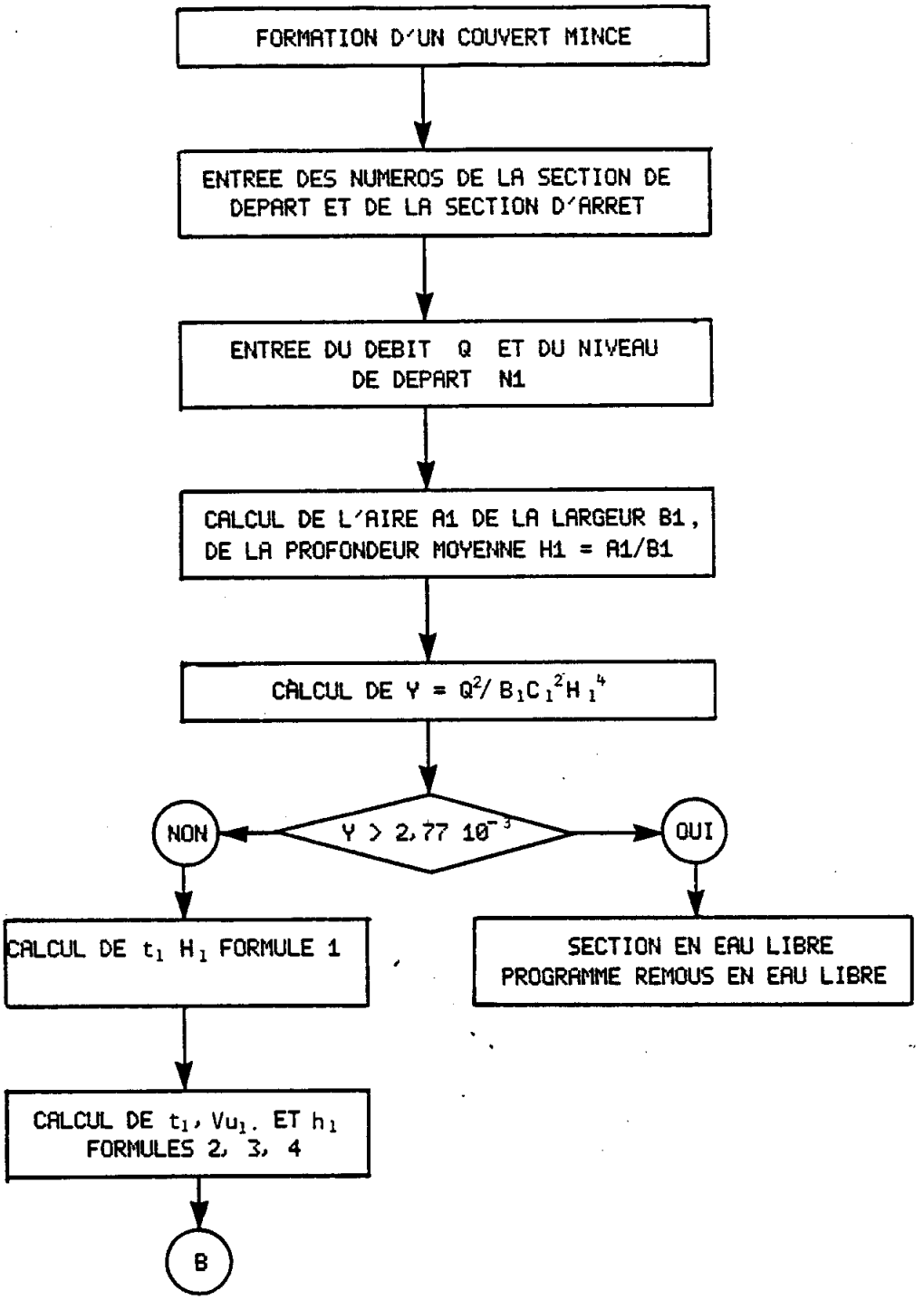
PROGRAMME NO 1 DE CALCUL DES GLACES (ICE CALCULATIONS PROGRAM #1)




REMOUS EN EAU LIBRE
ENTREE DES NUMEROS DE LA SECTION DE DEPART ET DE LA SECTION D'ARRET
ENTREE DU DEBIT Q ET DU NIVEAU DE DEPART: N1
CALCUL DE L'AIRE A1, DE LA LARGEUR B1 ET DU RAYON HYDRAULIQUE RH1
CALCUL DE LA VITESSE V1 ET DU NIVEAU D'ENERGIE E1
CALCUL DU NIVEAU CRITIQUE NC2 DE LA SECTION AMONT SUIVANTE
N1 ≥ NC2
OUI
NON
N2 = N1
N2 = NC2
CALCUL DE A2, B2, V2 ET RH2
A1
A


A
CALCUL DE Vm = (V1 + V2)/2
ET DE RHm = (RH1 + RH2)/2
CALCUL DE i = Vm²n² / RHm^4/3
ET DE ΔH = i.ΔL
CALCUL DU NIVEAU N'2
N'2 = E1 + ΔH - V'2/2g
N'2 = N2
OUI
NON
MET EN MEMOIRE
N2, V2, A2, B2, RH2, i
N2 = (N2 + N'2)/2
A1
REPREND LES MEMES CALCULS AVEC
LA SECTION 3 QUI REMPLACE LA
SECTION 2 ET LA SECTION 2 QUI
REMPLACE LA SECTION 1 ET AINSI
DE SUITE JUSQU'A LA SECTION D'ARRET
IMPRIME LE TABLEAU DES RESULTATS


PARTAGE DU DEBIT ENTRE DEUX BRAS
NIVEAU A LA SECTION AVAL COMMUNE AUX DEUX BRAS NAV
DEBIT DANS CHAQUE BRAS QA = QB = QT/2
E
REMOUS DANS LE BRAS A DONNE LE NIVEAU NA A LA SECTION COMMUNE AMONT
REMOUS DANS LE BRAS B DONNE LE NIVEAU NB A LA SECTION COMMUNE AMONT
NON
| NA - NB | ≤ 1 mm
OUI
XA = (NA - NAV) / QA
XB = (NB - NAV) / QB
NA EST LE NIVEAU A LA SECTION AMONT COMMUNE
QA ET QB SONT LES DEBITS DANS CHACUN DES BRAS
QA = QT XB / (XA + XB)
QB = QT XA / (XA + XB)
POURSUITE DES CALCULS POUR LES SECTIONS PLUS EN AMONT
E



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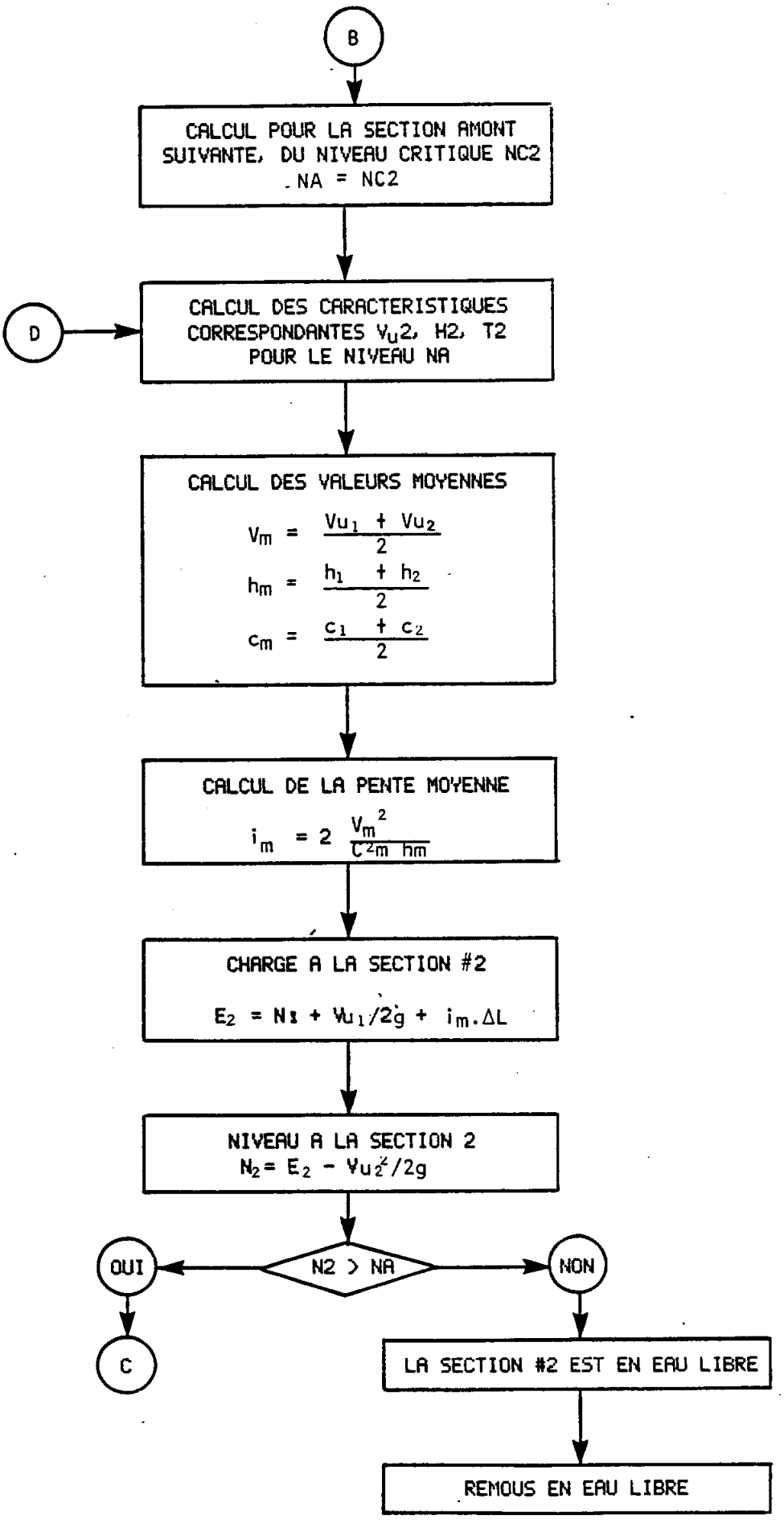
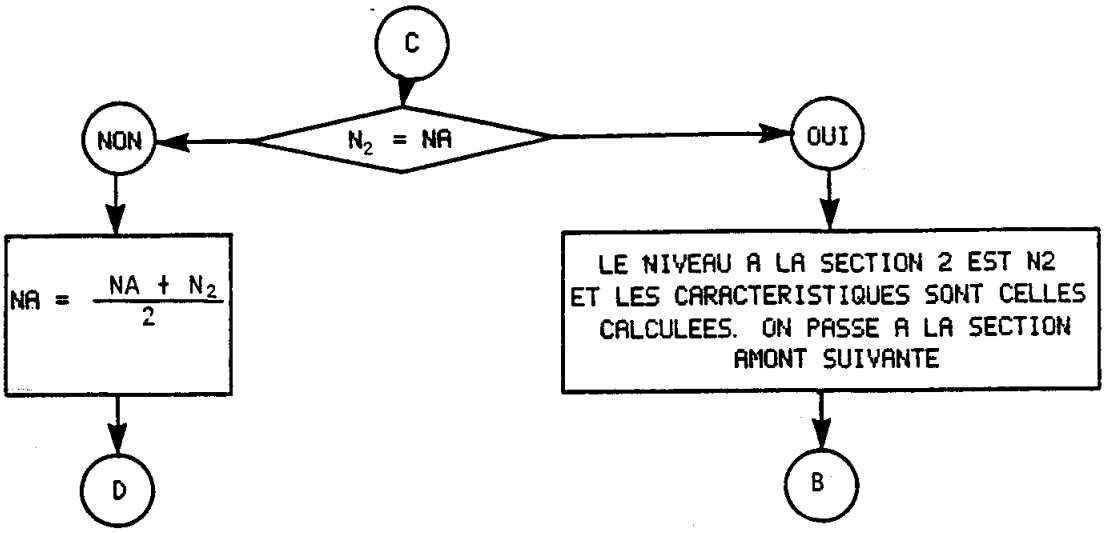
(1): $y = \dfrac{0{,}094\ (t/H)^2\ (1 - 0{,}92\ t/H)^3}{1 + 0{,}92\ t/H}$

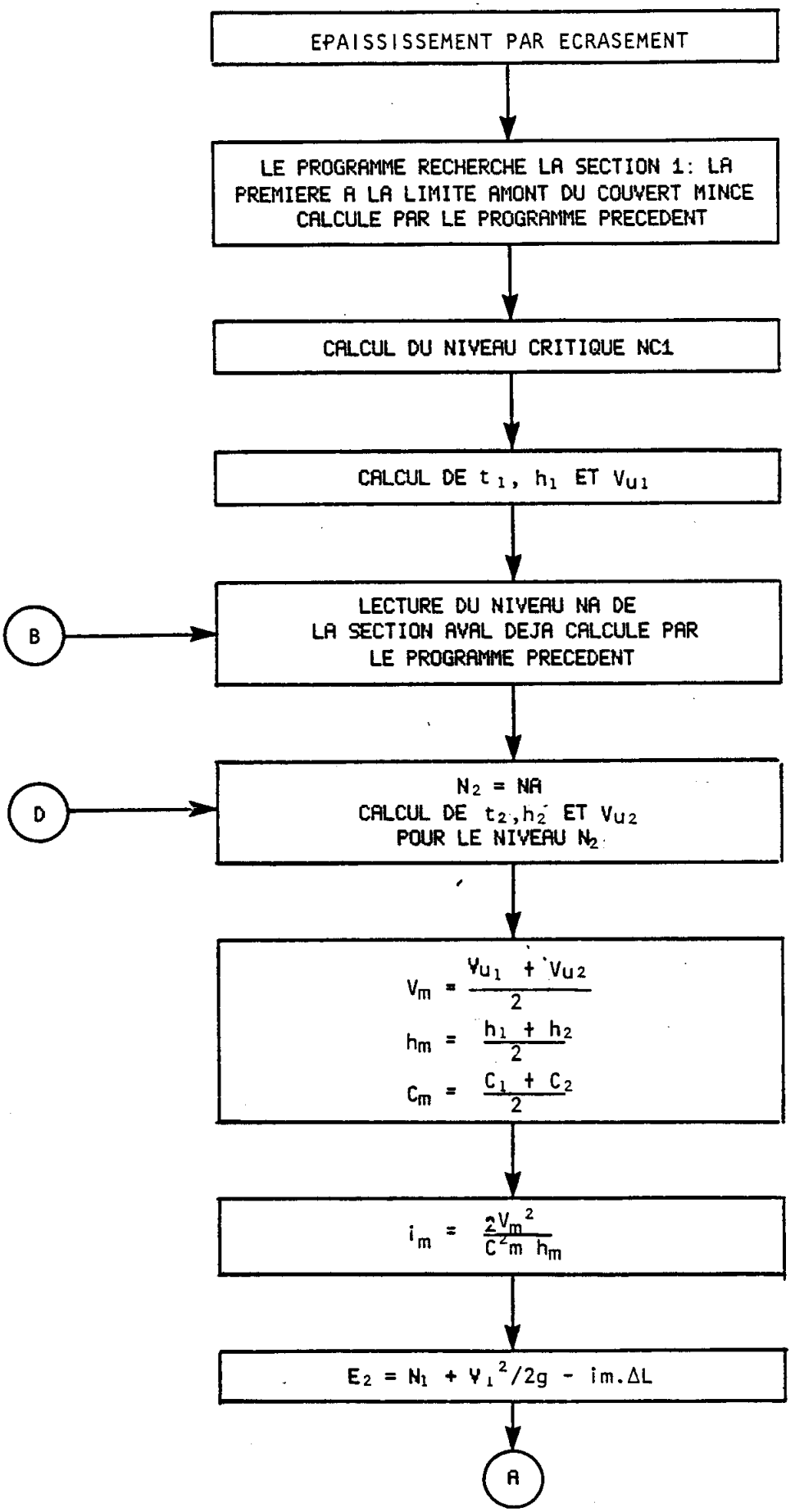
(2): $t = H(t/H)$

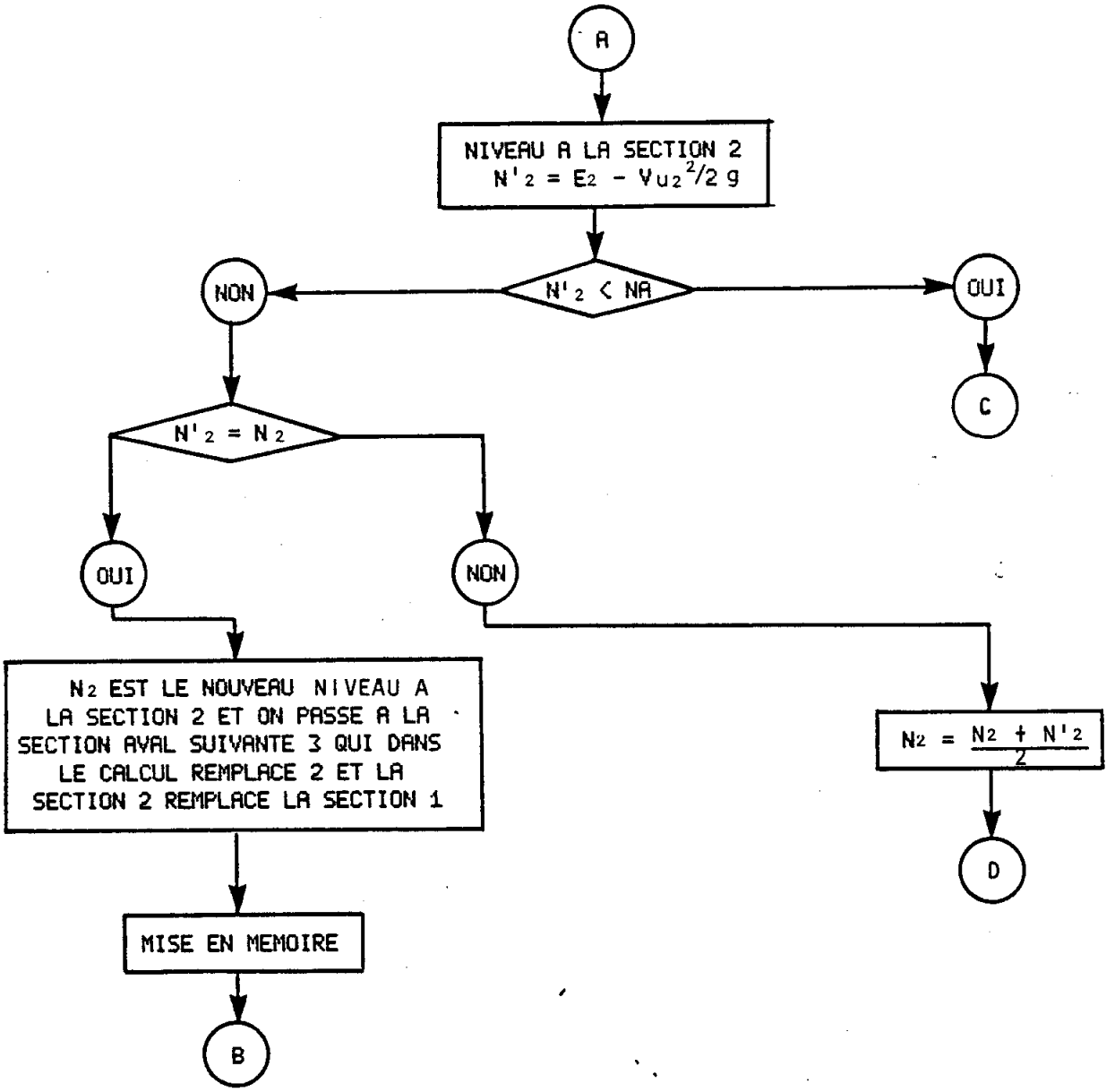
(3): $h = H - 0{,}92\ t$

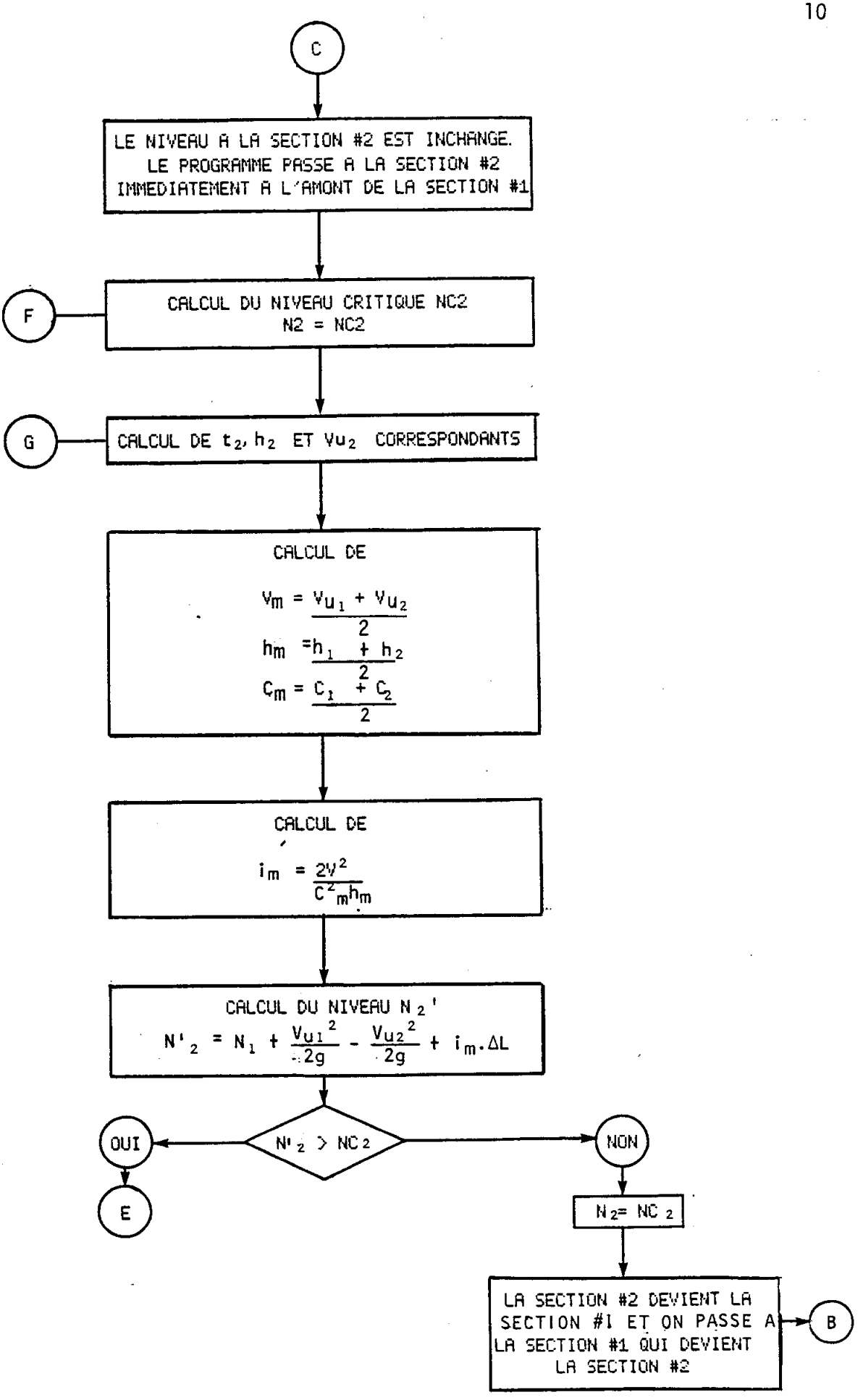
(4): $Vu = \dfrac{Q}{Bh}$

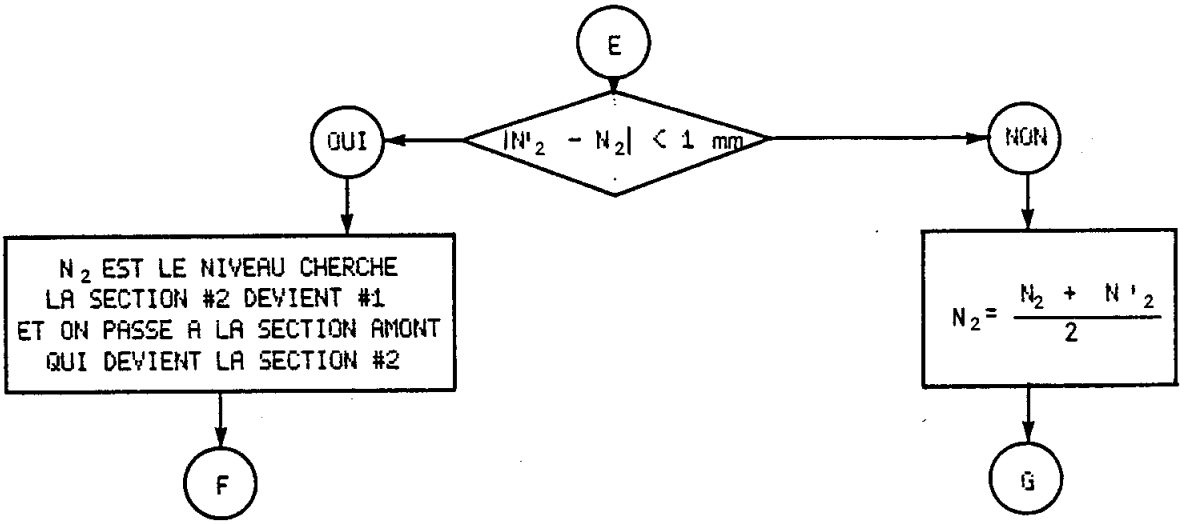

B
CALCUL POUR LA SECTION AMONT SUIVANTE, DU NIVEAU CRITIQUE NC2
. NA = NC2
D
CALCUL DES CARACTERISTIQUES CORRESPONDANTES Vu2, H2, T2 POUR LE NIVEAU NA
CALCUL DES VALEURS MOYENNES
Vm = (Vu1 + Vu2) / 2
hm = (h1 + h2) / 2
cm = (c1 + c2) / 2
CALCUL DE LA PENTE MOYENNE
im = 2 Vm² / C²m hm
CHARGE A LA SECTION #2
E2 = N1 + Vu1/2g + im.ΔL
NIVEAU A LA SECTION 2
N2 = E2 - Vu2²/2g
N2 > NA
OUI
NON
C
LA SECTION #2 EST EN EAU LIBRE
REMOUS EN EAU LIBRE

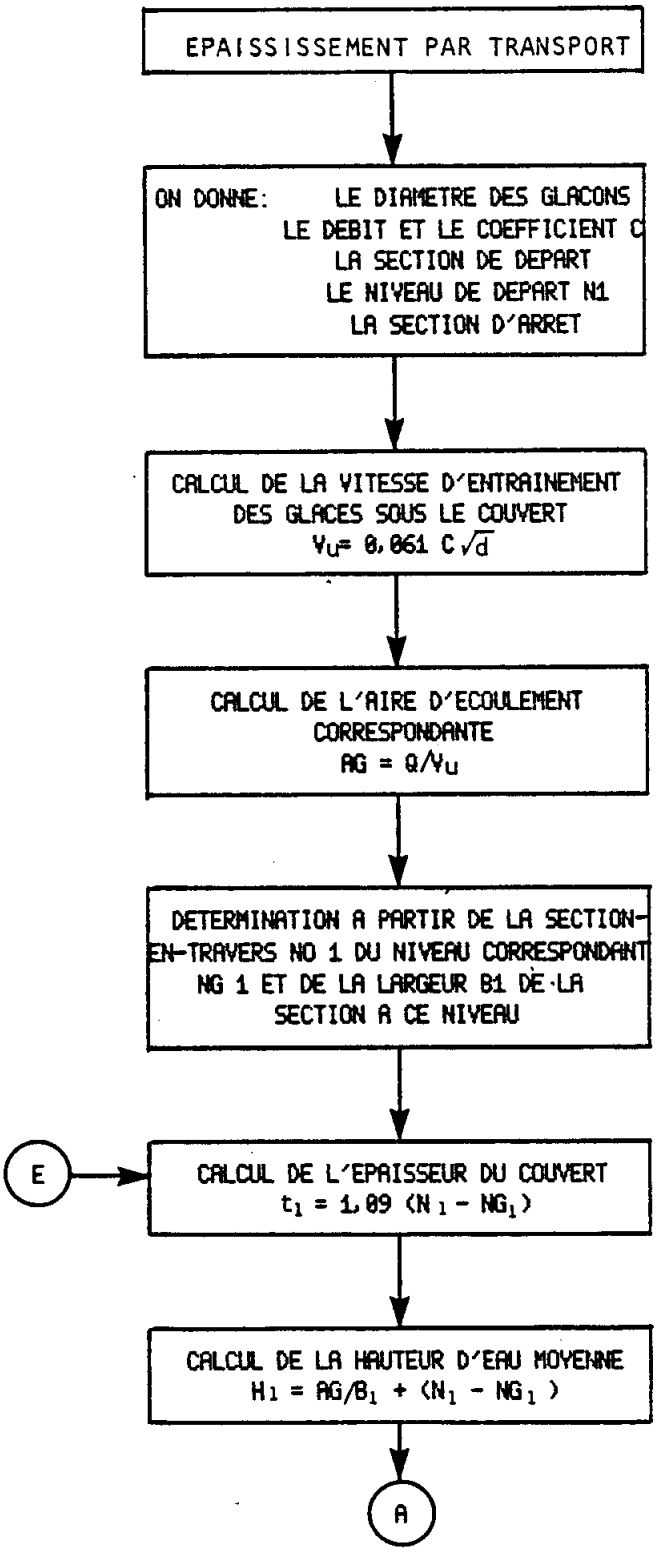

C
N_2 = NA
NON
OUI
NA = $\frac{NA + N_2}{2}$
LE NIVEAU A LA SECTION 2 EST N2 ET LES CARACTERISTIQUES SONT CELLES CALCULEES. ON PASSE A LA SECTION AMONT SUIVANTE
D
B

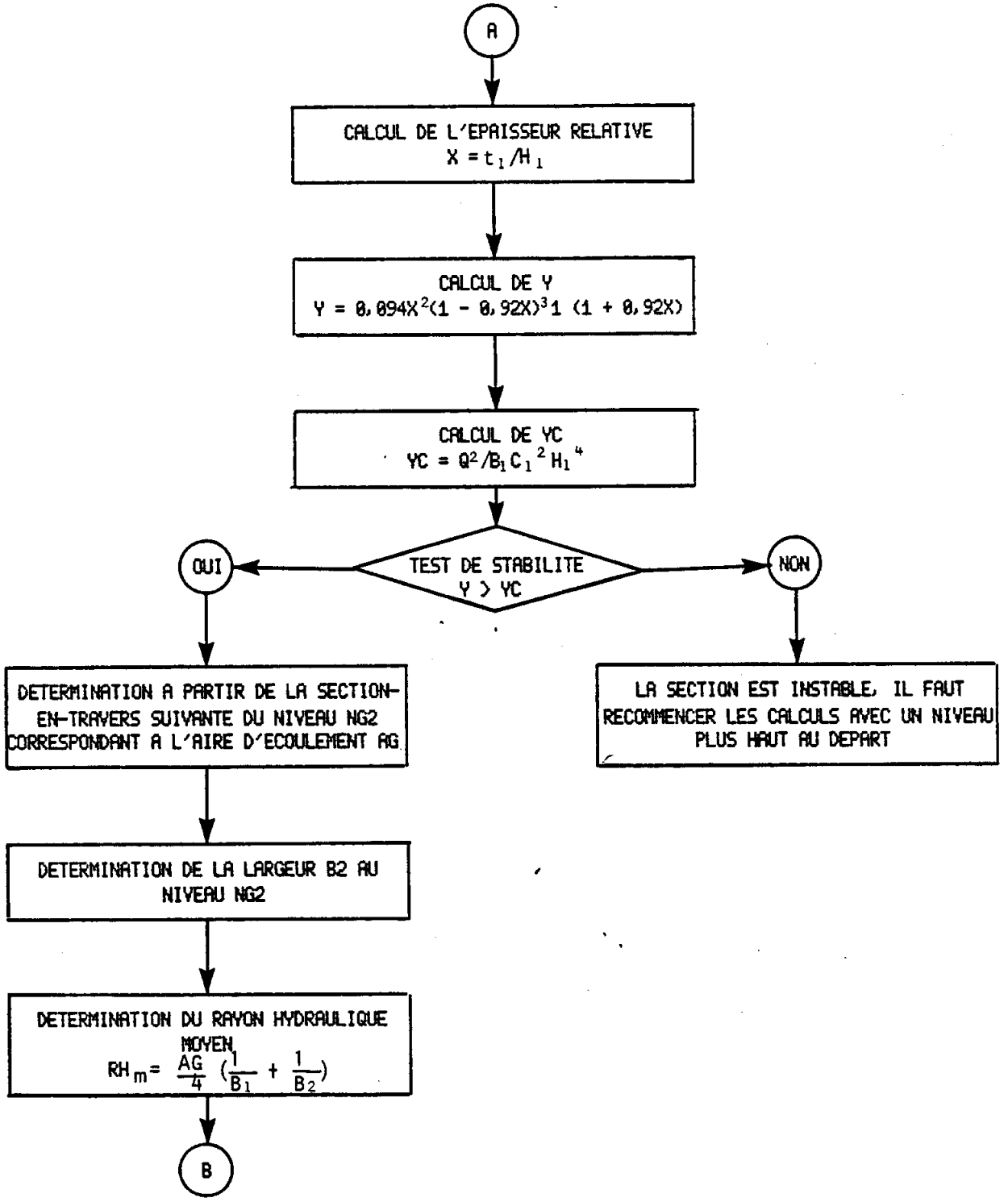

EPAISSISSEMENT PAR ECRASEMENT
LE PROGRAMME RECHERCHE LA SECTION 1: LA PREMIERE A LA LIMITE AMONT DU COUVERT MINCE CALCULE PAR LE PROGRAMME PRECEDENT
CALCUL DU NIVEAU CRITIQUE NC1
CALCUL DE t_1, h_1 ET V_{u1}
B
LECTURE DU NIVEAU NA DE LA SECTION AVAL DEJA CALCULE PAR LE PROGRAMME PRECEDENT
D
$N_2 = NA$
CALCUL DE t_2, h_2 ET V_{u2} POUR LE NIVEAU N_2
$V_m = \frac{V_{u1} + V_{u2}}{2}$
$h_m = \frac{h_1 + h_2}{2}$
$C_m = \frac{C_1 + C_2}{2}$
$i_m = \frac{2V_m^2}{C^2m\ h_m}$
$E_2 = N_1 + V_1^2/2g - im.\Delta L$
A

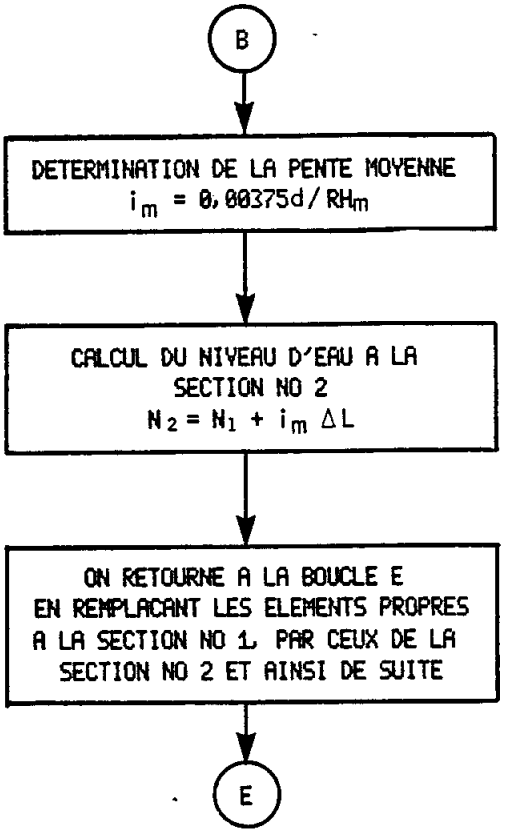

A
NIVEAU A LA SECTION 2
N'2 = E2 - Vu2²/2 g
N'2 < NA
NON
OUI
C
N'2 = N2
OUI
NON
N2 EST LE NOUVEAU NIVEAU A LA SECTION 2 ET ON PASSE A LA SECTION AVAL SUIVANTE 3 QUI DANS LE CALCUL REMPLACE 2 ET LA SECTION 2 REMPLACE LA SECTION 1
N2 = (N2 + N'2)/2
D
MISE EN MEMOIRE
B

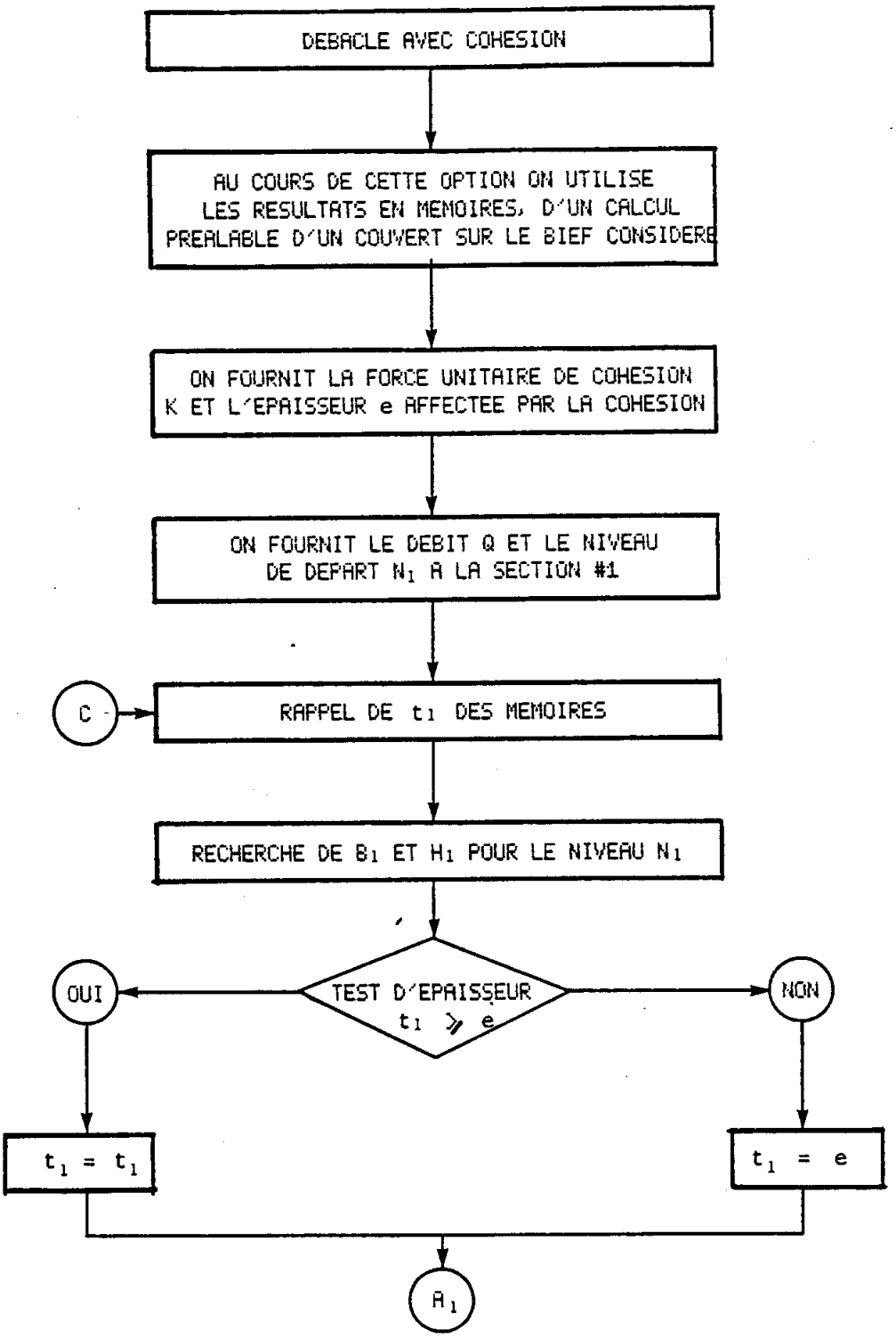

C
LE NIVEAU A LA SECTION #2 EST INCHANGE.
LE PROGRAMME PASSE A LA SECTION #2
IMMEDIATEMENT A L'AMONT DE LA SECTION #1
F
CALCUL DU NIVEAU CRITIQUE NC2
N2 = NC2
G
CALCUL DE t2, h2 ET Vu2 CORRESPONDANTS
CALCUL DE
Vm = (Vu1 + Vu2) / 2
hm = (h1 + h2) / 2
Cm = (C1 + C2) / 2
CALCUL DE
im = 2V² / (C²m hm)
CALCUL DU NIVEAU N'2
N'2 = N1 + Vu1²/2g - Vu2²/2g + im.ΔL
N'2 > NC2
OUI
NON
E
N2= NC2
LA SECTION #2 DEVIENT LA
SECTION #1 ET ON PASSE A
LA SECTION #1 QUI DEVIENT
LA SECTION #2
B

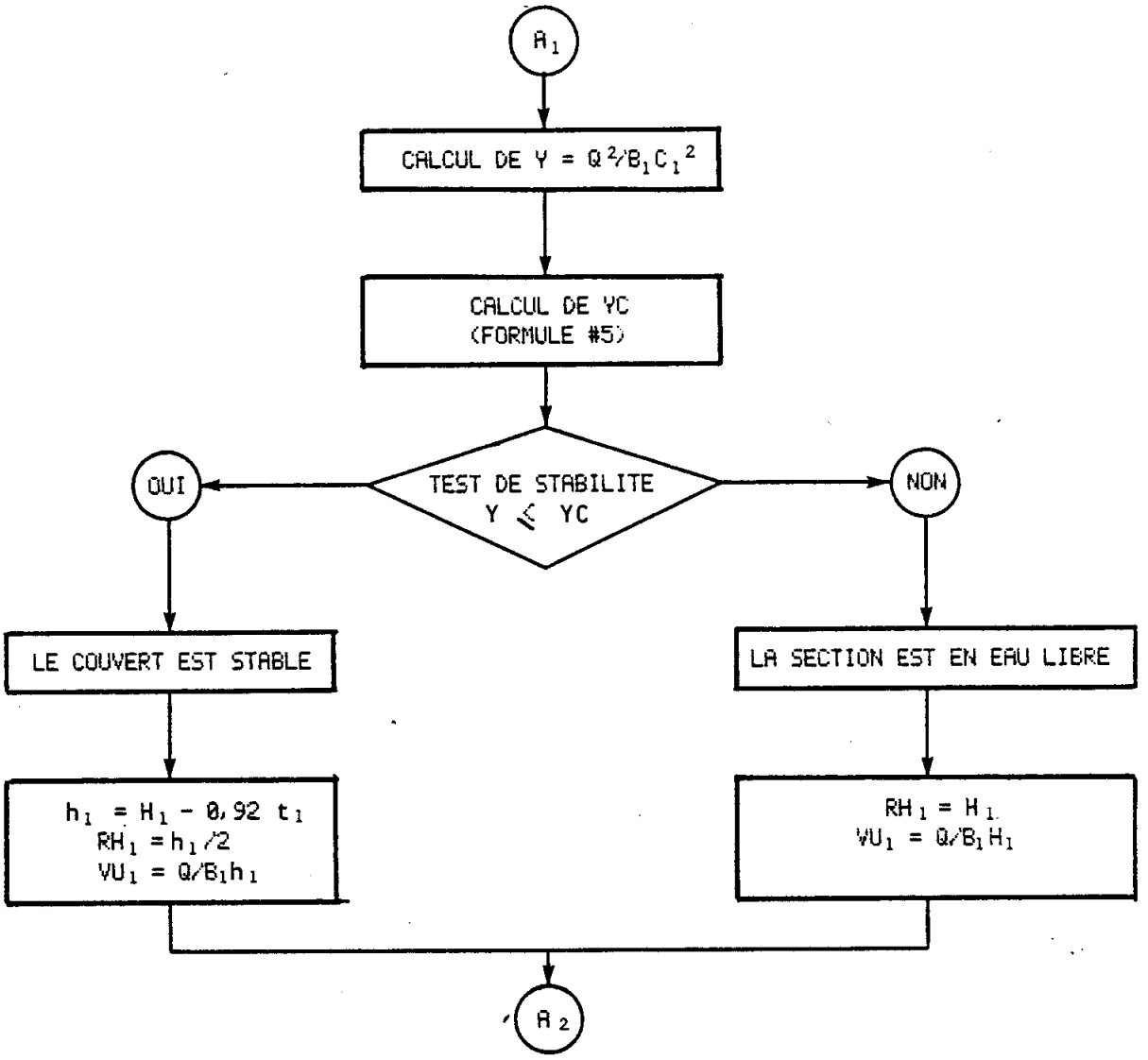

E
OUI
$|N'_2 - N_2| < 1$ mm
NON
N_2 EST LE NIVEAU CHERCHE
LA SECTION #2 DEVIENT #1
ET ON PASSE A LA SECTION AMONT
QUI DEVIENT LA SECTION #2
$N_2 = \frac{N_2 + N'_2}{2}$
F
G


EPAISSISSEMENT PAR TRANSPORT
ON DONNE: LE DIAMETRE DES GLACONS
LE DEBIT ET LE COEFFICIENT C
LA SECTION DE DEPART
LE NIVEAU DE DEPART N1
LA SECTION D'ARRET
CALCUL DE LA VITESSE D'ENTRAINEMENT DES GLACES SOUS LE COUVERT
$V_u = 0,061\ C\sqrt{d}$
CALCUL DE L'AIRE D'ECOULEMENT CORRESPONDANTE
$AG = Q/V_u$
DETERMINATION A PARTIR DE LA SECTION-EN-TRAVERS NO 1 DU NIVEAU CORRESPONDANT NG 1 ET DE LA LARGEUR B1 DE LA SECTION A CE NIVEAU
E
CALCUL DE L'EPAISSEUR DU COUVERT
$t_1 = 1,09\ (N_1 - NG_1)$
CALCUL DE LA HAUTEUR D'EAU MOYENNE
$H_1 = AG/B_1 + (N_1 - NG_1)$
A

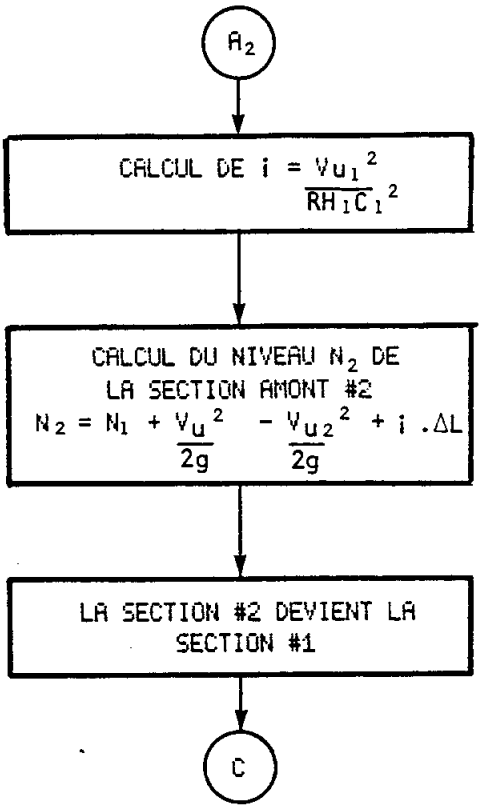

A
CALCUL DE L'EPAISSEUR RELATIVE
$X = t_1/H_1$
CALCUL DE Y
$Y = 0,094X^2(1 - 0,92X)^3 1 (1 + 0,92X)$
CALCUL DE YC
$YC = Q^2/B_1 C_1^2 H_1^4$
TEST DE STABILITE
Y > YC
OUI
NON
DETERMINATION A PARTIR DE LA SECTION-EN-TRAVERS SUIVANTE DU NIVEAU NG2 CORRESPONDANT A L'AIRE D'ECOULEMENT AG
LA SECTION EST INSTABLE, IL FAUT RECOMMENCER LES CALCULS AVEC UN NIVEAU PLUS HAUT AU DEPART
DETERMINATION DE LA LARGEUR B2 AU NIVEAU NG2
DETERMINATION DU RAYON HYDRAULIQUE MOYEN
$RH_m = \frac{AG}{4} (\frac{1}{B_1} + \frac{1}{B_2})$
B


B
DETERMINATION DE LA PENTE MOYENNE
$i_m = 0,00375d / RH_m$
CALCUL DU NIVEAU D'EAU A LA SECTION NO 2
$N_2 = N_1 + i_m \Delta L$
ON RETOURNE A LA BOUCLE E EN REMPLACANT LES ELEMENTS PROPRES A LA SECTION NO 1, PAR CEUX DE LA SECTION NO 2 ET AINSI DE SUITE
E


DEBACLE AVEC COHESION
AU COURS DE CETTE OPTION ON UTILISE LES RESULTATS EN MEMOIRES, D'UN CALCUL PREALABLE D'UN COUVERT SUR LE BIEF CONSIDERE
ON FOURNIT LA FORCE UNITAIRE DE COHESION K ET L'EPAISSEUR e AFFECTEE PAR LA COHESION
ON FOURNIT LE DEBIT Q ET LE NIVEAU DE DEPART N_1 A LA SECTION #1
C
RAPPEL DE t_1 DES MEMOIRES
RECHERCHE DE B_1 ET H_1 POUR LE NIVEAU N_1
OUI
TEST D'EPAISSEUR $t_1 \geqslant e$
NON
$t_1 = t_1$
$t_1 = e$
A_1



$$(5): \quad YC = \frac{\left[K.e.H_1^2 + 0.094\ H_1^4\ (t_1/H_1)^2 \right] (1 - 0.92\ t_1/H_1)^3}{1 + 0{,}92\ t/H}$$


A2
CALCUL DE i = Vu1² / RH1C1²
CALCUL DU NIVEAU N2 DE LA SECTION AMONT #2
N2 = N1 + Vu²/2g - Vu2²/2g + i .ΔL
LA SECTION #2 DEVIENT LA SECTION #1
C

APPENDIX V

RESULTS OF COMPUTER SIMULATIONS

(a) Explanation of Symbols
(b) Open Water Backwater Curves
(c) Ice Rupture Break-Up Profiles
(d) Ice Accummulation Cover Break-Up Profiles and Volumes
(e) Ice Accummulation Cover Break-Up Profiles and Volumes with Impermeable Cribs.

APPENDIX V

(a) Explanation of Symbols:

T(GLACE)	=	thickness of ice
Debit	=	flow
(MA)	=	Manning's roughness coefficient
(CH)	=	Chezy's roughness coefficient
T/H	=	ratio ice thickness/depth
NI EAU	=	water level
(D) GLACON	=	ice block size
AIRE	=	area
NCRI.FOR.	=	critical water level corresponding to top of stability curve
LARGEUR	=	width
ILI/TTH	=	slope
H.MOY	=	average depth
TALWEG	=	bottom elevation
VO	=	velocity - gross area
VU	=	velocity - net area, under ice
I	=	hydraulic gradient
DIST.AM	=	distance between sections
NI.EN	=	elevation - energy grade line
TO	=	shear stress (τ_o)
F	=	Froude Number

APPENDIX V

(b) OPEN WATER BACKWATER CURVES

Q = 0.21, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 and 60 m^3/s

RUSHOON BROOK OPEN WATER PROFILE Q=.21CMS

REF. : R.RUSHOON ICE; Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: .21 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	.007	.00000	.030	.002
2.000	1358.000	.030	71.683	127.486	.562	.003	.00000	.030	.001
3.000	1177.000	.030	20.194	99.081	.204	.010	.00077	.030	.007
4.000	1098.000	.087	.738	10.394	.071	.285	.00081	.091	.341
5.000	1058.000	.123	2.306	6.779	.340	.091	.00010	.123	.050
5.100	1038.000	.124	2.326	6.802	.342	.090	.00398	.126	.049
SECTION DE CONTROLE									
6.000	972.000	1.112	.293	5.752	.051	.716	.07368	1.138	1.000
SECTION DE CONTROLE									
7.000	881.000	2.814	.448	20.366	.022	.469	.07218	2.925	1.000
SECTION DE CONTROLE									
8.000	755.000	2.712	.298	5.851	.051	.784	.02089	2.737	1.000
9.000	666.000	4.593	.755	8.228	.092	.278	.02423	3.541	.293
SECTION DE CONTROLE									
10.000	351.000	6.395	.221	2.384	.092	.952	.00716	6.441	1.000
11.000	150.000	7.879	2.487	9.284	.268	.084	.00494	7.879	.052
SECTION DE CONTROLE									
12.000	.000	9.466	.294	5.760	.051	.715	.00000	9.492	1.000

RUSHOON BROOK OPEN WATER PROFILE ;Q=5CMS

REF. : R. RUSHOON EL. 0.5; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 5 (MA)(CH): .05									
1.000	1560.000	.030	38.588	15.400	1.981	.164	.00003	.031	.037
2.000	1358.000	.036	72.323	127.605	.567	.069	.00017	.035	.029
3.000	1177.000	.064	23.476	99.418	.236	.213	.00321	.065	.140
4.000	1038.000	.304	9.250	61.930	.149	.541	.00503	.322	.447
5.000	1038.000	.606	8.529	23.494	.363	.586	.01285	.623	.311
SECTION DE CONTROLE									
6.000	972.000	1.310	4.089	26.613	.154	1.223	.00478	1.386	1.000
7.000	861.000	1.818	20.162	31.044	.649	.248	.00258	2.722	.098
8.000	755.000	3.007	5.651	26.682	.212	.885	.00242	3.046	.613
9.000	666.000	3.259	22.975	35.123	.654	.218	.00502	4.354	.036
SECTION DE CONTROLE									
10.000	351.000	6.755	3.761	21.026	.179	1.330	.01369	6.845	1.000
11.000	150.000	9.578	8.264	22.585	.367	.665	.01339	8.238	.319
SECTION DE CONTROLE									
12.000	.000	9.683	3.877	22.725	.171	1.290	.00000	9.774	1.000

RUSHOON BROOK OPEN WATER PROFILE, Q=10CMS

REF. : R. RUSHOON EL. 8.5; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 10 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	.328	.00012	.035	.074
2.000	1358.000	.052	74.342	127.981	.581	.135	.00043	.052	.056
3.000	1177.000	.123	29.445	100.027	.294	.340	.00372	.129	.200
4.000	1093.000	.401	15.339	67.654	.227	.652	.00592	.422	.437
5.000	1033.000	.740	11.881	24.976	.472	.847	.01446	.777	.394
SECTION DE CONTROLE									
6.000	972.000	1.403	6.697	29.485	.227	1.493	.01157	1.517	1.000
7.000	881.000	2.547	14.963	29.625	.505	.668	.00519	2.571	.300
8.000	755.000	3.180	10.676	30.411	.351	.937	.00591	3.225	.505
9.000	666.000	3.726	14.197	31.640	.449	.704	.01370	4.114	.336
SECTION DE CONTROLE									
10.000	351.000	6.365	6.194	23.216	.267	1.614	.00650	6.998	1.000
11.000	150.000	8.293	22.523	28.843	.803	.444	.00616	8.778	.158
SECTION DE CONTROLE									
12.000	.000	9.789	6.572	27.929	.235	1.522	.00000	9.987	1.000

RUSHOON BROOK OPEN WATER PROFILE Q=13CMS

REF.: R RUSHOON EL 0.5; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR.	LARGEUR ILI/TTH	H MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	.492	.00026	.042	.112
2.000	1358.000	.078	77.669	128.519	.604	.193	.00064	.079	.073
3.000	1177.000	.185	35.598	100.651	.354	.421	.00387	.193	.226
4.000	1098.000	.471	20.231	69.726	.290	.741	.00661	.500	.439
5.000	1038.000	.841	14.327	26.063	.550	1.047	.01120	.896	.451
6.000	972.000	1.539	10.967	32.137	.341	1.368	.01079	1.636	.748
7.000	881.000	2.570	15.606	29.843	.523	.961	.00607	2.616	.424
8.000	755.000	3.333	15.421	31.643	.487	.973	.00832	3.382	.445
9.000	666.000	4.056	13.128	31.179	.421	1.143	.02075	4.121	.562
SECTION DE CONTROLE									
10.000	351.000	6.951	8.250	24.567	.336	1.818	.00842	7.120	1.000
11.000	158.000	8.790	23.103	28.137	.821	.649	.00812	8.810	.229
SECTION DE CONTROLE									
12.000	.000	9.863	8.651	28.258	.306	1.734	.00000	10.016	1.000

RUSHDON BROOK OPEN WATER PROFILE; Q=20CMS

REF. : R. RUSHDON EL. 0. S; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AR.	NI. EN TO	F
DEBIT: 20 (MA)(CH): .05									
1.000	1500.000	.030	30.588	15.400	1.981	.656	.00044	.052	.149
2.000	1358.000	.112	82.113	129.096	.636	.244	.00079	.114	.098
3.000	1177.000	.245	41.736	102.096	.406	.479	.00393	.256	.240
4.000	1098.000	.533	24.532	71.498	.343	.815	.00717	.566	.444
5.000	1038.000	.922	16.516	26.969	.612	1.211	.01120	.997	.494
6.000	972.000	1.630	13.876	33.318	.416	1.441	.01070	1.735	.713
7.000	881.000	2.645	17.925	38.535	.587	1.116	.00629	2.710	.465
8.000	755.000	3.446	19.015	32.546	.584	1.052	.00088	3.582	.439
9.000	666.000	4.139	15.756	32.285	.488	1.269	.02027	4.220	.580
SECTION DE CONTROLE									
10.000	351.000	7.027	10.158	25.663	.396	1.969	.00856	7.225	1.000
11.000	150.000	8.916	26.738	28.716	.931	.748	.00835	8.945	.247
SECTION DE CONTROLE									
12.000	.000	9.929	10.526	28.550	.369	1.900	.00000	10.113	1.000

RUSHOON BROOK OPEN WATER PROFILE; Q=25CMS

REF.: R RUSHOON EL 0.5; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 25 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	.819	.00066	.864	.186
2.000	1358.000	.153	87.438	129.581	.675	.286	.00089	.157	.111
3.000	1177.000	.304	47.823	105.620	.453	.523	.00392	.317	.248
4.000	1098.000	.587	28.533	73.108	.390	.876	.00763	.627	.448
5.000	1038.000	.991	18.398	27.553	.668	1.359	.01122	1.085	.531
6.000	972.000	1.711	16.675	34.416	.485	1.499	.01061	1.826	.688
7.000	881.000	2.712	19.991	31.006	.645	1.251	.00649	2.793	.497
8.000	755.000	3.546	22.322	33.354	.669	1.120	.00787	3.610	.437
9.000	666.000	4.215	18.262	33.298	.548	1.369	.01983	4.310	.590
SECTION DE CONTROLE									
10.000	351.000	7.895	11.937	26.643	.448	2.094	.00868	7.319	1.000
11.000	150.000	9.029	29.993	29.225	1.026	.834	.00654	9.065	.263
SECTION DE CONTROLE									
12.000	.000	9.989	12.247	28.817	.425	2.041	.00000	10.281	1.000

RUSHOON BROOK OPEN WATER PROFILE; Q=10CMS

REF. : R. RUSHOON EL. 0.5; Q=5

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 30 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	.983	.00089	.079	.223
2.000	1358.000	.200	93.545	130.136	.719	.321	.00094	.205	.121
3.000	1177.000	.360	53.952	100.293	.498	.556	.00388	.376	.252
4.000	1098.000	.638	32.275	74.582	.433	.929	.00804	.682	.451
5.000	1038.000	1.051	20.057	27.879	.719	1.496	.01130	1.165	.563
6.000	972.000	1.788	19.365	35.595	.544	1.549	.01055	1.911	.671
7.000	881.000	2.776	21.937	31.443	.698	1.368	.00664	2.871	.523
8.000	755.000	3.637	25.407	34.092	.745	1.181	.00770	3.788	.437
9.000	666.000	4.286	20.635	34.252	.604	1.450	.01942	4.393	.595
SECTION DE CONTROLE									
10.000	351.000	7.157	13.616	27.540	.494	2.203	.00000	7.404	1.000
11.000	150.000	9.131	32.960	29.685	1.111	.910	.00743	9.173	.276
12.000	.000	10.091	15.276	30.293	.504	1.964	.00000	10.288	.883

RUSHOON BROOK OPEN WATER PROFILE ;Q=40CMS
S

REF.: R.RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 40 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	1.311	.00140	.118	.297
2.000	1358.000	.389	107.776	131.463	.820	.371	.00097	.315	.131
3.000	1177.000	.472	66.381	114.335	.581	.683	.00372	.491	.252
4.000	1098.000	.732	39.461	77.335	.510	1.014	.01162	.735	.453
5.000	1058.000	1.042	19.802	27.829	.712	2.020	.00993	1.250	.765
5.100	1038.000	1.349	28.624	29.504	.970	1.397	.00039	1.449	.453
6.000	972.000	1.888	22.997	37.455	.614	1.739	.01123	2.042	.709
7.000	881.000	2.970	29.379	43.393	.677	1.362	.00649	3.065	.528
8.000	755.000	3.799	31.021	35.393	.876	1.289	.00745	3.884	.448
9.000	666.000	4.420	25.375	36.016	.705	1.576	.01865	4.546	.680
SECTION DE CONTROLE									
10.000	351.000	7.270	16.825	29.255	.575	2.377	.00839	7.558	1.000
11.000	150.000	9.309	38.316	38.489	1.257	1.044	.00719	9.363	.297
12.000	.000	10.228	19.519	32.401	.602	2.049	.00000	10.441	.843

RUSHOON BROOK OPEN WATER PROFILE ;Q=50CMS
5

REF. : R RUSHOON ICE Q=30CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H MOY TALWEG	VO VU	I DIST. AM	NI. EN TO	F
DEBIT: 50 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	1.639	.00194	.167	.372
2.000	1358.000	.434	124.252	133.025	.934	.402	.00092	.441	.133
3.000	1177.000	.587	80.098	123.915	.646	.624	.00350	.668	.248
4.000	1098.000	.826	46.741	80.435	.581	1.070	.01246	.864	.448
5.000	1056.000	1.115	21.821	28.222	.773	2.291	.01101	1.381	.832
5.100	1038.000	1.462	32.598	38.229	1.078	1.534	.00871	1.683	.472
6.000	972.000	2.014	27.868	39.814	.700	1.794	.01104	2.178	.685
7.000	881.000	3.074	34.070	47.900	.711	1.468	.00710	3.184	.556
8.000	755.000	4.000	49.374	52.391	.771	1.238	.00711	4.077	.450
9.000	666.000	4.581	31.372	38.000	.824	1.594	.01682	4.711	.561
SECTION DE CONTROLE									
10.000	351.000	7.372	19.889	30.822	.645	2.514	.00913	7.694	1.000
11.000	150.000	9.460	43.821	31.180	1.380	1.162	.00700	9.529	.316
12.000	.000	10.354	23.727	34.422	.689	2.187	.00000	10.579	.810

RUSHOON BROOK OPEN WATER PROFILE ;Q=60CMS
S

REF. : R. RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYE. FOR.	LARGEUR ILLI/TTHL	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 60 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	1.967	.00249	.227	.446
2.000	1358.000	.571	142.671	134.750	1.059	.421	.00081	.579	.130
3.000	1177.000	.706	95.563	131.147	.729	.628	.00317	.727	.235
4.000	1038.000	.914	53.961	83.233	.648	1.112	.01324	.977	.441
5.000	1858.000	1.175	23.552	28.553	.825	2.548	.01198	1.586	.896
5.100	1838.000	1.607	36.433	38.911	1.179	1.647	.00846	1.746	.484
6.000	972.000	2.135	32.825	42.826	.766	1.828	.01092	2.385	.667
7.000	881.000	3.162	39.687	55.920	.708	1.515	.00717	3.299	.575
8.000	755.000	4.119	46.897	56.394	.832	1.279	.00704	4.203	.448
9.000	666.000	4.662	35.294	39.822	.984	1.708	.01668	4.838	.571
SECTION DE CONTROLE									
10.000	351.000	7.464	22.789	32.235	.707	2.633	.00927	7.817	1.000
11.000	158.000	9.598	47.344	31.882	1.489	1.267	.00685	9.688	.332
12.000	.000	10.472	27.954	36.573	.764	2.146	.00000	10.787	.784

RUSHOON BROOK OPEN WATER PROFILE Q=10CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 10 (MA)(CH): .05									
1.000	1500.000	1.100	46.986	15.400	3.051	.213	.00002	1.102	.039
2.000	1358.000	1.105	215.583	137.883	1.564	.046	.00001	1.104	.012
3.000	1177.000	1.105	148.612	134.856	1.102	.067	.00003	1.106	.020
4.000	1098.000	1.107	70.563	89.101	.792	.142	.00033	1.107	.051
5.000	1058.000	1.110	21.690	28.196	.769	.461	.00078	1.129	.168
5.100	1038.000	1.125	22.164	28.288	.784	.451	.00576	1.136	.163
SECTION DE CONTROLE									
6.000	972.000	1.413	7.007	29.007	.235	1.427	.01136	1.517	.940
7.000	881.000	2.526	14.348	29.416	.488	.697	.00537	2.552	.319
8.000	755.000	3.185	10.852	30.456	.356	.922	.00579	3.230	.493
9.000	666.000	3.719	14.144	31.617	.447	.707	.01376	4.113	.337
SECTION DE CONTROLE									
10.000	351.000	6.865	6.194	23.216	.267	1.614	.00650	6.998	1.000
11.000	158.000	8.293	22.523	28.043	.803	.444	.00616	8.778	.158
SECTION DE CONTROLE									
12.000	.000	9.789	6.572	27.929	.235	1.522	.00000	9.987	1.000

RUSHDON BROOK OPEN WATER PROFILE; Q=20CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MCRI. FOR.	LARGEUR ILLI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 20 (MA)(CH): .05									
1.000	1500.000	1.100	46.986	15.400	3.051	.426	.00007	1.109	.078
2.000	1358.000	1.119	217.565	137.924	1.577	.092	.00002	1.119	.023
3.000	1177.000	1.122	150.896	135.014	1.118	.133	.00007	1.124	.040
4.000	1098.000	1.127	99.217	96.996	1.023	.202	.00053	1.128	.064
5.000	1058.000	1.130	32.990	49.538	.666	.606	.00152	1.149	.237
5.100	1038.000	1.163	34.547	49.692	.695	.579	.00308	1.179	.222
SECTION DE CONTROLE									
6.000	972.000	1.560	11.591	32.394	.358	1.725	.01173	1.711	.921
7.000	881.000	2.731	20.550	31.132	.660	.973	.00553	2.730	.382
8.000	755.000	3.414	13.006	32.295	.558	1.111	.00843	3.477	.475
9.000	666.000	4.150	16.166	32.453	.498	1.237	.01957	4.228	.560
SECTION DE CONTROLE									
10.000	351.000	7.627	18.158	25.663	.396	1.969	.01042	7.225	1.000
10.100	308.000	7.737	32.934	52.815	.633	.607	.00539	7.757	.244
11.000	150.000	8.464	14.204	26.267	.541	1.408	.02046	8.564	.611
SECTION DE CONTROLE									
12.000	.000	9.929	10.526	28.550	.369	1.900	.00000	10.113	1.000

RUSHOON BROOK OPEN WATER PROFILE; Q=30CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOUI. FOR.	LARGEUR ILLI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 30 (MA)(CH): .85									
1.000	1500.000	1.100	46.986	15.400	3.051	.638	.00016	1.121	.117
2.000	1358.000	1.143	220.827	137.998	1.600	.136	.00005	1.143	.034
3.000	1177.000	1.150	154.621	135.272	1.143	.194	.00013	1.152	.058
4.000	1058.000	1.158	102.313	97.774	1.046	.293	.00103	1.162	.092
5.000	1058.000	1.166	34.771	49.714	.699	.863	.00273	1.204	.329
5.100	1038.000	1.227	37.737	58.606	.755	.795	.00927	1.258	.292
SECTION DE CONTROLE									
6.000	972.000	1.683	15.661	34.023	.460	1.916	.01243	1.869	.901
7.000	881.000	2.943	28.169	42.387	.665	1.065	.00550	3.000	.417
8.000	755.000	3.619	24.766	33.940	.730	1.211	.00791	3.693	.453
9.000	666.000	4.291	20.847	34.310	.608	1.439	.01923	4.396	.589
SECTION DE CONTROLE									
10.000	351.000	7.157	13.616	27.540	.494	2.203	.01050	7.404	1.000
10.100	300.000	7.915	42.666	58.829	.735	.703	.00548	7.940	.262
11.000	150.000	8.633	18.778	27.432	.685	1.598	.00705	8.763	.617
12.000	.000	9.765	28.679	36.929	.777	1.046	.00000	10.548	.379

RUSHOON BROOK OPEN WATER PROFILE; Q=40CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 40 (MA)(CH): .85									
1.000	1500.000	1.100	46.936	15.400	3.051	.851	.00028	1.137	.156
2.000	1358.000	1.176	225.353	138.083	1.632	.177	.00007	1.177	.044
3.000	1177.000	1.187	159.677	135.621	1.177	.251	.00021	1.191	.074
4.000	1058.000	1.200	106.420	98.797	1.077	.376	.00156	1.207	.116
5.000	1058.000	1.209	36.946	49.928	.740	1.083	.00330	1.278	.402
5.100	1038.000	1.298	41.461	58.364	.822	.966	.00999	1.347	.348
6.000	972.000	1.767	19.334	35.579	.543	2.069	.01259	2.006	.896
7.000	881.000	3.084	34.495	48.384	.713	1.160	.00564	3.151	.438
8.000	755.000	3.772	38.886	35.188	.855	1.330	.00772	3.862	.459
9.000	666.000	4.424	25.525	36.071	.708	1.567	.01851	4.549	.595
SECTION DE CONTROLE									
10.000	351.000	7.270	16.825	29.255	.575	2.377	.01048	7.558	1.000
10.100	300.000	8.062	51.685	63.848	.818	.775	.00560	8.093	.274
11.000	158.000	8.775	22.688	28.878	.808	1.763	.01063	8.933	.626
12.000	.000	10.400	25.411	35.294	.720	1.574	.00000	10.528	.592

RUSHOON BROOK OPEN WATER PROFILE/Q=50CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 50 (MA)(CH): .85									
1.000	1500.000	1.100	46.986	15.400	3.051	1.064	.00043	1.158	.195
2.000	1358.000	1.217	231.019	139.198	1.672	.216	.00011	1.218	.052
3.000	1177.000	1.233	165.955	136.052	1.220	.301	.00030	1.238	.087
4.000	1098.000	1.251	111.545	101.236	1.102	.448	.00204	1.261	.136
5.000	1058.000	1.261	39.550	50.184	.788	1.264	.00463	1.344	.455
5.100	1038.000	1.374	45.219	50.735	.891	1.106	.01048	1.437	.374
SECTION DE CONTROLE									
6.000	972.000	1.882	22.729	37.321	.609	2.200	.01299	2.128	.900
7.000	881.000	3.241	43.070	62.291	.691	1.161	.00593	3.309	.446
8.000	755.000	3.973	39.026	51.584	.757	1.281	.00736	4.057	.470
9.000	666.000	4.584	31.519	38.127	.827	1.586	.01672	4.713	.557
SECTION DE CONTROLE									
10.000	351.000	7.372	19.889	30.822	.645	2.514	.01041	7.694	1.000
10.100	300.000	8.190	59.947	67.397	.889	.834	.00572	8.226	.282
11.000	150.000	8.898	26.195	28.631	.915	1.909	.01056	9.084	.637
12.000	.000	10.525	29.942	37.542	.799	1.670	.00000	10.665	.597

RUSHOON BROOK OPEN WATER PROFILE Q=68CMS
SPRING TIDE LEVEL 1.1M

REF. :

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOUI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 68 (MA)(CH): .05									
1.000	1500.000	1.100	46.986	15.400	3.051	1.277	.00061	1.183	.233
2.000	1358.000	1.266	237.382	138.338	1.720	.252	.00013	1.269	.061
3.000	1177.000	1.287	173.323	136.357	1.269	.346	.00037	1.294	.098
4.000	1098.000	1.318	117.566	104.300	1.121	.518	.00246	1.323	.154
5.000	1058.000	1.319	42.442	50.466	.841	-1.414	.00523	1.422	.492
5.100	1038.000	1.450	49.092	51.108	.961	1.222	.01078	1.527	.336
SECTION DE CONTROLE									
6.000	972.000	1.965	25.947	38.301	.667	2.312	.01238	2.238	.904
7.000	831.000	3.347	50.216	69.774	.720	1.195	.00596	3.428	.458
8.000	735.000	4.078	44.565	54.917	.811	1.346	.00744	4.178	.477
9.000	666.000	4.686	35.410	39.038	.907	1.694	.01652	4.832	.568
SECTION DE CONTROLE									
10.000	351.000	7.464	22.789	32.235	.707	2.633	.01036	7.817	1.000
10.100	300.000	8.386	67.960	71.324	.953	.983	.00583	8.346	.269
11.000	150.000	9.009	29.404	29.134	1.009	2.041	.01049	9.221	.648
12.000	.000	10.648	34.394	39.620	.868	1.744	.00000	10.736	.598

APPENDIX V

(c) ICE RUPTURE BREAK-UP PROFILES

Q = 10, 15, 20, 30, 40, 45 and 50m^3/s

RUSHOON BROOK BREAK-UP PROFILE Q=5CMS

REF. : R.RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTHL	H. MOY TALWEG	VO VU	I DIST. AML	NI. EN TO	F	
DEBIT: 5 (MA)(CH): 35										
1.000	1500.000	.438	36.668	15.400	2.381	.136	.00002	.431	.028	
.400	.168	.006	-1.241	.40000	-2.660	.161	142.000	243.000		
2.000	1358.000	.433	123.371	128.294	.962	.041	.00001	.433	.013	
.400	.416	.001	-.873	.40000	-.878	.066	181.000	243.000		
3.000	1177.000	.435	68.461	99.459	.688	.083	.00038	.437	.034	
.400	.658	.010	.358	.40000	-.718	.289	79.000	243.000		
DEBIT: 5 (MA)(CH): .05										
ILOT										
4.000	1098.000	.459	19.339	69.353	.279	.259	.00093	.462	.156	**
.000	.000	.000	.663	.40000	-.010	.000	40.000	243.000		
DEBIT: 5 (MA)(CH): 35										
5.000	1058.000	.496	4.855	6.823	.712	1.038	.02162	.728	.359	
.400	.562	.958	1.087	.40000	-.518	2.133	20.000	243.000		
5.100	1038.000	.928	15.936	22.996	.693	.314	.00225	.951	.120	
.400	.577	.897	1.087	.40000	-.518	.669	66.000	243.000		
DEBIT: 5 (MA)(CH): .05										
SECTION DE CONTROLE										
6.000	972.000	1.318	4.089	26.613	.154	1.223	.04613	1.386	.996	**
.000	.000	.000	1.983	.00038	1.818	.000	91.000	.000		
SECTION DE CONTROLE										
7.000	881.000	2.158	4.049	26.118	.155	1.235	.04648	2.236	1.001	**
.000	.000	.000	2.743	.00048	1.978	.000	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	2.940	3.957	24.516	.161	1.264	.04622	3.021	1.004	**
.000	.000	.000	3.538	.00045	2.618	.000	89.000	.000		
SECTION DE CONTROLE										
9.000	666.000	3.736	3.978	24.764	.161	1.257	.04602	3.817	1.001	**
.000	.000	.000	4.336	.00042	3.360	.000	315.000	.000		

RUSHOON BROOK BREAK-UP PROFILE Q=10CMS

REF. : R.RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE NCRI.FOR.	LARGEUR ILI/TTH.	H.MOY TALWEG	VO VU	I DIST.PAL	NI.EN TO	F	
DEBIT: 10 (MA)(CH): 35										
1.000	1500.000	.430	36.663	15.400	2.381	.273	.00000	.435	.056	
.400	.168	.023	-.794	.40000	-2.600	.323	142.000	243.000		
2.000	1358.000	.442	124.588	128.466	.970	.000	.00005	.443	.026	
.400	.412	.004	.153	.40000	-.870	.129	181.000	243.000		
3.000	1177.000	.458	62.036	99.612	.623	.161	.00099	.458	.065	
.400	.642	.034	.582	.40000	-.710	.394	79.000	243.000		
DEBIT: 10 (MA)(CH): .05										
ILOT										
4.000	1098.000	.529	24.273	71.392	.340	.412	.00181	.537	.226	**
.000	.000	.000	.873	.40000	-.010	.000	40.000	243.000		
5.000	1058.000	.601	8.425	23.446	.359	1.187	.01435	.673	.632	**
.000	.000	.000	1.340	.40000	-.510	.000	20.000	243.000		
DEBIT: 10 (MA)(CH): 35										
5.100	1038.000	.838	14.865	22.557	.659	.673	.01382	1.007	.265	
.400	.607	.585	1.340	.40000	-.510	1.524	66.000	243.000		
DEBIT: 10 (MA)(CH): .05										
6.000	972.000	1.748	17.925	34.896	.514	.558	.00197	1.764	.249	**
.000	.000	.000	2.224	.40000	1.010	.000	91.000	243.000		
SECTION DE CONTROLE										
7.000	831.000	2.251	6.532	27.287	.239	1.531	.04035	2.370	.999	**
.000	.000	.000	3.184	.00033	1.970	.000	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	3.039	6.538	27.572	.237	1.530	.04076	3.158	1.003	**
.000	.000	.000	3.848	.00045	2.610	.000	89.000	.000		
SECTION DE CONTROLE										
9.000	666.000	3.833	6.580	27.834	.236	1.520	.04041	3.951	.998	**
.000	.000	.000	4.651	.00052	3.360	.000	315.000	.000		

RUSHOON BROOK BREAK-UP PROFILE Q=15CMS

REF. : R.RUSHOON ICE/Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 15 (MA)(CH): 35										
1.000	1500.000	.430	36.668	15.480	2.381	.409	.00019	.442	.085	
.400	.163	.051	-.511	.40000	-2.600	.434	142.000	243.000		
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038	
.400	.407	.008	.316	.40000	-.870	.139	181.000	243.000		
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092	
.400	.619	.064	.765	.40000	-.710	.548	79.000	243.000		
DEBIT: 15 (MA)(CH): .85										
ILOT										
4.000	1038.000	.609	30.128	73.740	.409	.498	.00207	.622	.249	**
.000	.000	.000	1.035	.40000	-.010	.000	48.000	243.000		
5.000	1058.000	.692	18.609	24.447	.434	1.414	.01593	.794	.685	**
.000	.000	.000	1.582	.40000	-.510	.000	20.000	243.000		
DEBIT: 15 (MA)(CH): 35										
5.100	1038.000	1.011	18.214	23.986	.762	.824	.01052	1.140	.301	
.400	.525	.552	1.582	.40000	-.510	1.593	66.000	243.000		
DEBIT: 15 (MA)(CH): .85										
6.000	972.000	1.785	16.444	34.327	.479	.912	.00576	1.748	.421	**
.000	.000	.000	2.896	.40000	1.010	.000	91.000	243.000		
SECTION DE CONTROLE										
7.000	881.000	2.326	8.605	27.896	.308	1.743	.03753	2.481	1.002	**
.000	.000	.000	3.599	.00025	1.970	.000	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	3.118	8.794	29.537	.298	1.706	.03758	3.266	.998	**
.000	.000	.000	4.270	.00036	2.610	.000	89.000	.000		
SECTION DE CONTROLE										
9.000	666.000	3.969	8.738	28.968	.302	1.717	.03744	4.059	.998	**
.000	.000	.000	4.892	.00061	3.360	.000	315.000	.000		

RUSHOON BROOK BREAK-UP PROFILE Q=20CMS

REF. : R.RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE NORI.FOR.	LARGEUR ILI/TTH.	H.MOY TALWEG	VO VU	I DIST.AM.	NI.EN TO	F	
DEBIT: 20 (MA)(CH): 35										
1.000	1500.000	.430	36.663	15.400	2.381	.545	.00034	.451	.113	
.400	.163	.091	-.288	.40000	-2.600	.645	142.000	243.000		
2.000	1358.000	.478	129.445	129.681	1.003	.155	.00015	.481	.049	
.400	.399	.013	.452	.40000	-.870	.244	181.000	243.000		
3.000	1177.000	.506	67.785	100.177	.677	.295	.00221	.527	.115	
.400	.591	.091	.928	.40000	-.710	.647	79.000	243.000		
DEBIT: 20 (MA)(CH): .05										
ILOT										
4.000	1098.000	.681	35.438	75.806	.467	.564	.00223	.697	.264	**
.000	.000	.000	1.176	.40000	-.010	.000	48.000	243.000		
5.000	1058.000	.770	12.531	25.295	.495	1.596	.01710	.900	.724	**
.000	.000	.000	1.788	.40000	-.510	.000	28.000	243.000		
DEBIT: 20 (MA)(CH): 35										
5.100	1038.000	1.112	21.081	25.010	.843	.949	.00975	1.256	.338	
.400	.475	.617	1.788	.40000	-.510	1.684	66.000	243.000		
DEBIT: 20 (MA)(CH): .05										
6.000	972.000	1.755	18.176	34.991	.519	1.100	.00754	1.817	.487	**
.000	.000	.000	3.281	.40000	1.010	.000	91.000	243.000		
7.000	881.000	2.441	11.859	28.654	.414	1.687	.02395	2.586	.837	**
.000	.000	.000	3.794	.40000	1.970	.000	126.000	243.000		
DEBIT: 20 (MA)(CH): 35										
8.000	755.000	5.459	137.797	70.162	1.964	.145	.00003	5.460	.033	
.400	.204	.007	4.489	.40000	2.610	.179	89.000	243.000		
9.000	666.000	5.462	67.378	42.875	1.601	.297	.00020	5.469	.075	
.400	.250	.032	5.093	.40000	3.360	.385	315.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE Q=30MCS

REF. : R. RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. BR.	NI. EN TO	F	
DEBIT: 30 (MA)(CH): 35										
1.000	1500.000	.430	36.668	15.400	2.381	.818	.00076	.478	.169	
.400	.168	.284	.885	.40000	-2.600	.968	142.000	243.000		
2.000	1358.000	.538	137.460	129.787	1.059	.218	.00026	.544	.068	
.400	.378	.024	.677	.40000	-.870	.334	181.000	243.000		
3.000	1177.000	.586	76.375	101.636	.751	.393	.00252	.616	.145	
.400	.532	.129	1.172	.40000	-.710	.770	79.000	243.000		
DEBIT: 30 (MA)(CH): .05										
ILOT										
4.000	1058.000	.785	43.517	78.845	.552	.689	.00267	.809	.296	**
.000	.000	.000	1.410	.40000	-.010	.000	40.000	243.000		
5.000	1058.000	.892	15.784	26.637	.590	1.910	.01955	1.078	.794	**
.000	.000	.000	3.871	.40000	-.510	.000	20.000	243.000		
DEBIT: 30 (MA)(CH): 35										
5.100	1038.000	1.283	26.217	26.898	.975	1.144	.00909	1.455	.378	
.400	.418	.735	3.871	.40000	-.510	1.838	66.000	243.000		
DEBIT: 30 (MA)(CH): .05										
6.000	972.000	1.883	22.792	37.353	.610	1.316	.00874	1.971	.538	**
.000	.000	.000	3.499	.40000	1.010	.000	91.000	243.000		
7.000	881.000	2.678	18.893	38.756	.614	1.588	.01272	2.806	.647	**
.000	.000	.000	4.140	.40000	1.970	.000	126.000	243.000		
DEBIT: 30 (MA)(CH): 35										
8.000	755.000	4.288	54.169	49.561	1.093	.554	.00157	4.316	.169	
.400	.366	.152	4.824	.40000	2.610	.835	89.000	243.000		
DEBIT: 30 (MA)(CH): .05										
9.000	666.000	4.420	25.393	36.823	.705	1.181	.00585	4.491	.449	**
.000	.000	.000	5.410	.40000	3.360	.000	315.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE: 0=40CMS

REF.: R. RUSHOON ICE 0=30CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 40 (MA)(CH): 35										
1.000	1500.000	.430	36.668	15.400	2.381	1.091	.00135	.515	.226	
.400	.168	.362	.400	.40000	-2.680	1.290	142.000	243.000		
2.000	1358.000	.622	148.754	130.779	1.137	.269	.00034	.630	.050	
.400	.352	.034	.867	.40000	-.870	.398	181.000	243.000		
3.000	1177.000	.682	88.887	186.149	.830	.454	.00235	.716	.159	
.400	.482	.145	1.360	.40000	-.710	.816	79.000	243.000		
DEBIT: 40 (MA)(CH): .05										
ILOT										
4.000	1098.000	.868	58.226	82.056	.612	.796	.00311	.981	.325	**
.060	.000	.000	1.611	.40000	-.010	.000	40.000	243.000		
5.000	1058.000	.993	18.444	27.563	.669	2.169	.02140	1.233	.846	**
.000	.000	.000	3.276	.40000	-.510	.000	28.000	243.000		
DEBIT: 40 (MA)(CH): 35										
5.100	1038.000	1.421	38.371	27.889	1.069	1.317	.00696	1.623	.403	
.400	.367	.861	3.276	.40000	-.510	1.989	66.000	243.000		
DEBIT: 40 (MA)(CH): .05										
6.000	972.000	2.012	27.784	39.774	.699	1.440	.00875	2.118	.550	**
.000	.000	.000	3.682	.40000	1.010	.000	91.000	243.000		
7.000	881.000	2.809	22.986	31.676	.726	1.740	.01232	2.963	.652	**
.000	.000	.000	4.388	.40000	1.970	.000	126.000	243.000		
DEBIT: 40 (MA)(CH): 35										
8.000	755.000	4.362	59.298	52.233	1.135	.675	.00212	4.412	.202	
.400	.352	.217	5.091	.40000	2.610	.998	89.000	243.000		
DEBIT: 40 (MA)(CH): .05										
9.000	666.000	4.550	38.201	37.705	.801	1.324	.00623	4.640	.472	**
.000	.000	.000	5.683	.40000	3.360	.000	315.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE,Q=45CMS

REF. : R.RUSHOON ICE Q=30MS

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE NORI.FOR.	LARGEUR ILI/TTH.	H.MOY TALWEG	VO VU	I DIST.AM.	NI.EN TO	F	
DEBIT: 45 (MA)(CH): 35										
1.000	1500.000	.438	36.668	15.400	2.381	1.227	.00171	.537	.254	
.400	.168	.459	.543	.40000	-2.600	1.452	142.000	243.000		
2.000	1358.000	.673	155.666	131.418	1.185	.289	.00035	.682	.095	
.400	.338	.038	.954	.40000	-.870	.419	181.000	243.000		
3.000	1177.000	.736	94.801	188.663	.872	.475	.00218	.771	.162	
.400	.458	.147	1.446	.40000	-.710	.821	79.000	243.000		
DEBIT: 45 (MA)(CH): .05										
ILOT										
4.000	1038.000	.909	53.555	83.106	.644	.840	.00324	.945	.334	**
.000	.000	.000	1.719	.40000	-.010	.000	46.000	243.000		
5.000	1058.000	1.038	19.699	27.009	.708	2.284	.02208	1.304	.867	**
.000	.000	.000	3.363	.40000	-.510	.000	28.000	243.000		
5.100	1038.000	1.304	27.288	29.257	.933	1.649	.00810	1.443	.545	**
.000	.000	.000	3.363	.40000	-.510	.000	66.000	243.000		
6.000	972.000	1.839	21.166	36.529	.579	2.126	.02439	2.069	.852	**
.000	.000	.000	3.765	.40000	1.010	.000	91.000	243.000		
SECTION DE CONTROLE										
7.000	681.000	2.665	18.582	38.667	.603	2.432	.03854	2.966	1.000	**
.000	.000	.000	4.482	.00031	1.970	.000	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	3.441	18.878	32.510	.588	2.385	.03877	3.731	.939	**
.000	.000	.000	5.191	.00049	2.610	.000	89.000	.000		
SECTION DE CONTROLE										
9.000	666.000	4.238	19.068	33.614	.567	2.361	.03184	4.522	1.001	**
.000	.000	.000	5.807	.00090	3.360	.000	315.000	.000		

RUSHOON BROOK BREAK-UP PROFILE Q=50CMS

REF. : R. RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 50 (MA)(CH): 35										
1.000	1530.000	.430	36.668	15.400	2.381	1.364	.00211	.563	.282	
.400	.168	.566	.678	.40000	-2.600	1.613	142.000	243.000		
2.000	1358.000	.738	163.429	132.131	1.237	.396	.00036	.739	.608	
.400	.323	.041	1.035	.40000	-.870	.436	181.000	243.000		
3.000	1177.000	.794	102.185	111.455	.917	.489	.00199	.828	.163	
.400	.436	.145	1.527	.40000	-.710	.817	79.000	243.000		
DEBIT: 50 (MA)(CH): .05										
ILOT										
4.000	1096.000	.951	57.107	84.211	.678	.876	.00329	.990	.339	**
.000	.000	.000	1.808	.40000	-.810	.000	48.000	243.000		
5.000	1058.000	1.083	20.948	28.051	.746	2.388	.02256	1.373	.882	**
.000	.000	.000	3.443	.40000	-.510	.000	20.000	243.000		
5.100	1038.000	1.373	29.321	29.633	.989	1.705	.00804	1.521	.547	**
.000	.000	.000	3.443	.40000	-.510	.000	66.000	243.000		
6.000	972.000	1.904	23.572	37.741	.625	2.121	.02200	2.133	.857	**
.000	.000	.000	3.844	.40000	1.810	.000	91.000	243.000		
SECTION DE CONTROLE										
7.000	881.000	2.711	19.921	30.990	.643	2.510	.02997	3.032	1.000	**
.000	.000	.000	4.572	.00032	1.970	.000	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	3.485	20.308	32.864	.618	2.462	.03024	3.794	1.000	**
.000	.000	.000	5.284	.00051	2.610	.000	89.000	.000		
SECTION DE CONTROLE										
9.000	666.000	4.283	20.586	34.210	.602	2.429	.03040	4.584	1.000	**
.000	.000	.000	5.924	.00094	3.360	.000	315.000	.000		

RUSHOON BROOK BREAK-UP; Q=10CMS
SPRING TIDE LEVEL 1.1M

REF. : R.RUSHOON ICE Q=3(1)

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 10 (MA)(CH): 35										
1.000	1500.000	1.100	46.936	15.400	3.051	.213	.00004	1.103	.039	
.400	.131	.013	-.794	.40000	-2.600	.242	142.000	243.000		
2.000	1358.000	1.105	215.340	136.087	1.582	.046	.00000	1.105	.012	
.400	.253	.001	.153	.40000	-.870	.061	181.000	243.000		
3.000	1177.000	1.106	148.010	131.420	1.126	.068	.00002	1.106	.020	
.400	.355	.002	.582	.40000	-.710	.100	79.000	243.000		
ILOT										
4.000	1098.000	1.108	68.504	77.527	.884	.146	.00020	1.111	.050	
.400	.453	.014	.873	.40000	-.010	.258	40.000	243.000		
5.000	1058.000	1.116	21.193	25.052	.846	.472	.00233	1.151	.164	
.400	.473	.152	1.340	.40000	-.510	.835	20.000	243.000		
5.100	1038.000	1.163	22.592	25.575	.883	.443	.00182	1.193	.150	
.400	.453	.125	1.340	.40000	-.510	.759	66.000	243.000		
DEBIT: 10 (MA)(CH): .05										
SECTION DE CONTROLE										
6.000	972.000	1.403	6.697	29.435	.227	1.493	.04184	1.517	1.000	**
.000	.000	.000	2.224	.00042	1.010	.000	91.000	243.000		
SECTION DE CONTROLE										
7.000	881.000	2.251	6.532	27.287	.239	1.531	.04035	2.370	.999	**
.000	.000	.000	3.184	.00033	1.970	.000	126.000	243.000		
SECTION DE CONTROLE										
8.000	755.000	3.039	6.528	27.572	.237	1.530	.04076	3.158	1.003	**
.000	.000	.000	3.848	.00045	2.610	.000	89.000	243.000		
SECTION DE CONTROLE										
9.000	666.000	3.833	6.580	27.834	.236	1.520	.04041	3.951	.998	**
.000	.000	.000	4.651	.00052	3.360	.000	315.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE Q=20CMS
SPRING TIDE LEVEL 1.1M

REF. : R.RUSHOON ICE Q=3(1)

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 20 (MA)(CH): 35										
1.000	1500.000	1.100	46.366	15.400	3.051	.426	.00014	1.112	.073	
.400	.131	.051	-.283	.40000	-2.600	.484	142.000	243.000		
2.000	1358.000	1.120	217.438	136.170	1.597	.092	.00002	1.121	.023	
.400	.251	.003	.452	.40000	-.870	.120	181.000	243.000		
3.000	1177.000	1.124	150.402	131.585	1.143	.133	.00008	1.126	.040	
.400	.350	.008	.923	.40000	-.710	.196	79.000	243.000		
ILOT										
4.000	1093.000	1.130	70.469	78.179	.902	.284	.00070	1.142	.095	
.400	.444	.050	1.176	.40000	-.010	.479	40.000	243.000		
5.000	1058.000	1.158	22.443	25.520	.879	.891	.00750	1.278	.303	
.400	.455	.511	1.788	.40000	-.510	1.532	20.000	243.000		
5.100	1038.000	1.308	26.998	27.166	.994	.741	.00361	1.379	.237	
.400	.402	.301	1.783	.40000	-.510	1.176	66.000	243.000		
DEBIT: 20 (MA)(CH): .05										
SECTION DE CONTROLE										
6.000	972.000	1.546	11.162	32.218	.346	1.792	.03393	1.710	.972	**
.000	.000	.000	3.281	.40000	1.010	.000	91.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE: Q=30CMS
SPRING TIDE LEVEL 1.1M

REF. : R. RUSHOON ICE Q=3(1)

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 30 (MA)(CH): 35										
1.000	1500.000	1.100	46.986	15.400	3.051	.638	.00032	1.127	.117	
.400	.131	.115	.085	.40000	-2.600	.726	142.000	243.000		
2.000	1358.000	1.146	220.937	136.310	1.621	.136	.00004	1.147	.034	
.400	.247	.007	.677	.40000	-.870	.176	181.000	243.000		
3.000	1177.000	1.153	154.342	131.858	1.171	.194	.00016	1.157	.057	
.400	.342	.017	1.172	.40000	-.710	.284	79.000	243.000		
ILOT										
4.000	1098.000	1.166	73.711	79.307	.929	.407	.00132	1.189	.135	
.400	.430	.099	1.410	.40000	-.010	.674	48.000	243.000		
5.000	1058.000	1.219	24.247	26.182	.926	1.237	.01233	1.433	.411	
.400	.432	.918	3.071	.40000	-.510	2.053	20.000	243.000		
5.100	1038.000	1.465	31.784	28.131	1.127	.946	.00425	1.566	.285	
.400	.355	.438	3.071	.40000	-.510	1.405	66.000	243.000		
DEBIT: 30 (MA)(CH): .05										
6.000	972.000	1.745	17.839	34.863	.512	1.682	.01796	1.890	.751	**
.000	.000	.000	3.499	.40000	1.010	.000	91.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE; Q=40CMS
SPRING TIDE LEVEL 1.1M

REF. : R.RUSHOON ICE Q=I(1)

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 40 (MA)(CH): 35										
1.000	1500.000	1.100	46.986	15.420	3.051	.851	.00057	1.146	.156	
.400	.131	.204	.400	.40000	-2.600	.968	142.000	243.000		
2.000	1358.000	1.181	225.842	136.565	1.654	.177	.00007	1.184	.044	
.400	.242	.011	.867	.40000	-.870	.228	181.000	243.000		
3.000	1177.000	1.193	159.771	132.232	1.208	.250	.00025	1.200	.073	
.400	.331	.028	1.360	.40000	-.710	.368	79.000	243.000		
ILOT										
4.000	1038.000	1.213	78.191	81.220	.963	.512	.00188	1.248	.166	
.400	.415	.149	1.611	.40000	-.010	.828	40.000	243.000		
DEBIT: 40 (MA)(CH): .85										
5.000	1058.000	1.298	26.820	29.170	.919	1.491	.00675	1.481	.497	**
.000	.000	.000	3.276	.40000	-.510	.000	20.000	243.000		
DEBIT: 40 (MA)(CH): 35										
5.100	1038.000	1.423	30.438	27.901	1.091	1.314	.00888	1.623	.482	
.400	.367	.856	3.276	.40000	-.510	1.983	66.000	243.000		
DEBIT: 40 (MA)(CH): .85										
6.000	972.000	2.009	27.665	39.718	.697	1.446	.00886	2.116	.553	**
.000	.000	.000	3.682	.40000	1.010	.000	91.000	243.000		

RUSHOON BROOK BREAK-UP PROFILE: Q=50CMS
SPRING TIDE LEVEL 1.1M

REF.: R.RUSHOON ICE Q=3(1)

SECTION NO	POSITION	NI.ERU	AIRE	LARGEUR	H.MOY	VO	I	NI.EN	F	
T (GLACE)	T/H	(D)GLACON	MCRI.FOR	ILI/TTH	TALWEG	VU	DIST.AM	TO		
DEBIT: 50 (MA)(CH): 35										
1.000	1500.000	1.100	46.986	15.400	3.051	1.064	.00105	1.183	.195	
.552	.181	.355	.678	.40000	-2.600	1.277	142.000	243.000		
2.000	1358.000	1.249	235.222	136.878	1.718	.213	.00009	1.252	.052	
.400	.233	.016	1.035	.40000	-.870	.270	181.000	243.000		
3.000	1177.000	1.265	169.524	132.982	1.276	.295	.00031	1.273	.083	
.400	.314	.037	1.527	.40000	-.710	.415	79.000	243.000		
ILOT										
4.000	1098.000	1.289	85.287	83.428	1.022	.586	.00209	1.332	.185	
.400	.391	.183	1.888	.40000	-.810	.916	40.000	243.000		
DEBIT: 50 (MA)(CH): .85										
5.000	1058.000	1.373	29.310	29.631	.989	1.706	.00805	1.521	.548	**
.000	.000	.000	3.443	.40000	-.510	.000	20.000	243.000		
DEBIT: 50 (MA)(CH): 35										
5.100	1038.000	1.534	33.780	28.583	1.185	1.480	.00921	1.769	.434	
.400	.338	1.003	3.443	.40000	-.510	2.147	66.000	243.000		
DEBIT: 50 (MA)(CH): .85										
6.000	972.000	2.141	33.105	43.039	.769	1.510	.00848	2.258	.550	**
.000	.000	.000	3.844	.40000	1.010	.000	91.000	243.000		

APPENDIX V

(d) ICE ACCUMULATION COVER BREAK-UP PROFILES AND VOLUMES

Q = 10, 15, 20, 25, 30, 35, 40, 45 and 50m^3/s

RUSHOON BROOK BREAK-UP PROFILE Q=10CMS

REF. : R.RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F	
DEBIT: 10 (MA)(CH): 35										
1.000	1500.000	.430	36.668	15.400	2.381	.273	.00000	.435	.056	
.400	.168	.823	-.794	.40000	-2.600	.323	142.000	243.000		
2.000	1358.000	.442	124.588	128.466	.970	.080	.00005	.443	.026	
.400	.412	.804	.153	.40000	-.870	.129	181.000	243.000		
3.000	1177.000	.458	62.036	99.612	.623	.161	.00099	.458	.065	
.400	.642	.834	.582	.40000	-.710	.394	79.000	243.000		
DEBIT: 10 (MA)(CH): .05										
ILOT										
4.000	1098.000	.529	24.273	71.392	.340	.412	.00181	.537	.226	**
.000	.000	.000	.873	.40000	-.010	.000	40.000	243.000		
5.000	1058.000	.681	8.425	23.446	.359	1.187	.01435	.673	.632	**
.000	.000	.000	1.340	.40000	-.510	.000	20.000	243.000		
DEBIT: 10 (MA)(CH): 35										
ACCUMULATION										
5.100	1038.000	2.718	28.229	18.110	2.792	.354	.02419	3.023	.068	
2.596	.930	1.384	1.340	.00073	-.510	2.447	66.000	243.000		
6.000	972.000	3.033	58.535	31.841	1.838	.171	.00478	3.081	.040	
1.647	.896	.206	2.224	.00042	1.010	.972	91.000	243.000		
SECTION DE CONTROLE										
7.000	881.000	3.184	22.789	31.632	.720	.439	.00166	3.208	.165	
.282	.398	.102	3.184	.00033	1.970	.685	126.000	.000		
SECTION DE CONTROLE										
8.000	755.000	3.848	14.028	31.287	.448	.713	.03613	4.036	.340	
.306	.398	.882	3.848	.00045	2.610	1.920	89.000	.000		
9.000	666.000	5.456	67.679	44.339	1.526	.148	.00003	5.457	.038	
.104	.068	.005	4.651	.00052	3.360	.158	315.000	.000		

RUSHOON BROOK BREAK-UP PROFILE Q=10CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.466	.4	161.5	8298.99613	8736.26613
3	99.612	.4	130	5179.84144	13916.1076
4	71.392	0	59.5	0	13916.1076
5	23.446	0	38	0	13916.1076
5.1	18.11	2.596	43	1128.39911	15044.5067
6	31.841	1.647	78.5	4116.84082	19161.3467
7	31.652	.282	108.5	966.757627	20128.1045

VOLUME (APPARENT OU REEL) EN PLACE = = 20,128 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE POINT = 20128 - 13916
= 6212 m^3

RUSHOON BROOK BREAK-UP PROFILE; Q=15CMS

REF.: R. RUSHOON ICE; Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15. (MA)(CH): 35									
1.000	1500.000	.430	36.663	15.400	2.381	.409	.00019	.442	.085
.400	.168	.051	-.511	.40000	-2.600	.404	142.000	243.000	
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.000	.316	.40000	-.870	.189	181.000	243.000	
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .05									
ILOT									
4.000	1098.000	.609	38.128	73.740	.489	.498	.00207	.622	.249
.000	.000	.000	1.035	.40000	-.010	.000	40.000	243.000	
5.000	1058.000	.692	10.609	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.510	.000	20.000	243.000	
DEBIT: 15 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	3.158	69.485	23.844	2.911	.216	.01050	3.291	.040
2.740	.941	.567	1.582	.00085	-.510	1.613	66.000	243.000	
6.000	972.000	3.561	77.188	32.771	2.355	.194	.00609	3.633	.040
2.144	.910	.311	2.896	.00012	1.010	1.195	91.000	243.000	
7.000	881.000	4.010	57.132	28.832	1.982	.263	.00520	4.081	.060
1.676	.846	.385	3.599	.00025	1.970	1.183	126.000	.000	
8.000	755.000	4.366	48.226	31.812	1.516	.311	.00283	4.411	.081
1.099	.725	.190	4.270	.00036	2.610	.935	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	4.892	27.770	36.886	.753	.540	.00591	4.953	.199
.430	.398	.282	4.892	.00061	3.360	1.137	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE Q=15CMS
ICE COVER TO SECTION 9

REF.: R.RUSHOON ICE; Q=15

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE NORI.FOR.	LARGEUR ILI/TTH.	H.MOY THALWEG	VO VU	I DIST.AM.	NI.EN TO	F
DEBIT: 15 (MA)(CH): .05									
9.000	666.000	4.892	43.587	40.366	1.080	.344	.00493	4.898	.106
SECTION DE CONTROLE									
10.000	351.000	6.951	8.250	24.567	.336	1.818	.00842	7.120	1.000
11.000	150.000	8.790	23.103	28.137	.821	.649	.00812	8.810	.229
SECTION DE CONTROLE									
12.000	.000	9.863	8.651	28.258	.306	1.734	.00000	10.016	1.000

RUSHDON BROOK BREAK-UP PROFILE; Q=15CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52388	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	23.844	2.74	43	2809.37762	16756.6777
6	32.771	2.144	78.5	5514.76117	22271.4389
7	28.832	1.676	108.5	5242.78236	27514.1412
8	31.812	1.099	107.5	3759.68985	31273.8311
9	36.886	.43	202	3201.28464	34475.1157

VOLUME (APPARENT OU REEL) EN PLACE = 34,475 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 34475 - 13947
= 20,528 m^3

RUSHOON BROOK BREAK-UP PROFILE Q=20CMS

REF. : R RUSHOON B/U Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): 35									
1.000	1500.000	.430	36.668	15.400	2.381	.409	.00019	.442	.085
.400	.168	.051	-.511	.40000	-2.600	.484	142.000	243.000	
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.008	.316	.40000	-.870	.189	181.000	243.000	
3.000	1177.000	.474	64.517	99.656	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .05									
ILOT									
4.000	1098.000	.609	30.128	73.740	.409	.493	.00207	.622	.249
.000	.000	.000	1.035	.40000	-.010	.000	40.000	243.000	
5.000	1058.000	.692	10.609	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.510	.000	20.000	243.000	
DEBIT: 20 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	3.389	77.464	24.836	3.119	.258	.01095	3.546	.047
2.891	.927	.670	1.788	.00094	-.510	1.754	66.000	243.000	
6.000	972.000	3.810	87.682	33.799	2.592	.228	.00638	3.899	.045
2.331	.899	.381	3.281	.00011	1.010	1.322	91.000	243.000	
7.000	881.000	4.350	68.217	29.611	2.304	.293	.00594	4.443	.062
1.960	.851	.396	3.794	.00024	1.970	1.349	126.000	.000	
8.000	755.000	4.949	66.899	31.884	2.098	.299	.00475	5.025	.066
1.723	.821	.325	4.489	.00036	2.610	1.222	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	5.093	43.572	40.363	1.080	.459	.00162	5.125	.141
.491	.398	.136	5.093	.00066	3.360	.789	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE; 0=20CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52388	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	24.836	2.891	43	3087.82491	17035.1248
6	33.799	2.331	78.5	6184.22585	23219.3498
7	29.611	1.96	108.5	6297.13594	29516.4858
8	31.884	1.723	107.5	5904.85503	35421.3408
9	48.363	.491	202	4001.27037	39422.6112

VOLUME (APPARENT OU REEL) EN PLACE = 39,422 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 39422 - 13947
= 25,475 m^3

RUSHOON BROOK BREAK-UP PROFILE: Q=25CMS

REF. : R. RUSHOON B/U Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): 35									
1.000	1500.000	.430	36.666	15.400	2.381	.409	.00019	.442	.085
.400	.168	.051	-.511	.40000	-2.600	.484	142.000	243.000	
2.300	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.008	.316	.40000	-.870	.189	181.000	243.000	
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .05									
ILOT									
4.000	1098.000	.609	38.128	73.740	.489	.498	.00207	.622	.249
.000	.000	.000	1.035	.40000	-.810	.000	48.000	243.000	
5.000	1058.000	.692	18.609	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.510	.000	28.000	243.000	
DEBIT: 25 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	3.549	83.699	25.439	3.290	.299	.01104	3.730	.053
3.000	.914	.769	2.937	.00017	-.510	1.950	66.000	243.000	
6.000	972.000	3.968	95.286	34.884	2.732	.262	.00635	4.069	.051
2.415	.884	.431	3.395	.00012	1.810	1.407	91.000	243.000	
7.000	881.000	4.510	74.533	38.438	2.449	.335	.00596	4.616	.068
2.043	.834	.453	3.972	.00026	1.970	1.442	126.000	.000	
8.000	755.000	5.129	73.742	32.519	2.268	.339	.00491	5.219	.072
1.833	.808	.381	4.667	.00040	2.610	1.323	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	5.258	51.876	42.871	1.233	.482	.00144	5.291	.139
.539	.398	.142	5.258	.00071	3.360	.807	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE; Q=25CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52288	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	25.439	3.008	43	3290.51367	17237.8135
6	34.884	2.415	78.5	6614.42491	23852.2385
7	30.43	2.043	108.5	6745.21191	30597.4504
8	32.519	1.833	107.5	6407.85022	37005.3006
9	42.071	.539	202	4584.74328	41590.0439

VOLUME (APPARENT OU REEL) EN PLACE = 41,590 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 41590 - 13947
= 27,643 m^3

RUSHOON BROOK BREAK-UP PROFILE: Q=30CMS

REF. : R. RUSHOON B/U Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): 35									
1.000	1500.000	.430	36.668	15.400	2.381	.409	.00019	.442	.085
.400	.168	.851	-.511	.40000	-2.600	.484	142.000	243.000	
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.008	.316	.40000	-.870	.189	181.000	243.000	
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .05									
ILOT									
4.000	1098.000	.609	30.128	73.740	.409	.498	.00287	.622	.249
.000	.000	.000	1.835	.40000	-.010	.000	40.000	243.000	
5.000	1058.000	.692	18.609	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.510	.000	20.000	243.000	
DEBIT: 30 (MA)(CH): 35									
ACCUMULATION									
5.100	1032.000	3.692	90.609	26.578	3.387	.333	.01063	3.885	.858
3.050	.981	.823	3.071	.00018	-.510	1.944	66.000	243.000	
6.000	972.000	4.106	103.062	36.114	2.854	.291	.00627	4.216	.855
2.489	.872	.472	3.499	.00013	1.010	1.472	91.000	243.000	
7.000	831.000	4.652	79.894	38.961	2.580	.375	.00680	4.771	.875
2.115	.820	.588	4.140	.00028	1.970	1.527	126.000	.000	
8.000	755.000	5.283	79.835	33.122	2.410	.376	.00581	5.384	.877
1.920	.796	.430	4.824	.00044	2.610	1.406	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	5.410	58.920	43.467	1.355	.509	.00142	5.446	.140
.565	.398	.155	5.410	.00076	3.360	.844	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE Q=30CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52388	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	26.578	3.05	43	3485.62556	17432.9254
6	36.114	2.489	78.5	7054.81474	24487.7402
7	30.961	2.115	108.5	7105.54023	31593.2804
8	33.122	1.92	107.5	6835.02946	38428.3099
9	43.467	.585	202	5135.91598	43564.2259

VOLUME (APPARENT OU REEL) EN PLACE = 43,564 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 43564 - 13947
= 29,617 m^3/s

RUSHOON BROOK BREAK-UP PROFILE Q=35CMS

REF.: R. RUSHOON B/U Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): 35									
1.000	1500.000	.430	36.668	15.400	2.381	.409	.00019	.442	.065
.400	.168	.051	-.511	.40000	-2.600	.404	142.000	243.000	
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.000	.316	.40000	-.870	.169	181.000	243.000	
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .85									
ILOT									
4.000	1898.000	.609	38.128	73.740	.489	.498	.00207	.622	.249
.000	.000	.000	1.035	.40000	-.010	.000	40.000	243.000	
5.000	1858.000	.692	18.609	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.518	.000	20.000	243.000	
DEBIT: 35 (MA)(CH): 35									
ACCUMULATION									
5.100	1838.000	3.942	98.582	27.134	3.630	.355	.01114	4.160	.060
3.267	.900	.928	3.179	.00019	-.510	2.865	66.000	243.000	
6.000	972.000	4.388	115.641	37.855	3.121	.303	.00675	4.514	.055
2.740	.878	.540	3.595	.00013	1.010	1.575	91.000	243.000	
7.000	881.000	4.782	183.658	41.005	2.528	.338	.00434	4.870	.068
2.041	.808	.376	4.287	.00029	1.970	1.314	126.000	.000	
8.000	755.000	5.423	85.512	33.684	2.539	.409	.00508	5.534	.082
1.996	.736	.476	4.965	.00047	2.610	1.479	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	5.551	65.621	44.658	1.470	.533	.00145	5.591	.140
.635	.338	.171	5.551	.00081	3.360	.896	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE; Q=35CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52388	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	27.134	3.267	43	3811.66401	17758.9639
6	37.655	2.74	78.5	7971.02992	25729.9938
7	41.005	2.041	108.5	9081.77573	34811.7695
8	33.664	1.996	107.5	7226.3561	42038.1256
9	44.65	.635	202	5730.01891	47768.1445

VOLUME (APPARENT OU REEL) EN PLACE = 47,768 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 47768 - 13947
= 33,821 m^3/s

RUSHOON BROOK BREAK-UP PROFILE/Q=46CMS

REF.: R.RUSHOON B/U Q=15

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE NORI.FOR	LARGEUR ILI/TTH	H.MOY TALWEG	VO VU	I DIST.AM.	NI.EN TO	F
DEBIT: 15 (MA)(CH): 35									
1.000	1500.000	.430	36.663	15.400	2.381	.489	.00019	.442	.085
.400	.168	.051	-.511	.40000	-2.600	.484	142.000	243.000	
2.000	1358.000	.457	126.620	128.753	.983	.118	.00010	.459	.038
.400	.407	.008	.316	.40000	-.870	.189	181.000	243.000	
3.000	1177.000	.474	64.517	99.856	.646	.232	.00171	.489	.092
.400	.619	.064	.765	.40000	-.710	.540	79.000	243.000	
DEBIT: 15 (MA)(CH): .05									
ILOT									
4.000	1098.000	.603	38.128	73.740	.489	.498	.00207	.622	.249
.000	.000	.000	1.635	.40000	-.010	.000	40.000	243.000	
5.000	1058.000	.692	18.689	24.447	.434	1.414	.01593	.794	.685
.000	.000	.000	1.582	.40000	-.510	.000	20.000	243.000	
DEBIT: 40 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	4.119	104.631	27.577	3.794	.382	.01136	4.357	.063
3.394	.895	1.016	3.276	.00020	-.510	2.161	66.000	243.000	
6.000	972.000	4.541	125.641	39.371	3.191	.318	.00639	4.669	.057
2.772	.869	.546	3.682	.00014	1.010	1.584	91.000	243.000	
7.000	881.000	4.987	115.469	44.505	2.595	.346	.00403	4.994	.069
2.871	.738	.378	4.388	.00030	1.970	1.384	126.000	.000	
8.000	755.000	5.553	91.865	34.206	2.662	.439	.00516	5.680	.036
2.872	.778	.521	5.091	.00050	2.610	1.547	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	5.683	71.982	45.895	1.596	.556	.00141	5.726	.148
.682	.398	.182	5.683	.00086	3.360	.915	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE, Q=48CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
1	15.4	.4	71	437.36	437.36
2	128.753	.4	161.5	8317.416	8754.776
3	99.856	.4	130	5192.52388	13947.2999
4	73.74	0	59.5	0	13947.2999
5	24.447	0	30	0	13947.2999
5.1	27.577	3.394	43	4025.12081	17972.4207
6	39.371	2.772	78.5	8566.82117	26538.4419
7	44.585	2.071	108.5	9999.54634	36537.9882
8	34.206	2.072	107.5	7618.5396	44156.5278
9	45.895	.682	202	6210.4798	50367.0076

VOLUME (APPARENT OU REEL) EN PLACE = 50,367 METRES CUBES

VOLUME UPSTREAM OF SALMON HOLE PT. = 50367 - 13947
= 36,420 m^3/s

RUSHOON BROOK BREAK-UP PROFILE: Q=45CMS

REF. : R. RUSHOON ICE Q=30CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 45 (MA)(CH): 35									
ACCUMULATION									
1.000	1500.000	1.653	55.506	15.400	3.604	.811	.01623	2.134	.136
2.885	.800	2.057	.543	.00353	-2.600	3.074	142.000	243.000	
2.000	1358.000	1.856	383.000	126.352	2.398	.149	.00145	1.882	.031
2.038	.850	.101	.954	.00023	-.870	.661	181.000	243.000	
3.000	1177.000	2.102	251.707	114.211	2.204	.179	.00135	2.126	.038
1.773	.804	.103	1.446	.00022	-.710	.688	79.000	243.000	
ILOT									
4.000	1098.000	2.443	171.464	77.102	2.224	.262	.00432	2.511	.056
1.868	.840	.291	1.719	.00046	-.810	1.156	40.000	243.000	
SECTION DE CONTROLE									
5.000	1058.000	3.363	85.830	120.570	.712	.524	.02299	3.517	.198
.540	.398	.638	3.363	.00021	-.518	1.739	20.000	243.000	

RUSHOON BROOK BREAK-UP PROFILE, Q=45CMS

REF. : R RUSHOON ICE Q=3CMS

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H MOY TRLWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 45 (MA)(CH): .05									
5.000	1058.000	3.363	201.063	148.063	1.358	.224	.00009	3.366	.061
5.100	1038.000	3.365	201.441	148.184	1.359	.223	.00012	3.368	.061
6.000	972.000	3.373	172.006	101.947	.945	.262	.00069	3.377	.066
7.000	881.000	3.425	55.726	72.373	.770	.808	.00416	3.453	.234
8.000	755.000	3.899	35.255	49.046	.719	1.276	.00751	3.982	.481
9.000	666.000	4.531	29.500	37.479	.787	1.525	.01688	4.650	.549
SECTION DE CONTROLE									
10.000	351.000	7.322	18.367	30.054	.611	2.450	.00506	7.628	1.000
11.000	150.000	9.387	40.754	30.849	1.321	1.104	.00709	9.450	.307
12.000	.000	10.292	21.622	33.397	.647	2.081	.00000	10.512	.826

RUSHOON BROOK BREAK-UP PROFILE Q=45CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
1	15.4	2.635	71	3153.92883	3153.92883
2	126.352	2.038	161.5	41585.2668	44739.1876
3	114.211	1.773	130	26324.7587	71063.9334
4	77.102	1.965	59.5	8570.87366	79634.812
5	120.57	.54	30	1954.83316	81589.6452

VOLUME (APPARENT OU REEL) EN PLACE = 81,589 METRES CUBES

RUSHOON BROOK BREAK-UP PROFILE Q=50CMS

REF. : R.RUSHOON ICE Q=30CMS

SECTION NO T (GLACE)	POSITION T/H	NI.EAU (D)GLACON	AIRE MOYI.FOR.	LARGEUR ILI/TTH.	H.MOY TALWEG	VO VU	I DIST.AVL	NI.EN TO	F
DEBIT: 45 (MA)(CH): 35									
1.000	1538.000	.430	36.668	15.400	2.381	1.227	.00171	.537	.254
.400	.168	.459	.543	.40000	-2.600	1.452	142.000	243.000	
2.000	1358.000	.673	155.666	131.418	1.185	.269	.00035	.662	.085
.400	.338	.033	.954	.40000	-.670	.419	181.000	243.000	
DEBIT: 50 (MA)(CH): 35									
ACCUMULATION									
3.000	1177.000	2.274	274.332	115.282	2.380	.182	.00143	2.382	.038
1.943	.816	.117	1.527	.00022	-.710	.732	79.000	243.000	
ILOT									
4.000	1038.000	3.431	168.101	45.110	3.726	.297	.01463	3.666	.049
3.450	.937	1.096	1.803	.00048	-.010	2.150	48.000	243.000	
SECTION DE CONTROLE									
5.000	1858.000	3.443	201.045	148.057	1.358	.249	.00032	3.451	.068
.565	.396	.835	3.443	.00021	-.510	.403	28.000	243.000	

RUSHOON BROOK BREAK-UP PROFILE Q=50CMS

REF. : R.RUSHOON ICE Q=3CMS

SECTION NO. T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE MOYI. FOR	LARGEUR ILI/TTH	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 50 (MA)(CH): .05									
5.000	1858.000	3.443	213.022	150.000	1.420	.235	.00009	3.446	.063
5.100	1038.000	3.445	213.366	150.000	1.422	.234	.00012	3.448	.063
6.000	972.000	3.453	186.591	184.744	1.010	.268	.00085	3.457	.085
7.000	881.000	3.500	61.272	75.044	.808	.816	.00406	3.534	.290
8.000	755.000	3.959	38.268	51.095	.749	1.307	.00752	4.046	.462
9.000	666.000	4.587	31.588	38.149	.828	1.583	.01667	4.715	.555
SECTION DE CONTROLE									
10.000	351.000	7.372	19.889	38.822	.645	2.514	.00913	7.694	1.000
11.000	150.000	9.460	43.020	31.180	1.380	1.162	.00700	9.529	.316
12.000	.000	10.354	23.727	34.422	.689	2.107	.00000	10.579	.810

RUSHOON BROOK BREAK-UP PROFILE Q=50CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	15.4	.4	71	437.36	437.36
2	131.418	.4	161.5	8489.58453	8926.94453
3	115.282	1.943	138	29113.206	38040.1506
4	45.11	3.49	59.5	9367.55447	47407.705
5	146.857	.565	38	2510.68353	49918.5886

VOLUME (APPARENT OU REEL) EN PLACE = 49,918 METRES CUBES

RUSHOON BROOK BREAK-UP PROFILE, Q=50CMS

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
1	15.4	.4	71	437.36	437.36
2	131.418	.4	161.5	8489.58453	8926.94453
3	115.282	1.943	130	29113.286	38040.1506
4	45.11	3.49	59.5	9367.55447	47407.705
5	148.857	.565	30	2510.68353	49918.5886

VOLUME (APPARENT OU REEL) EN PLACE = 49,918 METRES CUBES

RUSHOON BROOK BREAK-UP PROFILE Q=15CMS
ACCUMULATION COVER TO SEAWARD BRIDGE

REF. : R.RUSHOON ICE; Q=15

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NORI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 15 (MA)(CH): 35									
ACCUMULATION									
1.000	1500.000	1.368	32.784	8.981	3.650	.458	.03606	1.932	.076
3.423	.938	2.412	-.511	.00204	-2.600	3.329	142.000	243.000	
2.000	1358.000	1.661	231.355	101.787	2.273	.065	.00207	1.678	.014
2.190	.964	.071	.316	.00014	-.870	.571	181.000	243.000	
3.000	1177.000	2.024	218.388	99.794	2.188	.069	.00200	2.040	.015
2.092	.956	.071	.765	.00014	-.710	.569	79.000	243.000	
ILOT									
4.000	1038.000	2.554	161.103	67.668	2.381	.093	.00671	2.682	.019
2.339	.983	.205	1.035	.00039	-.010	.969	48.000	243.000	
5.000	1858.000	2.941	64.621	24.071	2.685	.232	.00967	3.062	.045
2.480	.924	.520	1.582	.00085	-.510	1.545	20.000	243.000	
5.100	1838.000	3.158	69.405	23.844	2.911	.216	.01090	3.291	.040
2.740	.941	.567	1.582	.00085	-.510	1.613	66.000	243.000	
6.000	972.000	3.561	77.180	32.771	2.355	.194	.00609	3.633	.040
2.144	.910	.311	2.836	.00012	1.010	1.195	91.000	243.000	
7.000	881.000	4.010	57.132	28.832	1.982	.263	.00520	4.081	.060
1.676	.846	.385	3.599	.00025	1.970	1.183	126.000	.000	
8.000	755.000	4.366	48.226	31.812	1.516	.311	.00283	4.411	.081
1.099	.725	.190	4.270	.00036	2.610	.935	89.000	.000	
SECTION DE CONTROLE									
9.000	666.000	4.892	27.770	36.886	.753	.540	.00591	4.958	.199
.430	.398	.282	4.892	.00061	3.360	1.137	315.000	.000	

RUSHOON BROOK BREAK-UP PROFILE Q=15CMS
ACCUMULATION COVER TO SEAWARD BRIDGE

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL DE GLACE	VOL CUMULATIF
1	8.981	3.423	71	2182.35894	2182.35894
2	101.787	2.19	161.5	36004.247	38186.606
3	99.794	2.092	130	27136.0924	65322.6983
4	67.668	2.339	59.5	9418.33611	74741.0345
5	24.871	2.48	30	1790.7148	76531.7493
5.1	23.844	2.74	43	2809.37782	79341.1271
6	32.771	2.144	78.5	5514.76117	84855.8882
7	28.832	1.676	108.5	5242.70236	90098.5906
8	31.812	1.099	107.5	3759.68985	93858.2804
9	36.686	.43	202	3201.28464	97059.5651

VOLUME (APPARENT OU REEL) EN PLACE = 97,059 METRES CUBES

APPENDIX V

(e) ICE ACCUMULATED COVER BREAK-UP PROFILES AND VOLUMES WITH IMPERMEABLE CRIB
Q = 10, 20, 30 and 40m^3/s
OPEN WATER Q = 40 m^3/s

RUSHOON BROOK BREAK-UP PROFILE; Q=10CMS WITH IMPERMEABLE WALL

REF : R RUSHOON PRE B/U 10

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 10 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	2.541	27.552	10.637	2.590	.363	.02079	2.808	.072
2.369	.915	1.139	1.340	.00073	-.510	2.288	66.000	243.000	
6.000	972.000	2.786	51.068	32.320	1.580	.196	.00371	2.826	.050
1.339	.848	.172	2.224	.00042	1.010	.889	91.000	243.000	
SECTION DE CONTROLE									
7.000	881.000	3.056	22.788	31.632	.720	.439	.00296	3.091	.165
.370	.398	.150	3.056	.00063	1.970	.831	126.000	243.000	
SECTION DE CONTROLE									
									.398

RUSHOON BROOK BREAK-UP PROFILE; Q=10CMS WITH IMPERMEABLE WALL

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
5.1	10.637	2.369	33	831.471071	831.471071
6	32.32	1.339	78.5	3397.82751	4229.29858
7	31.632	.37	108.5	1268.3612	5497.65979

VOLUME (APPARENT OU REEL) EN PLACE = METRES CUBES

$3916.1 + \left(831.47 \times \frac{43}{33}\right) + 3397.83 + 1268.36 = 19690.92\ m^3$

RUSHOON BROOK BREAK-UP PROFILE; Q=20CMS WITH IMPERMEABLE WALL

REF. : R. RUSHOON PRE B/U 10

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 20 (MA)(CH): 35									
ACCUMULATION'									
5. 100	1038. 000	3. 389	77. 550	24. 881	3. 117	. 258	. 01092	3. 546	. 047
2. 889	. 927	. 668	1. 788	. 00094	-. 510	1. 752	66. 000	243. 000	
6. 000	972. 000	3. 811	87. 609	33. 788	2. 593	. 228	. 00639	3. 960	. 045
2. 332	. 899	. 381	2. 737	. 00040	1. 010	1. 323	91. 000	243. 000	
7. 000	881. 000	4. 356	68. 404	29. 569	2. 313	. 292	. 00599	4. 449	. 061
1. 971	. 852	. 399	3. 494	. 00079	1. 970	1. 354	126. 000	243. 000	
8. 000	755. 000	4. 944	66. 598	31. 992	2. 082	. 300	. 00467	5. 019	. 066
1. 703	. 818	. 321	4. 273	. 00077	2. 610	1. 214	89. 000	243. 000	
SECTION DE CONTROLE									
9. 000	666. 000	5. 092	43. 552	40. 137	1. 085	. 459	. 00165	5. 124	. 141
. 499	. 398	. 138	5. 092	. 00068	3. 360	. 796	315. 000	243. 000	

RUSHOON BROOK BREAK-UP PROFILE; Q=20CMS WITH IMPERMEABLE WALL

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
5. 1	24. 881	2. 889	33	2372. 21188	2372. 21188
6	33. 788	2. 332	78. 5	6185. 40656	8557. 61843
7	29. 569	1. 971	108. 5	6324. 74411	14882. 3625
8	31. 992	1. 703	107. 5	5856. 58731	20738. 9499
9	40. 137	. 499	202	4048. 22711	24787. 177

VOLUME (APPARENT OU REEL) EN PLACE = ~~24. 787~~ METRES CUBES

$$13947.30 + \left(2372.21 \times \frac{43}{33}\right) + 6185.41 + 6324.74$$

$$+ 5856.59 + 4048.23 = 39453.3\ m^3$$

RUSHOON BROOK BREAK-UP PROFILE; Q=30CMS WITH IMPERMEABLE WALL

REF. : R. RUSHOON PRE B/U 10

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 30 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	3.658	89.085	26.516	3.360	.337	.01052	3.849	.059
3.018	.898	.819	2.133	.00107	-.510	1.939	66.000	243.000	
6.000	972.000	4.055	101.601	36.381	2.793	.295	.00602	4.162	.056
2.417	.865	.457	3.123	.00041	1.010	1.448	91.000	243.000	
7.000	881.000	4.607	79.132	30.630	2.583	.379	.00607	4.727	.075
2.116	.819	.515	3.836	.00090	1.970	1.538	126.000	243.000	
8.000	755.000	5.180	76.710	33.306	2.303	.391	.00455	5.274	.082
1.783	.774	.402	4.601	.00092	2.610	1.359	89.000	243.000	
SECTION DE CONTROLE									
9.000	666.000	5.405	51.695	41.206	1.255	.580	.00253	5.461	.165
.603	.398	.236	5.405	.00080	3.360	1.041	315.000	243.000	

RUSHOON BROOK BREAK-UP PROFILE; Q=30CMS WITH IMPERMEABLE WALL

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
5.1	26.516	3.018	33	2640.4921	2640.4921
6	36.381	2.417	78.5	6901.96921	9542.46131
7	30.63	2.116	108.5	7032.13993	16574.6012
8	33.306	1.783	107.5	6384.29012	22958.8914
9	41.206	.603	202	5022.38031	27981.2717

VOLUME (APPARENT OU REEL) EN PLACE = ~~27.981~~ METRES CUBES

$3947.3 + \left(2640.49 \times \frac{4}{33}\right) + 6901.97 + 7032.14$

$+ 6384.29 + 5022.38 = 27925.72\ m^3$

RUSHOON BROOK BREAK-UP PROFILE; Q=40CMS WITH IMPERMEABLE WALL

REF. : R. RUSHOON PRE B/U 10

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 40 (MA)(CH): 35									
ACCUMULATION									
5.100	1038.000	3.937	99.943	27.656	3.614	.400	.01052	4.162	.067
3.181	.880	.964	2.426	.00117	-.510	2.104	66.000	243.000	
6.000	972.000	4.330	117.657	38.760	3.036	.340	.00596	4.454	.062
2.579	.850	.527	3.431	.00042	1.010	1.556	91.000	243.000	
7.000	881.000	4.870	88.752	31.940	2.779	.451	.00593	5.009	.086
2.199	.791	.597	4.119	.00102	1.970	1.656	126.000	243.000	
8.000	755.000	5.472	88.398	34.381	2.571	.453	.00478	5.587	.090
1.954	.760	.493	4.861	.00105	2.610	1.585	89.000	243.000	
SECTION DE CONTROLE									
9.000	666.000	5.668	64.887	42.000	1.516	.616	.00221	5.728	.160
.708	.398	.254	5.668	.00093	3.360	1.081	315.000	243.000	

RUSHOON BROOK BREAK-UP PROFILE; Q=40CMS WITH IMPERMEABLE WALL

SECTION	LARGEUR	EPAISSEUR	LONGUEUR	VOL. DE GLACE	VOL. CUMULATIF
5.1	27.656	3.181	33	2903.05734	2903.05734
6	38.76	2.579	78.5	7846.19793	10749.2553
7	31.94	2.199	108.5	7619.16407	18368.4193
8	34.381	1.954	107.5	7222.58644	25591.0058
9	42.8	.708	202	6120.96897	31711.9748

VOLUME (APPARENT OU REEL) EN PLACE = ~~31711~~ METRES CUBES

$$3547.3 + \left(2903.06 \times \frac{43}{33}\right) + 7846.2 + 7619.16$$

$$+ 7222.59 + 6120.97 = \underline{46539.0}\ m^3$$

RUSHOON BROOK OPEN WATER PROFILE WITH IMPERMEABLE WALL; Q=40CMS

REF. : R. RUSHOON PRE B/U 10

SECTION NO T (GLACE)	POSITION T/H	NI. EAU (D)GLACON	AIRE NCRI. FOR.	LARGEUR ILI/TTH.	H. MOY TALWEG	VO VU	I DIST. AM.	NI. EN TO	F
DEBIT: 40 (MA)(CH): .05									
1.000	1500.000	.030	30.508	15.400	1.981	1.311	.00140	.118	.297
2.000	1358.000	.309	107.776	131.463	.820	.371	.00097	.315	.131
3.000	1177.000	.472	66.381	114.335	.581	.603	.00372	.491	.252
4.000	1098.000	.732	39.461	77.335	.510	1.014	.01162	.785	.453
5.000	1058.000	1.042	19.802	27.829	.712	2.020	.00993	1.250	.765
5.100	1038.000	1.349	28.624	29.504	.970	1.397	.00899	1.449	.453
6.000	972.000	1.888	22.997	37.455	.614	1.739	.01090	2.042	.709
7.000	881.000	2.918	26.504	32.445	.817	1.509	.00666	3.035	.533
8.000	755.000	3.786	30.592	35.296	.867	1.308	.00757	3.874	.448
9.000	666.000	4.422	25.432	36.037	.706	1.573	.01860	4.547	.598
ECTION DE CONTROLE									
10.000	351.000	7.270	16.825	29.255	.575	2.377	.00899	7.558	1.000
11.000	150.000	9.309	38.316	30.489	1.257	1.044	.00719	9.363	.297
12.000	.000	10.228	19.519	32.401	.602	2.049	.00000	10.441	.843