CANADA - MANITOBA
MEMORANDUM OF AGREEMENT

for

WATER QUANTITY SURVEYS
ANNUAL REPORT 1984/85

SEPTEMBER 1985

TO: Mr. R.A. Halliday
Administrator for Canada

Mr. T.E. Weber
Administrator for Manitoba

In accordance with Article XII of the Memorandum of Agreement for Water Quantity Surveys in the Province of Manitoba, signed May 16, 1975, we submit herewith the annual report for the fiscal year 1984/85.

Province of Manitoba

V.M. Austford
Manitoba Department
of Natural Resources

Government of Canada

R.A. Hale
Environment Canada

Members
Manitoba Coordinating Committee

September, 1985

Winnipeg, Manitoba

HIGHLIGHTS

The 1984 spring runoff was much below normal in sothern Manitoba due to a minimal winter snow cover. Many smaller streams produced only a trickle of water. With the help of above-normal precipitation during April, most controlled lakes and reservoirs rose to within their desirable range. Areas of Manitoba north of a line through The Pas and Berens River experienced an average to above-average spring runoff.

With regard to the major river systems, spring flows on the Assiniboine and Souris Rivers were well below normal. Red River spring flows were above average due to high runoff in the United States portion of the basin. Flows on the Winnipeg River and the Saskatchewan River were slightly above average.

Below normal precipitation and above normal temperatures in late April and May came to an abrupt halt during June. June weather was highlighted by several storm events which produced heavy rainfall, strong winds, lightning, hail and several tornadoes. Property damage occurred due to sewer backup, basement flooding and surface flooding in Winnipeg. Agricultural flooding occurred in the Elie, Winnipeg, Garland River and Fork River areas. Tornado damages were reported in the Riverton, Warren and Bissett areas. June 1984 was the second wettest for Winnipeg since records have been kept. Bucket surveys were

carried out by AES in the vicinity of Elie, Manitoba (20 miles west of Winnipeg) where record 24 hour precipitation amounts of 230 mm were measured. Intense precipitation in the Red River Valley resulted in the issuance of high water forecasts by the Manitoba Water Resources Branch twice during June.

Summer temperatures were above normal with below normal precipitation.

Winter arrived early in northern Manitoba. Heavy, wet snow in amounts up to 20 cms occurred the third week of September. Although warmer weather did follow in October, winter had set in earlier than normal by early November. The Saskatchewan River at The Pas experienced one of its earlier freezeups.

By mid-February, 1985, snow pack conditions were near normal over southern Manitoba and above normal in northwestern Manitoba. Below normal precipitation in February and March, 1985, coupled with a very gradual snow melt, resulted in a significant reduction of the snowpack with very little runoff. Runoff was generally over in southern Manitoba by the end of March.

The Coordinating Committee met three times during the year to coordinate the operation of the hydrometric and sediment networks. New station designations, based on national guidelines dated October 20, 1982, were implemented, effective

April 1, 1984. There was a net increase of 3 stations over the previous year's network. A total of 215 discharge, 81 water level and 24 sediment stations and sampling sites were operated by CWRB in 1984/85. For the first time under the Agreement, a hydrometric station (Wilson Creek near McCreary) operated by MWRB, was included in Schedule A for cost-sharing under the federal/provincial category. The MWRB also contributed data from 31 stations for 1984/85 as compared to 14 the previous year. The CWRB acquired an in house PDP 11/44 minicomputer system which was used for the computation of the 1984 streamflow and water level data. A new procedure for sharing the data processing costs which include the minicomputer system was agreed upon by the Coordinating Committee and is incorporated in the computations of the cost sharing of the 1984-85 program.

A cost sharing program between the Department of Natural Resources and Manitoba Hydro was initiated, allowing for CWRB to install 55 DCPs over the next 5 years with cost recovery.

There were 58 construction projects in Manitoba including: one station reconstruction, 14 upgrading projects, consisting mainly of electrical service installation and shelter insulation; 35 maintenance projects ranging from gauge well repair to cableway platform reconstruction; and the installation of 8 data collection platforms.

During 1984/85, approximately 760 data requests were received and answered, down somewhat from the previous year following a review of standing requests. Requests for current information represented 71% of the total. Historical data and special types represented 15% and 14% repsectively. The various agencies of the provincial government accounted for 29% of the data requests followed by federal agencies with 27% and private users with 13%. Engineering consultants, hydro electric companies, education institutions and others account for the remaining 31%.

The federal share of the 1984/85 program was computed at $788,356 with the provincial share being $441,632. The Schedule D value for 1984/85 had been estimated at $450,000. During the year it was agreed to readjust the amount to $443,823 to cover operations, construction and instrumentation costs. This was done and combined with an adjustment of $12,177 for the 1983/84 fiscal year resulting in $456,000 being paid by Manitoba during the 1984/85 fiscal year. Schedule D for the 1985/86 fiscal year was estimated at $545,000, with $78,500 of it being applied to the installation of real time DCP systems.

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1.0 INTRODUCTION

This is the tenth Annual Report summarizing the activities of the Canada-Manitoba Coordinating Committee established by the Memorandum of Agreement in 1975. The Agreement (Appendix I) includes four schedules. Schedule A is a list of active water quantity stations operated in Manitoba under the terms of the Agreement showing their responsibility classification as "Federal", "Federal-Provincial" or "Provincial". Schedule B defines items that are to be included for cost-sharing under the Agreement while Schedule C describes procedures for computing annual payments. Schedule D indicates the annual transfer payment from Manitoba to Canada. Schedules A to C are attached as Appendices II to IV. Schedule D for 1984/85 is presented on page 26.

The Agreement is administered by senior managers, the Regional Director of Inland Waters Directorate, Western and Northern Region for Canada, and Director of Water Resources Branch for Manitoba. The Administrators in turn appoint a Coordinating Committee to plan and review network operations, to review Schedule A and to approve the annual construction program. The Coordinating Committee also prepares Schedule D annually for approval by the Administrators.

The report contains brief summaries from the three Canada/Manitoba and one National Coordinating Committee

meetings. Operational problems, station reclassifications, additions/deletions, and network planning aspects are also discussed.

Appendix V contains the guidelines for designating responsibility for stations in Schedule A. Appendices VI to IX contain more detailed station and financial information required for computing cost/share for 1984/85 and for estimating 1985/86 Schedule D.

2.0 SUMMARY OF OPERATIONAL CONSIDERATIONS

2.1 COORDINATORS MEETINGS

The Coordinators of the Canada/Manitoba Agreement met three times during the year to coordinate the operation of the hydrometric network. The Canada Water Resources Branch (CWRB) provided the secretarial services to the Committee. Chairmanship was on a rotating basis. Coordination also took place through correspondence, telephone conversations, and discussion at other related meetings. The Administrators did not meet. There was a National Meeting of Coordinators hosted by CWRB in Winnipeg.

Canada/Manitoba Coordinators' Meeting - April 17, 1984

The spring meeting was largely one of information and coordination of operational items with a few items of financial significance. The redesignations of the water quantity survey stations for the 1984/85 Schedule A was accepted. The new designations followed the national guidelines adopted October 20, 1982, at the National Coordinating Committee Meeting and did not produce any change in the cost share categories. The station Wilson Creek near McCreary was brought into Schedule A effective April, 1984, as a Federal-Provincial station. This is the first station operated by MWRB to become cost shareable. A proposal for the cost sharing of CWRB's recently installed

minicomputer was presented for consideration and adjustments were made to the capital acquisition plan as the actual provincial budget was below the Schedule D amount.

There were presentations and review of the construction program, (to which one project was added), the DCP deployment plan, the coordination of the spring runoff activities and information exchange, the review of MWRB's data contributions of 31 stations for 1984 and the data review for 3 sets of historical data. There were also reports on the status of upcoming meetings and conferences of mutual interest.

Canada/Manitoba Coordinators' Meeting - October 22, 1984

The Coordinators discussed the upcoming National Coordinating Committee Meeting and the implications of the DCPs and in-house computers. They commented favourably on the 1983/84 Cost Share Report and the draft national compendium report. The financial situation had been reported in the 1983/84 report and in correspondence with an adjustment of $12,177 for 1983/84 to be paid by MWRB and a projection of 1984/85 expenditures to be $6000 over the schedule D amount even with the deferring of $20,000 of the capital program. These increases were noted as being justifiable but still a concern. The estimates for 1985/86 were reported with the inclusion of the not-yet-approved Manitoba Hydro/MWRB DCP agreement.

The general condition of the network was discussed as a recently completed program evaluation by CWRB confirmed an earlier concern that in comparison to Saskatchewan and Alberta, Manitoba's funding of construction activities was low and the state of the network was below standard. There was also discussion of the review of contributed data and the relaxation of CWRB's review requirements for power plant data and the resultant lack of immediate need for a local publication for "non standard" data.

The designation of the station Wilson Creek near McCreary was clarified as F/P3 and the station Winnipeg River at Lac du Bonnet changed from P2 to P1. The name for Fish Lake near Meleb was changed to Fish Lake at Outlet Control Structure near Meleb. These changes were effective April 1, 1984. There was further progress on the cost sharing procedure for the CWRB minicomputer and a mechanism was set up for transferring information on reservoir operations and outflows. The agenda for the National Coordinators Meeting was discussed and the progress reported on 3 data reviews.

Canada/Manitoba Coordinator's Meeting January 19, 1985

The meeting was largely one of preparation for the 1985/86 fiscal year and the upcoming National Coordinator's meeting. Based on projections of the provincial share of the 1984/85 program the total to be paid by Manitoba to Canada in 1984/85

was set at $456,000. The proposals for station maintenance, upgrading and other construction for 1985/86 were being developed through correspondence.

MWRB and Manitoba Hydro had signed an agreement to provide for the cost sharing of the installation of satellite DCPs. The implementation of approximated 55 DCPs over 5 years would be by CWRB through a 3 party task force. It was decided that this DCP implementation program would be part of the Water Quantity Agreement and be a separate item in Schedule D. The Schedule D total for 1985/86 was estimated at approximately $545,000 with the exact amount to be set later when a better estimate was available for the DCP implementation program for 1985/86.

A proposal for the procedure of calculating the cost sharing the CWRB minicomputer was accepted. This procedure is described in Appendix IX. It included a ceiling that was based on 1983/84 pre-minicomputer data computation costs and annual inflationary increases.

The positions of, and implications for, CWRB and MWRB related to several of the agenda items of the National Coordinating Committee meeting were discussed. Other discussion items included the development of a 5 year station upgrading plan, a network evaluation and plan being conducted by CWRB and the Canadian DCP Users Coordinating Group. There was information

exchange and decisions reached on data reviews, station relocations (Assiniboine River near Holland), other programs or meetings of mutual interest such as the Canadian Water Resources Association and on the coordination of spring breakup operations.

National Coordinating Committee Meeting - February 6, 1985

The Seventh National Coordinating Committee Meeting was held in Winnipeg, February 6, 1985, and hosted by CWRB, Winnipeg. All provincial members except Prince Edward Island and Nova Scotia attended, with a full complement of federal members. Major agenda items included the Compendium of Standardized Practices, Interpretations and Procedures; the Level of Service in Real Time Data Acquisition, Status and Cost-Sharing of Minicomputer System; and identification of agreement articles which may be subject to interpretation and change. Agreement in principle to distribute a first edition of the Compendium was achieved. The development of a position paper by CWRB of a Level of Service in Real Time Data Acquisition generated a high degree of interest from all attendees. The timeliness of its development was supported by the provinces and CWRB agreed to proceed with its preparation. Technological advances in equipment data processing systems will have an impact on water quantity agreements. Discussion ensued on the identified potential agreement articles which may be affected. CWRB stated the intent, that the provision of the basic data storage device (equivalent to A 71 recorder) would remain the responsibility of

the operator. The spirit of cooperation was evident during the meeting and as the Chairman stated it bodes well for the future of water resource management in Canada.

2.2 OPERATIONAL ACHIEVEMENTS & PROBLEMS

2.2.1 Achievements

A total of 215 discharge, 81 water level and 18 sediment station along with 6 miscellaneous sediment sampling sites were operated by CWRB.

There were 58 construction projects in Manitoba, including: the reconstruction of one station; 14 upgrading projects, consisting mainly of electrical service installation and shelter insulation; 35 maintenance projects; and the installation of 8 satellite data collection platforms.

A cost sharing program between the Department of Natural Resources and Manitoba Hydro was initiated, allowing for CWRB to install 55 DCPs over the next 5 years with cost recovery.

During 1984/85, approximately 760 data rquests were received and answered, down somewhat from the previous year following a review of standing requests. Requests for current information represented 71% of the total. Historical data and special types represented 15% and 14% respectively. The various agencies of

the Provincial government accounted for 29% of the data requests followed by Federal agencies with 27% and private users with 13%. Engineering consultants, hydro electric companies, education institutions and others account for the remaining 31%.

The in-house minicomputer system became fully operational in July 1984. The minicomputer was used for the computation of the 1984 streamflow and water level data. This in-house system of automated computations has reduced computation time considerably once the learning phase was over. Purchase of 2 large disk drives has increased the storage capacity of the system from 32 to 442 online megabytes.

The existing procedure for the computation of discharges for the Saskatchewan River at The Pas was reviewed and, although adequate, was found to have some problems. A new computerized procedure was devised for computing discharge under the conditions of dynamic rapidly changing discharge and backwater from a downstream power reservoir. The procedure and report "Computation of Open Water Discharges" was accepted by the Prairie Provinces Water Board Committee on Hydrology subject to the inclusion of some short term water level monitoring stations in the report's recommendations.

2.2.2 Problems

Field survey positions were understaffed by two persons at year end. For the year, person year utilization was only 19.9 p.y.

out of the 21 p.y. assigned for field operations. Approximately 67% of hydrometric field staff were participating in the Career Development Program for Hydrometric Survey Technicians. As was the case the past two years the 1984/85 operation and maintenance program was achieved largely by the extra effort of senior technicians, line supervisors and area engineers. During the 1984/85 year, Mr. G.R. McCulloch acted as Regional Engineer from April 1 to May 7, 1984, and Mr. D.G. Hanson from May 8 to December 31, 1984. Mr. J.G. Way, incumbent Regional Engineer, returned to Winnipeg from his acting assignment in Regina on January 1, 1985.

Vandalism and theft accounted for approximately $3,500.00 in costs during 1984/85.

Problems with the operation of Data Acquisition and Telemetry Systems (DATS) continued although to a lesser degree than the past year. A one year evaluation of all systems performance was completed in December, 1984, and provided to the manufacturer, Canadian Applied Technology. No response has been received to date. In the interim, the acquisition of future DATS units is not recommended.

The timing of gate changes at provincially operated control structures had created minor difficulties to CWRB in scheduling field trips to downstream gauging stations. An arrangement between CWRB and MWRB was established whereby prior notification

of gate changes is given to CWRB to assist in trip planning. Measurements obtained are in turn provided to MWRB to verify target releases. Additional information for other structures is provided after the fact twice yearly to assist CWRB in computing daily discharge data.

2.3 NETWORKS

There was little change in the network at the beginning of the year. Four stations entered Schedule A and one was dropped. Of the new ones, 2 were reactivations of recently discontinued stations. These changes shown in Figure 1 and described in the 1983/84 annual report are:

Discontinued

05MG010 Oak River near Bradwardine

New

05EB006 Russell Lake near Herriot

05PF062 Winnipeg River near Lac du Bonnet

05NG026 Souris River near Minto (Sediment Sampling only)

05MG004 Oak River near Rivers

During the year, Wilson Creek near McCreary, operated by MWRB, was brought into Schedule A effective April 1, 1984, as an F/P3 station for seasonal water level data. This is the first station operated by MWRB to be included in Schedule A. The F/P3

designation was considered appropriate as the station was a remnant of the federal/provincial Headwater Control Committee.

Figures 3 and 4 provide a visual breakdown of the hydrometric network in terms of drainage area size and years of record versus the number of active and discontinued stations. Figure 3 shows that there is very little information on streams with drainage areas under 50 sq. km. Figure 4 shows that the majority of active stations have a range of between 6 and 30 years of record. These figures also indicate the substantial data base available at discontinued stations.

All stations underwent a change in designation April 1, 1984. The new station designation definitions, presented in Appendix V, dated October 20, 1982, came into effect for 1984/85. By prior agreement, there was no net change in cost share category, and, in fact, no change in cost share category occurred for any station. Figure 5 presents the annual station classifications from 1975 to 1984.

Following a year long field investigation the station Assiniboine River near Holland was moved 2 km downstream for better record recovery. The name for Fish Lake near Meleb was changed to Fish Lake at Outlet Control Structure near Meleb because during winter low water periods the data did not represent the elevation of the lake as a whole.

The network continued to be upgraded. The annual construction report identified 14 projects of an upgrading nature, largely the installation of electrical power, and the installation of 8 DCPs.

MWRB increased their contribution to the network by contributing their 1984 water level data for 31 stations to the federal data base. The data for these stations was reviewed at a joint meeting. This was an increase of 17 stations from the previous year's 14 stations and is the reason for the increase in "Historical Development at Hydrometric Stations" in Figure 2.

Provincial Network

In addition to participating in the operation of the Federal hydrometric network, the Province of Manitoba operates numerous additional hydrometric stations which are not included in the hydrometric agreement. Most of these stations are used for operation of Provincial water control structures, or to supplement the Federal network during flood events. During 1984/85 the Province operated a total of 114 water level stations and one discharge station. Of these, nine water level stations were operated all year and the remaining 105 were operated during the open water season.

2.4 NETWORK PLANNING

The CWRB districts within the Western and Northern Region completed a program evaluation during the year. A report was printed by the Inland Waters Directorate office in Regina. The costs of the many components of CWRB work were evaluated and found to be similar throughout the NWT, Alberta, Saskatchewan, N.W. Ontario and Manitoba. The report noted a lower standard of gauging station in Manitoba and recommended an upgrading.

A network evaluation and plan was begun by the CWRB offices within the Region. The terms of reference call for the definition of the federal and provincial requirements for data, the evaluation of those requirements against the existing network and a plan to adjust the network to meet those needs. Completion of the evaluation and plan is expected for January 1986.

The CWRB, MWRB and Manitoba Hydro Task Force for the DCP Implementation Program is developing a plan of network adjustments, construction instrumentation and installation for 32 DCPs by March 31, 1989. The plan brings 10 Manitoba Hydro stations into the CWRB network and Schedule A and involves $711,000 in total.

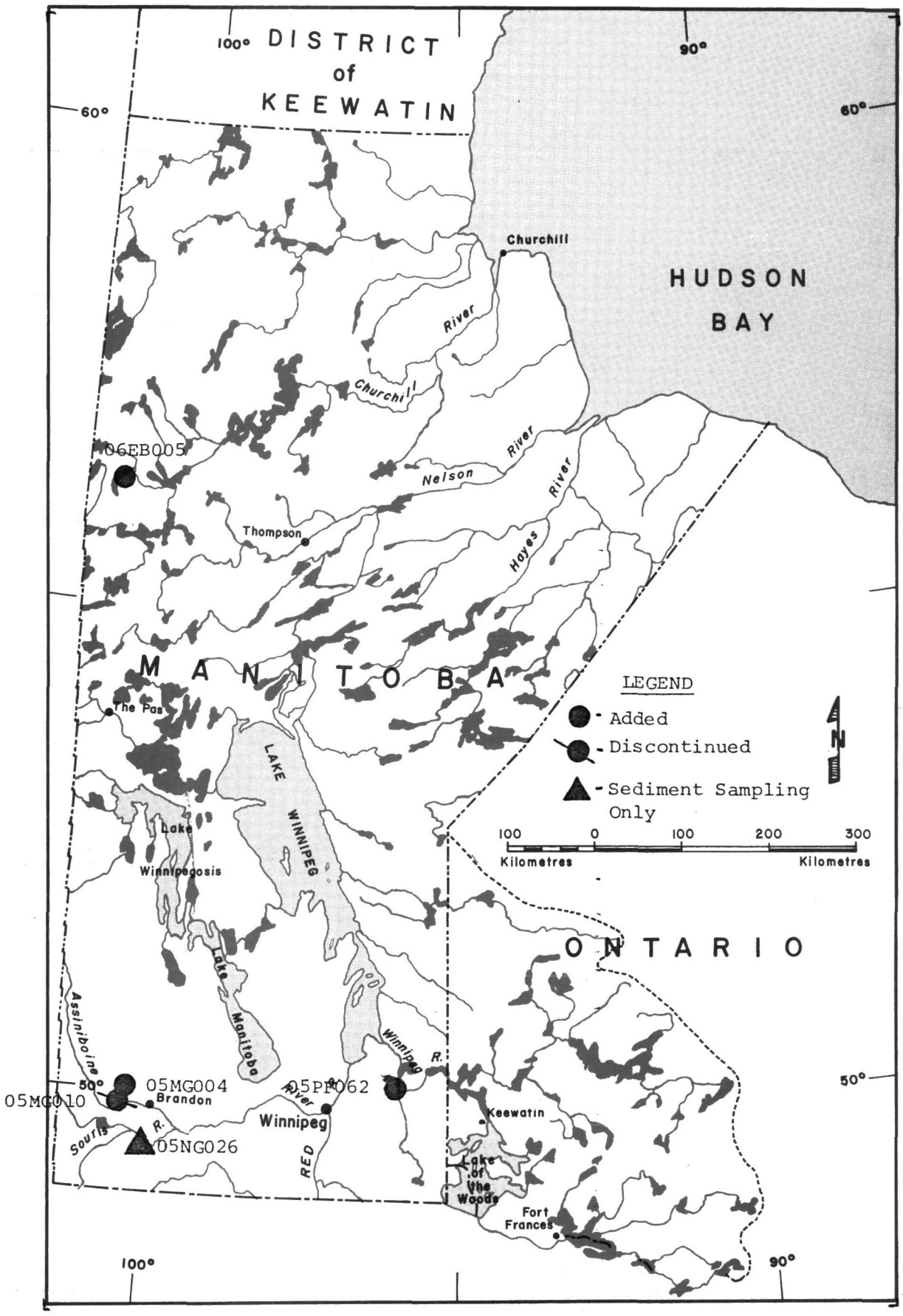

FIGURE 1 - CHANGES TO WATER QUANTITY NETWORK EFFECTIVE APRIL 1, 1984

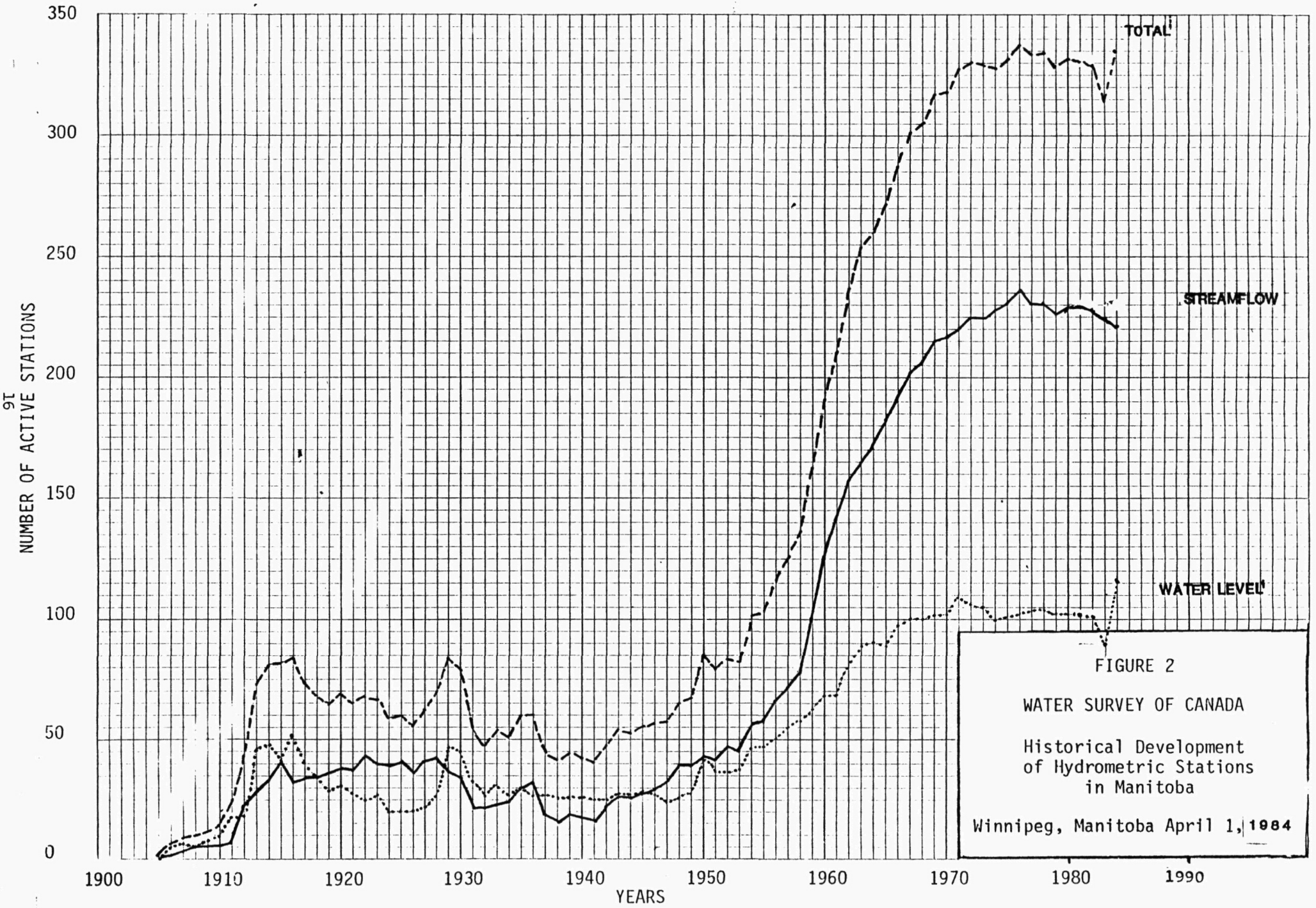

FIGURE 2

WATER SURVEY OF CANADA

Historical Development
of Hydrometric Stations
in Manitoba

Winnipeg, Manitoba April 1, 1984

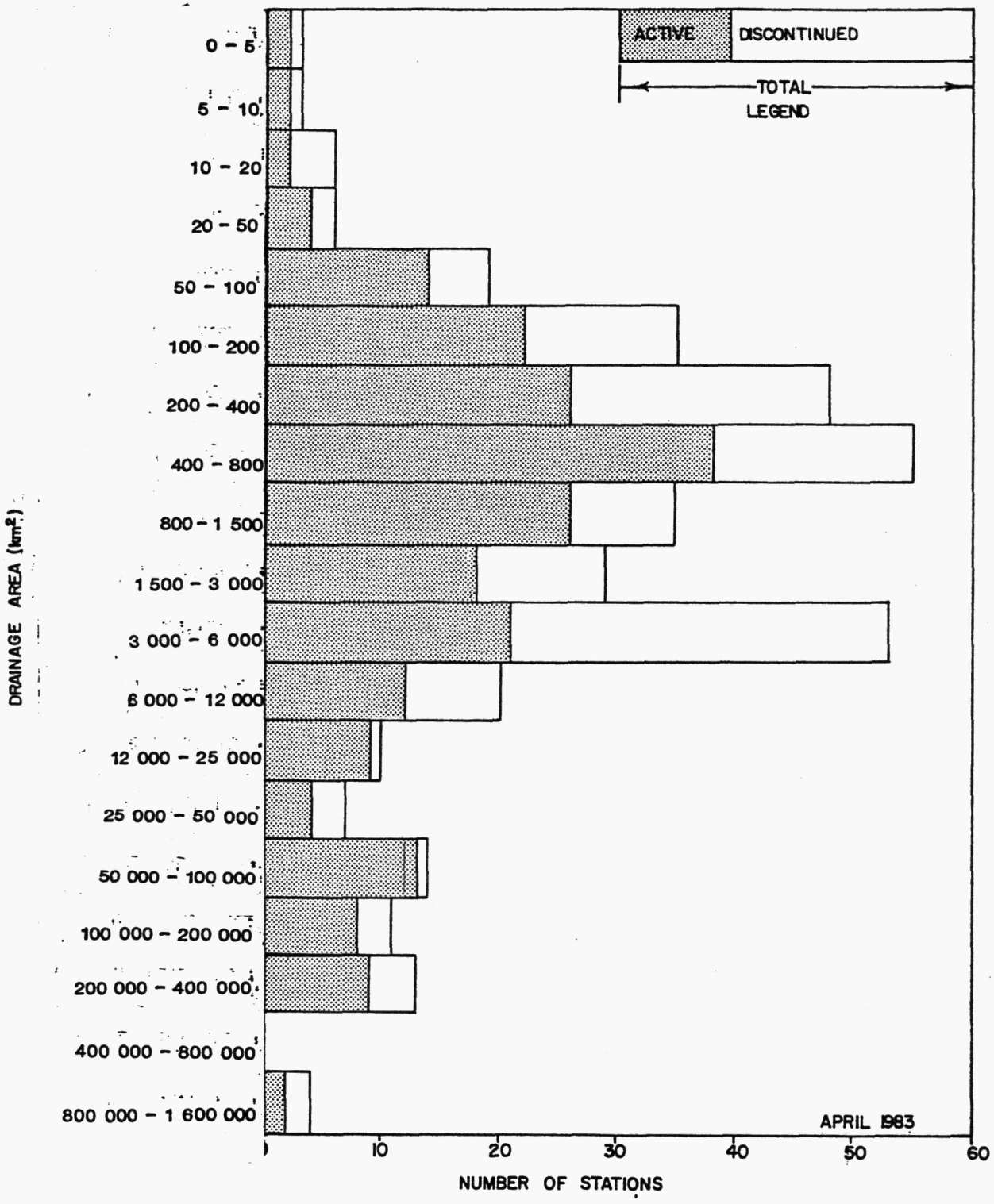

FIGURE 3 Sub-Division of Station by Drainage Area Size

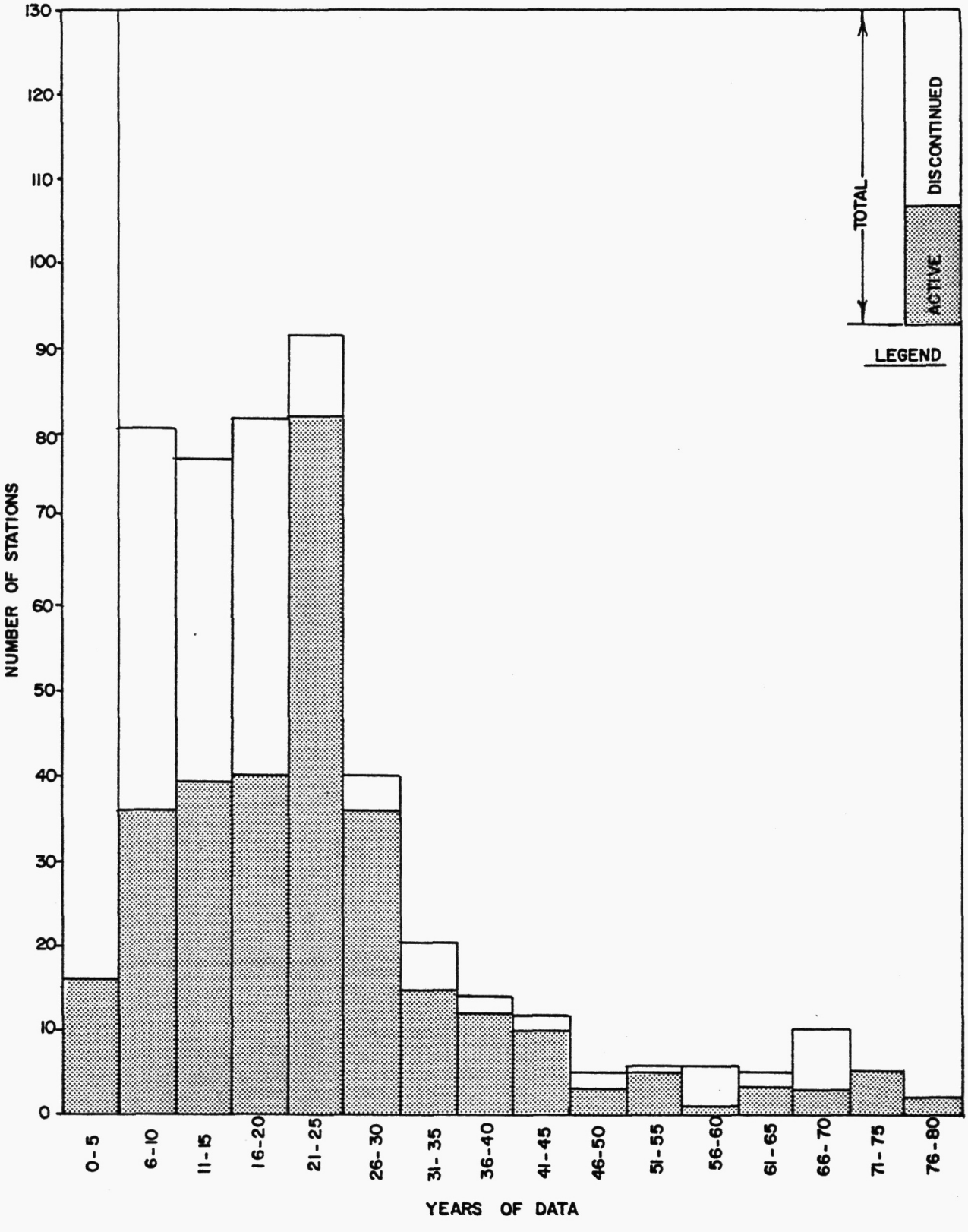

FIGURE 4: Histogram of Gauging Station Maturity— Manitoba

(April, 1984)

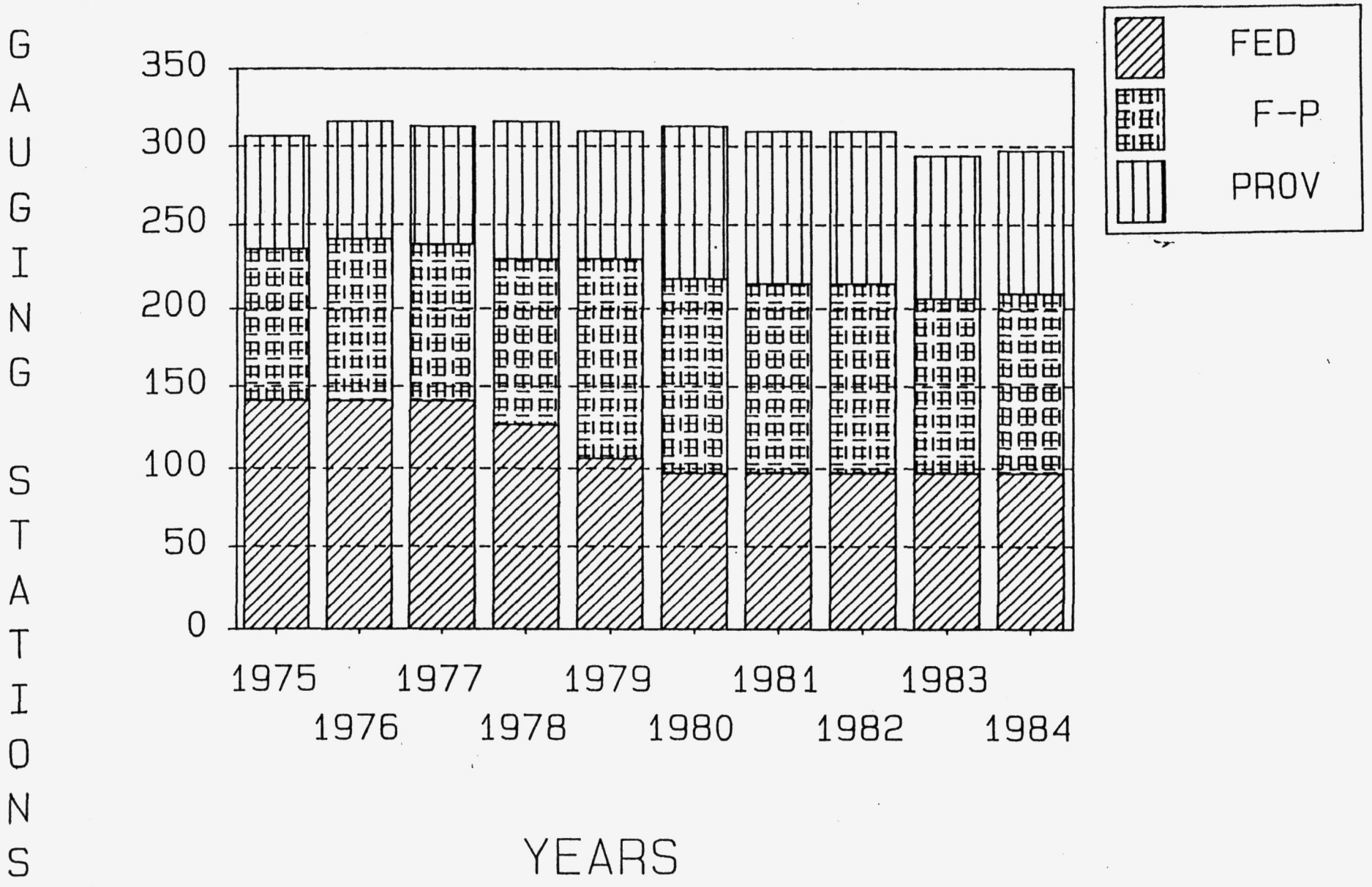

FIGURE 5 STATION CLASSIFICATION ON APRIL 1 OF EACH YEAR

(Water Survey of Canada operated stations only)

3.0 COST OF OPERATION

The cost summary, as presented in Table 1, consists of two parts:

Part A: Unit Cost Summary - presents the breakdown by salary, operations, capital and total costs of operating a station unit for the three station categories shown.

Part B: Total Cost Summary - shows breakdown of salary, O & M and capital depreciation costs according to Federal, Federal-Provincial and Provincial station classification.

There were two changes in computational procedure from last year. In the first instance, based on the procedure in Appendix IX, which was agreed upon by the Coordinating Committee, data processing station unit costs were computed separately in Table VI-6. A five percent increase was applied to last year's costs which resulted in a total of $29 452. This procedure also takes into account the sharing of the CWRB minicomputer system. In order to be comparable to previous years cost data information, these computed data processing station unit costs were then added to the other O & M station unit costs in Table VI-7, to derive total O & M station unit costs which are then used in Table 1, Part A, "Unit Cost Summary", in this section of the report.

TABLE 1
CANADA-MANITOBA WATER QUANTITY PROGRAM
COST SUMMARY 1984/85

Part A - Unit Cost Summary

Station Category	No. of Station Units	Salary $	Operations $	Capital Depreciation	Total #
1. Hydrometric Conventional Access	1.0	2,361	1,183	276	3,820
2. Hydrometric Remote Access	1.0	3,377	3,543	276	7,196
3. Sediment Program (incremental cost only)	1.0	2,125	487*	110	2,722

*not including sediment lab costs

Part B - Total Cost Summary

Station Category Classification	No. of Stations	No. of Station Units	Salary $	Operations $	Capital Depreciation	Total #
Federal						
Conventional access	70	55.15	130,209.15	65,242.45	15,221.40	210,673.00
Remote access	27	22.05	74,462.85	78,123.15	6,085.80	158,671.80
Sediment Program	12	11.50	24,437.50	5,600.50*	1,265.00	31,314.50
(incremental cost only)			229,109.50	148,966.10*	22,572.20	400,659.30
Federal-Provincial						
Conventional Access**	84	61.50	145,201.50	72,754.50	16,974.00	234,930.00
Remote Access	27	18.00	60,786.00	63,774.00	4,968.00	129,528.00
Sediment Program	6	2.50	5,312.50	1,217.50*	275.00	6,805.00
(incremental cost only)			211,300.00	137,746.00*	22,217.00	371,263.00
Provincial						
Conventional Access	83	52.30	123,480.30	61,870.90	14,434.80	199,786.00
Remote Access	6	2.40	8,104.80	8,503.20	662.40	17,270.40
Sediment Program	5	2.25	4,781.25	1,095.75*	247.50	6,124.50
(incremental cost only)			136,366.35	71,469.85*	15,344.70	223,180.90
Sub-Totals			$576,775.85	$358,181.95*	$60,133.90	$995,103.20

* not including sediment lab costs
** The federal/provincial station operated by MWRB has been included in these computations.

The second change in computation procedure was required due to inclusion of the station Wilson Creek near McCreary, operated by MWRB, into Schedule A under the federal-provincial category. To compute the station unit costs in Table 1 part A, the MWRB operated station was excluded in the detailed unit cost computations in Appendix IV in order to derive the CWRB unit costs. The unit cost of the MWRB operated station is then assumed to be the same. However, in order to determine the total cost of the water quantity program the MWRB station is inserted in Part B of Table 1. The cost summary information of total operating costs from Table 1 was combined with sediment laboratory analysis, construction and instrumentation costs and the federal and provincial cost shares were determined as depicted in Table 2. The total federal share of the 1984/85 costs was computed at $788,356 which includes $17 600 for eight water level recorders while the provincial share was computed at $441,632. The provincial share included a credit of $954 to the province for operating the Wilson Creek near McCreary station. Although the original Schedule D value was $450 000, this amount was revised to $443 823 as agreed by the Coordinating Committee at their January 19, 1985 meeting. With the adjustment of $12 177 to balance the 1983-84 books being applied during 1984/85, the total actual provincial payment during 1984/85 was $456 000.

Since the net payment for 1984/85 year was $443,823 while the provincial share of the actual costs was $441,632 a credit

TABLE 2

CANADA-MANITOBA WATER QUANTITY PROGRAM
COST-SHARE SUMMARY 1984/85

FEDERAL SHARE HYDROMETRIC COSTS = $400,659 + $371,263 / 2	=	$586,290
FEDERAL SHARE SEDIMENT LAB COSTS	=	20,124
FEDERAL CONSTRUCTION COST	=	49,992
FEDERAL INSTRUMENTATION COST	=	131,950
TOTAL FEDERAL SHARE	=	$788,356
PROVINCIAL SHARE HYDROMETRIC COSTS = $371,263 / 2 + $223,181	=	$408,812
PROVINCIAL SHARE SEDIMENT LAB COSTS	=	4,900
PROVINCIAL CONSTRUCTION COST	=	26,923
PROVINCIAL INSTRUMENTATION COSTS	=	1,950
PROVINCIAL CREDIT FOR OPERATING AN 8 MONTH WATER LEVEL STATION	=	- 954
TOTAL PROVINCIAL SHARE	=	$441,632
Provincial payment received for 1984/85 operating year	=	$443,823
Thus adjustment to be made to 1985-86 provincial invoice is	-	$ 2,191

adjustment for $2,191 will be applied to the provincial invoices in 1985/86 year to balance out the books for 1984/85. Furthermore, in addition to the provincial payment, Manitoba expended $114,295 for additional hydrometric data collection at stations operated by MWRB.

Under a separate Memorandum of Understanding, Manitoba paid $7,580 in 1984/85 for CWRB to operate the Domain and Mannes Drain stations.

Table 3 contains a comparison of station unit costs over the past six years. The average station unit costs in Table 3 show a 6.5% increase in conventional access station costs, a 7.2% decrease in remote access station costs, and a 4.4% decrease in incremental sediment station unit costs. When considering only O & M and capital depreciation unit costs the percent changes over 1983/84 are +8.1%, -12.6%, and -12.7% respectively for conventional access, remote access and incremental sediment program. Changes affecting the 1985/86 Schedule A and the computations of the 1985/86 Schedule D estimate of $545 500 are contained in Appendix VII.

TABLE 3

AVERAGE STATION UNIT COST IN MANITOBA

A. Salaries, O & M and Capital

	1984-85	% Change over previous year	1983-84	1982-83	1981-82	1980-81	1979-80
Conventional Access (Q12)	3820	+6.5	3585	3345	3079	2964	2865
Remote Access (Q12)	7196	- 7.2	7752	6106	6038	5300	4689
Sediment (incremental cost only)	4262	-4.4	4460	4272	3246	3473	3422

B. O & M and Capital Only

Conventional Access (Q12)	1459	+ 8.1	1349	1168	1087	1177	1055
Remote Access (Q12)	3819	-12.6	4368	3170	3312	2848	2555
Sediment (incremental cost only)	2137	-12.7	2448	2312	1453	1865	1699

Unit Weight

Q 12 = 1.00 S12 = 1.00
Q8 = 0.75 S8 = 0.75
H12 = 0.40
H8 = 0.25

Note: 1. To calculate average cost for any type of station multiply the unit cost by the appropriate unit weight.

2. The sediment incremental unit cost includes an average sediment laboratory analysis unit cost.

SCHEDULE D

This schedule provides a summary of the annual payment. The details of the calculations of operation and construction are available and have been jointly reviewed by officers of each party.

ANNUAL PAYMENT FOR 1984 - 1985 TO BE PAID TO CANADA BY MANITOBA

	Operation	Construction	Total
a) Streamflow and water level installations	$389,000	$44,000	$433,000
b) Sediment installations	17,000		17,000
ANNUAL PAYMENT	$406,000	$44,000	$450,000

ADMINISTRATOR FOR MANITOBA

(Signature)

Director
Water Resources Branch
Department of Natural Resources

ADMINISTRATOR FOR CANADA

D. A. Davis
(Signature)

Regional Director
Inland Waters Directorate
Environment Canada

Appendix I

Memorandum of Agreement

MEMORANDUM OF AGREEMENT

BETWEEN:

The Government of Canada, hereinafter called "Canada", represented by the Minister of the Environment

OF THE FIRST PART

-and-

The Government of the Province of Manitoba hereinafter called the "Province", represented by the Minister of Environment

OF THE SECOND PART.

WHEREAS co-operative water quantity surveys have been carried on for many years under various informal federal-provincial agreements in the Provinces of Canada by the Water Survey of Canada of the Department of the Environment, for the purpose of securing co-ordinated and standardized basic data to facilitate resource planning and management in general and the design and implementation of projects related to navigation, hydro-electric development, irrigation, drainage, flood control, recreation, domestic and industrial water supply and other purposes:

AND WHEREAS the Governor-in-Council has by Order-in-Council No. PC 1975-1/72 dated January 28, 1975, authorized the Minister of Environment to execute this agreement on behalf of Canada;

AND WHEREAS the Lieutenant Governor in Council has, by Order-in-Council No. O.C. 282/75 dated April 30, 1975 authorized the Minister of Environment to execute this agreement on behalf of the Province subject to funds being voted by the Legislative Assembly.

NOW THEREFORE this agreement witnesseth that water quantity surveys in the Province and financing thereof shall be continued and maintained upon the following basis;-

INTRODUCTION

DEFINITIONS

a) ANNUAL PAYMENT - a sum, agreed to by both parties in advance of the fiscal year, which shall represent the costs of operation and construction of water quantity survey stations.

b) CONSTRUCTION - includes the construction of new water quantity survey stations and the maintenance, repair and reconstruction of existing water quantity survey stations.

c) CONSTRUCTION PERSONNEL - includes foremen and labourers on full time duty as well as engineering and technical staff and part time supervisory duty or reconnaissance assignment.

d) FIELD PERSONNEL - includes hydrometric supervisors and field technicians on full time duty as well as engineering and technical staff on temporary assignment.

e) NETWORKS - an organized system of gauging stations for collection of water quantity survey data.

f) OPERATING PARTY - either party to this agreement which operates water quantity survey stations.

g) PUBLISHED DATA - includes streamflow, water level and sediment data. The data is to be available in publications and computer compatible data files.

h) SEDIMENT STATIONS - any location where surveys are undertaken to collect data on suspended sediment or bed material or bed load data singly or in combination. Water temperature data is to be collected.

i) WATER QUANTITY SURVEY STATIONS - any location where surveys are undertaken to collect streamflow or water level or suspended sediment or bed material or bed load data singly or in combination Water temperatures data may be collected.

ARTICLE I

Each water quantity survey station presently in operation has been identified according to the designation federal, federal-provincial or provincial. The current designation is given in Schedule A, hereto attached. Schedule A may be revised to include a change in the designation of a station, the addition of new stations or the deletion of stations as agreed by the Co-ordinating Committee (Article XII) and approved by the officials named in Article XIII.

OPERATIONAL CONSIDERATIONS

ARTICLE II

Canada will construct and operate and pay the cost of construction and the annual cost of operation of water quantity survey stations which have been designated as federal. Where Canada deems it desirable in the interest of efficiency of operation, the Province may be requested to construct and operate some federal water quantity survey stations. If the Province agrees to such agreements, Canada would in such cases reimburse the Province for the cost of construction and annual cost of operation in accordance with Article VI.

ARTICLE III

Where Canada constructs and operates water quantity survey stations designated as federal- provincial, the Province will reimburse Canada for 50% of the construction costs and 50% of the annual cost of operation Where the Province constructs and operates these stations, Canada will reimburse the Province 50% of the construction costs and 50% of the annual cost of operation in accordance with Article VI.

ARTICLE IV

If requested by the Province, Canada will construct and operate water quantity survey stations designated as provincial provided the Province reimburses Canada for the construction cost and annual cost of operation. If the Province constructs and operates these stations the Province will assume the cost of construction and operation in accordance with Article VI.

ARTICLE V

a) The operating party shall provide the staff to meet its responsibilities under this agreement.

ARTICLE V (Con't)

b) Canada will at its own expense publish data from stations that it operates. Canada will on request at its own expense, publish data from stations operated by the Province providing the data meets national standards.

c) Water quantity surveys under this agreement shall be carried out to national standards in field procedures, equipment and instrumentation, data compilation and will use national guidelines for station designations. Such standards and guidelines shall be developed and maintained by Canada in consultation with all of the Provinces.

d) Canada and the Province shall work together to take advantage of technological advancements which improve the quality of data and the efficiency of standard procedures and to develop methods and techniques to assist in planning water quantity survey networks.

e) Canada at its own expense will provide calibration service for water quantity survey velocity instruments for both parties.

FINANCIAL CONSIDERATIONS

ARTICLE VI

a) Procedures for computing the annual payment are given in Schedule C.

b) The annual payment for 1975-76 is set out in Schedule D. The annual payment for subsequent years shall be determined according to the terms of this agreement and the procedures as set out in Schedule C.

c) Annual operation costs, except for sediment stations, will be computed using average annual water quantity survey station costs and the number of stations to be operated. The average annual water quantity survey station costs shall be recomputed annually according to the items listed in Schedule B.

d) Annual construction costs, except for sediment stations, will be the cost of constructing new water quantity survey stations plus repairs to and major reconstruction of existing water quantity survey stations.

ARTICLE VI (Continued)

e) The annual operation costs for sediment stations will be the summation of the individual station operation costs.

f) The annual construction costs of sediment stations will be the cost of constructing new sediment stations plus repairs to and major reconstruction of existing stations.

ARTICLE VII

a) The party operating the water quantity survey stations in accordance with Articles II, III and IV, will be responsible for providing and paying the total cost of the water level recording equipment.

b) All costs associated with the purchase, installation and operation of specialized water quantity survey equipment will be paid for by the party or parties requiring service.

ARTICLE VIII

Canada or the Province, depending on the operating responsibilities shall submit invoices for one-quarter of the annual payment on July 1st of each fiscal year in accordance with the annual payment set out in Schedule D. Payment is to be made as soon as possible after receipt of each quarterly claim but in no case later than March 31st of each year.

ARTICLE IX

Except as agreed by the parties hereto where both parties have an interest, either operational or financial, the annual net change in the total number of water quantity survey stations, including federal, federal-provincial and provincial, as set out in Schedule A, is not to exceed 6% in any year.

ARTICLE X

Each party constructing or operating a water quantity survey station or stations shall keep complete records of all shareable expenditures made pursuant to this agreement and shall support such expenditures with proper documentation. Canada and the Province upon request shall make these records and documents available to auditors appointed by each other.

CO-OPERATION

ARTICLE XI

There shall be a free exchange of water quantity survey data between Canada and the Province. The party operating the water quantity survey station shall retain originals or a microfilm copy of observations, measurements, recorder charts and computations and these are to be available to the other party on request.

ARTICLE XII

The officials named in Article XIII shall establish a Co-ordinating Committee representing each of the parties affected by this agreement The Co-ordinating Committee shall be responsible for:

a) Planning and the continuing review of water quantity survey networks, including addition and deletion of all stations within Provincial boundaries.

b) Determining and reviewing the designation of water quantity survey stations using national guidelines which may from time to time be changed, subject to ratification by Canada and all of the Provinces.

c) Assuring the maintenance of standards in procedures, data compilation and instrumentation.

d) Reviewing annual operating costs and establishing average annual station costs, as per Article VI for revision of Schedule D.

e) Preparation annually of new Schedules A and D which with the approval of the officials named in Article XIII would apply for the second and each subsequent year of the agreement.

The committee shall meet at least once a year and shall report to the officials named in Article XIII.

ADMINISTRATIVE ARRANGEMENTS

ARTICLE XIII

This agreement is to be administrated for Canada by the Regional Director of the Inland Waters Directorate located at Regina, Saskatchewan, and for the Province by the Director, Water Resources

ARTICLE XIII (Cont'd)

Branch, Department of Mines, Resources and Environmental Management, located at Winnipeg, Manitoba.

IMPLEMENTATION

ARTICLE XIV

The parties hereto agree that water quantity surveys will be carried out as indicated in Articles I to XIII inclusive and the Schedules attached hereto.

PERIOD OF AGREEMENT

ARTICLE XV

This agreement shall become effective and binding on the parties upon the first day of April, 1975.

The agreement may be terminated by Canada or the Province on March 31st of any year provided that eighteen (18) months notice in writing is given. The agreement may be revised with the consent of the Governor-in-Council and the Lieutenant Governor-in-Council.

IN WITNESS WHEREOF the Honourable Jeanne Sauvé, Minister of Environment has hereunto set her hand on behalf of Canada, and the Honourable Sidney Green, Minister of Mines, Resources and Environmental Management has hereunto set his hand on behalf of the Province of Manitoba.

Signed on behalf of Canada by the Honourable Jeanne Sauvé, Minister of Environment)

IN THE PRESENCE OF)

Signed on behalf of the Province of Manitoba by the Honourable Sidney Green, Minister of Mines, Resources and Environmental Management)

IN THE PRESENCE OF)

APPENDIX II

SCHEDULE A, 1984-85

Listing of Stations

1984-1985 SCHEDULE A

OF

MEMORANDUM OF AGREEMENT

BETWEEN

DEPARTMENT OF THE ENVIRONMENT

MANITOBA - NORTHWESTERN ONTARIO DISTRICT

WATER SURVEY OF CANADA, WINNIPEG

AND

GOVERNMENT OF MANITOBA

DEPARTMENT OF NATURAL RESOURCES

WATER RESOURCES BRANCH

HYDROMETRIC COST S AGREEMENT 1984/1985

GAUGE INFORMATION

H=WATER LEVEL STATION
Q=DISCHARGE STATION
R=RECORDING GAUGE
M=MANUAL GAUGE
P=POWERPLANT RATING

DATA COLLECTION CODES

R=REMOTE ACCESS STATION
S=SEDIMENT SAMPLING
T=TELEMARK
Q=WATER QUALITY DATA
D=DATA COLLECTION PLATFORM
A=ARTIFICIAL CONTROL
W=WATER TEMPERATURE DATA
P=PRECIPITATION DATA
C=CABLEWAY
M=METERING PLATFORM
I=INTELLIGENT MICROPROCESSOR

FUNDING CODE INDEX

F1= FEDERAL 1. FEDERAL DEPARTMENTAL PROGRAMS
F2= FEDERAL 2. INTERPROVINCIAL WATERS
F3= FEDERAL 3. INTERNATIONAL WATERS
F4= FEDERAL 4. NATIONAL WATER QUANTITY INVENTORY
FP1= FEDERAL-PROVINCIAL 1. FEDERAL-PROVINCIAL AGREEMENTS
FP2= FEDERAL-PROVINCIAL 2. RIVER BASIN MANAGEMENT
FP3= FEDERAL-PROVINCIAL 3. REG. WATER QUANTITY INVENTORY
P1= PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS
P2= PROVINCIAL 2. SPECIFIC PURPOSE MONITORING PROGRAMS

MWRB= OPERATED BY PROVINCE OF MANITOBA
CONT= CONTRIBUTED DATA
CONF= CONTRIBUTED BY OTHER FEDERAL AGENCY
NEW= NEW CONSTRUCTION

STATION RESPONSIBILITY CODES

01 - WINNIPEG - MANITOBA CENTRAL
02 - WINNIPEG - MANITOBA WEST
03 - WINNIPEG - MANITOBA EAST
04 - THOMPSON SUB-OFFICE - W.ANTONYSHYN
05 - THE PAS SUB-OFFICE - W.KROLL
06 - KEEWATIN SUB-OFFICE - J.R.G.ROUSSON
07 - FORT FRANCES SUB-OFFICE - R.CARLSON
00 - OTHER WRB REGIONS
10 - OPERATED BY MANITOBA WATER RESOURCES BRANCH
11 - CONTRIBUTED BY MANITOBA HYDRO
12 - CONTRIBUTED BY FRESHWATER INSTITUTE
13 - CONTRIBUTED BY GREAT LAKES PAPER COMPANY
14 - CONTRIBUTED BY ONTARIO HYDRO
15 - CONTRIBUTED BY GREATER WINNIPEG WATER DISTRICT
16 - CONTRIBUTED BY WINNIPEG HYDRO
17 - CONTRIBUTED BY BOISE CASCADE CANADA LTD

OPERATION SCHEDULE - OP

C - CONTINUOUS OPERATION
S - SEASONAL OPERATION
M - MISCELLANEOUS

ACTIVE GAUGING STATIONS FOR MANITOBA
FEDERAL 1. FEDERAL DEPARTMENTAL PROGRAMS

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 1 NO.
05MH005	152000.0	M	03	QR	TSCW	F1	C	ASSINIBOINE RIVER NEAR HOLLAND	1
05LM006	81600.0	M	01	QR	C	F1	C	DAUPHIN RIVER NEAR AMANA BAY	2
05LK002	0.0	M	01	HR	IA	F1	C	LAKE MANITOBA AT STEEP ROCK	3
05LK003	0.0	M	01	HR	A	F1	C	LAKE MANITOBA AT THE NARROWS	4
05LL012	0.0	M	01	HR	AT	F1	C	LAKE MANITOBA NEAR WESTBOURNE	5
05LM005	0.0	M	01	HR		F1	C	LAKE ST MARTIN NEAR HILBRE	6
05RD005	0.0	M	03	HR	RT	F1	C	LAKE WINNIPEG AT BERENS RIVER	7
05SB006	0.0	M	01	HR	T	F1	C	LAKE WINNIPEG AT GIMLI	8
05SD002	0.0	M	03	HR		F1	S	LAKE WINNIPEG AT MATHESON ISLAND LANDING	9
05SG001	0.0	M	05	HR	RD	F1	C	LAKE WINNIPEG AT MISSION POINT	10
05RF001	0.0	M	04	HR	R	F1	S	LAKE WINNIPEG AT MONTREAL POINT	11
05SD001	0.0	M	03	HR		F1	C	LAKE WINNIPEG AT PINE DOCK	12
05SA003	0.0	M	03	HR	I	F1	C	LAKE WINNIPEG AT VICTORIA BEACH	13
05LD002	0.0	M	05	HR		F1	C	LAKE WINNIPEGOSIS AT DAWSON BAY	14
05LH001	0.0	M	01	HR		F1	C	LAKE WINNIPEGOSIS AT WINNIPEGOSIS	15
05UB003	0.0	M	04	HR	R	F1	C	NELSON RIVER AT WARREN LANDING	16
	0.0	M	04		Q	F1		NELSON RIVER NEAR THE WEIR RIVER	17
05MJ007	0.0	M	01	QR		F1	S	OMANDS CREEK NEAR METRO ROUTE 90	18
05MJ008	0.0	M	01	QR		F1	S	OMANDS CREEK NEAR BROOKSIDE CEMETRY	19
05OJ015	287000.0	M	01	HR	A	F1	C	RED RIVER AT JAMES AVE PUMPING STATION	20
05OJ010	287000.0	M	03	QR	CS	F1	C	RED RIVER NEAR LOCKPORT	21
05MJ009	0.0	M	01	QR		F1	S	TRURO CREEK AT WESTERN AIRPORT BOUNDARY	22
05MJ010	0.0	M	01	QR		F1	S	TRURO CREEK NEAR ASSINIBOINE GOLF COURSE	23

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 3	DISCHARGE (C) = 0	
	DISCHARGE (S) = 4	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 7
	WATER LEVEL (C) = 10	WATER LEVEL (C) = 3	WATER LEVEL = 15
	WATER LEVEL (S) = 1	WATER LEVEL (S) = 1	TOTAL = 22

ACTIVE GAUGING STATIONS FOR MANITOBA
FEDERAL 2. INTERPROVINCIAL WATERS

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 2 NO.
05NF002	3210.0	M	02	QR SW	F2	C	ANTLER RIVER NEAR MELITA	1
05ME001	19300.0	M	02	QR	F2	C	ASSINIBOINE RIVER NEAR RUSSELL	2
06EA006	228000.0	M	04	QR R	F2	C	CHURCHILL RIVER ABOVE GRANVILLE FALLS	3
06DA002	25000.0	M	04	QR RQ	F2	C	COCHRANE RIVER NEAR BROCHET	4
05NF007	1130.0	M	02	QR	F2	S	GAINSBOROUGH CREEK NEAR LYLETON	5
05NF008	754.0	M	02	QR A	F2	S	GRAHAM CREEK NEAR MELITA	6
05NF015	451.0	M	02	QR	F2	S	JACKSON CREEK NEAR MELITA	7
05MD009	0.0	M	02	HR TA	F2	C	LAKE OF THE PRAIRIES NEAR SHELLMOUTH	8
05LD001	3550.0	M	05	QR CQ	F2	S	OVERFLOWING RIVER AT OVERFLOWING RIVER	9
05NG024	0.0	M	00	QR	F2	S	PIPESTONE CREEK NEAR MANITOBA BOUNDARY	10
05LC004	14300.0	M	05	QR C	F2	C	RED DEER RIVER NEAR MOUTH L WINNIPEGOSIS	11
06DB001	0.0	M	04	HR RA	F2	C	REINDEER LAKE AT BROCHET	12
05KJ001	347000.0	M	05	QR CST	F2	C	SASKATCHEWAN RIVER AT THE PAS	13
05NG019	474.0	M	02	QR	F2	S	STONY CREEK NEAR BROOMHILL	14
05LE006	4220.0	M	05	QR CQ	F2	C	SWAN RIVER NEAR MINITONAS	15
05LE004	2110.0	M	05	QR CQ	F2	S	WOODY RIVER NEAR BOWSMAN	16

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 5	DISCHARGE (C) = 2	
	DISCHARGE (S) = 7	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 14
	WATER LEVEL (C) = 1	WATER LEVEL (C) = 1	WATER LEVEL = 2
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 16

AC GAUGING STATIONS FOR MANITOBA 2 - 1984-85
FEDERAL 3. INTERNATIONAL WATERS

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 3	NO.
05NF017	0.0	M	02	QM	F3	M	ANTLER RIVER AT WESTERN CROSSING		1
05OA007	1520.0	M	02	QR	F3	C	BADGER CREEK NEAR CARTWRIGHT		2
05OC025	448.0	M	01	QR	F3	S	BUFFALO LAKE CHANNEL NEAR ALTONA		3
05OB006	153.0	M	02	QR	F3	S	CRYSTAL CREEK NEAR CRYSTAL CITY		4
05OB010	389.0	M	02	QR	F3	S	CYPRESS CREEK NEAR CLEARWATER		5
05OB031	184.0	M	02	QR	F3	C	CYPRESS CREEK NEAR SARLES		6
05OA005	68.1	M	02	QR	F3	C	HIDDEN ISLAND COULEE NEAR HANSBORO		7
05OA006	578.0	M	02	QR	F3	S	LONG RIVER NEAR HOLMFELD		8
05OB021	262.0	M	02	QR A	F3	S	MOWBRAY CREEK NEAR MOWBRAY		9
05OC004	8470.0	M	01	QR A	F3	C	PEMBINA RIVER AT NECHE		10
05OB007	7510.0	M	03	QR CTSW	F3	C	PEMBINA RIVER NEAR WINDYGATES		11
05OD027	156.0	M	03	QR	F3	C	PINE CREEK DIVERSION NEAR PINEY		12
05OC001	104000.0	M	03	QR TS	F3	C	RED RIVER AT EMERSON		13
05OC022	138.0	M	01	QR	F3	S	RIVIERE AUX MARAIS NEAR CHRISTIE		14
05OD030	4120.0	M	03	QR D	F3	C	ROSEAU RIVER NEAR CARIBOU		15
05OD001	5150.0	M	03	QR S	F3	C	ROSEAU RIVER NEAR DOMINION CITY		16
05OD004	4430.0	M	03	QR S	F3	S	ROSEAU RIVER NEAR GARDENTON		17
05OB016	979.0	M	02	QR C	F3	C	SNOWFLAKE CREEK NEAR SNOWFLAKE		18
05NG001	60300.0	M	02	QR TSW	F3	C	SOURIS RIVER AT WAWANESA		19
05NF016	43300.0	M	02	QR SW	F3	C	SOURIS RIVER NEAR COULTER		20
05NF012	43000.0	M	02	QR CTA	F3	C	SOURIS RIVER NEAR WESTHOPE		21
05NG016	75.1	M	02	QR MA	F3	S	TURTLEHEAD CREEK ABOVE DELORAINE RESERV		22

DR.AREA.=0.0 IS NOT APPLICABLE

PAGE PRINTING SYSTEM- P1185-02

SUMMARY:

	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 13	DISCHARGE (C) = 0	
	DISCHARGE (S) = 8	DISCHARGE (S) = 0	
	DISCHARGE (M) = 1	DISCHARGE (M) = 0	DISCHARGE = 22
	WATER LEVEL (C) = 0	WATER LEVEL (C) = 0	WATER LEVEL = 0
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 22

ACTIVE GAUGING STATIONS FOR MANITOBA
FEDERAL 4. NATIONAL WATER QUANTITY INVENTORY

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 4	NO.
05MJ001	153000.0	M	03	QR	CTSW	F4	C	ASSINIBOINE RIVER AT HEADINGLEY		1
05RD007	0.0	M	03	QR	R	F4	C	BERENS RIVER AT OUTLET OF LONG LAKE		2
05ME003	1120.0	M	02	QR	DP	F4	S	BIRDTAIL CREEK NEAR BIRTLE		3
05OF011	565.0	M	02	QR	IP	F4	S	BOYNE RIVER NEAR ROSEISLE		4
06FD001	287000.0	M	04	QR	RQ	F4	C	CHURCHILL RIVER ABOVE RED HEAD RAPIDS		5
05OJ002	697.0	M	03	QR	C	F4	S	COOKS CREEK NEAR EAST SELKIRK		6
06FD002	1880.0	M	04	QR	R	F4	C	DEER RIVER NORTH OF BELCHER		7
05SD003	1360.0	M	01	QR	C	F4	C	FISHER RIVER NEAR DALLAS		8
04AD002	65500.0	M	04	QR	R	F4	C	GODS RIVER NEAR SHAMATTAWA		9
05TD001	15400.0	M	04	QR	R	F4	C	GRASS RIVER ABOVE STANDING STONE FALLS		10
05UA003	4400.0	M	04	QR	R	F4	C	GUNISAO RIVER ABOVE DIAMOND RAPIDS		11
04AB001	103100.0	M	04	QR	RQ	F4	C	HAYES RIVER BELOW GODS RIVER		12
05SC002	1140.0	M	01	QR		F4	S	ICELANDIC RIVER NEAR RIVERTON		13
05UF004	1960.0	M	04	QR	RCA	F4	C	KETTLE RIVER NEAR GILLAM		14
06EA009	0.0	M	04	HR	R	F4	C	KISSISSING LAKE AT COLD LAKE		15
05UG001	3160.0	M	04	QR	RC	F4	C	LIMESTONE RIVER NEAR BIRD		16
06FB002	4250.0	M	04	QR	R	F4	C	LITTLE BEAVER RIVER NEAR MOUTH		17
06FC001	5800.0	M	04	QR	R	F4	C	LITTLE CHURCHILL RIVER ABOVE RECLUSE LAKE		18
05MF001	2620.0	M	02	QR	CT	F4	C	LITTLE SASKATCHEWAN RIVER NEAR MINNEDOSA		19
05RD010	0.0	M	03	HR	R	F4	C	LONG LAKE NEAR LITTLE GRAND RAPIDS		20
05RA001	1800.0	M	03	QR	C	F4	C	MANIGOTAGAN RIVER NEAR MANIGOTAGAN		21
05UD004	1000000.0	M	04	QR	RCS	F4	C	NELSON RIVER ABOVE BLADDER RAPIDS		22
06GB001	17800.0	M	04	QR	R	F4	C	NORTH SEAL RIVER BELOW STONY LAKE		23
05NG010	1060.0	M	02	QR		F4	C	OAK CREEK NEAR STOCKTON		24
05LJ005	344.0	M	01	QR		F4	S	OCHRE RIVER AT OCHRE RIVER		25
05RD008	0.0	M	03	QR	R	F4	C	PIGEON RIVER AT OUTLET OF ROUND LAKE		26
05RE001	6798.0	M	03	QR	R	F4	C	POPLAR RIVER AT OUTLET OF WEAVER LAKE		27
05OE004	414.0	M	03	QR		F4	C	RAT RIVER NEAR SUNDOWN		28
04AC008	0.0	M	04	HR	R	F4	C	RED SUCKER LAKE AT RED SUCKER LAKE		29
06GD001	48200.0	M	04	QR	R	F4	C	SEAL RIVER BELOW GREAT ISLAND		30
05OH007	704.0	M	03	QR		F4	S	SEINE RIVER NEAR STE ANNE		31
05MD005	2000.0	M	02	QR	T	F4	C	SHELL RIVER NEAR INGLIS		32
06GA001	12200.0	M	04	QR	R	F4	C	SOUTH SEAL RIVER ABOVE FOX LAKE		33
05LJ010	2870.0	M	01	QR	CS	F4	S	VALLEY RIVER NEAR DAUPHIN		34
05LH005	55200.0	M	01	QR	CT	F4	C	WATERHEN RIVER NEAR WATERHEN		35
05PH003	3700.0	M	03	QR	C	F4	C	WHITEMOUTH RIVER NEAR WHITEMOUTH		36
05LL005	1750.0	M	01	QR	A	F4	C	WHITEMUD RIVER NEAR KEYES		37

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 10	DISCHARGE (C) = 17	
	DISCHARGE (S) = 7	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 34
	WATER LEVEL (C) = 0	WATER LEVEL (C) = 3	WATER LEVEL = 3
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 37

ACTIVE GAUGING STATIONS FOR MANITOBA
FEDERAL-PROVINCIAL 1. FEDERAL PROVINCIAL AGREEMENTS

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 4	NO.
					FP1		- NIL -		

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 0	DISCHARGE (C) = 0	
	DISCHARGE (S) = 0	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 0
	WATER LEVEL (C) = 0	WATER LEVEL (C) = 0	WATER LEVEL = 0
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 0

ACTIVE GAUGING STATIONS FOR MANITOBA
FEDERAL-PROVINCIAL 2. RIVER BASIN MANAGEMENT

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	NO.
				PAGE NO. 5				
05MH013	85700.0	M	02	QR CD	FP2	C	ASSINIBOINE RIVER NEAR BRANDON	1
05ME006	76100.0	M	02	QR T	FP2	C	ASSINIBOINE RIVER NEAR MINIOTA	2
05MJ003	152000.0	M	01	QR C	FP2	C	ASSINIBOINE RIVER NEAR PORTAGE LA PRAIRIE	3
05KG005	0.0	M	05	HR	FP2	C	ATHAPAPUSKOW LAKE AT CRANBERRY PTGE	4
05LL015	1050.0	M	01	QR	FP2	S	BIG GRASS RIVER NEAR GLENELLA	5
05RB003	9090.0	M	03	QR R	FP2	C	BLOODVEIN RIVER ABOVE BLOODVEIN BAY	6
05TE001	6660.0	M	04	QR RS	FP2	C	BURNTWOOD RIVER ABOVE THREE POINT LAKE	7
05TG001	18100.0	M	04	QR TS	FP2	C	BURNTWOOD RIVER NEAR THOMPSON	8
06EB004	242000.0	M	04	QR T	FP2	C	CHURCHILL RIVER ABOVE LEAF RAPIDS	9
06FB001	269000.0	M	04	QR R	FP2	C	CHURCHILL RIVER BELOW FIDLER LAKE	10
05UD001	0.0	M	04	HR RT	FP2	C	CROSS LAKE AT CROSS LAKE	11
05LJ009	0.0	M	01	HR AI	FP2	C	DAUPHIN LAKE AT OUTLET	12
05LM001	79300.0	M	01	QR CT	FP2	C	FAIRFORD RIVER NEAR FAIRFORD	13
05TF001	0.0	M	04	HR T	FP2	C	FOOTPRINT LAKE AT NELSON HOUSE	14
06EB002	0.0	M	04	HR R	FP2	C	GRANVILLE LAKE AT PICKERAL NARROWS	15
05UB013	0.0	M	04	HR R	FP2	C	KISKITTO LAKE NEAR NORWAY HOUSE	16
05UB007	0.0	M	04	HR R	FP2	C	KISKITTOGISU LAKE NEAR NORWAY HOUSE	17
05LK004	0.0	M	01	HR A	FP2	C	LAKE MANITOBA NEAR TOUTES AIDES	18
050B014	0.0	M	02	HR A	FP2	C	MARY JANE RESERVOIR NEAR LA RIVIERE	19
050F020	2200.0	M	01	QR	FP2	S	MORRIS RIVER NEAR ROSENORT	20
05LJ025	8700.0	M	01	QR C	FP2	C	MOSSY RIVER BELOW OUTLET OF DAUPHIN LAKE	21
05UB001	0.0	M	04	HR RT	FP2	C	NELSON RIVER AT NORWAY HOUSE	22
05UB008	0.0	M	04	QR R	FP2	C	NELSON RIVER BELOW SEA RIVER FALLS	23
05MG004	1160.0	M	02	QR A	FP2	C	OAK RIVER NEAR RIVERS	24
05LM002	104.0	M	01	HR	FP2	S	PARTRIDGE CREEK NEAR ST MARTIN	25
050A010	544.0	M	02	QR	FP2	S	PEMBINA RIVER ABOVE LORNE LAKE	26
050B023	4480.0	M	02	QR	FP2	C	PEMBINA RIVER BELOW CRYSTAL CREEK	27
05NG007	6630.0	M	02	QR	FP2	S	PLUM CREEK NEAR SOURIS	28
050C019	782.0	M	01	QR	FP2	S	PLUM RIVER NEAR ROSENFELD	29
05LL019	0.0	M	01	QR A	FP2	S	PORTAGE DIVERSION NEAR PORTAGE LA PRAIRIE	30
05MJ006	0.0	M	01	HR TA	FP2	C	PORTAGE RESERVOIR NEAR PORTAGE LA PRAIRIE	31
050E001	1350.0	M	03	QR C	FP2	C	RAT RIVER NEAR OTTERBOURNE	32
05LC003	0.0	M	05	HR	FP2	C	RED DEER LAKE NEAR BARROWS	33
050C021	0.0	M	03	HR A	FP2	S	RED RIVER ABOVE FLOODWAY CONTROL STRUCTURE	34
050C020	0.0	M	03	HR T	FP2	S	RED RIVER BELOW FLOODWAY CONTROL STRUCTURE	35
050C017	0.0	M	03	QR TA	FP2	S	RED RIVER FLOODWAY NEAR ST NORBERT	36
050C010	0.0	M	01	HR T	FP2	S	RED RIVER NEAR LETELLIER	37
050C012	117000.0	M	01	QR CT	FP2	C	RED RIVER NEAR STE AGATHE	38
050C008	124000.0	M	03	QR	FP2	S	RED RIVER NEAR ST NORBERT	39
050F009	212.0	M	02	QR	FP2	S	ROSEISLE CREEK NEAR ROSEISLE	40

DR.AREA.=0.0 IS NOT APPLICABLE

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 6	NO.
05UD006	0.0	M	04	HR	R	FP2	C	SIPIWESK LAKE AT FORESTRY DOCK		41
05NG021	58000.0	M	02	QR		FP2	S	SOURIS RIVER AT SOURIS		42
06EC003	0.0	M	04	HR		FP2	C	SOUTHERN INDIAN LAKE AT SOUTH BAY		43
06EC001	0.0	M	04	HR	R	FP2	C	SOUTHERN INDIAN LAKE NEAR SOUTH INDIAN LAKE		44
05UF003	0.0	M	04	HR	R	FP2	C	SPLIT LAKE AT SPLIT LAKE		45
05MJ004	572.0	M	02	QR		FP2	S	STURGEON CREEK AT ST JAMES		46
05QB018	0.0	M	02	HR		FP2	S	SWAN (PEMBINA)LAKE NEAR SWAN LAKE		47
05LJ046	0.0	M	01	HR	A	FP2	C	VERMILION RESERVOIR NEAR DAUPHIN		48
05LL002	6320.0	M	01	QR	C	FP2	C	WHITEMUD RIVER AT WESTBOURNE		49
05NG023	0.0	M	02	HR		FP2	S	WHITEWATER LAKE NEAR BOISSEVAIN		50

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 12	DISCHARGE (C) = 4	
	DISCHARGE (S) = 11	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 27
	WATER LEVEL (C) = 9	WATER LEVEL (C) = 8	WATER LEVEL = 23
	WATER LEVEL (S) = 6	WATER LEVEL (S) = 0	TOTAL = 50

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	NO.
05UH001	1630.0	M	04	QR	R	FP3	C	ANGLING RIVER NEAR BIRD	1
05MG001	671.0	M	02	QR	C	FP3	S	ARROW RIVER NEAR ARROW RIVER	2
04AA003	0.0	M	04	HR	R	FP3	C	BACK LAKE NEAR OXFORD HOUSE	3
06EB003	1770.0	M	04	QR	R	FP3	C	BARRINGTON RIVER BELOW FIRST RAPIDS	4
05LE010	136.0	M	05	QR		FP3	S	BIRCH RIVER NEAR BIRCH RIVER	5
05PJ001	1070.0	M	03	QR		FP3	S	BIRD RIVER AT OUTLET OF BIRD LAKE	6
05LL017	62.9	M	01	QR		FP3	S	BIRNIE CREEK NEAR BIRNIE	7
05RA002	712.0	M	03	QR	C	FP3	C	BLACK RIVER NEAR MANIGOTAGAN	8
05SA002	1580.0	M	03	QR		FP3	C	BROKENHEAD RIVER NEAR BEAUSEJOUR	9
05ME005	88.1	M	02	QR		FP3	S	CONJURING CREEK NEAR RUSSELL	10
05MH008	254.0	M	02	QR		FP3	S	CYPRESS RIVER NEAR BRUXELLES	11
05OJ016	249.0	M	03	QR	C	FP3	S	DEVILS CREEK NEAR LIBAU	12
05LG004	223.0	M	01	QR		FP3	S	DUCK RIVER AT COWAN	13
05SD004	394.0	M	01	QR		FP3	S	EAST FISHER RIVER NEAR HODGSON	14
05NG012	1180.0	M	02	QR		FP3	S	ELGIN CREEK NEAR SOURIS	15
05MH007	399.0	M	02	QR		FP3	S	EPINETTE CREEK NEAR CARBERRY	16
05RD006	0.0	M	03	HR	R	FP3	C	FAMILY LAKE AT LITTLE GRAND RAPIDS	17
05TF002	598.0	M	04	QR	C	FP3	C	FOOTPRINT RIVER ABOVE FOOTPRINT LAKE	18
05LJ016	258.0	M	01	QR		FP3	S	FORK RIVER NEAR ETHELBERT	19
05LG006	438.0	M	01	QR		FP3	S	GARLAND RIVER NEAR DUCK RIVER	20
06FA001	0.0	M	04	QR	R	FP3	C	GAUER RIVER BELOW THORSTEINSON LAKE	21
04AC006	0.0	M	04	HR	R	FP3	C	GODS LAKE AT OUTLET OF GODS LAKE	22
04AC005	25900.0	M	04	QR	R	FP3	C	GODS RIVER AT OUTLET OF GODS LAKE	23
05MG003	290.0	M	02	QR		FP3	S	GOPHER CREEK NEAR VIRDEN	24
05TB002	3290.0	M	05	QR	D	FP3	C	GRASS RIVER AT WESKUSKO FALLS	25
04AA004	8880.0	M	04	QR	R	FP3	C	HAYES RIVER BELOW TROUT FALLS	26
04AC002	0.0	M	04	HR	R	FP3	C	ISLAND LAKE NEAR ISLAND LAKE	27
04AC007	14000.0	M	04	QR	RC	FP3	C	ISLAND LAKE RIVER NEAR ISLAND LAKE	28
05OG001	1900.0	M	01	QR		FP3	C	LA SALLE RIVER NEAR SANFORD	29
05MF018	3910.0	M	02	QR		FP3	C	LITTLE SASKATCHEWAN RIVER NEAR RIVERS	30
05MH006	453.0	M	02	QR		FP3	S	LITTLE SOURIS RIVER NEAR BRANDON	31
05LC005	697.0	M	05	QR		FP3	S	LITTLE WOODY RIVER NEAR BARROWS	32
06EA008	1420.0	M	04	QR	R	FP3	C	LOON RIVER ABOVE BRITTON LAKE	33
05OD028	177.0	M	03	QR		FP3	S	MAIN DRAIN 4A NEAR DOMINION CITY	34
05OD033	0.0	M	03	QR		FP3	S	MAIN DRAIN 4B NEAR RIDGEVILLE	35
05LJ027	78.2	M	01	QR		FP3	S	MCKINNON CREEK NEAR MCCREARY	36
05NG020	458.0	M	02	QR		FP3	S	MEDORA CREEK NEAR NAPINKA	37
05LJ019	132.0	M	01	QR	C	FP3	S	MINK CREEK NEAR ETHELBERT	38
05OJ008	598.0	M	01	QR	C	FP3	S	NETLEY CREEK NEAR PETERSFIELD	39
05TG003	0.0	M	04	QR	S	FP3	C	ODEI RIVER NEAR THOMPSON	40

DR.AREA.=0.0 IS NOT APPLICABLE

ACTIVE GAUGING STATIONS FOR MANITOBA - 1984-85
FEDERAL-PROVINCIAL 3. REGIONAL WATER QUANTITY INVENTORY

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 8 NO.
04AA002	0.0	M	04	HR	R	FP3	C	OXFORD LAKE AT OXFORD HOUSE	41
05LL027	9.1	M	01	QR	A	FP3	S	PELICAN CREEK NEAR BIRNIE	42
05OA008	355.0	M	02	QR		FP3	S	PEMBINA RIVER NEAR KILLARNEY	43
05LL014	293.0	M	02	QR	AM	FP3	C	PINE CREEK NEAR MELBOURNE	44
05LL007	635.0	M	01	QR		FP3	S	PINE CREEK NEAR PINE CREEK STATION	45
05LJ031	262.0	M	01	QR	C	FP3	S	PLEASANT VALLEY CREEK NEAR GRANDVIEW	46
05LE005	837.0	M	05	QR	C	FP3	S	ROARING RIVER NEAR MINITONAS	47
05MF008	759.0	M	02	QR	C	FP3	C	ROLLING RIVER NEAR ERICKSON	48
05RD011	0.0	M	03	HR	R	FP3	C	ROUND LAKE AT OUTLET	49
05MD007	1330.0	M	02	QR		FP3	S	SHELL RIVER NEAR ROBLIN	50
05OF017	7383.0	M	02	QR	AM	FP3	S	SOUTH TOBACCO CREEK NEAR MIAMI	51
05TG002	883.0	M	04	QR	C	FP3	C	TAYLOR RIVER NEAR THOMPSON	52
05LJ007	974.0	M	01	QR	C	FP3	S	TURTLE RIVER NEAR LAURIER	53
05LJ012	673.0	M	01	QR		FP3	S	VERMILION RIVER NEAR DAUPHIN	54
05NF014	104.0	M	02	QR		FP3	S	WASKADA CREEK NEAR CRANMER	55
05LH008	0.0	M	01	HR		FP3	C	WATERHEN LAKE AT SKOWNAN	56
05RE002	0.0	M	03	HR	R	FP3	C	WEAVER LAKE AT OUTLET	57
05UH002	2280.0	M	04	QR	R	FP3	C	WEIR RIVER ABOVE THE MOUTH	58
05LL013	414.0	M	01	QR		FP3	S	WHITEMUD RIVER ABOVE NEEPAWA RESERVOIR	59
05LJ801	22.8	M	10	HR	CA	FP3	S	WILSON CREEK NEAR MCCREARY	60
05LJ045	0.0	M	01	QR		FP3	S	WILSON RIVER NEAR ASHVILLE	61

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 10	DISCHARGE (C) = 8	
	DISCHARGE (S) = 34	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 52
	WATER LEVEL (C) = 1	WATER LEVEL (C) = 7	WATER LEVEL = 9
	WATER LEVEL (S) = 1	WATER LEVEL (S) = 0	TOTAL = 61

ACTIVE GAUGING STATIONS FOR MANITOBA
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	NO.
05LL028	275.0	M	01	QR	P1	S	BEAVER CREEK EAST OF BEAVER	1
05LF002	170.0	M	05	QR	P1	S	BELL RIVER NEAR BELLSITE	2
05LL025	0.0	M	01	QM	P1	M	BIG GRASS DRAIN NEAR LANGRUTH	3
05KH003	2430.0	M	05	HR A	P1	S	BIRCH RIVER ABOVE BRACKEN DAM	4
05KH004	2430.0	M	05	HR A	P1	S	BIRCH RIVER BELOW BRACKEN DAM	5
05OF003	976.0	M	01	QR	P1	C	BOYNE RIVER NEAR CARMAN	6
05OF006	873.0	M	02	QR	P1	C	BOYNE RIVER NEAR STEPHENFIELD	7
05OF010	277.0	M	02	QR	P1	S	BOYNE RIVER NEAR TREHERNE	8
05PG003	0.0	M	03	HR	P1	S	BRERETON LAKE NEAR RENNIE	9
05SA004	847.0	M	03	QR	P1	S	BROKENHEAD RIVER NEAR VIVIAN	10
05LN002	334.0	M	01	QR	P1	S	BURNT LAKE DRAIN NO 1 NEAR DEERHORN	11
05LN003	746.0	M	01	QR	P1	S	BURNT LAKE DRAIN NO 2 NEAR LUNDAR	12
05KL005	0.0	M	05	HR RD	P1	C	CEDAR LAKE NEAR OLESON POINT	13
05MD008	0.0	M	02	HR	P1	S	CHILDS LAKE NEAR BOGGY CREEK	14
05KK009	0.0	M	05	HR	P1	C	CLEARWATER LAKE AT GUY HILL	15
05OJ006	513.0	M	03	QR	P1	S	COOKS CREEK AT COOKS CREEK	16
05OJ007	183.0	M	03	QR C	P1	S	COOKS CREEK NEAR GLASS	17
05KK002	0.0	M	05	HR	P1	C	CORMORANT LAKE AT CORMORANT	18
05MH004	572.0	M	02	QR	P1	S	CYPRESS RIVER NEAR CYPRESS RIVER	19
05LL023	0.0	M	01	QR	P1	S	DEAD LAKE DRAIN NEAR GLADSTONE	20
05OC015	136.0	M	02	QR	P1	S	DEADHORSE CREEK AT MORDEN	21
05NG014	0.0	M	02	HR A	P1	S	DELORAINE RESERVOIR NEAR DELORAINE	22
05LN005	0.0	M	01	HR	P1	S	DOG LAKE NEAR VOGAR	23
05LJ047	0.0	M	01	QR SC	P1	S	EDWARDS CREEK DRAIN BELOW JACKFISH CREEK TRIB	24
05OG005	673.0	M	01	QR	P1	S	ELM CREEK CHANNEL 2 NEAR ELM CREEK	25
05OG006	484.0	M	01	QR	P1	S	ELM CREEK CHANNEL 3 NEAR ELM CREEK	26
05SB005	632.0	M	01	QR C	P1	S	FISH LAKE DRAIN NEAR CAMP MORTON	27
05SB003	0.0	M	01	HR	P1	S	FISH LAKE NEAR MELEB	28
05OA015	0.0	M	02	QR	P1	S	GIMBY CREEK NEAR CARTWRIGHT	29
05LL026	0.0	M	01	QR CA	P1	S	GLENELLA DRAIN NEAR GLENELLA	30
05LL024	73.3	M	01	QR	P1	S	GOPHER CREEK NEAR GLADSTONE	31
05KJ002	0.0	M	05	HR	P1	S	GRACE LAKE NEAR THE PAS	32
05OJ017	471.0	M	03	QR	P1	S	GRASSMERE DRAIN NEAR MIDDLECHURCH	33
05OC016	0.0	M	01	QR I	P1	S	HESPELER FLOODWAY NEAR ROSENFELD	34
05OE007	311.0	M	03	QR	P1	S	JOUBERT CREEK AT ST PIERRE-JOLYS	35
05MG006	45.8	M	02	QR A	P1	S	KENTON CREEK AT KENTON	36
05OC024	0.0	M	01	QR	P1	S	KRONSGART DRAIN NEAR SEWELL	37
05OG008	198.0	M	02	QR	P1	S	LA SALLE RIVER NEAR ELIE	38
05RE005	0.0	M	03	HR RD	P1	C	LAKE WINNIPEG AT GEORGE ISLAND	39
05KG006	0.0	M	05	HR	P1	S	MANISTIKWAN LAKE NEAR FLIN FLON	40

DR.AREA.=0.0 IS NOT APPLICABLE

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO.10 NO.
05OE006	490.0	M	03	QR		P1	S	MANNING CANAL NEAR ILE DES CHENES	41
05OE010	445.0	M	03	QR		P1	S	MARSH RIVER NEAR OTTERBURNE	42
05NG022	0.0	M	02	HR	A	P1	S	MAPLE (MARSHY) LAKE NEAR PIPESTONE	43
05ME008	360.0	M	02	QR		P1	S	MINNEWASTA CREEK NEAR BEULAH	44
05LL009	165.0	M	01	QR		P1	S	NEEPAWA CREEK NEAR NEEPAWA	45
05LL010	0.0	M	01	HR	A	P1	C	NEEPAWA RESERVOIR NEAR NEEPAWA	46
05OJ009	245.0	M	01	QR		P1	S	NETLEY CREEK NEAR MATLOCK	47
05KK005	0.0	M	05	HR	R	P1	C	NORTH MOOSE LAKE AT MOOSE LAKE CONTROL STR	48
05LN004	0.0	M	01	HR		P1	C	NORTH SHOAL LAKE NEAR INWOOD	49
05NG008	0.0	M	02	HR	A	P1	S	OAK LAKE AT OAK LAKE RESORT	50
05MG008	370.0	M	02	QR		P1	C	OAK RIVER AT SHOAL LAKE	51
05MH012	435.0	M	02	QR		P1	S	OXTAIL CREEK NEAR CYPRESS RIVER	52
05OE014	0.0	M	03	QR		P1	S	PANSY DRAIN NEAR SARTO	53
05OB025	147.0	M	02	QR		P1	S	PILOT CREEK NEAR PILOT MOUND	54
05LG001	210.0	M	01	QR	C	P1	S	PINE RIVER NEAR PINE RIVER	55
05NG003	4200.0	M	02	QR		P1	C	PIPESTONE CREEK NEAR PIPESTONE	56
05OE002	901.0	M	03	QR		P1	S	RAT RIVER NEAR ST MALO	57
05OC026	0.0	M	03	HR	T	P1	S	RED RIVER ABOVE RED RIVER FLOODWAY	58
05PG002	159.0	M	03	QR	A	P1	C	RENNIE RIVER NEAR RENNIE	59
05MF020	0.0	M	02	HR	A	P1	C	RIVERS RESERVOIR NEAR RIVERS	60
05OE003	0.0	M	03	HR	A	P1	C	ST MALO RESERVOIR NEAR ST MALO	61
05KG004	0.0	M	05	HR		P1	S	SCHIST LAKE NEAR CHANNING	62
05ME009	162.0	M	02	QR		P1	S	SCISSOR CREEK NEAR MCAULEY	63
05OE011	0.0	M	03	QR	A	P1	S	SEINE RIVER DIVERSION NEAR ILE DES CHENES	64
05OH008	0.0	M	03	QR	A	P1	S	SEINE RIVER DIVERSION NEAR STE ANNE	65
05OH006	1090.0	M	03	QR		P1	C	SEINE RIVER NEAR PRAIRIE GROVE	66
05OF021	308.0	M	02	QR		P1	S	SHANNON CREEK NEAR MORDEN	67
05OF014	653.0	M	01	QR		P1	S	SHANNON CREEK NEAR MORRIS	68
05OF015	168.0	M	01	QR		P1	S	SHANNON CREEK TRIBURARY NEAR MYRTLE	69
05MG007	0.0	M	02	HM		P1	S	SHOAL LAKE NEAR SHOAL LAKE	70
05LJ040	137.0	M	01	QR		P1	S	SILVER CREEK NEAR GRANDVIEW	71
05NG025	0.0	M	02	QR	SW	P1	S	SOURIS RIVER NEAR LAUDER	72
05NG026	0.0	M	02		S	P1	M	SOURIS RIVER NEAR MINTO	73
05KK006	0.0	M	05	HR	R	P1	C	SOUTH MOOSE LAKE AT MOOSE LAKE CONTROL STR	74
05LF001	300.0	M	05	QR	C	P1	S	STEEPROCK RIVER NEAR MAFEKING	75
05OF008	0.0	M	02	HR	F4	P1	S	STEPHENFIELD RESERVOIR NEAR STEPHENFIELD	76
05MJ011	541.0	M	02	QR		P1	S	STURGEON CREEK NEAR PERIMETER HWY	77
05LE007	0.0	M	05	HR		P1	S	SWAN LAKE NEAR NOVRA	78
05OF018	87.3	M	02	QR		P1	S	TOBACCO CREEK NEAR ROSEBANK	79
05OE009	237.0	M	03	QR		P1	S	TOUROND CREEK NEAR TOUROND	80

DR.AREA.=0.0 IS NOT APPLICABLE

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO.11 NO.
05LJ021	1720.0	M	01	QR C	P1	S	VALLEY RIVER NEAR GRANDVIEW	81
05LL001	156.0	M	01	QR	P1	S	WEST SQUIRREL CREEK NEAR AUSTIN	82
05PH005	0.0	M	03	HR	P1	S	WHITEMOUTH LAKE NEAR THE OUTLET	83
05LL011	803.0	M	01	QR	P1	S	WHITEMUD RIVER NEAR NEEPAWA	84
05PG001	883.0	M	03	QR	P1	C	WHITESHELL R AT OUTLET OF JESSICA LAKE	85
05MH011	668.0	M	02	QR	P1	S	WILLOW CREEK NEAR CHATER	86
05SB002	156.0	M	01	QR	P1	S	WILLOW CREEK NEAR GIMLI	87
05PF062	0.0	M	03	HM	P1	C	WINNIPEG RIVER AT LAC DU BONNET	88
05TD002	0.0	M	04	HR R	P1	C	WINTERING LAKE AT THICKET PORTAGE	89

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 7	DISCHARGE (C) = 0	
	DISCHARGE (S) = 51	DISCHARGE (S) = 0	
	DISCHARGE (M) = 1	DISCHARGE (M) = 0	DISCHARGE = 59
	WATER LEVEL (C) = 7	WATER LEVEL (C) = 5	WATER LEVEL = 29
	WATER LEVEL (S) = 17	WATER LEVEL (S) = 0	TOTAL = 88

ACTIVE GAUGING STATIONS FOR MANITOBA
PROVINCIAL 2. SPECIFIC PURPOSE MONITORING REQUIREMENTS

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO.12	NO.
06EB006	0.0	M	04	HR RD	P2	C	RUSSELL LAKE NEAR HERRIOT		1

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 0	DISCHARGE (C) = 0	
	DISCHARGE (S) = 0	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 0
	WATER LEVEL (C) = 0	WATER LEVEL (C) = 1	WATER LEVEL = 1
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 1

ACTIVE GAUGING STATIONS FOR MANITOBA
OPERATED BY MANITOBA WATER RESOURCES BRANCH

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO.13 NO.
05OF801	0.0	M	10	HM		MWRB	S	BOYNE RIVER ABOVE CARMAN DAM	1
05LJ816	0.0	M	10	HM	A	MWRB	C	DAUPHIN LAKE AT OCHRE BEACH	2
05SB801	0.0	M	10	HM		MWRB	S	DENNIS LAKE NEAR MALONTON	3
05OG009	0.0	M	01	QR		MWRB	S	DOMAIN DRAIN NEAR DOMAIN	4
05PD801	0.0	M	10	HM		MWRB	S	FALCON LAKE AT FALCON LAKE	5
05LJ807	0.0	M	10	HR		MWRB	S	JACKFISH LAKE ABOVE JACKFISH LAKE DAM	6
05LL802	0.0	M	10	HR		MWRB	S	JACKSON LAKE NEAR SYDNEY	7
05MG803	0.0	M	10	HM		MWRB	S	KENTON RESERVOIR NEAR KENTON	8
05OA803	0.0	M	10	HM	A	MWRB	S	KILLARNEY LAKE AT KILLARNEY	9
05OG802	0.0	M	10	HM		MWRB	S	LA SALLE RIVER ABOVE HOGUE'S DAM	10
05OG803	0.0	M	10	HM		MWRB	S	LA SALLE RIVER ABOVE LEWKO'S DAM	11
05OG804	0.0	M	10	HM		MWRB	S	LA SALLE RIVER ABOVE ST. NORBERT DAM	12
05OG807	0.0	M	10	HM		MWRB	S	LA SALLE RIVER AT ELIE	13
05OG801	0.0	M	10	HM		MWRB	S	LA SALLE RIVER AT HAMPSON'S DAM	14
05OG808	0.0	M	10	HM		MWRB	S	LA SALLE RIVER AT LA SALLE	15
05OG806	0.0	M	10	HM		MWRB	S	LA SALLE RIVER AT SANFORD	16
05OG805	0.0	M	10	HM		MWRB	S	LA SALLE RIVER AT STARBUCK	17
05MF801	0.0	M	10	HM		MWRB	C	LITTLE SASKATCHEWAN R. ABOVE RAPID CITY DAM	18
05OG010	0.0	M	01	QR	S	MWRB	S	MANNES DRAIN NEAR SANFORD	19
05OC801	0.0	M	10	HM		MWRB	S	MORDEN RESERVOIR NEAR MORDEN	20
05SD801	0.0	M	10	HR		MWRB	S	OTTER LAKE NEAR BROAD VALLEY	21
05OA802	0.0	M	10	HM		MWRB	C	PELICAN LAKE NEAR NINETTE	22
05NG801	0.0	M	10	HR		MWRB	S	PLUM LAKE ABOVE DELEAU DAM	23
05NG809	0.0	M	10	HR		MWRB	S	PLUM LAKE NEAR FINDLAY	24
05OC803	0.0	M	10	HM		MWRB	S	RED RIVER AT ST ADOLPHE	25
05OB804	0.0	M	10	HM		MWRB	C	ROCK LAKE NEAR GLENORA	26
05NG805	0.0	M	10	HR		MWRB	S	SHARPE LAKE NEAR DELORAINE	27
05TB801	0.0	M	10	HM	A	MWRB	C	SNOW LAKE AT SNOW LAKE	28
05LJ811	0.0	M	10	HR		MWRB	S	UPPER GRANDVIEW RESERVOIR NEAR MERRIDALE	29
05PG803	0.0	M	10	HM		MWRB	S	WEST HAWK LAKE AT WEST HAWK LAKE CAMPGROUND	30
05PG801	0.0	M	10	HM		MWRB	S	WHITESHELL LAKE AT CAMPGROUND	31

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 0	DISCHARGE (C) = 0	
	DISCHARGE (S) = 2	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 2
	WATER LEVEL (C) = 5	WATER LEVEL (C) = 0	WATER LEVEL = 29
	WATER LEVEL (S) = 24	WATER LEVEL (S) = 0	TOTAL = 31

CONTRIBUTED DATA

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	NO.
05UB009	0.0	M	11	QP	CONT	C	NELSON RIVER AT JENPEG WEST CHANNEL	1
05UE005	1010000.0	M	11	QP QA	CONT	C	NELSON RIVER AT KELSEY GEN STATION	2
05KL001	363000.0	M	11	QP	CONT	C	SASKATCHEWAN RIVER AT GRAND RAPIDS	3
05PD004	0.0	M	15	HM A	CONT	C	SHOAL LAKE AT INDIAN BAY	4
05PF063	126000.0	M	16	QR CAQ	CONT	C	WINNIPEG RIVER AT SLAVE FALLS	5
05PF057	0.0	M	11	HR A	CONT	C	WINNIPEG RIVER HEAD WATER SEVEN SISTERS PPLANT	6
05PF048	0.0	M	11	HR	CONT	C	WINNIPEG RIVER TAILRACE GREAT FALLS POWERPLANT	7

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:

CONVENTIONAL STATIONS		REMOTE STATIONS		TOTALS	
DISCHARGE (C)	= 4	DISCHARGE (C)	= 0		
DISCHARGE (S)	= 0	DISCHARGE (S)	= 0		
DISCHARGE (M)	= 0	DISCHARGE (M)	= 0	DISCHARGE	= 4
WATER LEVEL (C)	= 3	WATER LEVEL (C)	= 0	WATER LEVEL	= 3
WATER LEVEL (S)	= 0	WATER LEVEL (S)	= 0	TOTAL	= 7

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP CONF	STATION NAME	PAGE NO.14	NO.
								- NIL -		

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 0	DISCHARGE (C) = 0	
	DISCHARGE (S) = 0	DISCHARGE (S) = 0	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 0
	WATER LEVEL (C) = 0	WATER LEVEL (C) = 0	WATER LEVEL = 0
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 0

STA.NO.	DR.AREA	DIST	RESP	GAUGE DATA	FUND.CD.	OP	STATION NAME	PAGE NO.14	NO.
						NEWP	- NIL -		

DR.AREA.=0.0 IS NOT APPLICABLE

SUMMARY:

CONVENTIONAL STATIONS		REMOTE STATIONS		TOTALS	
DISCHARGE (C)	= 0	DISCHARGE (C)	= 0		
DISCHARGE (S)	= 0	DISCHARGE (S)	= 0		
DISCHARGE (M)	= 0	DISCHARGE (M)	= 0	DISCHARGE	= 0
WATER LEVEL (C)	= 0	WATER LEVEL (C)	= 0	WATER LEVEL	= 0
WATER LEVEL (S)	= 0	WATER LEVEL (S)	= 0	TOTAL	= 0

SUMMARY

REMOTE STATIONS	= 60
SEDIMENT STATIONS	= 20
WATER QUALITY STATIONS	= 9
WATER TEMP STATIONS	= 7
D.C. PLATFORMS	= 8
TELEMARKS	= 27
INTELLIGENT MICROPROCESSORS	= 5

DISTRIBUTION LIST

REGIONAL CHIEF
REGIONAL HYDROLOGIST
REGIONAL ENGINEER
AREA ENGINEERS
HYDROMETRIC SUPERVISORS

OPERATION SCHEDULE P

C - CONTINUOUS OPERATION
S - SEASONAL OPERATION
M - MISCELLANEOUS

SCHEDULE A OF
ACTIVE SEDIMENT STATIONS FOR MANITOBA

NO.	STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME
1	05NF002	3210.0	M	02	QR	S	F2	C	ANTLER RIVER NEAR MELITA
2	05MJ001	153000.0	M	03	QR	CTS	F4	C	ASSINIBOINE RIVER AT HEADINGLEY
3	05MH005	152000.0	M	03	QR	TS	F1	C	ASSINIBOINE RIVER NEAR HOLLAND
4	05TE001	6660.0	M	04	QR	RS	FP2	S	BURNTWOOD RIVER ABOVE THREE POINT LAKE
5	05TG004	0.0	M	04		S	FP2	M	BURNTWOOD RIVER BELOW FIRST RAPIDS
6	05TG001	18100.0	M	04	QR	TS	FP2	C	BURNTWOOD RIVER NEAR THOMPSON
7	050G009	0.0	M	10	QR	S	MWRB	M	DOMAIN DRAIN NEAR DOMAIN
8	05LJ047	0.0	M	02	QR	S	P1	S	EDWARDS CREEK DRAIN BELOW JACKFISH CREEK TRIB
9	050G010	0.0	M	10	QR	S	MWRB	M	MANNES DRAIN NEAR SANFORD
10	05UD004	1000000.0	M	04	QR	RCS	F4	M	NELSON RIVER ABOVE BLADDER RAPIDS
11	05TG003	0.0	M	04	QR	S	FP3	S	ODEI RIVER NEAR THOMPSON
12	050B007	7510.0	M	03	QR	CTS	F3	C	PEMBINA RIVER NEAR WINDYGATES
13	050C001	104000.0	M	03	QR	CTS	F3	C	RED RIVER AT EMERSON
14	050C011	0.0	M	03	QR	TAS	FP2	M	RED RIVER FLOODWAY NEAR ST.NORBERT
15	050J010	287000.0	M	03	QR	CS	F1	C	RED RIVER NEAR LOCKPORT
16	050C008	124000.0	M	03	Q	S	FP2	M	RED RIVER NEAR ST. NORBERT
17	050D001	5150.0	M	01	QR	S	F3	C	ROSEAU RIVER NEAR DOMINION CITY
18	050D004	4430.0	M	01	QR	S	F3	S	ROSEAU RIVER NEAR GARDENTON
19	05KJ001	347000.0	M	05	QR	CS	F2	C	SASKATCHEWAN RIVER AT THE PAS
20	05NG001	60300.0	M	02	QR	TS	F3	C	SOURIS RIVER AT WAWANESA
21	05NG026	0.0	M	02		S	P1	S	SOURIS RIVER NEAR MINTO
22	05NG025	0.0	M	02	QR	S	P1	S	SOURIS RIVER NEAR LAUDER
23	05NF016	43300.0	M	02	QR	S	F3	C	SOURIS RIVER NEAR COULTER
24	05LJ010	2870.0	M	01	QR	CS	F4	S	VALLEY RIVER NEAR DAUPHIN

Appendix III

Schedule B - Annual Payments and Items to be included

SCHEDULE B

ANNUAL PAYMENTS - ITEMS TO BE INCLUDED

The items to be included in computing the annual payments of water quantity survey stations are:

I. Operational Cost Water Quantity Survey Stations Excluding Sediment

a) Salaries and overtime of field personnel and casual labour;

b) Field travel expenses, board and lodging costs for field personnel;

c) The computer costs associated with computing daily mean hydrometric data;

d) Observer pay;

e) Depreciation, operation and maintenance of vehicles and boats;

f) Maintenance of gauging station structures including material and labour for minor repairs;

g) Maintenance and depreciation of all field equipment and instruments (except as noted in Article VII of this agreement);

h) Fuels such as propane for heating recorder installations and gas such as nitrogen for operating pressure-sensing equipment, electricity charges;

i) Rental of aircraft, vehicles, boats, etc. supplied by either party or chartered;

j) The annual cost of land leases;

k) Services, e.g., cost of establishing gas caches, operation of line cabins, etc.

II. Operational Cost Sediment Stations

All items in 1. Operational Cost plus:

l) The computer costs associated with computing daily mean sediment data;

m) Cost of analysis of sediment samples.

SCHEDULE B (Cont'd)

III. New Construction Repair and Major Reconstruction Costs for Water Quantity Survey Stations

a) Salaries and overtime of construction personnel;

b) Field travel expenses, board and lodging costs of construction personnel;

c) Depreciation, operation and maintenance of vehicles;

d) Construction materials;

e) Maintenance, depreciation and operation of construction equipment;

f) Rental of aircraft, vehicles, boats, construction equipment, etc. supplied by either party or chartered;

g) Land acquisition costs including legal survey costs;

h) Construction contract payments.

Appendix IV

Schedule C - Procedures for Preparation of Annual Payments

SCHEDULE C

PROCEDURES FOR PREPARATION OF ANNUAL PAYMENTS

a) The annual payment is composed of two parts: the annual operating costs and the costs of construction for streamflow and water level installations and sediment installations.

b) The annual payment shall be computed for each year the agreement is in effect.

c) Cost data to be used as a basis for computing each annual payment will be the costs data from the latest available full fiscal year.

d) A cost index factor is to be used in computing the annual payment for the year in question commensurate with sound engineering practice.

e) The average annual unit costs for operating water quantity survey stations listed in Schedule A, but not including sediment stations will be determined from the cost data of c) above and where necessary, because of significant differences in transportation costs, these average annual unit costs will be computed for more than one area or condition of operation.

f) The total annual operation cost of the water quantity survey stations listed in Schedule A but not including sediment stations will be the summation of the appropriate average annual unit cost for each station multiplied by the cost index factor as determined in item d) above.

g) The total annual operation cost of the sediment stations listed in Schedule A will be the summation of the annual operating costs of each station multiplied by the cost index factor as determined in item d) above.

h) The construction cost to be apportioned in accordance with Articles II, III and IV will be the summation of the construction cost for each new, or reconstructed water quantity survey station. The entire cost of construction is to be included in the annual payment. Construction costs are to be determined using data from reconnaissance surveys, standard plans, etc. and incorporating the cost index factor from item d) above.

i) In cases where there is a significant deviation between the cost determined in (f), (g) and (h) and actual costs because of the cost index factor used, or changes in the construction program due to unforeseen circumstances such as flooding, and adjustment may be made in the final quarterly payment (March 1st) or the next fiscal year to more accurately reflect the cost shares of the parties to this agreement.

Appendix V

Guidelines for designating responsibility for stations

October 20, 1982

NATIONAL GUIDELINES FOR DESIGNATING WATER QUANTITY SURVEY STATIONS

These national guidelines of the Federal-Provincial Memoranda of Agreement for Water Quantity Surveys have been prepared by Canada in consultation with the Provinces for the purpose of designating federal, federal-provincial and provincial water quantity survey stations. In compliance with the agreements, the assignment and review of station designations is the responsibility of each Coordinating Committee.

The intent of these guidelines is to provide a uniform and consistent manner for designating water quantity survey stations throughout Canada. In these guidelines, "water quantity survey stations" have the same definition as in the Memoranda of Agreement and include water level, streamflow and sediment survey stations. The word "stations" in these guidelines means "water quantity survey stations". Where not otherwise specified, the word "Province" means "Province" or "Territory". The designation of each sediment station can be considered separately from the corresponding water quantity survey station designation.

FEDERAL STATIONS

These are stations that support programs of primary interest to the Government of Canada. These stations are funded 100 per cent by Canada in accordance with Article II and the procedures described in Schedules B, C and D (F for the Yukon) (and Schedules E, D, and F for Quebec) of the Memoranda of Agreement.

1. Federal Departmental Programs

These are stations required under statutory obligations that have developed in response to federal legislation and priorities, and as a result of programs of various federal government departments or agencies to provide quantity information on inland waters. These include stations operated in support of specific federal works, benchmark basins, studies or investigations, research projects, and to meet navigational requirements and management responsibilities. A station may be so designated where Canada has formally accepted responsibility for the continued operation of the station under an implementation agreement.

2. Interprovincial Waters

These are stations required for monitoring of waters flowing across or forming part of provincial or territorial boundaries where federal responsibility has been established by an agreement or where justified by an inter-jurisdictional concern.

3. International Waters

These are stations associated with federal responsibilities arising from international agreements, treaties, orders or studies. These include:

(a) Stations specifically named under the Boundary Waters Treaty and those approved officially as "International Gauging Stations".

(b) Stations specifically stipulated under IJC orders, or required to support such orders; to provide for control of waters crossing or forming part of the international boundary and for IJC related study, surveillance, flow regulation or apportionment purposes. Such stations may also be required for similar studies carried out under unilateral or bilateral mechanisms and undertaken in anticipation of the need for formal orders.

(c) Stations related to international treaties and agreements which involve waters crossing or forming part of the international boundary and which specifically stipulate the reaches of streams required to be monitored or special arrangements that need to be made to meet water quantity survey needs.

(d) Stations on streams flowing across or forming part of the international boundary for which Canada has determined that monitoring is required for water management purposes.

4. National Water Quantity Inventory

These are stations that provide information for a national inventory of surface waters. They consist of those stations required to determine water quantity trends in the major drainage basins in Canada that serve to provide an assessment of the total surface water resources and to measure significant discharge to the oceans.

FEDERAL-PROVINCIAL AND/OR FEDERAL-TERRITORIAL STATIONS

These are stations that support programs of joint interest to Canada and the Province. The construction and operation of these stations are funded in accordance with Article III and procedures described in Schedules B, C and D (F for the Yukon) (and Schedules E, D, and F for Quebec) of the Memoranda of Agreement.

1. Federal-Provincial Agreements

These are stations where joint federal and provincial (or territorial) responsibility is established under the terms and conditions of an agreement between Canada and one or more Provinces or Territories.

The joint funding arrangements for any particular agreement must be taken into consideration before designating a station in order to ensure the intended division of financial responsibility. Following the completion of a federal-provincial water study, a station may be designated in this category only if its continuation would be in the joint interest of Canada and the Province.

2. River Basin Management

These are stations where both Canada and the Province have stated an interest in the need for information to support the management of the water resources of a river basin.

3. Regional Water Quantity Inventory

These are stations that provide an assessment of the quantity of water resources available in distinct hydrologic zones within each Province through representative sampling taking into consideration climatic variabilty, geographic and geologic differences, levels of population and development, basin size, streamflow regime, relationship to major ground water resources and length of record.

PROVINCIAL AND/OR TERRITORIAL STATIONS

These are stations that support programs of primary interest to a Province. They are funded 100 percent by the Province in accordance with Article IV and procedures described in Schedules B, C and D (F for the Yukon) (and Schedules E, D, and F for Quebec) of the Memoranda of Agreement.

1. Provincial Departmental Programs

Tnese are stations required strictly for provincial programs where water quantity information on inland waters is needed.

2. Specific Purpose Monitoring Requirements

Tnese are stations established as a result of specific requests of provincial/territorial agencies, municipalities, or non-governement organizations. All such requests shall be referred to the Province for screening and funding arrangements before being presented to the applicable Co-ordinating Committee.

APPENDIX VI

Costing Procedures and Assumptions along with Detailed Cost Computations including number of stations and costs for 1984-85

COSTING PROCEDURES AND ASSUMPTIONS

Details of 1984/85 costs and computational methods are presented in this appendix.

For accounting and estimating purposes, costs are summarized using three categories:

I	Salaries Costs
II	Operations and Maintenance Costs
III	Capital Costs

Program costs are determined using the departmental cost accounting and coding systems along with the Department of Supply and Services detailed transaction computer listings.

Because total operational costs of hydrometric and sediment stations vary significantly with the period of operation and with the type of record produced, weighing factors have been developed. These weighing factors are used to compute "station units" which in turn are used to apportion both the operation and maintenance and the capital costs.

STATION UNITS

The calculation of station units is based on the 1984/85 Schedule A of the Memorandum of Agreement which is included in

Appendix II. The number of station units are not modified to include new stations constructed or stations discontinued during the fiscal year.

The standard weighing factors used by the Water Survey of Canada in the Western and Northern Region to calculate Federal, Federal-Provincial and Provincial costs are:

Type of Station	Symbol	Unit
12 month flow record	Q^{12}	1.00
8 month flow record	Q^{8}	0.75
12 month water level record	H^{12}	0.40
8 month water level record	H^{8}	0.25
12 month sediment record	S^{12}	1.00
8 month sediment record	S^{8}	0.75
Miscellaneous Record	M	0.00

Tables VI-1 and VI-2 contain the number of stations and station units operated in the hydrometric and sediment categories respectively.

Computation of "Incremental" Sediment Program Cost

The computation of the "incremental" sediment program costs was carried out in the same procedure as last year. The "incremental" cost is the cost over and above the normal

hydrometric program costs. Based on historical data prior to 1980, when the sediment program was carried out by a specifically designated sediment section staff, weighing factors have been computed and these have been in use since that time. With the exception of sediment laboratory analysis costs, the sediment program salary, O & M, and capital depreciation costs are integrated with the conventional hydrometric costs. The "incremental" sediment costs are split out from the conventional costs using the previously mentioned weighing factors.

The total laboratory costs for the analysis of suspended sediment samples are summed on the basis of the station classification and the federal and provincial shares are then computed in Table VI-8.

SALARY COSTS

Salary costs are wages of field personnel (hydrometric survey technicians and supervisory staff) directly associated with the collection and computation of the hydrometric and sediment record. Salaries vary according to classification related to career development, supervisory or non-supervisory duties and are adjusted to account for assignments to other programs. Where applicable, Isolated Post Allowances are included with the salary. In Manitoba, the two positions stationed at The Pas are in this category. The salaries of other personnel

assigned to hydrometric or sediment operations as the need arises are included. Salary costs are apportioned according to hydrometric conventional access and remote access stations and sediment program incremental costs. Table VI-3 presents the staff and salaries chargeable for the 1984/85 fiscal year. The total salary costs for the sediment program are included with the hydrometric conventional group. Based on previous years' data, the incremental salary cost for the sediment program over and above the hydrometric program at a site is estimated at 0.9 times the salary cost of a hydrometric station. Table VI-4 contains the calculation of station unit salary cost.

OPERATIONAL COSTS

Operations and maintenance costs cover a multitude of items. Table VI-5 presents a detailed breakdown of the expenditures according to the departmental coding system of line objects (expenditure items) and cost codes. This information was extracted from the Federal Department of Supply and Services year end expenditure data on computer listings. The coding system enables the separation of the shareable costs to hydrometric conventional (005 code) and hydrometric remote (006 code) and sediment field (004 code) for all expenditures. The procedure for computing O & M costs was revised for 1984/85 as a result of the CWRB acquisition of a minicomputer system for in-house data processing. All costs related to data processing for 1984/85 have been coded to Data Control cost code 0017 in

Table VI-5, and are thus not included in cost codes 004 to 006. Data processing station unit costs for 1984/85 have been computed in Table VI-6 according to the procedure agreed upon by the Coordinating Committee which has been included in this report as Appendix IX. Sediment laboratory analysis costs were computed on the basis of samples analyzed and this information is presented in Table VI-8. These costs were then shared on the basis of station classification in Schedule A. Table VI-7 provides a summary of the O & M costs and presents the derived station unit O & M costs for hydrometric conventional, hydrometric remote, and sediment program categories. To derive "incremental" sediment program O & M unit costs the more simply identifable sediment costs (004) excepting laboratory analysis were grouped with the conventional hydrometric (005) and an incremented cost of 0.4 over and above the hydrometric program costs were applied. The incremental sediment O & M unit cost was then determined by multiplying the conventional station unit O & M costs by the 0.4 weighing factor. The sediment analysis costs were computed separately as explained in the previous section on incremental sediment costs. The remote station unit cost was then derived by dividing the remote O & M costs (006) by the remote station units. In order to be comparable to previous years, total O & M station units costs, which would include data processing unit costs, have been computed at the bottom of Table VI-7 and used for computing the shareable costs.

CAPITAL DEPRECIATION COSTS

Capital costs include vehicle and equipment depreciation. The total inventory value of hyrometric, sediment and construction field equipment, not including water level recording equipment, is depreciated at 10% annually. The actual expenditure on capital items is on the last page of Table VI-5.

Table VI-9 presents the summation of the equipment inventory value at the beginning and end of the 1984/85 fiscal year and the average of the two is used as the value for computing the equipment depreciation. The year end value was obtained from the CWRB Automated Equipment Iventory Depreciation figures for vehicles are presented in Table VI-10 and are based on the Federal Fleet Management Information System suggested vehicle life times. Depreciation is charged only for the months that the vehicle is actually used for field operation.

Table VI-11 presents a summary of the vehicle depreciation, and the equipment depreciation along with the computation of the unit capital depreciation to be charged to hydrometric conventional and remote access and sediment program. the incremental capital depreciation costs for the sediment program over and above the hydrometric program is estimated at 0.4. This is due to higher equipment costs associated with the sediment program.

Construction vehicle and equipment depreciation is charged to the construction costs which are presented in Table VI-12.

CONSTRUCTION COSTS

A construction cost summary showing the cost breakdown by major items according to Federal, Federal-Provincial and Provincial categories is presented in Table VI-12. This information is obtained from the 1984/85 district construction report with the exceptions as noted. The construction equipment and vehicle depreciation values are derived from Tables VI-9 and VI-10 respectively. The breakdown of the vehicle and equipment depreciation costs for each of the Federal-Provincial and Provincial categories was derived on the basis of the proportion of the other costs in each category. The addition of vehicle and equipment depreciation costs results in construction costs being slightly higher than is shown in the Annual Construction Report.

Information on instrumentation costs is presented in Table VI-13. Table VI-14 summarizes the construction and instrumentation costs and identifies the federal and provincial shares. the total provincial share of $28,873 includes the net construction cost of $26,923 plusa $1,950 for servomanometer instrumentation costs.

The federal costs of $181,942 includes $49,992 for construction $50,750 for servomanometers and recorders, and $81,200 for real time telemetry.

HYDROMETRIC SUMMARY (STATION UNITS) 2 - 1984-85

	CONVENTIONAL			REMOTE		
FEDERAL						
DISCHARGE(C)	31 X 1.00=	31.00		DISCHARGE(C)	19 X 1.00=	19.00
DISCHARGE(S)	26 X 0.75=	19.50		DISCHARGE(S)	0 X 0.75=	0.00
DISCHARGE(M)	1 X 0.00=	0.00		DISCHARGE(M)	0 X 0.00=	0.00
WATER LEVEL(C)	11 X 0.40=	4.40		WATER LEVEL(C)	7 X 0.40=	2.80
WATER LEVEL(S)	1 X 0.25=	.25		WATER LEVEL(S)	1 X 0.25=	.25
SUB-TOTALS	70	55.15			27	22.05
FEDERAL-PROVINCIAL						
DISCHARGE(C)	22 X 1.00=	22.00		DISCHARGE(C)	12 X 1.00=	12.00
DISCHARGE(S)	45 X 0.75=	33.75		DISCHARGE(S)	0 X 0.75=	0.00
DISCHARGE(M)	0 X 0.00=	0.00		DISCHARGE(M)	0 X 0.00=	0.00
WATER LEVEL(C)	10 X 0.40=	4.00		WATER LEVEL(C)	15 X 0.40=	6.00
WATER LEVEL(S)	7 X 0.25=	1.75		WATER LEVEL(S)	0 X 0.25=	0.00
SUB-TOTALS	84	61.50			27	18.00
PROVINCIAL						
DISCHARGE(C)	7 X 1.00=	7.00		DISCHARGE(C)	0 X 1.00=	0.00
DISCHARGE(S)	51 X 0.75=	38.25		DISCHARGE(S)	0 X 0.75=	0.00
DISCHARGE(M)	1 X 0.00=	0.00		DISCHARGE(M)	0 X 0.00=	0.00
WATER LEVEL(C)	7 X 0.40=	2.80		WATER LEVEL(C)	6 X 0.40=	2.40
WATER LEVEL(S)	17 X 0.25=	4.25		WATER LEVEL(S)	0 X 0.25=	0.00
SUB-TOTALS	83	52.30			6	2.40
TOTALS	237	168.95 *			60	42.45

NUMBER OF: DISCHARGE STATIONS	=215
WATER LEVEL STATIONS	= 82
REMOTE STATIONS	= 60
SEDIMENT STATIONS	= 19
WATER QUALITY STATIONS	= 7
WATER TEMP STATIONS	= 7
D.C.PLATFORMS	= 8
TELEMARKS	= 27
INTELLIGENT MICROPROCESSORS	= 5

*NOTE The total number hydrometric conventional units used for computing station units costs in this Appendix was reduced to 168.70 to account for the station operated by MWRB (Wilson Creek near McCreary - 0.25 station units).

TABLE VI-2

SEDIMENT SUMMARY (STATION UNITS)

	CONVENTIONAL				REMOTE			
FEDERAL								
SEDIMENT (C)	10	X 1.00=	10.00		SEDIMENT (C)	0 X 1.00=	0.00	
SEDIMENT (S)	2	X 0.75=	1.50		SEDIMENT (S)	0 X 0.75=	0.00	
SEDIMENT (M)	0	X 0.00=	0.00		SEDIMENT (M)	1 X 0.00=	0.00	
SUB-TOTALS	12		11.50			1		0.00
FEDERAL-PROVINCIAL								
SEDIMENT (C)	1	X 1.00=	1.00		SEDIMENT (C)	0 X 1.00=	0.00	
SEDIMENT (S)	1	X 0.75=	.75		SEDIMENT (S)	1 X 0.75=	.75	
SEDIMENT (M)	3	X 0.00=	0.00		SEDIMENT (M)	0 X 0.00=	0.00	
SUB-TOTALS	5		1.75			1		.75
PROVINCIAL								
SEDIMENT (C)	0	X 1.00=	0.00		SEDIMENT (C)	0 X 1.00=	0.00	
SEDIMENT (S)	3	X 0.75=	2.25		SEDIMENT (S)	0 X 0.75=	0.00	
SEDIMENT (M)	2	X 0.00=	0.00		SEDIMENT (M)	0 X 0.00=	0.00	
SUB-TOTALS	5		2.25			0		0.00
TOTALS	22		15.50			2		.75

SUMMARY:	CONVENTIONAL STATIONS		REMOTE STATIONS		TOTALS
	SEDIMENT (C)	= 11	SEDIMENT (C)	= 0	SEDIMENT = 24
	SEDIMENT (S)	= 6	SEDIMENT (S)	= 1	
	SEDIMENT (M)	= 5	SEDIMENT (M)	= 1	

TABLE VI-3
WATER QUANTITY PROGRAM
SALARY COST 1984/85

Position No.	Position Title	Salary
Hydrometric Conventional Access and Sediment Stations		
840-1468	Hydrometric Supervisor	$
32 413		
840-1300	" "	32 413
840-1414	" "	34 574
840-1346	" "	32 413
840-1298 (4 months)	" "	31 128
840-1514	Hydrometric Technician	26 562
840-1591	" "	29 992
840-8010	" "	29 992
840-1440	" "	24 358
840-1513	" "	29 992
840-1402	" "	25 252
840-8921 (10 months)	" "	25 377
840-1590	" "	29 992
840-1434 (6 months)	" "	10 163
840-8963	" "	29 992
Additional assistance by Technical Services Section staff 4.0 person months		11 696
Overtime		1 706
Salary reduction for Domain & Mannes Drains (3 person months)		- 5 230
Total		432 785
Hydrometric Remote Access		
840-4917 (9.5 months)	Hydrometric Technican	16 077
840-8083 (9 months)	" "	22 724
840-1415	" "	24 268
840-8996	" "	25 649
840-1592	" "	25 483
840-8011 (10.5 months)	" "	20 963
Additional assistance by Area Engineers (7 weeks)		5 517
Overtime		3 983
Salary reduction for Churchill Tidal gauge (0.6 person months)		- 1 308
Total		$143 356

Total p - y utilization 19.9 person-years out of 21 positions

TABLE VI-4
CALCULATION OF STATION UNIT SALARY COST

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric station where sediment is monitored)	168.70
b)	Sediment Station Units = 16.25 x 0.90 (0.90 is the incremental salary cost coefficient for the sediment portion over and above the cost of a hydrometric station. It is based on previous years' data)	14.62
	Combined Hydrometric & Sediment Weighted Salary Units	183.32

Unit Salary Cost (Hydrometric Conventional)

$$= \frac{\$432\ 785}{183.32} = \$2\ 361$$

Unit Salary Cost (Sediment only) ($2361 x 0.9) = $2,125

c)	Hydrometric Remote Access Station Units	42.45

Unit Salary cost (Hydrometric Remote)

$$= \frac{\$143\ 356}{42.45} = \$3\ 377$$

TABLE VI-5

AUTHORITY CODE 101 — DETAILED COST SUMMARY 1984-85

DESCRIPTION	LINE OBJECT	0001	1615	0004	0005	0006	0007	0010	0016	0017	0003	TOTALS
02 TRANSPORTATION & COMMUNICATION												
TRAVEL EXPENSES	701	655.15	961.89			69.37	1452.31		833.04			3971.76
CAR MILEAGE	702	34.00										34.00
BUS TRAV CTS CHARGE	704	1582.75	2103.70			300.25	2900.82		802.55			7690.07
TRAVEL EXPENSE	711	141.36		1533.15	40875.21	8160.27	1500.35	5265.32	624.63	405.50	325.53	58831.32
CAR MILEAGE	712				162.12		68.00					230.12
CAR RENTALS	713								0.00	150.87		150.87
ITIN WK TRAV CHAR	714				138.25	373.65	3739.50	1172.95	0.00	863.00		6287.35
TRAVEL GOVT CONF	723		965.01									965.01
TRAVEL USA BUSIN	730											0.00
TRAVEL USA ITIN WORK	731			227.52	655.61							883.13
TRAVEL TAXI CHARGE	741		7.25									7.25
VACATION TRAV FROM I.P.A	743				519.25							519.25
TRAVEL TRAINING	744	43.62					9637.12			498.50		10179.24
TRAVEL FOR STAFFING	745	566.35										566.35
TRAV EXP NON-PS	750				70.31	3168.47	387.49				103.60	3729.87
TRAVEL COSTS	760				716.65							716.65
CENT REMOV SERV DSS	766	2233.18			0.00	0.00						2233.18
MERCH AIR TRANS	801	21.47	232.06		418.04		243.00		22.44	304.16	270.93	1512.10
MERCH RAIL TRANS	802				28.80							28.80
MERCH TRUCK TRANS	804		77.60		1096.78	350.00	209.76	3.50	15.65	438.36	87.72	2279.37
MERCH BUS TRANS	805				145.10	5.10	8.50					158.70
UNSPEC TRANS COSTS	809	12.00	4.75		43.00	20.00	3.00		18.00	59.50	17.50	177.75
PARCEL POST	851	3.13	16.11		27.90		2.23	2.24		7.68		59.29
OTHER POSTAL SERV	852	8.31	36.75		409.64	1.91	5.10	3.92		3.24		468.87
COURIER SERV	853	6.00	967.40		0.00	0.00	2.50	2.50	34.72	526.55		1539.67
CENT FREIGHT SERV	854	172.08	146.10	501.61	1164.01	1229.47		209.85		130.90	4.40	3558.42
TEL GTA DEPT COMM	901		1737.34		6125.63			816.75	816.74	816.77		10313.23
TEL INST REP CHARGE	902		220.50		279.75	53.00		79.50		225.00		857.75
TEL LONG DIST CHARGE	903		358.78		2092.87	1110.09	482.28	155.58	143.15	95.99		4438.74
TEL SERV CHARGES	904		7816.75		2.30	17.23	615.23					8451.51
MESS DATA COMM SERV	906		2978.50			56.03		1119.63		6823.87		10978.03
RENT MESS DATA EQUIP	907				2040.60							2040.60
ADVERTISING PRINTING	1001	454.30										454.30
SUB-TOTALS		5933.70	18630.49	2262.28	57011.82	14914.84	21257.19	8831.74	3310.92	11349.89	809.68	144312.55
03 INFORMATION												
ADVERTISING OTHER	1003	600.00					11.72					611.72
PRINT COMPET POST	1012									14.71		14.71
OTHER PRINT SERV ACQ DSS	1013		1983.93		50.27			165.41	1002.29	763.43		3965.33
OTH PRINT COMM PRINT	1022	222.36		323.40	13.25			37.97	174.30	16.45		787.73
SUB-TOTALS		822.36	1983.93	323.40	63.52	0.00	11.72	203.38	1176.59	794.59	0.00	5379.49
04 PROFESSIONAL & SPECIAL SERV												
GAUGE ATTEND SERV	1171			7851.50	2232.72							10084.22
STF DEV TR PSC EX LGTR	1220		795.00				38.00					833.00
TUI FEES UNIV & COLL	1221						88.50		82.50			171.00
TR PS OTH	1222	1875.00	197.00				2562.00	64.00		1342.00		6040.00
CONTRCT STENO TYP SERV	1301		4940.38					430.00	220.75			5591.13
CONTRACT CLERICAL SERVIC	1302		1590.56									1590.56
OTH TEMP HELP SERV	1303				596.16	745.75				788.00		2129.91
LAUND CLEAN REL SERV	1501	0.00			386.81	12.19			0.00	0.00		399.00

DESCRIPTION	L.O.	0001	1615	0004	0005	0006	0007	0010	0016	0017	0003	TOTALS
EDP SERV PURCH OTH DEPT	1505	8579.94			0.00				96.44	103.06		8779.44
EDP PURCH SOFT	1510		0.00		0.00	0.00			2371.86	11449.81		13821.67
REAL ESTATE SERVICES	1515									3.42		3.42
CNTRCT ADMIN DSS SERV CH	1525	19479.73										19479.73
GRAPHIC SERV	1535	10.59										10.59
OTH PHOTO SERV	1536	23.74			82.02	4.98	58.63	17.60	68.47			255.44
MAINT SERV MONUM PLQ	1543	2520.00										2520.00
PRINT SERV WIT DEPT	1545		654.68		836.14	300.00	94.69		94.70			1980.21
BROKERAGE FEES	1554						7916.85					7916.85
MEMBERSHIP FEES	1575											0.00
SNOW ICE REMOVAL SERVICE	1581							20.00				20.00
OTH SERV CONTR NOT SPEC	1586									1005.51		1005.51
PETTY CASH PURCH SERV	1589		21.77		49.29		12.47					83.53
SRV NES PUR GOV DEPT	1596	1589.64										1589.64
MISCELLANEOUS SERVICES	1597		61.20									61.20
SUB-TOTALS		34078.64	8260.59	7851.50	4183.14	1062.92	10771.14	531.60	2934.72	14691.80	0.00	84366.05
07 RENTALS												
RENTAL LANDS	1601				1715.00							1715.00
RENT EDP EQUIP	1615				0.00	0.00				173.00		173.00
WD PRDC PER EQUIPM	1660	1183.39	1816.61									3000.00
RNT PHOTO PRINT EQUIP	1621		1312.89				800.55					2113.44
RNT OFF MACH EXC FURN	1622		792.80				21.20					814.00
PHOTO AND AUDIOVISUAL EQ	1624	105.00										105.00
RENT MACH EQUIP	1625							1212.00				1212.00
LEASE MOTOR VEHIC	1630							251.16				251.16
RENTAL AIRCRAFT	1635					113450.63		228.00				113678.63
RENT BLDG OTH	1642				359.98							359.98
RENT GAS CYLIND	1650				4076.84	3300.00		90.00				7466.84
RENT EQUIP NES	1651	398.50			153.90							552.40
SUB-TOTALS		1686.89	3922.30	0.00	6305.72	116750.63	821.75	1781.16	0.00	173.00	0.00	131441.45
08 PURCHASED REPAIR & UPKEEP												
MEA CONT LAB INST EXCXRA	1718				3135.46	800.00	173.71				608.00	4717.17
SA SAN ALRM SIGH SYST	1719	30.42	19.17		2125.68							2175.27
FURNITURE FIXTURE	1722		31.00		73.48							104.48
OTHER EQUIP	1727				349.65			31.36				381.01
EDP EQUIPMENT	1735								806.66	5924.80		6731.46
OTH MACH EXCL FURN	1737						42.00					42.00
SHIPS BOATS	1740			3.00	330.00							333.00
RD MOT VEH	1746		356.01		5321.94			1089.22				6767.17
ACCID REPAIR DEPT'L VEHI	1748				772.31							772.31
GAUGE STATIONS	1805				10.60			612.30				622.90
OFFICE BLDG	1845	855.32										855.32
TENANT SERV DPW REVO FUN	1880		276.36									276.36
SUB-TOTALS		885.74	682.54	3.00	12119.12	800.00	215.71	1732.88	806.66	5924.80	608.00	23778.45
09 UTILITIES,MATERIALS & SUPP												
ELECT CONSUMP	1901				27285.49	808.54						28094.03
OTHER PUBLIC UTILITIES	1907							2.45				2.45
FOOD MAT FOOD PREP	2002						370.50					370.50
ROPE FABRIC	2006				6.36							6.36
OTHER SAND & GRAVEL MET	2009				115.20			382.50				497.70
PROPANE GAS LPG	2013				159.66						11.90	171.56
AUTOMOTIVE GAS	2014		1684.45	37.98	27746.14		328.24	7805.93	247.13	21.12		37870.99

DESCRIPTION	L.O.	0001	1615	0004	0005	0006	0007	0010	0016	0017	0003	TOTALS
AVIATION GAS	2015					573.59						573.59
JET FUEL	2016					3817.92						3817.92
OTH PETRO COAL PROD	2018		50.70		845.34		1.05	217.32				1114.41
LEATH FUR RUB MAT	2019				225.00							225.00
WOOD FAB MAT	2020	92.70			1075.37			3963.61			7.74	5139.42
PAPER PAPER BOARD	2021				189.41							189.41
TEXTILE FAB MAT	2022				82.98							82.98
CHEMICAL REL PROD	2023		11.61	1.51	652.53	200.00	1.81	7.22				874.68
HYDROGEN HELIUM	2024				21.02							21.02
CHLORIN OXYG ACETYL	2027				501.71			162.20				663.91
IRON STEEL ALLOYS	2028				3675.85			1190.08			681.93	5547.86
METAL FABR BASIC PROD	2030		12.21		249.67	100.00		289.30				651.18
CEMENT	2031				163.17			35.55				198.72
ROOFING MAT	2033							30.65				30.65
GLASS	2034				38.85			10.44				49.29
INSULATION MAT	2035							242.88				242.88
PROTECTIVE CLOTHING	2040				569.96	150.00						719.96
FOOTWEAR APPAREL ACCESS	2041			19.07	680.65	530.98	4.23					1234.93
TOILET CLEAN PREP ETC	2042				6.34							6.34
HOUSE FURNISHING	2044		93.00						204.00	1526.90		1823.90
KITCH UTENS CUTL TABLEW	2045				15.85							15.85
STCK ITEM OTH DSS	2048		4776.04		300.00	100.00						5176.04
MEDIC SUP OPHTHA ORTHO	2050	5.98										5.98
LIBRARY STCK PRINT	2051		342.16		39.84		281.25	20.00	112.00	336.67		1131.92
MAPS CHARTS	2052				113.60	50.00	30.00	2.00	73.00	49.00		317.60
STATION OFF SUPP	2054	189.40	2227.17		105.53	0.00	237.35	0.00	90.77	30.25	0.00	2880.47
DRAFT ART SUPP	2055				51.85			100.80	36.22		0.00	188.87
PHOTOC PAP CHEM	2058		633.19				18.53					651.72
DATA PROCES SUPP	2059		160.00		0.00	0.00			992.22	1470.12		2622.34
PHOTOGRAPH GOODS	2060	8.04			22.57	3.37	21.48	5.08	9.24			69.78
MED PHARMAC PROD	2061		5.99									5.99
CONTAIN CLS RETURN	2063	37.59			30.43	660.00		15.66			53.90	797.58
FLAGS	2067				27.20							27.20
PAINT	2068				419.25			10.58				429.83
MISC PROD AUD-VIS BULB	2070	56.66	4.61	1.58	561.60	203.17	48.23	40.01			90.99	1006.85
HARDWARE	2071				1073.31	250.00		2049.03		1.69	6.19	3380.22
SLIDES, FILMS & VH TAPES	2081				5.00							5.00
SUBSCRIPTIONS	2082		61.44									61.44
PURCHASED CASH INC TX	2083	34.92	86.29		952.76		48.57		169.27	66.67		1358.48
HT AIR COND REFRIG EQUIP	2111										201.92	201.92
PLUMB EQUIP FIT	2113				258.64			443.13				701.77
ELEC LIGHT DIST CONT EQU	2114				3844.85	1000.00		2079.43			1718.30	8642.58
OTH ELEC APPL EQUIP	2116				11.31		116.95		1.89			130.15
GEN ELEC EQUIP	2117				6.74							6.74
BATTERIES	2118			602.50	2768.45	834.08		120.12			1555.10	5880.25
MEA CONT MED OPT INST	2122				5120.40	1511.60	6676.50	1.50		10.59	807.74	14128.33
SIGNAL SYSTEM	2123				945.00		173.65					1118.65
SAF SANIT EQUIP	2124				4527.00		133.70			127.00		4787.70
HND TOOL CUTL	2126				1001.04			292.20				1293.24
GRADER BLADES	2127				2.32		40.00					42.32
OTH EQUIP INCL X-RAY	2128				186.37			129.10				315.47
EDP EQUIPMENT	2135								759.16	253.00		1012.16

DESCRIPTION	L.O.	0001	1615	0004	0005	0006	0007	0010	0016	0017	0003	TOTALS
OFF EQUIP UND $500	2136		31.75									31.75
OTH OFF EQUIP	2138		462.00		59.95							521.95
SHIPS BOATS	2140				281.80							281.80
RD MOT VEH	2146		220.70		2773.13		105.34	786.57				3885.74
RUB TIRE TUBES	2147		191.18		3557.40			85.96				3834.54
MISC VEHICLES	2148				9.41			79.50				88.91
OVERSNOW VEHICLES	2149				5.09							5.09
SUB-TOTALS		425.29	11054.49	662.64	93368.39	10793.25	8637.38	20600.80	2694.90	3893.01	5135.71	157265.86
14 ALL OTHER PAYMENTS												
OTH MISC EXPEND	2527	5.72			267.00							272.72
VEH RE FEES	2528	30.00			80.00							110.00
CURRENT METER PARTS					1200.00	400.00						1600.00
REDUCE FOR DOMAIN & MANNES					-1850.00							-1850.00
CHURCHILL TIDAL GAUGE												3201.11
WATER QUALITY MONITOR												409.83
IJC & INTERPROV BOARDS												672.12
SUB-TOTALS		35.72	0.00	0.00	-303.00	400.00	0.00	0.00	0.00	0.00	0.00	4415.78
TOTALS		43868.34	44534.34	11102.82	172748.71	144721.64	41714.89	33681.56	10923.79	36827.09	6553.39	550959.63
AUTHORITY CODE 201												
10 CAPITAL CONSTRUCTION												
GAUGE STATION	2206							19289.81				19289.81
SUB-TOTALS		0.00						19289.81				19289.81
11 MACHINERY & EQUIPMENT												
CNV ELEV MAT HNDLG	2302						516.80					516.80
TELECOM EQUIP EXC EDP	2312								5476.75			5476.75
HT AIR CDTNG REFRIG EQUI	2313						444.72			3291.00		3735.72
GENERATORS	2315							875.00				875.00
OTH ELEC EQUIP APPL	2317						180.00					180.00
ELECTRONIC EQUIP	2320	457.90										457.90
MEA CONT LAB INST EXCXRA	2322						27705.15				29981.70	57686.85
FURN FIXT EXC DSS	2333		1585.77							2600.72		4186.49
FURN FIXT DSS	2334						360.00					360.00
OTH EQUIP EXC PHOTO	2347						1118.20	1308.33				2426.53
OTH EDP EQUIP	2357								11872.15	82161.68	967.80	95001.63
OTH OFF MACH & EQUIP	2362		1102.00									1102.00
RD MOTOR VEHIC							50125.22					50125.22
SUB-TOTALS		457.90	2687.77	0.00	0.00	0.00	80450.09	2183.33	17348.90	88053.40	30949.50	222130.89
TOTALS		457.90	2687.77				80450.09	21473.14	17348.90	88053.40	30949.50	241420.70

TABLE VI-6
1984/85 DATA PROCESSING COSTS

Actual 1984/85 Costs

Captial Expenditures for Mini Computer System			
as of April 1, 1984	$130,000		
during 1984/85	82, 162		
Total for 1984/85	212,162	(2 additional RUA-60 disk drives, 2 printers, terminal & plotter)	
minus inputed rental recovered	0	(recovered since last increase i	
	212,162		
Inputed rental charge for 1984/85	212,162 x. 10 =	(10 year recovery period)	$21,216
Annual Maintenance Costs (Data Control Shareable coded) maintenance of hardware			$7,100
Annual Operating Costs (Data Control Shareable coded) software licences, communications and supplies			12,696
Actual Total 1984/85 Computing Costs for District			41,012
Manitoba Portion based on station units (219.3) (219.3+46)			33,901

Computing Cost Ceiling

Cost for data computations	$28,050	
Base year 83/84	x 1.05	(supplied by Finance & Admin.
(1984/85 G.P.I. 1.05)		Branch, Ottawa)
Base Ceiling	$29,452	

Total 84/85 Computing Cost Ceiling $29,452

Shareable cost for 1984/85

The lesser of the Actual* or Ceiling* $29,452

By Station Unit

Data Processing Station Units in Manitoba	
Hydrometric Conventional	168.70
Sediment (16.25 x 0.5)	8.12
Hydrometric Remote	42.45
	219.27

Shareable Data Processing Costs = $\frac{\$29,452}{219.3}$ = $134/station unit

Hydrometric Conventional Data Processing Unit Cost	$134.00
Sediment Data Processing Unit Cost ($134 x 0.5)	$67.00
Hydrometric Remote data Processing Unit Cost	$134.00

TABLE VI-7
CALCULATION OF STATION UNIT O&M COST

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric stations where sediment is monitored).	168.70
b)	Sediment Station Units 16.25 X 0.4 (0.4 is the incremental O & M cost coefficient for the sediment portion over and above the cost of a conventional hydrometric station)	6.5
	Combined Hydrometric and Sediment Weighted O & M units	175.20

Combined Hydrometric Conventional and Sediment (excluding lab analysis and data processing) O&M Costs from Table VI-5

= $172 749 + $11 103 = $183 852

Hydrometric Conventional Station

Unit O&M Cost (Hydrometric Conventional)
= $\frac{\$183\ 852}{175.20}$ = $1049 (excluding data processing)

Unit O&M Cost (Sediment incremental cost only)
(excluding lab costs)
= $1044 X 0.4 = $420 (excluding data processing)

c)	Hydrometric Remote Access Station Units	42.45

Unit O&M Cost (Hydrometric Remote)

= $\frac{\$144\ 722}{42.45}$ = $3409 (excluding data processing)

Total O & M Station Unit Costs - Including data processing from Table VI-6

Hydrometric Conventional	- $1049 + $134 = $1183
Sediment (incremental cost)	- $ 420 + $ 67 = $ 487
Hydrometric Remote	- $3409 + $134 = $3543

TABLE VI-8

SEDIMENT SAMPLE LABORATORY ANALYSIS COSTS*

FOR 1984/85

Filtration Analysis Cost per sample - $14.42
Bottom Withdrawal Tube Analysis Cost per sample - $60.64

	Number of Samples		
Federal Category Sediment Sampling Sites	Filtration	Bottom Withdrawal	Total Cost
Antler River near Melita	33		475.86
Assiniboine River at Headingley	95	6	1733.74
Assiniboine River near Holland	137		1975.54
Pembina River near Windygates	60	1	925.84
Red River at Emerson	139	9	2550.14
Red River near Lockport	200	4	3126.56
Red River near Lockport (Selkirk)	61	8	1364.74
Roseau River near Dominion City	153	1	2266.90
Roseau River at Gardenton	48		692.16
Souris River at Wawanesa	52		749.84
Souris River near Coulter	101	1	1638.34
Saskatchewan River at The Pas	135		1946.70
Nelson River above Bladder Rapids	12		173.04
Sub-Total			$19619.40
Federal - Provincial Category Sediment Sampling Sites			
Burntwood River above Three Point lake	10		144.20
Burntwood River below First Rapids	3		43.26
Burntwood River near Thompson	8		115.36
Odei River near Thompson	49		706.58
Sub-Total			$1009.40
Provincial Category Sediment Sampling Sites			
Edwards Creek Drain below Jackfish Creek	44	4	877.04
Souris River below Souris	75		1081.50
Souris River below Hartney	83		1196.86
Valley River near Dauphin	86		1240.12
Sub-Total			$4395.52

Total sediment Analysis Laboratory Cost - $25,024.32

Federal Share Sediment Analysis Cost = $19,619.40 + $\frac{\$1009.40}{2}$ = $20,124.10

Provincial Share Sediment Analysis Cost = $4,395.52 + $\frac{1009.40}{2}$ = $4,900.22

* Data obtained from CWRB, Sediment Laboratory in Regina

TABLE VI-9
MANITOBA 1984/85
INVENTORY OF HYDROMETRIC, SEDIMENT AND CONSTRUCTION
EQUIPMENT BASED ON ECS AUTOMATED EQUIPMENT INVENTORY SYSTEM

Hydrometric and Sediment

	April 1, 1984	April 1, 1985
	$306 438	$240 522
1984/85 Average	$273 480	

Construction

	April 1, 1984	April 1, 1985
	$25 505	$18 285
1984/85 Average	$21 895	

TABLE VI-10
VEHICLE DEPRECIATION
MANITOBA FY 1984/85

Vehicle Number	Original Capital Cost $	Depr. per month $	Time in use Month	Annual Depr. $	Remarks
Station Wagons - Lifetime 5 years (60 months)					
84-121	$10 775	$180	10	$1 800	
76-22	4 711	79	2	158	
78-309	5 694	95	12	1 140	
79-461	7 106	118	12	1 416	
78-095	5 348	89	4	356	
Multi-Purpose Vehicles or Light Trucks - Lifetime 6 years (72 months)					
78-308	6 944	97	12	1 194	
78-311	6 428	89	12	1 068	
79-194	8 935	124	12	1 488	
79-195	7 445	103	13	1 309	
79-477	7 731	107	12	1 284	
81-004	8 460	118	12	1 416	Construction
81-005	8 952	124	12	1 488	
81-006	11 522	160	12	1 920	
81-042	9 458	131	13	393	Construction
81-041	14 281	198	12	2 376	
81-043	9 892	137	12	1 644	
82-004	9 952	138	12	1 656	
82-066	10 468	145	12	1 740	
82-067	10 684	148	12	1 776	
83-001	11 478	159	12	1 908	
83-153	10 379	144	12	1 728	
83-154	12 300	171	12	2 052	
84-004	13 758	191	12	2 292	
84-119	12 593	175	8	1 400	
84-120	14 357	199	9	1 791	Construction
84-122 (June/84)	12 401	172	9	1 548	

Field Surveys Vehicles Depreciation (excluding Construction Vehicles) = $32 741

Construction Vehicles Depreciation = $3 600

Capital Cost of new Vehicles for Manitoba acquired in 1984/85 was $50 126

TABLE VI-11
CALCULATION OF STATION UNIT
CAPITAL DEPRECIATION COST 1984/85

Vehicle Depreciation - Based on FMIS* recommended lifetimes and vehicle use.		$32 741
Equipment Depreciation**		
Average Inventory Value for 1984/85 - $273 480		
Capital Depreciation of equipment (10 years)	$273 480 / 10	27 348
Total Capital Depreciation		60 089

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric stations where sediment is monitored)	168.70
b)	Sediment Station Units 16.25 X 0.4 (0.4 is the incremental capital depreciation cost coefficient for the sediment portion over and above the cost of a hydrometric conventional station)	6.5
c)	Hydrometric Remote Access Station Units	42.45
	Combined Weighted Capital Depreciation Units	217.65

Unit Capital Depreciation Cost = $\frac{\$60\ 089}{217.65} = \$276$
(Hydrometric Conventional)

Unit Capital Depreciation Cost = $\$276 \times 0.4 = \$110$
(Sediment only)

Unit Capital Depreciation Cost = $\$276 \times 1.0 = \$276$
(Hydrometric Remote)

* - Departmental Fleet Management INformation System
** - Departmental Equipment-In-Use Material Management System

TABLE VI-12
MANITOBA CONSTRUCTION PROGRAM
COST SUMMARY 1984-85

Federal Stations

Material and supplies	$ 5,033.87
Travel expenses	5,669.45
Salaries	14,467.00
Aircraft	228.00
Labour	20.00
Electrical	933.17
Hydro	1,114.00
Contracts	4,658.00
Telephone	575.00
Vehicle & Equip.Depreciation (1)	2,418.00
Total Federal Cost	$32,116.32

Federal-Provincial Stations

Materials and Supplies	$8,772.36
Travel Expenses	3,753.06
Salaries	12,711.00
Hydro	4,973.00
Electrical	1,440.21
M.T.S.	1,000.00
Contracts	410.00
Vehicle & Equip.Depreciation (1)	2,691.00
Total Federal-Provincial Cost	$35,750.63

Provincial Stations

Materials and Supplies	$908.64
Travel Expenses	1,601.82
Salaries	4,445.00
Rentals	251.16
Hydro	973.00
Electrical	187.50
Vehicle & Equip. Depreciation (1)	681.00
Total Provincial Cost	$ 9,048.12
TOTAL MANITOBA PROGRAM COST	$76,915.07

$$\text{Federal Share} = \$32,116.32 + \frac{\$35,750.63}{2} = \$49,991.64$$

$$\text{Provincial Share} = \$9,048.12 + \frac{\$35,750.63}{2} = \$26,923.44$$

(1) Total Construction Vehicle and Equipment Depreciation cost of $5,790 is proportioned on the basis of all other project costs in each category. This cost is not included in construction report.

TABLE VI-13

INSTRUMENTATION AND TELEMETRY COSTS 1984/85

Federal		
	8 Water Level Recorders	$17,600.00
	8 Servomanometers	31,200.00
	8 DCP Systems including installation	70,400.00
	5 Memomark III's and interfacing cables	10,800.00
Federal-Provincial		
	1 Servomanometer	$ 3,900.00
	TOTAL MANITOBA	$133,900.00
	Federal Share	$131,950.00
1	Provincial Share	$1,950.00

TABLE VI-14
1984/85 CAPITAL PROGRAM
COST SUMMARY

MANITOBA

Federal Costs

Construction Program	$49,991.64
Recorders and Servomanometers	50,750.00
Real Time Telemetry	81,200.00
TOTAL	$181,941.64

Provincial Costs

Construction Program	$26,923.44
Real-Time Telemetry	$ 0
Servomanometers	1,950.00
TOTAL	$28,873.44

Appendix VII

Changes affecting 1985/86 Schedule A and computation of 1985/86 Schedule D

STATION CHANGES TO 1984/85 SCHEDULE A - MANITOBA FOR 1985/86

NAME CHANGE

05SB093 Fish Lake near Meleb changed to Fish Lake at Outlet Control Structure near Meleb

No other changes.

ESTIMATED COST FOR SCHEDULE D - MANITOBA 1985/86

	No. of Stations	No. of Units	Unit* Cost		Total Cost	Provincial Share	
A Hydrometric Stations:							
Federal							
Conventional Access	70	55.15	x3900	=	215100	0	
Remote Access	27	22.05	x8400	=	185200	0	
Sub-total	97	77.20			400300		
Federal-Provincial							
Conventional Access	84	61.50	x3900	=	239900	119950	
Remote Access	27	18.00	x8400	=	151200	75600	
Sub-total	111	79.25			391100	195550	
Provincial							
Conventional Access	83	52.30	x3900	=	204000	204000	
Remote Access	6+	2.40	x8400	=	20200	20200	
Sub-total	89	54.70			224200	224200	
TOTAL					1015600	419750	
Credit for Provincial Operation of one station of 0.25 units						- 1000	
						418750	419,000
B Sediment Stations:							
Federal	11	10.75	x2800	=	30100	0	
Federal-Provincial	3	2.50	x2800	=	7000	3500	
Provincial	4	3.00	x2800	=	8400	8400	
Sub-total	18	16.25			45500	11900	
Lab Analysis					36000	6000	
TOTAL	18	16.25			81500	17900	18,000
C Construction:							
a) Streamflow and water level installations					55000	30000	30,000
D Installation of Satellite Based Real Time Hydrometric and Meteorologic Data Collection Network							
a) DCP installation (11 DCPs at 9 F/P and 2 P sites)					114500	69000	
b) Servo manometers (1 Man. Hydro, 1-1/2 CWRB, 1-1/2 MWRB)					15200	9500	
					129700	78500	78,500
TOTAL PROVINCIAL SHARE FOR 1985/86							$545,550

*Actual 1983-84 unit costs plus 5% + 4%

+ Includes one station at .40 units, $3400, operated under MWRB, Manitoba Hydro Agreement

SCHEDULE D

This schedule provides a summary of the annual payment. The details of the calculations of operation and construction are available and have been jointly reviewed by officers for each party

ANNUAL PAYMENT FOR 1985-86 TO BE PAID TO CANADA BY MANITOBA

	Operation	Construction	Total
a) Streamflow and water level installations	$419,000	$30,000	$449,000
b) Sediment installations	18,000	0	18,000
c) Installation of Satellite based Real Time hydrometric and Meteorlogic Data Collection Network			78,500
ANNUAL PAYMENT			$545,500

ADMINISTRATOR FOR MANITOBA

(signature)

Director
Water Resources Branch
Department of Natural Resources

ADMINISTRATOR FOR CANADA

(signature)

Regional Director
Inland Waters Directorate
Environment Canada

Appendix VIII

Summary of station data and cost information for inclusion to 1984/85 National Annual Report

Province: MANITOBA

TABLE 1
WATER QUANTITY SURVEYS
GAUGING STATION DATA FOR 1984-85

No. of Stations			Changes during 84/85		Stn. Designation April 1, 1984			
April 1/83	April 1/84	Change	Added	Discontinued	Fed.	F/P	Prov.	Contrib.
315	335	+20	0	0	97 (13)*	111 (6)*	89 (5)*	38

*Bracket Sediment Stations

TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA April 1/75 - April 1/84

Federal Stations			F/P Stations			Provincial Stations			Total Stations		
Apr 1/75	Apr 1/84	Chge	Apr 1/75	Apr 1/84	Chge	Apr 1/75	Apr 1/84	Chge	Apr 1/75	Apr 1/84	Chge
142	97	-45	92	111	+19	72	89	+17	306	297	-9

TABLE 3
WATER QUANTITY SURVEYS 1984-85
DETAILED GAUGING STATION DATA

F-1	F-2	F-3	F-4	F/P-1	F/P-2	F/P-3	P-1	P-2		Contributed	Total-All
22 (2)	16 (2)	22 (6)	37 (3)	0	50 (5)	61 (1)	89 (5)	0		38	335 (24)

Bracket Sediment Stations in all categories.

Province: MANITOBA

TABLE 4
WATER QUANTITY SURVEYS
TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1984-85
(× $1000)

Total Program Costs					Shareable Costs						
P/Yrs	Sal.	Oper.	Cap.	Total	P/Yrs	Sal.	Oper.	Const.	Total	F Share	P Share
40.0	1200.8	553.6	241.4	1995.8	20.9	576.8	442.7	192.9	1,212.4	770.8	441.6

TABLE 5
WATER QUANTITY SURVEYS
COMPARISON - SCHEDULED & ACTUAL COSTS FOR 1984-85
(Dollars)

Salary & Operations		Construction		Total			Annual Payment Received	Received Minus Actual
Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Difference		
410 823	412 759	33 000	28 873	443 823	441 632	- 2.101	456 000*	

* includes +12 177 to balance books for 1983-84

APPENDIX IX

Procedure for Cost-Sharing of CWRB Minicomputer

Environment Canada | Environnement Canada
Environmental Conservation | Conservation de l'environnement

521-269 Main Street,
Winnipeg, Manitoba.
R3C 1B2

Your file Votre reference

Our file Notre reference
1165-36-10 (0696K)

1985-04-18

Mr. V.M. Austford,
Chief of Hydrotechnical Services,
Manitoba Department of Natural
Resources,
Water Resources Branch,
1577 Dublin Ave.,
Winnipeg, Manitoba

Dear Mr. Austford:

Re: Cost Sharing Procedure for the CWRB Minicomputer

A letter, January 4, 1985, from Ian McLaurin to Rick Bowering contained a proposal for the procedure for the cost sharing of CWRB minicomputer. This proposal was accepted at the Coordinating Committee Meeting of January 18 with a slight change and with the note that it would be discussed at the National Coordinating Committee Meeting on February 6.

At the National Coordinating Committee Meeting, Russell Boals presented a Cost Sharing Formula for the WRB Minicomputer System (attached) which contained an added wrinkle of reducing the capital expenditure by the imputed rental recovered. Ian has discussed this with Rick and revised the Canada-Manitoba formula accordingly.

Unless you have objections, the formula and format in the attached Example Minicomputer Cost Sharing Canada-Manitoba will be used.

Yours truly,

for D.R. Kimmett
Regional Chief
Water Resources Branch

ISM/cg

EXAMPLE ONLY

MINI COMPUTER COST SHARING
Canada-Manitoba

The following table illustrates how the mini computer will be cost shared in Winnipeg. This format will be used as a table in the annual cost share report. The specific items and costs shown here are realistic but are examples only. Actual items and costs for 1984/85 may be different.

TABLE X
DATA PROCESSING COSTS

Actual 1984/85 Costs

Capital Expenditures for Mini Computer System			
as of April 1, 1984	$130,000		
during 1984/85	81,500	[additions explained in text]	
Total for 1984/85	211,500		
minus inputed rental recovered	0	[recovered since last increase in capital]	
	211,500		
Imputed rental charge for 1984/85	211,500	x .10 = [10 year recovery period]	$21,150
Annual Maintenance Costs [Data Control Shareable coded]			
maintenance of hardware			7,100
Annual Operating Costs [Data Control Shareable coded]			
software licences, communications and supplies			10,900
Actual Total 1984/85 Computing Costs for District			$39,150
Manitoba Portion based on station units (215 / 215+45)			$32,374*

Computing Cost Ceiling

Cost for data computations	$28,050	
Base year 83/84 (1984/85 G.P.I. 1.05)	x 1.05	[supplied by Finance & Admin. Branch, Ottawa]
Base Ceiling	$29,452	

Increases to Ceiling [agreed to and referenced in Minutes]

DCP data acquisition and archiving costs	$ 1,250
Communication Link to MWRB	545

Total 84/85 Computing Cost Ceiling $31,247 *

Shareable Cost for 1984/85

The lesser of the Actual* or Ceiling* $31,247

By Station Unit

Station Units in Manitoba -- 215
Shareable Data Processing Costs = $31,247 / 215 = $145/station unit

NAMSOM1
NCC Meeting Feb 6

Cost Sharing Formula for the WRB Minicomputer System

Objective:

To provide a simple and equable method for the determination of the total (shareable) annual computing cost vis-a-vis the Hydrometric Agreements.

Cost Sharing Formula:

The formula includes imputed rental, necessary to amortize the capital expenditure for the minicomputer system, the annual operating cost (AOC) and the annual maintenance cost (AMC). The capital expenditure is amortized over a period of 10 years by multipling by 0.10. The expected residual value of the minicomputer system at the end of this period is assumed to be zero. This procedure for determining the annual (shareable) computing costs is to come int effect for the 1984/85 fiscal year and is to be used until such time that the present minicomputer system is replaced.

The formula can be expressed as Total (Shareable) Annual Computing Cost
= (Capital Expenditure X 0.10) + AOC + AMC

However, since the decision of using a in-house minicomputer system was not a joint federal-provincial one, a ceiling for the total (shareable) annual computing cost is being recommended. The ceiling is determined using the previous years total (shareable) computing costs multiplied by a national cost increase factor (i.e. Government Price Index).

In summary, the cost to be shared is the lesser of the two; that calculated using the formula or that determined using the previous years total (shareable) computing cost times the Government Price Index.

Assumption and Conditions:

I Shared Costs

1. Capital Expenditure:

   - The imputed rental will be calculated using the capital cost of the minicomputer system determined on April 1st of the fiscal year. The items to be included when determining the imputed rental are the digitizer system, terminals, plotters, microcomputers, modems, printers, and other hardware items which maybe added from time to time

- The purchase cost of additional equipment will only be added when the equipment can be used in the computional process.

- When the capital cost is adjusted to include additions, due to the purchase of new equipment, the capital cost will be reduced by the amount of the imputed rental recovered since the last upgrade.

2. Annual Operating Costs (AOC):

- The annual operating cost will include any annual charge for rental and/or licence charges for software, communications costs between the minicomputer and host computer, communications costs between sub-offices and the minicomputer for the compilation of annual data as well as host computer costs and miscellaneous supplies.

3. Annual Maintenance Costs (AMC):

- The annual maintenance costs will include the charge for the maintenance of the complete minicomputer system.

II Non-shared Costs

1. Ottawa system

- The capital cost, annual operating cost and annual maintenance costs for the Ottawa system is considered a non-shareable cost.

- The software maintenance agreement for the Ottawa system is also considered a non-shareable cost.

2. Regional systems

- In the regions the cost of renovations for the minicomputer system is a non-shareable item.

- The cost of the communication system between the minicomputers and the Direct Readout Ground Station, i.e. datapac and modem rentals, is considered a non-shareable cost. The method for the recovery of these communications costs will be defined in the VRB policy statement on realtime data service.

R. Boals
December 05, 1983
rev. January 29, 1985

EXAMPLE I:

APPLICATION OF THE COST SHARING FORMULA
FOR THE - 1984-85
CANADA-SASKATCHEWAN MEMORANDUM
OF AGREEMENT WATER QUANTITY SURVEYS

I. Calculation of Total (Shareable) Computing Cost

The total (shareable) annual computing cost will be:

= A + B + C
= 18 350 + 24 400 + 6 900 = $49 650.

A. Capital Expenditure X 0.10

Capital Cost as of April 1, 1984 was 183.5 K and includes:

PDP-11/44 minicomputer	-	113.4 K
Hi-state digitizer	-	19.3 K
Calcomp 1012 plotter	-	11.6 K
RUA-60 disc drive	-	33.1 K
Rixon - R212 modem	-	1.1 K
Vision 2000 terminals	-	5.0 K
		183.5 K

Therefore the imputed rental will be $18 350.

B. Annual Operating Costs (AOC)

The operating costs are:

- installation of communication lines	-	0.7 K
- rental of communication lines	-	6.7 K
- estimated host computer (SASKCOMP) costs	-	12.0 K
- supplied for printer, plotters etc.	-	4.6 K
- off site storage of discs	-	0.4 K
		24.4 K

Therefore the annual operating cost will be $24 400.

C. Annual Maintenance Costs (AMC)

The maintenance cost are:

- fire system maintenance	-	0.4 K
- power and air maintenance	-	0.5 K
- minicomputer maintenance	-	4.8 K
- plotter maintenance	-	1.2 K
		6.9 K

Therefore the annual maintenance cost will be $6 900.

II Ceiling Calculation of Total (Shareable) Annnual Computing Cost

From Table 4 page 33, 1983-84 Annual Report - Canada-Saskatchewan Memorandum of Agreement Water Quantity Surveys

The 1983-84 costs (Cost Codes 005, 006 and 007) were:

- EDP Service - Other Department	-	117
- EDP Purchase Software	-	49 484
		49 601

Assuming a Government Price Index of 4% the 1984-85 Ceiling is

= 1.04 x 49 601
= $51 585

Therefore the total (shareable) annual computing cost for 1984-85 will be is the lesser of I or II which would be $49 650.

Agr-MAN-10

AUTHOR

WSC - Winnipeg.

TITLE CANADA-MANITOBA MEMORANDUM OF AGRMT.-WATER QUAN. SURV. ANN.REPT (84/85)

DATE Borrowed	BORROWER'S NAME	Ret'd

DATE DUE	BORROWER'S NAME