CANADA-MANITOBA
MEMORANDUM OF AGREEMENT
for
WATER QUANTITY SURVEYS
ANNUAL REPORT 1986/87

August 1987

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 1986/87.

PROVINCE OF MANITOBA

V.M. Austford
Manitoba Department
of Natural Resources

GOVERNMENT OF CANADA

R.A. Hale
Environment Canada

Members
Manitoba Coordinating Committee

August, 1987

Winnipeg, Manitoba

EXECUTIVE SUMMARY

The Canada-Maniotba Coordinating Committee held three meetings during the year. Frequent contact was maintained between the members of the Committee and senior staff of both agencies to attend to numerous operational matters requiring immediate attention. Major items arising from the Coordinating Committee meetings were the 1987/88 construction and maintenance plan; 1986/87 expenditure estimates; financial matters related to Schedule D for 1987/88; DCP implementation plan; implementation of Lake Winnipeg Datum; CWRB's sub-office micro-computer systems; review of the winter sediment sampling program; cost recovery of fringe benefits; and the Manitoba Sediment Program Review.

Three new stations were constructed during the year and a total of 16 DCPs were installed. Construction expenditures for the hydrometric program were $104,401.61 (federal) and $20,184.60 (provincial). Expenditures related to the DCP implementation Plan were $159,081.00 federal and $76,551.75 provincial, including $71,952.75 for work done for Manitoba Hydro. The province recovers this amount directly from Manitoba Hydro.

The federal share of 1986/87 program costs was $945,901.00. The provincial share was $559,643.00. A provincial carry over deficit of $7,156.00 from 1985/86 and a 1986/87 payment of $562,000 results in a $4,799.00 provincial deficit to be carried over to 1987/88. Schedule D costs for the 1987/88 fiscal year are estimated at $552,000.

Table of Contents

Page

Figures

Tables

1.0 INTRODUCTION

This is the 12th Annual Report summarizing the activities of the Canada-Manitoba Coordinating Committee established by 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 shows the annual transfer payment from Manitoba to Canada. Schedules A to C are attached as Appendix I (I-2 to I-4). The guidelines for designating Federal and Provincial responsibility for Water Quantity Survey Stations in Schedule A are contained in Appendix I (I-5). Schedule D for 1986/87 is presented in Appendix I (I-6). Detailed station and financial information required for computing shareable costs are included in Appendix II.

The Agreement is administered by the Director of Inland Waters and Lands, Western and Northern Region for Canada, and the Director of the 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 for approval by the Administrators.

The report contains brief summaries from the three Canada-Manitoba Coordinating Committee meetings that were held in 1986/87 as well as a summary of surface water conditions, hydrometric, sediment, construction activities and hydrometric network changes which occurred in 1986/87.

Details of the cost-sharing arrangements for 1986/87 are provided in the report. The federal share of 1986/87 program costs was $945,901.00; the provincial share was $559,643.00. A provincial deficit carryover of $7,156.00 from 1985/86 and a 1986/87 payment of $562,000.00 results in a provincial deficit of $4,799.00 for 1986/87. Program costs for 1987/88 are estimated at $552,000 in Schedule D which includes $40,900.00 for the DCP Implementation Program.

2.0 SUMMARY OF OPERATIONAL CONSIDERATIONS

2.1 COORDINATING COMMITTEE MEETINGS

The Canada-Manitoba Coordinating Committee held three meetings in 1986/87. The highlights of the meetings are included in this section.

Canada-Manitoba Coordinating Committee Meeting May 15, 1986

Schedule D for 1986/87 equal to $552,000 which had been signed by Mr. Weber and Mr. Halliday was presented at the meeting. The final cost summary for 1985/86 was not available for the meeting, however it was noted that due to the timing and nature of spring break-up in southern Manitoba the provincial share was expected to be higher than the Schedule D total of $552,000.

The 1986/87 Construction Plan was reviewed and a number of changes were proposed. The most significant change was the relocation of the Seine River near Prairie Grove station due to bridge construction at the present location. CWRB reported that two of the 15 DCP sites were already installed and operating. MWRB designated Rivers Reservoir as the site for the DCP system that was purchased in 1985/86. CWRB indicated that two Telemark II Data Loggers would be installed at Lake Winnipegosis at Winnipegosis and Saskatchewan River at The Pas for a one year trial period in order to evaluate these units.

CWRB reported that the new microcomputer system to be used for hydrometric data computations will be installed at The Pas Sub-office during the week of June 16-20. Installation of the same system at the Thompson Sub-office will be delayed until suitable office accommodations can be acquired. The new systems will allow each sub-office to complete all computations in-house.

Mr. Hale outlined the Ecological Monitoring Program that was being implemented by federal agencies in response to the Northern Flood Agreement (NFA). Treasury Board had recently approved $1,768,000.00 to be spent over the next five years to implement this program in northern Manitoba. Mr. Hale has been assigned the duties of overall project coordinator. Some of the proposed projects which may impact on the hydrometric network in the north are:

1) installation of an accoustic flow meter at Churchill River at South Bay;

2) upgrade of the G.S. of C. vertical control network in the area; and

3) assessment of the existing hydrometric network in the area.

Mr. Hale will provide reports on the progress of NFA activities at future meetings.

CWRB reported that there was a provincial deficit of $7156.00 in fiscal year 1985/86 and this would be recovered in the 1986/87 fiscal year. The other factor that may affect the 1986/87 program costs is the back pay totalling $40,000.00 that was a result of a recent contract settlement with CWRB technical staff.

The 1986/87 Construction and DCP Implementation Plans are on schedule and within the allotted budget. The decision was made to operate Seine River near Prairie Grove as a seasonal station and upgrade to electrical power at the site to ensure that spring water level record can be collected.

CWRB reported that the Ottawa Sediment Survey Section is sponsoring a Manitoba Sediment Workshop on November 18 and 19 in Winnipeg. A total of 80 participants are expected to attend.

The USGS has constructed a new sheet pile weir at Souris River near Westhope. This structure will enable USGS to accurately monitor discharges at the North Dakota - Manitoba boundary during the June 1 to October 31 period when a minimum of 0.566 cms (20 cfs) must be maintained.

CWRB indicated that the recommendations of the Lake Winnipeg Datum report would be implemented. All affected stations would be referenced to the Lake Winnipeg Datum in the 1986 Surface Water Data Publication and all real time stations would be converted by April 1, 1987.

The topic of Cost Recovery of Fringe Benefits was dealt with briefly at the meeting. MWRB stated that any change that would increase the provincial share of program costs would be reviewed very carefully.

Canada - Manitoba Committee Meeting February 17, 1987

CWRB reported that 1986/87 expenditures are expected to total $562,000.00. Therefore the last quarter billing by CWRB will reflect this new total. The total for Schedule D in 1987/88 was estimated at $552,000.00. CWRB was to forward the draft of Schedule D to MWRB for their review by March 1, 1987.

The Committee approved the construction of a new provincial water level station at Lake Minnewasta near Morden. The real time equipment from the Grass River above Wekusko Falls would be installed at the new site. The remote provincial water level station at Wintering Lake at Thicket Portage was approved for discontinuation effective December 31, 1986. MWRB had indicated that there was sufficient data available to meet their long term needs at this site.

It was agreed that Oak River near Rivers and Oak River at Shoal Lake will be operated on a seasonal basis effective March 1, 1987. Mr. Frank Penner of MWRB distributed a status report on the Manitoba Sediment Program Review. This is a joint report with Ted Yuzyk of CWRB's Ottawa Sediment Section. The recommendations of this review will be distributed prior to the fall Coordinating Committee Meeting so that detailed discussion can take place at the meeting.

2.2 SURFACE WATER CONDITIONS

By April 1, 1986, spring runoff due to snowmelt was well underway in southern Manitoba. Both the Red River Floodway and Portage Diversion were utilized to reduce potential flooding problems. During the rapid snowmelt in early April, localized precipitation events of up to 25 mm combined with river ice jamming did create flooding problems in the Interlake area. In particular, the Fisher River and Icelandic River basins were affected. The lack of significant precipitation in early April over most of the District resulted in most rivers, large and small, experiencing flows due to snowmelt slightly below or near the forecasted median values. The situation was quickly reversed during the last 12 days of April when much above normal rainfall over southern areas of the district resulted in rapid increases in flow. The southwestern area of Manitoba, and the Dauphin and Ste.Rose du Lac areas were hard hit by flooding.

In northwestern Manitoba, snowmelt runoff was a major event. Record high discharge measurements were attained at many sites. For the Seal River basin, a number of long term daily maximum and maximum instantaneous values for the period of record were exceeded.

By mid June flows were generally in recession except for the Winnipeg River watershed. The severe flooding in Alberta and Saskatchewan on the North Saskatchewan River in July did not have a major impact on the Saskatchewan River in Manitoba. Most of the flood flows were stored in

upstream reservoirs in Saskatchewan, significantly reducing the flood peaks. For the period July to October precipitation was near normal. The below average precipitation during August and October was somewhat balanced by above average precipitation in July and September.

A near record blizzard struck southern Manitoba November 7 to 9. This winter blizzard equalled Winnipeg's great March snowstorm of 1966. The storm dumped snowfall amounts of 35 to 50 centimetres over most of the area.

Winter river flows, and lake and reservoir water levels were near normal, although the winter of 1986/87 from December to March will be remembered as one of the mildest on record, which it was. Winnipeg and vicinity established a record warm winter season with a mean temperature of $-9^{o}C$ over the December to February period. This eclipsed the previous record held in 1930/31 of $-10.1^{o}C$.

The above normal temperatures continued into March with precipitation being scattered in the form of rain. Snowmelt runoff began the third week of March in the upper Souris, Dauphin and Neepawa areas but the general 1987 spring runoff was awaiting warmer temperatures at month end.

2.3 HYDROMETRIC OPERATIONS

A total of 216 discharge and 84 water level stations were operated by

CWRB during 1986/87. The network continued to be relatively stable with only a net four station increase from the 1985/86 program.

Approximately 19 percent of the stations are designated as remote access which is above the national average. The 84 water level stations are a significant proportion of the network at approximately 28 percent. The distribution of the operational periods is 47 percent seasonal, 1 percent miscellaneous and 52 percent continuous.

Field survey positions were understaffed by one person at year end. Person year utilization for hydrometric and sediment network operation was 19.9 out of 21 assigned for field operations. Approximately 33 percent of the hydrometric field staff participated in the Career Development Program for Hydrometric Survey Technicians. Three individuals graduated from the program during the year. The number of staff remaining in the program is the lowest in the past five years, a reflection of recent low staff turnover.

2.4 SEDIMENT OPERATIONS

A total of twenty one sediment stations were operated during 1986/87. Sixteen stations were classified as full program stations and five as miscellaneous stations. Sampling at both types of stations was conducted on a discharge weighted basis following established sediment sampling guide programs. Sediment observers were used at fifteen of the

full program stations to collect depth integrated sediment samples. All sediment samples were analyzed at the Western and Northern Region sediment laboratory in Regina.

2.5 CONSTRUCTION ACTIVITIES

Forty-two projects were completed as part of the regular construction program and sixteen as part of the DCP Implementation Program. Of the forty-two regular projects, twenty required upgrading with the remaining twenty-two requiring maintenance. Three new stations were constructed as part of the DCP Implementation Program. The total cost of the regular construction program was $124,586.21 (excluding instrumentation). The total DCP Implementation Program cost was $235,632.75. The respective agency shares were: CWRB - $159,081.00, MWRB - $4,599.00 and Manitoba Hydro - $71,952.75. Specific details on the 1986/87 Construction program can be found in the Contruction Upgrading and Maintenance 1986/87 Annual Report.

Station upgrading consisted of insulating five walk-in shelters and wells, providing power to nine shelters, constructing three controls, one cableway, one bank installation and upgrading electrical facilities at two sites. Station maintenance consisted mainly of repairing functional wells, electrical repairs, repairing cableways and dismantling gauging structures.

It has been recognized by both parties that a significant influx of funding will be necessary to upgrade the provincial and federal-provincial hydrometric stations in Manitoba. The physical condition of these stations has continued to deteriorate. Of the twenty-four upgrading projects completed in 1986/87 at hydrometric stations, five were at federal-provincial stations and one was at a provincial station.

The 1986/87 construction program was completed under the direction of the Construction Engineer and Construction Supervisor with assistance from a summer student (two months), a term construction assistant (five months) and Water Survey of Canada field staff.

2.6 NETWORK DEVELOPMENT

2.6.1 Network Changes for 1986/87

Schedule A of the Memorandum of Agreement identifies the operational and financial responsibility for hydrometric stations that comprise the water quantity network and are active on April 1 of each year. Schedule A also shows the type of data collected and the period of operation. Decisions regarding changes to Schedule A are made by the Coordinating Committee with reference to the national station designation guidelines. Network changes from the preceding year (1985/86) are shown on Figure 1 and are summarized as follows:

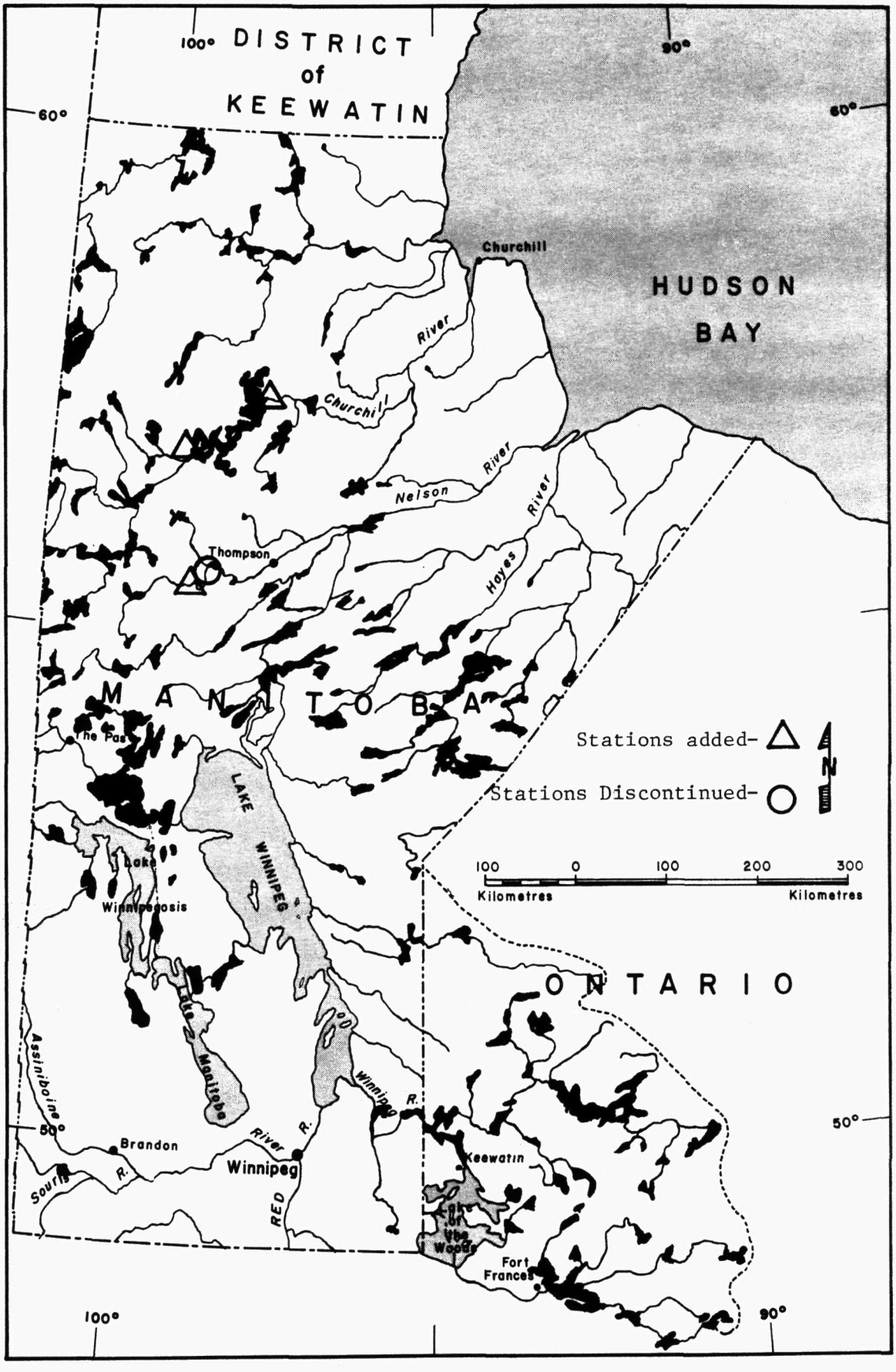


Figure 1 Network Changes (April 1, 1986)

Stations Added to the Network

1)	05TE002	Burntwood River above Leaf Rapids	Federal-Provincial
2)	06EC006	Southern Indian Lake at Missi Falls	Provincial
3)	06EC007	Southern Indian Lake near Opachuanau Lake	Provincial

Stations Discontinued

1)	05TE001	Burntwood River above Threepoint Lake	Federal-Provincial

Station Classification Changes

1)	050G009	Domain Drain near Domain - Contributed to Federal-Provincial
2)	050G010	Mannes Drain near Sanford - Contributed to Federal-Provincial

2.6.2 Provincial Network

In addition to participating in the operation of the federal hydrometric network, the Province of Manitoba operates numerous hydrometric stations which are not included in the hydrometric agreement. The majority are used to operate provincial water control structures, or to supplement the federal network during peak flow events. During 1986/87 the province operated a total of 125 water level stations. Of these, 11 stations were operated on a continuous basis while the remainder were classified as seasonal. A total of 42 stations were published as contributed in the 1986 CWRB Surface Water Data Publication. A total of $119,000 was spent on the operation of the provincial hydrometric network in 1986/87.

2.6.3 Network Planning

The Water Resources Branch, Western and Northern Region network evaluation and planning project which was initiated in 1984

concluded with the distribution of the committee's reports. The regional summary report made a number of recommendations to the Regional Director on the streamflow and water level network and on the sediment network. The report on the Manitoba and Northwestern Ontario District documented the activities of the study team, the analysis of the questionnaires, reviews of previous studies, comparisons to World Metereorological Organization (WMO) station density criteria and consideration of water inventory requirements.

The Manitoba Sediment Issues Workshop held on November 18 and 19 was attended by 58 representatives from consulting firms, universities and various government agencies. The objective of the workshop was to identify sediment issues and comment on the existing network of stations. A number of recommendations were made regarding the direction of the sediment program in terms of agriculture, fisheries, water quality, water resource engineering and interagency cooperation. The proceedings of the workshop were published and distributed in March, 1987.

A sediment station analysis report was completed for the Pembina River near Windygates station by Hydrocon Engineering. The final report contains a variety of data summaries and graphs for the data collected between 1962 and 1984. The report concludes that the data sufficiently describes the present sediment regime and

that the detailed sediment data collection program can be suspended. The report also recommends that a miscellaneous sediment data collection program be instituted to study organic contaminant loading, sediment concentrations at low and high flows and particle size at low flows. The report will be printed and distributed in 1987/88.

The winter suspended sediment data for 11 stations was analyzed to follow up on previous suggestions to discontinue all winter sampling. Based on the criteria of winter sediment loads being less than 7% of the annual load, concentrations less than 50 mg/L and loads having low temporal variability; winter sampling was discontinued at eight stations and retained at two stations. Due to the limited amount of data available for the Burntwood River near Thompson it was recommended that a regular sampling program be instituted if there is a defined need for winter sediment data.

The historical development of the Manitoba hydrometric network is shown on Figure 2. The distribution of the network by drainage area and maturity is shown on Figures 3 and 4. The historical development of the network with respect to station classification is shown on Figure 5.

FIGURE 2

HISTORICAL DEVELOPMENT OF HYDROMETRIC STATIONS IN MANITOBA

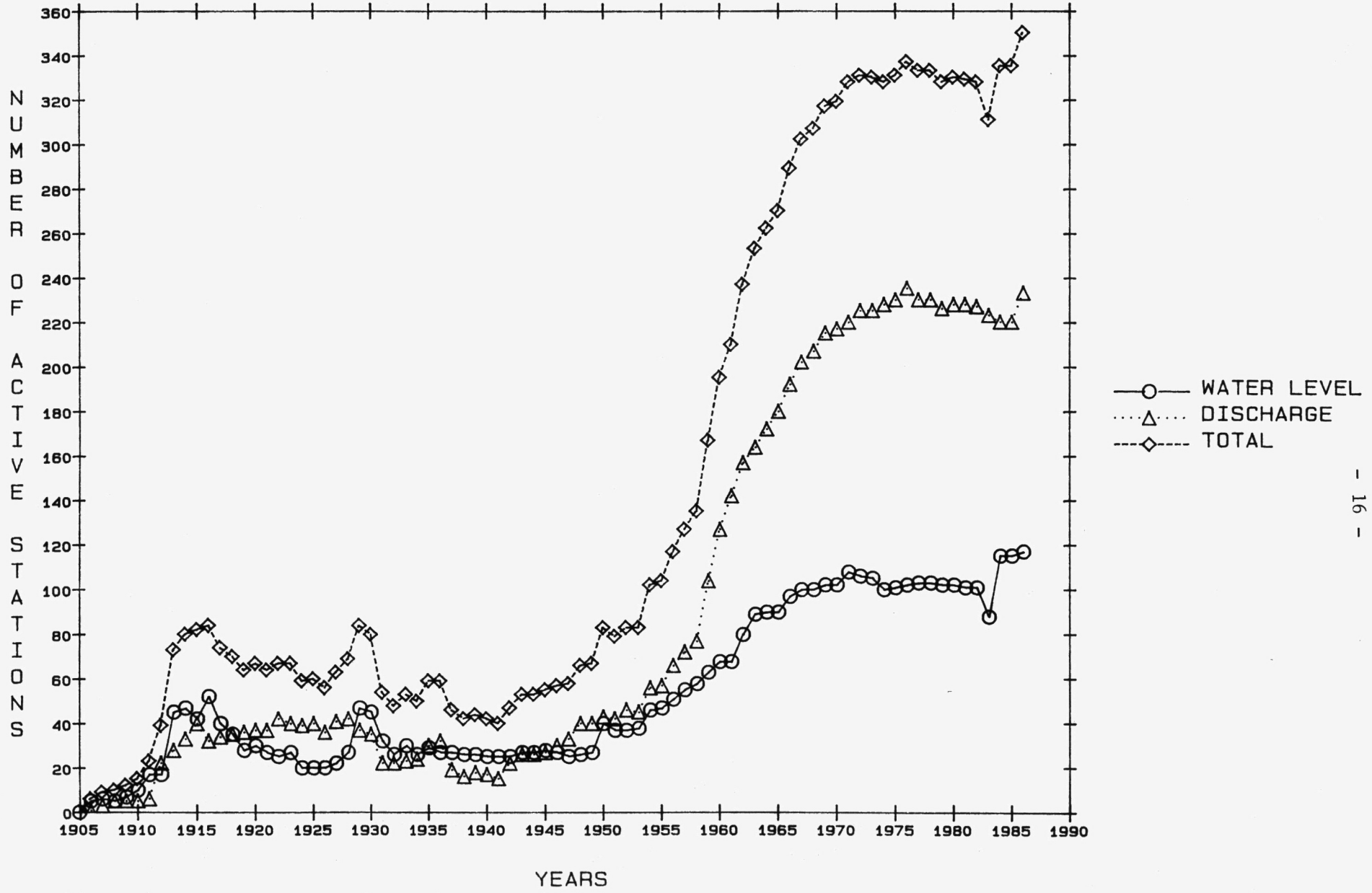


FIGURE 3

GAUGING STATION MATURITY-APRIL 1, 1987

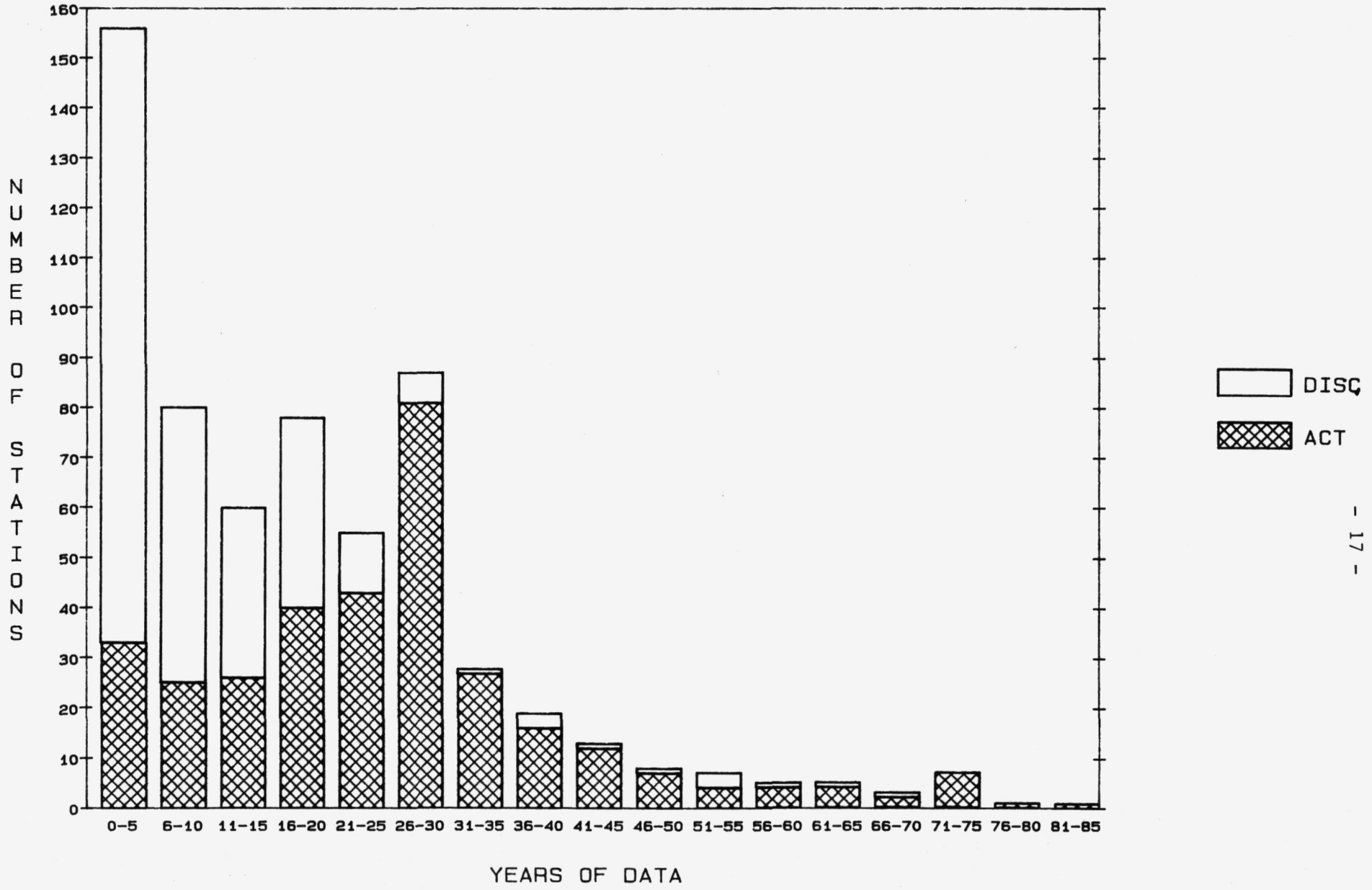


FIGURE 4

HYDROMETRIC STATIONS RANKED BY DRAINAGE AREA

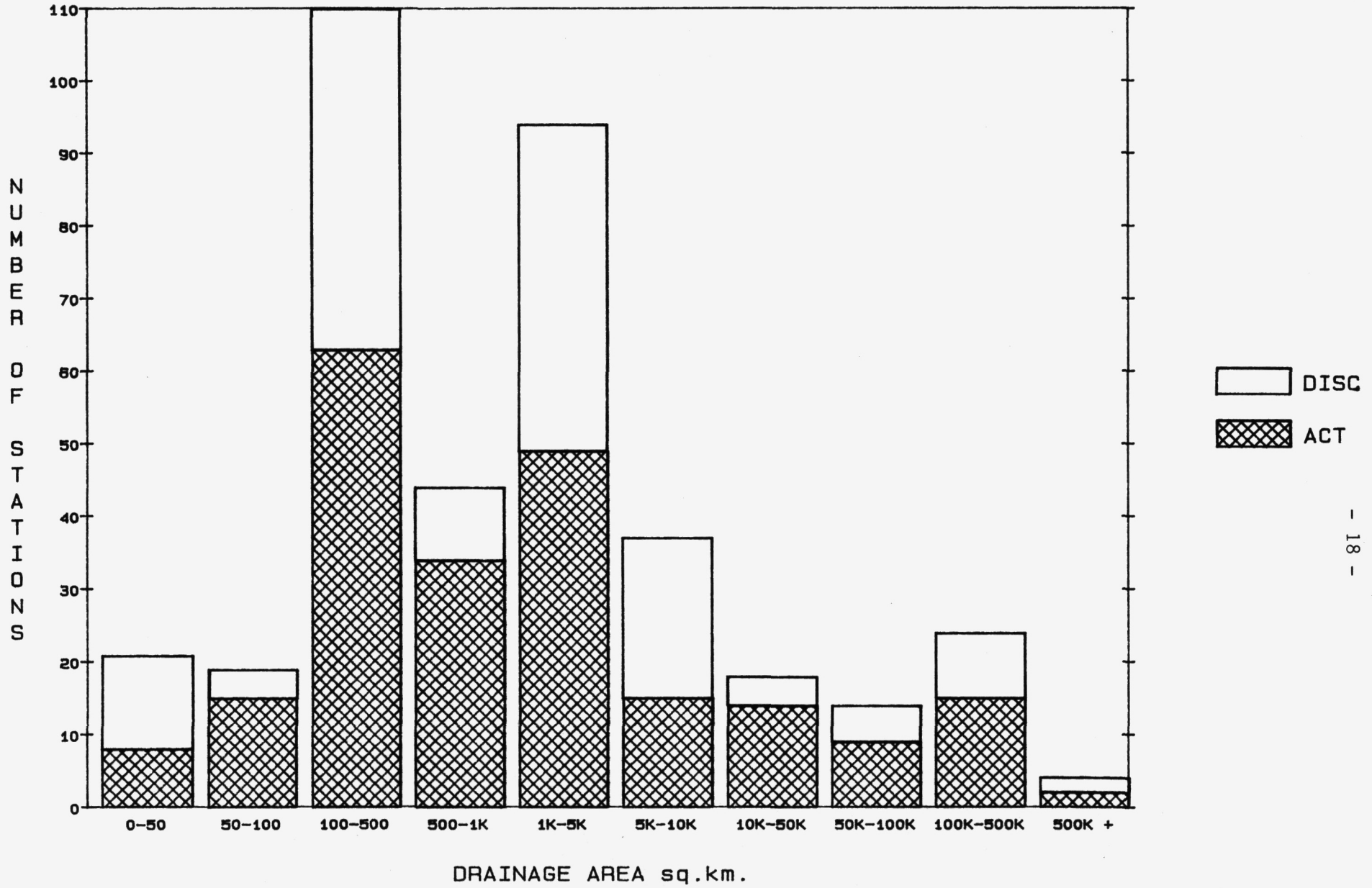
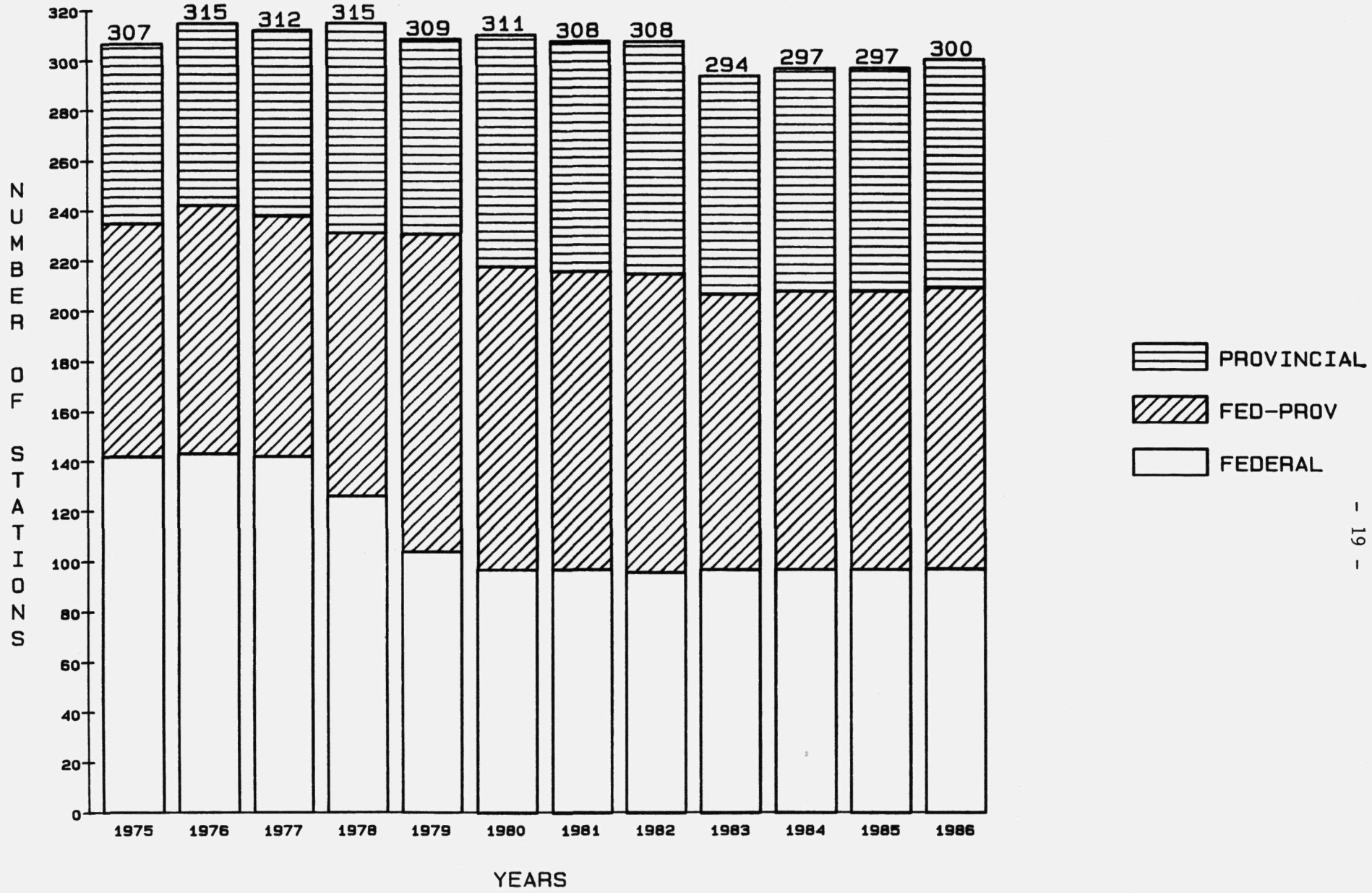


FIGURE 5

HISTORICAL SUMMARY OF STATION CLASSIFICATION ON APRIL 1st



3.0

COST OF OPERATION

3.1 DERIVATION OF STATION UNITS

The calculation of station units (Table 1) is derived from Schedule A of the Memorandum of Agreement which lists the hydrometric network stations existing and operating as of April 1, 1986. Total operating costs of hydrometric and sediment stations vary significantly according to period of operation and type of record produced. Weighting factors have been developed to account for these differences.

The standard weighting factors used by the Water Resources Branch in the Western and Northern Region to calculate program costs for remote and conventional stations are:

12 month flow station (Q12)	- 1.00
8 month flow station (Q8)	- 0.75
12 month water level station (H12)	- 0.40
8 month water level station (H8)	- 0.25
12 month sediment station (S12)	- 1.00
8 month sediment station (S8)	- 0.75
Miscellaneous record (M)	- 0.00

Table 3 contains the summary of hydrometric and sediment station units for 1986/87.

3.2 COST OF OPERATION: 1986/87

Station unit costs and total network cost for salary, operations and maintenance, and capital for 1986/87 are derived from detailed program costs contained in Appendix II.

Tables 1 and 2 show the station unit costs and cost share summary for 1986/87. Figure 6 shows the changes in station unit costs since 1979/80. Figure 7 shows the changes in unit costs for O & M and capital and Figure 8 shows the historical station unit costs in 1975 dollars. The provincial share of the program cost in 1986/87 was $559,643. Combined with a payment of $562,000 and a 1985/86 deficit of $7,156 a net deficit of $4,799 will be applied to the 1987/88 provincial invoice.

Salaries for the hydrometric program increased significantly over the 1985/86 values. This was due to the contract settlement for the technical category combined with a large backpay award. The extremely large increase in remote salaries is also due to the fact that the remote operation was almost fully staffed for 1986/87 and there were a number of Career Development Program promotions in the technical category during the year. In previous years there were vacancies and the technicians were classified in more junior categories.

The O & M portion of the program showed a slight decrease during 1986/87. This was due in part to the nature and timing of spring

breakup in 1986; adjustment of remote winter trip schedules; and the reduction in field trips as a result of the DCP Implementation Program.

Increases in the capital depreciation portion of the station unit cost resulted from the acquisition of new vehicles. Although the inventory was unchanged in 1986/87, additions to the (capital equipment) inventory in 1985/86 resulted in an increase in the average 1986/87 depreciation cost for this category.

3.3 COST ESTIMATES: 1987/88

Changes affecting the 1987/88 Schedule A and the computation of the 1987/88 Schedule D are included in Appendix III. Schedule D for 1987/88 is $552,000.

TABLE 1
CANADA-MANITOBA WATER QUANTITY PROGRAM
COST SUMMARY 1986/87

Part A - Unit Cost Summary

Station Category	No. of Station Units	Salary $	Operations $	Capital Depreciation	Total #
1. Hydrometric Conventional Access	1.0	2,642	1,252	306	4,200
2. Hydrometric Remote Access	1.0	4,585	3,628	306	8,519
3. Sediment Program (incremental cost only)	1.0	2,378	515	122	3,015

*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	72	57.15	150,990	71,552	17,488	240,030
Remote Access	25	20.05	91,929	72,741	6,135	170,806
Sediment Program	13	11.50	27,347	5,925	1,403	34,638
(incremental cost only)			270,266	150,216	25,026	445,508
Federal-Provincial						
Conventional Access	87	64.15	169,484	80,316	19,630	269,430
Remote Access	25	16.60	76,111	60,225	5,080	141,416
Sediment Program	5	1.75	4,162	901	214	5,271
(incremental cost only)			249,757	141,442	24,924	416,123
Provincial						
Conventional Access	85	52.35	138,309	65,542	16,019	219,870
Remote Access	6	2.40	11,004	8,707	734	20,446
Sediment Program	5	2.25	5,351	1,159	275	6,777
(incremental cost only)			154,664	75,408	17,028	247,100
Totals			674,687	367,066	66,979	1,108,731

TABLE 2

CANADA-MANITOBA WATER QUANTITY PROGRAM
COST-SHARE SUMMARY 1986/87

FEDERAL SHARE HYDROMETRIC COSTS		$653,570
FEDERAL SHARE SEDIMENT LAB COSTS	=	28,848
FEDERAL DCP IMPLEMENTATION PROGRAM CONSTRUCTION COSTS	=	12,661
FEDERAL CONSTRUCTION COST	=	104,402
FEDERAL INSTRUMENTATION COST	=	146,420
TOTAL FEDERAL SHARE	=	$945,901
PROVINCIAL SHARE HYDROMETRIC COSTS		$455,162
PROVINCIAL SHARE SEDIMENT LAB COSTS	=	8,794
PROVINCIAL CONSTRUCTION COST	=	20,185
PROVINCIAL INSTRUMENTATION COSTS	=	4,350
SATELLITE REAL TIME HYDROMETRIC NETWORK	=	72,202
PROVINCIAL CREDIT FOR OPERATING AN 8 MONTH WATER LEVEL STATION	=	- 1,050
TOTAL PROVINCIAL SHARE		$559,643
Provincial payment received for 1986/87 operating year		$554,844
Adjustment to be made to 1987/88 provincial invoice		$ 4,799

TABLE 3

1 - 1986-87

HYDROMETRIC SUMMARY (STATION UNITS)
OPERATED BY WATER SURVEY OF CANADA

FEDERAL	CONVENTIONAL			REMOTE		
DISCHARGE(C)	33 X 1.00=	33.00		DISCHARGE(C)	17 X 1.00=	17.00
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	72	57.15			25	20.05
FEDERAL-PROVINCIAL						
DISCHARGE (C)	23 X 1.00=	23.00		DISCHARGE (C)	11 X 1.00=	11.00
DISCHARGE (S)	47 X 0.75=	35.25		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)	11 X 0.40=	4.40		WATER LEVEL(C)	14 X 0.40=	5.60
WATER LEVEL (S)	6 X 0.25=	1.50		WATER LEVEL(S)	0 X 0.25=	0.00
SUB-TOTALS	87	64.15			25	16.60
PROVINCIAL						
DISCHARGE(C)	7 X 1.00=	7.00		DISCHARGE(C)	0 X 1.00=	0.00
DISCHARGE(S)	50 X 0.75=	37.50		DISCHARGE(S)	0 X 0.75=	0.00
DISCHARGE(M)	2 X 0.00=	0.00		DISCHARGE(M)	0 X 0.00=	0.00
WATER LEVEL(C)	9 X 0.40=	3.60		DISCHARGE(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	85	52.35			6	2.40
TOTALS	244	173.65			56	39.05

SEDIMENT SUMMARY (STATION UNITS)

FEDERAL	CONVENTIONAL			REMOTE		
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)	0 X 1.00=	1.00		SEDIMENT (C)	0 X 1.00=	0.00
SEDIMENT (S)	1 X 0.75=	.70		SEDIMENT (S)	0 X 0.75=	0.00
SEDIMENT (M)	3 X 0.00=	0.00		SEDIMENT (M)	0 X 0.00=	0.00
SUB-TOTALS	5	1.75			0	0.00
PROVINCIAL						
SEDIMENT (C)	0 X 1.00=	1.00		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			1	0.00

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	SEDIMENT (C) = 11	SEDIMENT (C) = 0	SEDIMENT = 23
	SEDIMENT (S) = 6	SEDIMENT (S) = 0	
	SEDIMENT (M) = 5	SEDIMENT (M) = 1	

FIGURE 6

HISTORICAL AVERAGE STATION UNIT COST IN MANITOBA

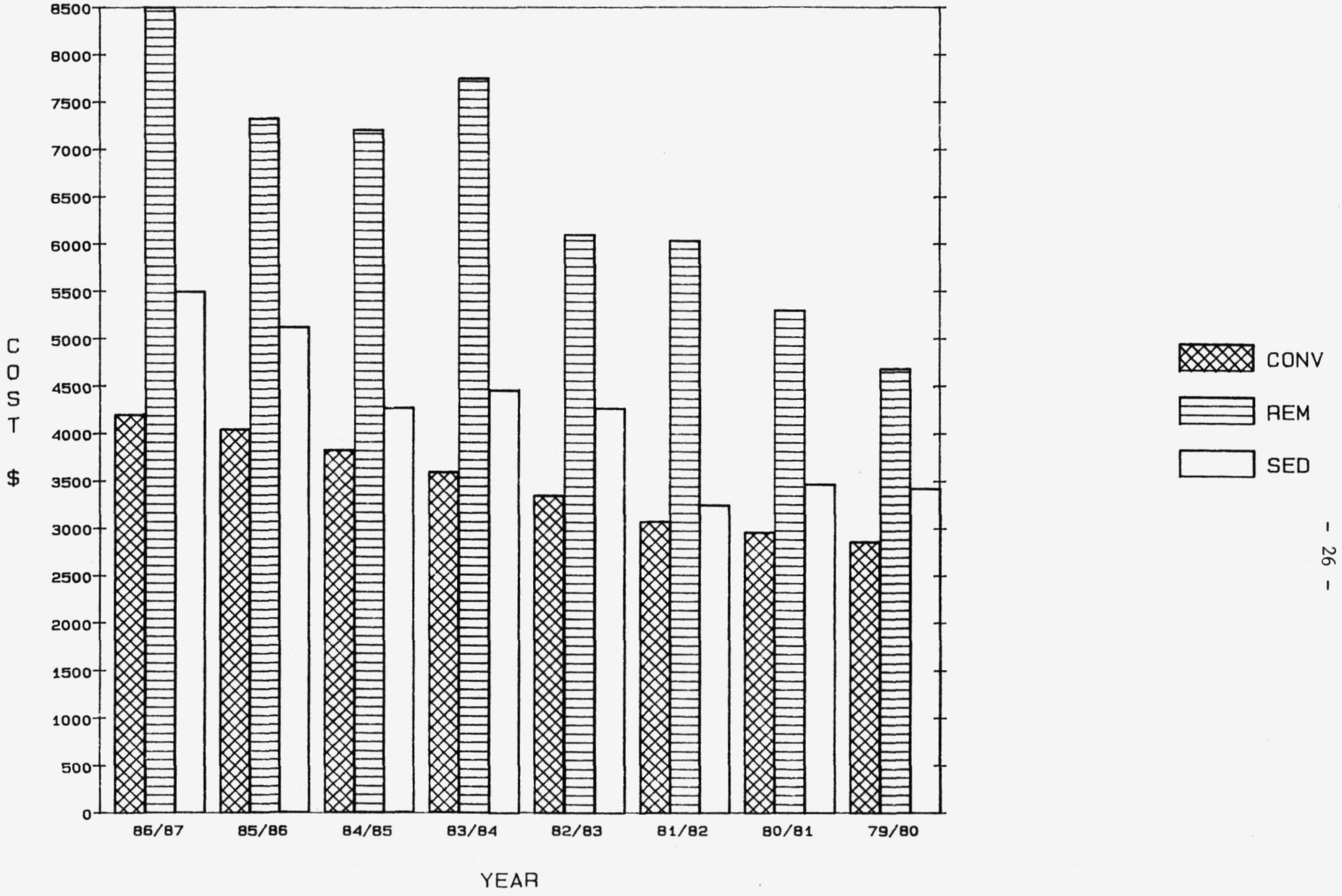


FIGURE 7

HISTORICAL AVERAGE STATION UNIT COST IN MANITOBA
(O&M and CAPITAL ONLY)

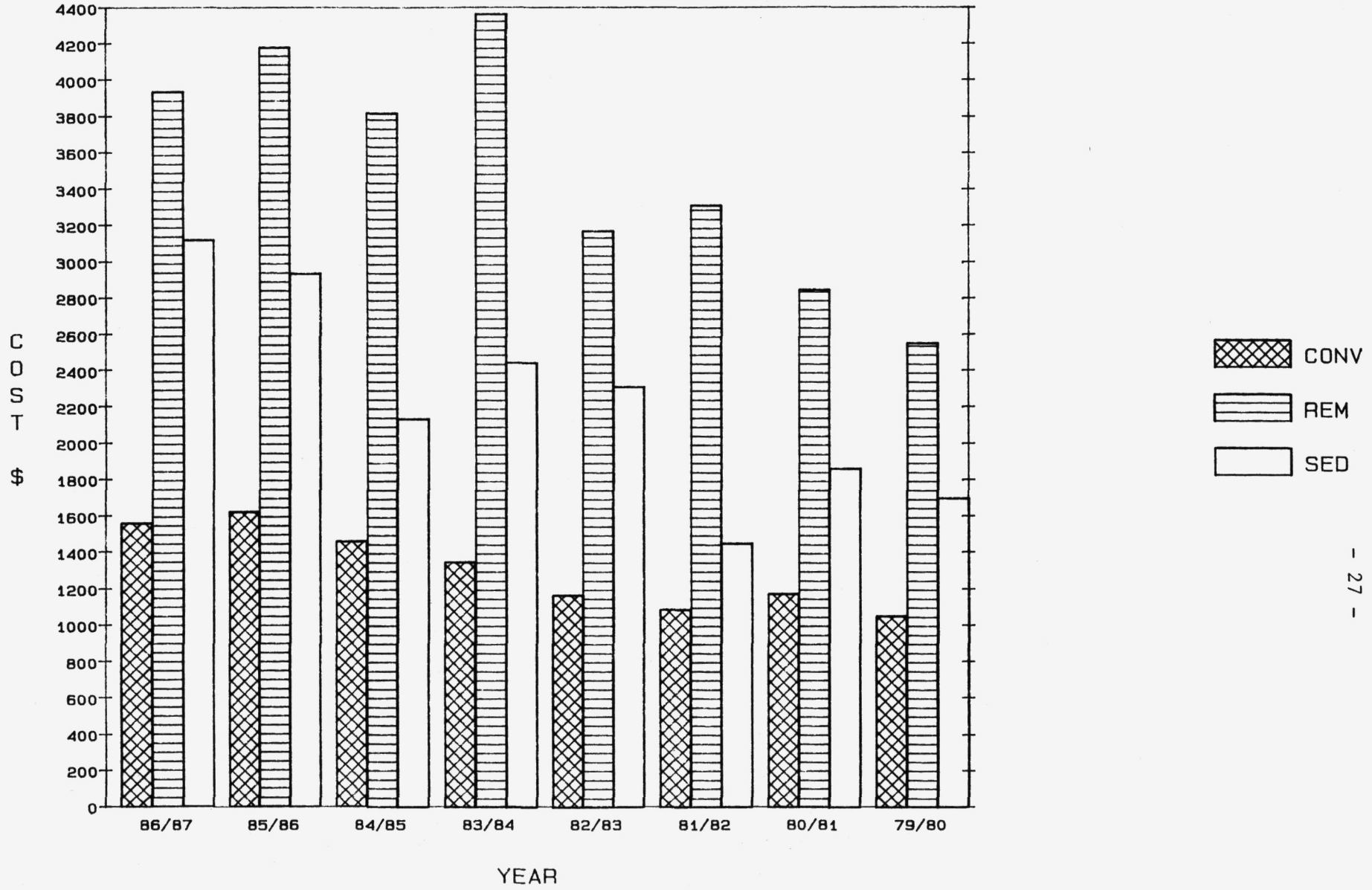
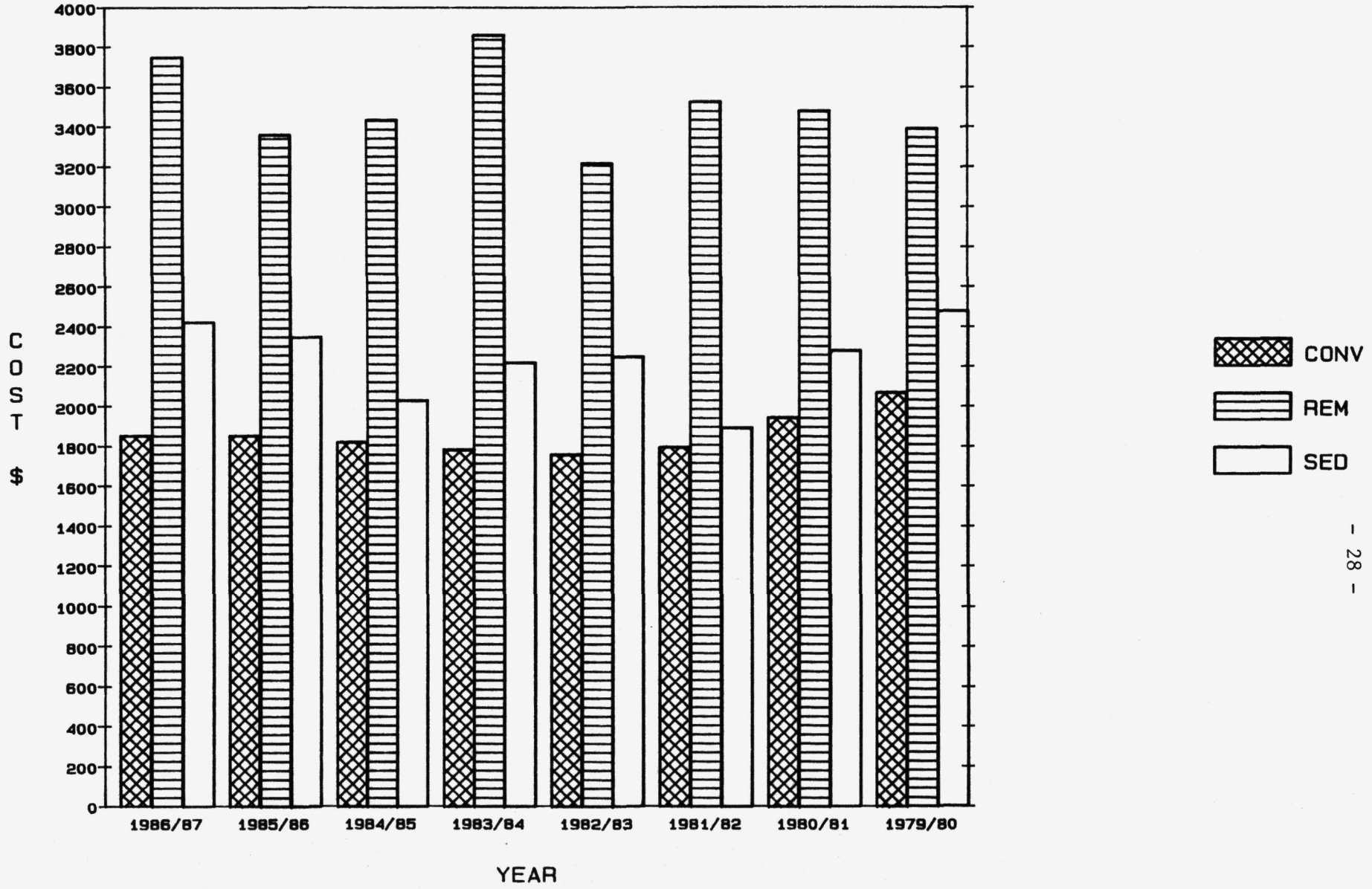


FIGURE 8

HISTORICAL AVERAGE STATION UNIT COST IN MANITOBA
(1975 DOLLARS)



APPENDIX I

I-1 **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 project related to navigation, hydroelectric 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.

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 1

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.

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 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 the terms of this agreement and the procedures as set out in Schedule C.

c) Annual construction 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.

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 of 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,

ARTICLE IX (Cont'd)

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 X1

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 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 one 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 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 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 or the Governor-in-Council and Lieutenant Governor-in-Council.

IN WITNESS WHEREOF the Honourable Jeanne Sauve, 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 Sauve, 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)

1986-1987 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 SHARE AGREEMENT 1986/1987

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

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 - ST. JAMES SUB-OFFICE
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

1 -1986-87

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	I	F1	C	LAKE MANITOBA AT STEEPROCK	3
05LK003	0.0	M	01	HR		F1	C	LAKE MANITOBA AT THE NARROWS	4
05LL012	0.0	M	01	HR	T	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
05MJ007	0.0	M	07	QR		F1	S	OMANDS CREEK NEAR METRO ROUTE 90	17
05MJ008	0.0	M	07	QR		F1	S	OMANDS CREEK NEAR BROOKSIDE CEMETRY	18
05OJ015	287000.0	M	01	HR		F1	C	RED RIVER AT JAMES AVE PUMPING STATION	19
05OJ010	287000.0	M	03	QR	CSW	F1	C	RED RIVER NEAR LOCKPORT	20
05MJ009	0.0	M	07	QR		F1	S	TRURO CREEK AT WESTERN AIRPORT BOUNDARY	21
05MJ010	0.0	M	07	QR		F1	S	TRURO CREEK NEAR ASSINIBOINE GOLF COURSE	22

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	RDQ	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	T	F2	C	LAKE OF THE PRAIRIES NEAR SHELLMOUTH		8
05LD001	3550.0	M	05	QR	C	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	RD	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	C	F2	C	SWAN RIVER NEAR MINITONAS		15
05LE004	2110.0	M	05	QR	C	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

ACTIVE GAUGING STATIONS FOR MANITOBA
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 C	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 TSW	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 STW	F3	C	ROSEAU RIVER NEAR DOMINION CITY	16
05OD004	4430.0	M	03	QR SW	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 SWD	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

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	RD	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	RQD	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	CAT	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	C	F4	C	LIMESTONE RIVER NEAR BIRD	16
06FB002	4250.0	M	04	QR	RD	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	RD	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	RCSW	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	RD	F4	C	PIGEON RIVER AT OUTLET OF ROUND LAKE	26
05RE001	6798.0	M	03	QR	RDP	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	CSW	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) = 12	DISCHARGE (C) = 15	
	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. 5	NO.
05OG009	0.0	M	01	QR	FP1	S	DOMAIN DRAIN NEAR DOMAIN		1
05OG010	0.0	M	01	QR	FP1	S	MANNES DRAIN NEAR SANFORD		2

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)	= 0	WATER LEVEL (C)	= 0	WATER LEVEL	= 0
	WATER LEVEL (S)	= 0	WATER LEVEL (S)	= 0	TOTAL	= 2

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

STA. NO.	DR. AREA	DIST	RESP	GAUGE	DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 6 NO.
05MH013	85700.0	M	02	QR	CD	FP2	C	ASSINIBOINE RIVER NEAR BRANDON	1
05ME006	76100.0	M	02	QR	TC	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	RD	FP2	C	BLOODVEIN RIVER ABOVE BLOODVEIN BAY	6
05TE002	0.0	M	04	QR	RD	FP2	S	BURNTWOOD RIVER ABOVE LEAF RAPIDS	7
05TG001	18100.0	M	04	QR	TSW	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	RD	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	I	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	RD	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		FP2	C	LAKE MANITOBA NEAR TOUTES AIDES	18
05OB014	0.0	M	02	HR		FP2	C	MARY JANE RESERVOIR NEAR LA RIVIERE	19
05OF020	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	T	FP2	C	NELSON RIVER AT NORWAY HOUSE	22
05UB008	0.0	M	04	QR		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
05OA010	544.0	M	02	QR		FP2	S	PEMBINA RIVER ABOVE LORNE LAKE	26
05OB023	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
05OC019	782.0	M	01	QR		FP2	S	PLUM RIVER NEAR ROSENFELD	29
05LL019	0.0	M	01	QR		FP2	S	PORTAGE DIVERSION NEAR PORTAGE LA PRAIRIE	30
05MJ006	0.0	M	01	HR	T	FP2	C	PORTAGE RESERVOIR NEAR PORTAGE LA PRAIRIE	31
05OE001	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
05OC021	0.0	M	03	HR		FP2	S	RED RIVER ABOVE FLOODWAY CONTROL STRUCTURE	34
05OC020	0.0	M	03	HR	T	FP2	S	RED RIVER BELOW FLOODWAY CONTROL STRUCTURE	35
05OC017	0.0	M	03	QR	TS	FP2	S	RED RIVER FLOODWAY NEAR ST NORBERT	36
05OC010	0.0	M	01	HR	T	FP2	S	RED RIVER NEAR LETELLIER	37
05OC012	117000.0	M	01	QR	CT	FP2	C	RED RIVER NEAR STE AGATHE	38
05OC008	124000.0	M	03	QM	S	FP2	S	RED RIVER NEAR ST NORBERT	39
05OF009	212.0	M	02	QR		FP2	S	ROSEISLE CREEK NEAR ROSEISLE	40

DR. AREA. =0.0 IS NOT APPLICABLE

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

STA.NO.	DR.AREA	DIST	RESP	GAUGE	DATA	FUND.CD.	OP	STATION NAME	PAGE NO. 7 NO.
05UD006	0.0	M	04	HR	RD	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	RD	FP2	C	SOUTHERN INDIAN LAKE AT SOUTH BAY	43
06EC001	0.0	M	04	HR	RD	FP2	C	SOUTHERN INDIAN LAKE NEAR SOUTH INDIAN LAKE	44
05UF003	0.0	M	04	HR	D	FP2	C	SPLIT LAKE AT SPLIT LAKE	45
05MJ004	572.0	M	07	QR		FP2	S	STURGEON CREEK AT ST JAMES	46
05GB018	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	CA	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) = 13	DISCHARGE (C) = 2	
	DISCHARGE (S) = 11	DISCHARGE (S) = 1	
	DISCHARGE (M) = 0	DISCHARGE (M) = 0	DISCHARGE = 27
	WATER LEVEL (C) = 10	WATER LEVEL (C) = 7	WATER LEVEL = 23
	WATER LEVEL (S) = 6	WATER LEVEL (S) = 0	TOTAL = 50

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

STA. NO.	DR. AREA	DIST	RESP	GAUGE	DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 8 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	RD	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 NEAR DOMINION CITY	34
05OD033	0.0	M	03	QR		FP3	S	MAIN DRAIN 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	SW	FP3	C	ODEI RIVER NEAR THOMPSON	40

DR. AREA.=0.0 IS NOT APPLICABLE

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

STA. NO.	DR. AREA	DIST	RESP	GAUGE	DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 9 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	RD	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	RDP	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 PAGE NO. 10	NO.
05LJ803	0.0	M	10	HM	P1	S	BALD HILL RESERVOIR NEAR MCCREARY	1
05LL028	275.0	M	01	QR	P1	S	BEAVER CREEK EAST OF BEAVER	2
05LG801	0.0	M	10	HM	P1	S	BEAVER LAKE NEAR PINE RIVER	3
05LG801	0.0	M	10	HM	P1	S	BELL LAKE NEAR OUTLET	4
05LF002	170.0	M	05	QR	P1	S	BELL RIVER NEAR BELLSITE	5
05LL025	0.0	M	01	QM	P1	M	BIG GRASS DRAIN NEAR LANGRUTH	6
05KH003	2430.0	M	05	HR	P1	S	BIRCH RIVER ABOVE BRACKEN DAM	7
05KH004	2430.0	M	05	HR	P1	S	BIRCH RIVER BELOW BRACKEN DAM	8
05OA801	0.0	M	10	HM	P1	C	BOISSEVAIN RESERVOIR NEAR BOISSEVAIN	9
05OF801	0.0	M	10	HM	P1	S	BOYNE RIVER ABOVE CARMAN DAM	10
05OF003	976.0	M	01	QR	P1	C	BOYNE RIVER NEAR CARMAN	11
05OF006	873.0	M	02	QR	P1	C	BOYNE RIVER NEAR STEPHENFIELD	12
05OF010	277.0	M	02	QR	P1	S	BOYNE RIVER NEAR TREHERNE	13
05PG003	0.0	M	03	HR	P1	S	BRERETON LAKE NEAR RENNIE	14
05SA004	847.0	M	03	QR	P1	S	BROKENHEAD RIVER NEAR VIVIAN	15
05LN002	334.0	M	01	QR	P1	S	BURNT LAKE DRAIN NO 1 NEAR DEERHORN	16
05LN003	746.0	M	01	QR	P1	S	BURNT LAKE DRAIN NO 2 NEAR LUNDAR	17
05PG806	0.0	M	10	HM	P1	S	CADDY LAKE AT CADDY LAKE CAMPGROUND	18
05KL005	0.0	M	05	HR RD	P1	C	CEDAR LAKE NEAR OLESON POINT	19
05MD008	0.0	M	02	HR	P1	S	CHILDS LAKE NEAR BOGGY CREEK	20
05KK009	0.0	M	05	HR	P1	C	CLEARWATER LAKE AT GUY HILL	21
05OJ006	513.0	M	03	QR	P1	S	COOKS CREEK AT COOKS CREEK	22
05OJ007	183.0	M	03	QR C	P1	S	COOKS CREEK NEAR GLASS	23
05KK002	0.0	M	05	HR	P1	C	CORMORANT LAKE AT CORMORANT	24
05OB801	0.0	M	10	HM	P1	S	CRYSTAL CREEK ABOVE CRYSTAL CITY DAM	25
05MH004	572.0	M	02	QR	P1	S	CYPRESS RIVER NEAR CYPRESS RIVER	26
05LJ816	0.0	M	10	HM	P1	C	DAUPHIN LAKE AT OCHRE BEACH	27
05LL023	0.0	M	01	QM	P1	M	DEAD LAKE DRAIN NEAR GLADSTONE	28
05OC015	136.0	M	02	QR	P1	S	DEADHORSE CREEK AT MORDEN	29
05NG014	0.0	M	02	HR	P1	S	DELORAINE RESERVOIR NEAR DELORAINE	30
05SB801	0.0	M	10	HM	P1	S	DENNIS LAKE NEAR MALONTON	31
05LN005	0.0	M	01	HR	P1	S	DOG LAKE NEAR VOGAR	32
05LJ047	0.0	M	01	QR SCW	P1	S	EDWARDS CREEK DRAIN BELOW JACKFISH CREEK TRIB	33
05NG803	0.0	M	10	HM	P1	S	ELGIN RESERVOIR NEAR ELGIN	34
05OG005	673.0	M	01	QR	P1	S	ELM CREEK CHANNEL 2 NEAR ELM CREEK	35
05OG006	484.0	M	01	QR	P1	S	ELM CREEK CHANNEL 3 NEAR ELM CREEK	36
05PD801	0.0	M	10	HM	P1	S	FALCON LAKE AT FALCON LAKE	37
05SB005	632.0	M	01	QR C	P1	S	FISH LAKE DRAIN NEAR CAMP MORTON	38
05SB003	0.0	M	01	HR	P1	S	FISH LAKE AT OUTLET CONTROL STRUCTURE NR MELEB	39
05OA015	0.0	M	02	QR	P1	S	GIMBY CREEK NEAR CARTWRIGHT	40

DR. AREA. =0.0 IS NOT APPLICABLE

ACTIVE GAUGING STATIONS FOR MANITOBA 1 -1986-87
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

STA. NO.	DR. AREA	DIST	RESP	GAUGE DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 11 NO.
05LL026	0.0	M	01	QR CA	P1	S	GLENELLA DRAIN NEAR GLENELLA	41
05LL024	73.3	M	01	QR	P1	S	GOPHER CREEK NEAR GLADSTONE	42
05KJ002	0.0	M	05	HR	P1	S	GRACE LAKE NEAR THE PAS	43
050J017	471.0	M	03	QR	P1	S	GRASSMERE DRAIN NEAR MIDDLECHURCH	44
050C016	0.0	M	01	QR I	P1	S	HESPELER FLOODWAY NEAR ROSENFELD	45
05LJ807	0.0	M	10	HR	P1	S	JACKFISH LAKE ABOVE JACKFISH LAKE DAM	46
05LL802	0.0	M	10	HR	P1	S	JACKSON LAKE NEAR SYDNEY	47
050E007	311.0	M	03	QR	P1	S	JOUBERT CREEK AT ST PIERRE-JOLYS	48
05MG006	45.8	M	02	QR A	P1	S	KENTON CREEK AT KENTON	49
05MG803	0.0	M	10	HM	P1	S	KENTON RESERVOIR NEAR KENTON	50
050A803	0.0	M	10	HM	P1	S	KILLARNEY LAKE AT KILLARNEY	51
050C024	0.0	M	01	QR	P1	S	KRONSGART DRAIN NEAR SEWELL	52
050G802	0.0	M	10	HM	P1	S	LA SALLE RIVER ABOVE HOGUE'S DAM	53
050G803	0.0	M	10	HM	P1	S	LA SALLE RIVER ABOVE LEWKO'S DAM	54
050G804	0.0	M	10	HM	P1	S	LA SALLE RIVER ABOVE ST. NORBERT DAM	55
050G807	0.0	M	10	HM	P1	S	LA SALLE RIVER AT ELIE	56
050G801	0.0	M	10	HM	P1	S	LA SALLE RIVER AT HAMPSON'S DAM	57
050G808	0.0	M	10	HM	P1	S	LA SALLE RIVER AT LA SALLE	58
050G806	0.0	M	10	HM	P1	S	LA SALLE RIVER AT SANFORD	59
050G805	0.0	M	10	HM	P1	S	LA SALLE RIVER AT STARBUCK	60
050G008	198.0	M	07	QR	P1	S	LA SALLE RIVER NEAR ELIE	61
05RE005	0.0	M	03	HR RD	P1	C	LAKE WINNIPEG AT GEORGE ISLAND	62
05MF801	0.0	M	10	HM	P1	C	LITTLE SASKATCHEWAN R. ABOVE RAPID CITY DAM	63
05KG006	0.0	M	05	HR	P1	S	MANISTIKWAN LAKE NEAR FLIN FLON	64
050E006	490.0	M	03	QR	P1	S	MANNING CANAL NEAR ILE DES CHENES	65
05PF801	0.0	M	10	HM	P1	S	MARGARET LAKE NEAR OTTER FALLS	66
050E010	445.0	M	03	QR	P1	S	MARSH RIVER NEAR OTTERBURNE	67
05NG022	0.0	M	02	HR A	P1	S	MAPLE (MARSHY) LAKE NEAR PIPESTONE	68
05ME008	360.0	M	02	QR	P1	S	MINNEWASTA CREEK NEAR BEULAH	69
050C801	0.0	M	10	HM	P1	S	MORDEN RESERVOIR NEAR MORDEN	70
05LL009	165.0	M	01	QR	P1	S	NEEPAWA CREEK NEAR NEEPAWA	71
05LL010	0.0	M	01	HR	P1	C	NEEPAWA RESERVOIR NEAR NEEPAWA	72
050J009	245.0	M	01	QR	P1	S	NETLEY CREEK NEAR MATLOCK	73
05KK005	0.0	M	05	HR D	P1	C	NORTH MOOSE LAKE AT MOOSE LAKE CONTROL STR	74
05LN004	0.0	M	01	HR	P1	C	NORTH SHOAL LAKE NEAR INWOOD	75
05NG008	0.0	M	02	HR	P1	S	OAK LAKE AT OAK LAKE RESORT	76
05MG008	370.0	M	02	QR	P1	C	OAK RIVER AT SHOAL LAKE	77
05SD801	0.0	M	10	HR	P1	S	OTTER LAKE NEAR BROAD VALLEY	78
05MH012	435.0	M	02	QR	P1	S	OXTAIL CREEK NEAR CYPRESS RIVER	79
050E014	0.0	M	03	QR	P1	S	PANSY DRAIN NEAR SARTO	80

DR. AREA. =0.0 IS NOT APPLICABLE

ACTIVE GAUGING STATIONS FOR MANITOBA
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

STA. NO.	DR. AREA	DIST	RESP	GAUGE	DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 12 NO.
05OA802	0.0	M	10	HM		P1	C	PELICAN LAKE NEAR NINETTE	81
05OB025	147.0	M	02	QR		P1	S	PILOT CREEK NEAR PILOT MOUND	82
05OB803	0.0	M	10	HM		P1	S	PILOT MOUND RESERVOIR NEAR PILOT MOUND	83
05LG001	210.0	M	01	QR	C	P1	S	PINE RIVER NEAR PINE RIVER	84
05NG003	4200.0	M	02	QR		P1	C	PIPESTONE CREEK NEAR PIPESTONE	85
05LJ808	0.0	M	10	HM		P1	S	PLEASANT VALLEY RESERVOIR NEAR PETLURA	86
05NG801	0.0	M	10	HR		P1	S	PLUM LAKE ABOVE DELEAU DAM	87
05NG809	0.0	M	10	HR		P1	S	PLUM LAKE NEAR FINDLAY	88
05OE002	901.0	M	03	QR		P1	S	RAT RIVER NEAR ST MALO	89
05OC026	0.0	M	03	HR	T	P1	S	RED RIVER ABOVE RED RIVER FLOODWAY	90
05OC803	0.0	M	10	HM		P1	S	RED RIVER AT ST ADOLPHE	91
05PG002	159.0	M	03	QR	A	P1	C	RENNIE RIVER NEAR RENNIE	92
05MF020	0.0	M	02	HR		P1	C	RIVERS RESERVOIR NEAR RIVERS	93
05OB804	0.0	M	10	HM		P1	C	ROCK LAKE NEAR GLENORA	94
05OD802	0.0	M	10	HM		P1	S	ROSEAU RIVER AT DOMINION CITY (P.R. 200)	95
05ME803	0.0	M	10	HM		P1	S	RUSSELL RESERVOIR NEAR RUSSELL	96
05OE003	0.0	M	03	HR		P1	C	ST MALO RESERVOIR NEAR ST MALO	97
05KG004	0.0	M	05	HR		P1	S	SCHIST LAKE NEAR CHANNING	98
05ME009	162.0	M	02	QR		P1	S	SCISSOR CREEK NEAR MCAULEY	99
05OE011	0.0	M	03	QR	A	P1	S	SEINE RIVER DIVERSION NEAR ILE DES CHENES	100
05OH008	0.0	M	03	QR	A	P1	S	SEINE RIVER DIVERSION NEAR STE ANNE	101
05OH006	1090.0	M	03	QR		P1	C	SEINE RIVER NEAR PRAIRIE GROVE	102
05OF021	308.0	M	02	QR		P1	S	SHANNON CREEK NEAR MORDEN	103
05OF014	653.0	M	01	QR		P1	S	SHANNON CREEK NEAR MORRIS	104
05OF015	168.0	M	01	QR		P1	S	SHANNON CREEK TRIBURARY NEAR MYRTLE	105
05NG805	0.0	M	10	HR		P1	S	SHARPE LAKE NEAR DELORAINE	106
05MG007	0.0	M	02	HM		P1	S	SHOAL LAKE NEAR SHOAL LAKE	107
05LJ040	137.0	M	01	QR		P1	S	SILVER CREEK NEAR GRANDVIEW	108
05TB801	0.0	M	10	HM		P1	C	SNOW LAKE AT SNOW LAKE	109
05NG025	0.0	M	02	QR	SW	P1	S	SOURIS RIVER NEAR LAUDER	110
05NG026	0.0	M	02		S	P1	M	SOURIS RIVER NEAR MINTO	111
05KK006	0.0	M	05	HR	D	P1	C	SOUTH MOOSE LAKE AT MOOSE LAKE CONTROL STR	112
05LF001	300.0	M	05	QR	C	P1	S	STEEPROCK RIVER NEAR MAFEKING	113
05OF008	0.0	M	02	HR	D	P1	S	STEPHENFIELD RESERVOIR NEAR STEPHENFIELD	114
05MJ011	541.0	M	07	QR		P1	S	STURGEON CREEK NEAR PERIMETER HWY	115
05LE007	0.0	M	05	HR		P1	S	SWAN LAKE NEAR NOVRA	116
05OF018	87.3	M	02	QR		P1	S	TOBACCO CREEK NEAR ROSEBANK	117
05OE009	237.0	M	03	QR		P1	S	TOUROND CREEK NEAR TOUROND	118
05LJ811	0.0	M	10	HR		P1	S	UPPER GRANDVIEW RESERVOIR NEAR MERRIDALE	119
05LJ812	0.0	M	10	HM		P1	C	VALLEY RIVER AT GILBERT PLAINS	120

DR. AREA. =0.0 IS NOT APPLICABLE

STA. NO.	DR. AREA	DIST	RESP	GAUGE DATA	FUND. CD.	OP	STATION NAME PAGE NO. 13	NO.
05LJ021	1720.0	M	02	QR C	P1	S	VALLEY RIVER NEAR GRANDVIEW	121
05PG803	0.0	M	10	HM	P1	S	WEST HAWK LAKE AT WEST HAWK LAKE CAMPGROUND	122
05LL001	156.0	M	01	QR	P1	S	WEST SQUIRREL CREEK NEAR AUSTIN	123
05PH005	0.0	M	03	HR	P1	S	WHITEMOUTH LAKE NEAR THE OUTLET	124
05LL011	803.0	M	01	QR	P1	S	WHITEMUD RIVER NEAR NEEPAWA	125
05PG801	0.0	M	10	HM	P1	S	WHITESHELL LAKE AT CAMPGROUND	126
05PG001	883.0	M	03	QR	P1	C	WHITESHELL R AT OUTLET OF JESSICA LAKE	127
05MH011	668.0	M	02	QR	P1	S	WILLOW CREEK NEAR CHATER	128
05SB002	156.0	M	01	QR	P1	S	WILLOW CREEK NEAR GIMLI	129
05PF062	0.0	M	03	HM	P1	C	WINNIPEG RIVER AT LAC DU BONNET	130
05TD002	0.0	M	04	HR R	P1	C	WINTERING LAKE AT THICKET PORTAGE	131

DR. AREA. =0.0 IS NOT APPLICABLE

SUMMARY:	CONVENTIONAL STATIONS	REMOTE STATIONS	TOTALS
	DISCHARGE (C) = 7	DISCHARGE (C) = 0	
	DISCHARGE (S) = 50	DISCHARGE (S) = 0	
	DISCHARGE (M) = 2	DISCHARGE (M) = 0	DISCHARGE = 59
	WATER LEVEL (C) = 16	WATER LEVEL (C) = 3	WATER LEVEL = 71
	WATER LEVEL (S) = 52	WATER LEVEL (S) = 0	TOTAL =130

ACTIVE GAUGING STATIONS FOR MANITOBA 1 -1986-87
PROVINCIAL 2. SPECIFIC PURPOSE MONITORING REQUIREMENTS

STA. NO.	DR. AREA	DIST	RESP	GAUGE	DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 14 NO.
06EB006	0.0	M	04	HR	RD	P2	C	RUSSELL LAKE NEAR HERRIOT	1
06EC006	0.0	M	04	HR	RD	P2	C	SOUTHERN INDIAN LAKE AT MISSI FALLS	2
06EC007	0.0	M	04	HR	RD	P2	C	SOUTHERN INDIAN LAKE NEAR OPACHUANAU	3

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) = 3	WATER LEVEL = 3
	WATER LEVEL (S) = 0	WATER LEVEL (S) = 0	TOTAL = 3

HYDROMETRIC SUMMARY (STATION UNITS) 1 -1986-87
OPERATED BY WATER SURVEY OF CANADA

	CONVENTIONAL				REMOTE			
FEDERAL								
DISCHARGE(C)	33	X 1.00=	33.00		DISCHARGE(C)	17	X 1.00=	17.00
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	72		57.15			25		20.05
FEDERAL-PROVINCIAL								
DISCHARGE(C)	23	X 1.00=	23.00		DISCHARGE(C)	10	X 1.00=	10.00
DISCHARGE(S)	47	X 0.75=	35.25		DISCHARGE(S)	1	X 0.75=	.75
DISCHARGE(M)	0	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)	14	X 0.40=	5.60
WATER LEVEL(S)	6	X 0.25=	1.50		WATER LEVEL(S)	0	X 0.25=	0.00
SUB-TOTALS	87		64.15			25		16.35
PROVINCIAL								
DISCHARGE(C)	7	X 1.00=	7.00		DISCHARGE(C)	0	X 1.00=	0.00
DISCHARGE(S)	50	X 0.75=	37.50		DISCHARGE(S)	0	X 0.75=	0.00
DISCHARGE(M)	2	X 0.00=	0.00		DISCHARGE(M)	0	X 0.00=	0.00
WATER LEVEL(C)	9	X 0.40=	3.60		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	85		52.35			6		2.40
TOTALS	244		173.65			56		38.80

NUMBER OF:
DISCHARGE STATIONS =217
WATER LEVEL STATIONS = 83
REMOTE STATIONS = 56
SEDIMENT STATIONS = 20
WATER QUALITY STATIONS = 3
WATER TEMP STATIONS = 16
D.C.PLATFORMS = 33
TELEMARKS = 29
INTELLIGENT MICROPROCESSORS = 5

ACTIVE GAUGING STATIONS FOR MANITOBA
CONTRIBUTED DATA

STA. NO.	DR. AREA	DIST	RESP	GAUGE DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 15	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

ACTIVE GAUGING STATIONS FOR MANITOBA
CONTRIBUTED BY OTHER FEDERAL AGENCY.

1 -1986-87

STA. NO.	DR. AREA	DIST	RESP	GAUGE DATA	FUND. CD.	OP CONF	STATION NAME	PAGE NO. 15	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

ACTIVE GAUGING STATIONS FOR MANITOBA
NEW CONSTRUCTION

1 -1986-87

STA. NO.	DR. AREA	DIST	RESP	GAUGE DATA	FUND. CD.	OP	STATION NAME	PAGE NO. 16	NO.
	0.0				NEWP		EAGER LAKE		1
	0.0				NEWP		SIPIWESK LAKE AT SIPIWESK LANDING		2
	0.0				NEWP		SOUTH PLAYGREEN LAKE		3

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 =	56
SEDIMENT STATIONS =	20
WATER QUALITY STATIONS =	5
WATER TEMP STATIONS =	16
D.C. PLATFORMS =	33
TELEMARKS =	29
INTELLIGENT MICROPROCESSORS =	5

DISTRIBUTION LIST

REGIONAL CHIEF
REGIONAL HYDROLOGIST
REGIONAL ENGINEER
AREA ENGINEERS
HYDROMETRIC SUPERVISORS

I-3 SCHEDULE B

ANNUAL PAYMENTS - ITEMS TO BE INCLUDED

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

1. 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.

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.

I.4 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 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 operating cost for 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 operating 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, an 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.

I.5 NATIONAL GUIDELINES FOR DESIGNATING WATER QUANTITY SURVEY STATIONS

October 20, 1982

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 agreement, 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 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 estabished 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 variability, 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

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

2. Specific Purpose Monitoring Requirements

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

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 1986-87 TO BE PAID TO CANADA BY MANITOBA

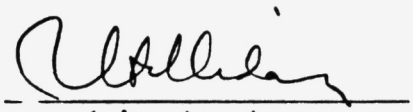
	Operation	Construction	Total
a) Streamflow and water level installations	$440,500	$20,000	$460,500
b) Sediment installations	14,200	0	14,200
c) Installation of Satellite based Real Time hydrometric and Meteorologic Data Collection Network			77,300
ANNUAL PAYMENT			$552,000

ADMINISTRATOR FOR MANITOBA

(signature)

Director
Water Resources Branch
Department of Natural Resources

ADMINISTRATOR FOR CANADA



(signature)

Regional Director
Inland Waters Directorate
Environment Canada

APPENDIX II

II-1 DETAILED PROGRAM COSTS 1986/87

Appendix II contains Tables 4 to 12 which provide details of expenditures under the Memorandum of Agreement. Program costs were determined using the departmental cost accounting and coding systems along with the Department of Supply and Services detailed transaction computer listing. Costs are summarized using three categories.

1. Salary Costs
2. Operation and Maintenance Costs
3. Capital Construction and Depreciation Costs

1. Salary Costs

The salaries of staff with full time hydrometric duties are shared under the program. Salaries of staff with partial hydrometric duties or those seconded to the program for brief periods are shared proportionately. The Isolated Post Allowances paid to the two staff members at The Pas sub-office are included in the salary total. Table 4 shows the salaries charged to the conventional and remote program and the calculation of the station unit salary cost. Incremental sediment salary costs are included with the conventional unit salary costs (estimated at 0.9 times the unit salary cost of a hyrometric station).

2. Operation and Maintenance Costs

Table 5 shows a detailed breakdown of all expenditures. Shareable categories include: hydrometric conventional (005) hydrometric remote (006), and sediment (004). Non shareable categories are also shown for documentation purposes. An explanation of all cost codes is included in Table 5. Table 6 shows the calculation of the station unit O & M costs for hydrometric conventional, hydrometric remote and sediment categories. Sediment laboratory costs were computed on the basis of the total number of samples analyzed. The costs are apportioned on the basis of station classification (refer to Table 7).

Data processing station unit costs for 1986/87 (Table 8) were computed on the basis of the procedure agreed upon by the Coordinating Committee in 1984/85.

3. Capital Depreciation and Construction

Capital depreciation includes vehicle and equipment depreciation. The total inventory value of hydrometric, sediment and construction equipment, not including water level recording equipment is depreciated 10% per year. Table 9 shows the vehicle depreciation values for 1986/87. Vehicle depreciation is charged only for the months that the vehicle was used for field operations. Table 10 details the equipment inventory value used for depreciation purposes in 1986/87.

The summary of construction costs is shown in Table 11. This information is obtained from the 1986/87 Construction Report. Construction vehicle and equipment depreciation costs derived from Tables 10 and 11 are also included in the construction cost summary. The Manitoba DCP Implementation Cost Summary is shown in Table 12.

TABLE 4
MANITOBA WATER QUANTITY PROGRAM
SALARY COST 1986/87

Hydrometric Conventional Access and Sediment Stations

Position No.	Position Title	Salary
840-1468	Hydrometric Supervisor	$36 909
840-1300	" "	36 905
840-1346	" "	37 124
840-1298	" "	34 771
840-1414	" "	40 683
840-1514	Hydrometric Technician	33 778
840-1591 (1 month)	" "	1 405
840-8010	" "	34 170
840-8996	" "	33 307
840-1513	" "	33 235
840-1402	" "	34 108
840-1590	" "	34 183
840-8963	" "	34 260
840-8921	" "	24 741
840-1467	" "	30 530
840-1592 (10 months)	" "	31 701
Additional assistance by Technical Services (3 pers. mo.)		7 673
Overtime		7 273
Total		495,061

Hydrometric Remote Access

840-4917	Hydrometric Technican	27 398
840-8083	" "	32 872
840-1415	" "	28 678
840-1440	" "	32 598
840-8011	" "	25 898
Overtime		3 790
Salary reduction for Churchill Tidal gauge (0.5 person months)		- 1 195
Total		$179,052
Total p - y utilization	19.9 person-years out of 21 positions	

CALCULATION OF STATION UNIT SALARY COST

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric station where sediment is monitored)	173.40
b)	Sediment Station Units = 15.50 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 year's data)	13.95
	Combined Hydrometric & Sediment Weighted Salary Units	187.35
	Unit Salary Cost (Hydrometric Conventional) = $\frac{\$495,061}{187.35}$ = $2,642	
	Unit Salary Cost (Sediment only) ($2642 x 0.9) = $2,378	
c)	Hydrometric Remote Access Station Units	39.05
	Unit Salary cost (Hydrometric Remote) = $\frac{\$179,052}{39.05}$ = $4,585	

DETAILED COST SUMMARY 1986-87 TABLE 5

AUTHORITY CODE 101 DESCRIPTION	LINE OBJECT	0001	0003	0004	0005	0006	0007	0010	0016	0017	1615
02 TRANSPORTATION & COMMUNICATION											
TRAVEL EXPENSES	401	5330					1821		3237	1500	525
CAR MILEAGE	402						5				525
BUS TRAV CTS EXPEN	404	2538					4222		1806		1515
TRAVEL EXPENSES	411		76	1137	44237	8582	666	6810		1326	761
CAR MILEAGE	412						480		19		
ITIN WK TRAV CHAR	414	537					2046	1663	36	2033	
TRAVEL ADVANCES	420										
GOVERNMENT CONFERENCES	423										
GOVERNMNENT CONF.CTS	428								231		
TRAVEL USA	430	420					411				
TRAVEL USA ITIN WORK	431				844		152	416			
TRAVEL US CTS	433	352					740				
VACATION TRAVEL IPA	443				303						
TRAVEL TRAINING	444						9205			267	
TRAVEL STAFFING	445	661					615			714	
TRAVEL EXP NON-PS	450	116				3196		266			
REMOVAL COSTS	560										735
REMOVAL ADVANCE	567										
TRANS GOODS AIR	601		93		118	104	50	68	38	19	391
TRANS GOODS RAIL	602				19			35			
TRANS GOODS TRUCK	604	73			535	500	251	237	16	172	111
TRANS GOODS BUS	605				126						
TRANS GOODS OTHER	609	28	6		26			9	12	26	38
PARCEL POST	651				101		5			2	15
OTHER POSTAL SERVICE	652				395			3		66	3019
COURRIER SERVICE	653	19			37		18	3	8	140	883
CENTRAL FREIGHT SERVIC	654			809	1620	1133	128	121	61	20	219
TEL GTA	701				4307	750		774	774	774	1650
TEL INSTALL REPAIR	702										39
TEL LONG DISTANCE CHAR	703	31		3	3445	623	260	87	157	1412	613
TEL SERVICE CHARGES	704				223		2791			2500	10554
MESS DATA COMM SERVICE	806	11						1140		13413	
ENVOY 100	815										34
SUB-TOTAL		10116	175	1949	56336	14888	23866	11632	6395	24384	21627
03 INFORMATION											
ADVERT PRINT OUTSD.	901	2521									188
PUBLIC BROCHURES	1042										263
PUBLICATION OUTSD.	1053						204				
OTHER PRINT SERV (DSS)	1062								325		82
OTHER PRINT COMM	1064	140					2352	178	576	1955	1824
DEPT PRINT SERV	1073	34700					675	99	784		129
SUBTOTALS		37361	0	0	0	0	3231	277	1685	1955	2486
04 PROFESSIONAL AND SPEC SERV											
ENGINEER ELECT CONS	1132	1500									
RESEARCH CONTRACT	1160								15670		
GAUGE ATTEND. SERV.	1171			10438	2841						
STF DEV TR PSC EX LGTR	1220						5045		1220	1070	1135
TUITION FEES UNIV & CO	1221						323		329		
TR PS OTH	1222	233					2104		98	900	
CONTACT STENO SERV	1301										5476
CONTACT CLERICAL SERV	1302										368
OTHER TEMP HELP SERV	1303				1329	635		209		72	148
LAUND CL & REL SERV	1501				221			23			
EDP SERV PURCHASES	1505								1057	6779	3816
EDP PURCH SOFTWARE	1510									2177	
CONTR. ADMIN DSS SERV	1525	20337									

DESCRIPTION	LINE OBJECT	0001	0003	0004	0005	0006	0007	0010	0016	0017	1615
OTHER PHOTO SERV	1536		27				330	32			
BROKERAGE FEES	1554		112				896			31	
CONFERENCE FEES	1574								225		
SNOW ICE REMOVAL	1581									700	
OTHER SERV CONTRACTS	1586	1436									
PETTY CASH PURCHASES	1589	20			79				52		
SRV NES PUR GOV DEPT	1595							261			
SRV N E S PUR GOV	1596	25									
MISC SERV	1597							1	2		
SUBTOTALS		23551	139	10438	4470	635	8698	526	18653	11729	10943
07 RENTALS											
RENTAL LANDS	1601				2075						14
WD PROC PER EQUIP	1620										5929
OFFICE MACH EXC FURN	1622										182
ELECT/AUTO OFFICE SYST	1623										1321
PHOTO/AUDIO EQUIP	1624	324									
RENTAL MACH EQUIP	1625				280			575			
LEASE MOTOR VEHICLES	1630							282			
RENTAL AIRCRAFT	1635		924			107117		17426			
RENTAL OF WAREHOUSE	1640	523					13800			343	
RENTAL GAS CYLINDERS	1650				3340	2250					
RENTAL EQUIP NES	1651	25			34			481			
FURN AND FIXT	1653	144									
SUBTOTALS		1016	924	0	5729	109367	13800	18764	0	343	7446
08 PURCHASE REPAIR AND UPKEEP											
OTHER ELECT EQUIP	1714				120						
MEAS CONTR LAB INSTR.	1718	303	1871		4058	900	235				
FURNITURE FIXTURE	1722				16						
OTHER EQUIP	1727				682			467			
TELECOM EQUIP	1734				375						
EDP EQUIP	1735									15201	
OFFICE MACHINE EQUIP	1736									192	
OTHER MACHINE	1737				50						
MARINE EQUIP	1741				11						
RD MOTOR VEH	1746	7		6	3663		7	1018			7446
MISC VEHICL	1747				47						
GAUGE STATIONS	1805							512			
SUBTOTALS		310	1871	6	9022	900	242	1997	0	15393	7446
09 UTILITIES MATERIALS & SUPP											
ELECT CONSUMP	1901				35452	909	3076				
TOPSOIL	2010							434			
PROPANE GAS LPG	2013				101			3			
AUTOMOTIVE GAS	2014			6	28140		129	5625	66		2003
AVIATION GAS	2015										
JET FUEL	2016										
OTH PETROL PROD	2018				800		39	152			56
WOOD FAB MAT	2020				712			336			
PAPER BOARD	2021				144						110
TEXTILE FAB MAT	2022				50			7			
CHEM REL PRODUCTS	2023		108		891			54			4
CHLOR OXY	2027						527	114			
IRON STEEL ALLOYS	2028		346		1046			933			
MET FAB BASIC PROD	2030			4	2043	1014		102			
CEMENT	2031				492			34			
DEICING SALT	2032				3						
ROOFING MAT	2033				44						
PROTECTIVE CLOTHING	2040				1684	525		20			
FOOTWEAR APPAREL	2041		3		728	225		12			
TOILET CLEAN PREP ETC	2042						72	4			

DESCRIPTION	LINE OBJECT	0001	0003	0004	0005	0006	0007	0010	0016	0017	1615
KITCH UTENS	2045							5			
STCK ITEM OTH DSS	2048				259					220	4300
LIBRARY STCK PRINT	2051				71			70	19	1242	
MAPS CHARTS	2052				3203	800		4		467	143
STATION OFF SUPP	2054	90	14		227		22			256	2768
DRAFT ART SUPP	2055				5			6			
FACSIMILE PAPER	2057										220
PHOTOCOP PAPER CHEM	2058										579
DATA PROCESSING SUPP	2059	161							888	3882	545
PHOTO GOODS	2060		46		110	6		19	8		
MED PHARM PROD	2061				46						11
FIREARM	2062						359				
CONTAINER CLS RETURN	2063				34	60					
CAMERA	2065								355		
PAINT	2068				322			140			
GARDEN SUPP	2069				10						
MISC PROD AUD-VIS BULB	2070			7	919	26		316	227	439	
HARDWARE	2071		50		944	15		179			
SUBSCRIPTIONS	2082										88
PURCHASED CASH INC TX	2083	273	11	27	1580	400	81		142	12	58
CONVEY ELEV MAT HNDL	2105				1377						
HT AIR COND REFRIG EQU	2111										
PLUMBING EQUIP FIT	2113				386						
ELECT LIGHT DIST	2114		728	2	3117	800	8	57	67	124	
OTH ELEC APPL EQUIP	2116				56		379	8			
BATTERIES	2118		2940		3162	1000	13	37			87
MEAS CONT MED OPT INST	2122		6760		6102	2357	6194	16			
SAF SANIT EQUIP	2124				2174	700					
HAND TOOL CUTL	2126		93	2	1372	400	66	463			
GRADER BLADES	2127							5			
OTH EQUIP INCL X-RAY	2128				471			575			
EDP EQUIP	2135				30		94			228	
TELECOM EQUIP	2136				5						
ELECTRONIC OFFICE EQ.	2137		50								
OTH OFFICE EQUIP	2138				4						
MARINE EQUIP	2141				156						
RD MOT VEH	2146			16	4269			1158			123
RUB TIRE TUBES	2147				2345			106			
MISC VEHICLES	2148			8	87						
OVERSNOW VEHICLES	2149				76						
SUBTOTALS		524	11149	72	105249	9237	11059	10994	1772	6870	11095
14 ALL OTHER PAYMENTS											
PAY MISC TX	2525				376						
OTHER MISC EXP	2527	50							385		
VEH RE FEES	2528				456						
DEPART AWARDS	2530	34									
CURRENT METER PARTS					5180	1120					
CHURCHILL TIDAL GAUGE							2624				
SUBTOTALS		84	0	0	6012	1120	2624	0	385	0	0
TOTAL		72962	14258	12465	186818	136147	63521	44190	28890	60674	61043
AUTHORITY CODE 201											
10 CAPITAL CONSTRUCTION											
GAUGE STATION	2206							74656			
WAREHOUSE	2260						15520				
SUBTOTALS		0	0	0	0	0	15520	74656	0	0	0
11 MACHINERY & EQUIPMENT											
OTHER ELECT EQUIP	2317						297				
MEAS CONTR LAB	2322		11850				80464				
WATER SEWER PUMPS	2330						399				

DESCRIPTION	LINE OBJECT	0001	0003	0004	0005	0006	0007	0010	0016	0017	1615
SRV IND EQUIP VEND	2332						174				
FURN FIXT EXC DSS	2334						54				
OTHER EQUIP	2347						466				
MESS DATA & COMP	2354						4		11716		
OTHER EDP EQUIP	2357						708		1295	3580	
EDP SOFTWARE	2361									4190	
RD MOTOR VEHIC	2371						72847				
MISC VEH OTH RD VEH	2372						1308				
SUBTOTALS		0	11850	0	0	0	157469	0	13011	7770	0
TOTAL		0	11850	0	0	0	172989	0	13011	7770	0

COST CODE LEGEND

0001 - General
0003 - DCP Implementation Program
0004 - Sediment Surveys
0005 - Hydrometric Surveys - Conventional Access
0006 - Hydrometric Surveys - Remote Access
0007 - Hydrometric - Non Shareable
0010 - Construction
0016 - Hydrology Division (Hydrologic Studies)
0017 - Hydrology Division (Data Control)
1615 - Common Support Services

TABLE 6

CALCULATION OF STATION UNIT OPERATIONS AND MAINTENANCE COST

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric stations where sediment is monitored).	173.40
b)	Sediment Station Units = 15.50 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)	6.20
	Combined Hydrometric and Sediment Weighted O & M units	179.60

Combined Hydrometric Conventional and Sediment
(excluding lab analysis and data processing)
O & M Costs from Table VI-5
= $186,818 + $12,465 = $199,283

Hydrometric Conventional Station

Unit O & M Cost (Hydrometric Conventional)
= $199,283 / 179.60 = $1,110 (excluding data processing costs)

Unit O & M Cost (Sediment incremental cost only) (Excluding lab costs)
= $1,110 x 0.4 = $444 (excluding data processing)

c) Hydrometric Remote Access Station Units 39.05

Unit O & M Cost (Hydrometric Remote)
= $136,147 / 39.05 = $3,486 (excluding data processing)

Total O & M Station Unit Costs - Including data processing

Hydrometric Conventional	-	$1,110 + $142	= $1,252
Sediment (incremental cost)	-	$444 + $ 71	= $ 515
Hydrometric Remote	-	$3,486 + $142	= $3,628

TABLE 7

SEDIMENT SAMPLE LABORATORY ANALYSIS COSTS*

FOR 1986/87

Filtration Analysis Cost per sample - $15.60
Bottom Withdrawal Tube Analysis Cost per sample - $65.59

	Number of Samples		
Federal Category Sediment Sampling Sites	Filtration	Bottom Withdrawl	Total Cost
Antler River near Melita	67		$1 045.20
Assiniboine River at Headingley	119	14	2 774.66
Assiniboine River near Holland	171	7	3 126.73
Pembina River near Windygates	118	12	2 627.88
Red River at Emerson	239	29	5 630.51
Red River near Lockport	50	12	1 567.08
Red River near Lockport (Selkirk)	189	6	3 341.98
Roseau River near Dominion City	140		2 184.00
Rouseau River at Gardenton	57		889.20
Souris River at Wawanesa	126		1 965.60
Souris River near Coulter	94		1 466.40
Saskatchewan River at The Pas	105	9	2 228.31
Sub-Total			$28 847.51
Federal - Provincial Category Sediment Sampling Sites			
Burntwood River below First Rapids	2		31.20
Burntwood River near Thompson	8		124.80
Odei River near Thompson	94		1 466.40
Sub-Total			$1 622.40
Provincial Category Sediment Sampling Sites			
Edwards Creek Drain below Jackfish Creek	49	26	2 469.79
Souris River below Souris	94	1	1 531.99
Souris River below Hartney	118		1 840.80
Valley River near Dauphin	112	6	2 140.74
Sub-Total			$7 983.27

Total Sediment Analysis Laboratory Cost - $38,453.18

Federal Share Sediment Analysis Cost = $28,847.51 + $\frac{\$1622.40}{2}$ = $29,658.71

Provincial Share Sediment Analysis Cost = $\frac{\$1,622.40}{2}$ + $7,983.27 = $8,794.47

* Financial Data obtained from CWRB, Sediment Laboratory in Regina

TABLE 8

1986/87 DATA PROCESSING COSTS

Actual 1986/87 Costs

Capital Expenditures for Mini Computer System		
as of April 1, 1986	$281,762	
during 1986/87	3,230 (two terminals)	
Total for 1986/87	284,992	
minus inputted rental recovered	26,055	
	258,937	
Inputed rental charge for 1986/87	258,937/8 (Depreciated to 1994)	$32,367.13
Annual Maintenance Costs (Data Control Shareable coded) maintenance of hardware		17,379.74
Annual Operating Costs (Data Control Shareable coded) software licences, communications and supplies		24,581.52
Actual Total 1986/87 Computing Costs for District		74,328.26
Manitoba Portion based on station units (220.2) / (220.2 + 34.2)		$64,336.01

Computing Cost Ceiling

Cost for data computations	$28,050 (base year 1983/84)
84/85 G.P.I.	x 1.05 (supplied by Finance & Admin.
1985/86 G.P.I.	x 1.031 Branch, Ottawa)
1986/87 G.P.I.	x 1.028
Base Ceiling	$31,185

Total 86/87 Computing Cost Ceiling $31,185

Shareable Cost for 1986/87

The lesser of the Actual or Ceiling $31,185

By Station Unit

Data Processing Station Units in Manitoba	
Hydrometric Conventional	173.40
Sediment (15.5 x 0.5)	7.75
Hydrometric Remote	39.05
	220.20

Shareable Data Processing Costs = $31,185 / 220.20 = $138/station unit

Hydrometric Conventional Data Processing Unit Cost	$142.00
Sediment Data Processing Unit Cost ($142 x 0.5)	$71.00
Hydrometric Remote Data Processing Unit Cost	$142.00

TABLE 9

VEHICLE DEPRECIATION
MANITOBA FY 1986/87

Vehicle Number	Original Capital Cost ($)	Depr. per month ($)	Time in use Month	Annual Depr. ($)	Remarks
Station Wagons - Lifetime 5 years (60 months)					
85-107	11 428	190	2	380	
84-121	10 775	180	2	360	
78-309	5 694	95	3	285	
79-461	7 106	118	4	1 472	
78-095	5 348	89	12	1 068	
Multi-Purpose Vehicles or Light Trucks - Lifetime 6 years (72 months)					
79-477	7 731	107	4	1 428	
78-311	6 428	89	12	1 068	
81-005	8 952	124	4	1 496	
81-006	11 522	160	12	1 920	
81-041	14 281	198	12	2 376	
81-043	9 892	137	4	1 548	
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	
84-004	13 758	191	12	2 292	
84-119	12 593	175	12	2 100	
84-122	12 401	172	12	2 064	
85-106	13 326	185	12	2 220	
86-052	12 309	171	8	1 368	
86-054	15 344	213	8	1 704	
86-055	15 123	210	8	1 680	
86-056	15 123	210	8	1 680	
84-120	14 357	199	12	2 388	Construction
86-003	13 561	188	12	2 256	Construction

Field Surveys Vehicles Depreciation (excluding Construction Vehicles) = $33 317

Construction Vehicles Depreciation = $4 644

Capital Cost of New Vehicles for Manitoba Acquired in 1986/87 was $57,899

TABLE 10

CALCULATION OF STATION UNIT
CAPITAL DEPRECIATION COST 1986/87

Vehicle Depreciation		$33,317
Construction Depreciation		$28,741
Equipment Depreciation*		
Average Inventory Value for 1986/87		334 826
Capital Depreciation of equipment (10 years)	$334 826 / 10	33 483
Total Capital Depreciation		66 800

Station Group		Units
a)	Hydrometric Conventional Access Station Units (includes hydrometric stations where sediment is monitored)	173.40
b)	Sediment Station Units 15.5 X 0.4 (0.4 is the incremental capital depreciation cost coefficient for the sediment portion over and above hydrometric depreciation)	6.2
c)	Hydrometric Remote Access Station Units	39.05
	Combined Weighted Capital Depreciation Units	218.65

Unit Capital Depreciation Cost = $\frac{\$66\ 800}{217.65} = \$306$
(Hydrometric Conventional)

Unit Capital Depreciation Cost = $306 x 0.4 = $122
(Sediment only)

Unit Capital Depreciation Cost = $306 x 1.0 = $306
(Hydrometric Remote)

* - Departmental Equipment-In-Use Materiel Management System

TABLE 11

Manitoba Construction Program
Cost Summary 1986/87

Federal Stations	
Material and Supplies	$21,545.32
Travel Expenses	9,432.32
Salaries	33,153.00
Labour	336.62
Rentals	469.19
Electrical	4,822.84
Hydro	12,542.00
Contracts	3,226.80
Vehicle and Equipment Depreciation	5,414.97
Total Federal Cost	$90,943.06
Federal-Provincial Stations	
Materials and Supplies	$ 5, 671.02
Travel Expenses	1,909.13
Salaries	8,320.00
Hydro	3,450.00
Electrical	2,995.67
Vehical and Equipment Depreciation	1,602.70
Labour	62.72
Aircraft Charter	2,905.85
Total Federal-Provincial Cost	$26,917.09
Provincial Stations	
Materials and Supplies	$ 579.91
Travel Expenses	526.72
Salaries	4,109.00
Hydro	550.00
Electrical	380.00
Contracts	182.00
Vehical and Equipment Depreciation	400.43
Total Provincial Cost	$ 6,726.06
TOTAL MANITOBA	$124,586.21
TOTAL FEDERAL COST	$104,401.61
TOTAL PROVINCIAL COST	20,184.60

Table 12

Manitoba DCP Implementation Cost Summary 1986/87

Federal Costs	
Construction	$ 12,661.00
Recorders (12)	32,400.00
Servomanometers (8)	34,800.00
Real Time Telemetry Systems (10)	79,220.00
Total	$159,081.00
Provincial Costs	
Construction	$ 249.00
Servomanometers (1)	4,350.00
Total	$ 4,599.00
Manitoba Hydro Costs	
Construction	$19,292.75
Servomanometers (3)	13,050.00
Real Time Telemetry Systems (5)	39,610.00
Total	$71,952.75

APPENDIX III

CHANGES TO SCHEDULE A - MANITOBA 1987/88

Stations Added to the Network

1)	06EB007	Eager Lake near Todd Lake	Provincial
2)	050C027	Lake Minnewasta near Morden	Provincial
3)	05UB005	Playgreen Lake at Entrance to East Nelson River	Provincial
4)	05UD007	Sipiwesk Lake at Sipiwesk Landing	Provincial
5)	050H009	Seine River South of Prairie Grove	Provincial

Stations Discontinued

1)	05TD002	Wintering Lake at Thicket Portage
2)	050H006	Seine River near Prairie Grove

Changes in Operational Schedule

1)	05MG008	Oak River at Shoal Lake	Continuous to Seasonal
2)	05MG004	Oak River near Rivers	Continuous to Seasonal

Additions to Contributed List

1)	05SA801	Gull Lake at North Shore Road
2)	05PD802	Moose Lake near Sprague
3)	05PF802	Nutimik Lake near Nutimik Lake Lodge
4)	050H802	Seine River at Ste. Anne
5)	05NG806	Souris River above Hartney Dam
6)	05LJ810	Turtle River above Ste. Rose Dam

ESTIMATED COST FOR SCHEDULE D - MANITOBA 1987-88

	No. of Stations	No. of Units		Unit Cost		Total Cost	Provincial Share	Schedule D Amount
A HYDROMETRIC STATIONS:								
Federal								
Conventional Access	72	57.15	x	4367	=	249,574	0	
Remote Access	25	20.05	x	8577	=	171,969	0	
Sub-total	97	77.20				421,543		
Federal Provincial								
Conventional Access	87	64.15	x	4367	=	280,143	140,072	
Remote Access	25	16.35	x	8577	=	140,234	70,117	
Sub-total	12	80.50				420,377	210,189	
Provincial								
Conventional Access	85	52.35	x	4367	=	228,612	228,612	
Remote Access	9	3.60	x	8577	=	30,877	30,877	
Sub-total	92	55.95				259,490	259,490	
TOTAL								
Credit for Provincial Operation of one station of 0.25 units							- 1,092	
							468,586	470,000
B Sediment Stations:								
Federal	12	10.50	x	3105	=	32,603		
Federal Provincial	5	1.75	x	3105	=	5,434	2,717	
Provincial	5	2.25	x	3105	=	6,986	6,986	
Sub-total	22	14.50				45,023	9,703	
Lab Analysis						24,000	7,000	
TOTAL	22	14.50				69,023	16,703	17,000
C Construction:								
a) Streamflow and water level installations						184,750	24,100	24,100
D Installation of Satellite Based Real Time Hydrometric and Meteorologic Data Collection Network								
a) DCP installation (10 DCPs at 4 Fed, 6 Fed.Prov.)						106,250	32,100	32,100
b) Servomanometers (4 CWRB, 2 MWRB)						26,400	8,800	8,800
						132,650	40,900	40,900
TOTAL PROVINCIAL SHARE FOR 1987/88								$552,000

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 1987-88 TO BE PAID TO CANADA BY MANITOBA

	Operation	Construction	Total
a) Streamflow and water level installations	$470,000	$24,100	$494,100
b) Sediment installations	17,000	0	17,000
c) Installation of Satellite based Real Time Hydrometric and Meteorologic Data Collection Network			40,900
ANNUAL PAYMENT			$552,000

ADMINISTRATOR FOR MANITOBA

(signature)
T. Weber
Director
Water Resources Branch
Department of Natural Resources

ADMINISTRATOR FOR CANADA

(signature)
R. A. Halliday
Regional Director
Inland Waters/Lands
Environment Canada

APPENDIX IV

Station and Cost Summary Data For Inclusion in National Report

PROVINCE: MANITOBA

TABLE 1
WATER QUANTITY SURVEYS
GAUGING STATION DATA FOR 1986/87

No. of Stations 1			Changes during 1986/87		Stn. Designation April 1, 1986			
April 1/85	April 1/86	Change	Added	Discontinued	Fed.	F/P	Prov.	Contrib.
335	350	15	0	0	97 (13)	113 (5)	91 (5)	49

(1) includes contributed data stations

Bracket Sediment Stations

TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA April 1/75 April 1/86

Federal Stations			F/P Stations			Provincial Stations			Total Stations		
Apr 1/75	Apr 1/86	Chge	Apr 1/75	Apr 1/86	Chge	Apr 1/75	Apr 1/86	Chge	Apr 1/75	Apr 1/86	Chge
142	97	-45	92	113	+21	72	91	+19	306	301	-5

TABLE 3
WATER QUANTITY SURVEYS
DETAILED GAUGING STATION DATA 1986/87

F-1	F-2	F-3	F-4	Total F	FP-1	FP-2	FP-3	Total F P	P-1	P-2	Total P	Contributed	Total-All
22(2)	16(2)	22(6)	37(3)	97(13)	2	50(4)	61(1)	111(6)	88(5)	3	91 (5)	49	350(23)

Bracket Sediment Stations in all catagories

TABLE 4
WATER QUANTITY SURVEYS
TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1986/87 (x $1000)

Total Program Costs					Shareable Costs						
P/Yrs	Sal.	Oper.	Cap.	Total	P/Yrs	Sal.	Oper.	Const.	Total	F Share	P Share
41.0	1350.9	744.9	336.0	2431.8	22.0	674.6	470.6	360.0	1505.2	945.6	559.6

TABLE 5
WATER QUANTITY SURVEYS
COMPARISON - SCHEDULED & ACTUAL COSTS FOR 1986/87
(DOLLARS)

SALARY & OPERATIONS		CONSTRUCTION		TOTAL			ANNUAL	RECEIVED
Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Difference	PAYMENT RECEIVED	MINUS ACTUAL
440,500	455,162	20,000	20,185	552,000	559,643	7,643	5,548.44	-4,799

AUTHOR WRB - Winnipeg, Man.

1986-87 Manitoba Annual Report.

TITLE CANADA-MANITOBA MEMORANDUM OF AGRMT. FOR WATER QUANT. SURVEYS.

DATE Borrowed	BORROWER'S NAME	Ret'd

DATE DUE	BORROWER'S NAME