CANADA - SASKATCHEWAN
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS
ANNUAL REPORT 1984-1985

October , 1985

TO: Mr. D.L. MacLeod
Administrator for Saskatchewan

Mr. R.A. Halliday
Administrator for Canada

In accordance with Article XII of the Memorandum of Agreement for Water Quantity Surveys in the Province of Saskatchewan, signed February 18, 1975, we submit herewith the annual report for fiscal year 1984-85.

Saskatchewan

D. R. Richards
Saskatchewan Water Corporation

Canada

B. N. Johnson
Environment Canada

Members
Saskatchewan Co-ordinating Committee

September, 1985

Regina, Saskatchewan

EXECUTIVE SUMMARY

The Canada/Saskatchewan Co-ordinating Committee met twice during the report year. Several program activities were highlighted during these meetings. These included: appointment of Mr. B.N. Johnson, Acting Regional Chief, Water Resources Branch, as the member for Canada; appointment of Mr. D.R. Richards, Saskatchewan Water Corporation as the member for Saskatchewan; appointment of Mr. R.A. Halliday, Inland Waters Directorate, as the Administrator for Canada and the appointment of Mr. D.L. MacLeod, Saskatchewan Water Corporation, as the Administrator for Saskatchewan; expansion of the Data Collection Platform (DCP) program; hydrometric network planning; cost sharing arrangements for the Water Resources Branch minicomputer system; and, financial items related to Schedule D. Frequent contact was maintained between the members of the Committee and senior staff of both agencies during the year.

The 1984-85 program was completed satisfactorily following below normal flows in much of Saskatchewan during the spring of 1984. Southern areas experienced an abnormally dry summer while many areas recorded unusually cold temperatures in September and October with an early start to winter.

Nine DCPs were installed during the year and an additional 11 units ordered. The six water level encoders purchased by Saskatchewan Water Corporation were installed at sites with provincial DCPs. There were 21 active DCPs in Saskatchewan at the end of the fiscal year.

Hydrometric data computations were completed for publication as scheduled.

One new streamflow station was constructed during the year and maintenance was carried out at 59 sites. Station upgrading occurred at an additional 8 stations. Construction expenditures during 1984-85 were $68 290 (federal) and $41 117 (provincial).

The federal share of 1984-85 program costs was $712 676; the provincial share was $417 442. A provincial deficit carryover of $2 006 from 1983-84 and a 1984-85 payment of $418 700 results in a provincial deficit of $748 for 1984-85 operations. The Schedule D costs for the 1985-86 fiscal year are estimated at $471 000, which includes $43 000 for work to be done for Saskatchewan Power Corporation (SPC) and paid for by SPC through the Saskatchewan Water Corporation.

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1.0 INTRODUCTION

This is the tenth annual report summarizing the activities of the Canada/Saskatchewan Co-ordinating Committee established by the Memorandum of Agreement for Water Quantity Surveys in 1975. The Agreement, along with Schedules A, B, C and D which detail operational, administrative and cost-sharing arrangements, is included as Appendix 3. The report contains brief summaries of the two Co-ordinating Committee meetings convened during the fiscal year ending March 31, 1985 as well as a summary of surface water conditions, hydrometric operations, construction activities and hydrometric network changes which occurred during the year.

Details of the cost-sharing arrangements for 1984-85 are provided in the report. The federal share of 1984-85 program costs was $712 676; the provincial share was $417 442. A provincial deficit carryover of $2006 from 1983-84 and a 1984-85 payment of $418 700 results in a provincial deficit of $748 for 1984-85 operations. The costs for the 1985-86 fiscal year are estimated at $471 000 in Schedule D, which includes $43 000 for work to be done for Saskatchewan Power Corporation (SPC).

2.0 SUMMARY OF ACTIVITIES

2.1 CANADA/SASKATCHEWAN CO-ORDINATING COMMITTEE MEETINGS

The Canada/Saskatchewan Co-ordinating Committee met twice during the report year, on September 18, 1984 and January 16, 1985. Both routine and specific issues of mutual interest were discussed at these meetings. The highlights are summarized in the following sections.

2.1.1 Co-ordinators' Meeting - September 18, 1984

The meeting was attended by Mr. D.R. Richards, the member for Saskatchewan, Mr. J.G. Way, the member for Canada, Mr. B.N. Johnson, Water Resources Branch (WRB) and Mr. R. Herrington, WRB.

It was noted at this time that Mr. Johnson would be replacing Mr. Way as Acting Regional Chief, WRB, effective January 2, 1985 and would be designated the member for Canada at that time. Mr. R.A. Halliday would assume the duties of Regional Director, Inland Waters Directorate, Western and Northern Region on October 1, 1984 and will become the Administrator for Canada. Mr. S.R. Blackwell, Administrator for Saskatchewan, will retire September 28, 1984 and will be replaced by Mr. D.L. MacLeod.

The financial outlook for 1984-85 was discussed at this meeting. It was stated that although provincial funding of the Agreement had been approved until March 31, 1985, a new budget would be in place by January 1, 1985 as the Saskatchewan Water Corporation (Sask Water) reverted to a calendar year budgetary cycle. No difficulties were foreseen in Schedule D funding for the remainder of the fiscal year and in completing the program as anticipated.

Several items related to telemetry projects were discussed. Saskatchewan Power Corporation (SPC) had expressed an interest in constructing a station on the Reindeer River at Devil Rapids complete with Data Collection Platform (DCP). Additional DCP sites would also be requested by SPC. Four DCPs were ordered by WRB for deployment in 1985-86.

Network planning was discussed at this meeting. This included such items as problem stations, progress of construction, hydrometric station profiles and changes to Schedule A for 1985-86. It was stated that WRB would be undertaking a network review in support of the Federal Water Inquiry during the year with an anticipated completion date of August, 1985.

The proposed cost-sharing formula for the WRB minicomputer system was discussed and an example calculation provided. Comments were solicited from Sask Water at this time.

A copy of the Water Quantity Surveys Compendium Report was distributed to Sask Water at this time. Comments were solicited prior to the proposed February, 1985 National Co-ordinating Committee meeting.

Other items discussed at this meeting included the Lake Diefenbaker and South Saskatchewan River Sediment Survey Program and progress of data computations.

2.1.2 Co-ordinators' Meeting - January 16, 1985

The meeting was attended by Mr. D.R. Richards, the member for Saskatchewan, Mr. B.N. Johnson, the member for Canada, and Mr. R. Herrington, WRB.

It was noted that federal restraint initiatives were adversely affecting WRB staffing as five positions within the Branch were vacant. The recent formation of Sask Water had also created some difficulties due to regionalization of operations.

The financial outlook for 1984-85 was discussed. The 1985 budget of Sask Water Corporation remained to be finalized but it was expected that Schedule D funds would be adequate for the balance of the fiscal year.

Proposed network changes as a result of the hydrology study prepared by Sask Water for the Frenchman River basin were discussed. It was suggested that two former stations could be re-established for provincial water management purposes and the period of operation of an existing station could be extended.

Various items related to the hydrometric network were discussed. These included: SPC funding arrangements for the proposed Reindeer River at Devil Rapids station; the status of four proposed urban runoff stations in and adjacent to Regina; the 1985-86 Prairie Provinces Water Board (PPWB) list of monitoring stations; and, changes to Schedule A for 1985-86.

Other items discussed were: the status of hydrometric data computations; the 1985-86 draft construction plan; national standards and the "contributed data" policy; network evaluation; WRB minicomputer cost-sharing formula; South Saskatchewan River degradation survey; and, the Environment Canada proposal for a satellite Direct Readout Ground Station.

2.2 OPERATIONAL CONSIDERATIONS

2.2.1 Surface Water Conditions

Spring runoff in 1984 was low throughout much of Saskatchewan due to a generally thin snow cover and unseasonably mild temperatures from January to the end of March. Two major storms swept through the province in April: on April 11, heavy precipitation fell in eastern Saskatchewan while a blizzard on April 27-28 swept southern Saskatchewan closing highways and downing transmission lines. Below normal precipitation was experienced across the southern portion of the province in May but abundant precipitation fell in central and northern areas during the month. Dust storms were reported in southern Saskatchewan at the end of the month. Severe weather with abundant rainfall and a series of tornadoes occurred sporadically across southern Saskatchewan in June but abnormally dry conditions prevailed in July. In many areas of southern Saskatchewan precipiation amounts for the period April 1 until July 30 were less than 50% of normal. The dry conditions continued into August and helped to promote a serious grasshopper infestation in the south and grass fires in southwestern Saskatchewan.

Cold weather moved into Saskatchewan during the third week of September with widespread, killing frosts. By the middle of October, a series of storms established new October snowfall and low temperature records at many locations in Saskatchewan.

Temperatures were generally below normal throughout most of Saskatchewan in November and December with the snowfall for these two months being above normal in the southeast and north, below normal in the southwest and normal in other areas.

Temperatures in January fluctuated wildly from well below normal to well above normal while February tended to be very cold. March temperatures were generally above normal over most of the province and were sufficient to initiate runoff in most southern locations. Spring runoff volumes were light in most of these areas but were expected to be normal to above normal in other areas.

2.2.2 Hydrometric Operations

Data computations and hydrometric field work were completed as scheduled during the year by a fully-staffed hydrometric section. Vacancies were experienced during this time in various support and administrative positions. These included a construction foreman, accounts clerk, data processing operator, project engineer and a construction engineer. Due largely to federal restraint initiatives, two engineering and one technical position were still vacant at the end of the fiscal year. The Acting Regional Chief appointment continued.

The number of stations equipped with satellite telemetry systems (Data Collection Platforms) increased during the year to 21 stations. Eight DCPs and peripheral equipment were installed in June 1984 at northern stations and one was installed in southwest Saskatchewan to assist in monitoring flows for international and interprovincial apportionment. There are now four active platforms in this area and an additional unit is planned for 1985-86. Seven platforms and peripheral equipment were received in support of the national remote program but were not installed due to their late arrival. Similarly, four units were received at the end of the fiscal year for installation at stations where either real-time data or an indication of runoff is required. These 11 units will be installed in 1985. Nine Memomark III water level encoders and one programming test set were also received.

The DCPs purchased by WRB on behalf of the United States National Weather Service (NWS) in 1983 and installed in the lower Souris River basin at Moose Mountain Creek near Oxbow and Souris River near Roche Percee continued to provide real-time information about runoff in the upper Souris to Sask Water as well as to the NWS.

Significant cost savings have been realized by the DCP program to date. The units installed in the southwest have provided real-time data to WRB, Sask Water and others and have reduced the requirement for field staff from Regina to visit these stations. Field travel time and aircraft charter costs were reduced in December, 1984 for the remote station coverage as the DCPs at 6 locations indicated that all equipment was operating satisfactorily and no unusual flow

conditions were apparent and consequently, these stations were not visited. It is anticipated that future installation of telemetry systems at other locations will produce similar savings.

The 6 water level encoders purchased by WRB in 1983 on behalf of Sask Water were installed during the fiscal year. Three reports summarizing the status of the telemetry program were prepared and distributed during the year.

A major review of the hydrometric and sediment network in IWD, Western and Northern Region was initiated during the year. This is scheduled to be completed in August, 1985 and will identify, in particular, the federal interest in specific hydrometric stations in 1985 and by 1990.

As an ongoing commitment to hydrometric network review, hydrometric station profiles have been prepared for approximately half of the stations in Saskatchewan. These profiles provide summary data outlining the gauge history, current status, monitoring purpose and other relevant information and are designed to be updated annually. The remaining profiles will be completed in 1985-86.

A bucket survey was undertaken by personnel from Atmospheric Environment Service (AES) on the July 30, 1984 storm centred on Creelman in southern Saskatchewan. This survey was satisfactorily conducted by telephone and a summary report prepared by AES. Prompt hydrometric field coverage was obtained upon notification by AES officials.

An inspection by WRB of 17 manual gauging stations operated by Sask Water was undertaken during the year. This completed the review of the stations operated by the province which was initiated in the previous fiscal year. A report was prepared outlining recommendations for improvements to the stations.

2.2.3 Construction Activities

The construction program during the fiscal year was affected by federal restraint initiatives and to some degree by the delay in signing Schedule D. Both the construction engineer and construction foreman positions were vacant during part of the year and summer students were employed for a total duration of 7 man-months. The late signing of Schedule D meant that construction activities in the early part of the season concentrated on federal stations. As a result of these factors and changing priorities due to additions to the program, 75% of the construction program was completed as planned and available provincial construction funding was not fully utilized.

Sixty-eight construction projects were undertaken during the fiscal year. The majority of these projects involved maintenance and upgrading activities designed to improve record quality and to reduce the associated effort and cost. Maintenance was carried out at 59 stations while station upgrading occurred at an additional 8 sites. One new seasonal provincial streamflow was constructed as well.

The construction program included the installation of the following:

Shelters

a) 1 - new wired shelter

b) 1 - new unwired shelter

c) 2 - wired in place

d) 3 - relocated

Stilling Wells

a) 1 - new wood stave stilling well

b) 1 - 2.5 m wood stave well extension in place

c) 3 - wood stave wells were relocated

Artificial Controls

a) 2 - steel sheet piling controls repaired

b) 4 - rock controls repaired

Cableways

a) 1 - new

b) 1 - removed

c) 7 - repaired

Electrical service was installed at three sites during the construction season, bringing the total number of sites with power to 168. This program will continue in future years where feasible as heating stilling wells in the spring significantly improves record recovery.

A safety inspection program is ongoing in the Saskatchewan network. A cableway field inspection report form was distributed to each hydrometric technician as guidance in evaluating safety and mechanical malfunctions. These report forms will be used to determine upgrading and maintenance priorities for the upcoming year.

A special project established in 1982 to test the stability of a variety of bench marks continued. It appears that the screw-type bench mark may be most suitable in boggy soil. It is easy to install but is limited to vehicle accessibility and boulder-free soil conditions. Eighty percent of the bench marks installed in 1984-85 were of this type.

Installation of electric tape gauges, predominantly in conjunction with deep wells, continued during the year. These instruments have a low initial cost, are safer than climbing a stilling well ladder and are probably more accurate than using a staff gauge. Further installations are planned.

A lightweight two-man cable car was built and tested. The design enables easy and quick installation or removal, transportation in a station wagon and storage in an instrument shelter. Construction of three lightweight cable cars are scheduled for the 1985-86 construction program. They will primarily be used at constantly vandalized sites and will be removed after each measurement.

Construction expenditures during 1984-85 were $68 290 (federal) and $41 117 (provincial). Details of the construction program are documented in the 1984-85 Saskatchewan Construction, Upgrading and Maintenance Annual Report.

2.3 NETWORK DEVELOPMENT

2.3.1 Network changes for 1984-85

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. The Schedule also shows the type of data collected (flow, water level, sediment) and the period of operation (seasonal or annual). Decisions regarding changes to the Schedule are made by the Co-ordinating Committee with reference to the national designation guidelines for station classification. Network changes from the preceding year (1983-84) are shown in Figure 1 and summarized as follows:

Stations Deleted from Network

	Station Name	Station Number	Designation
1.	Saskatchewan River near Manitoba Boundary	05KH008	F2
2.	Middle Creek Reservoir Main Outlet	11AB113	F3
3.	Porter Lake at Crew Cabin	06BC002	FP3

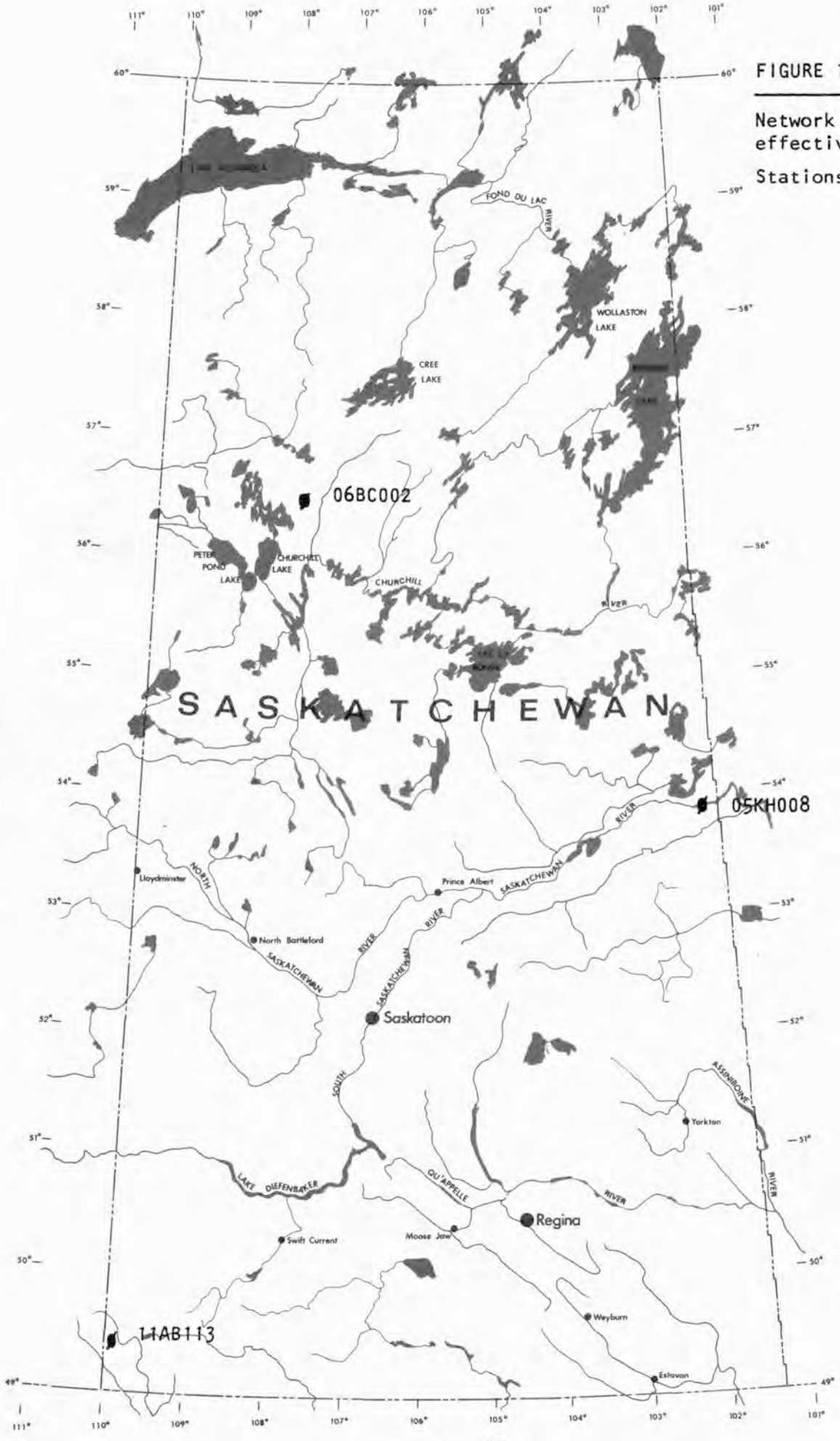

FIGURE 1

Network changes effective April 1, 1984

Stations deleted - ▮

Station Operation Changes

	Station Name	Station Number	From	To
1.	Wascana Creek below Kronau Marsh (FP2)	05JF012	SWC	WRB

Station Name/Number Changes

	Station Name	Station Number	Change to
1.	Montreal Lake near Molanosa (FP2)	06CA005	Montreal Lake near Weyakwin 06CA006
2.	Wascana Lake at Marina (FP2)	05JF002	05JF015
3.	Sturgeon-Weir River at Outlet of Amisk Lake (FP3)	05KB002	05KG002
4.	Wakaw Lake near Wakaw	05HH004	05KA012

2.3.2 Network Development in Saskatchewan

The historical development of the Saskatchewan hydrometric network and the annual increase in the streamflow data base are shown in Figures 2 and 3. These figures illustrate the rapid increase in the acquisition of hydrometric data since the 1950s and the relative stability of the network during the last few years.

Although the number of hydrometric stations operated within Saskatchewan has been relatively constant recently, network planning is not dormant. Changes to the network from the inception of the cost-sharing agreement are well illustrated in the following:

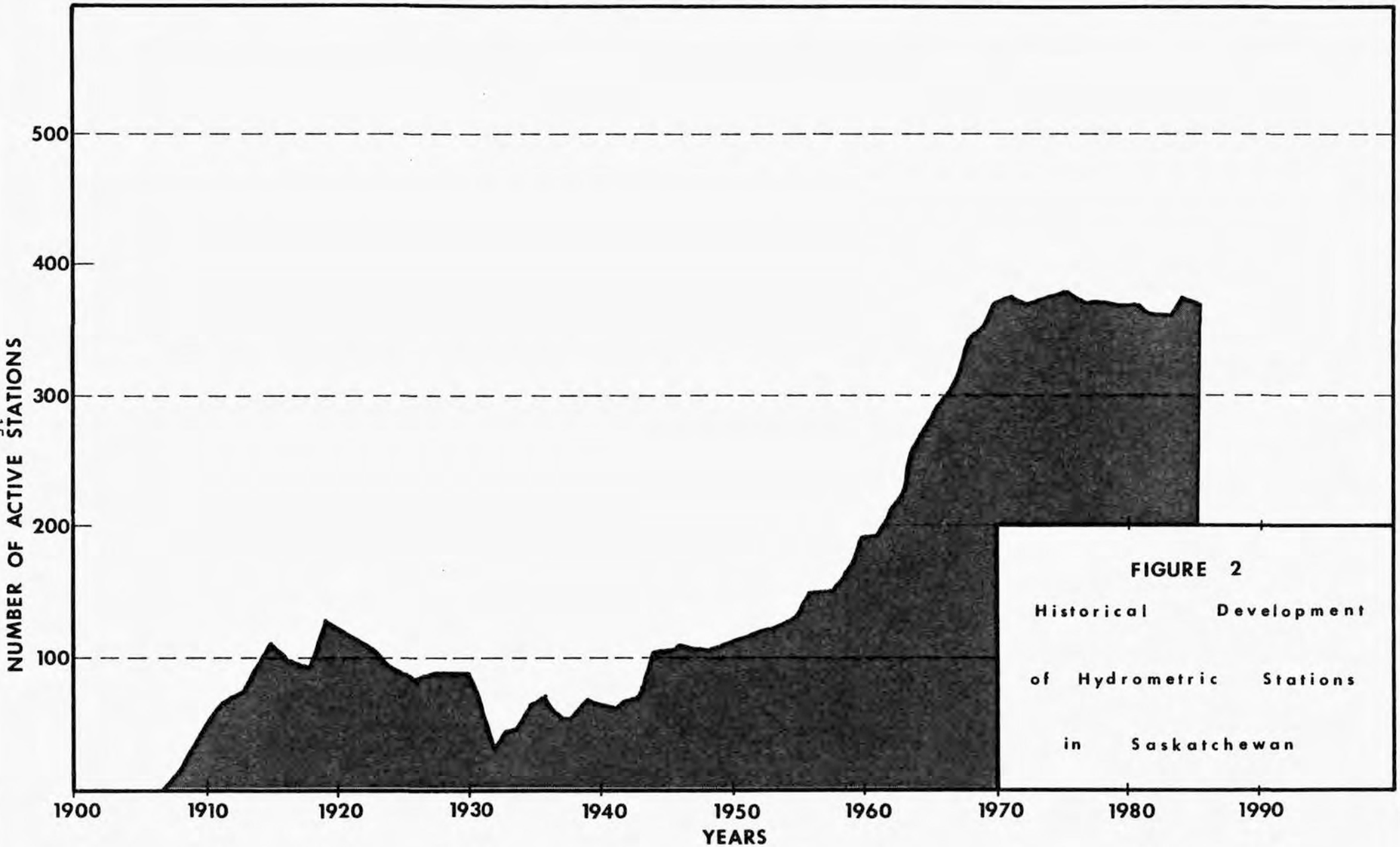

FIGURE 2

Historical Development of Hydrometric Stations in Saskatchewan

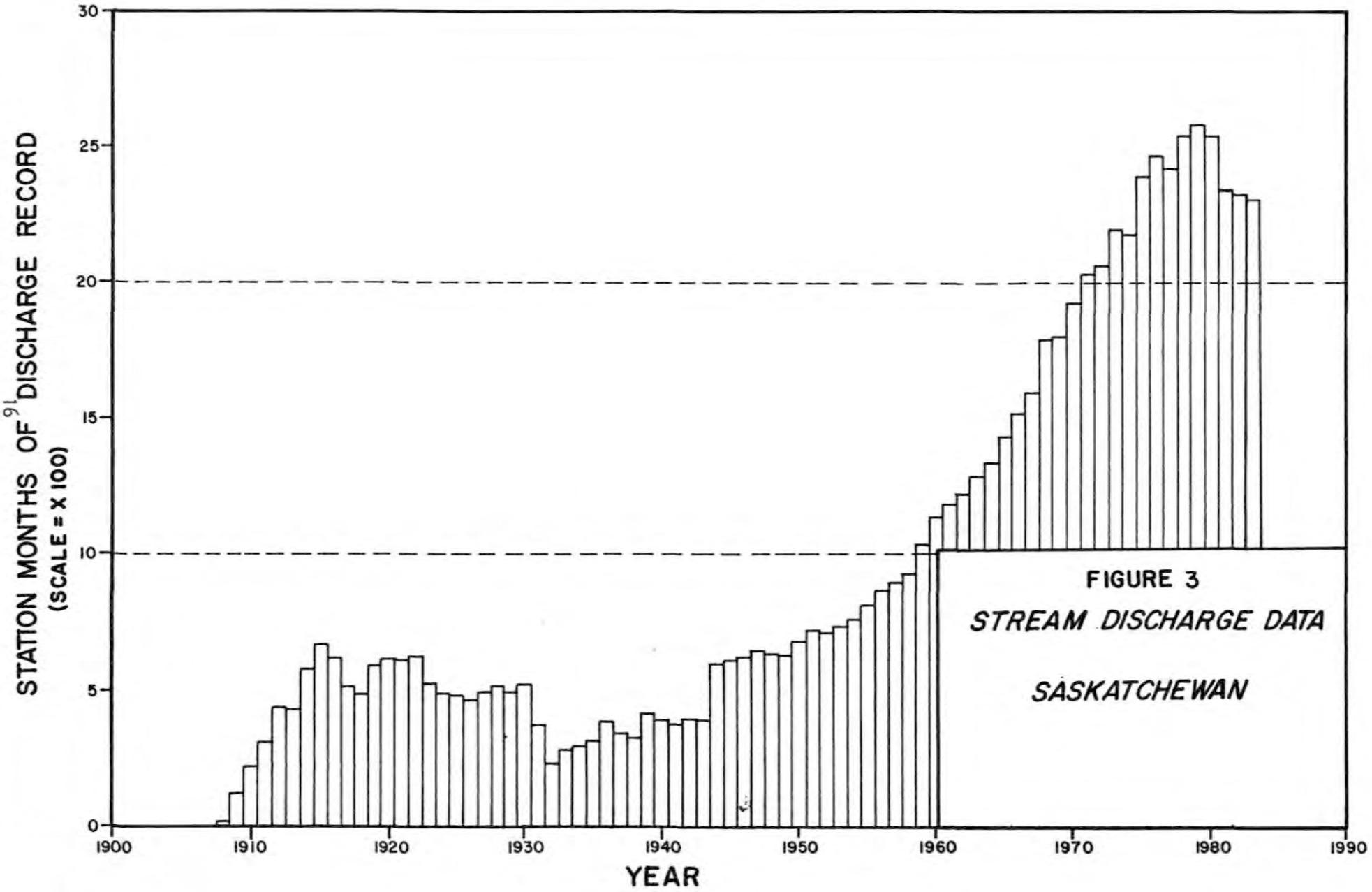

FIGURE 3

STREAM DISCHARGE DATA

SASKATCHEWAN

Year	Stations Added*	Stations Deleted*
1975-76	52	6
1976-77	11	4
1977-78	6	8
1978-79	10	3
1979-80	0	1
1980-81	3	11
1981-82	2	2
1982-83	1	3
1983-84	22	1
1984-85	0	3
Total	107	42

* Includes all stations from Schedule A other than contributed data.

The stations added to Schedule A over this period represent approximately 29% of the hydrometric network operated by WRB and Sask Water as of April 1, 1984, and the stations deleted from the Schedule represent 11% of the network.

In addition to the 149 stations which have been added to or deleted from the network, many stations designation changes have also occurred during the period. In general, there has been a significant decrease in the number of federal stations and a large increase in provincial stations. The federal stations represented 52% of the total network in 1975-76 and 36% in 1984-85 while the provincial category represented 16% in 1975-76 and 30% in 1984-85. Figure 4 illustrates the changing nature of designated responsibility of the hydrometric network operated by WRB since the inception of the cost-sharing agreement.

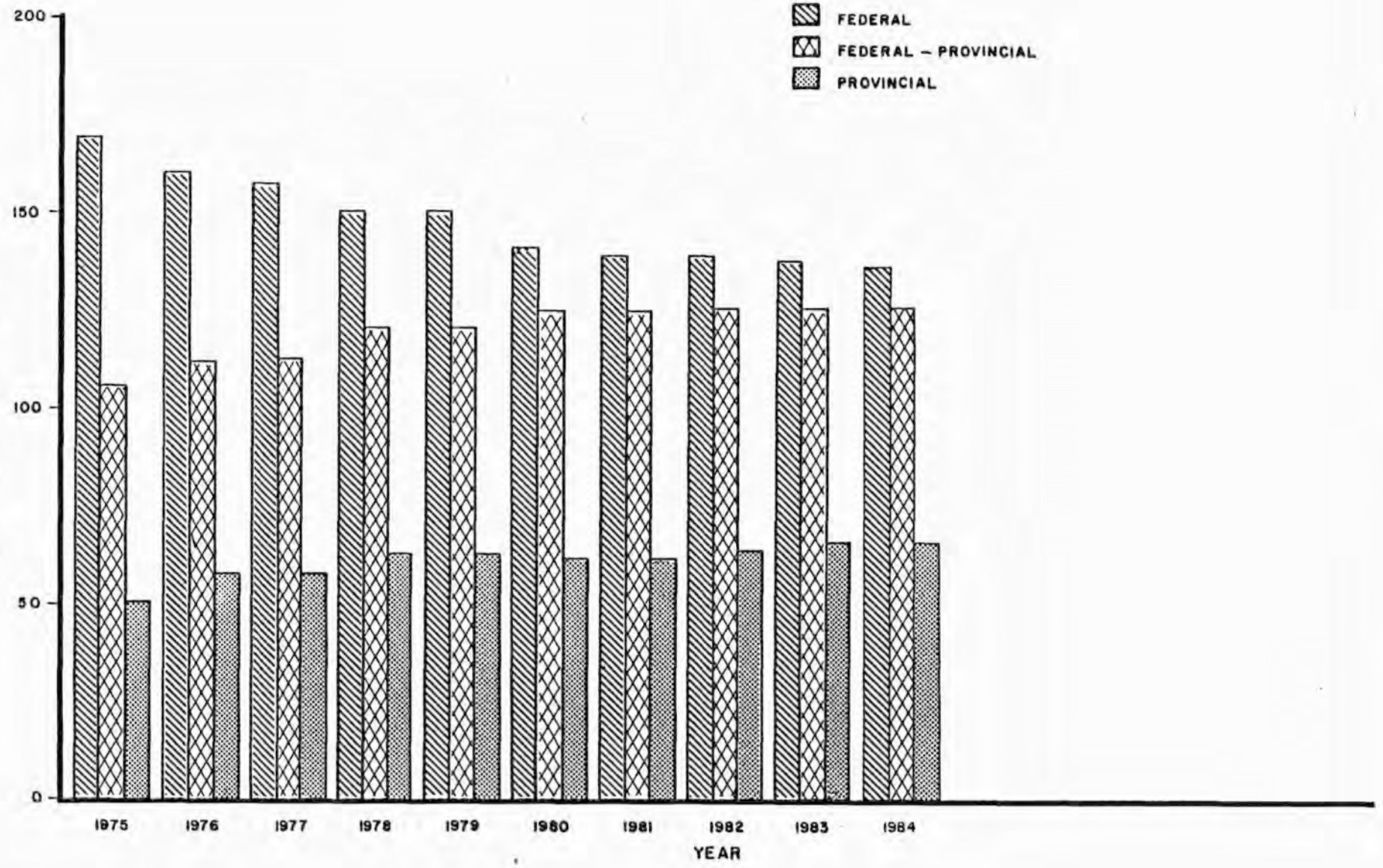

FIGURE 4
DESIGNATED RESPONSIBILITY FOR STATIONS
IN SASKATCHEWAN NETWORK
(Graph only includes those stations operated by Water Survey of Canada)

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, 1984. Provincial stations operated by Sask Water and published by WRB are not considered as these stations are not included for costing purposes (Memorandum of Agreement, Article V (b)).

Total operational costs of hydrometric stations vary significantly with the period of operation (seasonal or annual) and with the type of data produced (water level only or water level and flow). Weighting factors to account for these differences and to convert stations to station units have been assigned as follows:

8 month water level station (8L) = 0.25
12 month water level station (12L) = 0.40

8 month flow station (8Q) = 0.75
12 month flow station (12Q) = 1.00

These factors are used by the four WRB offices within Inland Waters Directorate, Western & Northern Region and apply to normal, remote and international stations.

3.2 COST OF OPERATION: 1984-85

Station unit costs and total network costs for salary, operations and maintenance, and capital for 1984-85 are derived from the detailed program costs incorporated in Appendix 1 and are summarized in Table 2.

TABLE 1

SASKATCHEWAN WATER QUANTITY PROGRAM
STATION CLASSIFICATION - TYPE - UNITS SUMMARY
1984-1985

CLASSIFICATION	TYPE*	NO. of STATIONS**	CONVERSION	UNITS
Federal				
Remote Access	8L	0	0.25	0.00
	12L	3	0.40	1.20
	8Q	0	0.75	0.00
	12Q	12	1.00	12.00
		15		13.20
Normal Access	8L	8	0.25	2.00
	12L	10	0.40	4.00
	8Q	17	0.75	12.75
	12Q	23	1.00	23.00
		58		41.75
International	8L	15	0.25	3.75
	12L	4	0.40	1.60
	8Q	36	0.75	27.00
	12Q	8	1.00	8.00
		63		40.35
Total		136		95.30
Federal-Provincial				
Remote Access	8L	0	0.25	0.00
	12L	2	0.40	0.80
	8Q	0	0.75	0.00
	12Q	15	1.00	15.00
		17		15.80
Normal Access	8L	2	0.25	0.50
	12L	5	0.40	2.00
	8Q	87	0.75	65.25
	12Q	15	1.00	15.00
		109		82.75
Total		126		98.55
Provincial				
Normal Access	8L	11	0.25	2.75
	12L	1	0.40	0.40
	8Q	53	0.75	39.75
	12Q	1	1.00	1.00
Total		66		43.90
Grand Total		328		237.75

* 8L - 8 month water level station
12L - 12 month water level station
8Q - 8 month flow station
12Q - 12 month flow station

** From Schedule A

TABLE 2

SASKATCHEWAN WATER QUANTITY PROGRAM
COST SUMMARY 1984-1985

Unit Cost Summary

STATION CLASSIFICATION	UNIT	SALARY $	OPERATIONS $	CAPITAL $	TOTAL $
1. Normal Access					
- Non-International	1.0	2426	1032	283	3741
- International	1.0	3397	793	283	4473
2. Remote Access	1.0	2669	4292	283	7244

Total Cost Summary

STATION CLASSIFICATION	NO. OF STATIONS	UNITS	SALARY $	OPERATIONS $	CAPITAL $	TOTAL $
Federal						
Remote	15	13.20	35 230	56 655	3 739	95 624
Normal						
- Non-International	58	41.75	101 298	43 104	11 825	156 227
- International	63	40.35	137 062	31 993	11 428	180 483
						432 334
Federal-Provincial						
Remote	17	15.80	42 168	67 814	4 475	114 457
Normal	109	82.75	200 776	85 434	23 437	309 647
						424 104
Provincial						
Normal	66	43.90	106 515	45 324	12 434	164 273
Total	328	237.75	623 049	330 324	67 338	1 020 711

Overall salary costs increased 5.7% over the previous year while the total shareable program operations and maintenance costs decreased 3.0% during the fiscal year. This reflects significant decreases in travel expenses, purchased repairs and purchased materials. The only category to increase significantly was rentals, which is largely attributed to completion of the two-year northern propane re-supply trip during the year. It should also be noted that the cost of current meter maintenance was not included as a shareable item this year but will be in future years.

The total operating costs for non-international, normal access stations decreased by about $5000 (2.6%) in 1984-85 compared to the previous fiscal year. A slight increase in station units (0.75) was also experienced. The net result was that unit operational costs for these stations decreased by 3.1%.

The total operating costs for international, normal access stations decreased by approximately $6000 (14.9%) and the network decreased slightly by 0.75 station units. The net effect was that the unit operating costs were reduced by 13.2%. This is attributed primarily to lower travel expenses as a result of the installation of data collection platforms at key international stations in 1984.

In contrast, total operating costs for remote access stations were virtually identical to those reported for the previous fiscal year. However, the network decrease in this category by 1.4 station units resulted in a unit operational cost which was 4.8% higher in 1984-85 than in the previous year.

The overall capital depreciation costs increased 4.1% this fiscal year. This reflects an increase in vehicle and field equipment depreciation as old equipment and instrumentation are written off and replaced with new, more costly items. Detailed program costs (salaries, operations and capital) are shown in Appendix 1, Tables 5 to 10.

Table 3 summarizes the Saskatchewan water quantity surveys program shared costs for 1984-85. The total federal share was $712 676 while the total provincial share was $417 442. The provincial deficit from 1983-84 of $2006 and the provincial payment for 1984-85 of $418 700 results in a provincial deficit for 1984-85 operations of $748.

Table 4 shows the change (increase) in station unit costs since the implementation of the cost sharing agreement in 1975. Although overall station unit costs have more than doubled since 1975, the average increase in station unit costs in fiscal year 1984-85 is the lowest since 1975.

3.3 COST ESTIMATES; 1985-86

Changes affecting the 1985-86 Schedule A and the computations of the 1985-86 Schedule D estimate of $471 000, including work to be done for SPC ($43 000), are contained in Appendix 5.

TABLE 3

SASKATCHEWAN WATER QUANTITY PROGRAM
SHARED COST SUMMARY 1984-1985
(From Table 2 & Construction Report)

FEDERAL SHARE = $432 334 + $\frac{\$424\ 104}{2}$	=	$644 386
FEDERAL CONSTRUCTION SHARE	=	$ 68 290
TOTAL FEDERAL SHARE	-	$712 676
PROVINCIAL SHARE = $\frac{\$424\ 104}{2}$ + $164 273	=	$376 325
PROVINCIAL CONSTRUCTION SHARE	=	$ 41 117
TOTAL PROVINCIAL SHARE (1984-85)	=	$417 442
PROVINCIAL DEFICIT (from 1983-84)	=	$ 2 006
NET PROVINCIAL SHARE	=	$419 448
PROVINCIAL PAYMENT 1984-85	=	($418 700)
PROVINCIAL DEFICIT FOR 1984-85	=	$ 748

TABLE 4

SASKATCHEWAN WATER QUANTITY PROGRAM
HISTORICAL SUMMARY OF STATION UNIT COSTS

	TYPE OF STATION					
FISCAL YEAR	NORMAL	CHANGE	INTERNATIONAL	CHANGE	REMOTE	CHANGE
1975-76	$1 583	-	$1 810	-	$3 643	-
1976-77	$1 721	8.7%	$1 971	8.9%	$3 949	8.4%
1977-78	$1 928	12.0%	$2 220	12.6%	$4 213	6.7%
1978-79	$2 106	9.2%	$2 434	9.6%	$4 501	6.8%
1979-80	$2 200	4.5%	$2 791	14.7%	$4 631	2.9%
1980-81	$2 415	9.8%	$3 055	9.5%	$5 894	27.3%
1981-82	$3 067	27.0%	$3 852	26.1%	$5 993	1.6%
1982-83	$3 297	7.5%	$4 170	8.3%	$7 003	1.7%
1983-84	$3 615	9.6%	$4 375	4.9%	$6 872	-1.9%
1984-85	$3 741	3.5%	$4 473	2.2%	$7 244	5.4%
1975-85	-	136.3%	-	147.1%	-	98.8%

Average percent increase for all stations since 1975-76 = 127.4%

* % = 100 x (year 2 - year 1)/year 1

** Method of calculation of station units costs was modified this year and in subsequent years so values may not be directly comparable.

APPENDIX 1

DETAILED PROGRAM COSTS
1984-85

4.0 DETAILED PROGRAM COSTS

4.1 INTRODUCTION

Appendix 1 contains Tables 5 to 10 which provide details of expenditures under the Memorandum of Agreement. Expenditures were extracted from various departmental financial systems such as payroll, materiel and fleet management. Operations expenditures were obtained from Supply and Services Canada detailed transaction listings. A record of individual expenditures is further supported by various purchase/pay documents which, under the federal records management system, are retained for a period of five years.

4.2 SALARY COSTS

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 calculation of station unit salary costs is shown in Table 5. A factor of 1.15 and 1.25 was applied to the salary costs of remote and international gauging stations, respectively, for the first four years of the Agreement (1975-1979) to account for the greater effort needed to operate these types of stations. These factors were revised to 1.10 and 1.40 for remote and international stations, respectively, based on an analysis of 1978-79 salary costs and have been used to date. It is proposed to re-evaluate these factors in 1985 based on 1984-85 salary costs.

4.3 OPERATIONAL COSTS

The derivation of station unit operating costs is shown in Table 6. A record of each expenditure is shown in Table 7 while vehicle operating costs are listed in Table 8. A breakdown of 1984-85 operating costs indicates that the cost of operating a remote hydrometric station in Saskatchewan was 4.16 times greater than a normal access station. This reflects high air charter costs and the generally greater cost of travelling in northern areas.

4.4 CAPITAL DEPRECIATION COSTS

Capital depreciation is charged for hydrometric survey vehicles and equipment as shown in Tables 9 and 10. Consumables such as small tools and clothing are charged to the program at the time of purchase as are certain other items such as metering boats that are part of the inventory of a specific station. All stage recording instruments are excluded.

The rate of depreciation for survey equipment is 10 percent annually. The actual calculation of inventory value is based on the mean of the value at the beginning and end of the fiscal year to reflect purchasing activity throughout the year.

The depreciation data for hydrometric vehicles is provided by the Fleet Management Information System which assumes a 60 month service period for station wagons and a 72 month service period for multi-purpose vehicles or trucks.

TABLE 5
SASKATCHEWAN WATER QUANTITY PROGRAM
SALARY COST 1984-1985

	Position No.	Position Title	Salary
1.	840-1265 (x0.85)	Hydrometric Technician	$ 25 493
2.	840-1279	Hydrometric Supervisor	$ 32 413
3.	840-1285	Hydrometric Supervisor	$ 32 413
4.	840-1370	Hydrometric Supervisor	$ 32 278
5.	840-1401	Hydrometric Technician	$ 27 493
6.	840-1409	Hydrometric Technician	$ 29 992
7.	840-1413	Hydrometric Technician	$ 29 992
8.	840-1431 (x0.10)	Sediment Lab Supervisor	$ 2 999
9.	840-1460	Hydrometric Supervisor	$ 32 413
10.	840-1505	Hydrometric Technician	$ 29 992
11.	840-1506	Hydrometric Technician	$ 29 992
12.	840-5619 (x0.10)	Data Control Supervisor	$ 3 693
13.	840-8004	Hydrometric Technician	$ 29 992
14.	840-8012	Hydrometric Technician	$ 29 992
15.	840-8013 (x0.05)	Construction Supervisor	$ 1 621
16.	840-8073	Hydrometric Technician	$ 27 781
17.	840-8119	Hydrometric Technician	$ 29 992
18.	840-8189 (x0.05)	Boundary Waters Engineer	$ 1 845
19.	840-8907	Hydrometric Technician	$ 29 992
20.	840-8913	Hydrometric Technician	$ 29 992
21.	840-8914	Hydrometric Technician	$ 29 992
22.	840-8915 (x0.90)	Hydrometric Technician	$ 26 993
23.	840-8916	Hydrometric Technician	$ 29 992
24.	840-8951	Hydrometric Supervisor	$ 32 413
25.	840-8952 (x0.15)	Computations Technician	$ 3 729
26.	COSEP (x0.15)	Hydrometric Assistant	$ 1 640
27.	COSEP (x0.15)	Hydrometric Assistant	$ 1 391
28.	Overtime	All Positions	$ 6 529
	TOTAL	20.5 P-Y's	$623 049

CALCULATION OF STATION UNIT SALARY COST

Station Units: Remote	29.00
Normal	
- Non-International	168.40
- International	40.35
TOTAL	237.75
Salary-weighted Station Units	
- Remote x 1.10	31.90
- Normal, Non-International	168.40
- International x 1.40	56.49
TOTAL	256.79

$$\text{Unit Salary Cost} = \frac{\text{Total Salary Cost}}{\text{Salary-weighted Station Units}} = \frac{623\ 049}{256.79} = 2\ 426$$

Unit Salary Cost Normal =	$2 426
Unit Salary Cost Remote = $2 426 x 1.10 =	$2 669
Unit Salary Cost International = $2 426 x 1.40 =	$3 397

TABLE 6

SASKATCHEWAN WATER QUANTITY NETWORK
OPERATIONS COST SUMMARY 1984-1985

	COST CODE* 00005	00006	00007	TOTAL
Travel	40 437	4 499	7 554	52 490
Transportation and Postage	402	324	35	761
Telephones	5 424	175	2 010	7 609
Advertising and Printing Services	378	-	63	441
Professional and Special Services	1 788	-	2 000	3 788
Temporary Help Services	611	-	-	611
Other Services	1 773	6 021	110	7 904
Rentals	2 114	97 318	429	99 861
Purchased Repairs (other than vehicles)	3 858	600	92	4 550
Public Utility Services	32 150	-	664	32 814
Purchased Materials (other than capital)	5 972	7 293	847	14 112
Parts and Consumable Tools (other than vehicles)	13 156	964	1 361	15 481
Other Expenditures	5	-	-	5
Total	108 068	117 194	15 165	240 427
Minicomputer Costs**	38 889	6 573	9 311	54 773
Vehicle Operating Costs (Table 8)	26 905	702	7 517	35 124
Total Operating Costs	173 862	124 469	31 993	330 324
Station Units	168.40	29.00	40.35	237.75
Unit Operations Cost	1 032	4 292	793	1 389

* 00005 - conventional
00006 - remote
00007 - international

** See Appendix 2 for details

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
TRAVEL																	
Travel Expenses	44	0701	44														
- Business Travel Expenses	1 315	0704	1 315														
- Itinerant Work Travel Expenses	64 263	0711	3 989			39 729	4 379	7 554	617	7 510				427	58		
- Car Rentals	302	0713					120		182								
- Itinerant Work Travel	5 928	0714	5 013			415								500			
- Travel USA - Itinerant work	1 509	0731							1 290	219							
- Travel Training	3 922	0744	3 922														
- Travel Non Public Service	2 120	0750				293				1 827							
- Travel Costs	1 193	0760	1 193														
- Central Removal Service DSS	2 656	0766	2 656														
TRANSPORTATION & POSTAGE																	
- Air	1 269	0801	206	8		251					187			617			
- Rail	163	0802		163													
- Truck	2 613	0804	1 466	737		86	324										
- Bus	250	0805	172			9		10							59		
- Parcel Post	66	0851	48			18											
- Other Postal	220	0852	194			1		25									
- Courier	467	0853	430			37											
TELEPHONES																	
- Telephones (GTA)	7 335	0901	7 322			13											
- Install & Repair	172	0902					53				119						
- Long Distance	4 903	0903	552			3 373	5	537		276	22	138					
- Service Charges (Rental)	19 198	0904	6 824			2 038	117	1 473			7 608			1 138			
- Message Data Communications	4 927	0906	1 727								3 167			33			
- Message Data Equipment	60	0907									60						
- Telex	37	0909	37														

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
ADVERTISING & PRINTING																	
- Advertising	95	1001	32					63									
- Advertising Printing	6	1010	6														
- Other Printing Services DSS	1 026	1013	327	22		378				114						185	
- Other	384	1022	226	158													
PROFESSIONAL & SPECIAL SERVICE																	
- Gauge Attendants	3 788	1171				1 788		2 000									
TRAINING																	
- Tuition University & College	229	1221	229														
- Other	2 595	1222	2 595														
TEMPORARY HELP SERVICE																	
- Contract Clerical	23 712	1302	23 712														
- Other Temporary Help	611	1303				611											
OTHER SERVICES																	
- Laundry Dry Cleaning	355	1501	69	49		210				27							
- EDP Purchase Software	16 550	1510		4	2						13 600	101	2 734			109	
- Contract Admin DSS	15 491	1525	6 823	125		943	5 406		163	389	579			1 063			
- Photo Processing	8	1532						8									
- Graphic Service	61	1535	61														
- Other Photo Service	137	1536	19			97	10			11							
- Print Services	907	1545	907														
- Brokerage Fees	4 677	1554				523	605	102						3 447			
- Storage Warehouse	430	1560									430						
- Garbage Collection	278	1566	278														
- Membership Fees	75	1575	75														
- Snow & Ice Removal	1 005	1581	1 005														
- Petty Cash Purchase	31	1589		15						16							
- Word Processing	532	1591	532														

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
- Design Services	5	1592	5														
- Other Services N.E.S.	10	1596	10														
RENTALS																	
- Land	268	1601					268										
- Photo Printing Equipment	1 324	1621	1 324														
- Rental of Office Machines	116	1622	116														
- Machine Equipment	5 715	1625	599			255		20		4 841							
- Motor Vehicle	243	1630				223	20										
- Aircraft	108 209	1635					94 985		3 915	115				9 194			
- Building Rental	87	1640							87								
- Gas Cylinders	4 237	1650				1 636	2 045	409		147							
- Other	512	1651	7	480						25							
- Lease Purchase Other	19	1652	19														
PURCHASED REPAIR																	
- Air Conditioning	216	1711	77								139						
- Measuring	3 854	1718	27			3 249	443	92		8				35			
- Safety	251	1719	92				81				78						
- Fire Fighting	28	1720	28														
- Service Industry	136	1721	113			23											
- Furniture Fixture	111	1722	111														
- Other Equipment	548	1727	235			298	15										
- EDP Equipment	10 022	1735									10 022						
- Office Machine	641	1736	641														
- Other Machinery excl. Furniture	290	1737	290														
- Ships, Boats	105	1740				105											
- Marine Equipment	151	1741				90	61										
- Road Motor Vehicles	5 774	1746	5 756			11					7						
- Miscellaneous Vehicles	119	1747	119														

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
- Accident Repair	112	1748				82				30							
- Oversnow Vehicles	42	1749	42														
BUILDING & STRUCTURES REPAIR																	
- Gauge Station	600	1805								600							
- Warehouse	10 364	1850	10 364														
PUBLIC UTILITY SERVICES																	
- Electric Consumption	32 814	1901				32 150		664									
- Other Public Utilities	1	1907	1														
PURCHASED MATERIALS																	
- Other Sand, Gravel	1 452	2009	162							1 290							
- Propane	1 651	2013	93			229	1 247	82									
- Automotive Gas	35 610	2014	35 553						57								
- Aviation Gas	1 914	2015					1 914										
- Other Petro Products	978	2018	961	3		10	4										
- Wood Fabric Materials	878	2020	193			302				383							
- Paper, paper board	392	2021	392														
- Textile Fabricated Materials	12	2022					12										
- Chemical & Related Products	535	2023	218	3		161	104			45				4			
- Oxygen, Acetylene & Nitrogen	4 259	2027				1 679	2 099	420		61							
- Iron, Steel	5 503	2028	532			573	720			3 678							
- Metal Fabricated Products	5 776	2030	1 514	2		514	75	150		681				56			2 784
- Cement	728	2031	21							707							
- Insulation	101	2035								101							
- Protective Clothing	2 148	2040	222			1 000	481	49		396							
- Footwear	907	2041				529	102	102		174							
- Toiletries	119	2042	73	25						21							
- House Furniture	101	2044	101														
- Stocked Items - DSS	3 602	2048	3 602														

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
- Library Stock	506	2051	479								27						
- Maps, Charts etc.	65	2052	37			28											
- Library Loan Service	3	2053				3											
- Stationery	2 750	2054	2 466			218	22	44									
- Drafting Supplies	476	2055	461	15													
- Photocopy Paper	441	2058	441														
- Data Processing Supplies	1 860	2059	321			97					1 395			47			
- Photographic Goods	76	2060				43	33										
- Med. Pharm. Products	41	2061	41														
- Containers	660	2063	81			159	420										
- Paint	774	2068	233	8		54				479							
- Miscellaneous Products	1 285	2070	638			256	60			318	5			8			
- Hardware	430	2071	143	4		88				195							
- Subscriptions	208	2082	208														
- Petty Cash Purch (Incl E&H Tax)	199	2083	128	21		29				21							
PARTS & CONSUMABLE TOOLS																	
- Heat, Air Conditioning, etc.	21	2111									21						
- Plumbing	1 385	2113				1 086				299							
- Electric Lighting	11 606	2114	534			559	65	57		6 297				243			3 851
- Other Electrical Equipment	1 392	2116	951			35	151			62	11			182			
- General Electronic Equipment	26	2117												26			
- Batteries	2 618	2118	45			1 402	503							668			
- Lab Glassware	528	2119		528													
- Measuring Instruments	12 864	2122	889	98		9 062		1 304						991			520
- Signal System	23	2123	23														
- Safety Equipment	1 588	2124	753			140	173			82	440						
- Service Industry	341	2125	172			169											
- Hand Tools	1 472	2126	955			349				168							

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
- Other Equipment	345	2128	220			125											
- EDP Equipment	3 839	2135				143					462			3 234			
- Other Office Equipment	97	2138	97														
- Ships, Boats	12	2140				12											
- Marine Equipment	109	2141				37	72										
- Motor Vehicles	7 279	2146	7 242			37											
- Tires & Tubes	2 748	2147	2 748														
- Miscellaneous Vehicles	128	2148	128														
- Over Snow Vehicles	14	2149	14														
EQUIPMENT ACQUISITION																	
- Generators	3 547	2315															3 547
- Measuring Device	53 774	2322															53 774
- Safety Saw Alarm	4 775	2330															4 775
- Pumps	504	2331															504
- Service Industry Equipment	1 695	2332															1 695
- Furniture	3 499	2333															3 499
- Furniture - DSS	2 411	2334															2 411
- Outboard Motors	759	2337															759
- Other Equipment	9 741	2347															9 741
- Other EDP Equipment	40 469	2357															40 469
- Other EDP Equipment Over $500	10 500	2358															10 500
- Vehicle	36 159	2371															36 159
- Misc. Vehicle - Other	9 390	2372															9 390
OTHER EXPENDITURES																	
- Damage Claims	262	2510	262														
- Vehicle Registration	227	2528	227														
- Other Misc. Expenditures	25	2527	20			5											

TABLE 7
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1984 - 1985

Line Object Name	Total	LO#	001	003	004	005	006	007	008	010	013	016	017	019	050	179	CAPITAL
Sub-Total	687 451		158 576	2 468	2	108 068	117 194	15 165	6 311	31 613	38 379	239	2 734	21 913	117	294	184 378
Total (shareable) computing costs prorated on basis of station units	54 773					38 889	6 573	9 311									
TOTAL	742 224		158 576	2 468	2	146 957	123 767	24 476	6 311	31 613	38 379	239	2 734	21 913	117	294	184 378

TABLE 8

VEHICLE OPERATING COSTS 1984-1985*

Vehicle Type	Usage vehicle-months	Average Cost/Month	Total Cost Construction 010	Total Cost Hydrometric 005,006,007	Hydrometric Cost Normal 005	Hydrometric Cost Remote 006	Hydrometric Cost Int'l 007
Full Size	49	$136.10	$408.30	$6 260.60	$4 795.62	$125.21	$1 339.77
Multi-purpose	136	$172.55	$2 070.60	$21 396.20	$16 389.50	$427.92	$4 578.78
Light Truck	44	$169.70	-	$7 466.80	$5 719.58	$149.34	$1 597.88
Med. Truck	23	$373.65	$8 593.95	-	-	-	-
TOTAL	252		$11 072.85	$35 123.60	$26 904.70	$702.47	$7 516.43

* Data extracted from F.M.I.S. - Motor Vehicle Annual Detail Report

TABLE 9

SASKATCHEWAN WATER QUANTITY PROGRAM
CAPITAL DEPRECIATION COSTS 1984-1985

1.	VEHICLE DEPRECIATION (Table 10)			$32 957
2.	EQUIPMENT DEPRECIATION*			
	- Field Equipment	$107 397		
	- Marine Equipment	$ 17 964		
	- Scientific Equipment	$ 89 819		
	- Transportation Equipment	$ 15 259		
	- Shop & Construction Equipment	$ 58 440		
	- Accountable Items	$ 60 334		
	Total Inventory Value March 31, 1985	$349 213		
	Total Inventory Value March 31, 1984	$338 414		
	Average Inventory Value for 1984-85	$343 814		
	Capital Depreciation of Equipment @ 10%	$343 814 / 10	=	$34 381
3.	TOTAL CAPITAL DEPRECIATION			$67 338
4.	UNIT CAPITAL DEPRECIATION			
	= Total Capital Depreciation / Total Station Units =	$ 67 338 / 237.75	=	$ 283

* Departmental Equipment-In-Use Material Management System

TABLE 10

VEHICLE DEPRECIATION
SASKATCHEWAN FY 1984-1985

Vehicle Number	Original Capital Cost $	Depr. per month $	Time in use Months	Annual Depr. $	Remarks
Station Wagons - Lifetime 5 years (60 months)					
78-340	5 653	94	12	1 128	Hydrometric
79-462	6 806	113	12	1 356	Hydrometric
81-046	7 874	131	12	1 572	Hydrometric
81-047	7 874	131	12	1 572	Hydrometric
81-048	7 874	131	3	393	Construction
			8	1 048	Hydrometric
			1	131	Office Car
83-150	9 009	150	12	1 800	Office Car
Multi-Purpose Vehicles or Trucks - Lifetime 6 years (72 Months)					
78-067	20 166	280	11	3 080	Construction - CADC* March 1985
79-192	7 327	102	1	102	Hydrometric - CADC May 1984
79-193	7 219	100	1	100	Hydrometric
			6	600	Warehouse - CADC Nov. 1984
79-213	7 198	100	1	100	Hydrometric - CADC May 1984
80-102	6 181	86	12	1 032	Hydrometric
80-103	6 181	86	12	1 032	Hydrometric
80-104	9 506	132	12	1 584	Hydrometric
80-105	7 913	110	12	1 320	Hydrometric
80-106	11 233	156	12	1 872	Hydrometric
81-044	9 919	138	12	1 656	Hydrometric
82-068	12 295	171	12	2 052	Hydrometric
82-069	12 295	171	12	2 052	Hydrometric
82-070	9 276	129	12	1 548	Construction
83-002	8 059	112	12	1 344	Hydrometric
83-003	12 719	177	12	2 124	Construction
83-149	14 395	200	12	2 400	Hydrometric
83-151	12 660	176	12	2 112	Hydrometric
83-152	12 660	176	12	2 112	Hydrometric
84-123	12 755	177	11	1 947	Hydrometric
84-124	14 610	203	6	1 218	Hydrometric
84-125	12 755	177	11	1 947	Hydrometric
84-126	21 549	299	1	299	Hydrometric

Actual replacement cost of Saskatchewan vehicles in 1984/85 = $61 669

Depreciation of field surveys vehicles (excluding construction vehicles) = $32 957

Depreciation of construction vehicles (charged to individual projects) = $ 7 145

Total shareable depreciation = $40 102

* Crown Assets Disposal Corporation

APPENDIX 2

WRB MINICOMPUTER
COST-SHARING
1984-85

5.0 WRB MINICOMPUTER COST SHARING: 1984-85

5.1 COST SHARING PROCEDURE

Determination of the 1984-85 shareable computer costs has been complicated by the installation of the WRB minicomputer and by the need for the continued use of SaskComp for a portion of the hydrometric data computations. The SaskTel, Telecommunications charges are itemized in Section 5.2 and the calculations for the shareable computer costs are shown in Sections 5.3 and 5.4.

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

The formula can be expressed as Total (Shareable) Annual Computing Cost

= (Capital Expenditure X 0.10) + AOC + AMC

However, since the decision of using a in-house minicomputer system was not a joint federal-provincial one, a ceiling for the total (shareable) annual computing cost has been recommended. The ceiling is determined using the previous year's total (shareable) computing costs multiplied by

a national cost increase factor (i.e. Government Price Index). The actual cost to be shared is the lesser of the two; that calculated using the formula or that determined using the previous years total (shareable) computing cost times the Government Price Index.

The items considered to be shareable may be classified as either part of the capital expenditure, annual operating costs or annual maintenance costs and are itemized as follows:

Shared Costs

1. Capital Expenditure:

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

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

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

2. Annual Operating Costs (AOC):

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

3. Annual Maintenance Costs (AMC):

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

Some explanation of the shareable Sask Tel Telecommunication Charges is required. The transition from mainframe to minicomputer for hydrometric data computations was gradual which is the reason for some items appearing as shareable later in the year. The PTS-2000 terminals were used for data computations in 1983-84 and continued to be used in 1984-85 until the minicomputer could be used exclusively for data entry and job submission. The RJE line and modems are required to link the minicomputer and SaskComp. The link is required to access the hydrometric data computation software at SaskComp although much of the preliminary processing is now being done on the minicomputer.

The Prince Albert sub-office had acquired a terminal and a Datacom 1200n KSR terminal that was used during the latter part of the year for hydrometric computations. The sub-office utilized dial-in facilities for data entry and Datapac facilities for receiving printed output. The charges associated with these functions were only considered as shareable from the time Prince Albert actively began using the facilities.

5.2 SASK TEL TELECOMMUNICATION CHARGES: 1984-85

Month	Item	Amount
April	1. LL34 - 3 PTS-2000 terminals (includes 2 datasets and line)	*669.40
	2. Installation of dial-in line	119.00
	Rental of line	31.21
	3. Installation of RJE	*339.00
	Rental from April 02 (RJE)	*94.61
	4. Datapac installation (April 11)	216.65
	Datapac rental (from April 11)	131.40
	Datapac Equipment rental	197.00
		1800.27
	*Shareable	
	Shareable portion	1103.01
May	1. LL34 (PTS-2000 Terminals)	*669.40
	2. Dial-in line rental	30.60
	3. RJE line and modems	*123.40
	4. Datapac rental	197.00
	Datapac charges	Nil
		1020.40
	*Shareable	
	Shareable portion	792.80
June	1. LL34 (PTS-2000 Terminals)	*669.40
	2. Dial-in line rental	30.00
	3. RJE line and modem	*123.40
	4. Datapac rental	197.00
	Datapac charges	26.89
		1047.29
	*Shareable	
	Shareable portion	792.80

July	1. LL34 (PTS-2000 Terminals)	*669.40
	2. Dial-in line rental	30.60
	3. RJE line and modems	*123.40
	4. Datapac rental	197.00
	Datapac charges	6.04
		1026.44
	Shareable	
	Shareable portion	792.80
August	1. LL34 (PTS-2000 Terminals)	*669.40
	2. Dial-in line rental	30.60
	3. RJE line and modems	*123.40
	4. Datapac rental	197.00
	Datapac charges	16.65
	5. Installation of Prince Albert data line	*119.00
	Service rental	*7.14
	Rental for one month	*30.60
		1193.79
	*Shareable	
	Shareable portion	949.14
September	1. LL34 (PTS-2000 Terminals) -terminated September 30, 1984	*669.40
	2. Dial-in line rental	30.60
	3. RJE line and modems	*123.40
	4. Datapac rental	197.00
	Datapac charges	17.24
	5. P.A. line rental	*30.60
	Long distance charge	
		1068.24
	*Shareable	
	Shareable portion	823.40

October	1. Dial-in line rental	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	197.00
	Datapac charges	7.41
	4. P.A. line rental	*30.60
	Long distance charges	Nil
		389.01
	*Shareable	
	Shareable portion	184.60
November	1. Dial-in line rental	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	197.00
	Datapac charges	10.07
	4. P.A. line rental	*30.60
	Long distance charges	*176.90
		568.57
	*Shareable	
	Shareable portion	361.50
December	1. Dial-in line renta	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	*198.00
	Datapac charges	*112.16
	4. P.A. line rental	*30.60
	Long distance charges	*212.09
		706.85
	*Shareable	
	Shareable portion	706.85
January 1985	1. Dial-in line rental	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	*198.00
	Datapac charges	*238.86
	4. P.A. line rental	*30.60
	Long distance charges	*647.34
		1268.80
	*Shareable	
	Shareable portion	1268.80

February	1. Dial-in line rental	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	*198.00
	Datapac charges	*674.72
	4. P.A. line rental	*30.60
	Long distance charge	*579.26
		1636.58
	*Shareable	
	Shareable portion	1636.58
March	1. Dial-in line rental	*30.60
	2. RJE line and modems	*123.40
	3. Datapac rental	*198.00
	Datapac charges	*534.64
	4. P.A. line rental	*30.60
	Long distance charges	*260.22
		1177.46
	*Shareable	
	Shareable portion	1177.46

Summary - Telecommunication Costs 1984/85

Month	Total Cost	Shareable Portion
April	1 800.27	1 103.01
May	1 020.40	792.80
June	1 047.29	792.80
July	1 026.44	792.80
August	1 193.79	949.14
September	1 068.24	823.40
October	389.01	184.60
November	568.57	361.50
December	706.85	706.85
January	1 268.80	1 268.80
February	1 636.58	1 636.58
March	1 177.46	1 177.46
	12 903.70	10 589.74

5.3 MINI-COMPUTER - MAINFRAME COSTS: 1984-85

A Mainframe

1. SaskComp	-shareable portion (includes mini-port)	$13 319.84

B Services Charges

1.	Electronic Environments (Power, air conditioning,. fire system)		
	- annual maintenance	$973.00	
	- halon recharge	78.00	
			$1 051.00
2.	Digital Annual maintenance - mini-computer system (partial year due to 90 day warranty)		$5 409.30
3.	Brinks (Storage of backup disks)		$430.00
	-November - March only		
4.	SaskTel -shareable portion		$10 589.74
5.	Calcomp (Plotter service)		$1 152.00
6.	Gentian Electronics (Digitizer maintenance)		$125.00
			18 757.04

C Supplies

- computer printer paper (ABF & RL Crain)	$401.08
- LA120 printer ribbons (Digital)	111.00
- plotter paper	Nil
- plotter pens (Calcomp)	142.50
- 10 RL02 disks	2 710.00
- 1 RA60 disk pack	1 052.00
	$4 416.58

D Capital

-2 Vision 2000 terminals (Lanpar)	$2 890.00
-1 Vision 2200 + terminal (Lanpar)	1 395.00
-1 RIXON R212A mmodem (DSS-Computerland)	620.00
-1 RIXON R212A modem (SaskTel)	765.00
-1 Datacom 1200 KSR terminal (SaskTel)	2 916.00
-1 RA60 disk drive	21 038.00
	29 624.00

*NOTE: Capital items (D) were purchased during the 1984/85 fiscal year and will be included in the 1985/86 cost-sharing calculations for the value of the mini system.

5.4 CALCULATION OF SHAREABLE COMPUTATION COSTS: 1984-85

1. Formula for Total (Shareable) Annual Computing Cost

= Imputed Rental Charged + AOC + AMC

Where the Inputed Rental Charge is the capital value of the computer system on April 1, 1984 amortized for 10 years.

and

AOC is the annual-operating cost

and

AMC is the annual maintenance cost.

This total shareable cost cannot exceed the 1983-84 shareable cost multiplied by the Government Price Index.

2. Calculation of 1984-85 costs.

a) Capital Expenditure x 0.10

Capital cost on April 1, 1984

1 - PDP 11/44 mini-computer	113.4 K
1 - Hi-State digitizer	19.3 K
1 - Calcomp 1012 plotter	11.6 K
1 - RUA-60 disk drive	33.1 K
2 - Vision 2000 terminals	3.6 K
1 - LA120 terminal (used)	1.4 K
1 - RIXON T212A modem	0.4 K
	182.8 K

Therefore imputed rental

= 0.10 x 182,800
= $18,280.00

b) Annual Operating Cost (AOC)

Operating costs were

- Host computer (SaskComp) shareable cost	13 319.84
- Storage of backup disks (Brinks)	430.00
- Telecommunication charges and rentals	10 589.74
- Supplies - paper, ribbons, disks	4 416.58
	28 756.16

Therefore the annual operating cost was $28 756.16.

c) Annual Maintenance Cost (AMC)

Maintenance costs were

- PDP 11/44 computer	5 409.30
- Fire protection and power and air conditioners	1 051.00
- Plotter	1 152.00
- Digitizer	125.00
	$7 737.30

Therefore the annual maintenance cost was $7,737.30.

d) Total Shareable Computing Costs

= a) + b) + c)

= 18,280.00 + 28,756.16 + 7,737.30

= $54,733.16

3. Ceiling Calculation of Total (Shareable) Annual Computing Cost

From Table 7, pages 33, 34, 36, 1983-84 Annual Report Canada - Saskatchewan Memorandum of Agreement Water Quantity Survey.

Line Object #	Line Object Name		Amount
1505	EDP Service other Dept.	(Code 005)	117
1510	EDP Purchase Software	(Code 005)	34 639
1510	EDP Purchase Software	(Code 006)	6 433
1510	EDP Purchase Software	(Code 007)	8 412
1735	EDP Equipment	(Code 005)	3 629
1735	EDP Equipment	(Code 006)	619
1735	EDP Equipment	(Code 007)	809
2059	Data Processing Supplies	(Code 003)	144
			$54 802

Government Price Index = 5% for 1984-85

Ceiling = 1.05 X $54 802

= $57 542

Therefore the Total (Shareable) Computing Cost for 1984-85 = $54 773.43.

APPENDIX 3

STATION AND COST SUMMARY DATA

FOR INCLUSION IN NATIONAL ANNUAL REPORT

Province/Territory: SASKATCHEWAN

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

No. of Stations			Changes during 1984-85		Stn. Designation April 1, 1984			
April 1 1983	April 1 1984	Change	Added	Discontinued	Fed	F P	Prov	Contrib.
378	375	-3	0	3	(2)* 136	126*	113*	11

* Bracket Sediment Stations

TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA April 1/75 to April 1, 1984

Federal Stations			F P Stations			Provincial Stations			Total Stations		
Apr 1 75	Apr 1/84	Chge	Apr 1 75	Apr 1 84	Chge	Apr 1 75	Apr 1 84	Chge	Apr 1/75	Apr 1/ 84	Chge
173	136	-37	106	126	+20	51	113	+62	330	375	+45

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

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
12	(2) 42	63	19	136	0	21	105	126	92	21	113	11	386

Bracket Sediment Stations in all catagories.

Province: SASKATCHEWAN

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

Total Program Costs					Shareable Costs						
P/Yrs	Sal.	Oper.	Cap.	Total	P/Yrs	Sal.	Oper.	Const.	Total	F Share	P Share
33.9	1 096.1	557.8	184.4	1 838.3	20.5	623.0	397.7*	109.4	1 130.1	712.7	417.4

TABLE 5
WATER QUANTITY SURVEYS
SUMMARY OF SCHEDULES D/F - 1984-85

Streamflow & Water Level		Sediment		Total
Operation	Construction	Operation	Construction	
370 000	50 000	0	0	428 000

TABLE 6
WATER QUANTITY SURVEYS
COMPARISON - SCHEDULED & ACTUAL COSTS FOR 1984-85
(Dollars)

Salary & Operations		Construction		Total			Annual Payment Received	Received Minus Actual
Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Sch. D/F	Actual Cost	Difference		
378 000	376 325	50 000	41 117	428 000	417 442	10 558	418 700	1 258**

* Consists of operations cost (Table 6) + capital depreciation costs (Table 9)
** Deficit for 1983-85 = $2 006, therefore, net Saskatchewan deficit for 1984-85 = $2 006 = $1 258 = $748.

APPENDIX 4

CANADA-SASKATCHEWAN

MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS

7.0 MEMORANDUM OF AGREEMENT

7.1 MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT made this eighteenth day of February, 1975,

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 Saskatchewan, hereinafter called the "Province", represented by the Minister of Environment

OF THE SECOND PART.

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

AND WHEREAS the Governor-in-Council has by Order-in-Council No. PC 1975-1/172 dated January 28, 1975, authorized the Minister of Environment to execute this agreement on behalf of Canada, subject to funds being voted by the Parliament of Canada;

AND WHEREAS the Lieutenant Governor in Council has, by Order-in-Council No. O.C. 282/75 dated February 11, 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 the financing thereof shall be continued and maintained upon the following basis;-

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 on part time supervisory duty or reconnaissance assignment.

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

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

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

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

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

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

ARTICLE I

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

OPERATIONAL CONSIDERATIONS

ARTICLE II

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

ARTICLE III

Where Canada constructs and operates water quantity survey stations designated as federal-provincial, the Province will reimburse Canada for 50% of the construction costs and 50% of the annual cost of operation. Where the Province constructs and operates these stations, Canada will reimburse the Province for 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 meet national standards.

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

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

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

FINANCIAL CONSIDERATIONS

ARTICLE VI

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

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

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

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

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.

ARTTICLE 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 the service.

ARTICLE VIII

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

ARTICLE IX

Except as agreed by the parties hereto where both parties have an interest, either operational or financial, the annual net change in the total number of water quantity survey stations, including federal, federal-provincial and provincial, as set out in Schedule A, is not to exceed 7% in any year.

ARTICLE X

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

CO-OPERATION

ARTICLE XI

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

ARTICLE XII

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

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

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

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

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

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

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

ADMINISTRATIVE ARRANGEMENTS

ARTICLE XIII

This agreement is to be administrated for Canada by the Regional Director of the Inland Waters Directorate located at Regina, Saskatchewan, and for the Province by the Chief, Water Management Service, Saskatchewan Department of Environment, located at Regina, Saskatchewan.

IMPLEMENTATION

ARTICLE XIV

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

PERIOD OF AGREEMENT

ARTICLE XV

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

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

IN WITNESS WHEREOF the Honourable Jeanne Sauve, Minister of Environment has hereunto set her hand on behalf of Canada, and the Honourable Neil E. Byers, Minister of Environment has hereunto set his hand on behalf of the Province of Saskatchewan.

Signed on behalf of Canada)
by the Honourable Jeanne Sauve,)
Minister of Environment)
)
)
)
)
IN THE PRESENCE OF)
)
)
)
)
)
Signed on behalf of the Province of)
Saskatchewan by the Honourable)
Neil E. Byers, Minister of)
Environment)
)
)
)
IN THE PRESENCE OF)
)
)
)
)

7.2 SCHEDULE A: APRIL 1, 1984

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. The Schedule also shows the type of data collected (flow, water level, sediment) and the period of operation (seasonal or annual). Decisions regarding changes to the Schedule are made by the Co-ordinating Committee with reference to the national designation guidelines for station classification. The Saskatchewan hydrometric network existing as of April 1, 1984 is documented in this section.

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 1. FEDERAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05GG005	ANGLIN LAKE RESERVOIR	WSC	12L			PRINCE ALBERT
2.	05HA070	DOWNIE LAKE INFLOW CANAL	WSC	8Q			REGINA
3.	05HA064	DOWNIE LAKE RESERVOIR NEAR MAPLE CREEK	WSC	8L			REGINA
4.	05JF008	FAHLMAN CREEK NEAR DAVIN	WSC	8Q			REGINA
5.	05HA069	GAP CREEK BELOW DOWNIE LAKE DIVERSION	WSC	8Q			REGINA
6.	05HA074	HARRIS RESERVOIR NEAR MAPLE CREEK	WSC	8L			REGINA
7.	05HA063	JUNCTION RESERVOIR NEAR MAPLE CREEK	WSC	8L			REGINA
8.	07MC003	LAKE ATHABASCA NEAR CRACKINGSTONE POINT	WSC	12L		REMOTE	PRINCE ALBERT
9.	05HA076	MAPLE CREEK BELOW JUNCTION RESERVOIR	WSC	8Q			REGINA
10.	05JC004	RUSHLAKE CREEK ABOVE HIGHFIELD RESERVOIR	WSC	8Q			REGINA
11.	05GG007	SPRUCE RIVER BELOW ANGLIN LAKE RESERVOIR	WSC	12Q			PRINCE ALBERT
12.	05GG006	SPRUCE RIVER DIVERSION TO EMMA LAKE	WSC	8Q			PRINCE ALBERT

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FEDERAL 1. FEDERAL DEPARTMENTAL PROGRAMS
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	1	0.40	0.40
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		1		0.40
NORMAL ACCESS				
	8L	3	0.25	0.75
	12L	1	0.40	0.40
	8Q	6	0.75	4.50
	12Q	1	1.00	1.00
TOTAL		11		6.65
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		12		7.05

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 2. INTERPROVINCIAL WATERS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05MD004	ASSINIBOINE RIVER AT KAMSACK	WSC	12Q			REGINA
2.	05JE010	AVONLEA INDEX RESERVOIR	WSC	8L			REGINA
3.	05JE007	AVONLEA RESERVOIR NEAR AVONLEA	WSC	8L			REGINA
4.	11AB117	BATTLE CREEK AT ALBERTA BOUNDARY	WSC	8Q			REGINA
5.	05JF006	BOGGY CREEK NEAR LUMSDEN	WSC	8Q			REGINA
6.	05AH001	BOXELDER CREEK NEAR WALSH	WSC	8Q			CALGARY
7.	05HF007	BRODERICK IRRIGATION CANAL BELOW PUMPING STATION	WSC	8Q			REGINA
8.	05JG009	BUFFALO POUND LAKE AT PUMPING STATION	WSC	12L			REGINA
9.	05KH007	CARROT RIVER NEAR TURNBERRY	WSC	12Q			WINNIPEG
10.	06EA002	CHURCHILL RIVER AT SANDY BAY	WSC	12Q		REMOTE	PRINCE ALBERT
11.	05JM006	CROOKED LAKE NEAR GRAYSON	WSC	12L			REGINA
12.	05KH011	DRAGLINE CHANNEL NEAR SQUAW RAPIDS	WSC	12Q			PRINCE ALBERT
13.	05JK005	ECHO LAKE AT FISH HATCHERY	WSC	12L			REGINA
14.	05JM010	EKAPO CREEK NEAR MARIEVAL	WSC	8Q			REGINA
15.	05JG006	ELBOW DIVERSION CANAL AT DROP STRUCTURE	WSC	12Q			REGINA
16.	05JL002	INDIANHEAD CREEK NEAR INDIAN HEAD	WSC	8Q			REGINA
17.	05JL004	KATEPWA LAKE AT KATEPWA BEACH	WSC	12L			REGINA
18.	05HF003	LAKE DIEFENBAKER AT GARDINER DAM	WSC	12L			REGINA
19.	05JH004	LAST MOUNTAIN LAKE AT ROWAN'S RAVINE	WSC	12L			REGINA
20.	11AB082	LODGE CREEK AT ALBERTA BOUNDARY	WSC	8Q			REGINA
21.	05JF013	LUMSDEN INDEX RESERVOIR	WSC	8L			REGINA
22.	05JE006	MOOSE JAW RIVER NEAR BURDICK	WSC	12Q	X		REGINA
23.	05GG001	NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT	WSC	12Q	X		PRINCE ALBERT

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 2. INTERPROVINCIAL WATERS

APR 01 1984

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	05EF001	NORTH SASKATCHEWAN RIVER NEAR DEER CREEK	WSC	12Q			PRINCE ALBERT
25.	05JG004	QU'APPELLE RIVER ABOVE BUFFALO POUND LAKE	WSC	12Q			REGINA
26.	05JM013	QU'APPELLE RIVER AT HYDE	WSC	8Q			REGINA
27.	05JK002	QU'APPELLE RIVER BELOW CRAVEN DAM	WSC	12Q			REGINA
28.	05JL001	QU'APPELLE RIVER BELOW KATEPWA LAKE	WSC	12Q			REGINA
29.	05JK007	QU'APPELLE RIVER BELOW LOON CREEK	WSC	12Q			REGINA
30.	05JG007	QU'APPELLE RIVER BELOW MOOSE JAW RIVER	WSC	12Q			REGINA
31.	05JF001	QU'APPELLE RIVER NEAR LUMSDEN	WSC	12Q			REGINA
32.	05JM001	QU'APPELLE RIVER NEAR WELBY	WSC	12Q			REGINA
33.	05LC001	RED DEER RIVER NEAR ERWOOD	WSC	12Q			PRINCE ALBERT
34.	05HD033	REID LAKE NEAR DUNCAIRN	WSC	12L			REGINA
35.	05JG013	RIDGE CREEK NEAR BRIDGEFORD	WSC	8Q			REGINA
36.	05JM007	ROUND LAKE NEAR WHITEWOOD	WSC	12L			REGINA
37.	05JH007	SILTON INDEX RESERVOIR	WSC	8L			REGINA
38.	05HG001	SOUTH SASKATCHEWAN RIVER AT SASKATOON	WSC	12Q			REGINA
39.	05HH001	SOUTH SASKATCHEWAN RIVER AT ST. LOUIS	WSC	12Q			PRINCE ALBERT
40.	05HD034	SWIFT CURRENT CANAL AT SWIFT CURRENT	WSC	8Q			REGINA
41.	05MB009	THEODORE RESERVOIR NEAR THEODORE	WSC	8L			REGINA
42.	05JF005	WASCANA CREEK NEAR LUMSDEN	WSC	12Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FEDERAL 2. INTERPROVINCIAL WATERS
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	1	1.00	1.00
TOTAL		1		1.00
NORMAL ACCESS				
	8L	5	0.25	1.25
	12L	8	0.40	3.20
	8Q	10	0.75	7.50
	12Q	18	1.00	18.00
TOTAL		41		29.95
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		42		30.95

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 3. INTERNATIONAL WATERS

APR 01 1984

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	11AB095	ADAMS LAKE	WSC	8L			REGINA
2.	11AB089	ALTAWAN RESERVOIR NEAR GOVENLOCK	WSC	8L			REGINA
3.	05NC006	ARCOLA INDEX RESERVOIR	WSC	8L			REGINA
4.	11AB027	BATTLE CREEK AT INTERNATIONAL BOUNDARY	WSC	8Q			REGINA
5.	11AB101	BATTLE CREEK BELOW NASHLYN PROJECT	WSC	8Q			REGINA
6.	11AB118	BATTLE CREEK BELOW WILSONS WEIR	WSC	8Q			REGINA
7.	11AB096	BATTLE CREEK NEAR CONSUL	WSC	8Q			REGINA
8.	11AF005	BEAVER CREEK NEAR INTERNATIONAL BOUNDARY	WSC	12Q			REGINA
9.	11AC064	BELANGER CREEK DIVERSION TO CYPRESS LAKE	WSC	8Q			REGINA
10.	05NB012	BOUNDARY RESERVOIR NEAR ESTEVAN	WSC	12L			REGINA
11.	11AE013	COOKSON RESERVOIR NEAR CORONACH	WSC	12L			REGINA
12.	11AC037	CYPRESS LAKE	WSC	8L			REGINA
13.	11AC060	CYPRESS LAKE EAST OUTFLOW CANAL	WSC	8Q			REGINA
14.	11AB078	CYPRESS LAKE WEST INFLOW CANAL	WSC	8Q			REGINA
15.	11AB085	CYPRESS LAKE WEST INFLOW CANAL DRAIN	WSC	8Q			REGINA
16.	11AB077	CYPRESS LAKE WEST OUTFLOW CANAL	WSC	8Q			REGINA
17.	05NB029	DEAD LAKE PROJECT - SOURIS RIVER CHANNEL	WSC	8L			REGINA
18.	05NB022	DEAD LAKE RESERVOIR NEAR MIDALE	WSC	8L			REGINA
19.	11AC025	DENNIEL CREEK NEAR VAL MARIE	WSC	8Q			REGINA
20.	11AE003	EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY	WSC	12Q			REGINA
21.	11AC052	EASTEND CANAL	WSC	8Q			REGINA
22.	11AC055	EASTEND RESERVOIR	WSC	8L			REGINA
23.	11AC041	FRENCHMAN RIVER AT INTERNATIONAL BOUNDARY	WSC	8Q			REGINA

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 3. INTERNATIONAL WATERS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	11AC001	FRENCHMAN RIVER BELOW EASTEND RESERVOIR	WSC	8Q			REGINA
25.	11AC062	FRENCHMAN RIVER BELOW NEWTON LAKE	WSC	8Q			REGINA
26.	05ND006	FROBISHER INDEX RESERVOIR	WSC	8L			REGINA
27.	11AB102	GAFF DITCH NEAR MERRYFLAT	WSC	8Q			REGINA
28.	11AC065	HUFF LAKE GRAVITY CANAL	WSC	8Q			REGINA
29.	11AC063	HUFF LAKE NEAR VAL MARIE	WSC	8L			REGINA
30.	11AC066	HUFF LAKE PUMPING CANAL	WSC	8Q			REGINA
31.	05NA006	LARSEN RESERVOIR NEAR RADVILLE	WSC	8L			REGINA
32.	11AB083	LODGE CREEK BELOW MCRAE CREEK AT INTERNATIONAL BOUNDARY	WSC	8Q			REGINA
33.	05NA003	LONG CREEK AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY	WSC	12Q			REGINA
34.	05NB001	LONG CREEK NEAR ESTEVAN	WSC	12Q			REGINA
35.	05NB027	LONG CREEK NEAR NOONAN	WSC	12Q			REGINA
36.	11AB075	LYONS CREEK AT INTERNATIONAL BOUNDARY	WSC	8Q			REGINA
37.	11AB044	MCKINNON DITCH NEAR CONSUL	WSC	8Q			REGINA
38.	11AB008	MIDDLE CREEK ABOVE LODGE CREEK	WSC	8Q			REGINA
39.	11AB001	MIDDLE CREEK BELOW MIDDLE CREEK RESERVOIR	WSC	8Q			REGINA
40.	11AB108	MIDDLE CREEK NEAR GOVENLOCK	WSC	8Q			REGINA
41.	11AB080	MIDDLE CREEK RESERVOIR	WSC	8L			REGINA
42.	11AB114	MIDDLE CREEK RESERVOIR BEDFORD OUTLET	WSC	8Q			REGINA
43.	11AB115	MIDDLE CREEK RESERVOIR FLOOD SPILLWAY	WSC	8Q			REGINA
44.	11AE008	MIDDLE FORK POPLAR RIVER AT INTERNATIONAL BOUNDARY	WSC	8Q			REGINA
45.	05NC002	MOOSE MOUNTAIN LAKE (RESERVOIR) NEAR CORNING	WSC	12L			REGINA
46.	11AB018	NASHLYN CANAL NEAR CONSUL	WSC	8Q			REGINA

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 3. INTERNATIONAL WATERS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	SEDIMENT	ACCESS	OPERATIONS CENTER
47.	11AC054	NEWTON LAKE MAIN CANAL	WSC	8Q			REGINA
48.	11AC056	NEWTON LAKE NEAR VAL MARIE	WSC	8L			REGINA
49.	05NA009	RADVILLE INDEX RESERVOIR	WSC	8L			REGINA
50.	11AB058	RICHARDSON DITCH NEAR CONSUL	WSC	8Q			REGINA
51.	05NB016	ROUGHBARK RESERVOIR NEAR WEYBURN	WSC	8L			REGINA
52.	11AB020	SHEPHERD DITCH NEAR CONSUL	WSC	8Q			REGINA
53.	05NB021	SHORT CREEK NEAR ROCHE PERCEE	WSC	12Q			REGINA
54.	05ND001	SOURIS RIVER NEAR GLEN EWEN	WSC	12Q			REGINA
55.	05ND007	SOURIS RIVER NEAR SHERWOOD	WSC	12Q			REGINA
56.	11AB060	SPANGLER DITCH NEAR GOVENLOCK	WSC	8Q			REGINA
57.	11AB103	SQUAW COULEE NEAR WILLOW CREEK	WSC	8Q			REGINA
58.	05NB018	TATAGWA LAKE DRAIN NEAR WEYBURN	WSC	8Q			REGINA
59.	11AC068	VAL MARIE PUMP NO. 1	WSC	8Q			REGINA
60.	11AB084	VIDORA DITCH NEAR CONSUL	WSC	8Q			REGINA
61.	05NB024	WEYBURN INDEX RESERVOIR	WSC	8L			REGINA
62.	05NB020	WEYBURN RESERVOIR NEAR WEYBURN	WSC	12L			REGINA
63.	05NB011	YELLOW GRASS DITCH NEAR YELLOW GRASS	WSC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FEDERAL 3. INTERNATIONAL WATERS
UNIT SUMMARY

APR 01 1984

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
NORMAL ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
INTERNATIONAL				
	8L	15	0.25	3.75
	12L	4	0.40	1.60
	8Q	36	0.75	27.00
	12Q	8	1.00	8.00
TOTAL		63		40.35
GRAND TOTAL		63		40.35

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FEDERAL 4. NATIONAL WATER QUANTITY INVENTORY

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	06CA004	BIGSTONE LAKE NEAR LA RONGE	WSC	12L			PRINCE ALBERT
2.	05KC001	CARROT RIVER NEAR SMOKY BURN	WSC	12Q			PRINCE ALBERT
3.	07LC002	CHIPMAN RIVER ABOVE BLACK LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
4.	06CD002	CHURCHILL RIVER ABOVE OTTER RAPIDS	WSC	12Q			PRINCE ALBERT
5.	06BB003	CHURCHILL RIVER NEAR PATUANAK	WSC	12Q		REMOTE	PRINCE ALBERT
6.	07CD006	CLEARWATER RIVER AT OUTLET OF LLOYD LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
7.	07LD001	CREE LAKE AT CABLE BAY	WSC	12L		REMOTE	PRINCE ALBERT
8.	07LD002	CREE RIVER AT OUTLET OF WAPATA LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
9.	06BA002	DILLON RIVER AT OUTLET OF DILLON LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
10.	07LE002	FOND DU LAC RIVER AT OUTLET OF BLACK LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
11.	06DA004	GEIKIE RIVER BELOW WHEELER RIVER	WSC	12Q		REMOTE	PRINCE ALBERT
12.	07LE003	GREASE RIVER BELOW FONTAINE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
13.	06BD001	HAULTAIN RIVER ABOVE NORBERT RIVER	WSC	12Q		REMOTE	PRINCE ALBERT
14.	07MB001	MACFARLANE RIVER AT OUTLET OF DAVY LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
15.	06CA001	MONTREAL RIVER AT OUTLET OF BIGSTONE LAKE	WSC	12Q			PRINCE ALBERT
16.	05KJ014	PASQUIA RIVER AT HIGHWAY NO. 9	WSC	8Q			PRINCE ALBERT
17.	07LC003	PORCUPINE RIVER AT OUTLET OF GROVE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
18.	05HD036	SWIFT CURRENT CREEK BELOW ROCK CREEK	WSC	12Q			REGINA
19.	06DA001	WOLLASTON LAKE AT ROSS CHANNEL	WSC	12L		REMOTE	PRINCE ALBERT

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FEDERAL 4. NATIONAL WATER QUANTITY INVENTORY
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	2	0.40	0.80
	8Q	0	0.75	0.00
	12Q	11	1.00	11.00
TOTAL		13		11.80
NORMAL ACCESS				
	8L	0	0.25	0.00
	12L	1	0.40	0.40
	8Q	1	0.75	0.75
	12Q	4	1.00	4.00
TOTAL		6		5.15
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		19		16.95

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FED-PROV 2. RIVER BASIN MANAGEMENT

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05KG003	AMISK LAKE NEAR FLIN FLON	WSC	12L			WINNIPEG
2.	05JE005	AVONLEA CREEK NEAR ROULEAU	WSC	8Q			REGINA
3.	05KH002	CUMBERLAND LAKE NEAR CUMBERLAND HOUSE	WSC	12L			PRINCE ALBERT
4.	05JG015	KNOX COULEE NEAR TUXFORD	WSC	8Q			REGINA
5.	06CB001	LAC LA RONGE AT LA RONGE	WSC	12L			PRINCE ALBERT
6.	06CA006	MONTREAL LAKE NEAR WEYAKWIN	WSC	12L			PRINCE ALBERT
7.	06CA003	MONTREAL RIVER AT HIGHWAY NO. 2	WSC	12Q			PRINCE ALBERT
8.	05JE004	MOOSE JAW RIVER NEAR ROULEAU	WSC	8Q			REGINA
9.	05NC001	MOOSE MOUNTAIN CREEK BELOW MOOSE MOUNTAIN LAKE	WSC	8Q			REGINA
10.	05NE002	MOOSOMIN RESERVOIR NEAR MOOSOMIN	WSC	8L			REGINA
11.	05JB001	NOTUKEU CREEK NEAR VANGUARD	WSC	8Q			REGINA
12.	05NE001	PIPESTONE CREEK NEAR MOOSOMIN	WSC	8Q			REGINA
13.	05KD003	SASKATCHEWAN RIVER BELOW TOBIN LAKE	WSC	12Q			PRINCE ALBERT
14.	05KH009	SASKATCHEWAN RIVER OLD CHANNEL	WSC	12Q			PRINCE ALBERT
15.	05NB009	SOURIS RIVER NEAR ROCHE PERCEE	WSC	8Q			REGINA
16.	05KG007	STURGEON-WEIR RIVER AT LEAF RAPIDS	WSC	12Q			PRINCE ALBERT
17.	05HD041	SWIFT CURRENT CREEK BELOW REID LAKE	WSC	12Q			REGINA
18.	07QC002	TAZIN LAKE NEAR OUTLET	WSC	12L		REMOTE	PRINCE ALBERT
19.	05JF012	WASCANA CREEK BELOW KRONAU MARSH	WSC	8Q			REGINA
20.	05JF015	WASCANA LAKE AT MARINA	WSC	12L			REGINA
21.	05MB008	WHITESAND RIVER NEAR SPRINGSIDE	WSC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FED-PROV 2. RIVER BASIN MANAGEMENT
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	1	0.40	0.40
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		1		0.40
NORMAL ACCESS				
	8L	1	0.25	0.25
	12L	5	0.40	2.00
	8Q	9	0.75	6.75
	12Q	5	1.00	5.00
TOTAL		20		14.00
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		21		14.40

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
FED-PROV 3. REGIONAL WATER QUANTITY INVENTORY

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	06AD011	ALCOTT CREEK ABOVE MEADOW LAKE	WSC	8Q			PRINCE ALBERT
2.	05HC005	ANTELOPE CREEK NEAR CABRI	WSC	8Q			REGINA
3.	05NF010	ANTLER RIVER NEAR WAUCHOPE	WSC	8Q			REGINA
4.	05JH001	ARM RIVER NEAR BETHUNE	WSC	8Q			REGINA
5.	05MC001	ASSINIBOINE RIVER AT STURGIS	WSC	8Q			REGINA
6.	05KF001	BALLANTYNE RIVER ABOVE BALLANTYNE BAY	WSC	12Q			PRINCE ALBERT
7.	05FF001	BATTLE RIVER AT BATTLEFORD	WSC	8Q			PRINCE ALBERT
8.	05HA003	BEAR CREEK NEAR PIAPOT	WSC	8Q			REGINA
9.	06AG001	BEAVER RIVER BELOW WATERHEN RIVER	WSC	12Q			PRINCE ALBERT
10.	06AD001	BEAVER RIVER NEAR DORINTOSH	WSC	12Q			PRINCE ALBERT
11.	05EF005	BIG GULLY CREEK NEAR MAIDSTONE	WSC	8Q			PRINCE ALBERT
12.	05MA011	BIRCH CREEK NEAR ELFROS	WSC	8Q			REGINA
13.	05EG006	BIRLING CREEK NEAR PAYNTON	WSC	8Q			PRINCE ALBERT
14.	05HA015	BRIDGE CREEK AT GULL LAKE	WSC	8Q			REGINA
15.	05HG002	BRIGHTWATER CREEK NEAR KENASTON	WSC	8Q			REGINA
16.	05KB005	BURNTOUT BROOK NEAR ARBORFIELD	WSC	8Q			PRINCE ALBERT
17.	06BB005	CANOE RIVER NEAR BEAUVAL	WSC	12Q		REMOTE	PRINCE ALBERT
18.	05KB003	CARROT RIVER NEAR ARMLEY	WSC	8Q			PRINCE ALBERT
19.	05JF011	COTTONWOOD CREEK NEAR LUMSDEN	WSC	8Q			REGINA
20.	05HF014	CREIGHTON TRIBUTARY NEAR TOTNES	WSC	8Q			REGINA
21.	05HH002	CROMARTY CREEK NEAR BIRCH HILLS	WSC	8Q			PRINCE ALBERT
22.	05MB006	CROOKED HILL CREEK NEAR CANORA	WSC	8Q			REGINA
23.	05EG004	CRYSTAL CREEK NEAR IFFLEY	WSC	8Q			PRINCE ALBERT

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	05JM015	CUTARM CREEK NEAR SPY HILL	WSC	8Q			REGINA
25.	07CD007	DESCHARME RIVER BELOW DUPRE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
26.	06AG002	DORE RIVER NEAR THE MOUTH	WSC	12Q		REMOTE	PRINCE ALBERT
27.	07MA003	DOUGLAS RIVER NEAR CLUFF LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
28.	05GC006	EAGLE CREEK NEAR ENVIRON	WSC	8Q			REGINA
29.	05LB002	ETOMAMI RIVER NEAR BERTWELL	WSC	8Q			PRINCE ALBERT
30.	05GA007	EYEHILL CREEK NEAR MACKLIN	WSC	8Q			PRINCE ALBERT
31.	05LB007	FIR RIVER NEAR HUDSON BAY	WSC	12Q			PRINCE ALBERT
32.	06CE001	FOSTER RIVER ABOVE CHURCHILL RIVER	WSC	12Q		REMOTE	PRINCE ALBERT
33.	05NF013	GAINSBOROUGH CREEK NEAR STORTHOAKS	WSC	8Q			REGINA
34.	05GG010	GARDEN RIVER NEAR HENRIBOURG	WSC	8Q			PRINCE ALBERT
35.	05NA005	GIBSON CREEK NEAR RADVILLE	WSC	8Q			REGINA
36.	05KA009	GOOSEHUNTING CREEK NEAR BEATTY	WSC	8Q			PRINCE ALBERT
37.	05HF016	GREENLEIGH RESERVOIR NEAR BICKLEIGH	WSC	8L			REGINA
38.	05HB002	HAPPYLAND CREEK NEAR FOX VALLEY	WSC	8Q			REGINA
39.	11AE010	HAY MEADOW CREEK NEAR LISIEUX	WSC	8Q			REGINA
40.	05MA012	IRONSPRING CREEK NEAR WATSON	WSC	8Q			REGINA
41.	05JG014	ISKWAO CREEK NEAR CRAIK	WSC	8Q			REGINA
42.	05NB014	JEWEL CREEK NEAR GOODWATER	WSC	8Q			REGINA
43.	05JK004	JUMPING DEER CREEK NEAR LIPTON	WSC	8Q			REGINA
44.	06BB004	KEELEY RIVER AT OUTLET OF KEELEY LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
45.	05HH003	KOHLESCHMIDT CREEK NEAR ROSTHERN	WSC	8Q			PRINCE ALBERT
46.	05JD004	LAKE OF THE RIVERS WEST INFLOW	WSC	8Q			REGINA

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
47.	05JJ003	LANIGAN CREEK ABOVE BOULDER LAKE	WSC	8Q			REGINA
48.	05KB006	LEATHER RIVER NEAR STAR CITY	WSC	8Q			PRINCE ALBERT
49.	05JH005	LEWIS CREEK NEAR IMPERIAL	WSC	8Q			REGINA
50.	05NF006	LIGHTNING CREEK NEAR CARNDUFF	WSC	8Q			REGINA
51.	05MC003	LILIAN RIVER NEAR LADY LAKE	WSC	8Q			REGINA
52.	05LB004	LOISELLE CREEK NEAR HUDSON BAY	WSC	8Q			PRINCE ALBERT
53.	05NA004	LONG CREEK NEAR MAXIM	WSC	8Q			REGINA
54.	05HF005	MACDONALD CREEK NEAR BOUNTY	WSC	8Q			REGINA
55.	05MA021	MAGNUSSON CREEK NEAR WYNYARD	WSC	8Q			REGINA
56.	06AD007	MAKWA RIVER AT RAPID VIEW	WSC	8Q			PRINCE ALBERT
57.	05LE011	MALONECK CREEK NEAR PELLY	WSC	8Q			REGINA
58.	05JA003	MCDONALD CREEK NEAR MCCORD	WSC	8Q			REGINA
59.	05HF015	MCDONALD TRIBUTARY NEAR TOTNES	WSC	8Q			REGINA
60.	05EF004	MONNERY RIVER NEAR PARADISE HILL	WSC	8Q			PRINCE ALBERT
61.	05JE001	MOOSE JAW RIVER ABOVE THUNDER CREEK	WSC	8Q			REGINA
62.	05ND004	MOOSE MOUNTAIN CREEK NEAR OXBOW	WSC	8Q			REGINA
63.	05JB007	MOSQUITO CREEK NEAR PAMBRUN	WSC	8Q			REGINA
64.	06BC001	MUDJATIK RIVER NEAR FORCIER LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
65.	05JB004	NOTUKEU CREEK ABOVE ADMIRAL RESERVOIR	WSC	8Q			REGINA
66.	05GD002	OSCAR CREEK NEAR KRYDOR	WSC	8Q			PRINCE ALBERT
67.	07LE004	OTHERSIDE RIVER AT OUTLET OF MERCREDI LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
68.	06EA007	PAGATO RIVER AT OUTLET OF PAGATO LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
69.	05JL005	PHEASANT CREEK NEAR ABERNETHY	WSC	8Q			REGINA

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
70.	05JA004	PINTO CREEK NEAR WOODROW	WSC	8Q			REGINA
71.	07LD003	PIPESTONE RIVER BELOW ROTARIU LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
72.	05MA020	QUILL CREEK NEAR QUILL LAKE	WSC	8Q			REGINA
73.	05MA014	RANCH CREEK NEAR ANNAHEIM	WSC	8Q			REGINA
74.	05LB005	RED DEER RIVER NEAR STEEN	WSC	8Q			PRINCE ALBERT
75.	05HF013	RIDALLS TRIBUTARY BELOW GREENLEIGH RESERVOIR	WSC	8Q			REGINA
76.	05JJ009	SALINE CREEK NEAR NOKOMIS	WSC	8Q			REGINA
77.	05LB006	SHAND CREEK NEAR DILLABOUGH	WSC	8Q			PRINCE ALBERT
78.	05GF001	SHELL BROOK NEAR SHELLBROOK	WSC	8Q			PRINCE ALBERT
79.	05ME007	SMITH CREEK NEAR MARCHWELL	WSC	8Q			REGINA
80.	06CC001	SMOOTHSTONE RIVER BELOW EMMELINE LAKE	WSC	12Q			PRINCE ALBERT
81.	05HE001	SNAKEBITE CREEK NEAR BEECHY	WSC	8Q			REGINA
82.	05NB017	SOURIS RIVER NEAR HALBRITE	WSC	8Q			REGINA
83.	05MB007	SPIRIT CREEK NEAR BUCHANAN	WSC	8Q			REGINA
84.	05MD010	STONY CREEK NEAR KAMSACK	WSC	8Q			REGINA
85.	05MC002	STONY CREEK NEAR STENEN	WSC	8Q			REGINA
86.	05GF002	STURGEON RIVER NEAR PRINCE ALBERT	WSC	8Q			PRINCE ALBERT
87.	05KG002	STURGEON-WEIR RIVER AT OUTLET OF AMISK LAKE	WSC	12Q			WINNIPEG
88.	05LE008	SWAN RIVER NEAR NORQUAY	WSC	12Q			REGINA
89.	05HD039	SWIFT CURRENT CREEK NEAR LEINAN	WSC	12Q	X		REGINA
90.	05JG012	THUNDER CREEK NEAR DARMODY	WSC	8Q			REGINA
91.	06DB003	THYMEHILL RIVER BELOW MACKENZIE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
92.	05KE002	TORCH RIVER NEAR LOVE	WSC	12Q			PRINCE ALBERT

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
93.	05EG005	TURTLELAKE RIVER NEAR TURTLEFORD	WSC	8Q			PRINCE ALBERT
94.	05JF004	WASCANA CREEK NEAR SEDLEY	WSC	8Q			REGINA
95.	07LB001	WATERBURY LAKE AT CREW CABIN	WSC	12L		REMOTE	PRINCE ALBERT
96.	07LB002	WATERFOUND RIVER BELOW UNKNOWN LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
97.	06AF005	WATERHEN RIVER NEAR GOODSOIL	WSC	12Q			PRINCE ALBERT
98.	06DC001	WATHAMAN RIVER BELOW WATHAMAN LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
99.	06DA005	WHEELER RIVER BELOW RUSSELL LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
100.	05KE005	WHITE FOX RIVER NEAR GARRICK	WSC	8Q			PRINCE ALBERT
101.	05MB003	WHITESAND RIVER NEAR CANORA	WSC	8Q			REGINA
102.	07MA004	WILLIAM RIVER ABOVE CARSWELL RIVER	WSC	12Q		REMOTE	PRINCE ALBERT
103.	05MB005	WILLOW BROOK AT WILLOWBROOK	WSC	8Q			REGINA
104.	05JA002	WOOD RIVER NEAR LAFLECHE	WSC	8Q			REGINA
105.	05MB001	YORKTON CREEK NEAR EBENEZER	WSC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
FED-PROV 3. REGIONAL WATER QUANTITY INVENTORY
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	1	0.40	0.40
	8Q	0	0.75	0.00
	12Q	15	1.00	15.00
TOTAL		16		15.40
NORMAL ACCESS				
	8L	1	0.25	0.25
	12L	0	0.40	0.00
	8Q	78	0.75	58.50
	12Q	10	1.00	10.00
TOTAL		89		68.75
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		105		84.15

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

APR 01 1984

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05LA006	BARRIER RIVER BELOW BARRIER LAKE	WSC	8Q			PRINCE ALBERT
2.	05MA022	BECKETT BROOK NEAR FOAM LAKE	WSC	8Q			REGINA
3.	05MA010	BIG QUILL LAKE NEAR KANDAHAR	SDOE	8L			REGINA
4.	05KF004	BIG SANDY LAKE ON THE HANSON LAKE ROAD	SDOE	8L			REGINA
5.	05KE006	BISSETT CREEK NEAR CHOICELAND	WSC	8Q			PRINCE ALBERT
6.	05EG010	BRIGHTSAND LAKE NEAR ST WALBURG	SDOE	8L			REGINA
7.	05JE009	BROKENSHELL CREEK NEAR TROSSACHS	WSC	8Q			REGINA
8.	05KE008	CANDLE LAKE AT CANDLE LAKE	WSC	8L			PRINCE ALBERT
9.	05KA001	CARROT RIVER NEAR KINISTINO	WSC	8Q			PRINCE ALBERT
10.	06AD012	CHITEK LAKE AT CHITEK VILLAGE	SDOE	8L			REGINA
11.	05GG009	CHRISTOPHER LAKE NEAR CHRISTOPHER LAKE	SDOE	8L			REGINA
12.	05MC004	CONJURING CREEK NEAR PREECEVILLE	WSC	8Q			REGINA
13.	05KC002	CONNELL CREEK NEAR CONNELL CREEK	WSC	8Q			PRINCE ALBERT
14.	06AE002	COWAN LAKE NEAR HONEYMOON POINT	SDOE	8L			REGINA
15.	05FF003	CUTKNIFE CREEK NEAR CUTKNIFE	WSC	8Q			PRINCE ALBERT
16.	06AE004	DELARONDE LAKE NEAR BIG RIVER	SDOE	8L			REGINA
17.	05KF003	DESCHAMBAULT LAKE ON THE HANSON LAKE ROAD	SDOE	8L			REGINA
18.	05KB011	DOGHIDE RIVER NEAR RUNCIMAN	WSC	8Q			PRINCE ALBERT
19.	06AG003	DORE LAKE AT DORE LAKE	SDOE	8L			REGINA
20.	05LA003	DUCK CREEK NEAR KELVINGTON	WSC	8Q			PRINCE ALBERT
21.	05GC002	EAGLE CREEK NEAR ANGLIA	WSC	8Q			REGINA
22.	05GG008	EMMA LAKE NEAR TWEEDSMUIR	SDOE	8L			REGINA
23.	05EF006	ENGLISHMAN RIVER NEAR SPRUCE LAKE	WSC	8Q			PRINCE ALBERT

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	11AE016	FIFE LAKE NEAR LISIEUX	WSC	8L			REGINA
25.	05MB013	FISHING LAKE NEAR WADENA	SDOE	8L			REGINA
26.	05JC007	FLOWING WELL WEST INFLOW NEAR FLOWING WELL	WSC	8Q			REGINA
27.	05MB010	GOOD SPIRIT LAKE NEAR CANORA	SDOE	8L			REGINA
28.	05LB011	GREENWATER LAKE NEAR CHELAN	SDOE	8L			REGINA
29.	06AF010	GREIG LAKE NEAR DORINTOSH	SDOE	8L			REGINA
30.	05JF014	HUNTER CREEK NEAR RICHARDSON	WSC	8Q			REGINA
31.	05HG021	INVERNESS CREEK NEAR BRODERICK	WSC	8Q			REGINA
32.	05EG003	JACKFISH LAKE NEAR COCHIN	WSC	8L			PRINCE ALBERT
33.	05EG007	JACKFISH RIVER NEAR PRINCE	WSC	8Q			PRINCE ALBERT
34.	05KG010	JAN LAKE NEAR THE HANSON LAKE ROAD	SDOE	8L			REGINA
35.	05KE007	KELSEY CREEK NEAR GARRICK	WSC	8Q			PRINCE ALBERT
36.	05ND009	KENOSEE LAKE NEAR CARLYLE	WSC	8L			REGINA
37.	05LA007	KIPABISKAU LAKE NEAR MCKAGUE	SDOE	8L			REGINA
38.	06AF009	LAC DES ILES NEAR GOODSOIL	SDOE	8L			REGINA
39.	05HD028	LAC PELLETIER NEAR VESPER	WSC	8L			REGINA
40.	05HC004	LAKE DIEFENBAKER AT SASKATCHEWAN LANDING	WSC	8L			REGINA
41.	05JJ010	LANIGAN CREEK NEAR LANIGAN	WSC	8Q			REGINA
42.	05MB012	LAWRIE CREEK NEAR INSINGER	WSC	8Q			REGINA
43.	05KA011	LENORE LAKE NEAR MIDDLE LAKE	SDOE	8L			REGINA
44.	05KF002	LITTLE BEAR LAKE ON THE HANSON LAKE ROAD	SDOE	8L			REGINA
45.	05KB008	LITTLE BRIDGE CREEK NEAR ARMLEY	WSC	8Q			PRINCE ALBERT
46.	05JJ001	LITTLE MANITOU LAKE AT MANITOU BEACH	SDOE	8L			REGINA

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
47.	05MA002	LITTLE QUILL LAKE NEAR WYNYARD	SDOE	8L			REGINA
48.	05KE009	LOWER FISHING LAKE ON THE HANSON LAKE ROAD	SDOE	8L			REGINA
49.	05LB008	MACNAB CREEK NEAR SOMME	WSC	8Q			PRINCE ALBERT
50.	05LE012	MADGE LAKE NEAR KAMSACK	SDOE	8L			REGINA
51.	06AD014	MAKWA LAKE NEAR LOON LAKE	SDOE	8L			REGINA
52.	06AD009	MAKWA RIVER AT OUTLET OF MAKWA LAKE	WSC	8Q			PRINCE ALBERT
53.	05GA006	MANITO LAKE NEAR MARSDEN	SDOE	8L			REGINA
54.	05LB012	MAREAN LAKE NEAR CHELAN	SDOE	8L			REGINA
55.	06AD010	MEADOW RIVER BELOW MEADOW LAKE	WSC	12Q			PRINCE ALBERT
56.	05MA023	MILLIGAN CREEK NEAR WADENA	WSC	8Q			REGINA
57.	05JE002	MOOSE JAW RIVER NEAR LANG	WSC	8Q			REGINA
58.	06AD008	MORIN CREEK NEAR MEADOW LAKE	WSC	8Q			PRINCE ALBERT
59.	06AE003	MORIN LAKE NEAR VICTOIRE	SDOE	8L			REGINA
60.	05GB004	MUDDY LAKE INFLOW NEAR REVENUE	WSC	8Q			PRINCE ALBERT
61.	06CB003	NEMEIBEN LAKE NEAR LA RONGE	SDOE	8L			REGINA
62.	06AE001	NORBURY CREEK NEAR SPIRITWOOD	WSC	8Q			PRINCE ALBERT
63.	05GC007	OPUNTIA LAKE WEST INFLOW	WSC	8Q			REGINA
64.	05LD003	OVERFLOWING RIVER NEAR HUDSON BAY	WSC	8Q			PRINCE ALBERT
65.	05EG008	PAGE CREEK NEAR IFFLEY	WSC	8Q			PRINCE ALBERT
66.	05KG009	PELICAN LAKE AT PELICAN NARROWS	SDOE	8L			REGINA
67.	05LA004	PIPESTONE CREEK NEAR ROSE VALLEY	WSC	8Q			PRINCE ALBERT
68.	05LB010	PRAIRIE RIVER NEAR PRAIRIE RIVER	WSC	8Q			PRINCE ALBERT
69.	05GE001	RADOUGA CREEK NEAR BLAINE LAKE	WSC	8Q			PRINCE ALBERT

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
70.	05MA024	RANCH LAKE NEAR ST JAMES	SDOE	8L			REGINA
71.	05LA005	RED DEER RIVER NEAR ARCHERWILL	WSC	8Q			PRINCE ALBERT
72.	05GD003	REDBERRY LAKE NEAR KRYDOR	SDOE	8L			REGINA
73.	05MA016	ROMANCE CREEK NEAR WATSON	WSC	8Q			REGINA
74.	05JB002	RUSSELL CREEK NEAR VANGUARD	WSC	8Q			REGINA
75.	05JG001	SANDY CREEK NEAR CARON	WSC	8Q			REGINA
76.	05GF004	SHELL LAKE NEAR SHELL LAKE	SDOE	8L			REGINA
77.	05HC002	SNIPE LAKE NEAR ESTON	WSC	8L			REGINA
78.	05HC003	SNIPE LAKE NORTH INFLOW	WSC	8Q			REGINA
79.	05NB031	SOURIS RIVER NEAR BECHARD	WSC	8Q			REGINA
80.	05NB025	SOURIS RIVER NEAR LEWVAN	WSC	8Q			REGINA
81.	05NB030	SOURIS RIVER NEAR MCTAGGART	WSC	8Q			REGINA
82.	05HF004	SOUTH SASKATCHEWAN RIVER BELOW GARDINER DAM	WSC	12L			REGINA
83.	05GF003	STURGEON LAKE NEAR PRINCE ALBERT	SDOE	8L			REGINA
84.	05EG009	TURTLE LAKE NEAR GLASLYN	SDOE	8L			REGINA
85.	05HF022	UNNAMED CREEK NEAR CUTBANK	WSC	8Q			REGINA
86.	05MB011	VAN PATTENS CREEK NEAR KUROKI	WSC	8Q			REGINA
87.	05KA012	WAKAW LAKE NEAR WAKAW	SDOE	8L			REGINA
88.	05KA010	WALDSEA LAKE NEAR HUMBOLDT	SDOE	8L			REGINA
89.	06AF007	WATERHEN LAKE NEAR DORINTOSH	SDOE	8L			REGINA
90.	05ND008	WHITE BEAR (CARLYLE) LAKE NEAR CARLYLE	WSC	8L			REGINA
91.	05JC006	WIWA CREEK NEAR ST. BOSWELLS	WSC	8Q			REGINA
92.	05MB014	YORK LAKE NEAR YORKTON	SDOE	8L			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
NORMAL ACCESS				
	8L	8	0.25	2.00
	12L	1	0.40	0.40
	8Q	44	0.75	33.00
	12Q	1	1.00	1.00
TOTAL		54		36.40
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		54		36.40

SCHEDULE A

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SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
PROVINCIAL 2. SPECIFIC PURPOSE MONITORING

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05KH014	BIRCH RIVER MARSH NEAR CUMBERLAND HOUSE	DU	12L		REMOTE	PRINCE ALBERT
2.	05KH013	BIRCH RIVER NEAR MANITOBA BOUNDARY	SDOE	12Q		REMOTE	REGINA
3.	05HG014	BLACKSTRAP RESERVOIR AT SOUTH SIDE OF CAUSEWAY	SDOE	8L			REGINA
4.	05HG013	BRADWELL RESERVOIR AT PUMP STATION	SDOE	8L			REGINA
5.	05HG020	BRIGHTWATER CREEK NEAR PROCTOR LAKE	WSC	8Q			REGINA
6.	05HG006	BRIGHTWATER RESERVOIR AT RIPARIAN OUTLET	SDOE	8L			REGINA
7.	05HF017	BRODERICK RESERVOIR AT WEST EMBANKMENT	WSC	8L			REGINA
8.	05JJ008	DELLWOOD RESERVOIR AT PUMP STATION	SDOE	8L			REGINA
9.	11AE014	EAST POPLAR RIVER ABOVE COOKSON RESERVOIR	WSC	8Q			REGINA
10.	11AE015	GIRARD CREEK NEAR CORONACH	WSC	8Q			REGINA
11.	05HG003	PIKE LAKE NEAR SASKATOON	SDOE	8L			REGINA
12.	05JB006	RUSSELL CREEK RESERVOIR	WSC	8L			REGINA
13.	05HG008	S.S.E.P. EAST MAIN CANAL BELOW BLACKSTRAP RESERVOIR	WSC	8Q			REGINA
14.	05HG004	S.S.E.P. EAST MAIN CANAL BELOW BRIGHTWATER RESERVOIR	WSC	8Q			REGINA
15.	05HG019	S.S.E.P. EAST MAIN CANAL BELOW BRODERICK RESERVOIR	WSC	8Q			REGINA
16.	05HG009	S.S.E.P. EAST MAIN CANAL BELOW ZELMA RESERVOIR	WSC	8Q			REGINA
17.	05KD004	TOBIN LAKE AT SQUAW RAPIDS SPILLWAY	SDOE	12L			REGINA
18.	05JE008	WILCOX MAIN DITCH NEAR WILCOX	WSC	8Q			REGINA
19.	05JD005	WILLOWS COULEE RESERVOIR NEAR ASSINIBOIA	WSC	8L			REGINA
20.	05JC005	WOOD RIVER DIVERSION TO CHAPLIN LAKE	WSC	8Q			REGINA
21.	05HG012	ZELMA RESERVOIR AT PUMP STATION	SDOE	8L			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
PROVINCIAL 2. SPECIFIC PURPOSE MONITORING
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
NORMAL ACCESS				
	8L	3	0.25	0.75
	12L	0	0.40	0.00
	8Q	9	0.75	6.75
	12Q	0	1.00	0.00
TOTAL		12		7.50
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		12		7.50

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
DATA CONTRIBUTED BY OTHER AGENCY

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	11AE009	ROCK CREEK BELOW HORSE CREEK NEAR INTERNATIONAL BOUNDARY	USGS	12Q			HELENA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
DATA CONTRIBUTED BY OTHER AGENCY
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
NORMAL ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		0		0.00

SCHEDULE A

APR 01 1984

SASKATCHEWAN WATER QUANTITY STATIONS
1984-85
DATA CONTRIBUTED BY SASKATCHEWAN

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED · HYDROMETRIC	SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05HG016	BRIGHTWATER CREEK BELOW BRIGHTWATER RESERVOIR	SDOE	8Q			REGINA
2.	06BA001	CHURCHILL LAKE AT BUFFALO NARROWS	CRPC	12L			WINNIPEG
3.	06DB002	REINDEER RIVER AT OUTLET OF REINDEER LAKE	CRPC	12Q		REMOTE	WINNIPEG
4.	05HG010	S.S.E.P. BRADWELL INLET CANAL ABOVE BRADWELL RESERVOIR	SDOE	8Q			REGINA
5.	05JJ006	S.S.E.P. DIVERSION TO LITTLE MANITOU LAKE	SDOE	8Q			REGINA
6.	05HG005	S.S.E.P. MAIN CANAL ABOVE BLACKSTRAP RESERVOIR	SDOE	8Q			REGINA
7.	05HG007	S.S.E.P. MAIN CANAL ABOVE BRIGHTWATER RESERVOIR	SDOE	8Q			REGINA
8.	05HG011	S.S.E.P. MAIN CANAL ABOVE ZELMA RESERVOIR	SDOE	8Q			REGINA
9.	05JJ007	S.S.E.P. MAIN CANAL AT INLET TO DELLWOOD RESERVOIR	SDOE	8Q			REGINA
10.	05JJ005	S.S.E.P. MAIN CANAL OUTLET OF MANITOU PUMPING STATION	SDOE	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1984-85
DATA CONTRIBUTED BY SASKATCHEWAN
UNIT SUMMARY

	TYPE	NO. OF STATIONS	CONVERSION	UNITS
REMOTE ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
NORMAL ACCESS				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
INTERNATIONAL				
	8L	0	0.25	0.00
	12L	0	0.40	0.00
	8Q	0	0.75	0.00
	12Q	0	1.00	0.00
TOTAL		0		0.00
GRAND TOTAL		0		0.00

SASKATCHEWAN WATER QUANTITY NETWORK
STATIONS OPERATED BY WATER SURVEY OF CANADA
STATION CLASSIFICATION - TYPE - UNITS SUMMARY
1984-85

CLASSIFICATION	TYPE	NO. OF STATIONS	CONVERSION	UNITS
FEDERAL				
REMOTE ACCESS	8L	0	0.25	0.00
	12L	3	0.40	1.20
	8Q	0	0.75	0.00
	12Q	12	1.00	12.00
		15		13.20
NORMAL ACCESS	8L	8	0.25	2.00
	12L	10	0.40	4.00
	8Q	17	0.75	12.75
	12Q	23	1.00	23.00
		58		41.75
INTERNATIONAL	8L	15	0.25	3.75
	12L	4	0.40	1.60
	8Q	36	0.75	27.00
	12Q	8	1.00	8.00
		63		40.35
TOTAL		136		95.30
FEDERAL-PROVINCIAL				
REMOTE ACCESS	8L	0	0.25	0.00
	12L	2	0.40	0.80
	8Q	0	0.75	0.00
	12Q	15	1.00	15.00
		17		15.80
NORMAL ACCESS	8L	2	0.25	0.50
	12L	5	0.40	2.00
	8Q	87	0.75	65.25
	12Q	15	1.00	15.00
		109		82.75
TOTAL		126		98.55
PROVINCIAL				
NORMAL ACCESS	8L	11	0.25	2.75
	12L	1	0.40	0.40
	8Q	53	0.75	39.75
	12Q	1	1.00	1.00
TOTAL		66		43.90
GRAND TOTAL		328		237.75

7.3 SCHEDULE B: ANNUAL PAYMENTS - ITEMS TO BE INCLUDED

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

I OPERATIONAL COST WATER QUANTITY SURVEY STATIONS EXCLUDING SEDIMENT

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

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

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

d) Observer pay;

e) Depreciation, operation and maintenance of vehicles and boats

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

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

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

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

j) The annual cost of land leases;

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

II OPERATIONAL COST SEDIMENT STATIONS

All items in I 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.

7.4 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 the cost data from the latest available full fiscal year.

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

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

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

g) The total annual operation cost of the sediment stations listed in Schedule A will be the summation of the annual operating cost for 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 and 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.

7.5 SCHEDULE D: 1984-85

Schedule D to the Memorandum of Agreement is determined jointly by the Co-ordinating Committee Members for Saskatchewan and Canada and signed prior to April 1 of each year by the Administrators for Saskatchewan and Canada. This Schedule provides a summary of the annual payment to be made by the province and is included in this section.

SCHEDULE D - MEMORANDUM OF AGREEMENT

SASKATCHEWAN WATER QUANTITY SURVEYS

1984-85

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

ANNUAL PAYMENT FOR 1984-85 TO BE PAID TO CANADA BY SASKATCHEWAN

	Operation	Construction*	Total
a) Streamflow and water level installations	378 000	50 000	428 000
b) Sediment installations	-	-	-
TOTAL			$428 000

*Saskatchewan's share of maintenance, upgrading and construction of hydrometric gauging stations.

ADMINISTRATOR FOR SASKATCHEWAN

S.R. Blackwell
Executive Director
Water Management Service
Saskatchewan Department of the Environment

ADMINISTRATOR FOR CANADA

D.A. Davis
Regional Director
Inland Waters Directorate
Environment Canada

APPENDIX 5

STATION CHANGES TO 1985-86

SCHEDULE A
AND
COMPUTATION OF 1985-86
SCHEDULE D

8.1 CHANGES TO SCHEDULE A - SASKATCHEWAN FROM 1984-85 TO 1985-86

STATIONS ADDED TO NETWORK

	Station Name	Station Number	Record	Designation
1.	Codette Reservoir above the Spillway	05KD006	12L	P2
2.	Echo Creek at Fort Qu'Appelle	05JK008	8Q	P1

CHANGES IN STATION DESIGNATION

	Station Name	Station Number	Record	From	To
1.	North Saskatchewan River at Prince Albert	05GG001	12Q	F2	F4
2.	Saskatchewan River below Tobin Lake	05KD003	12Q	FP2	F2
3.	South Saskatchewan River at Saskatoon	05HG001	12Q	F2	FP3
4.	South Saskatchewan River at St. Louis	05HH001	12Q	F2	F4
5.	Theodore Reservoir near Theodore	05MB009	8L	F2	FP2
6.	Tobin Lake at Squaw Rapids Spillway (SWC)	05KD004	12L	P2	F2

CHANGES IN STATION NAME

	Station Name	Station Number	To
1.	Broderick Irrigation Canal below Pumping Station	05HF007	Broderick Irrigation Main Canal below Pumping Station
2.	Huff Lake near Val Marie	11AC063	Huff Lake
3.	Middle Fork Poplar River at International Boundary	11AE008	Poplar River at International Boundary
4.	Moosomin Reservoir near Moosomin	05NE002	Moosomin Lake near Moosomin
5.	Newton Lake near Val Marie	11AC056	Newton Lake
6.	Thymehill River below Mackenzie Lake	06DB003	Thyme Hill River below Mackenzie Lake

CHANGES IN OPERATIONS CENTRE

	Station Name	Station Number	From	To
1.	Amisk Lake near Flin Flon	05KG003	Winnipeg	Prince Albert
2.	Sturgeon-Weir River at Outlet of Amisk Lake	05KG002	Winnipeg	Prince Albert

8.2 ESTIMATED COST OF SCHEDULE D - SASKATCHEWAN: 1985-86

A Hydrometric Station

	No. of Stations	No. of Units	Unit* Cost	Approx Total Cost	Provincial Share
Federal					
Normal Access	57	41.50	3980	165 200	0
Remote Access	15	13.20	7560	99 800	0
International	63	40.35	4810	194 100	0
Sub Total	135	95.05		459 100	0
Federal-Provincial					
Normal Access	110	83.00	3980	330 300	165 150
Remote Access	17	15.80	7560	119 500	59 750
International	0	0		0	0
Sub Total	127	98.80		449 800	224 900
Provincial					
Normal Access	68	45.05	3980	179 300	179 300
Remote Access	0	0	7560	0	0
International	0	0	4810	0	0
Sub Total	68	45.05		179 300	179 300
Total	330	238.90		1 088 200	404 200
Federal Stations Operated by Province	1	0.40	3980	1 600	(1 600)

B Construction

a) Streamflow and water level stations

Sask Water	25 525
SPC	43 000
Total	68 525

C Total Provincial Share = 404 200 - 1 600 + 68 525
= 471 000 (actually 471 125)

For Schedule D breakdown as

Operating	403 000	
Construction	25 000	Sask Water
	43 000	SPC
	471 000	

* 10% increase over actual 1983/84 costs

APPENDIX 6

NATIONAL GUIDELINES FOR DESIGNATION OF FEDERAL AND PROVINCIAL RESPONSIBILITY FOR WATER QUANTITY SURVEY STATIONS

9.0 NATIONAL GUIDELINES FOR DESIGNATING WATER QUANTITY SURVEY STATIONS

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

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

FEDERAL STATIONS

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

1. Federal Departmental Programs

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

2. Interprovincial Waters

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

3. International Waters

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

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

(b) Stations specifically stipulated under IJC orders, or required to support such orders; to provide for control of waters crossing or forming part of the international boundary and for IJC related study, surveillance, flow regulation or apportionment purposes. Such stations may also be required for similar studies carried out under unilateral or bilateral mechanism 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 program 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 per cent 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 as 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 Coordinating Committee.