Environment Canada
Environmental Conservation Service

Environnement Canada
du Service de la Conservation d'environnement

Inland Waters Directorate
Western and Northern Region

Direction générale des eaux intérieures
Région de l'Ouest et du Nord

CANADA - SASKATCHEWAN
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS
ANNUAL REPORT 1985 - 1986

September, 1986

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 1985-86.

Saskatchewan

A.B. Banga
Saskatchewan Water Corporation

Canada

B. N. Johnson
Environment Canada

Members
Saskatchewan Co-ordinating Committee

August, 1986

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. A.B. Banga, Saskatchewan Water Corporation as the member for Saskatchewan; changes to 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 1985-86 program was completed satisfactorily following below normal flows in much of southern Saskatchewan during the spring of 1985 and high flows in central and northern areas. Southern areas experienced a dry summer. September and October were cool and wet and winter began in earnest in November. An early runoff was recorded in 1986 throughout much of Saskatchewan.

Eight DCPs were installed during the year and an additional 13 units ordered. There were 29 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 50 sites. Station upgrading occurred at an additional 13 sites. Construction expenditures during 1985-86 were $147 478 (federal) and $47 296 (provincial).

The federal share of 1985-86 program costs was $832 307; the provincial share was $488 654. A provincial deficit carryover of $748 from 1984-85 and a 1985-86 payment of $471 000 results in a provincial deficit of $18 402 for 1985-86 operations. The Schedule D costs for the 1986-87 fiscal year are estimated at $508 000, which includes $50 000 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 eleventh 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 4. The report contains brief summaries of the two Co-ordinating Committee meetings convened during the fiscal year ending March 31, 1986 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 1985-86 are provided in the report. The federal share of 1984-85 program costs was $832 307; the provincial share was $488 654. A provincial deficit carryover of $748 from 1984-85 and a 1985-86 payment of $418 700 results in a provincial deficit of $18402 for 1985-86 operations. The costs for the 1986-87 fiscal year are estimated at $508 000 in Schedule D, which includes $50 000 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 October 31, 1985 and March 11, 1986. 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 - October 31, 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, Water Resources Branch (WRB).

The financial outlook for 1985-86 was discussed at this meeting. It was apparent that the Schedule D amount for hydrometric construction on behalf of the Saskatchewan Power Corporation (SPC) would not be fully utilized and it was agreed that SPC should be notified.

Several items pertaining to telemetry projects were discussed. These included: implementation of a DCP service schedule; installation of DCPs for SPC and replacement of obsolete telemetry.

Network planning was also discussed at this meeting. This included such items as problem stations, progress of construction, hydrometric station profiles and changes to Schedule A for 1986-87. The draft hydrometric construction plan for the next fiscal year was reviewed and preliminary priorities were assigned.

The proposed cost-sharing formula for the WRB minicomputer system was discussed and accepted by both parties. It was noted that the cost ceiling would likely be reached this fiscal year.

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

2.1.2 Co-ordinators' Meeting - March 11, 1986

The meeting was attended by Mr. A.B. Banga, the member for Saskatchewan, Mr. B.N. Johnson, the member for Canada, and Mr. R. Herrington, WRB. It was noted that Mr. D.R. Richards had recently assumed other responsibilities within Sask Water. Mr. A.B. Banga has been appointed the new member for Saskatchewan.

Federal restraint initiatives continued to adversely affect WRB staffing. One proposed position within WRB Saskatchewan has been deleted and staffing of the Regional Chief and Construction Engineer positions is on hold.

The financial outlook for 1986-87 was discussed. It was noted that the outlook for the next fiscal year is for a 7% reduction in the total WRB budget, which includes a 37% decrease in capital. It was uncertain what impact this reduction would have on operations. It was expected that Schedule D would be $398 000 for operations and $110 000 for construction. The latter figure would include $50 000 for work to be done on behalf of SPC.

The status of the WRB hydrometric network evaluation and planning activities was reviewed. A report is in preparation which evaluates the network required to satisfy present and near-term future federal water management responsibilities and addresses the network required for regional hydrological information needs. The report should be completed by April 1, 1986.

The proposed 1986-87 construction program was reviewed in terms of provincial priorities and priorities were established.

Other items discussed were: the status of hydrometric data computations; changes to Schedule A for 1986-87; South Saskatchewan River and Lake Diefenbaker surveys; hydrometric station profiles; and, the review of the provincial satellite station network.

2.2 OPERATIONAL CONSIDERATIONS

2.2.1 Surface Water Conditions

Spring runoff in 1985 was generally below normal in the southwest and southeast while runoff volumes in the Assiniboine River basin were high. Runoff in the west-central area was uneventful. In the Meadow Lake and Lloydminister area flows were about normal but flows for several streams in the Prince Albert area equalled or exceeded previously measured values. This was the result of a combination of snowmelt and heavy rainfall on April 20. Further east, flows in the Carrot River basin were also high but lower than recorded previously. Many roads were washed-out in this area and a

train derailment occurred as a result of a wash-out. Flows in northern Saskatchewan were high with maximum recorded peaks being equalled or exceeded at several gauging stations.

A severe storm was recorded in southeast Saskatchewan in early August with 355 mm of precipitation being recorded in a 24 hour period at Parkman. This far exceeded any point value ever documented on the Prairies and was the third largest recorded 24-hour rainfall in Canada. However, in spite of the intensity, only localized erosion and flooding were recorded. Measured streamflows in the area were not extreme due to the location of our gauging stations with respect to the storm centre and the very dry soil conditions before the storm.

September and October were cool and wet. Twenty centimetres of snow fell in the Cypress Hills in early October. This resulted in increased soil moisture levels and caused several streams to start flowing again after being dry for two months. Flows in the southeast increased considerably as a result of the wet weather.

Winter began early with extremely cold temperatures being recorded in November. Snowfall during the month was recorded throughout much of the province.

Very warm, temperatures in mid-January resulted in snow pack consolidation and runoff in southwest Saskatchewan. Spring occurred in the south in late February with flows being recorded in the lower Souris River basin and throughout much of the southwest and

west central areas, several weeks earlier than normal. Streamflow volumes and peaks were very low in most areas.

2.2.2 Hydrometric Operations

Data computations and hydrometric field work were completed as scheduled during the year. This was a significant achievement as one hydrometric technician position was vacant for part of the year and early spring runoff in 1986 necessitated additional field work during the normal data computation period. In part, this achievement was aided by the new WRB computer system which improved both the efficiency and quality of data computation. Vacancies were experienced during the fiscal year in various support positions. These included a project engineer, studies engineer and a construction engineer. The Acting Regional Chief appointment continued.

The number of stations equipped with satellite telemetry systems (Data Collection Platforms) increased during the year to 29 stations. Seven DCPs and peripheral equipment were installed in June 1985 at northern stations and one was installed in southwest Saskatchewan to assist in monitoring flows for international and interprovincial apportionment. There are now five active platforms in the southwest area. Eight platforms and peripheral equipment were received in support of the national remote program but were not installed due to their late arrival. Similarly, five units were received at the end of the fiscal year for installation at stations of interest to SPC. These 13 units will be installed in 1986.

Cost savings continue to be realized as a result of the DCP program. 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 have been reduced for the remote station coverage as the DCPs at several locations indicated that all equipment was operating satisfactorily and no unusual flow conditions were apparent. Consequently, these stations were not visited. It is anticipated that future installation of telemetry systems at other locations will produce similar savings. Two 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 completed during the year. This review identified the present and near-term future federal water management responsibilities and regional hydrology needs. The sediment survey program requirements were also reviewed. Recommendations were presented to improve planning and evaluation, the management process and technical capability.

As an ongoing commitment to hydrometric network review, hydrometric station profiles were prepared in draft form for all the hydrometric 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 profiles will be finalized in 1986-87.

A bucket survey was undertaken by personnel from Atmospheric Environment Service (AES) on the August 3-4, 1985 storm centred on Parkman in southeastern Saskatchewan. This storm represented the largest point value ever documented on the Prairies and was the third largest recorded 24-hour rainfall in Canada. Prompt hydrometric field coverage was obtained upon notification by AES officials.

A joint WRB-Sask Water project was undertaken in September on the South Saskatchewan River below Gardiner Dam. This project involved surveying river cross-sections at 16 predetermined locations and collecting bed material samples for analysis. The results will be analyzed and compared to previous surveys to determine degradation and aggradation changes within this 40 km section of the river. The last survey was undertaken in 1980.

During the year SPC expressed considerable interest in the hydrometric program operated by WRB in Saskatchewan. In July WRB took the lead in a measurement program below the Churchill River Island Falls generating station. This field program was designed to rate the flow through several generating units and also verified the flow records obtained at the hydrometric station below the plant.

A request was made by SPC through Sask Water for additional monitoring of the Churchill River system. WRB subsequently constructed a station on the Reindeer River to monitor outflows

below Whitesand Dam. Five DCP systems were purchased on behalf of SPC. Two of these have been installed at the Reindeer River site and at Churchill River above Otter Rapids. The remaining units will be installed in 1986.

Several reconnaissance trips were completed during the year to identify potential gauging station sites above and below the Island Falls generating station. As a result, hydrometric stations will be constructed in 1986 for SPC at Churchill River at Wintego Rapids and Churchill River at Maple Leaf Rapids. These stations will also be equipped with DCP systems.

A meeting was held in January with officials from Sask Water, SPC and WRB at Nipawin to discuss water management and monitoring in the Lower Saskatchewan River system. Decisions were made on the future direction of the hydrometric program in this area.

Training of hydrometric staff was undertaken during the year in areas related to safety. Workshops were held in water rescue techniques and transportation of dangerous goods. Technical training sessions were also provided as required during the year.

2.2.3 Construction Activities

Sixty-four 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 50 stations while station upgrading occurred at an additional 13 sites. One new provincial streamflow station was constructed as well.

The construction program included the installation of the following:

Shelters

a) 1 - new wired shelter

b) 8 - new unwired shelter

c) 3 - relocated

Stilling Wells

a) 2 - new wood stave stilling well

b) 2 - wood stave well extensions in place

Artificial Controls

a) 1 - steel sheet piling controls repaired

b) 5 - rock controls repaired or built

c) 1 - concrete weir

Cableways

a) 1 - new

b) 2 - repaired

Bench Marks

a) 16 - screw-type

b) 2 - rod-type

c) 2 - brass plugs

A safety inspection program is ongoing in the Saskatchewan district. Field inspection report forms were completed for each cableway in the province. These report forms are used to evaluate the safety of these structures and are used to determine upgrading and maintenance priorities for the upcoming year.

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.

Three lightweight two-man aluminum cable cars were built during the year. The design enables easy and quick installation or removal, transportation in a station wagon and storage in an instrument shelter. They will primarily be used at constantly-vandalized sites and will be removed after each measurement.

A Trenton-type reinforced concrete weir was constructed at the Frenchman River at International Boundary to replace one that had deteriorated. The weir is V-shaped and has a crest length of 20 m. Steel sheet piling was used to form upstream and downstream cut-off walls. The project was carried out by the construction crew with considerable assistance from the hydrometric staff.

As an experiment, an insulated lower intake was installed at one station. A 3 NPS black steel pipe was insulated with 76 mm of polyurethane foam. The foam was protected with treated planks and treated plywood. The intake worked well through its first spring runoff.

All projects identified for the 1985-86 Saskatchewan hydrometric construction program were subjected to a preliminary assessment to determine potential adverse environmental effects. Fourteen projects were subsequently screened as required by the federal Environmental Assessment and Review Process but none was judged to result in significant alteration to the natural environment.

Construction expenditures during 1985-86 were $147 478 (federal) and $47 296 (provincial). Details of the construction program are documented in the 1985-86 Saskatchewan Construction, Upgrading and Maintenance Annual Report.

2.3 NETWORK DEVELOPMENT

2.3.1 Network changes for 1985-86

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 (1984-85) are shown in Figure 1 and summarized as follows:

Stations Added to the Network

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

Responsibility Centre Changes

	Station Name	Station Number	From	To
1.	Amisk Lake near Flin Flon (FP2)	05KG003	Winn	P.A.
2.	Sturgeon-Weir River at Outlet of Amisk Lake (FP3)	05KG002	Winn	P.A.

Station Classification Changes

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

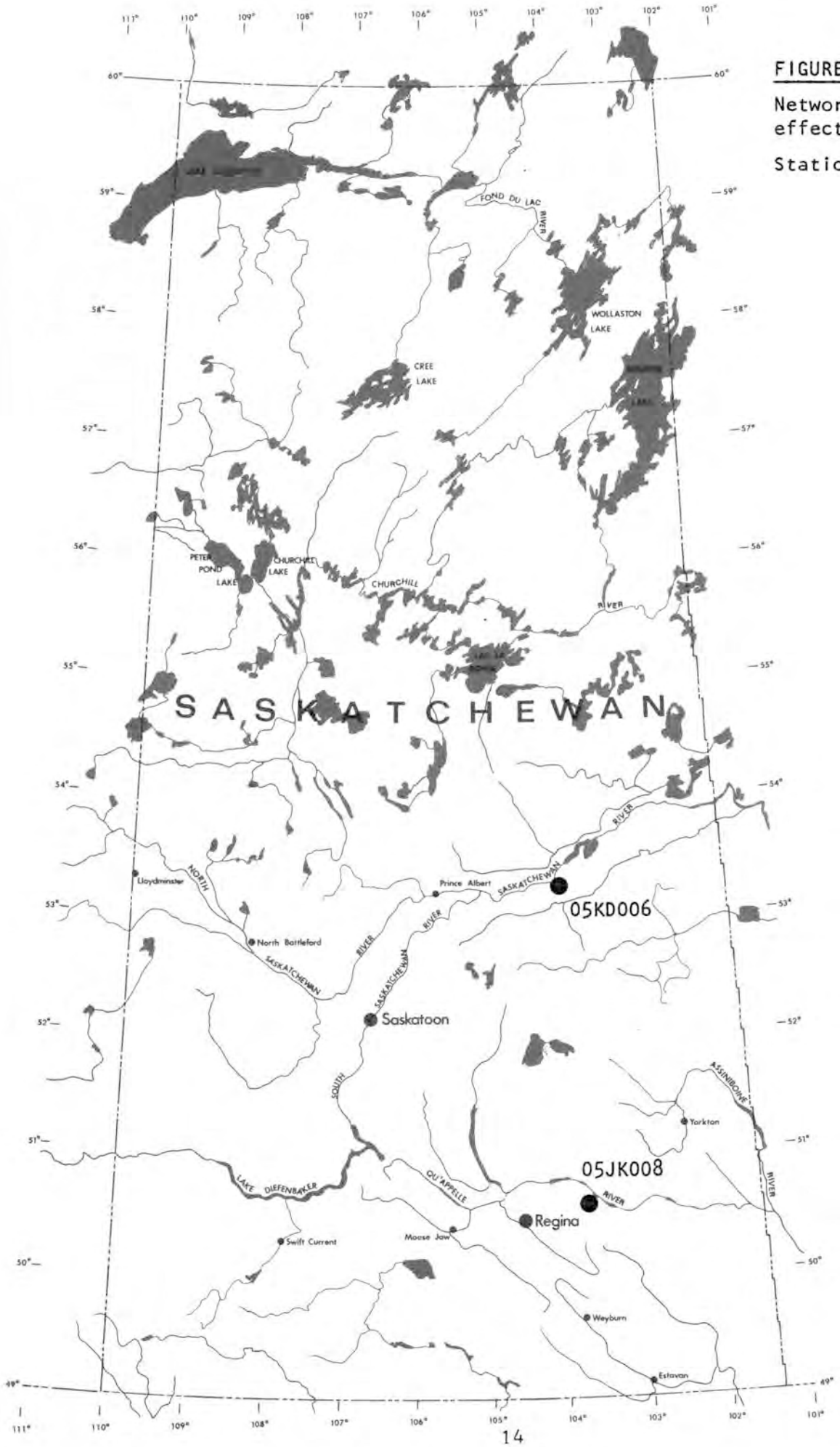

FIGURE 1

Network changes effective April 1, 1985

Stations added = ●

Station Name/Number Changes

	Station Name	Station Number	Change to
1.	Broderick Irrigation Canal below Pumping Station (F2)	05HF007	Broderick Irrigation Main Canal below Pumping Station
2.	Huff Lake near Val Marie (F3)	11AC063	Huff Lake
3.	Middle Fork Poplar River at International Boundary (F3)	11AE008	Poplar River at International Boundary
4.	Newton Lake near Val Marie (F3)	11AC056	Newton Lake
5.	Moosomin Reservoir near Moosomin (FP2)	05NE002	Moosomin Lake near Moosomin
6.	Thymehill River below Mackenzie Lake (FP3)	06DB003	Thyme Hill River below Mackenzie Lake

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 - 4. 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:

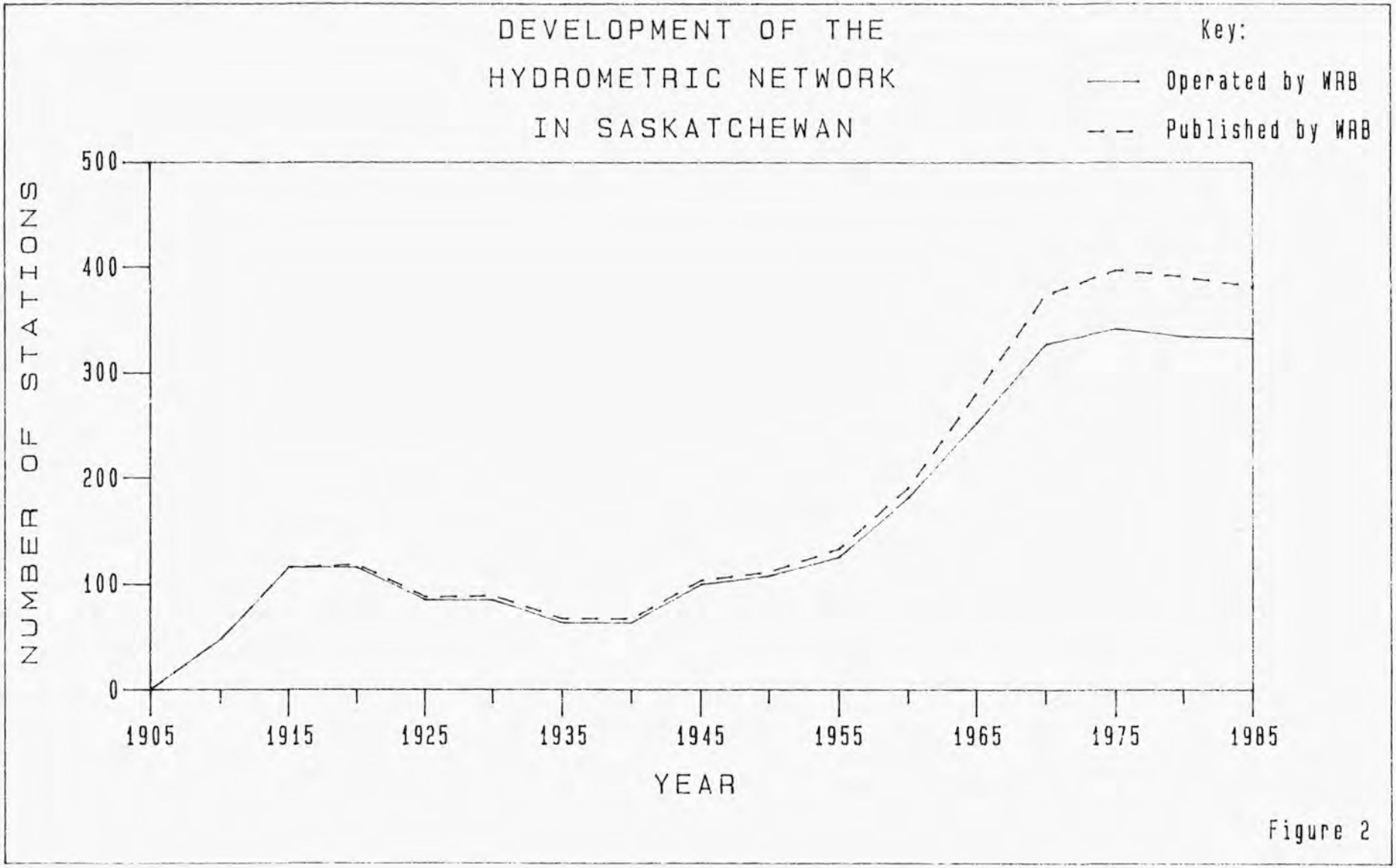
DEVELOPMENT OF THE
HYDROMETRIC NETWORK
IN SASKATCHEWAN
Key:
Operated by WRB
Published by WRB
NUMBER OF STATIONS
500
400
300
200
100
0
1905
1915
1925
1935
1945
1955
1965
1975
1985
YEAR

Figure 2

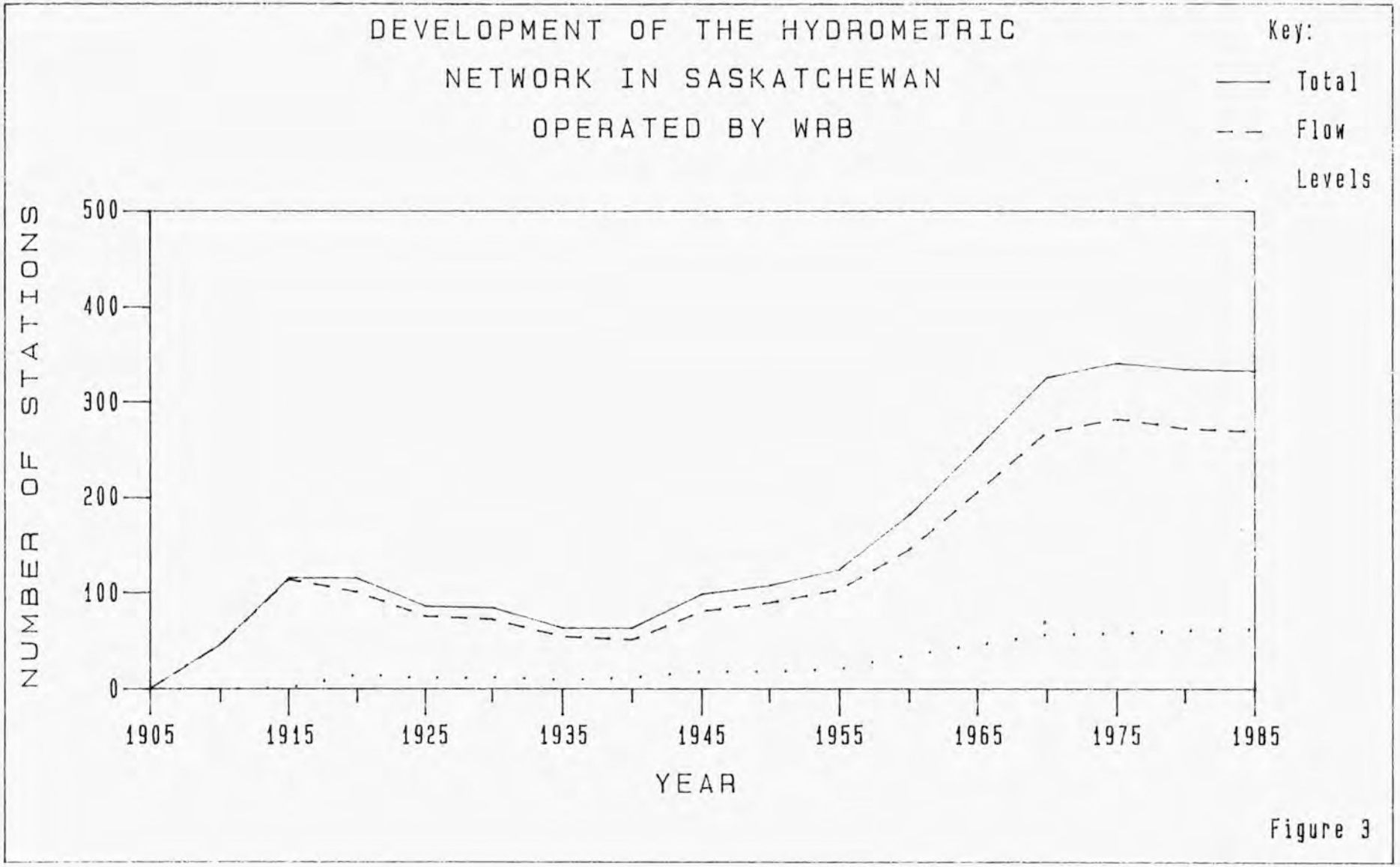
DEVELOPMENT OF THE HYDROMETRIC
NETWORK IN SASKATCHEWAN
OPERATED BY WRB
Key:
Total
Flow
Levels
NUMBER OF STATIONS
500
400
300
200
100
0
1905
1915
1925
1935
1945
1955
1965
1975
1985
YEAR

Figure 3

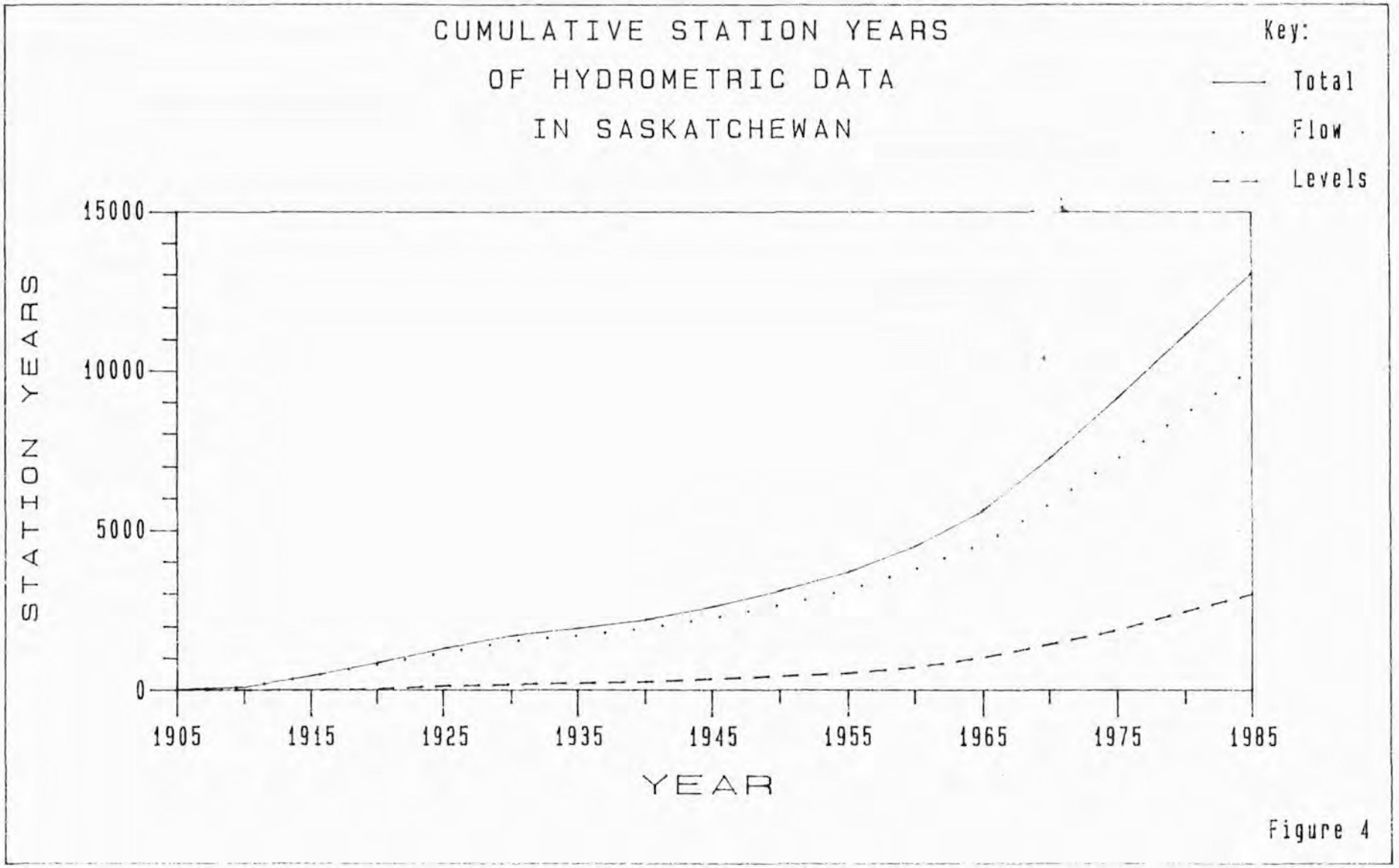
CUMULATIVE STATION YEARS
OF HYDROMETRIC DATA
IN SASKATCHEWAN
Key:
Total
Flow
Levels
STATION YEARS
15000
10000
5000
0
1905
1915
1925
1935
1945
1955
1965
1975
1985
YEAR

Figure 4

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	0
1985-86	2	0
Total	109	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, 1985, and the stations deleted from the Schedule represent 11% of the network.

In addition to the 151 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 1985-86 while the provincial category represented 16% in 1975-76 and 30% in 1985-86. Figure 5 illustrates the changing nature of designated responsibility of the hydrometric network operated by WRB since the inception of the cost-sharing agreement.

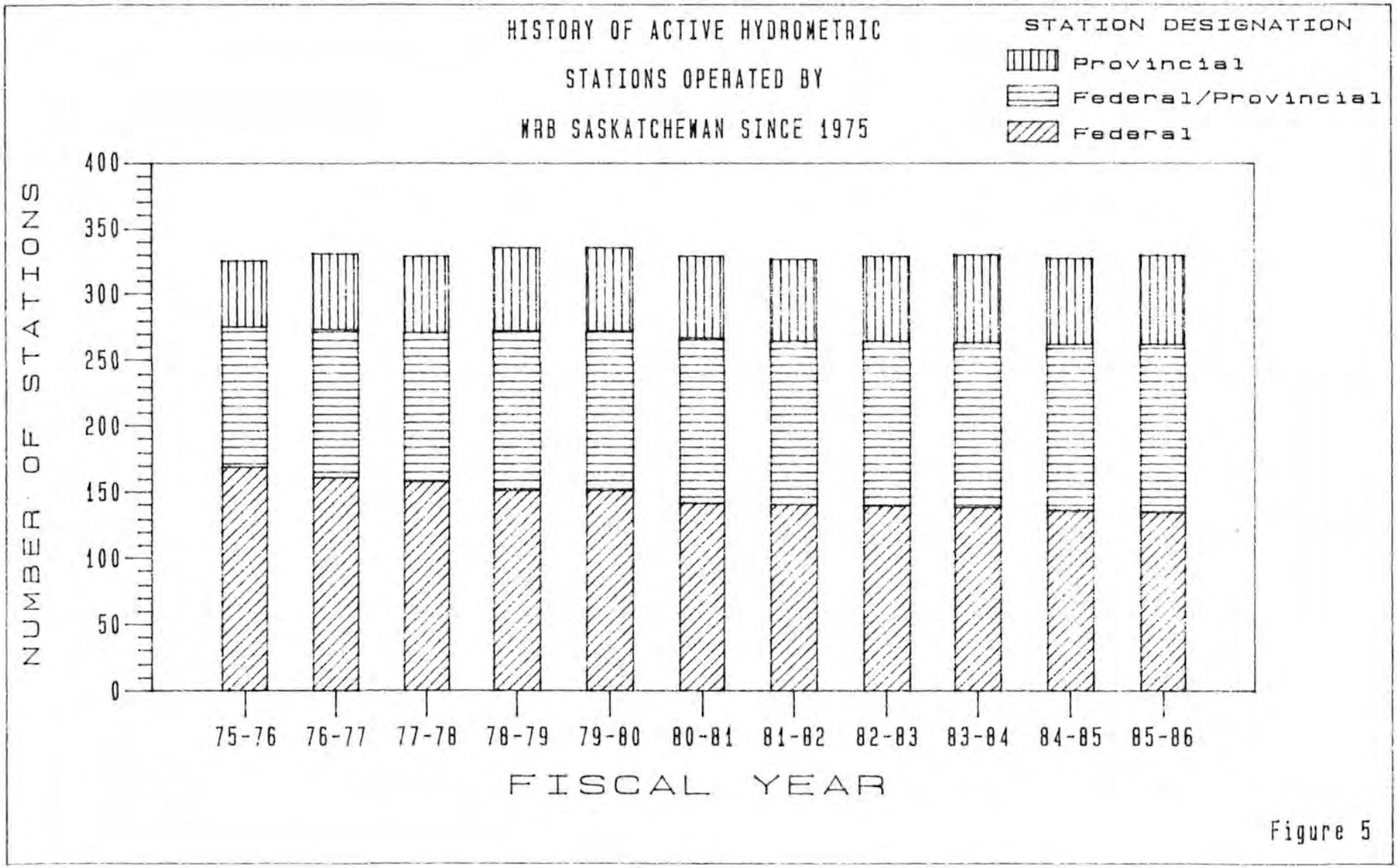
HISTORY OF ACTIVE HYDROMETRIC
STATIONS OPERATED BY
WRB SASKATCHEWAN SINCE 1975
STATION DESIGNATION
Provincial
Federal/Provincial
Federal
NUMBER OF STATIONS
400
350
300
250
200
150
100
50
0
75-76
76-77
77-78
78-79
79-80
80-81
81-82
82-83
83-84
84-85
85-86
FISCAL YEAR

Figure 5

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, 1985. 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: 1985-86

Station unit costs and total network costs for salary, operations and maintenance, and capital for 1985-86 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
1985-1986

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	7	0.25	1.75
	12L	10	0.40	4.00
	8Q	17	0.75	12.75
	12Q	23	1.00	23.00
		57		41.50
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		135		95.05
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	3	0.25	0.75
	12L	5	0.40	2.00
	8Q	87	0.75	65.25
	12Q	15	1.00	15.00
		110		83.00
Total		127		98.80
Provincial				
Normal Access	8L	11	0.25	2.75
	12L	2	0.40	0.80
	8Q	54	0.75	40.50
	12Q	1	1.00	1.00
Total		68		45.05
Grand Total		330		238.90

* 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 1985-1986

Unit Cost Summary

STATION CLASSIFICATION	UNIT	SALARY $	OPERATIONS $	CAPITAL $	TOTAL $
1. Normal Access					
- Non-International	1.0	2411	1313	339	4063
- International	1.0	3375	1094	339	4808
2. Remote Access	1.0	2652	4286	339	7277

Total Cost Summary

STATION CLASSIFICATION	NO. OF STATIONS	UNITS	SALARY $	OPERATIONS $	CAPITAL $	TOTAL $
Federal						
Remote	15	13.20	35 009	56 574	4 481	96 064
Normal						
- Non-International	57	41.50	100 060	54 470	14 088	168 618
- International	63	40.35	136 202	44 136	13 698	194 036
						458 718
Federal-Provincial						
Remote	17	15.80	41 905	67 717	5 364	114 986
Normal	110	83.00	200 119	108 940	28 177	337 236
						452 222
Provincial						
Normal	68	45.05	108 618	59 129	15 294	183 041
Total	328	238.90	621 913	390 966	81 102	1 093 981

Overall hydrometric salary costs in 1985-86 were virtually unchanged from the previous year. Although the shareable person-years was slightly lower in 1985-86, this was offset by higher overtime costs. No general salary increases were experienced by hydrometric personnel during the fiscal year as the collective agreement was under negotiation. Significant salary increases can be expected in 1986-87, however.

The total shareable program operations and maintenance costs in 1985-86 increased 18% over the previous fiscal year. This increase can be attributed to several items. Higher travel costs were incurred due to a normal spring runoff in 1985 and a much earlier than normal runoff in 1986. Significant purchases of materials and parts and consumable tools were made during the year as WRB's Equipment Calibration and Development Unit was transfered from Calgary to Saskatoon and stockpiling was recommended during the expected lengthy transition phase. Also, current meter maintenance costs were not charged to the Agreement on 1984-85 but were in 1985-86. Finally, vehicle operating costs were higher during 1985-86 due to the timing of spring runoff in 1986 and significant vehicle repairs.

As expected from the foregoing, the total and unit operating costs for normal and international stations increased significantly in 1985-86 compared to the previous fiscal year. However, the cost of operating a remote station remained essentially unchanged during this period. This was primarily due to the fact that travel costs for spring runoff monitoring are not applicable to a remote area and aircraft rentals were lower as no propane resupply trip was undertaken during the fiscal year.

Table 3 and Figure 6 summarize the Saskatchewan water quantity surveys program shared costs for 1985-86. The total federal share was $832 307 while the total provincial share was $488 654. The provincial deficit from 1984-85 of $748 and the provincial payment for 1985-86 of $471 000 results in a provincial deficit for 1985-86 operations $18 402. It should be noted that $55 014 was spent on work done and equipment purchased on behalf of SPC. This exceeded the schedule D estimate of $43 000 but the Schedule D value for SPC work in 1986-87 should be reduced accordingly. Therefore, the "apparent" provincial deficit is $6 388.

Table 4 and Figures 7 to 9 show the change (increase) in station unit costs since the implementation of the cost sharing agreement of 1975.

3.3 COST ESTIMATES: 1986-87

Changes affecting the 1986-87 Schedule A and the computation of the 1986-87 Schedule D estimate of $508 000, including work to be done for SPC ($50 000), are contained in Appendix 5.

TABLE 3

SASKATCHEWAN WATER QUANTITY PROGRAM
SHARED COST SUMMARY 1985-1986
(From Table 2 & Construction Report)

FEDERAL SHARE = $458 718 + $\frac{\$452\ 222}{2}$	=	$684 829
FEDERAL CONSTRUCTION SHARE	=	$147 478
TOTAL FEDERAL SHARE	=	$832 307
PROVINCIAL SHARE = $183 041 + $\frac{\$452\ 222}{2}$	=	$409 152
PROVINCIAL CONSTRUCTION SHARE[1]	=	$ 47 296
ADDITIONAL CAPITAL PURCHASES ON BEHALF OF SPC[2]	=	$ 33 279
CAPITAL PURCHASES ON BEHALF OF SASK WATER[3]	=	$ 540
PROVINCIAL CREDIT FOR OPERATION OF ONE FEDERAL STATION[4]	=	($ 1 613)
TOTAL PROVINCIAL SHARE	=	$488 654
PROVINCIAL DEFICIT (from 1984-85)	=	$ 748
NET PROVINCIAL SHARE	=	$489 402
PROVINCIAL PAYMENT 1985-86	=	($471 000)
PROVINCIAL DEFICIT FOR 1985-86	=	$ 18 402

[1] Includes $21 735 for work done and capital purchases for SPC

[2] Includes DCP installation at Reindeer River above Devil Rapids

[3] 4 Electric Tape Gauges

[4] 05KD004 Tobin Lake at Squaw Rapids Spillway

WATER QUANTITY PROGRAM - SHARED COST SUMMARY

Figure 6

(1985-86)

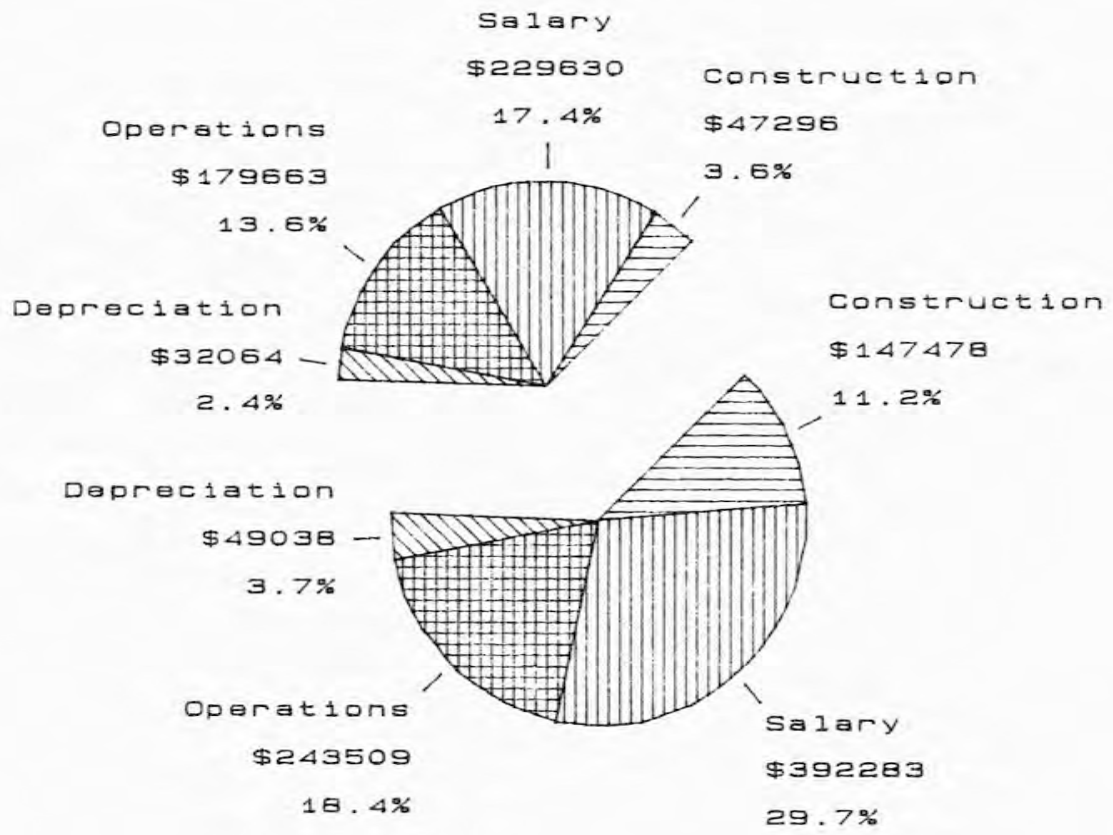

TABLE 4

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%
1985-86	$4 063	8.6%	$4 808	7.5%	$7 277	0.5%
1975-85	-	156.7%	-	165.6%	-	99.8%

Average percent increase for all stations since 1975-76 = 140.7%

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

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

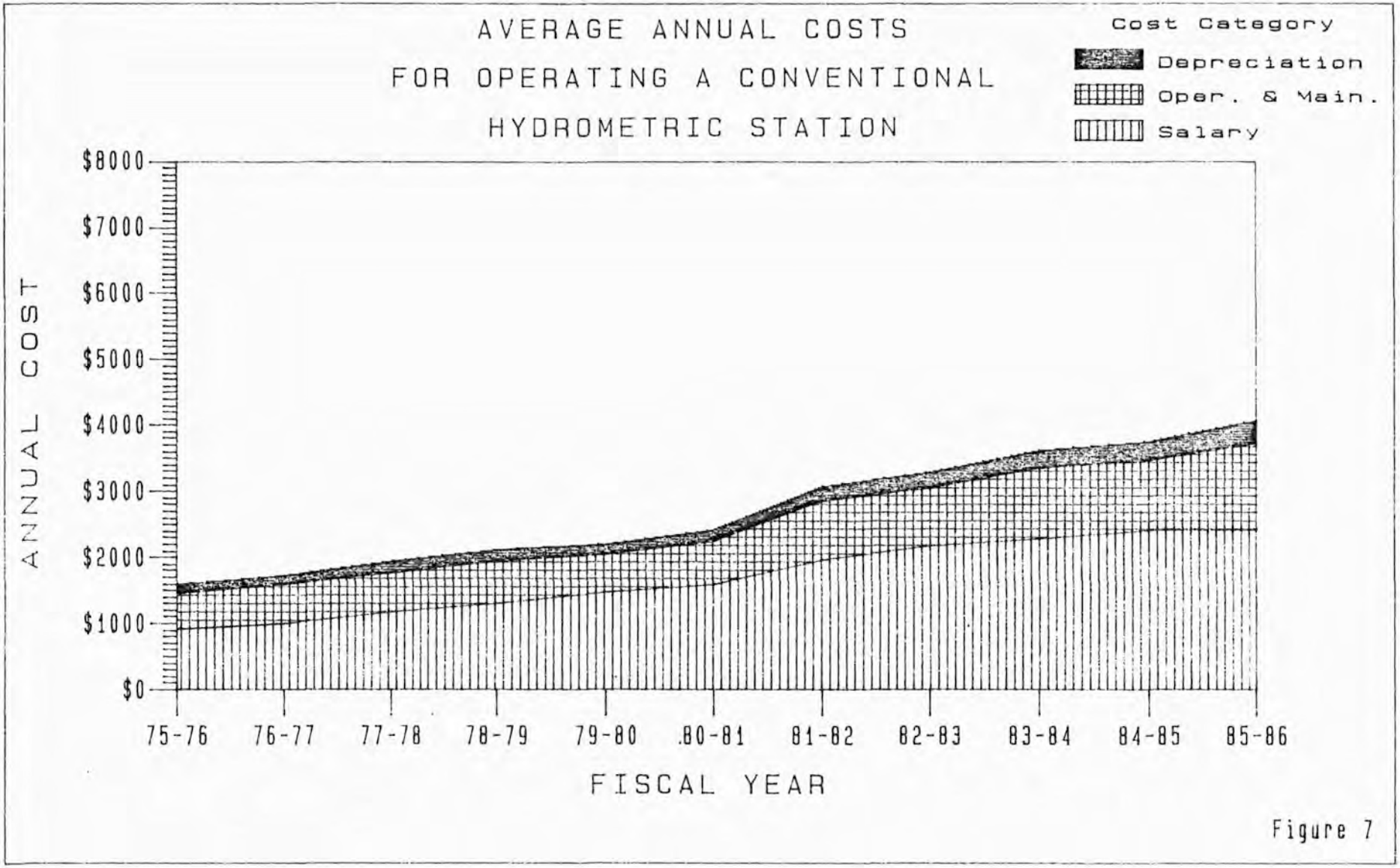
AVERAGE ANNUAL COSTS
FOR OPERATING A CONVENTIONAL
HYDROMETRIC STATION
Cost Category
Depreciation
Oper. & Main.
Salary
ANNUAL COST
$8000
$7000
$6000
$5000
$4000
$3000
$2000
$1000
$0
75-76
76-77
77-78
78-79
79-80
80-81
81-82
82-83
83-84
84-85
85-86
FISCAL YEAR

Figure 7

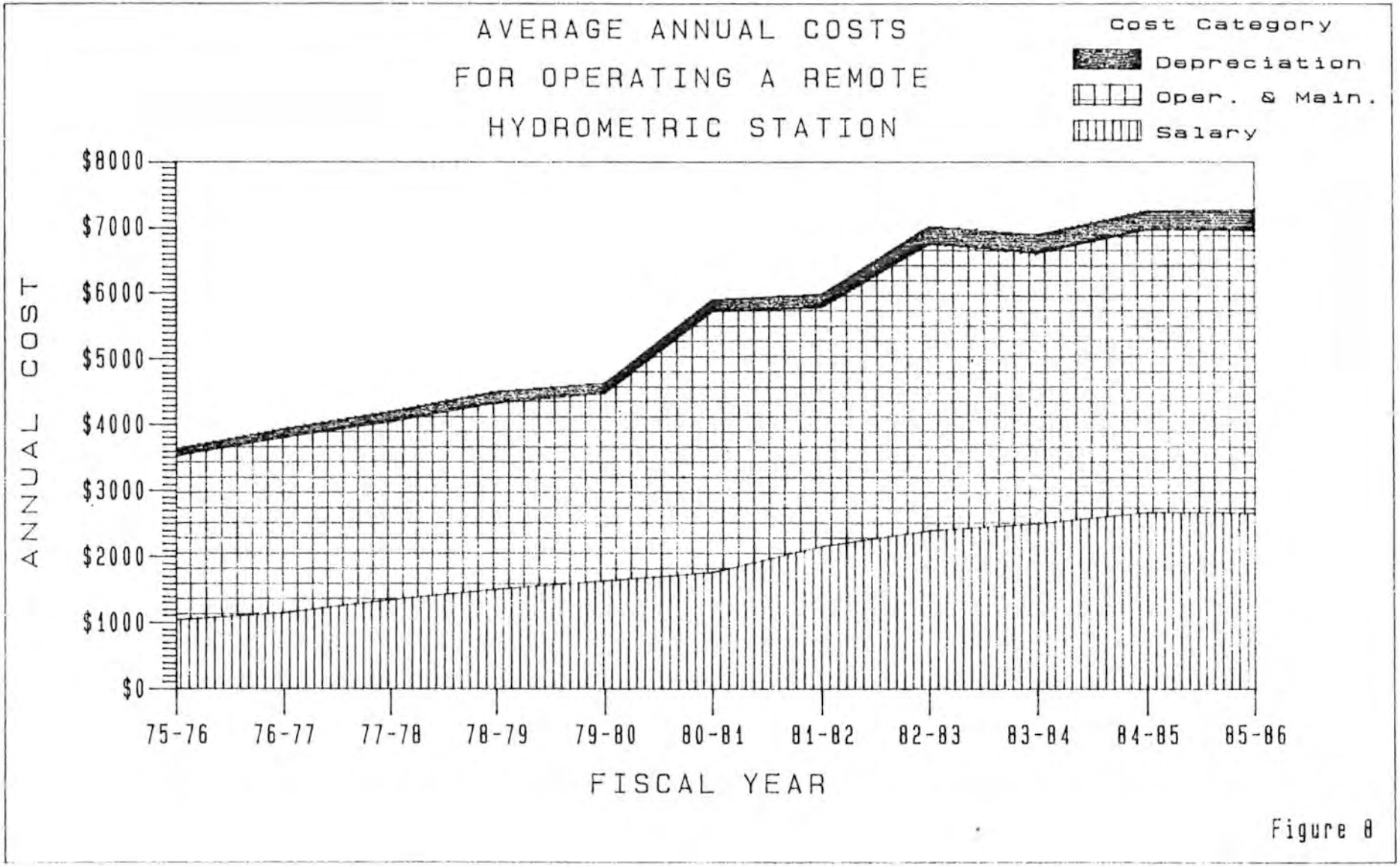
AVERAGE ANNUAL COSTS
FOR OPERATING A REMOTE
HYDROMETRIC STATION
Cost Category
Depreciation
Oper. & Main.
Salary
ANNUAL COST
$8000
$7000
$6000
$5000
$4000
$3000
$2000
$1000
$0
75-76
76-77
77-78
78-79
79-80
80-81
81-82
82-83
83-84
84-85
85-86
FISCAL YEAR

Figure 8

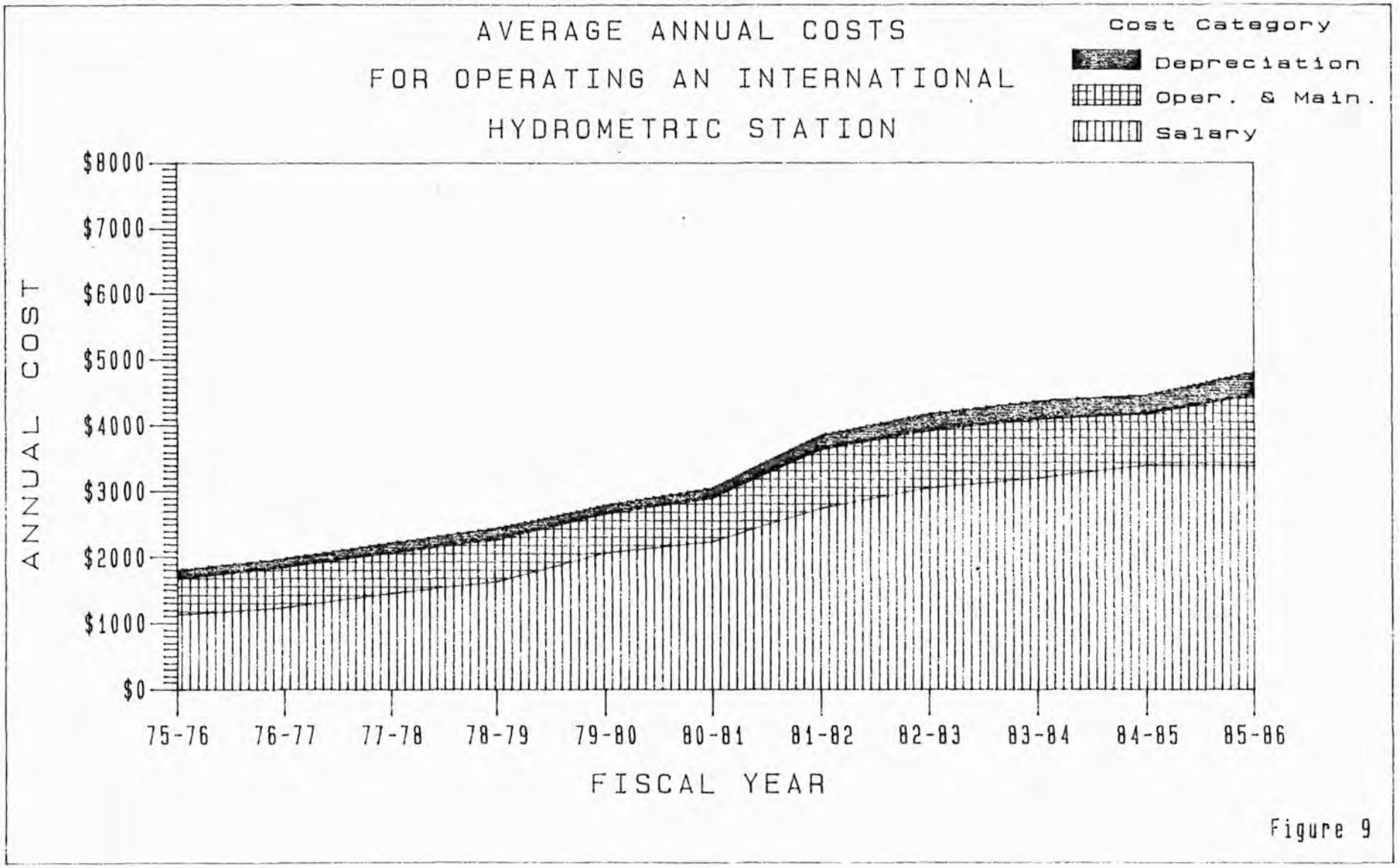
AVERAGE ANNUAL COSTS
FOR OPERATING AN INTERNATIONAL
HYDROMETRIC STATION
Cost Category
Depreciation
Oper. & Main.
Salary
ANNUAL COST
$8000
$7000
$6000
$5000
$4000
$3000
$2000
$1000
$0
75-76
76-77
77-78
78-79
79-80
80-81
81-82
82-83
83-84
84-85
85-86
FISCAL YEAR

Figure 9

APPENDIX 1

DETAILED PROGRAM COSTS
1985-86

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. These factors are currently being re-evaluated.

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 1985-86 operating costs indicates that the cost of operating a remote hydrometric station in Saskatchewan was 3.26 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 1985-1986

	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	$ 32 413
5.	840-1401 (x0.60)	Hydrometric Technician	$ 13 477
6.	840-1409	Hydrometric Technician	$ 29 992
7.	840-1413	Hydrometric Technician	$ 29 992
8.	840-1460	Hydrometric Supervisor	$ 32 413
9.	840-1505	Hydrometric Technician	$ 29 992
10.	840-1506	Hydrometric Technician	$ 29 992
11.	840-5619 (x0.10)	Data Control Supervisor	$ 3 693
12.	840-8004	Hydrometric Technician	$ 29 992
13.	840-8012	Hydrometric Technician	$ 29 992
14.	840-8013 (x0.05)	Construction Supervisor	$ 1 621
15.	840-8073	Hydrometric Technician	$ 29 414
16.	840-8119	Hydrometric Technician	$ 29 992
17.	840-8189 (x0.05)	Boundary Waters Engineer	$ 1 980
18.	840-8907	Hydrometric Technician	$ 29 992
19.	840-8913	Hydrometric Technician	$ 29 992
20.	840-8914	Hydrometric Technician	$ 29 992
21.	840-8915 (x0.90)	Hydrometric Technician	$ 26 993
22.	840-8916	Hydrometric Technician	$ 29 992
23.	840-8951	Hydrometric Supervisor	$ 32 413
24.	840-8952 (x0.15)	Computations Technician	$ 3 816
25.	TERM (x0.35)	Hydrometric Assistant	$ 8 130
26.	Overtime	All Positions	$ 15 319
	TOTAL	20.05 P-Ys	$621 913

CALCULATION OF STATION UNIT SALARY COST

Station Units:	Remote	29.00
	Normal	
	- Non-International	169.55
	- International	40.35
	TOTAL	238.90
	Salary-weighted Station Units	
	- Remote x 1.10	31.90
	- Normal, Non-International	169.55
	- International x 1.40	56.49
	TOTAL	257.94

Unit Salary Cost =

$$\frac{\text{Total Salary Cost}}{\text{Salary-weighted Station Units}} = \frac{621\ 913}{257.94} = 2\ 411$$

Unit Salary Cost Normal =	$2 411
Unit Salary Cost Remote = $2 411 x 1.10 =	$2 652
Unit Salary Cost International = $2 411 x 1.40 =	$3 375

TABLE 6

SASKATCHEWAN WATER QUANTITY NETWORK
OPERATIONS COST SUMMARY 1985-1986

	COST CODE* 00005	00006	00007	TOTAL
Travel	48 623	5 173	9 121	62 917
Transportation and Postage	796	1 579	0	2 375
Telephones	4 981	350	2 659	7 990
Advertising and Printing Services	6	0	75	81
Professional and Special Services	1 670	0	2 280	3 950
Temporary Help Services	570	0	0	570
Other Services	4 276	6 199	340	10 815
Rentals	2 260	89 717	616	92 593
Purchased Repairs (other than vehicles)	4 172	529	177	4 878
Building and Structures Repair	84	0	0	84
Public Utility Services	33 670	221	606	34 497
Purchased Materials (other than capital)	11 102	4 016	791	15 909
Parts and Consumable Tools (other than vehicles)	22 907	6 967	5 023	34 897
Other Expenditures	0	141	0	141
Sub-Total	135 117	114 892	21 688	271 697
Current Meter Maintenance	6 276	1 166	1 523	8 965
Minicomputer Costs**	42 186	7 216	10 039	59 441
Vehicle Operating Costs (Table 8)	38 961	1 017	10 885	50 863
Total Operating Costs	222 540	124 291	44 135	390 966
Station Units	169.55	29.00	40.35	238.90
Unit Operations Cost	1 313	4 286	1 094	1 637

* 00005 - conventional
00006 - remote
00007 - international

** See Appendix 2 for details

TABLE 7

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
TRAVEL																	
Travel Expenses	0701	24	24														
Car Mileage	0702	38	38														
Itinerant Work Travel Expenses	0711	82132	3260		417	47869	5173	9099	5	15740	288		101	180			
Car Mileage	0712	102							102								
Itinerant Work Travel	0714	3559	3072	1		486											
Travel USA - Itinerant Work	0731	2994						22	398	2574							
Travel Training	0744	1780	1780														
Travel Non-Public Service	0750	560	292			268											
TRANSPORTATION AND POSTAGE																	
Air	0801	854	433	74		271	15						61				
Truck	0804	4844	669	1951	96	405	1533				156		34				
Bus	0805	477	343			15	24							95			
Other Postal	0852	2555	2534			6					15						
Courier	0853	674	552			99	7						16				
TELEPHONES																	
Telephones (GTA)	0901	7078	6725			336		17									
Install & Repair	0902	590	395				17	119			59						
Long Distance	0903	4837	509			2722	84	812		215	388	107					
Service Charges (Rental)	0904	16796	9738			1923	249	1711			3175						
Message Data Communications	0906	18348	13								18335						
Other Communication Service	0910	61									61						
ADVERTISING & PRINTING																	
Advertising	1001	145	76					69									
Advertising Other	1003	6						6									
Printing Competition Poster	1012	13	13														
Other Printing Services DSS	1013	968	968														

TABLE 7 (Continued)
SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
Other	1022	1068	1062			6											.
Printing Service within Dept.	1026	966	966														.
PROFESSIONAL & SPECIAL SERVICE																	
Gauge Attendants	1171	4652			702	1670		2280									.
TRAINING																	
Staff Development Training PSC	1220	2249	2249														.
Tuition University & College	1221	829	829														.
Other	1222	1252	1252														.
TEMPORARY HELP SERVICE																	
Contract Steno	1301	868	868														.
Contract Clerical	1302	9234	9234														.
Other Temporary Help	1303	570				570											.
OTHER SERVICES																	
Laundry Dry Cleaning	1501	525	468			57											.
EDP Purchase Software	1510	6005			2						5621	281			101		.
Contract Admin. DSS	1525	12861	5631	103	5	2337	4004				781						.
Graphic Service	1535	18				18											.
Other Photo Service	1536	391	25		42	95	173			56							.
Inter Office Movers	1540	57	57														.
Brokerage Fees	1554	10474				1747	2022	340					6365				.
Storage Warehouse	1560	1075									1075						.
Garbage Collection	1566	277	277														.
Snow & Ice Removal	1581	558	558														.
Petty Cash Purchase	1589	91	11		30	22				28							.
Other Services - N.E.S.	1595	1	1														.

TABLE 7 (continued)

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
Land	1601	296					296										
Word Processing Equipment	1620	6000	6000														
Photo Printing Equipment	1621	1489	1489														
Rent of Office Machines	1622	61	61														
Machine Equipment	1625	5459				490		20		4949							
Aircraft	1635	100092			418		87178		912	2489			9095				
Boat	1636	35					35										
Building Rental	1640	675	675														
Gas Cylinders	1650	4583				1770	2208	596		9							
Other	1651	500	20	480													
Furniture & Fixtures	1653	298	298														
PURCHASED REPAIR																	
Electric Distrib. Equipment	1713	368	368														
Other Electrical Appliances	1714	71	71														
Measuring	1718	4453	257			3537	482	177									
Safety	1719	178					28				150						
Fire Fighting	1720	635	635														
Service Industry	1721	741	100			420				221							
Camera Audio-Visual Equipment	1725	120	120														
Other Equipment	1727	151	68			64	19										
EDP Equipment	1735	15166									15166						
Office Machine	1736	571	503								68						
Ships, Boats	1740	142	72			70											
Road Motor Vehicles	1746	7574	7486			81							?				
Miscellaneous Vehicles	1747	338	338														

TABLE 7 (Continued)

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
BUILDING & STRUCTURES REPAIR																	
Gauging Stations	1805	549				50				499							
Enc. Enamshed Sign etc.	1837	34				34											
Warehouse	1850	3618	3618														
Tenant Service DPW	1880	28108														28108	
PUBLIC UTILITY SERVICES																	
Electric Consumption	1901	35824	1294		33	33670	221	606									
PURCHASED MATERIALS																	
Other Sand, Gravel	2009	1048				232				816							
Diesel Fuel	2012	22	22														
Propane	2013	704	164			324	63	25		128							
Automotive Gas	2014	46199	46150							49							
Aviation Gas	2015	1883					1883										
Other Petro Products	2018	1204	1151			18				35							
Leather Furniture	2019	4	4														
Wood Fabric Materials	2020	4208	1986			12				2210							
Paper, paper board	2021	6099	409	183		4603	387	517									
Textile Fabricated Materials	2022	227	44			127				56							
Chemical & Related Products	2023	941	376			96	382	1		75			11				
Plastic Bag, Sheet	2025	74	49		22		3										
Oxygen, Acetylene, & Nitrogen	2027	593				431	45			117							
Iron, Steel	2028	2956	278			137	1004	1		1536							
Metal Fabricated Products	2030	10828	5064			4295	134	247		1088							
Cement	2031	3680				19				3661							
De-icing Salt	2032	19				19											
Insulation	2035	32	32														
Protective Clothing	2040	377	298				79										
Toiletries	2042	302	125	137		40											
House Furniture	2044	78	78														

TABLE 7 (Continued)

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
Stocked Items - GSS	204H	3601	3601														
Library Stock	2051	1042	1042														
Maps, Charts, etc.	2052	79	20		34	12	13										
Stationery	2054	4466	4147			286					33						
Drafting Supplies	2055	563	563														
Photocopy Paper	2058	645	645														
Data Processing Supplies	2059	2004	574								1430						
Photographic Goods	2060	421	177		61	161	5			17							
Containers	2063	88	88														
Audio-visual	2065	30				30											
Paint	2068	906	685			12	9			176			24				
Miscellaneous Products	2070	861	275			178				360			48				
Hardware	2071	1121	1020			30	9			62							
Subscriptions	2082	25	25														
Petty Cash Purch in. E & H tax	2083	168	94			40				34							
PARTS & CONSUMABLE TOOLS																	
Heat, Air Conditioning, etc.	2111	12				12											
Plumbing	2113	93	93														
Electric Lighting	2114	1741	450			347		29		915							
Other Electrical Equipment	2116	1108	437			103				145	405		18				
Batteries	2118	3319	421			1038	1173	142					545				
Lab Glassware	2119	821		821													
Other Lab Supplies	2120	1567		1567													
Measuring Instruments	2122	28512	448			19284	2428	4852					1500				
Signal System	2123	400	65								335						
Safety Equipment	2124	8295	3658			1344	3293										
Service Industry	2125	685	145			70				470							
Hand Tools	2126	2696	1688			529	56			148	275						

TABLE 7 (Continued)

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
Other Equipment	2128	3057	30								3027						
Photographic Equipment	2129	220	220														
EDP Equipment	2135	499	65								434						
Other office equipment	2138	111	79								32						
Software Packages	2139	1415	1415														
Ships, Boats	2140	39	39														
Motor Vehicles	2146	7095	6891			180	17			7							
Tires & Tubes	2147	3793	3793														
Miscellaneous Vehicles	2148	322	322														
EQUIPMENT ACQUISITION																	
Electric Light Dist. Equipment	2316	544															544
Other Electrical Equipment	2317	75															75
Measuring Device	2322	127994															127994
Safety, Sanitation, & Alarms	2331	915															915
Service Industry Equipment	2332	25167															25167
Furniture - DSS	2334	759															759
Other EDP Equipment	2357	72229															72229
Ship & Boat Equipment	2365	1195															1195
Vehicle	2371	60135															60135
Misc. Vehicle Other	2372	7437															7437
OTHER EXPENDITURES																	
Pay Customer Duty Tax	2524	2657					141						2516				
Vehicle Registration	2528	226	226														
SUB-TOTAL		884216	168066	5317	1862	135117	114892	21688	1417	38885	51309	388	20341	275	101	28108	296450

SASKATCHEWAN WATER QUANTITY PROGRAM
COST ACTIVITY SUMMARY
1985-1986

LINE OBJECT NAME	LO#	TOTAL	001	003	004	005	006	007	008	010	013	016	019	050	179	77000	CAPITAL
Current meters - calibration, servicing and parts		8965				6276	1166	1523									
Total (shareable) computing costs prorated on basis of station units		59441				42186	7216	10039									
GRAND TOTAL		952926	168066	5621	1862	183579	123274	33250	1417	38885	51309	388	20341	275	101	28108	296450

TABLE 8

VEHICLE OPERATING COSTS 1985-1986*

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	$189.00	-	$9 261.00	$7 094.00	$185.00	$ 1 982.00
Multi-purpose	127	$274.00	$3 288.00	$31 510.00	$24 137.00	$630.00	$ 6 743.00
Light Truck	58	$174.00	-	$10 092.00	$7 730.00	$202.00	$ 2 160.00
Med. Truck	12	$430.00	$5 160.00	-	-	-	-
Heavy Truck	12	$474.00	$5 688.00	-	-	-	-
TOTAL	258		$14 136.00	$50 863.00	$38 961.00	$1 017.00	$10 885.00

* Data extracted from F.M.I.S. Cost Summary Report

** Hydrometric costs for 1985-86 are prorated on basis of the 1985-86 Annual Report.

TABLE 9

SASKATCHEWAN WATER QUANTITY PROGRAM
CAPITAL DEPRECIATION COSTS 1985-1986

1.	VEHICLE DEPRECIATION (Table 10)			$45 046
2.	EQUIPMENT DEPRECIATION*			
	- Field Equipment	$ 97 397		
	- Marine Equipment	$ 18 012		
	- Scientific Equipment	$ 96 274		
	- Transportation Equipment	$ 19 884		
	- Shop & Construction Equipment	$ 63 475		
	- Accountable Items	$ 76 864		
	Total Inventory Value March 31, 1986	$371 906		
	Total Inventory Value March 31, 1985	$349 213		
	Average Inventory Value for 1985-86	$360 560		
	Capital Depreciation of Equipment @ 10%	$360 560 / 10 .	=	$36 056
3.	TOTAL CAPITAL DEPRECIATION			$81 102
4.	UNIT CAPITAL DEPRECIATION			
	= Total Capital Depreciation / Total Station Units =	$ 81 102 / 238.90	=	$ 339

* Departmental Equipment-In-Use Material Management System

TABLE 10

VEHICLE DEPRECIATION
SASKATCHEWAN FY 1985-1986

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	-	94	CADC* - May 85
79-462	6 806	113	12	1 356	
81-046	7 874	131	12	1 572	
81-047	7 874	131	12	1 572	
81-048	7 874	131	12	1 572	
83-150	9 009	150	12	1 800	
Multi-Purpose Vehicles or Trucks - Lifetime 6 years (72 Months)					
78-067	20 166	280	0	0	Construction - CADC April 1985
80-102	6 181	86	1	86	CADC - May 85
80-103	6 181	86	12	1 032	
80-104	9 506	132	3	1 396	CADC - July 85
80-105	7 913	110	12	1 320	
80-106	11 233	156	12	1 872	
81-044	9 919	138	3	414	CADC - July 85
82-068	12 295	171	12	2 052	
82-069	12 295	171	12	2 052	
82-070	9 276	129	12	1 548	Construction
83-002	8 059	112	12	1 344	
83-003	12 719	177	12	2 124	Construction
83-149	14 395	200	12	2 400	
83-151	12 660	176	12	2 112	
83-152	12 660	176	12	2 112	
84-123	12 755	177	4	708	CADC - Total loss Accident - August, 1985
84-124	14 610	203	12	2 436	
84-125	12 755	177	12	2 124	
84-126	21 549	299	12	3 588	Construction
85-087	13 506	188	8	1 504	
85-088	13 506	188	8	1 504	
85-089	8 478	118	11	1 298	
85-090	13 506	188	8	1 504	
85-091	11 140	155	10	1 550	

Actual replacement cost of Saskatchewan vehicles in 1985-86 = $60 136

Vehicle depreciation = $45 046

*Crown Assets Disposal Corporation

APPENDIX 2

WRB MINICOMPUTER
COST-SHARING
1985-86

5.0 WRB MINICOMPUTER COST SHARING: 1985-86

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 and the calculations for the shareable computer costs are shown in Section 5.2.

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 was effective 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

$$= (\text{Capital Expenditure} \times 0.10) + \text{AOC} + \text{AMC}$$

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.

5.2

MINI-COMPUTER - MAINFRAME CHARGES

1985-86 FISCAL YEAR

A.	Mainframe	
	1. SaskComp - shareable portion (including RJE Port)	4468.24
B.	Service Charges	
	1. Electronic Environments	973.00
	Power and air conditioning -install high temperature cutout	440.00
		1413.00
	2. Chubb Fire Security	
	-install Halon abort station	335.00
	-service fire control system	150.00
		485.00
	3. Digital	
	-annual maintenance - mini-computer system	11961.12
	-annual maintenance Decmate III (partial year)	312.75
		12273.87
	4. Brinks	
	-storage of backup disks April 01/85 - Nov 29/85	688.00
	5. Crown Store-All	
	-storage of backup disks Dec 01/85 - March 31/86	300.00
	6. Calcomp	
	-plotter maintenance	1188.48
	7. Gentian	
	-digitizer maintenance	259.20
	8. Sask Tel	
	-repair R212 modem and LA120 printer	120.00
	-Datapac rental	2474.00
	-Datapac charges	3956.17
	-Datapac upgrade	59.21
	-install data line (PA) Aug 20/85	119.00
	-line rental (2 data lines - PA)	629.34
	-long distance charges (dialin PA)	5882.51
		13240.23
	Service charges Total	29847.78

C. Supplies

-computer paper (R.L. Crain)	1050.13
-CITOH printer ribbons	240.00
-printwheels and printer ribbons	691.28
-cabling, cable matcher, pack poles	845.90
-2 RA60 disk packs	3561.00
-plotter paper	1100.00
	7488.31

D. Capital

Capital items were purchased during the 1985-86 fiscal year and will be included in the 1986-87 cost-sharing calculations for the value of the mini system.

-1 Micro Vax II computer for PA (Digital)	45244.00
-1 Decmate III (Data Terminal Mart)	3995.00
-1 LQP02 Printer (Data Terminal Mart)	3761.00
-1 Tractor Feed for LQP02 (Data Terminal Mart)	300.00
-1 Vision II -3222 for PA (Lanpar)	1249.00
-1 Vision II -3222 w/graphics for Regina (Lanpar)	1899.00
-1 Racal Vadic 2400PA modem (Gescan)	1225.00
-1 CITOH 600+ line printer (Westcan)	10495.00
	68168.00

1. Formula for Total (Shareable) Annual

Computing cost
= Imputed Rental Charged + AOC + AMC

Where the Imputed Rental Charge is the capital value of system on April 1/85 amortized for 9 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 1985-86 costs

a) Capital Expenditure

Capital value April 1, 1984 = 182 800

Imputed rental 1984-85 = 0.10 x 182 800 = 18 280

New purchases 1984-85 = 29 624

New capital value April 1, 1985 =
182 800 - 18 280 + 29 624 = 194 144

Imputed rental 1985-86 = 1/9 x 194 144 = 21571.56

b) Annual Operating Cost (AOC)

Operating costs were:

-Host computer (SaskComp) Shareable cost	4468.24
-storage of backup disks	988.00
-telecommunication charges and rentals	13240.23
-supplies - paper, ribbons, cable, disks	7488.31
	26184.78

Therefore annual operating cost was 26184.78

c) Annual Maintenance Cost (AMC)

Maintenance costs were

-PDP 11/44 computer and Decmate III	12273.87
-fire protection, power and air conditioners	1898.00
-plotter	1188.48
-digitizer	259.20
	15619.55

Therefore the annual maintenance cost was 15619.55

d) Total Shareable Computing Costs

= a) + b) + c)

= $21,572.56 + $26,184.78 + $15,619.55

= $63,375.85

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

1983-84 costs = $54,802 x 1.05
1984-85 Government Price Index = 5%
1984-85 Ceiling = $54,802
= $57,542

1985-86 Government Price Index = 3.3%
1985-86 Ceiling = $57,542 x 1.033
= $59,441

Computed costs for 1985-86 = $63,375.85

Therefore, shareable computing cost = ceiling
= $59,441

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 1985-1986

No. of Stations			Changes during 1985-86		Stn. Designation April 1, 1985			
April 1 ___	April 1 ___	Change	Added	Discontinued	Fed.	F P	Prov.	Contrib.
375	377	+2	2	0	* (2)	* 127	* 114	11

* Bracket Sediment Stations

TABLE 2
WATER QUANTITY SURVEYS
COMPARATIVE GAUGING STATION DATA April 1/75 to April 1, 1985

Federal Stations			F/P Stations			Provincial Stations			Total Stations		
Apr 1 75	Apr 1 85	Chge	Apr 1 75	Apr 1/ 85	Chge	Apr 1/75	Apr 1/ 85	Chge	Apr 1/75	Apr 1/ 85	Chge
173	136	-37	106	127	+21	51	114	+63	330	377	+47

TABLE 3
WATER QUANTITY SURVEYS
DETAILED GAUGING STATION DATA 1985-86

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) 40	63	21	136	0	21	106	127	93	21	114	11	388

Bracket Sediment Stations in all catagories.

Province: SASKATCHEWAN

TABLE 4
WATER QUANTITY SURVEYS
TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1985-1986
(× $1000)

Total Program Costs					Shareable Costs						
P/Yrs	Sal.	Oper.	Cap.	Total	P/Yrs	Sal.	Oper.	Const.	Total	F Share	P Share
36.44	1 123.8	587.6	296.5	2 007.9	20.05	621.9	504.3*	194.8	1321.0	832.3	488.7

* Consists of operations cost (Table 6) + capital depreciation costs (Table 9) + capital purchases on behalf of SPC and Sask Water ($33 819) - cost of operation of 1 federal station ($1 613)

TABLE 5
WATER QUANTITY SURVEYS
SUMMARY OF SCHEDULES D/F-1985- 1986

Streamflow & Water Level		Sediment		Total
Operation	Construction	Operation	Construction	
403 000	68 000	0	0	471 000

TABLE 6
WATER QUANTITY SURVEYS
COMPARISON - SCHEDULED & ACTUAL COSTS FOR 1985 - 1986
(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		
403 000	408 079	68 000	80 575	471 000	488 654	-17 654	471 000	+17 654 **

** - Deficit for 1985-85 = $748, therefore, net Saskatchewan deficit for 1985-86 = $17 654 + $748 = $18 402

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)
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)
)
)
)
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, 1985

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, 1985 is documented in this section.

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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
1985-86
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 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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 MAIN 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.	05EF001	NORTH SASKATCHEWAN RIVER NEAR DEER CREEK	WSC	12Q			PRINCE ALBERT

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
FEDERAL 2. INTERPROVINCIAL WATERS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	05JG004	QU'APPELLE RIVER ABOVE BUFFALO POUND LAKE	WSC	12Q			REGINA
25.	05JM013	QU'APPELLE RIVER AT HYDE	WSC	8Q			REGINA
26.	05JK002	QU'APPELLE RIVER BELOW CRAVEN DAM	WSC	12Q			REGINA
27.	05JL001	QU'APPELLE RIVER BELOW KATEPWA LAKE	WSC	12Q			REGINA
28.	05JK007	QU'APPELLE RIVER BELOW LOON CREEK	WSC	12Q			REGINA
29.	05JG007	QU'APPELLE RIVER BELOW MOOSE JAW RIVER	WSC	12Q			REGINA
30.	05JF001	QU'APPELLE RIVER NEAR LUMSDEN	WSC	12Q			REGINA
31.	05JM001	QU'APPELLE RIVER NEAR WELBY	WSC	12Q			REGINA
32.	05LC001	RED DEER RIVER NEAR ERWOOD	WSC	12Q			PRINCE ALBERT
33.	05HD033	REID LAKE NEAR DUNCAIRN	WSC	12L			REGINA
34.	05JG013	RIDGE CREEK NEAR BRIDGEFORD	WSC	8Q			REGINA
35.	05JM007	ROUND LAKE NEAR WHITEWOOD	WSC	12L			REGINA
36.	05KD003	SASKATCHEWAN RIVER BELOW TOBIN LAKE	WSC	12Q			PRINCE ALBERT
37.	05JH007	SILTON INDEX RESERVOIR	WSC	8L			REGINA
38.	05HD034	SWIFT CURRENT CANAL AT SWIFT CURRENT	WSC	8Q			REGINA
39.	05KD004	TOBIN LAKE AT SQUAW RAPIDS SPILLWAY	SWC	12L			REGINA
40.	05JF005	WASCANA CREEK NEAR LUMSDEN	WSC	12Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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	4	0.25	1.00
	12L	8	0.40	3.20
	8Q	10	0.75	7.50
	12Q	16	1.00	16.00
TOTAL		38		27.70
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		39		28.70

SCHEDULE A

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
FEDERAL 3. INTERNATIONAL WATERS

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 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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.	11AC063	HUFF LAKE	WSC	8L			REGINA
29.	11AC065	HUFF LAKE GRAVITY CANAL	WSC	8Q			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.	05NC002	MOOSE MOUNTAIN LAKE (RESERVOIR) NEAR CORNING	WSC	12L			REGINA
45.	11AB018	NASHLYN CANAL NEAR CONSUL	WSC	8Q			REGINA
46.	11AC056	NEWTON LAKE	WSC	8L			REGINA

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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.	11AE008	POPLAR RIVER AT INTERNATIONAL BOUNDARY	WSC	8Q			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
1985-86
FEDERAL 3. INTERNATIONAL 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	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

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
FEDERAL 4. NATIONAL WATER QUANTITY INVENTORY

APR 01 1985

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.	05GG001	NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT	WSC	12Q	X		PRINCE ALBERT
17.	05KJ014	PASQUIA RIVER AT HIGHWAY NO. 9	WSC	8Q			PRINCE ALBERT
18.	07LC003	PORCUPINE RIVER AT OUTLET OF GROVE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
19.	05HH001	SOUTH SASKATCHEWAN RIVER AT ST. LOUIS	WSC	12Q			PRINCE ALBERT
20.	05HD036	SWIFT CURRENT CREEK BELOW ROCK CREEK	WSC	12Q			REGINA
21.	06DA001	WOLLASTON LAKE AT ROSS CHANNEL	WSC	12L		REMOTE	PRINCE ALBERT

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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	6	1.00	6.00
TOTAL		8		7.15
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		21		18.95

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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			PRINCE ALBERT
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 LAKE NEAR MOOSOMIN	WSC	8L			REGINA
11.	05JB001	NOTUKEU CREEK NEAR VANGUARD	WSC	8Q			REGINA
12.	05NE001	PIPESTONE CREEK NEAR MOOSOMIN	WSC	8Q			REGINA
13.	05KH009	SASKATCHEWAN RIVER OLD CHANNEL	WSC	12Q			PRINCE ALBERT
14.	05NB009	SOURIS RIVER NEAR ROCHE PERCEE	WSC	8Q			REGINA
15.	05KG007	STURGEON-WEIR RIVER AT LEAF RAPIDS	WSC	12Q			PRINCE ALBERT
16.	05HD041	SWIFT CURRENT CREEK BELOW REID LAKE	WSC	12Q			REGINA
17.	07QC002	TAZIN LAKE NEAR OUTLET	WSC	12L		REMOTE	PRINCE ALBERT
18.	05MB009	THEODORE RESERVOIR NEAR THEODORE	WSC	8L			REGINA
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
1985-86
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	2	0.25	0.50
	12L	5	0.40	2.00
	8Q	9	0.75	6.75
	12Q	4	1.00	4.00
TOTAL		20		13.25
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		13.65

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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

SCHEDULE A

APR 01 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
FED-PROV 3. REGIONAL WATER QUANTITY INVENTORY

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.	05HG001	SOUTH SASKATCHEWAN RIVER AT SASKATOON	WSC	12Q			REGINA
84.	05MB007	SPIRIT CREEK NEAR BUCHANAN	WSC	8Q			REGINA
85.	05MD010	STONY CREEK NEAR KAMSACK	WSC	8Q			REGINA
86.	05MC002	STONY CREEK NEAR STENEN	WSC	8Q			REGINA
87.	05GF002	STURGEON RIVER NEAR PRINCE ALBERT	WSC	8Q			PRINCE ALBERT
88.	05KG002	STURGEON-WEIR RIVER AT OUTLET OF AMISK LAKE	WSC	12Q			PRINCE ALBERT
89.	05LE008	SWAN RIVER NEAR NORQUAY	WSC	12Q			REGINA
90.	05HD039	SWIFT CURRENT CREEK NEAR LEINAN	WSC	12Q	X		REGINA
91.	05JG012	THUNDER CREEK NEAR DARMODY	WSC	8Q			REGINA
92.	06DB003	THYME HILL RIVER BELOW MACKENZIE LAKE	WSC	12Q		REMOTE	PRINCE ALBERT

SCHEDULE A

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
FED-PROV 3. REGIONAL WATER QUANTITY INVENTORY

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
93.	05KE002	TORCH RIVER NEAR LOVE	WSC	12Q			PRINCE ALBERT
94.	05EG005	TURTLELAKE RIVER NEAR TURTLEFORD	WSC	8Q			PRINCE ALBERT
95.	05JF004	WASCANA CREEK NEAR SEDLEY	WSC	8Q			REGINA
96.	07LB001	WATERBURY LAKE AT CREW CABIN	WSC	12L		REMOTE	PRINCE ALBERT
97.	07LB002	WATERFOUND RIVER BELOW UNKNOWN LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
98.	06AF005	WATERHEN RIVER NEAR GOODSOIL	WSC	12Q			PRINCE ALBERT
99.	06DC001	WATHAMAN RIVER BELOW WATHAMAN LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
100.	06DA005	WHEELER RIVER BELOW RUSSELL LAKE	WSC	12Q		REMOTE	PRINCE ALBERT
101.	05KE005	WHITE FOX RIVER NEAR GARRICK	WSC	8Q			PRINCE ALBERT
102.	05MB003	WHITESAND RIVER NEAR CANORA	WSC	8Q			REGINA
103.	07MA004	WILLIAM RIVER ABOVE CARSWELL RIVER	WSC	12Q		REMOTE	PRINCE ALBERT
104.	05MB005	WILLOW BROOK AT WILLOWBROOK	WSC	8Q			REGINA
105.	05JA002	WOOD RIVER NEAR LAFLECHE	WSC	8Q			REGINA
106.	05MB001	YORKTON CREEK NEAR EBENEZER	WSC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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	11	1.00	11.00
TOTAL		90		69.75
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		106		85.15

SCHEDULE A

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

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	SWC	8L			REGINA
4.	05KF004	BIG SANDY LAKE ON THE HANSON LAKE ROAD	SWC	8L			REGINA
5.	05KE006	BISSETT CREEK NEAR CHOICELAND	WSC	8Q			PRINCE ALBERT
6.	05EG010	BRIGHTSAND LAKE NEAR ST WALBURG	SWC	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	SWC	8L			REGINA
11.	05GG009	CHRISTOPHER LAKE NEAR CHRISTOPHER LAKE	SWC	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	SWC	8L			REGINA
15.	05FF003	CUTKNIFE CREEK NEAR CUTKNIFE	WSC	8Q			PRINCE ALBERT
16.	06AE004	DELARONDE LAKE NEAR BIG RIVER	SWC	8L			REGINA
17.	05KF003	DESCHAMBAULT LAKE ON THE HANSON LAKE ROAD	SWC	8L			REGINA
18.	05KB011	DOGHIDE RIVER NEAR RUNCIMAN	WSC	8Q			PRINCE ALBERT
19.	06AG003	DORE LAKE AT DORE LAKE	SWC	8L			REGINA
20.	05LA003	DUCK CREEK NEAR KELVINGTON	WSC	8Q			PRINCE ALBERT
21.	05GC002	EAGLE CREEK NEAR ANGLIA	WSC	8Q			REGINA
22.	05JK008	ECHO CREEK AT FORT QU'APPELLE	WSC	8Q			REGINA
23.	05GG008	EMMA LAKE NEAR TWEEDSMUIR	SWC	8L			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

APR 01 1985

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
24.	05EF006	ENGLISHMAN RIVER NEAR SPRUCE LAKE	WSC	8Q			PRINCE ALBERT
25.	11AE016	FIFE LAKE NEAR LISIEUX	WSC	8L			REGINA
26.	05MB013	FISHING LAKE NEAR WADENA	SWC	8L			REGINA
27.	05JC007	FLOWING WELL WEST INFLOW NEAR FLOWING WELL	WSC	8Q			REGINA
28.	05MB010	GOOD SPIRIT LAKE NEAR CANORA	SWC	8L			REGINA
29.	05LB011	GREENWATER LAKE NEAR CHELAN	SWC	8L			REGINA
30.	06AF010	GREIG LAKE NEAR DORINTOSH	SWC	8L			REGINA
31.	05JF014	HUNTER CREEK NEAR RICHARDSON	WSC	8Q			REGINA
32.	05HG021	INVERNESS CREEK NEAR BRODERICK	WSC	8Q			REGINA
33.	05EG003	JACKFISH LAKE NEAR COCHIN	WSC	8L			PRINCE ALBERT
34.	05EG007	JACKFISH RIVER NEAR PRINCE	WSC	8Q			PRINCE ALBERT
35.	05KG010	JAN LAKE NEAR THE HANSON LAKE ROAD	SWC	8L			REGINA
36.	05KE007	KELSEY CREEK NEAR GARRICK	WSC	8Q			PRINCE ALBERT
37.	05ND009	KENOSEE LAKE NEAR CARLYLE	WSC	8L			REGINA
38.	05LA007	KIPABISKAU LAKE NEAR MCKAGUE	SWC	8L			REGINA
39.	06AF009	LAC DES ILES NEAR GOODSOIL	SWC	8L			REGINA
40.	05HD028	LAC PELLETIER NEAR VESPER	WSC	8L			REGINA
41.	05HC004	LAKE DIEFENBAKER AT SASKATCHEWAN LANDING	WSC	8L			REGINA
42.	05JJ010	LANIGAN CREEK NEAR LANIGAN	WSC	8Q			REGINA
43.	05MB012	LAWRIE CREEK NEAR INSINGER	WSC	8Q			REGINA
44.	05KA011	LENORE LAKE NEAR MIDDLE LAKE	SWC	8L			REGINA
45.	05KF002	LITTLE BEAR LAKE ON THE HANSON LAKE ROAD	SWC	8L			REGINA
46.	05KB008	LITTLE BRIDGE CREEK NEAR ARMLEY	WSC	8Q			PRINCE ALBERT

SCHEDULE A

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
47.	05JJ001	LITTLE MANITOU LAKE AT MANITOU BEACH	SWC	8L			REGINA
48.	05MA002	LITTLE QUILL LAKE NEAR WYNYARD	SWC	8L			REGINA
49.	05KE009	LOWER FISHING LAKE ON THE HANSON LAKE ROAD	SWC	8L			REGINA
50.	05LB008	MACNAB CREEK NEAR SOMME	WSC	8Q			PRINCE ALBERT
51.	05LE012	MADGE LAKE NEAR KAMSACK	SWC	8L			REGINA
52.	06AD014	MAKWA LAKE NEAR LOON LAKE	SWC	8L			REGINA
53.	06AD009	MAKWA RIVER AT OUTLET OF MAKWA LAKE	WSC	8Q			PRINCE ALBERT
54.	05GA006	MANITO LAKE NEAR MARSDEN	SWC	8L			REGINA
55.	05LB012	MAREAN LAKE NEAR CHELAN	SWC	8L			REGINA
56.	06AD010	MEADOW RIVER BELOW MEADOW LAKE	WSC	12Q			PRINCE ALBERT
57.	05MA023	MILLIGAN CREEK NEAR WADENA	WSC	8Q			REGINA
58.	05JE002	MOOSE JAW RIVER NEAR LANG	WSC	8Q			REGINA
59.	06AD008	MORIN CREEK NEAR MEADOW LAKE	WSC	8Q			PRINCE ALBERT
60.	06AE003	MORIN LAKE NEAR VICTOIRE	SWC	8L			REGINA
61.	05GB004	MUDDY LAKE INFLOW NEAR REVENUE	WSC	8Q			PRINCE ALBERT
62.	06CB003	NEMEIBEN LAKE NEAR LA RONGE	SWC	8L			REGINA
63.	06AE001	NORBURY CREEK NEAR SPIRITWOOD	WSC	8Q			PRINCE ALBERT
64.	05GC007	OPUNTIA LAKE WEST INFLOW	WSC	8Q			REGINA
65.	05LD003	OVERFLOWING RIVER NEAR HUDSON BAY	WSC	8Q			PRINCE ALBERT
66.	05EG008	PAGE CREEK NEAR IFFLEY	WSC	8Q			PRINCE ALBERT
67.	05KG009	PELICAN LAKE AT PELICAN NARROWS	SWC	8L			REGINA
68.	05LA004	PIPESTONE CREEK NEAR ROSE VALLEY	WSC	8Q			PRINCE ALBERT
69.	05LB010	PRAIRIE RIVER NEAR PRAIRIE RIVER	WSC	8Q			PRINCE ALBERT

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
70.	05GE001	RADOUGA CREEK NEAR BLAINE LAKE	WSC	8Q			PRINCE ALBERT
71.	05MA024	RANCH LAKE NEAR ST JAMES	SWC	8L			REGINA
72.	05LA005	RED DEER RIVER NEAR ARCHERWILL	WSC	8Q			PRINCE ALBERT
73.	05GD003	REDBERRY LAKE NEAR KRYDOR	SWC	8L			REGINA
74.	05MA016	ROMANCE CREEK NEAR WATSON	WSC	8Q			REGINA
75.	05JB002	RUSSELL CREEK NEAR VANGUARD	WSC	8Q			REGINA
76.	05JG001	SANDY CREEK NEAR CARON	WSC	8Q			REGINA
77.	05GF004	SHELL LAKE NEAR SHELL LAKE	SWC	8L			REGINA
78.	05HC002	SNIPE LAKE NEAR ESTON	WSC	8L			REGINA
79.	05HC003	SNIPE LAKE NORTH INFLOW	WSC	8Q			REGINA
80.	05NB031	SOURIS RIVER NEAR BECHARD	WSC	8Q			REGINA
81.	05NB025	SOURIS RIVER NEAR LEWVAN	WSC	8Q			REGINA
82.	05NB030	SOURIS RIVER NEAR MCTAGGART	WSC	8Q			REGINA
83.	05HF004	SOUTH SASKATCHEWAN RIVER BELOW GARDINER DAM	WSC	12L			REGINA
84.	05GF003	STURGEON LAKE NEAR PRINCE ALBERT	SWC	8L			REGINA
85.	05EG009	TURTLE LAKE NEAR GLASLYN	SWC	8L			REGINA
86.	05HF022	UNNAMED CREEK NEAR CUTBANK	WSC	8Q			REGINA
87.	05MB011	VAN PATTENS CREEK NEAR KUROKI	WSC	8Q			REGINA
88.	05KA012	WAKAW LAKE NEAR WAKAW	SWC	8L			REGINA
89.	05KA010	WALDSEA LAKE NEAR HUMBOLDT	SWC	8L			REGINA
90.	06AF007	WATERHEN LAKE NEAR DORINTOSH	SWC	8L			REGINA
91.	05ND008	WHITE BEAR (CARLYLE) LAKE NEAR CARLYLE	WSC	8L			REGINA
92.	05JC006	WIWA CREEK NEAR ST. BOSWELLS	WSC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
PROVINCIAL 1. PROVINCIAL DEPARTMENTAL PROGRAMS

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
93.	05MB014	YORK LAKE NEAR YORKTON	SWC	8L			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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	45	0.75	33.75
	12Q	1	1.00	1.00
TOTAL		55		37.15
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		55		37.15

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SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
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	SWC	12Q		REMOTE	REGINA
3.	05HG014	BLACKSTRAP RESERVOIR AT SOUTH SIDE OF CAUSEWAY	SWC	8L			REGINA
4.	05HG013	BRADWELL RESERVOIR AT PUMP STATION	SWC	8L			REGINA
5.	05HG020	BRIGHTWATER CREEK NEAR PROCTOR LAKE	WSC	8Q			REGINA
6.	05HG006	BRIGHTWATER RESERVOIR AT RIPARIAN OUTLET	SWC	8L			REGINA
7.	05HF017	BRODERICK RESERVOIR AT WEST EMBANKMENT	WSC	8L			REGINA
8.	05KD006	CODETTE RESERVOIR ABOVE THE SPILLWAY	WSC	12L			PRINCE ALBERT
9.	05JJ008	DELLWOOD RESERVOIR AT PUMP STATION	SWC	8L			REGINA
10.	11AE014	EAST POPLAR RIVER ABOVE COOKSON RESERVOIR	WSC	8Q			REGINA
11.	11AE015	GIRARD CREEK NEAR CORONACH	WSC	8Q			REGINA
12.	05HG003	PIKE LAKE NEAR SASKATOON	SWC	8L			REGINA
13.	05JB006	RUSSELL CREEK RESERVOIR	WSC	8L			REGINA
14.	05HG008	S.S.E.P. EAST MAIN CANAL BELOW BLACKSTRAP RESERVOIR	WSC	8Q			REGINA
15.	05HG004	S.S.E.P. EAST MAIN CANAL BELOW BRIGHTWATER RESERVOIR	WSC	8Q			REGINA
16.	05HG019	S.S.E.P. EAST MAIN CANAL BELOW BRODERICK RESERVOIR	WSC	8Q			REGINA
17.	05HG009	S.S.E.P. EAST MAIN CANAL BELOW ZELMA RESERVOIR	WSC	8Q			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	SWC	8L			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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	1	0.40	0.40
	8Q	9	0.75	6.75
	12Q	0	1.00	0.00
TOTAL		13		7.90
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		13		7.90

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
DATA CONTRIBUTED BY OTHER AGENCY

APR 01 1985

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
1985-86
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 1985

SASKATCHEWAN WATER QUANTITY STATIONS
1985-86
DATA CONTRIBUTED BY SASKATCHEWAN

ITEM NO.	STATION NUMBER	STATION NAME	OPERATING AGENCY	RECORD OBTAINED HYDROMETRIC	RECORD OBTAINED SEDIMENT	ACCESS	OPERATIONS CENTER
1.	05HG016	BRIGHTWATER CREEK BELOW BRIGHTWATER RESERVOIR	SWC	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	SWC	8Q			REGINA
5.	05JJ006	S.S.E.P. DIVERSION TO LITTLE MANITOU LAKE	SWC	8Q			REGINA
6.	05HG005	S.S.E.P. MAIN CANAL ABOVE BLACKSTRAP RESERVOIR	SWC	8Q			REGINA
7.	05HG007	S.S.E.P. MAIN CANAL ABOVE BRIGHTWATER RESERVOIR	SWC	8Q			REGINA
8.	05HG011	S.S.E.P. MAIN CANAL ABOVE ZELMA RESERVOIR	SWC	8Q			REGINA
9.	05JJ007	S.S.E.P. MAIN CANAL AT INLET TO DELLWOOD RESERVOIR	SWC	8Q			REGINA
10.	05JJ005	S.S.E.P. MAIN CANAL OUTLET OF MANITOU PUMPING STATION	SWC	8Q			REGINA

SCHEDULE A

SASKATCHEWAN WATER QUANTITY STATIONS
STATIONS OPERATED BY WATER SURVEY OF CANADA
1985-86
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
1985-86

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	7	0.25	1.75
	12L	10	0.40	4.00
	8Q	17	0.75	12.75
	12Q	23	1.00	23.00
		57		41.50
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		135		95.05
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	3	0.25	0.75
	12L	5	0.40	2.00
	8Q	87	0.75	65.25
	12Q	15	1.00	15.00
		110		83.00
TOTAL		127		98.80
PROVINCIAL				
NORMAL ACCESS	8L	11	0.25	2.75
	12L	2	0.40	0.80
	8Q	54	0.75	40.50
	12Q	1	1.00	1.00
TOTAL		68		45.05
GRAND TOTAL		330		238.90

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: 1985-86

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 HYDROMETRIC SURVEYS

1985-86

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 1985-86 TO BE PAID TO CANADA BY SASKATCHEWAN

		OPERATION	CONSTRUCTION*	TOTAL
a)	Streamflow and water level installations	403 000	68 000	471 000
b)	Sediment installations	-	-	-
	TOTAL			$471 000

*Saskatchewan's share of maintenance, upgrading and construction of hydrometric gauging stations. Includes $43 000 for work to be done for Saskatchewan Power Corporation and paid for by SPC through Saskatchewan Water Corporation

D.L. MacLeod
Vice President
Resource Management
Saskatchewan Water Corporation
Administrator for Saskatchewan

R.A. Halliday
Regional Director
Inland Waters Directorate
Administrator for Canada

APPENDIX 5

STATION CHANGES TO 1986-87
SCHEDULE A
AND
COMPUTATION OF 1986-87
SCHEDULE D

8.1 CHANGES TO SCHEDULE A - SASKATCHEWAN FROM 1985-86 TO 1986-87

STATIONS ADDED TO NETWORK

	Station Name	Station Number	Record	Designation
1.	Stockholm Index Reservoir	05JM019	8L	F2
2.	Reindeer River above Devil Rapids	06DD002	12Q	P2

STATIONS DELETED FROM NETWORK

	Station Name	Station Number	Record	Designation
1.	Beckett Brook near Foam Lake	05MA022	8Q	P1
2.	Bissett Creek near Choiceland	05KE006	8Q	P1
3.	Connell Creek near Connell Creek	05KC002	8Q	P1
4.	Lawrie Creek near Insinger	05MB012	8Q	P1
5.	SSEP East Main Canal below Blackstrap Reservoir	05HG008	8Q	P2
6.	SSEP East Main Canal below Brightwater Reservoir	05HG004	8Q	P2
7.	SSEP East Main Canal below Zelma Reservoir	05HG009	8Q	P2
8.	Birch River near Manitoba Boundary *	05KH013	12Q	P2

* Station formerly operated by Sask Water/Ducks Unlimited

CHANGES IN STATION NAME/NUMBER

	FROM	
Station Name		Station Number
Ranch Creek near Annaheim		05MA014
	TO	
Ranch Creek above Ranch Lake		05MA025

CONTRIBUTED STATIONS NO LONGER PUBLISHED BY WRB

Station Name	Station Number	Record
Brightwater Creek below Brightwater Reservoir	05HG016	8Q
SSEP Bradwell Inlet Canal above Bradwell Reservoir	05HG010	8Q
SSEP Diversion to Little Manitou lake	05JJ006	8Q
SSEP Main Canal above Blackstrap Reservoir	05HG005	8Q
SSEP Main Canal above Brightwater Reservoir	05HG007	8Q
SSEP Main Canal above Zelma Reservoir	05HG011	8Q
SSEP Main Canal at Inlet to Dellwood Reservoir	05JJ007	8Q
SSEP Main Canal Outlet of Manitou Pumping Station	05JJ005	8Q

8.2 ESTIMATED COST OF SCHEDULE D - SASKATCHEWAN: 1986-87

A Hydrometric Stations

	No. of Stations	No. of Units	Unit* Cost	Approx Total Cost	Provincial Share
Federal					
Normal Access	58	41.75	4090	170 800	0
Remote Access	15	13.20	7910	104 400	0
International	63	40.35	4890	197 300	0
Sub Total	136	95.30		472 500	0
Federal-Provincial					
Normal Access	110	83.00	4090	339 500	169 750
Remote Access	17	15.80	7910	125 000	62 500
International	0	0		0	0
Sub Total	127	98.80		464 500	232 250
Provincial					
Normal Access	62	40.80	4090	166 900	166 900
Remote Access	0	0		0	0
International	0	0		0	0
Sub Total	62	40.80		166 900	166 900
Total	325	234.90		1 103 900	399 150
Federal Stations Operated by Province**	1	0.40	4090	1 640	(1 640)

B Construction

a) Streamflow and water level stations

Sask Water	60 000
SPC	50 000
Total	110 000

C Total Provincial Share = 399 150 - 1 640 + 110 000
= 508 000 (actually 507 510)

For Schedule D breakdown as Operating 398 000
Construction 60 000 Sask Water
50 000 SPC
508 000

* Based on 5% increase to 1984-85 actual costs and subsequently increased by 4%

** 05KD004 Tobin Lake at Squaw Rapids Spillway

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.