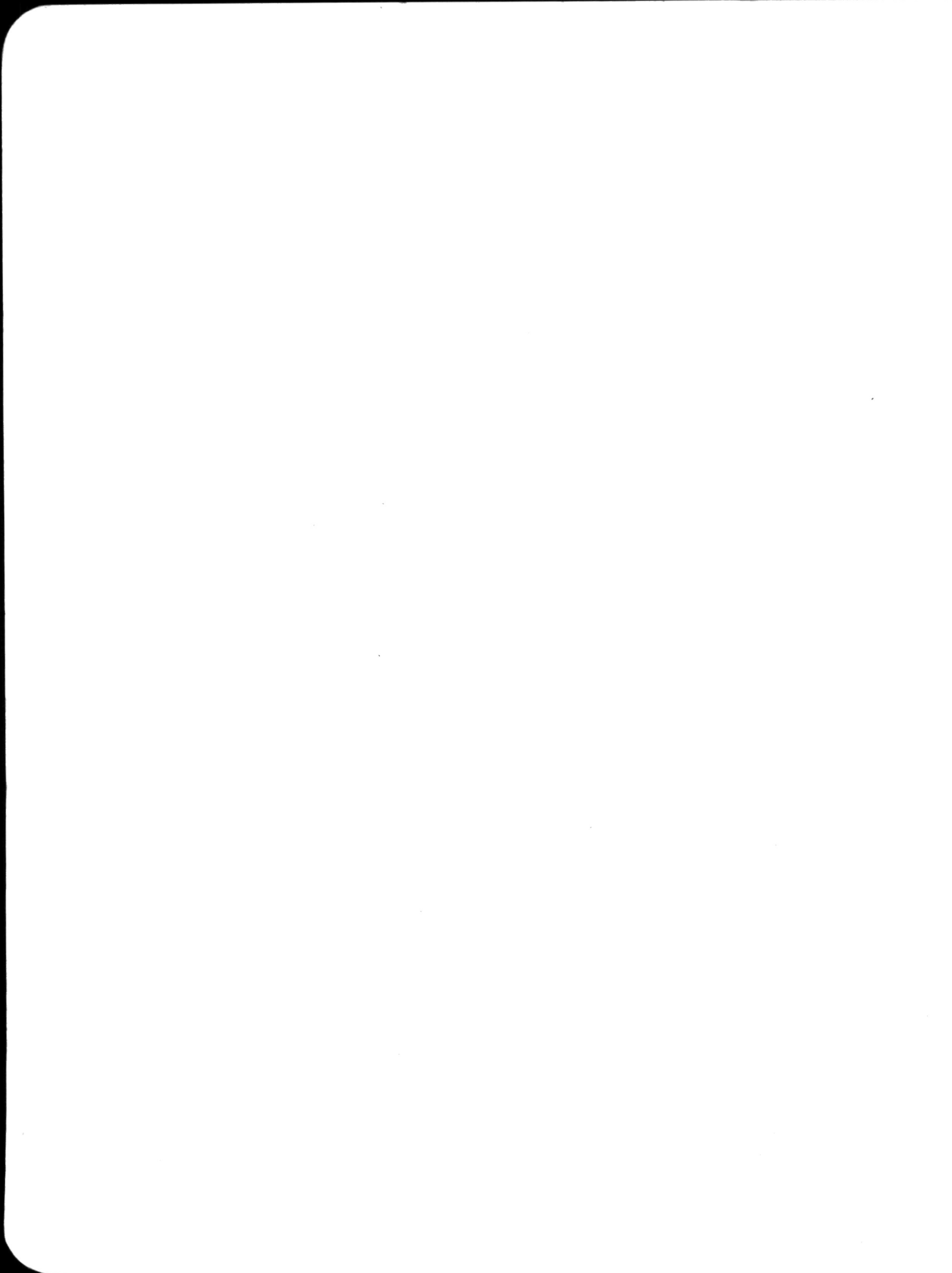
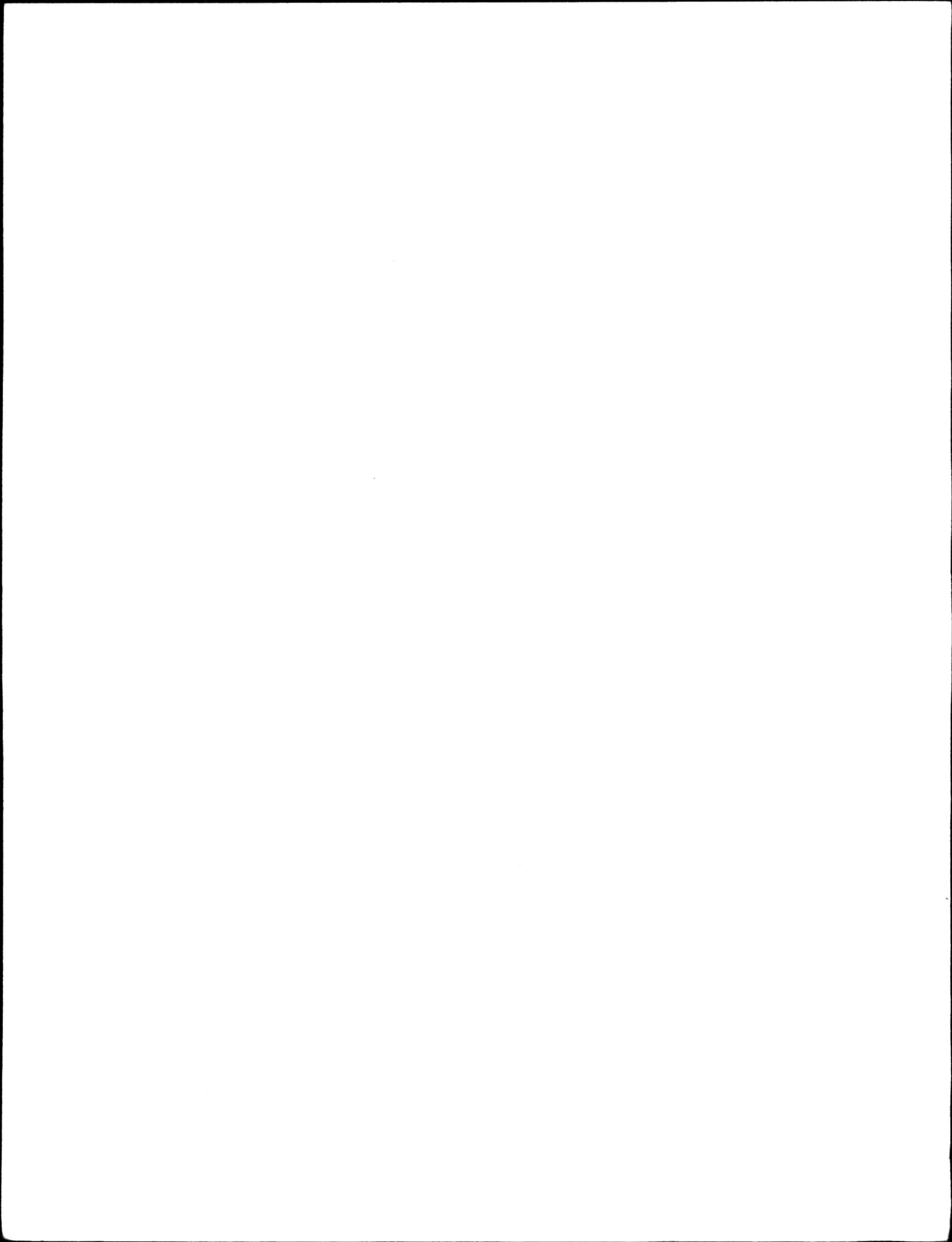


CANADA - ALBERTA
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS
ANNUAL REPORT 1984-85



CANADA - ALBERTA
MEMORANDUM OF AGREEMENT
FOR
WATER QUANTITY SURVEYS

ANNUAL REPORT 1984-85



TO: R. A. Halliday
Administrator for Canada

P. G. Melnychuk
Administrator for Alberta

We hereby submit an annual report for fiscal year 1984-85 covering activities under the Memorandum of Agreement for Water Quantity Surveys for the Province of Alberta.

Government of Canada

Province of Alberta



G. H. Morton
Government of Canada



P. Valentine
Alberta Environment



M. O. Spitzer
Environment Canada

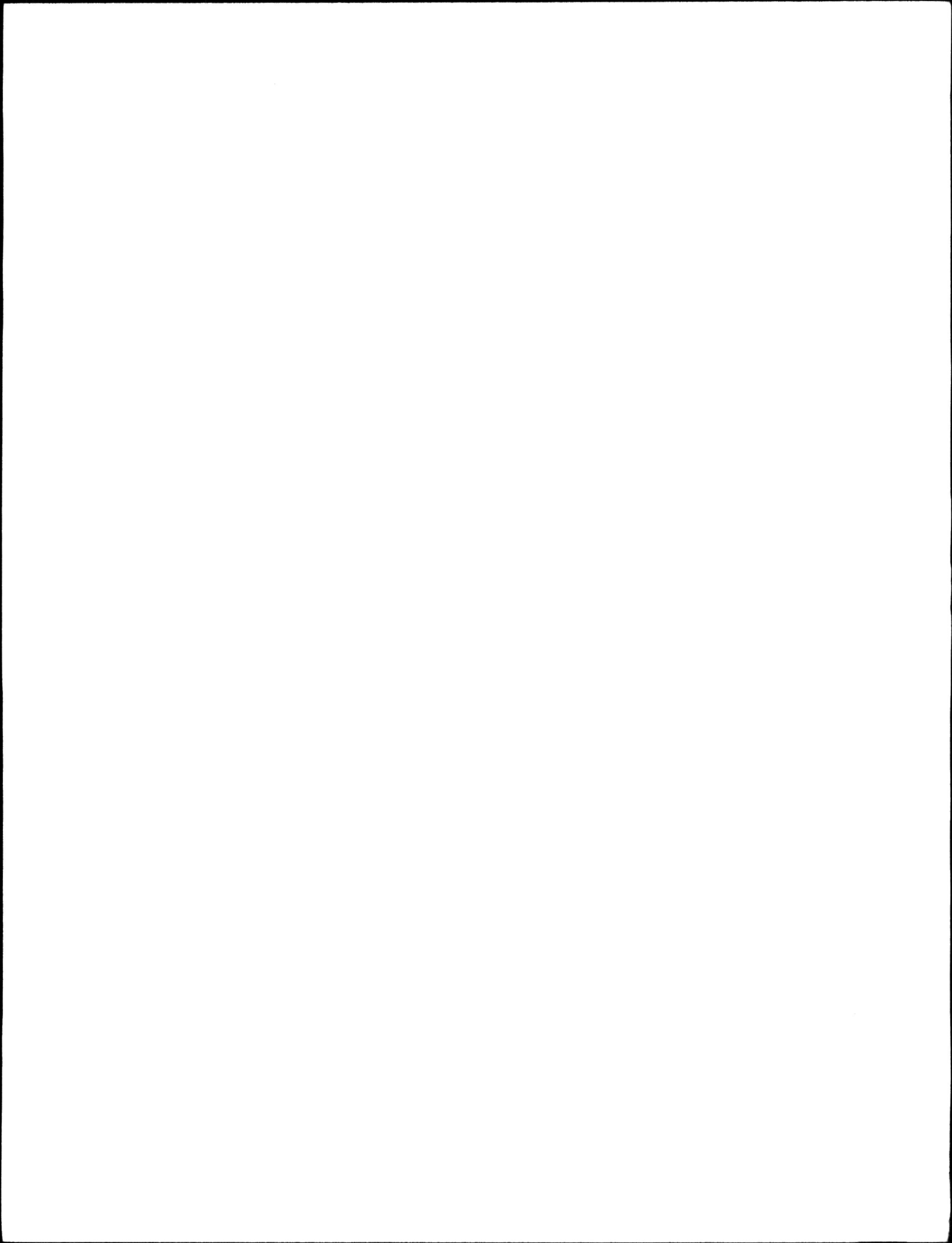


G. Coles
Alberta Environment

Members

Alberta Co-ordinating Committee

June 1985.

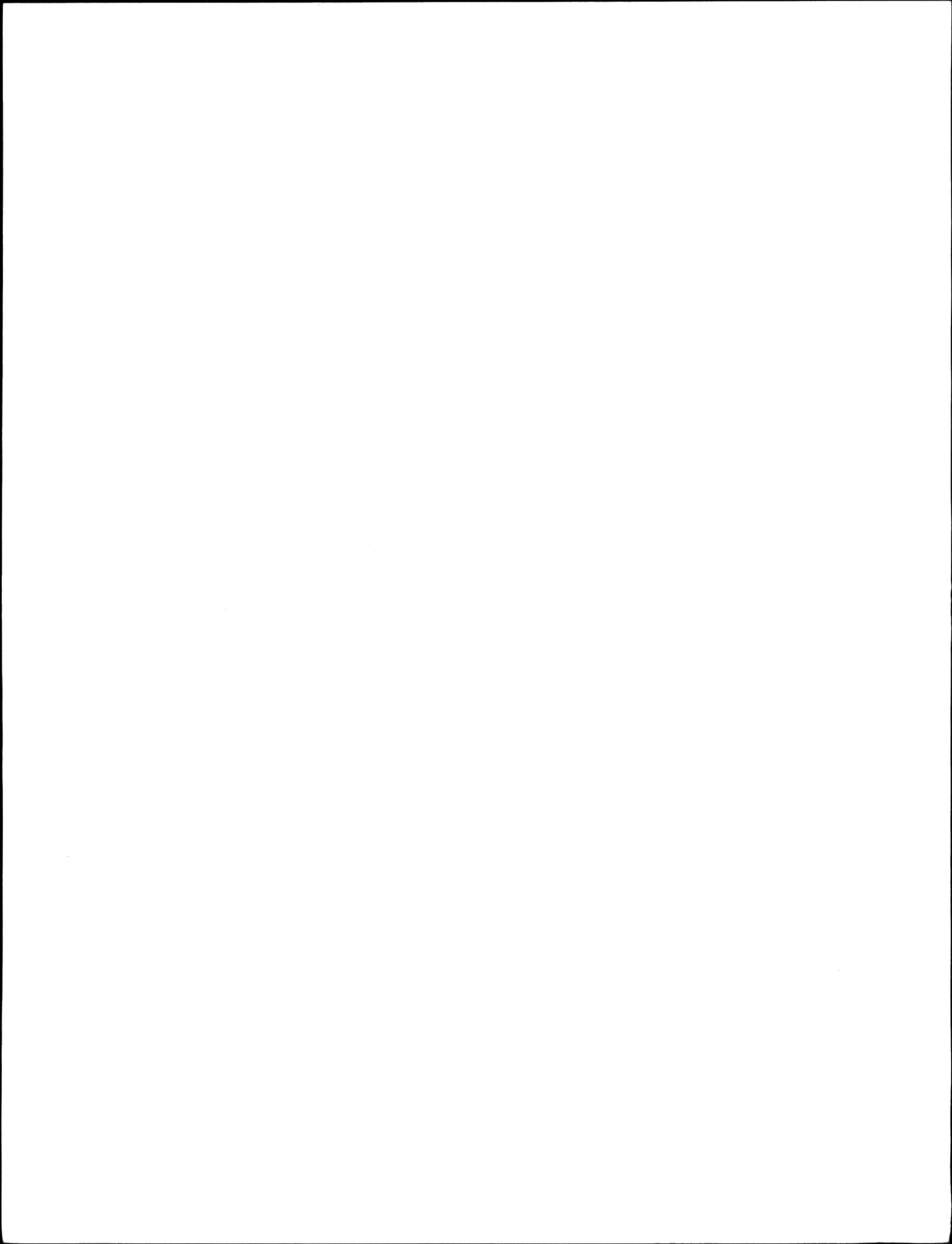


E X E C U T I V E S U M M A R Y

The Canada-Alberta Co-ordinating Committee met twice during the year and there was one National Co-ordinators' meeting. Frequent contact was maintained between the members of the committee and senior staff of both agencies. Major items arising from the Co-ordinating Committee meetings were cost sharing of federal EDP equipment; the federal sediment study contract; plans for DCP installations and operations; Alberta funding for the 1985/86 program; designation of Mackenzie River Basin hydrometric stations; compendium report of cost sharing practices and interpretations; review of hydrometric stations with operational difficulties; and reduction of the existing sediment network and plans for future sediment programs.

The 1984-85 program was satisfactory in most aspects as a normal runoff, with the exception of high water in the Birch Mountain area, occurred throughout most of the province. These conditions permitted adequate field coverage of the majority of hydrometric stations. Data computations for 1984 were again completed on schedule for publication. Another main achievement during the year was the satisfactory completion of all aspects of the construction and maintenance program.

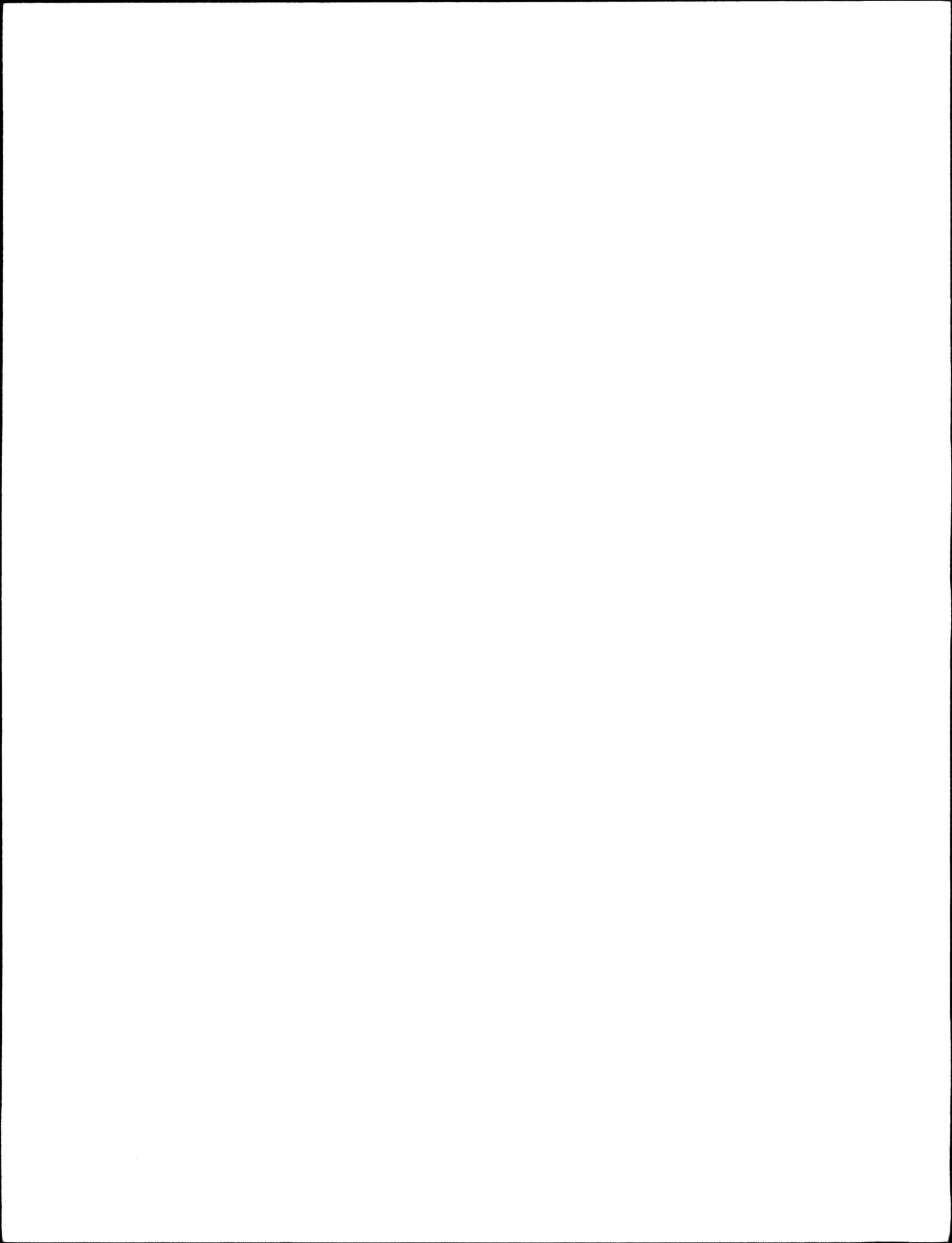
The co-operative Oldman River Basin network planning study was completed. An analysis of long term sediment stations was continued on a limited basis by Water Survey of Canada, Ottawa and Calgary staff, to determine if some of these stations can be discontinued. Based on



a preliminary evaluation, the sediment programs were discontinued at three sites on the Red Deer River and one site on the South Saskatchewan River after 1984-85.

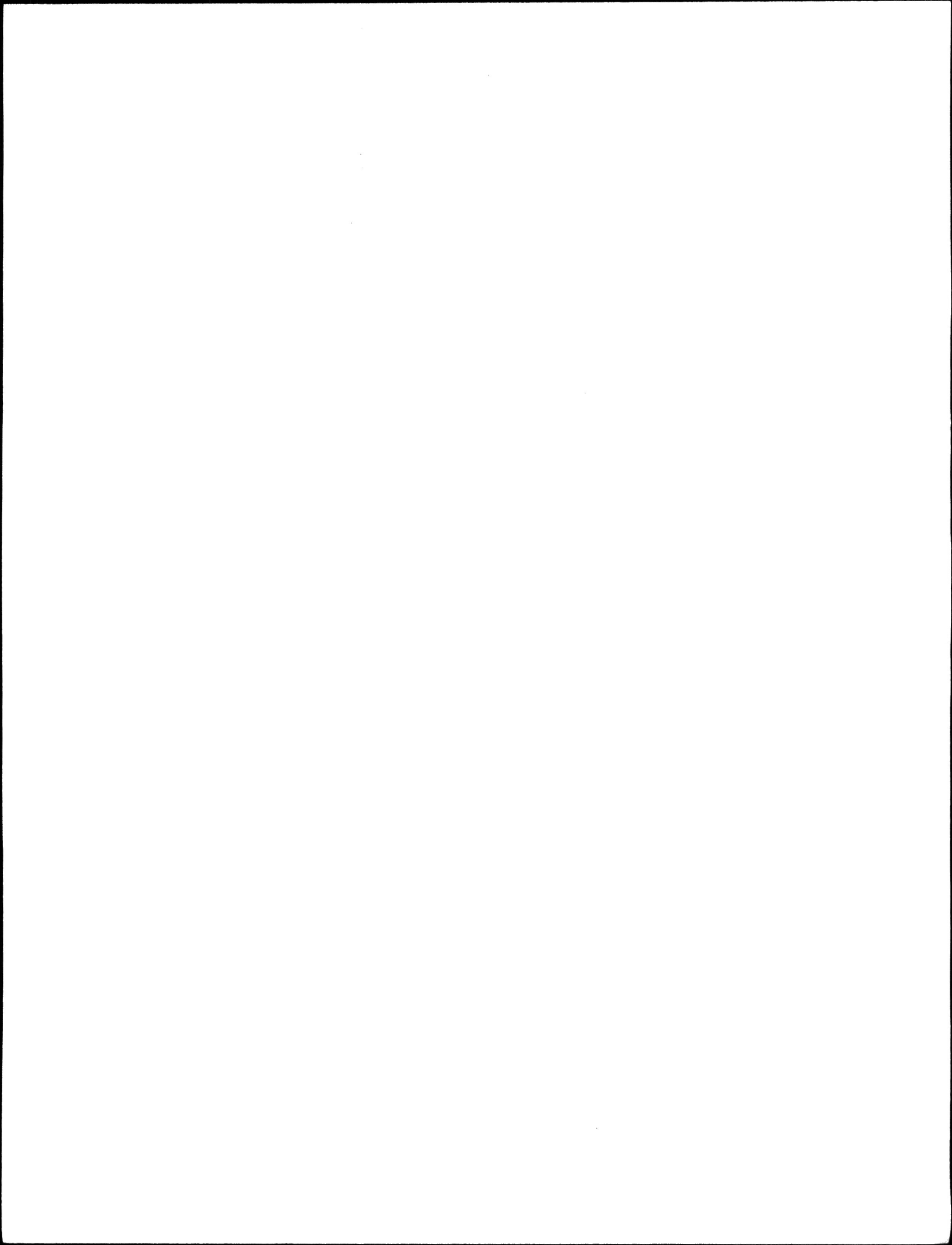
During 1984-85, 27 new hydrometric stations were established and 14 stations were discontinued. Operations of this increase in network are being accommodated by additional staff resources made available by the approved network enhancement program.

During 1984-85 Alberta paid \$933,500 to the hydrometric agreement, as listed in Schedule "D". The computed cost for the Alberta share of the program was \$935,664, which resulted in an underpayment of \$2,164 by the Province. During 1984-85 the increase in unit costs per hydrometric station was 9.1% and this significant increase was partially offset in total program costs by depreciation and construction costs being less than estimated in the preparation of Schedule "D".



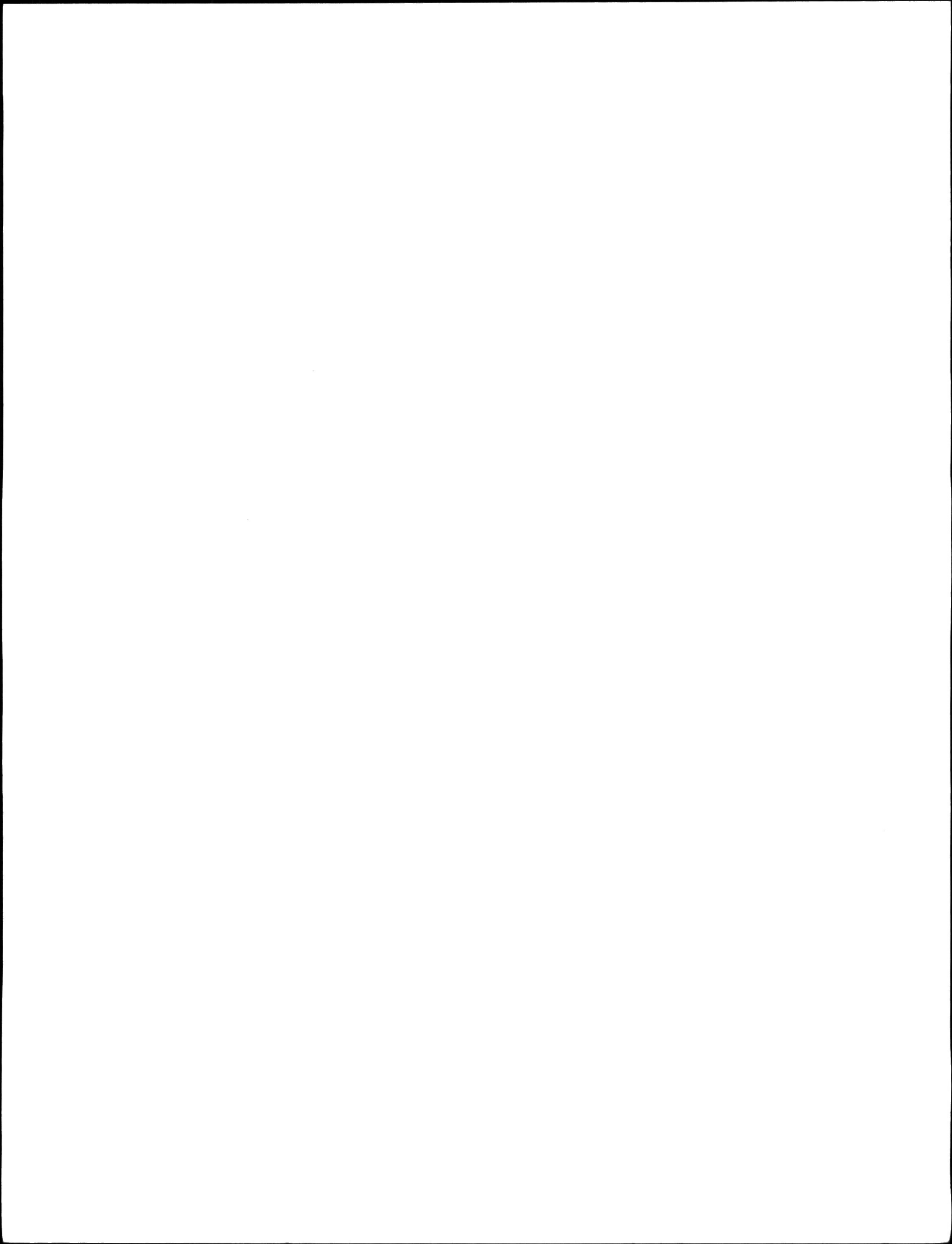
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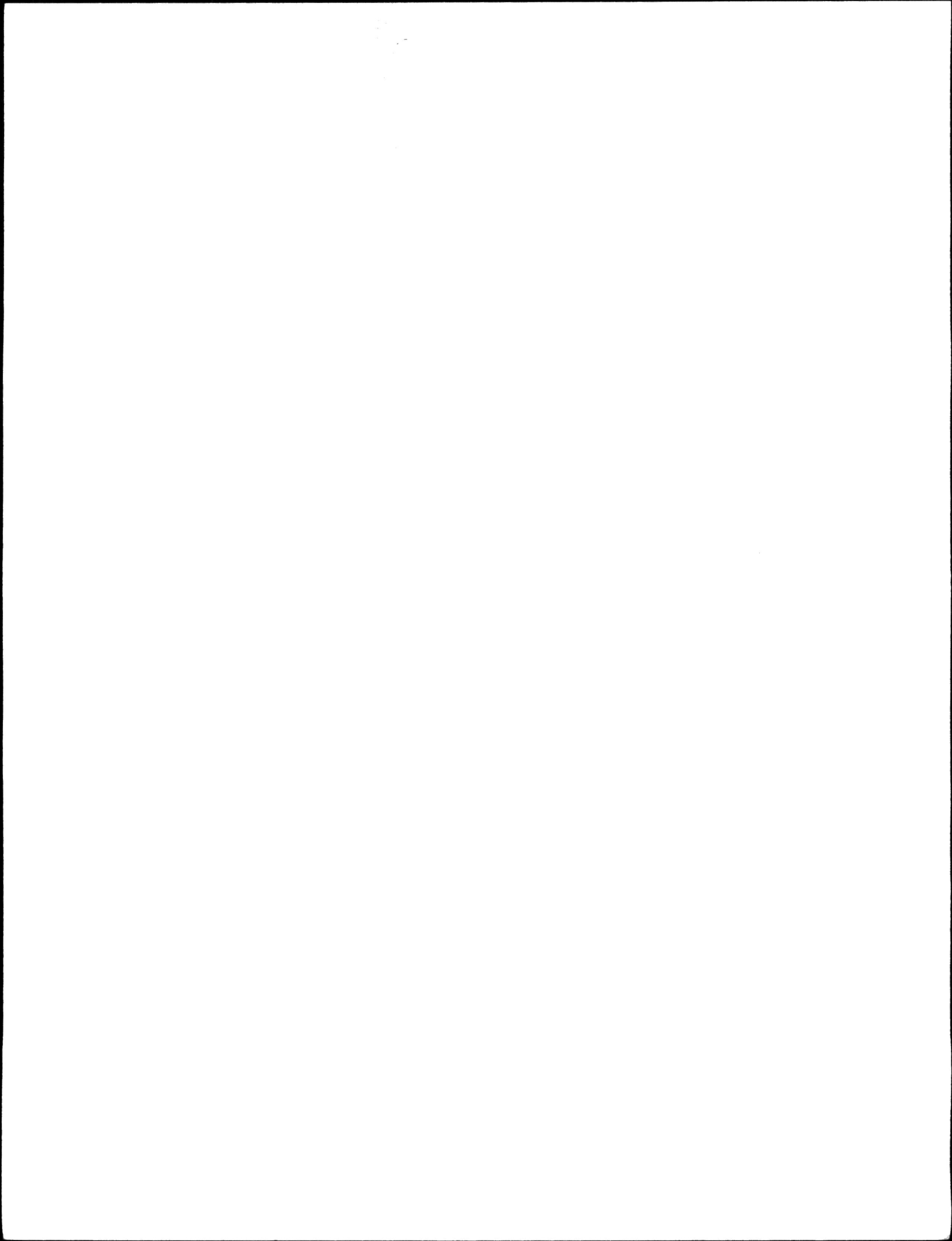
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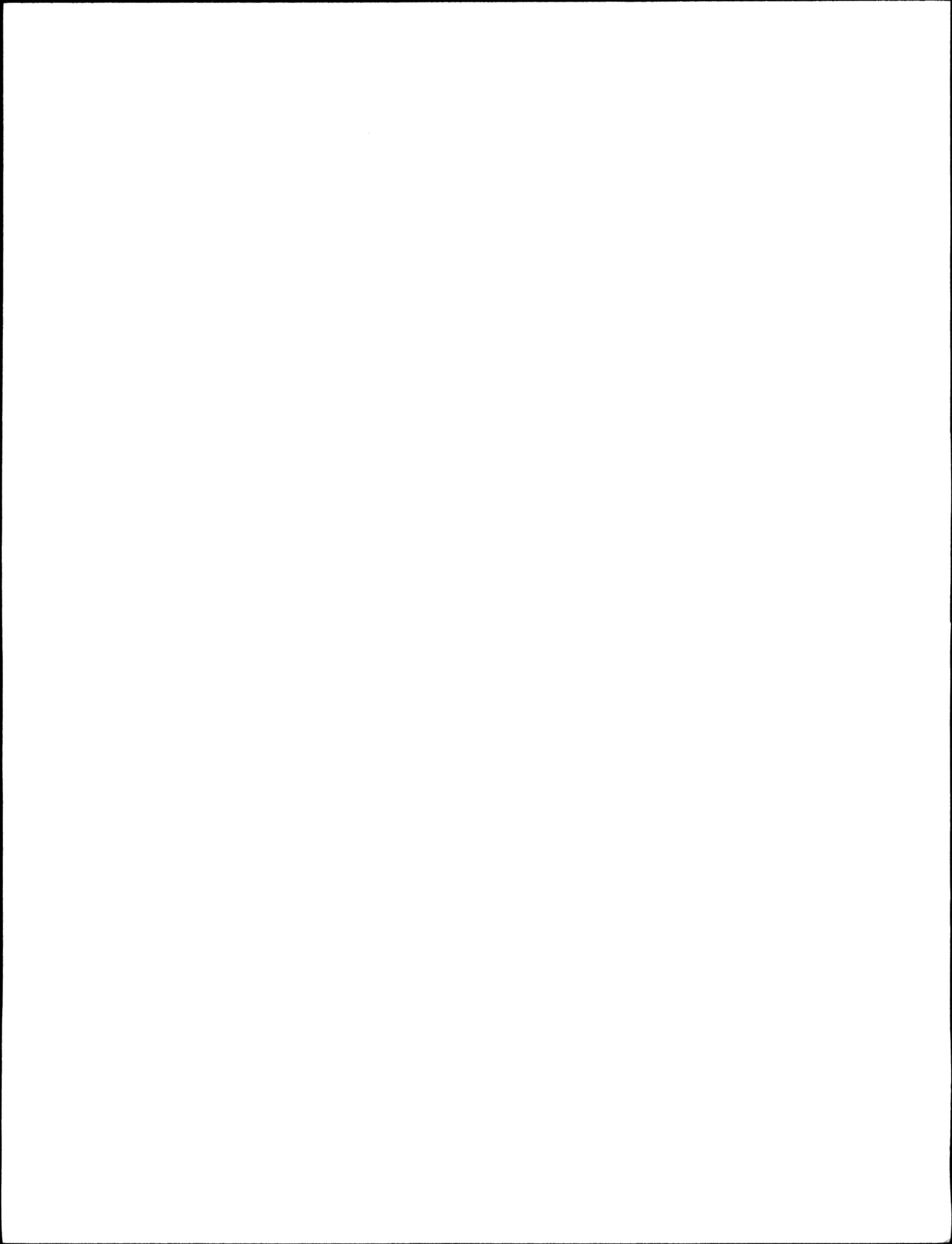


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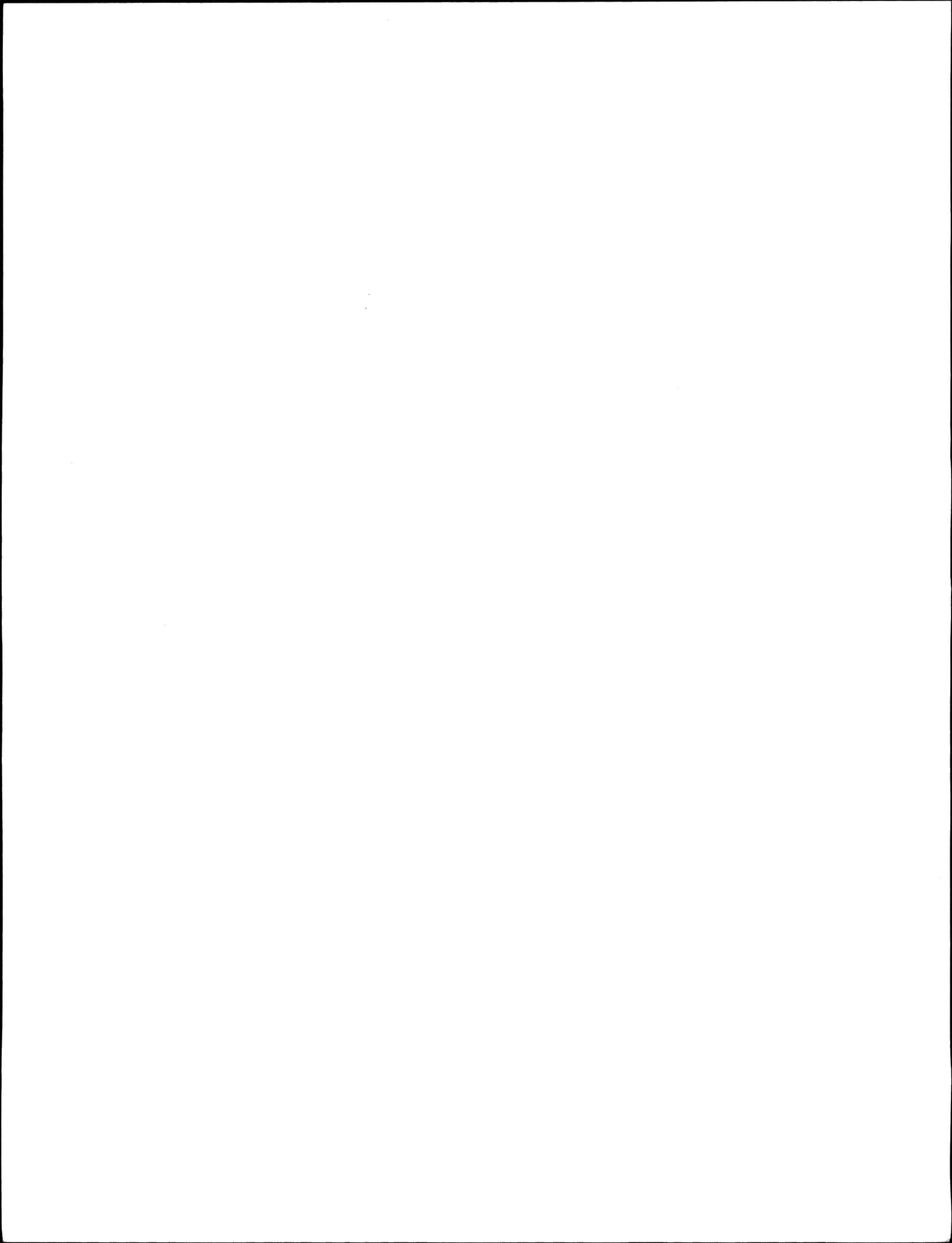


This is the tenth annual report summarizing the activities of the Canada-Alberta Co-ordinating Committee established by the Memorandum of Agreement in 1975. A sample copy of the agreement, which is relatively similar for all provinces and the territories, is contained in the Annual National Cost Sharing Report.¹

The agreement establishes the basis on which co-operative water quantity surveys are carried out in Alberta and describes the costs which are shareable and the costs borne solely by the party operating the network. It requires that the Administrators of the agreement establish a Co-ordinating Committee to plan and review network operations and to prepare annually, Schedules "A" and "D" for approval by the Administrators. Schedule "A" (Appendix A) lists the gauging stations covered by the agreement, designation for cost sharing purpose, and operational responsibility. Schedule "D" (Appendix C) gives the annual cost sharing payment to be paid by Alberta to Canada.

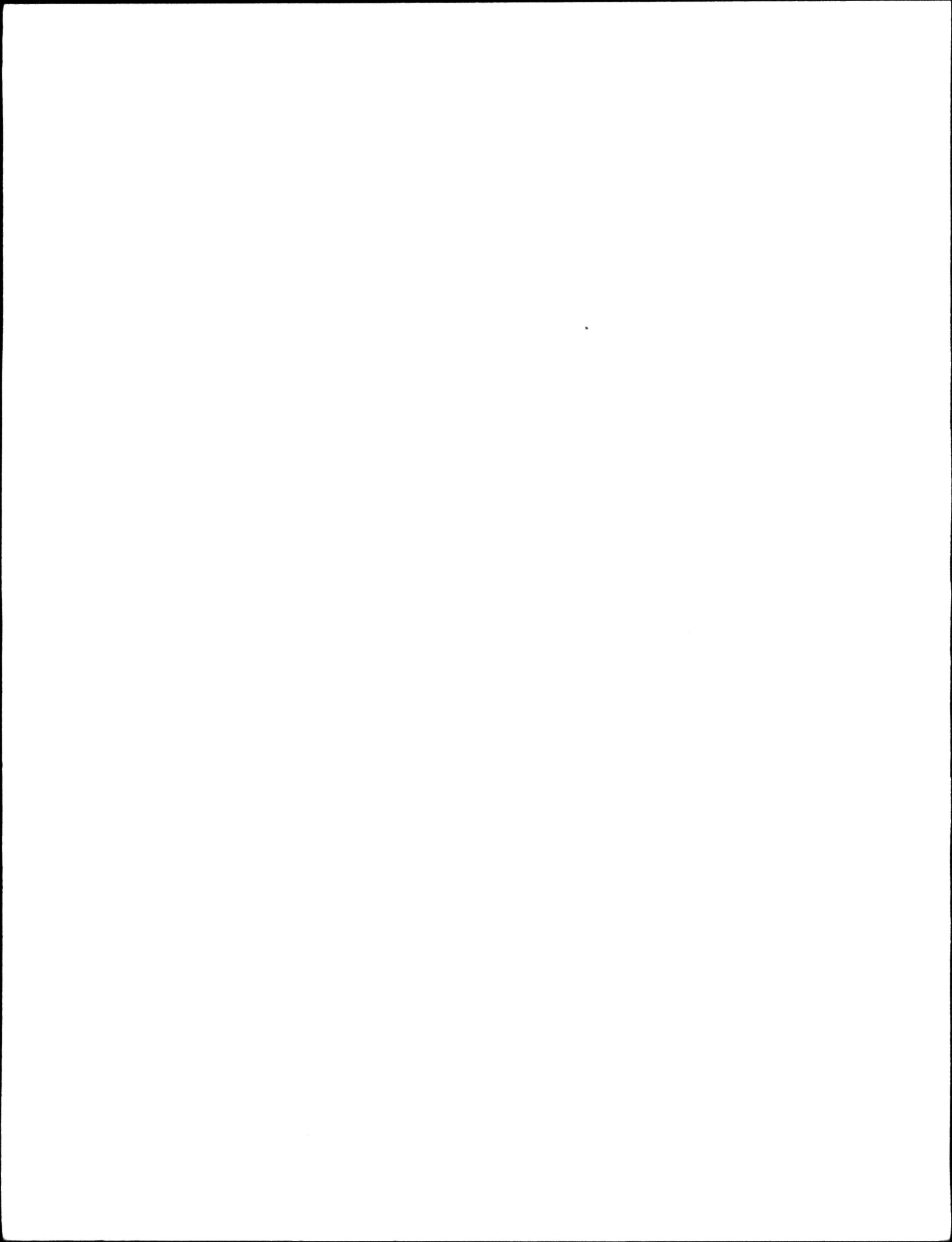
The water quantity survey network in operation on March 31, 1975 was reviewed to determine the division of responsibility between the federal and provincial governments. Each stations was designated either 'Federal', 'Federal-Provincial' or 'Provincial', the designation not only indicating the prime need, but also the financial responsibility.

¹ Environment Canada, Water Quantity Surveys, Federal-Provincial Cost Sharing Agreements, Annual Report.



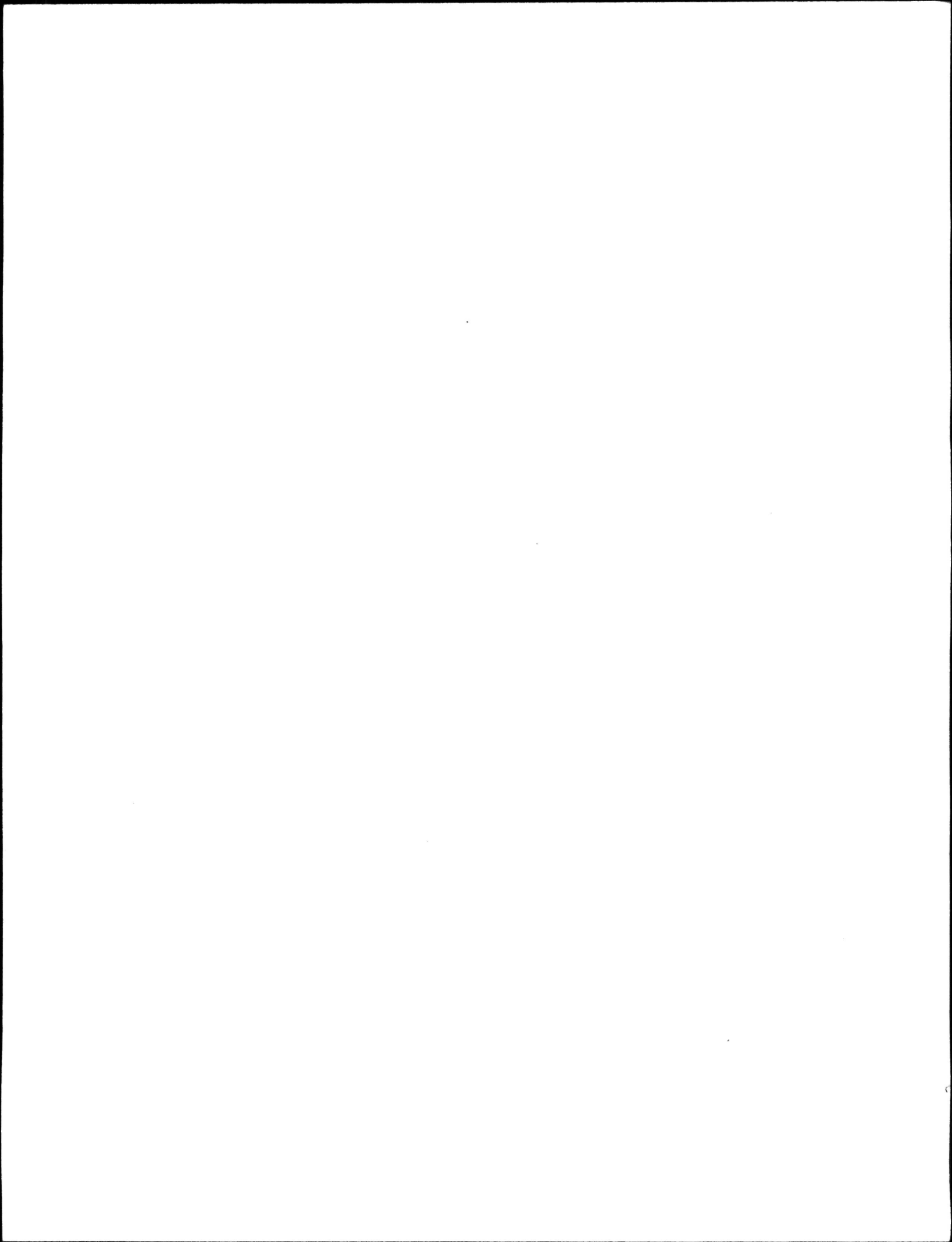
Schedule "B" (contained in the National Report) of the agreement, lists the items to be included in computing the annual payments. The federal government pays 100% of the cost of operation and construction of stations designated 'Federal' and 50% of the cost of stations designated 'Federal-Provincial'. The provincial government pays 100% of the cost of operation and construction of stations designated 'Provincial' and 50% of the cost of operation and construction of stations designated 'Federal-Provincial'. Initially, guidelines were developed for 'Federal' gauging stations with 'Federal-Provincial' and 'Provincial' gauging stations being designated by a review of user requests. In 1977 a set of guidelines was developed for the three categories. This set of guidelines was reviewed and discussed at many National Co-ordinating Committee meetings. During 1982-83 the guidelines were reviewed and rewritten by both Administrators and Co-ordinating Committees. At the end of 1982-83 agreement was reached on the new set of guidelines which were utilized commencing in 1984-85. A copy of the approved guidelines is contained in the National Report.

Section 2.0 of this report summarizes the operational considerations of the 1984-85 water quantity program. Significant issues discussed at the Co-ordinating Committee meetings are identified in sub-section 2.1. Operational achievements are then outlined in sub-section 2.2. Changes to the network, which were previously agreed upon but which affect Schedule "A" for April 1, 1985 are listed in the sub-section 2.3, "Water Quantity and Sediment Networks" and Tables 1 to 3 summarize the



designation of hydrometric stations. Sub-section 2.4 includes a brief summary of network planning activities and figures provided to indicate the financial responsibility and network changes from 1975 to 1985, the history of the size of the hydrometric network, and histograms of gauging station maturity. The final subsection provides a description of program plans for 1985-86.

Section 3.0 summarizes the cost of operation for the 1984-85 program. This section contains a summary of the federal and provincial costs associated with the water quantity network operations and construction activities. Detailed cost calculations for the 1984-85 fiscal year are presented in Appendix B. Tables 4 and 5 summarize the Total Program and Shareable Costs, Schedule "D", and a Comparison of Schedule "D" Costs with Actual Costs.



2.0 SUMMARY OF OPERATIONAL CONSIDERATIONS

2.1 CO-ORDINATING COMMITTEE MEETINGS

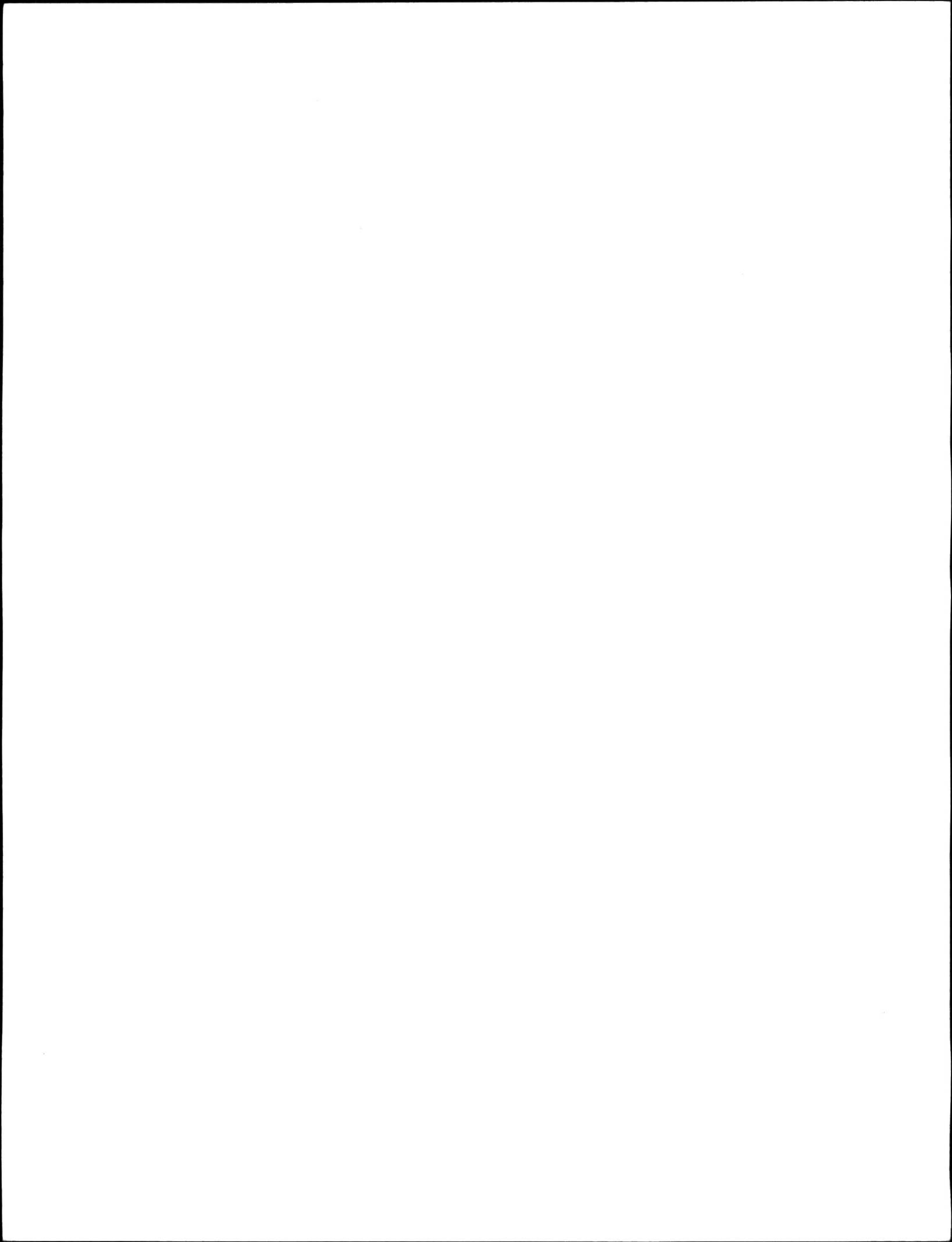
2.1.1 National Federal-Provincial Co-ordinators Meeting,
February 6, 1985

The Director of the federal Water Resources Branch outlined the composition and activities of the Nielsen Commission with regard to the water program. He also described the progress of the Inquiry on Federal Water Policy, noting a report will be submitted to Cabinet in July and available for public release in August 1985.

The Compendium Report, Water Quantity Surveys was discussed but not finalized, as some parties wished another opportunity to provide comments. Areas of the federal-provincial cost sharing agreements subject to interpretation and possible future changes were also discussed.

2.1.2 Canada-Alberta Co-ordinators Meetings,
September 13, 1984 and January 21, 1985

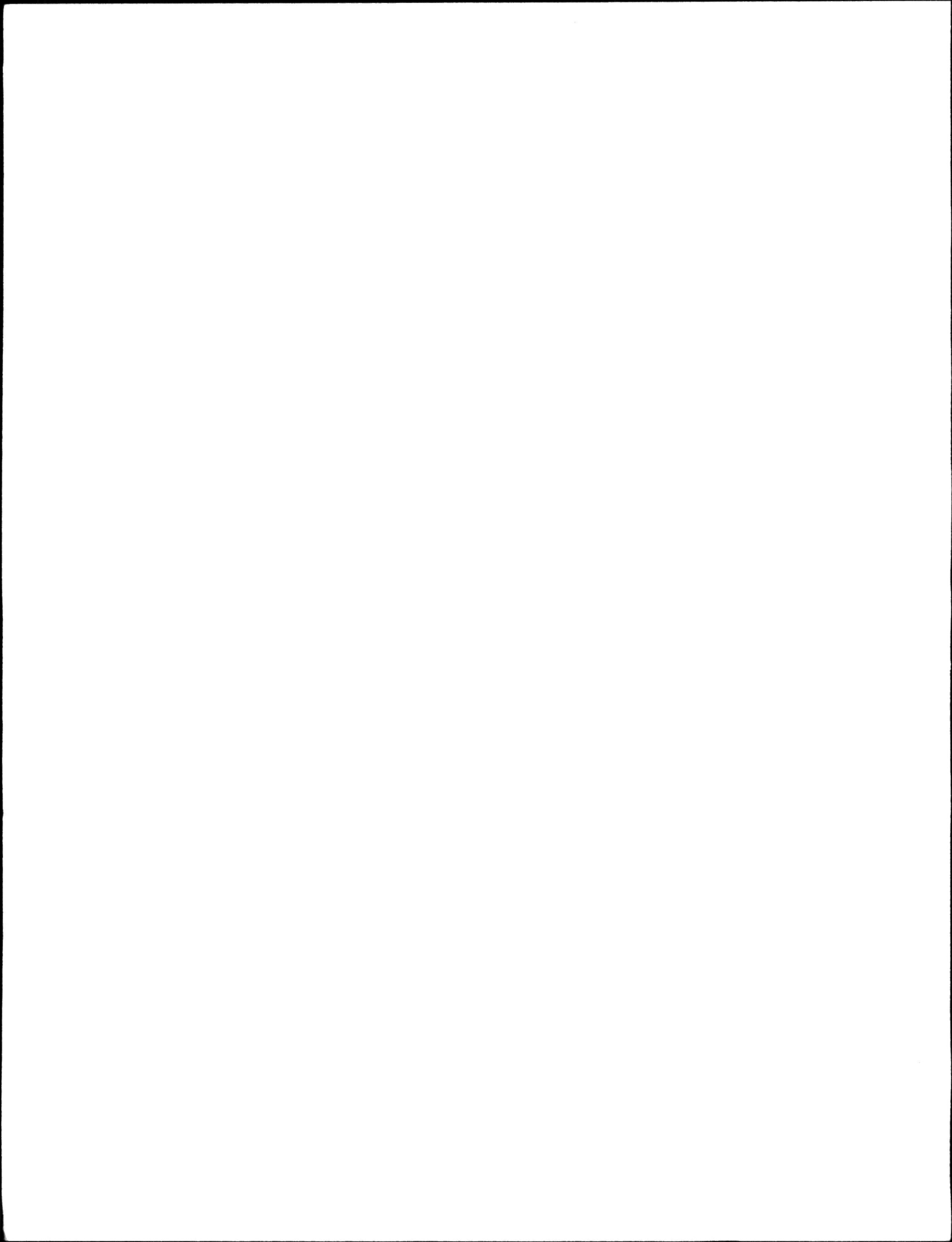
2.1.2.1 Cost sharing formula for EDP system. Two memoranda were discussed on a proposed cost sharing formula. It was noted that there will be no increase in cost to the Province.



2.1.2.2 Water Resources sediment study contract. This item was briefly discussed for information purposes. The province was informed that the contract to investigate the suspended sediment network in the prairie provinces had been awarded to Northwest Hydraulics.

2.1.2.3 DCP installation and operations. A long range work plan for installation of DCPs during the period 1984-85 to 1988-89 was discussed. The committee was in agreement with the sites selected for the installation of approximately five DCPs each year during the five-year period. Arrangements were made for Water Survey to operate DCPs at five sites currently operated by the province commencing in 1985-86.

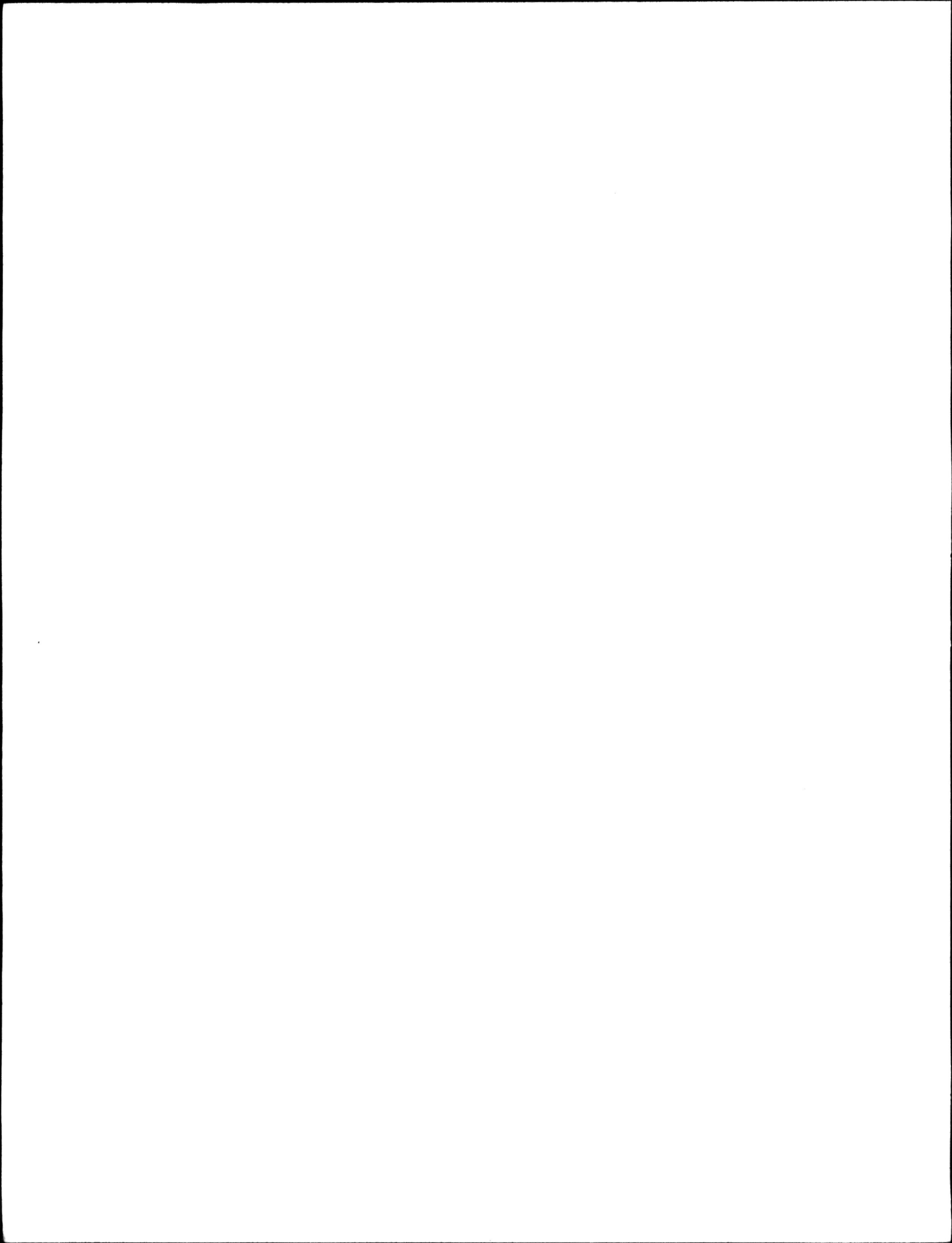
2.1.2.4 Alberta funding for the 1985-86 program. The province noted there would be very limited funding available for new construction in 1985-86 and that it appeared there would be no increase in the operating budget for 1986-87. The committee appointed two members to develop various scenarios for 1985-86 and 1986-87, based on the projected increase in the cost index factor and increase or decrease in the number of stations to be operated.



2.1.2.5 Designation of Mackenzie River Basin hydrometric stations. This item was discussed at both meetings with the committee encountering difficulty in being able to determine the procedure which would be utilized to designate hydrometric stations for cost sharing purposes. It appeared to the committee that recommendations pertaining to the hydrometric network arising from the Mackenzie River Basin Committee wouldn't become a factor for some considerable time in the future.

2.1.2.6 Compendium Report, water quantity surveys. The August 1984 draft report was discussed and both parties were generally satisfied with its composition. Comments on areas of concern were provided to WRB, Ottawa for consideration in the preparation of the final report.

2.1.2.7 Review of hydrometric stations with operational difficulties. A list of problem stations prepared by Water Survey, which was circulated to various Branches of Alberta Environment, was discussed. The responses indicated that all stations were required and the province queried how the operational problems could be overcome. Discussion included work items such as "Do we change the operational period to spring runoff only?"; "Can construction alternatives be applied?";



"Do we run but not publish?". It was agreed that Water Survey would investigate possible solutions and discuss these with the province.

2.1.2.8 Reduction of sediment network. Based on final and preliminary results a discussion ensued on discontinuing the sediment program at the following six stations:

Oldman River near Brocket

Oldman River near Lethbridge

Red Deer River at Drumheller

Red Deer River at Red Deer

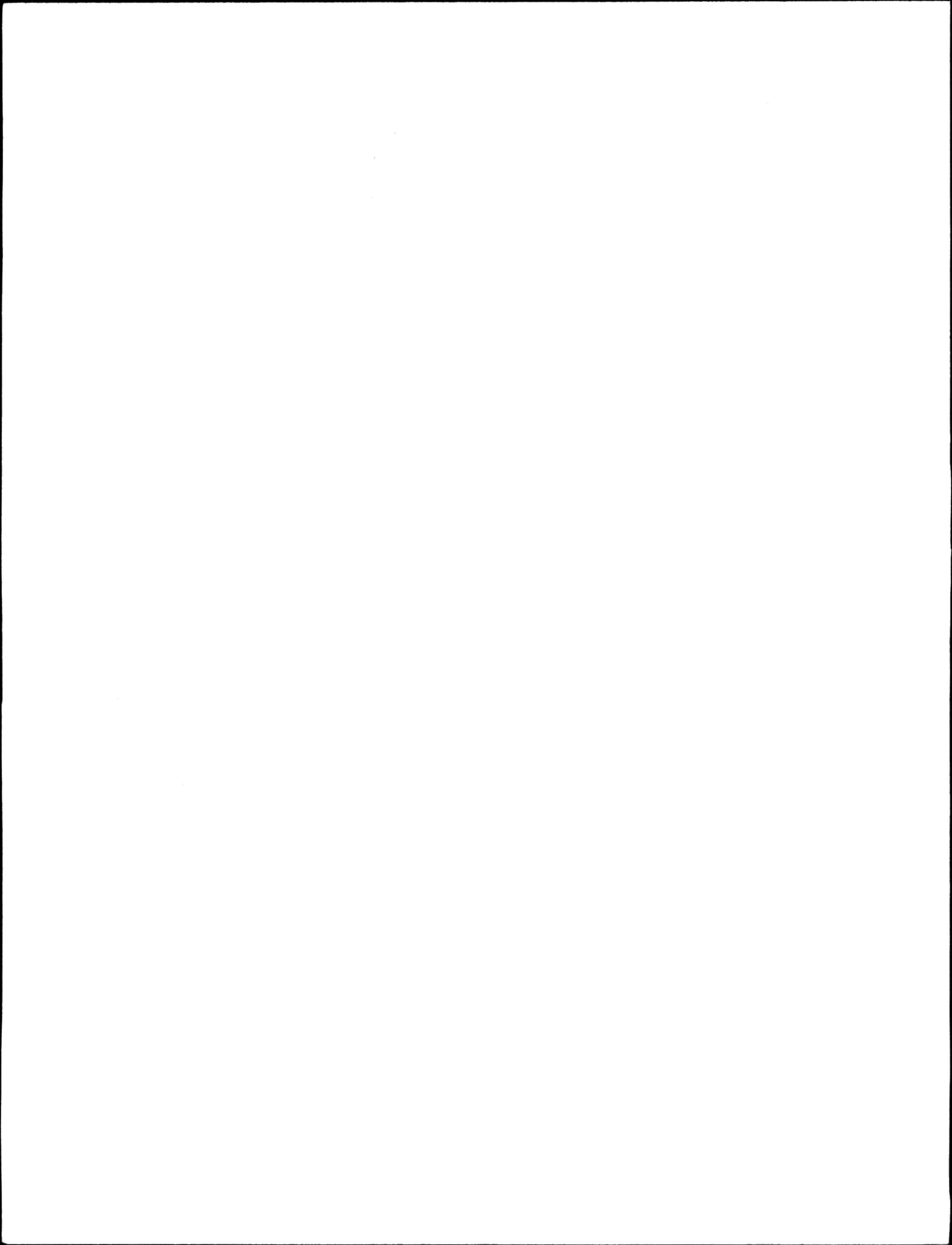
Red Deer River near Bindloss

South Saskatchewan River at Hwy. 41

It was agreed that the latter four stations could be discontinued, but it was necessary to continue operation of the two stations on the Oldman River due to the imminent construction of a dam on this stream.

2.2 OPERATIONAL ACHIEVEMENTS

Problems during 1984-85 were minimal due to no staff turnover. Main achievements during the year were meeting the November 1 deadline for the annual "Sediment Data" publication, meeting the May 1



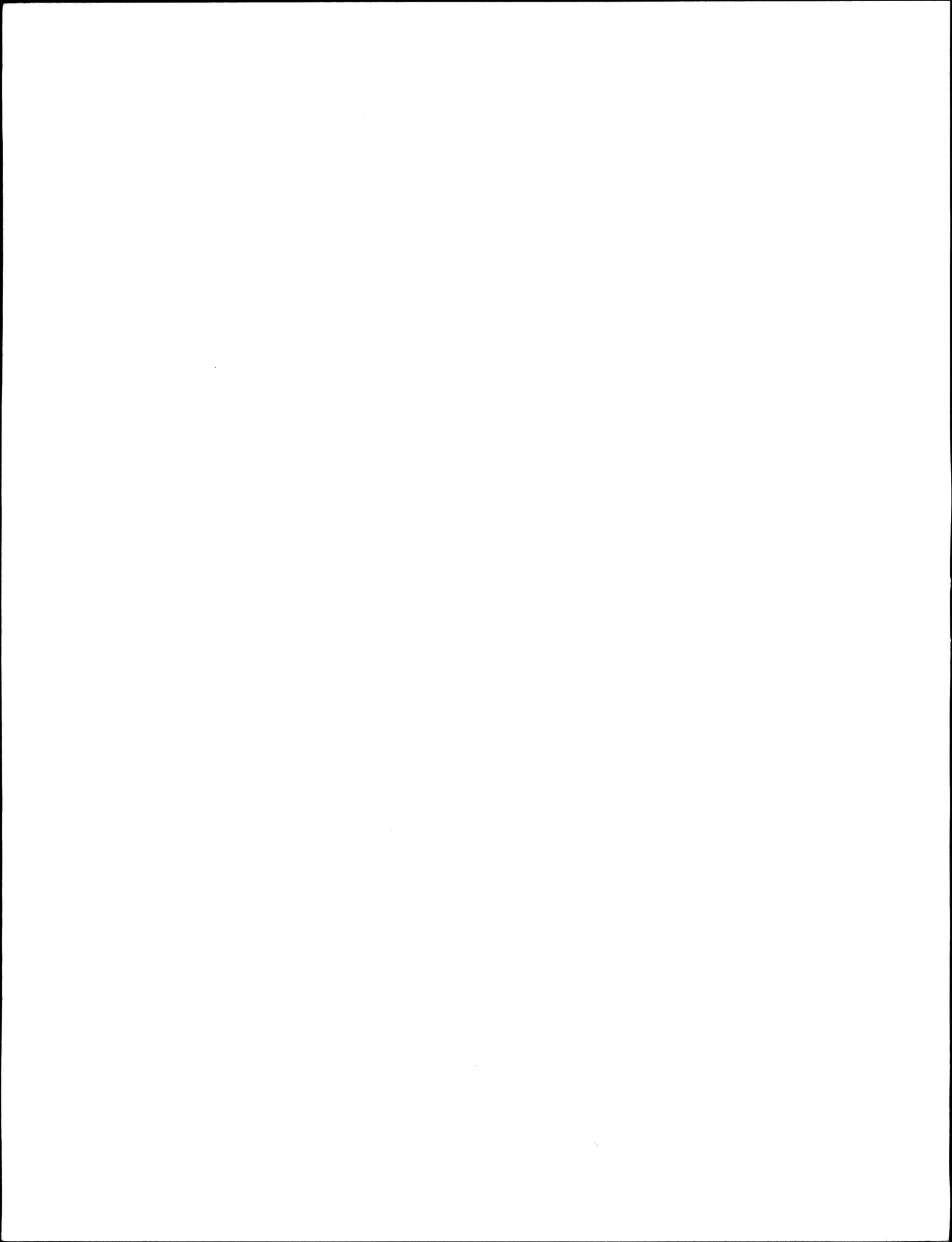
deadline for the annual "Surface Water Data" publication, satisfactory completion of the construction and maintenance program, and training staff in a variety of hydrometric program activities.

2.2.1 Training Program

The Headquarters Hydrometric Methods Section sponsored a DCP training course for staff involved in the operation of DCPs. Headquarters Data Control Section and in-house training was provided in the new mini-computer system.

2.2.2 Construction and Maintenance Program

As was the case during the previous few years, the construction and maintenance program was of a significant size and all aspects of the program were satisfactorily completed. A total of 27 new hydrometric stations were installed. Maintenance was conducted at 15 stations and major reconstruction was conducted at seven stations. Localities where both maintenance and construction were carried out are indicated in Appendix B, Table II and Figure I. Additional details regarding the construction and maintenance program are provided in the annual report "Alberta Gauging Station Construction and Maintenance, 1984-85".

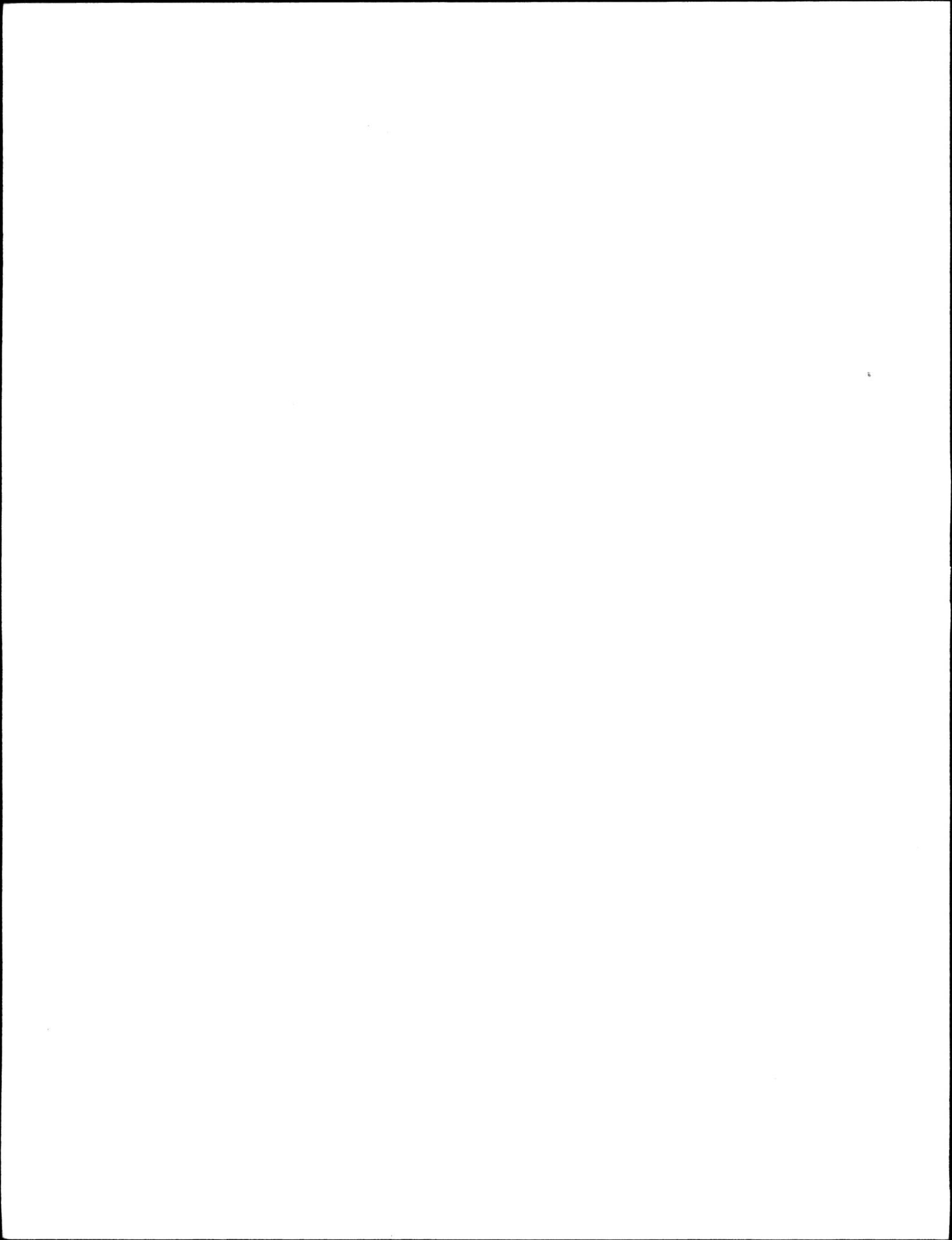


2.3 WATER QUANTITY AND SEDIMENT NETWORKS

Changes which are reflected in Schedule "A", April 1, 1985 are summarized as follows:

2.3.1 New Stations Established during 1984-85

<u>Station Name</u>	<u>Station No.</u>	<u>Designation</u>
1. Drain L-5 near Diamond City	05AD040	F-2
2. Drain T-1 near Taber	05AG027	F-2
3. Ross Creek at Medicine Hat	05AH049	F-2
4. McLeod River near Rosevear	07AG007	F-4
5. Buchanan Creek near Manning	07HC002	FP-3
6. Deep Valley Creek near Valleyview	07GF008	FP-3
7. Pipestone River near Lake Louise	05BA002	FP-3
8. Tomahawk Creek near Tomahawk	05DE009	FP-3
9. Wabasca River below Trout River	07JB002	FP-3
10. Willow River near Wabasca	07JA004	FP-3
11. APL Cooling Pond Outlet	05CH015	P-1
12. Babette Creek near Colinton	07CA008	P-1
13. Baptiste River near the Mouth	05DC012	P-1
14. Bear Creek near Valhalla Centre	07GE007	P-1
15. Elder Creek at Highway No. 686	07HB002	P-1
16. Embarras River near Weald	07AF014	P-1
17. Fish Creek above Little Fish Lake	05CG006	P-1
18. Groat Creek near Whitecourt	07AG008	P-1
19. Loyalist Creek near Consort	05GA013	P-1
20. McLeod River near Cadomin	07AF013	P-1
21. Peerless Lake at Peerless Lake	07JB001	P-1
22. Redwater River near Vimy	05EC007	P-1
23. Red Willow Creek near Red Willow	05FC005	P-1
24. Sounding Creek near Chinook	05GA012	P-1
25. Waskasoo Creek at Red Deer	05CC011	P-1
26. Weiller Creek near Wetaskiwin	05FA024	P-1
27. White Earth Creek near Smoky Lake	05EC006	P-1



2.3.2 Discontinued Hydrometric Stations at end of 1984-85

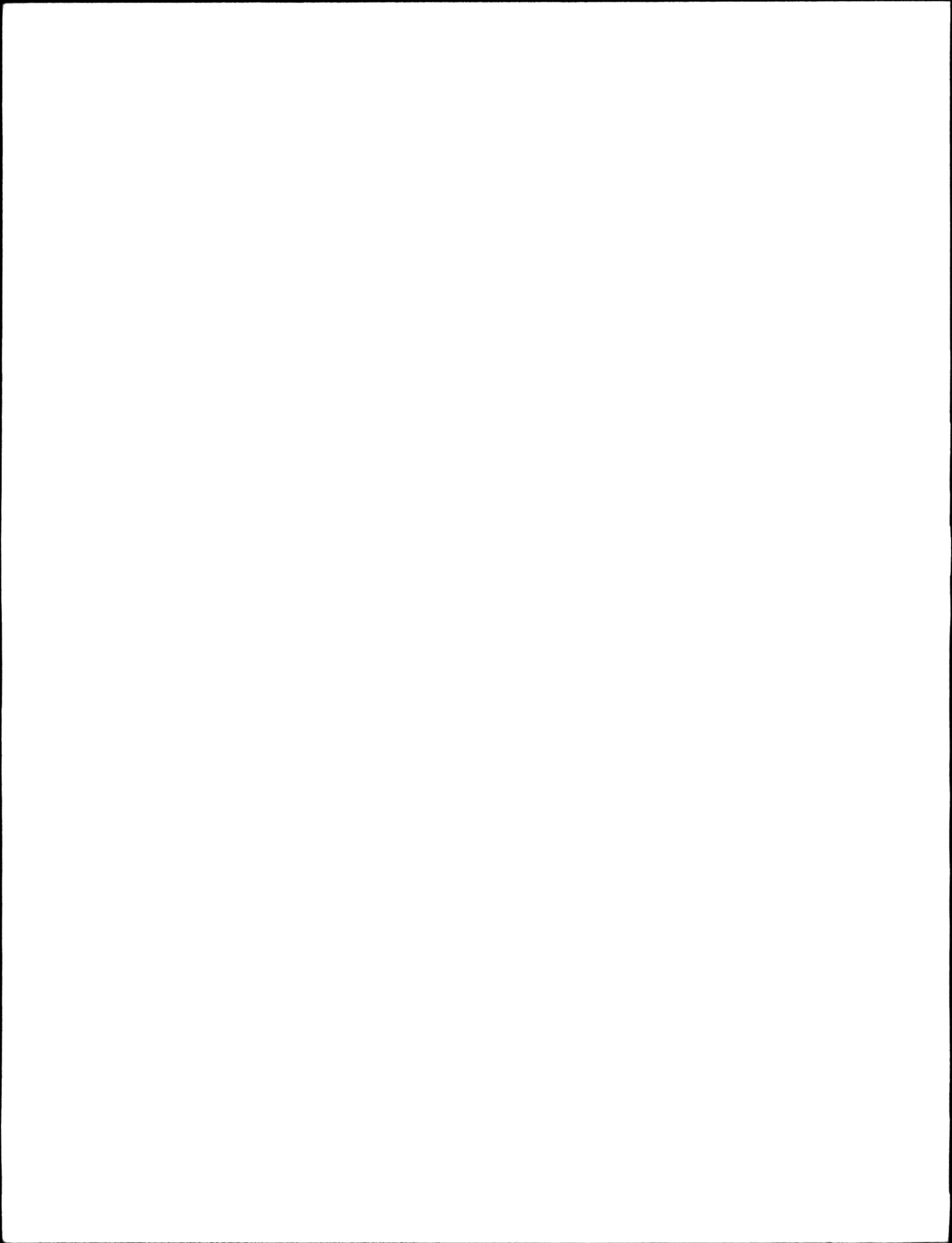
<u>Station</u>	<u>Station No.</u>	<u>Designation</u>
1. Bench Mark Creek near Fort Smith	07NB006	F-1
-2. Bountiful Coulee near Cranford	05AG008	F-2
-3. Drain T-2 near Taber	05AG023	F-2
-4. Drain T-11 near Fincastle	05AG025	F-2
-5. McLeod River near Wolf Creek	07AG001	F-4
-6. Natural Flow B near Princess	05CJ011	FP-3
-7. Natural Flow C near Bow City	05BN024	FP-3
8. B.R.D. Drain A near Hays	05AG004	P-1
-9. B.R.D. Drain E near Vauxhall	05BN023	P-1
-10. Bow River at Canmore	05BE008	P-1
11. Clear Lake near Stavely	05AC032	P-1
-12. Red Deer River at Sundre	05CA010	P-1
13. Ross Creek Diversion Canal near Irvine	05AH045	P-1
-14. Waiparous Creek below Meadow Creek	05BG009	P-1

2.3.3 Designation Changes

<u>Station</u>	<u>Station No.</u>	<u>Former Designation</u>	<u>Present Designation</u>
1. North Saskatchewan River at Edmonton	05DF001	F-2	F-4
2. North Saskatchewan River near Rocky Mountain House	05DC001	F-2	FP-2

2.3.4 Access Changes (From Normal Access to Remote Access)

<u>Station</u>	<u>Station No.</u>	<u>Designation</u>
1. Cutbank River near Grande Prairie	07GB001	FP-3
2. Kakwa River near Grande Prairie	07GB002	FP-2



2.3.5 Changes to Sediment Program (Sediment Program Discontinued)

<u>Station</u>	<u>Station No.</u>	<u>Sediment Program Designation</u>
1. Red Deer River at Drumheller	05CE001	P
2. Red Deer River at Red Deer	05CC002	FP
3. Red Deer River near Bindloss	05CK004	F
4. South Saskatchewan River at Highway 41	05AK001	F

Table 1 indicates additions and deletions to the hydrometric network during 1984-85, which resulted in an increase of 13 stations operated by Water Survey of Canada, and the station designation effective April 1, 1984. Table 2 illustrates the changes which have occurred in each of the designation categories from the commencement of the cost sharing agreement in April 1975 to April 1, 1984. Table 3 provides detailed gauging station data as of April 1, 1984.

2.4 NETWORK PLANNING ACTIVITIES

2.4.1 Sediment

The report "Sediment Station Analysis - Highwood River near the Mouth" was finalized and distributed in 1984. A similar report for Oldman River near Brocket was also completed and will be distributed early in 1985-86. Planning analysis studies for other long term sediment stations will continue to remain a high priority project during 1985-86.

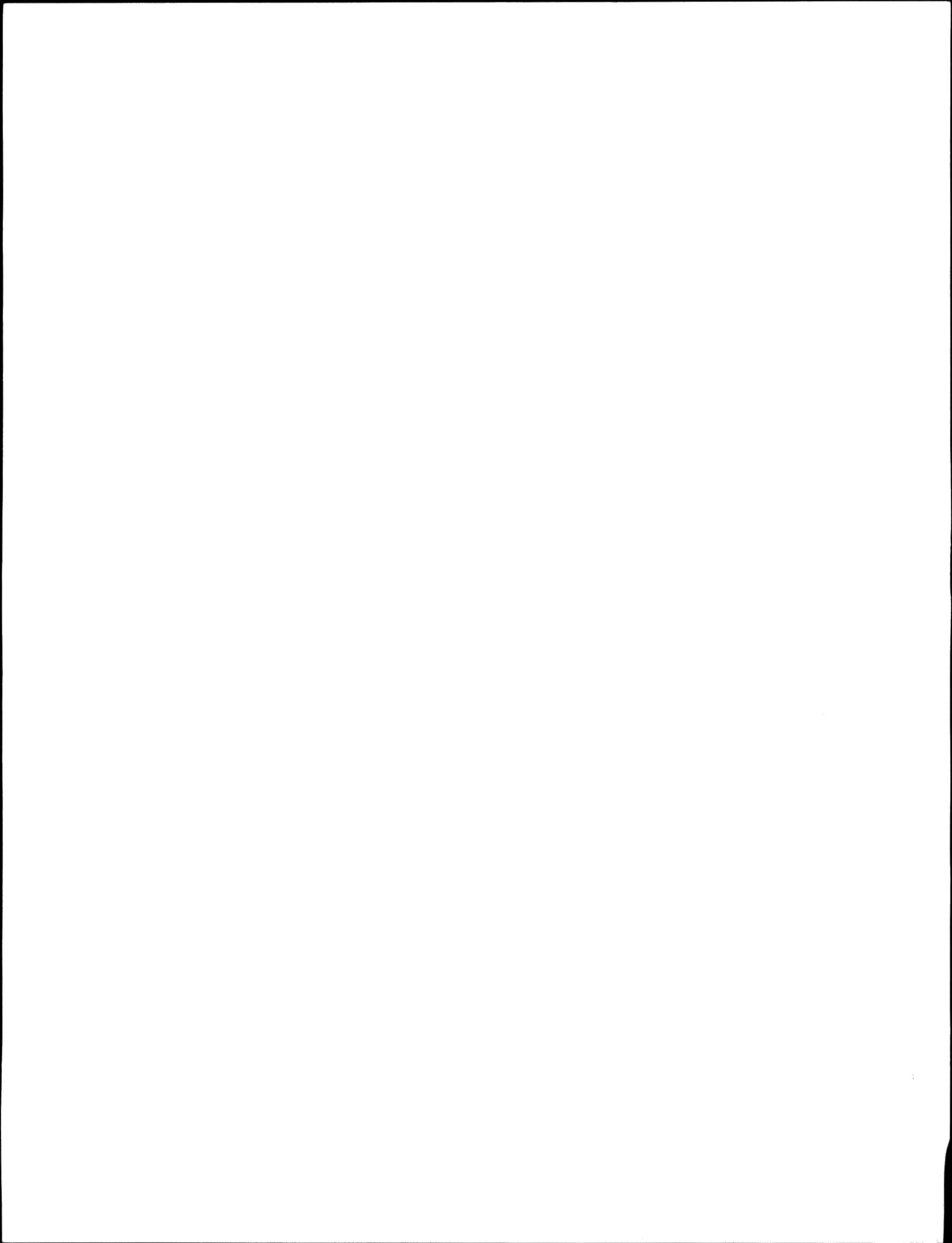


TABLE 1
WATER QUANTITY SURVEYS
GAUGING STATION DATA FOR 1984-85

No. of Stations			Changes during <u>1984/85</u>		Stn. Designation April 1, <u>1984</u>			
April 1 / <u>83</u>	April 1 / <u>84</u>	Change	Added	Discontinued	Fed.	F P	Prov.	Contrib.
539	553	+14	27	14	* 126(3)	* 214(6)	* 159(9)	54(0)

* Bracket Sediment Stations

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

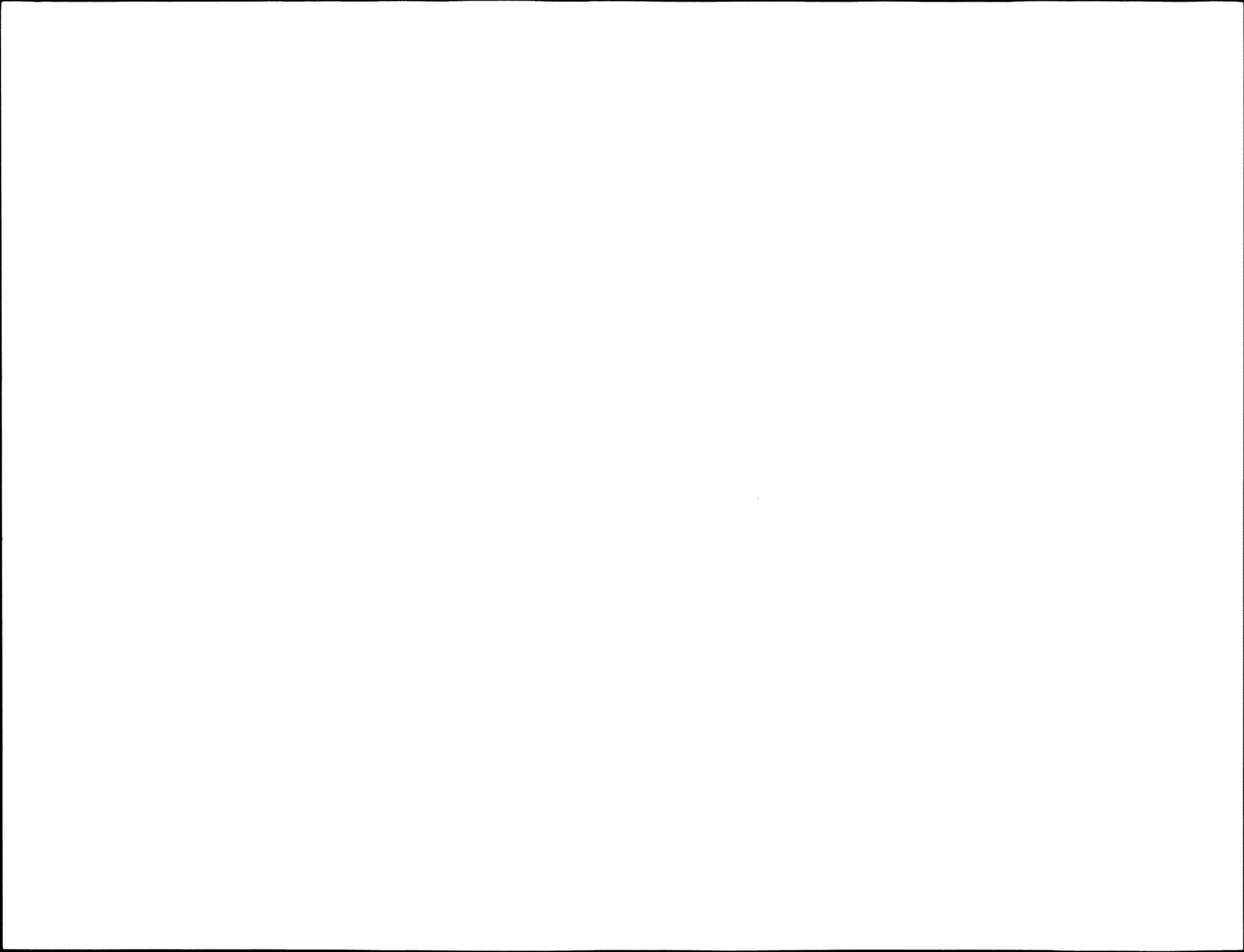
Federal Stations			F P Stations			Provincial Stations			Total Stations		
Apr 1/ <u>75</u>	Apr 1/ <u>84</u>	Chge	Apr 1/ <u>75</u>	Apr 1/ <u>84</u>	Chge	Apr 1/ <u>75</u>	Apr 1/ <u>84</u>	Chge	Apr 1/ <u>75</u>	Apr 1/ <u>84</u>	Chge
157	126	-31	221	214	-7	46	159	+113	424	499	+75

-12-

TABLE 3
WATER QUANTITY SURVEYS
DETAILED GAUGING STATION DATA April 1, 1984.

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
27(1)	60(5)	30(0)	9(2)	126(8)	21(3)	23(3)	170(2)	214(8)	159(2)	0	159(2)	54	553(18)

Bracket Numbers are Sediment Stations in Each Hydrometric Designation, but don't Indicate Financial Responsibility.



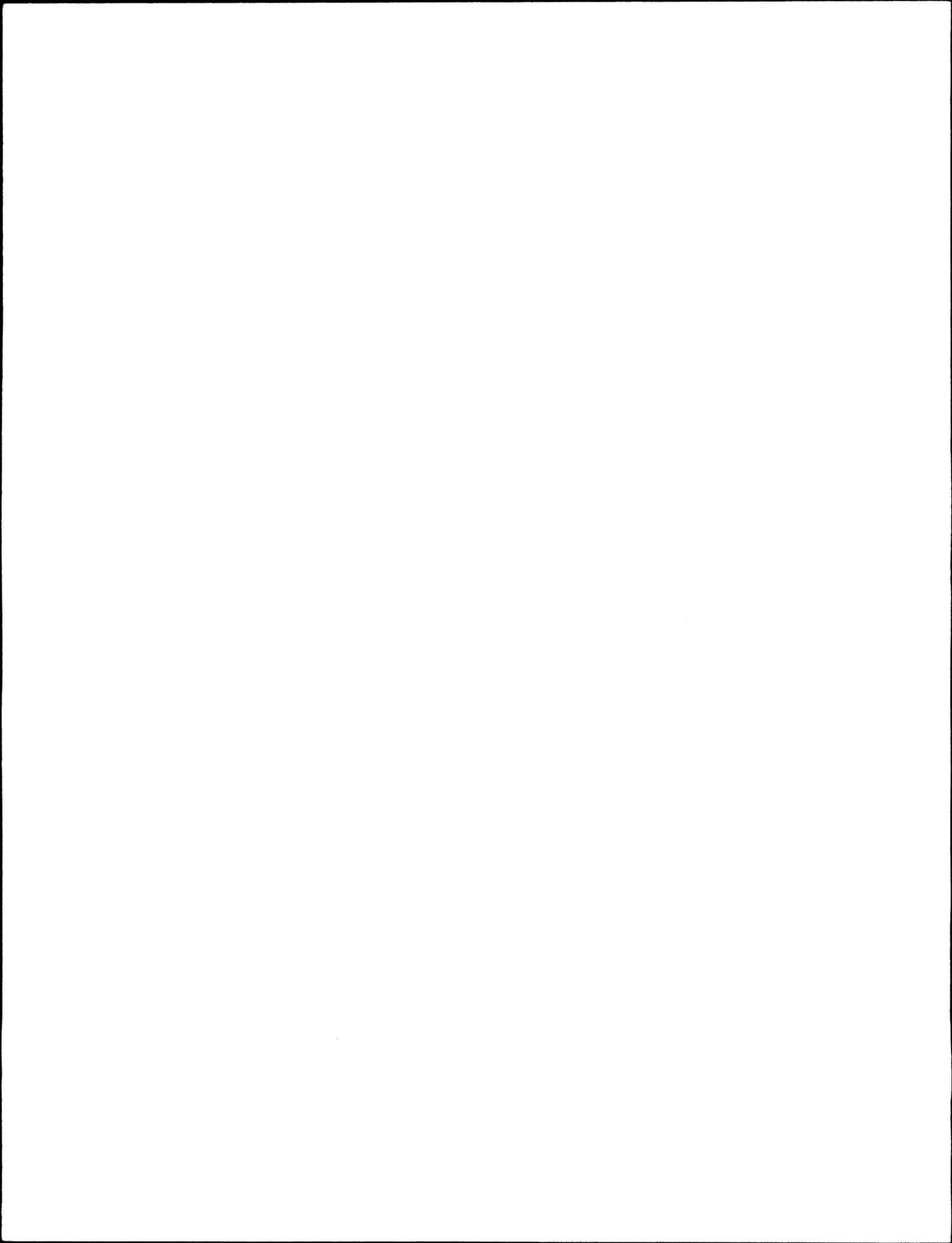
2.4.2 Network Planning Project

The co-operative report "Hydrometric Network Pilot Study for the Oldman River Basin" was finalized and distributed in 1984.

2.4.3 Historical Network Changes

As the total number of stations in the hydrometric network may remain the same or change by a small amount from year to year, it can appear that the network is dormant and that network planning is not occurring. This is actually far from the truth, and in fact, dynamic changes have occurred in the network from the inception of the cost sharing agreement, as indicated in the following summary:

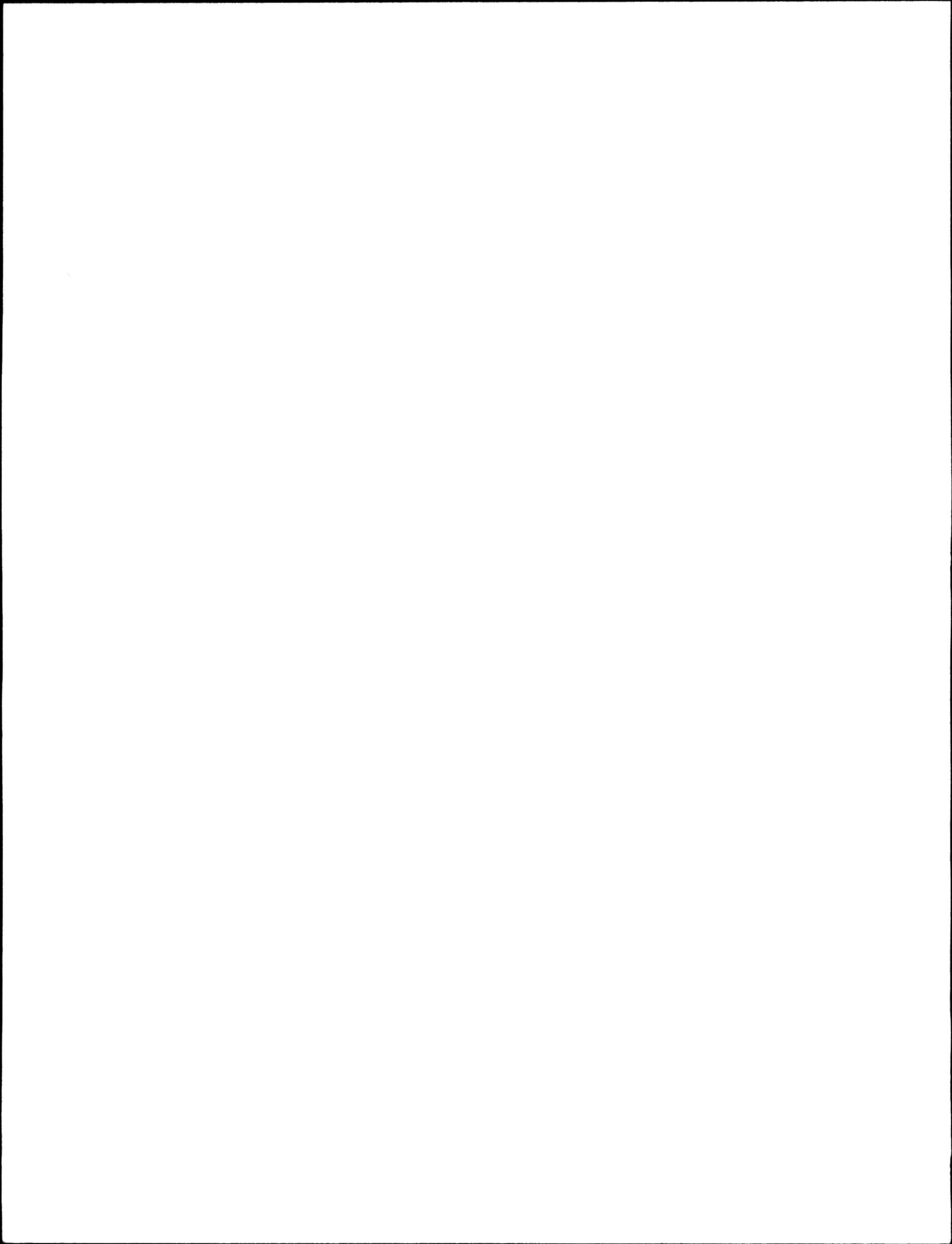
<u>Year</u>	<u>New Stations Established</u>	<u>Stations Discontinued</u>
1975-76	33	14
1976-77	21	9
1977-78	11	25
1978-79	15	11
1979-80	5	5
1980-81	17	8
1981-82	17	0
1982-83	17	2
1983-84	22	8
1984-85	<u>27</u>	<u>14</u>
Total:	185	96



The new stations established over this ten-year period represent 36% of the hydrometric network operated by Water Survey of Canada and Alberta Environment as of April 1, 1985 and the discontinued stations represent 19% of the network.

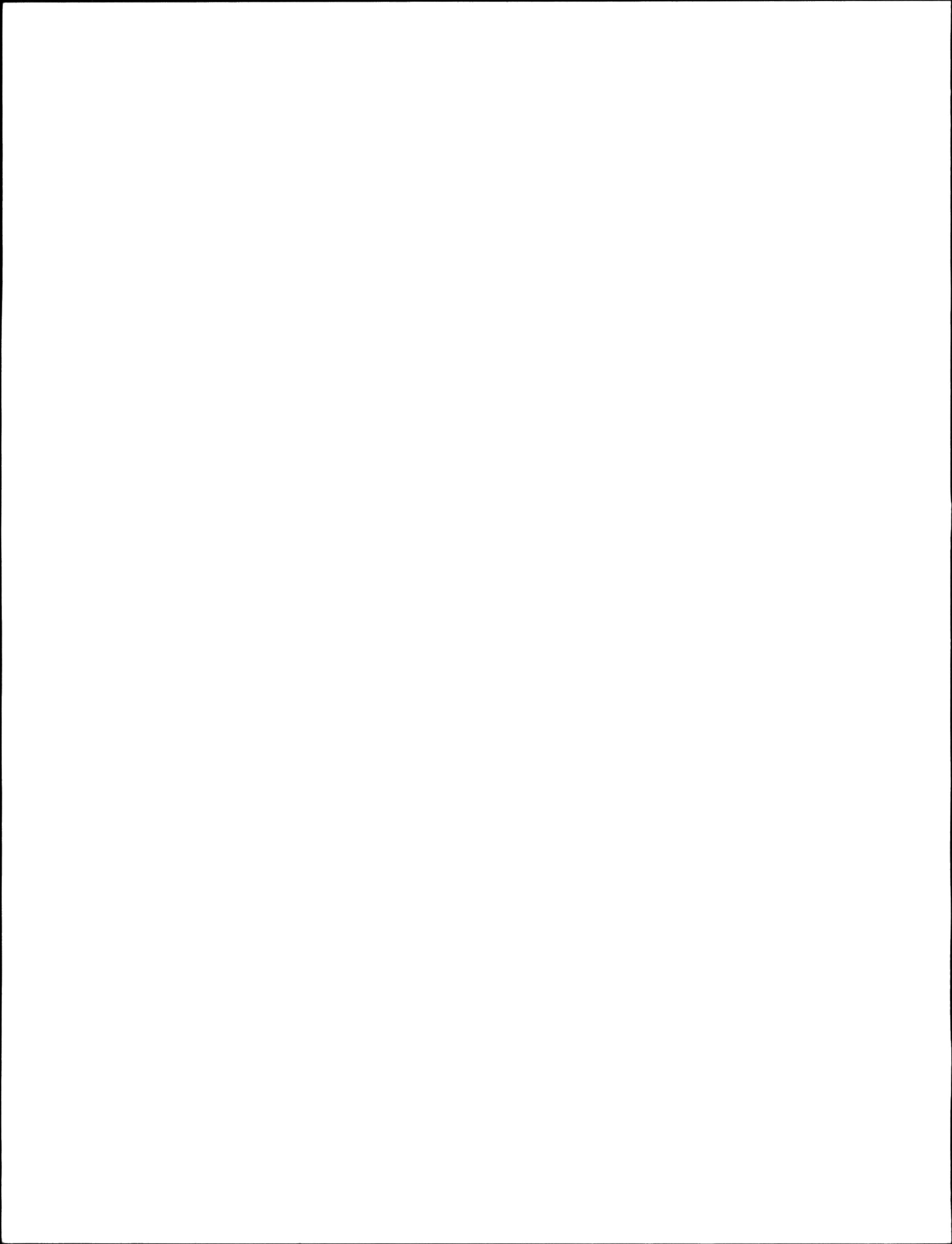
In addition to the 281 stations which have been added or deleted from the network, a large number of station designation changes has also occurred over the ten-year period and these are summarized as follows:

<u>Designation Change</u>	<u>Number of Stations</u>
F to F-P	15
F to P	14
F-P to F	7
F-P to P	27
F-P to Contributed	1
P to F	2
P to F-P	1
F to F-P (Sediment)	5
F-P to P (Sediment)	<u>5</u>
Total:	77



These designation changes represent 15% of the network and therefore between designation changes, new station construction and station discontinuance, there has been a change of 70% during the period of the cost-sharing agreement.

The changing nature for financial responsibility of the hydrometric network since the inception of the cost-sharing agreement is illustrated in Figure 1. This figure includes stations in Schedule "A" operated by the province. It is readily apparent from this graph that there has been a decrease in the federal financial involvement in the network and a significant increase in the provincial involvement since the inception of the agreement; however, at the same time, it should be noted that initially the federal government financed the majority of the network and it wasn't until April 1, 1982 that the respective shares were approximately equal. One of the major reasons for the shift in financial responsibility is that a thorough review of 'Federal' and 'Federal-Provincial' designated stations indicated that there was no longer a federal interest in a large number of stations and the province assumed financial responsibility for these stations. Also, since the inception of the agreement, the requirements for additional stations have mainly been of a provincial nature for regional water resource inventory and analysis, water allocation and management, and flow forecasting.



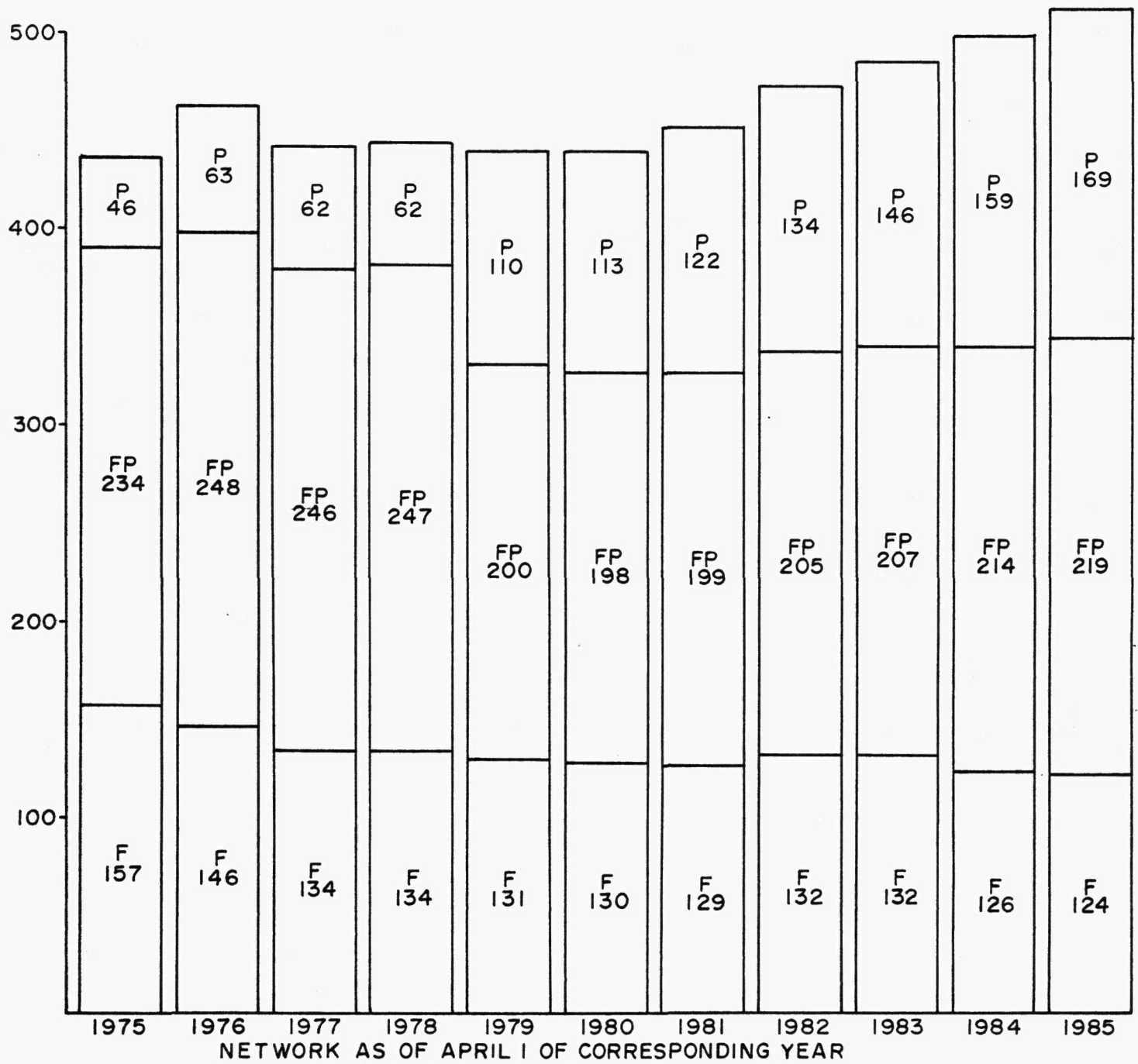
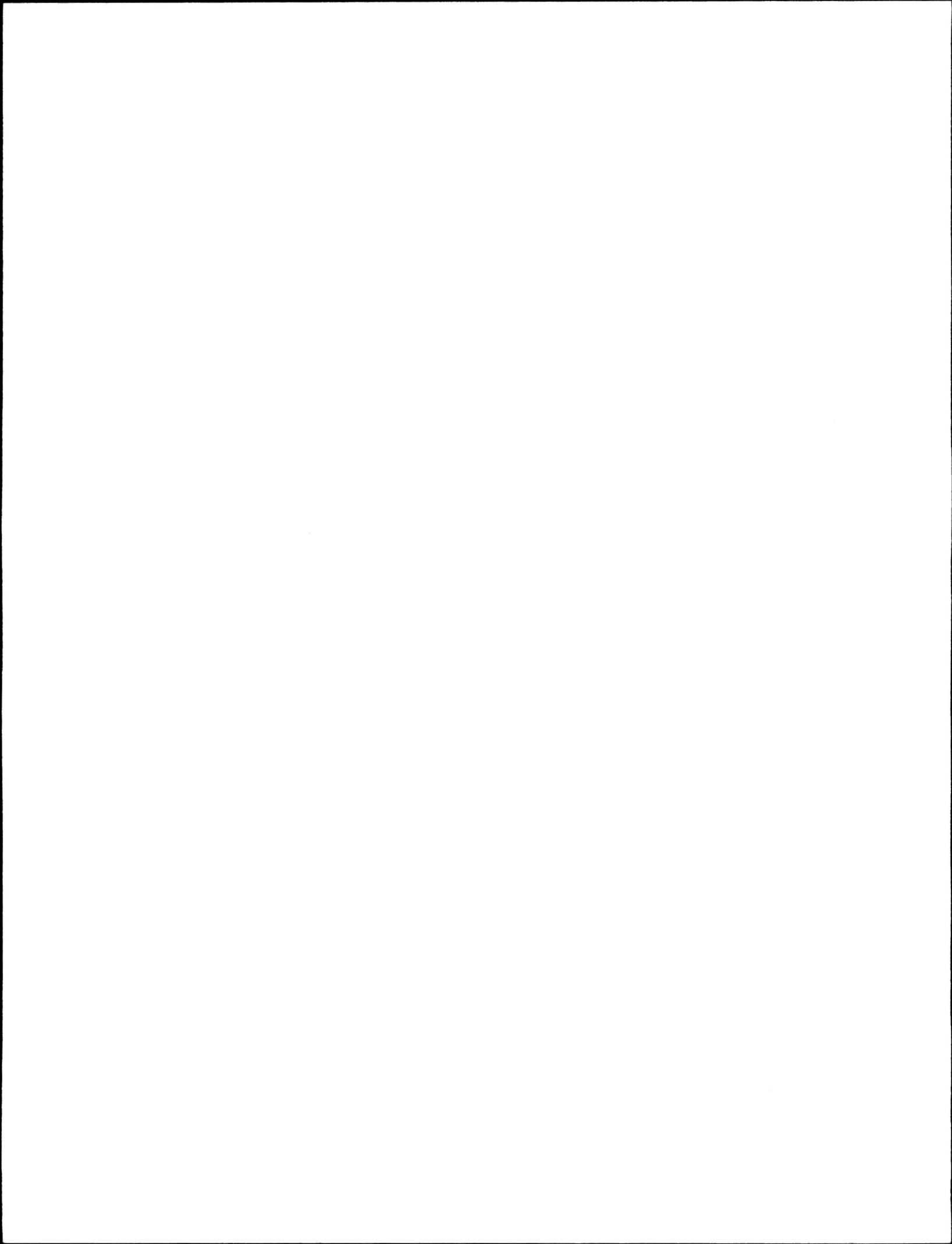
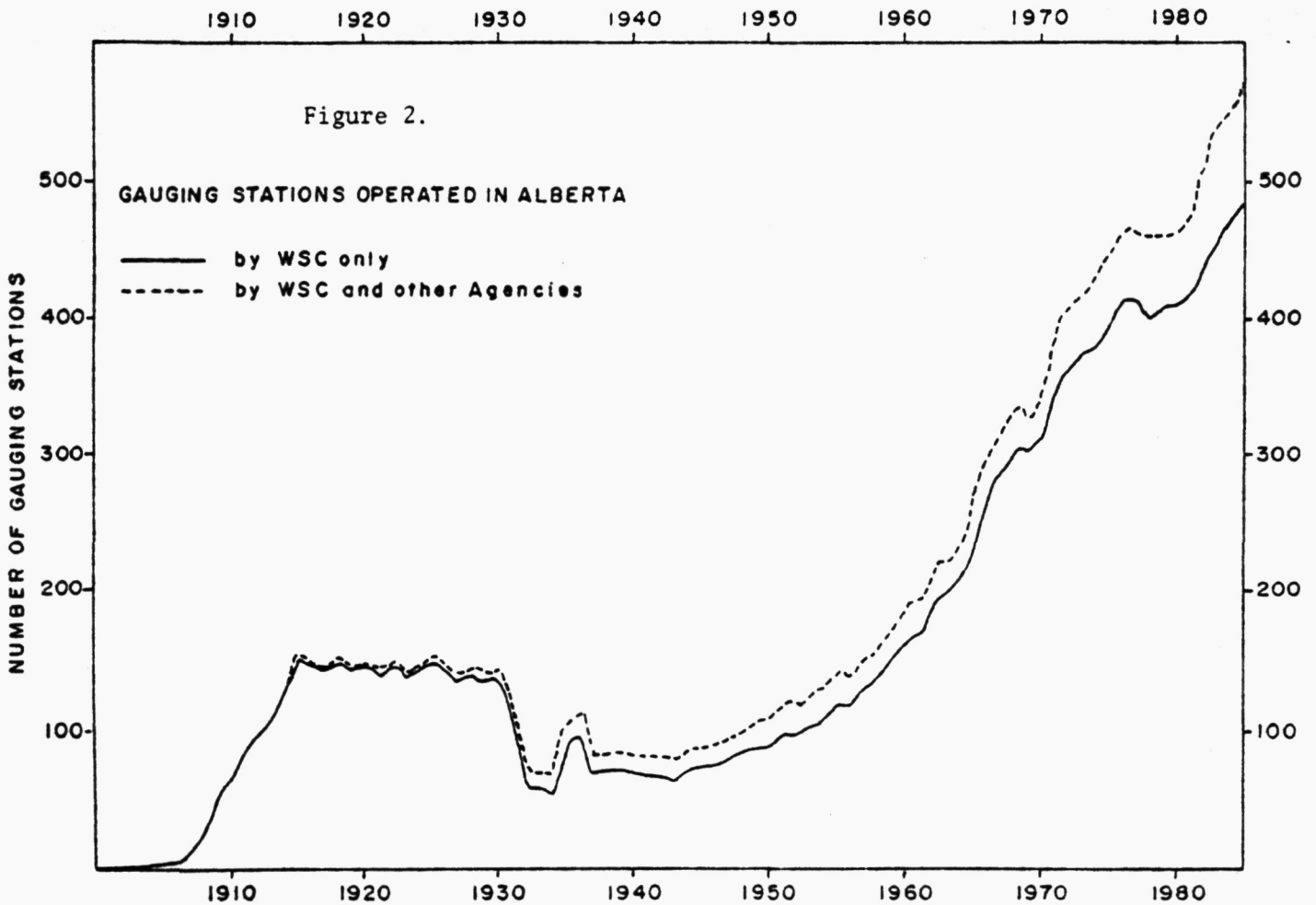


Figure 1

FINANCIAL RESPONSIBILITY AND NETWORK CHANGES
IN ALBERTA 1975 - 1985



The history of the size of the hydrometric network in Alberta is illustrated in Figure 2. In terms of the current era, it can be seen that the hydrometric network increased rapidly from the mid-50's until the signing of the cost-sharing agreement in 1975. Since the implementation of the agreement, the network has remained relatively stable in size with an increase of 17% of the stations in the cost sharing agreement occurring from April 1, 1975 to the end of 1984-85. The majority of this increase has occurred during the few years preceding the Alberta hydrometric enhancement program and during the enhancement program period.



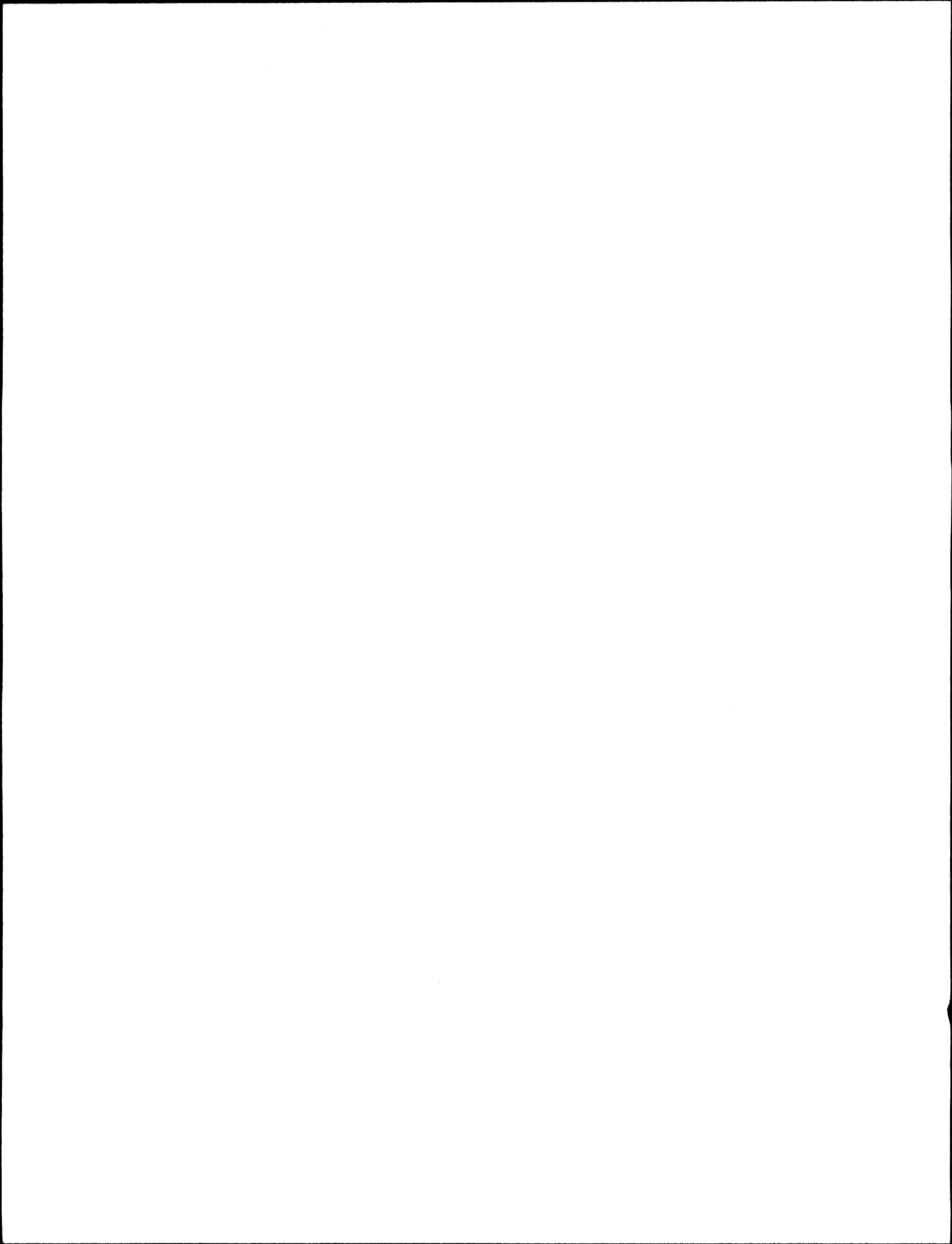
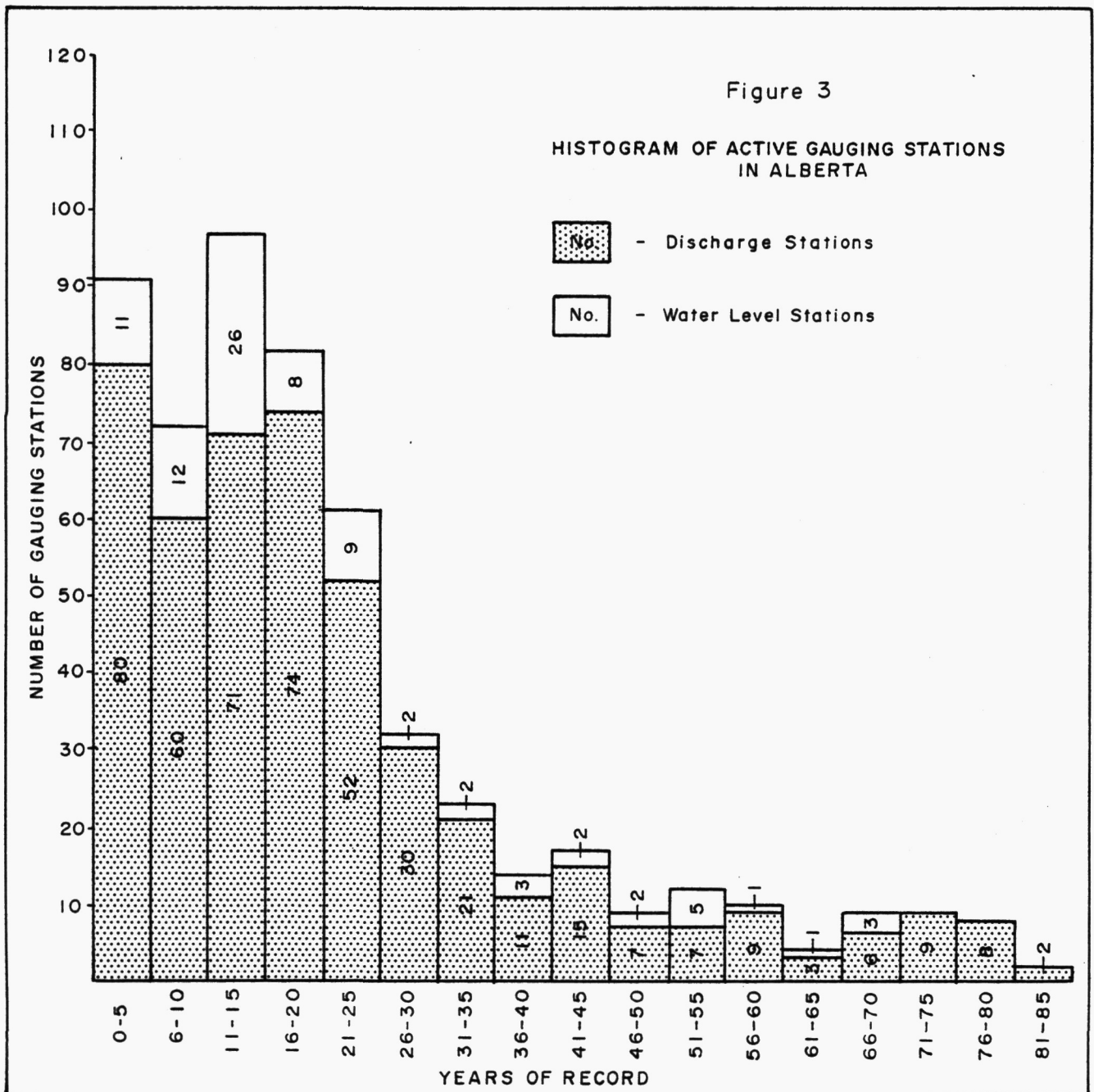
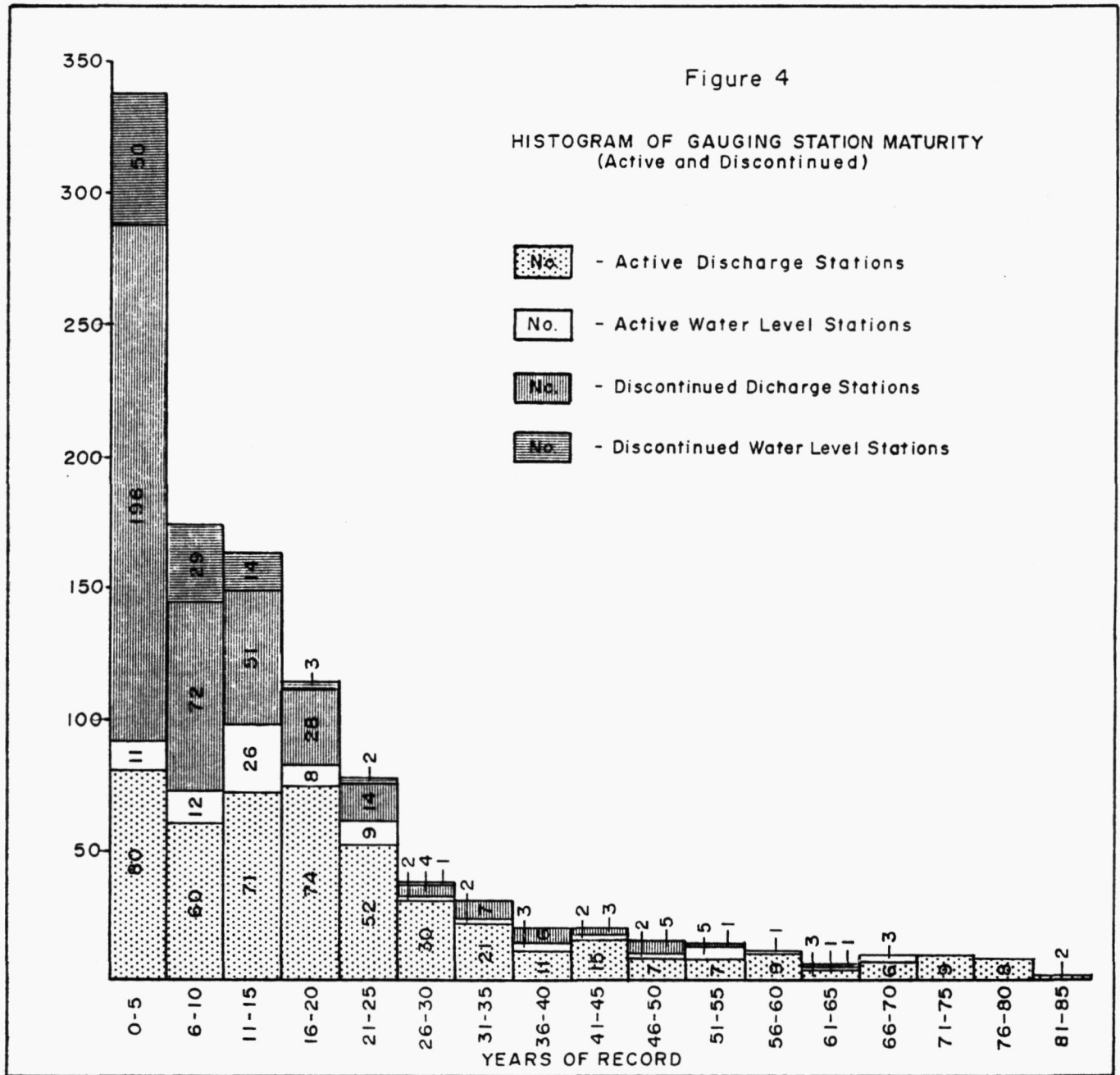


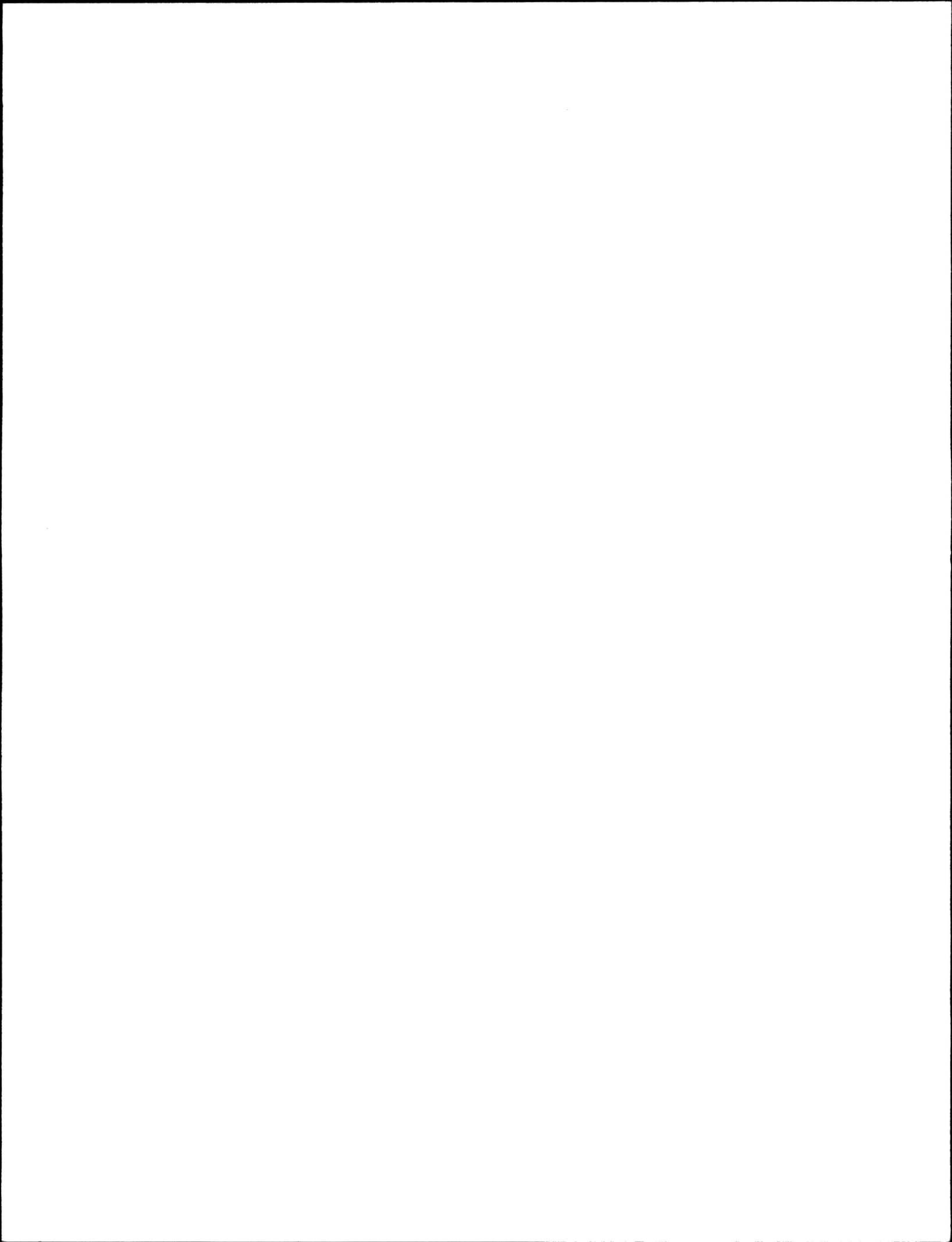
Figure 3 is a histogram of active gauging station maturity in Alberta and Figure 4 is a similar histogram which also includes discontinued gauging stations. The histogram of active gauging stations depicts the lack of maturity of the Alberta network as 28%







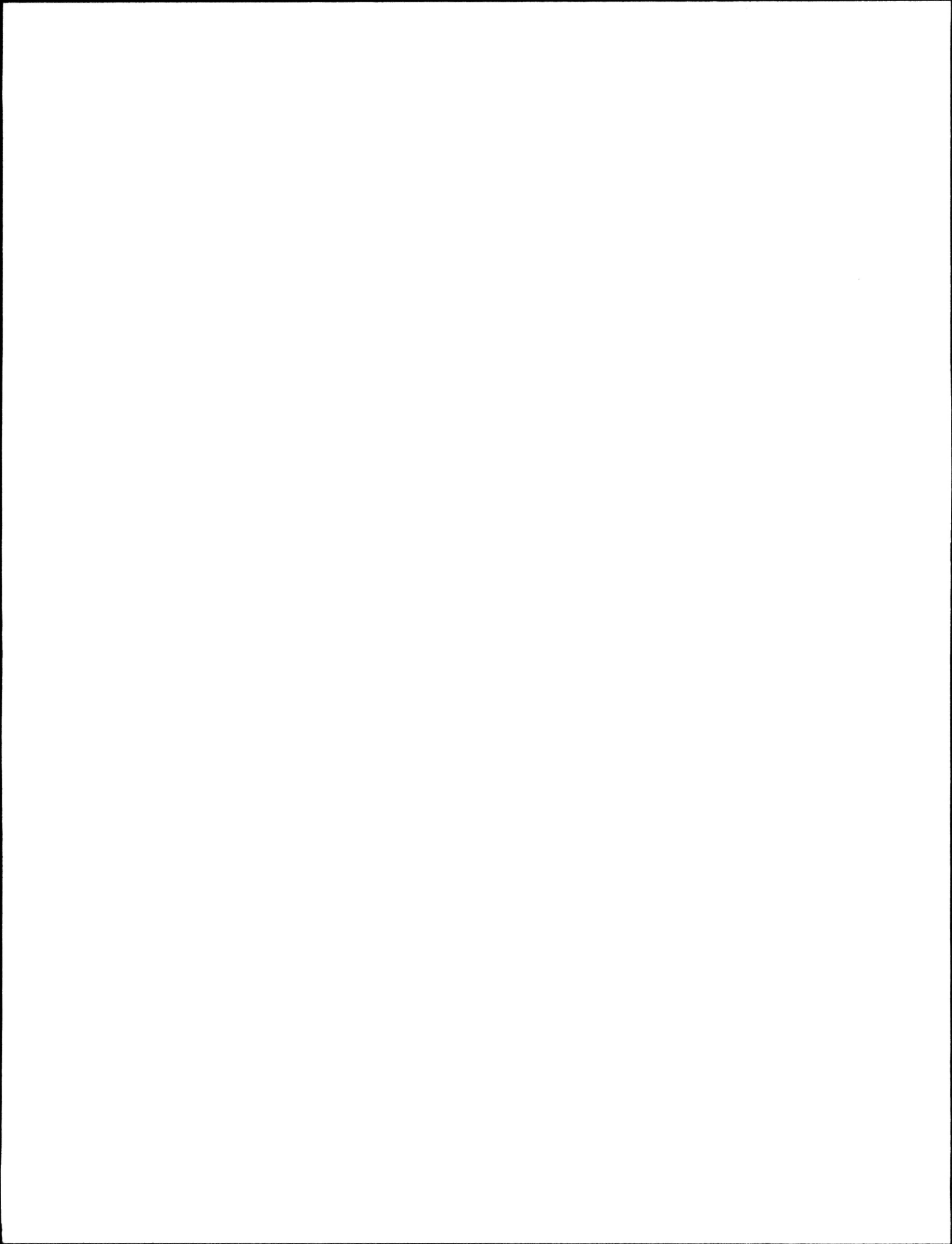
of the network has ten years or less of record and that the modal value for years of data for the active network is only 17 years.



2.5 PROGRAM PLANS FOR 1985-86

The major program plan for 1985-86 is the operation of the hydrometric and sediment networks, which will be listed in Schedule "A" dated April 1, 1985. Co-operative program plans for 1985-86 include continuing work on a study similar to that which produced the report 'Selected Characteristics of Streamflows in Alberta'. Office studies conducted by the federal Water Resources Branch will include an updated method of determination of Milk River natural flow, analysis of long term sediment stations, completion of the 1982 Smoky River Basin flood report, and a network planning study to re-evaluate short and long term federal hydrometric network requirements.

The construction and maintenance program for 1985-86 also comprises a significant portion of program plans. This includes construction at eight sites and maintenance and major reconstruction at approximately 47 stations. The program is relatively similar in size to that conducted the last few years; however, weather conditions will remain a critical factor in completing the program.

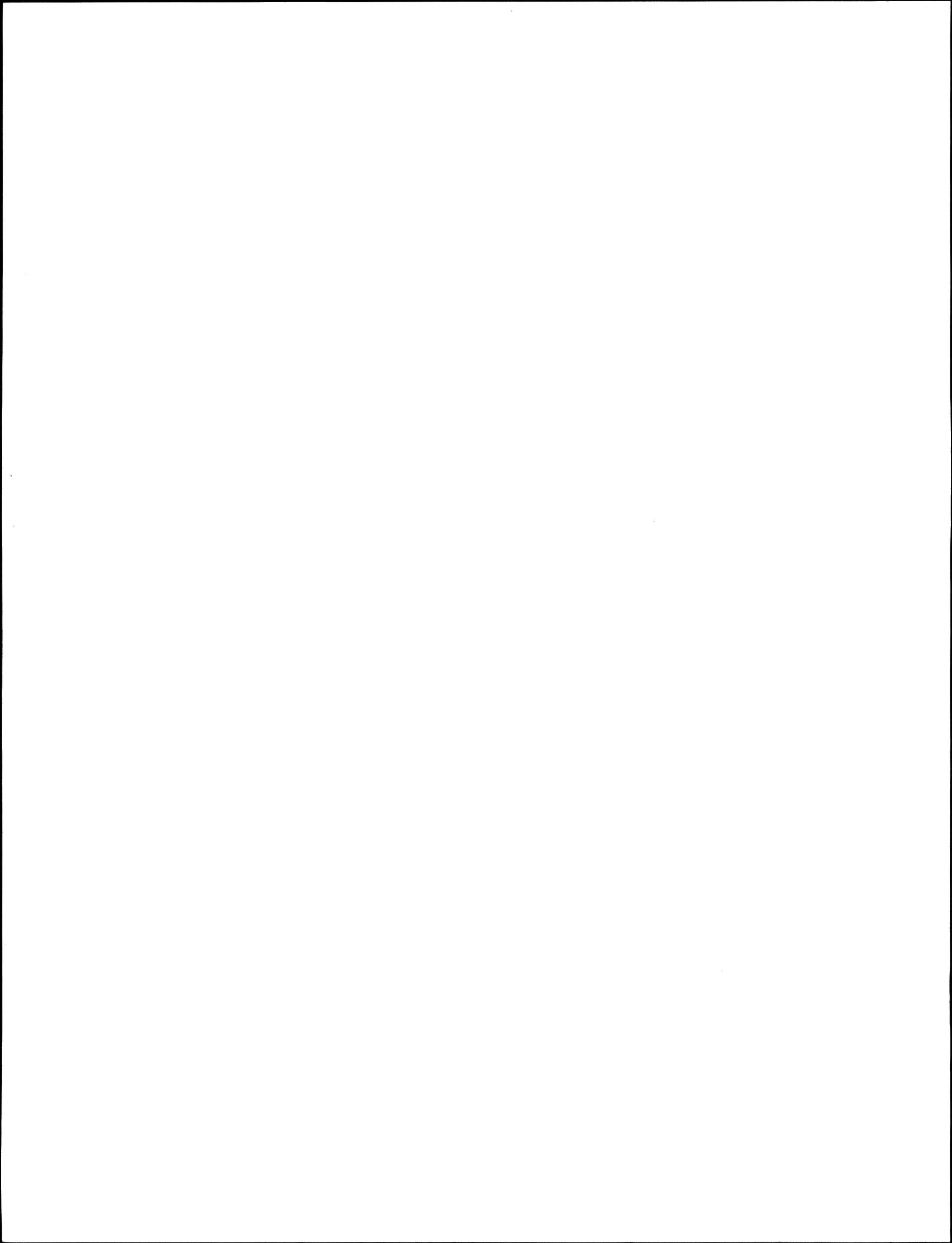


3.0

COST OF OPERATION

The Summary of Financial Considerations 1984-85 (p.22) is largely based upon information contained in Appendix "B", which provides detailed information on the respective federal and provincial shares of salaries and O&M for the hydrometric and sediment networks. Appendix "B" also provides a detailed breakdown of hydrometric station construction and maintenance costs and a brief description of the procedure utilized for the calculation of depreciation. During 1984-85 Alberta paid the Schedule "D" amount of \$933,500 to the hydrometric agreement, whereas the Alberta net share was \$935,664.

The reason for the difference in the 1984-85 payment and Alberta net share was mainly due to a decrease in hydrometric units/staff created by a lesser amount of staff turnover than occurred in the previous year. During 1984-85 the increase in unit costs per hydrometric station was 9.1%. In terms of total program costs this increase was partially offset by depreciation being significantly less than the previous year, as much of the equipment in-use had been fully depreciated by 1983-84.



SUMMARY OF FINANCIAL CONSIDERATIONS

1984-85

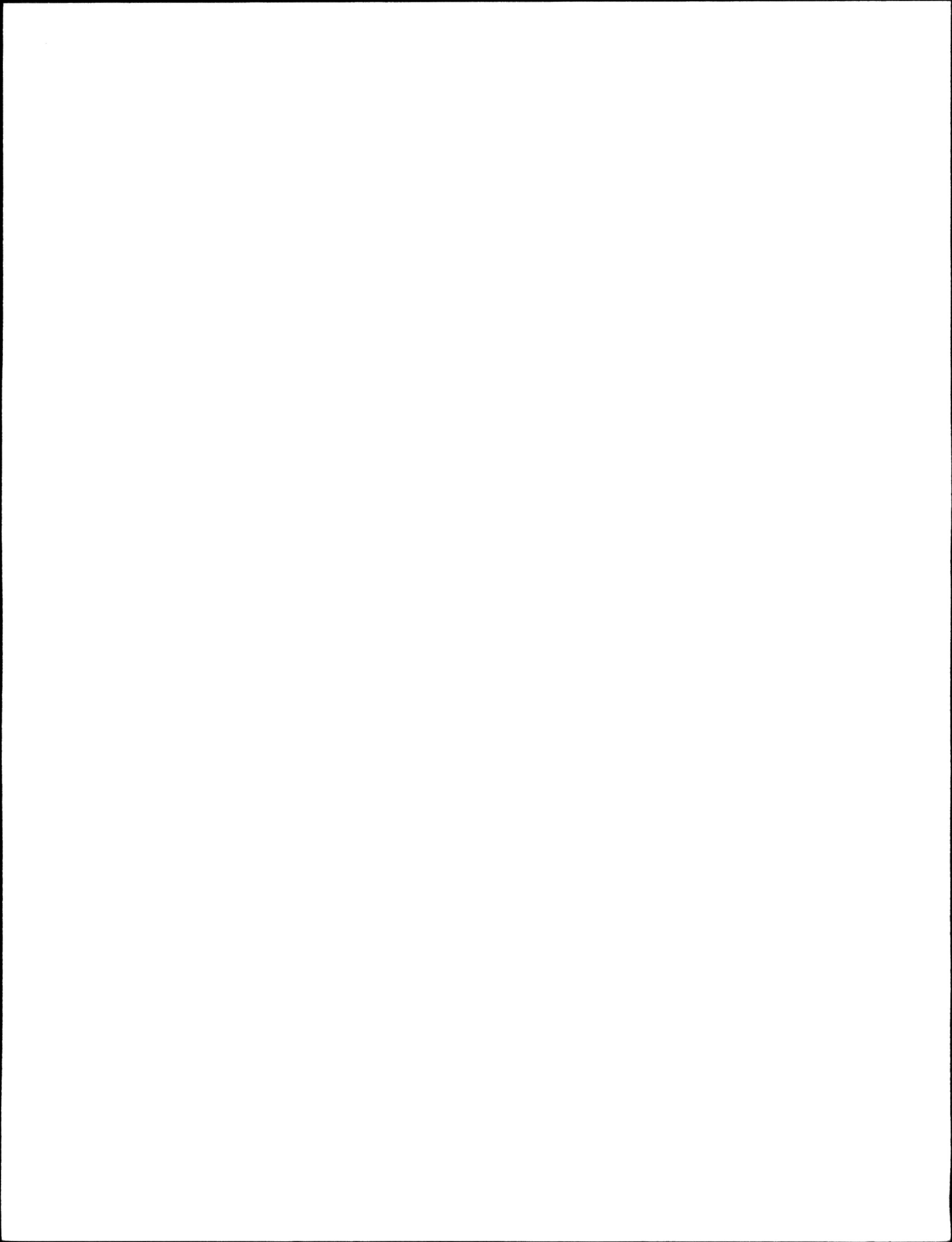
	No. of Stns.	Total Cost	Share	
			Federal	Alberta
1. <u>Hydrometric Network</u>				
Operated by Water Survey of Canada	456	1,411,767	678,806	732,961
Depreciation-Hydrometric Equipment and Vehicles		75,900	36,494	39,406
2. <u>Sediment Stations</u>				
Full program operated by Water Survey of Canada(a)	17	63,945	21,315	42,630
Depreciation - Sediment Equipment		1,800	600	1,200
3. <u>Construction & Maintenance</u>				
Construction of 26 hydro-metric stations and maintenance of 22 hydrometric stations	48	296,144	137,355	158,789
Depreciation - Construction Equipment and Vehicles		7,600	3,525	4,075
TOTAL: Equipment & Vehicles		1,857,156	878,095	979,061

Alberta Net Share: 979,061 - 39,941(b) - 3,456(c) = 935,664

(a) As specified in Appendix B, these are incremental costs.

(b) Credit to Alberta for stations of federal interest operated in the Peace-Athabasca Delta (PAD) Area by Alberta Environment (10.40 units x 3,840.50)

(c) Credit to Alberta for F-P station Spring Creek near Valleyview

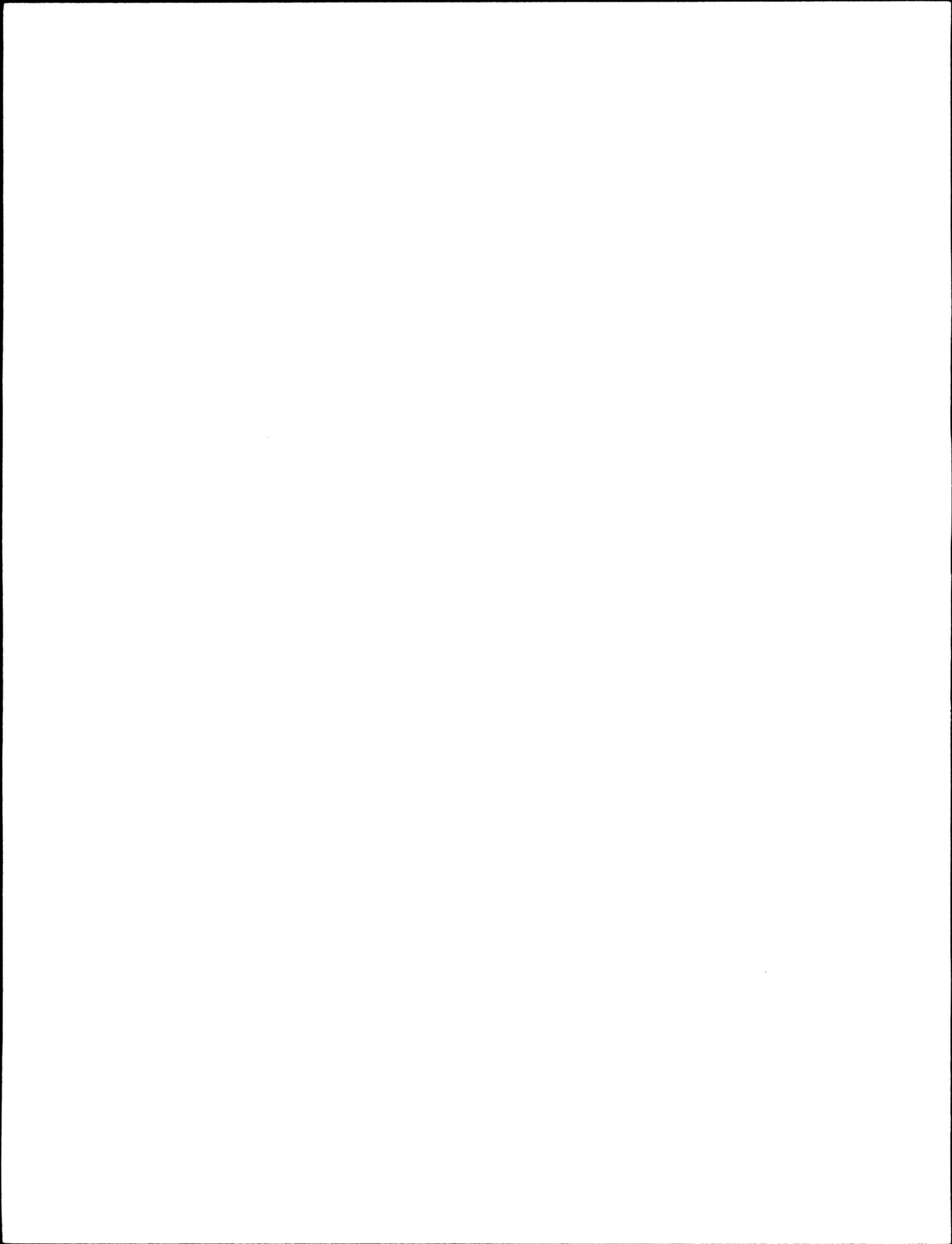


A summary of hydrometric units per staff indicates a steady increase from the inception of the hydrometric agreement in 1975-76 to 1980-81 with the first decrease occurring in 1981-82. During 1982-83 the units per staff again rose to the 1980-81 level; however, it should be recognized that units/staff of 13.25 is excessive, with data collection and computations stretched to the limit in terms of providing quality data. The 12.59 hydrometric units/staff in 1981-82 is likely an optimum amount to satisfactorily operate the hydrometric network.

HYDROMETRIC UNITS VERSUS HYDROMETRIC STAFF

Year Item	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
Hydrometric Units	289.55	309.80	302.41	326.20	342.95	346.00	351.15	364.35	374.30	382.45
Hydrometric Person-Years	32.4	32.7	28.6	26.5	26.4	26.1	27.9	27.5	29.3	30.8
Hydrometric Units/staff	8.94	9.47	10.57	12.31	12.99	13.26	12.59	13.25	12.77	12.42

A similar type of summary for hydrometric station unit costs indicate a minimal annual increase during the first five years of the agreement. During 1980-81 a significant increase in unit costs occurred and this trend remained to the end of 1982-83. A significant decrease in the percent increase from the previous year



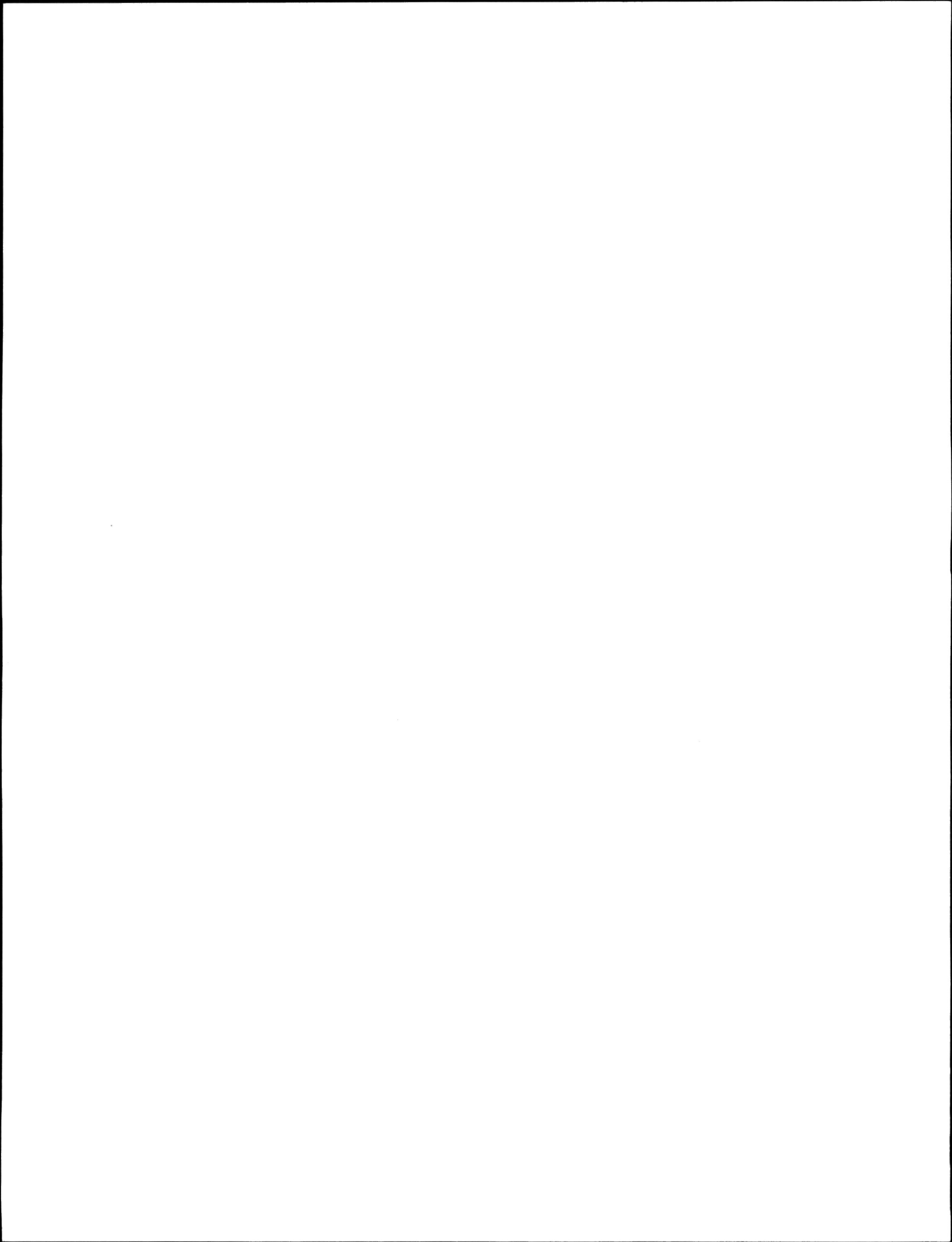
occurred in 1983-84 and is a reflection of the federal government 6 and 5 program. The principal reason for the small increases which occurred during the initial years of the agreement is due to the large increase in each year of the hydrometric units/staff.

UNIT COSTS PER HYDROMETRIC STATION

Year Item	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85
Unit Cost per Station	\$2,072	\$2,137	\$2,264	\$2,242	\$2,250	\$2,529	\$2,945	\$3,285	\$3,521	3,840*
% Increase from Previous Year	-	3.1	5.9	(-)1.0	0.4	12.4	16.4	11.5	7.2	9.1

*See note on page D-2.

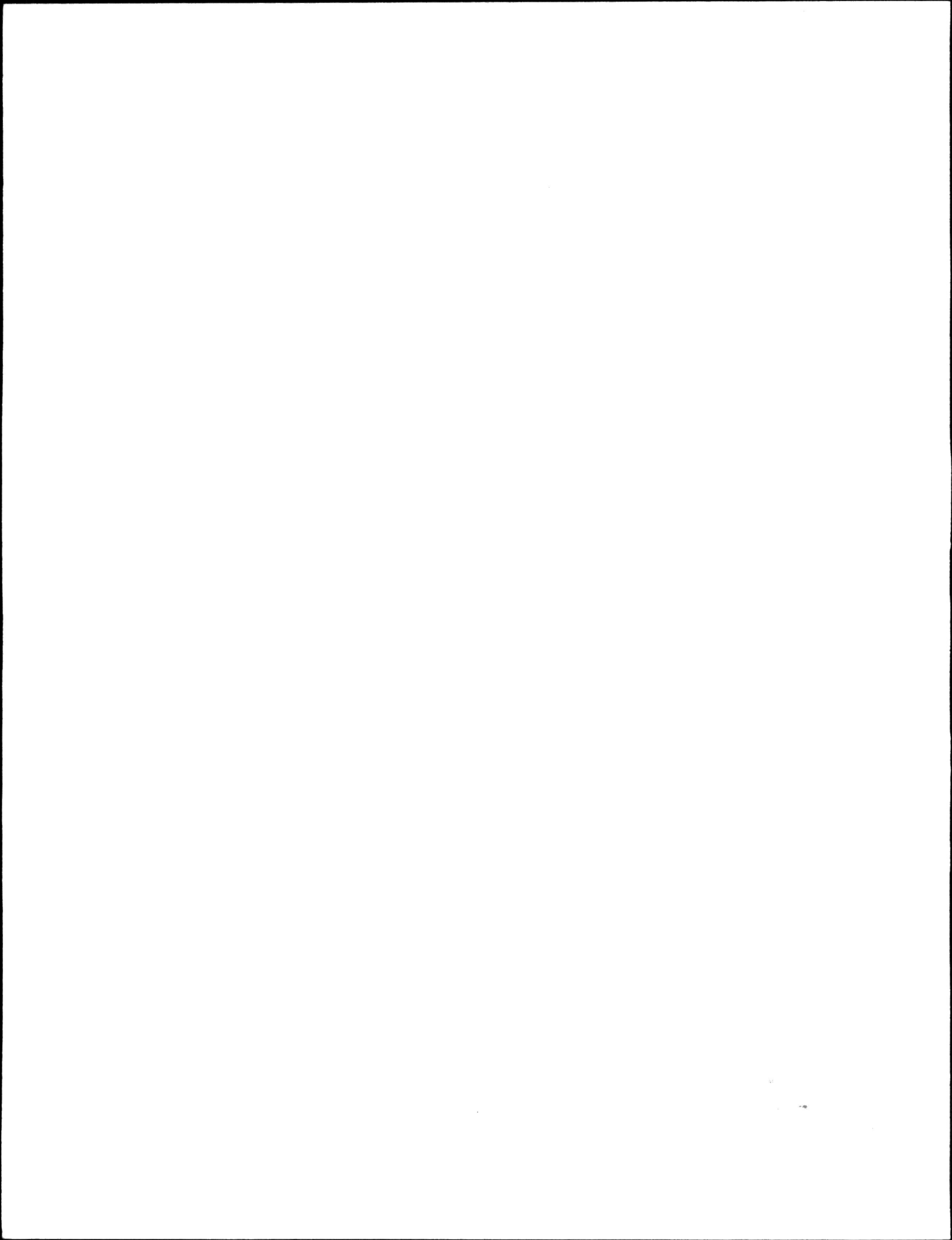
The following summary of over and under annual payments by Alberta for the period of the agreement indicates that although Alberta had underpaid the initial years of the agreement, the overpayment in 1979-80 had brought the payments for the five-year period up to that time to be almost identical to the actual cost of the program to Alberta (N.B. The actual cost for 1978-79 differs from the amount in the National Memorandum of Agreement report and the reason for this is provided in the 1978-79 Alberta Memorandum of Agreement report). At the end of the ten-year period from 1975-76 to 1984-85 the underpayment by Alberta was 0.8% of the total payment Alberta made during this period.



Cumulative Provincial
Over or Underpayment
for Period of Agreement

<u>Year</u>	<u>Actual Cost</u>	<u>Annual Payment</u>	<u>Overpayment (+) Underpayment(-)</u>	<u>% of Annual Payment</u>
1975-76	197,852	197,400	(-) 452	(-) 0.23
1976-77	231,100	231,100	Nil	Nil
1977-78	247,430	240,000	(-) 7,430	(-) 3.10
1978-79	267,055	260,000	(-) 7,055	(-) 2.71
1979-80	353,768	370,000	(+)16,232	(+) 4.39
1980-81	423,906	390,000	(-)33,906	(-) 8.69
1981-82	556,741	568,240	(+)11,499	(+) 2.02
1982-83	747,352	747,352	Nil	Nil
1983-84	812,593	796,033	(-)16,560	(-) 2.08
1984-85	<u>935,664</u>	<u>933,500</u>	<u>(-) 2,164</u>	<u>(-) 0.23</u>
Total:	4,773,461	4,733,625	(-)39,836	(-) 0.84

Schedule "C" of the Memorandum of Agreement for Water Quantity Surveys describes procedures for preparation of annual reports. The procedure described in Schedule "C" is designed to make an approximation of Schedule "D" for the forecast year of 1986-87 for utilization by both the federal and provincial agencies for budgetary purposes. Data contained in this report with respect to annual unit costs for operating water quantity survey and sediment stations, Schedule "A" estimated for 1986-87, depreciation, a cost index factor and an estimate of construction and maintenance costs for 1986-87 are utilized in the preparation of the cost estimate for the forecast year. Based upon the average annual unit costs contained in this report, and proposed designation and operation



changes, it was possible to calculate the estimated operation costs of Schedule "D" for 1986-87 and this is provided in Appendix "D".

The financial information contained in Tables 4 and 5 are a summary for input to the Annual National Cost-Sharing Report. The format and required input to Table 4 varies from the determination of the cost-sharing amounts in Alberta and thus these values should not be compared.

TABLE 4

WATER QUANTITY SURVEYS

TOTAL PROGRAM COSTS & SHAREABLE COSTS FOR 1984-85

(\$1000)

Province	Total Program					Shareable Costs						
	P/Yrs	Salary	Operating	Capital	Total	P/Yrs	Salary	Operating ¹	Const.	Total	Fed. Share	Prov. Share ²
Alberta	51.8	1712.0	837.8	293.1	2842.9	30.8	935.3	618.2	303.7	1857.2	878.1	979.1

NOTE: ¹ Operating costs are comprised of \$540.5K as described in Appendix "B" and \$77.7K for depreciation, as shown in Summary of Financial Considerations.

² Credit to Alberta for operation of Federal and Federal-Provincial stations in the Peace-Athabasca Delta and operation of a Federal-Provincial station in the Spring Creek Basin resulted in an Alberta actual cost of \$935.7K, as shown in Table 5.

TABLE 5

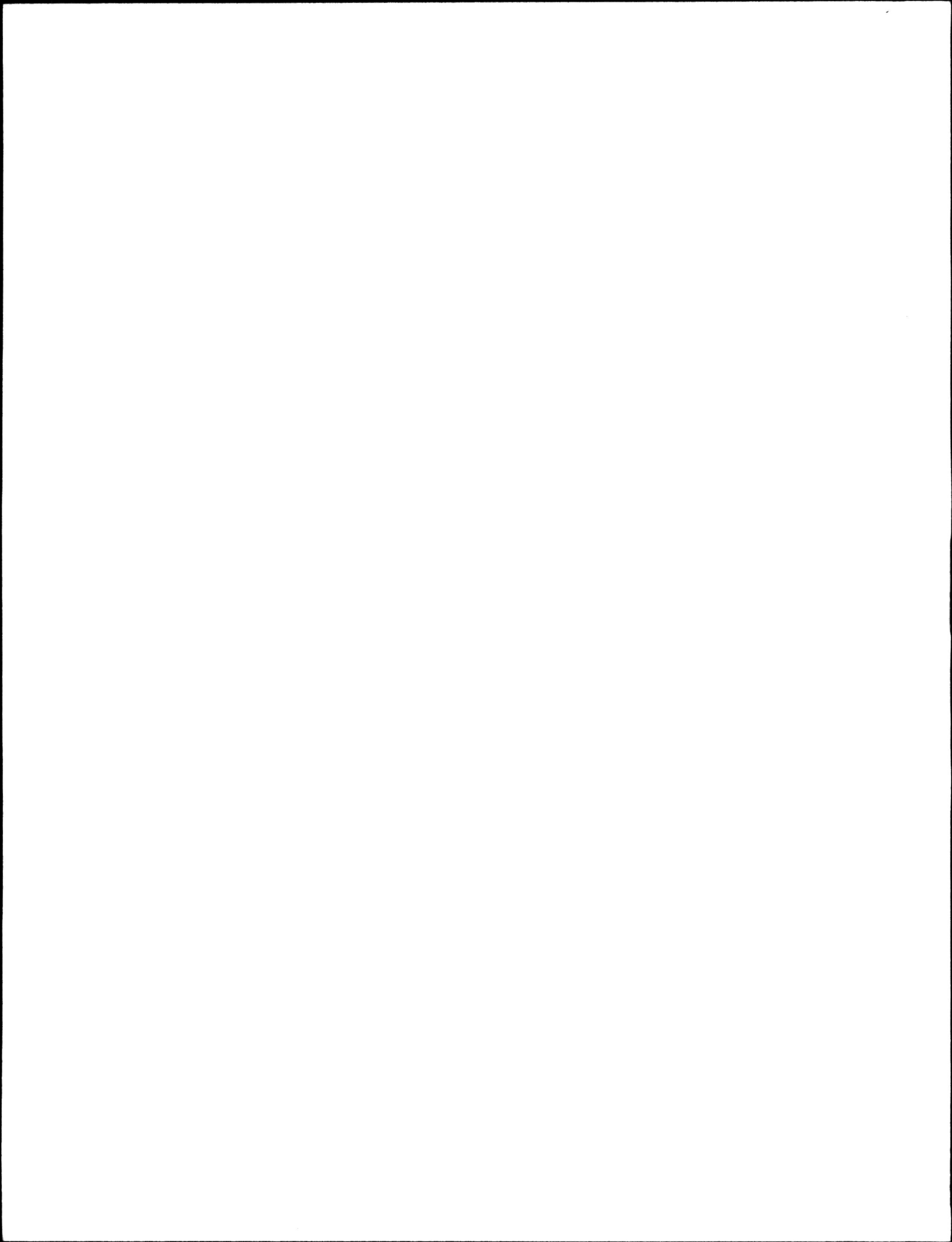
WATER QUANTITY SURVEYS

COMPARISON - SCHEDULE "D" COSTS WITH ACTUAL COSTS & PAYMENTS
1984-85

(Dollars)

Province	Salary & Operation		Construction		Total			Annual Payment Received	Received Minus Actual
	Sched. "D"	Actual Cost	Sched. "D"	Actual Cost	Sched. "D"	Actual Cost	Difference		
Alberta	764,900	772,320	168,600	162,864	933,500	935,664	2,164	933,500	- 2,164

772,800



A P P E N D I X "A"

SCHEDULE "A"

OF

MEMORANDUM OF AGREEMENT

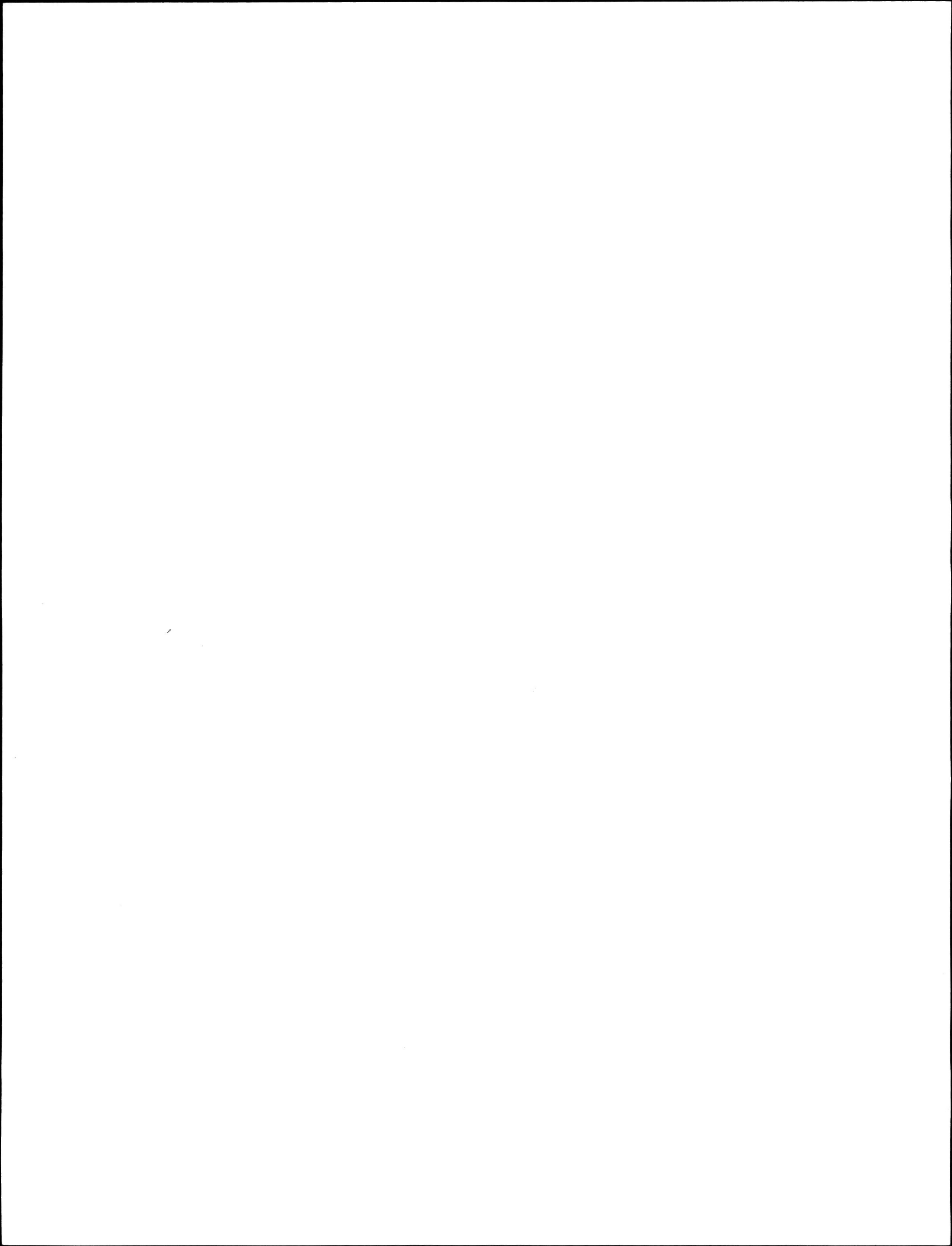
BETWEEN

GOVERNMENT OF CANADA

AND

GOVERNMENT OF ALBERTA

April 1, 1984



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - FEDERAL DEPARTMENTAL PROGRAMS (1)

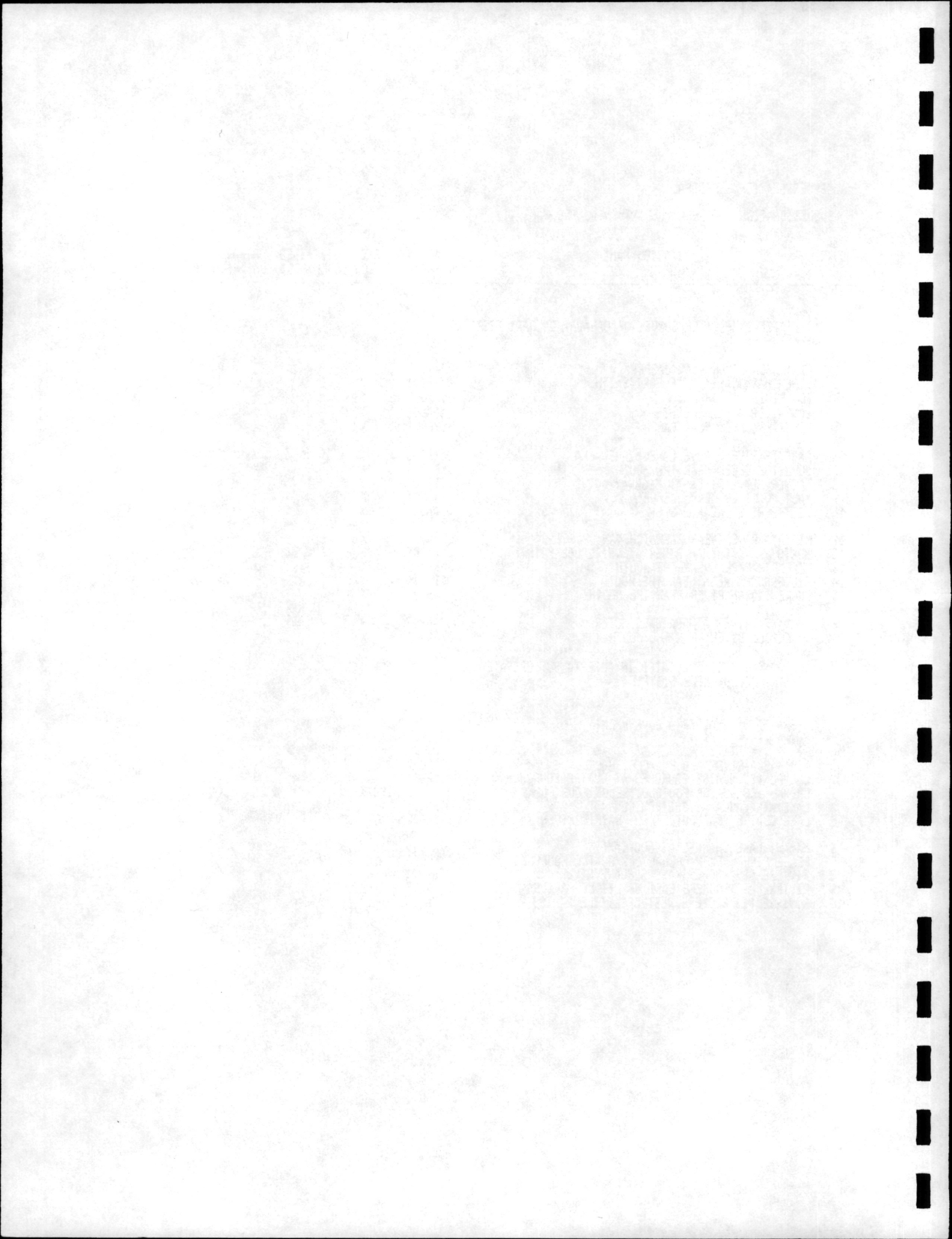
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT									
1	ATHABASCA RIVER NEAR JASPER	07AA002	X				X		X
2	BENCH MARK CREEK NEAR FORT SMITH	07NE003	X				X	X	
3	BOW RIVER AT BANFF	05BB001	X				X		X
4	BOW RIVER AT LAKE LOUISE	05BA001	X				X		X
5	BREWSTER CREEK NEAR BANFF	05BB004	X				X		X
6	CASCADE RIVER ABOVE LAKE MINNEWANKA	05BD005	X				X		X
7	JOHNSTON CREEK NEAR THE MOUTH	05BA006	X				X		X
8	LESSER SLAVE RIVER AT HIGHWAY NO. 2	07BK006	X	X			X		X
9	MALIGNE RIVER NEAR JASPER	07AA004	X				X		X
10	MIETTE RIVER NEAR JASPER	07AA001	X				X		X
11	MISTAYA RIVER NEAR SASKATCHEWAN CROSSING	05DA007	X				X		X
12	NORTH SASKATCHEWAN RIVER AT WHIRLPOOL POINT	05DA009	X				X		X
13	REDEARTH CREEK NEAR THE MOUTH	05BB005	X				X		X
14	SILVERHORN CREEK NEAR THE MOUTH	05DA010	X				X		X
15	SNAKE INDIAN RIVER NEAR THE MOUTH	07AB002	X				X		X
16	SUNWAPTA RIVER ATHABASCA GLACIER	07AA007	X				X		X
17	WHIRLPOOL RIVER NEAR THE MOUTH	07AA009	X				X		X

#GAUGING STATIONS LOCATED IN ALBERTA BUT OPERATED BY THE YELLOWKNIFE DISTRICT

OPERATED BY - ALBERTA GOVERNMENT

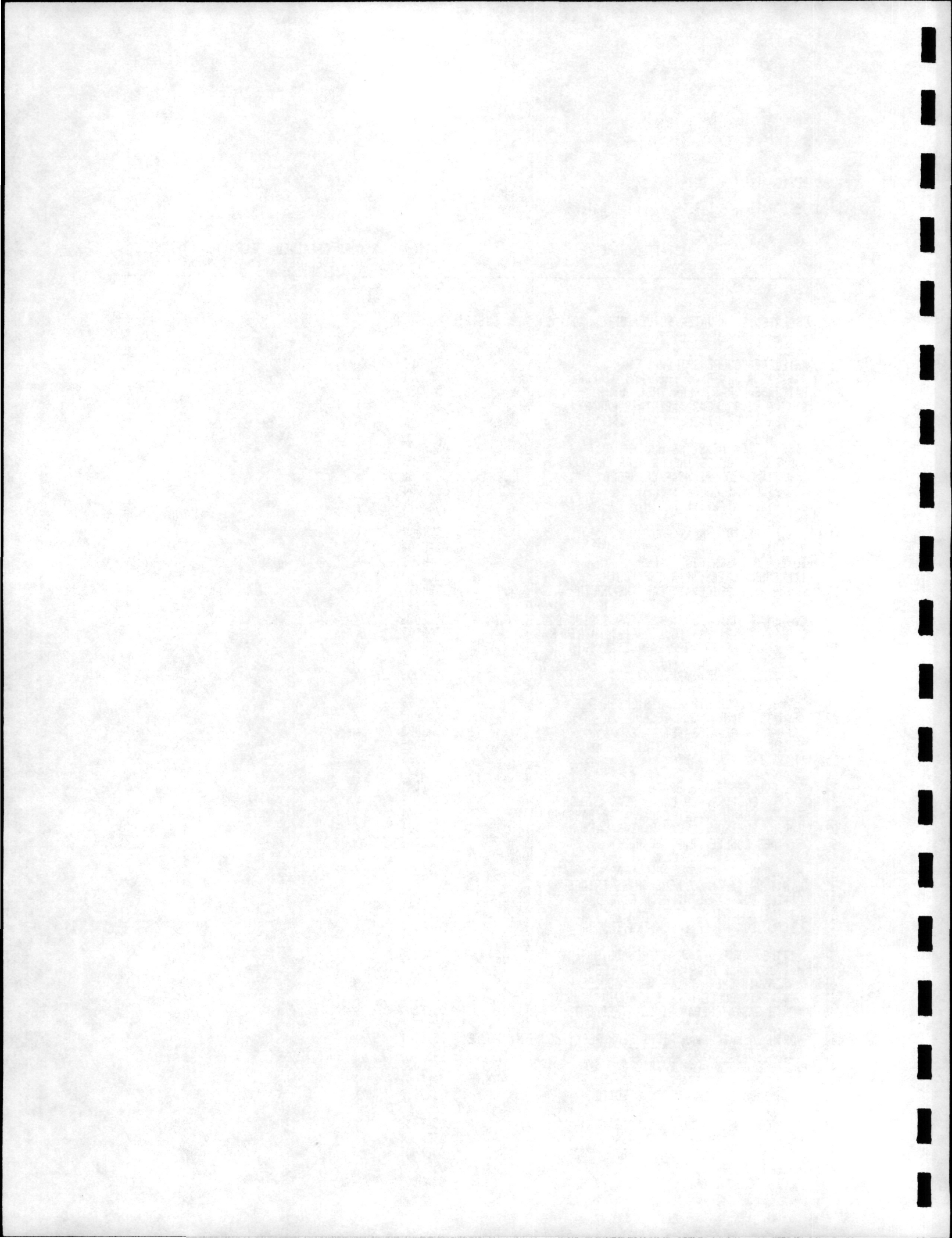
1	ATHABASCA RIVER ABOVE JACQ.FISH CREEK	07DD007	X				X		X
2	CHENAL DES QUATRE FOURCHES AT QUATRE FOURCHES	07KF001	X				X		X
3	CHENAL DES QUATRE FOURCHES BELOW FOUR FORKS	07KF006 MISC X					X		X
4	LAKE ATHABASCA AT FORT CHIPEWYAN	07MD001	X				X		X
5	LAKE CLAIRE NEAR OUTLET TO PRAIRIE RIVER	07KF002	X				X		X
6	MAMAWI LAKE CHANNEL AT DOG CAMP	07KF010 MISC X					X		X
7	PEACE RIVER BELOW CHENAL DES QUATRE FOURCHES	07KC005	X				X		X
8	RIVIERE DES ROCHERS ABOVE SLAVE RIVER	07NA001	X				X		X
9	RIVIERE DES ROCHERS EAST OF LITTLE RAPIDS	07NA007	X				X		X
10	RIVIERE DES ROCHERS WEST OF LITTLE RAPIDS	07NA008	X				X		X



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			ACCESS		
			FLOW	LEVEL	SED.	SM	12M	REMOTE
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								
1	ANTELOPE COULEE SPILLWAY	05BN010	X			X		X
2	ATHABASCA RIVER AT EMBARRAS AIRPORT	07DD001	X		X			X
3	BATTERSEA DRAIN NEAR THE MOUTH	05AD038	X			X		X
4	*BATTLE RIVER NEAR ALBERTA BOUNDARY	05FE004	X				X	X
5	BEAVER RIVER AT COLD LAKE RESERVE	06AD006	X				X	X
6	BERRY CREEK NEAR THE MOUTH	05CH007	X			X		X
7	BOUNTIFUL COULEE INFLOW NEAR CRANFORD	05AG026	X			X		X
8	BOUNTIFUL COULEE NEAR CRANFORD	05AG008	X			X		X
9	BOW RIVER AT CALGARY	05BH004	X				X	X
10	BOW RIVER NEAR THE MOUTH	05BN012	X				X	X
11	B.R.D. DRAIN K NEAR VAUXHALL	05BN009	X			X		X
12	B.R.D. MAIN CANAL	05AC004	X			X		X
13	-BOXELDER CREEK NEAR WALSH	05AH001	X			X		X
14	BULLPOUND CREEK NEAR THE MOUTH	05CG003	X			X		X
15	CAIRN HILL SPILLWAY NEAR THE MOUTH	05BN012	X			X		X
16	CANADIAN ST. MARY CANAL NEAR SPRING COULEE	05AE026	X			X		X
17	CLEARWATER RIVER ABOVE CHRISTINA RIVER	07CD005	X				X	X
18	COAL LAKE RESERVOIR NEAR WETASKIWIN	05FA016		X			X	X
19	COLD LAKE AT COLD LAKE	06AF002		X			X	X
20	CROWFOOT CREEK NEAR CLUNY	05BN008	X			X		X
21	DICKSON RESERVOIR NEAR DICKSON	05CB006		X			X	X
22	DRAIN S-10 NEAR BOW ISLAND	05AJ003	X			X		X
23	DRAIN S-4 NEAR GRASSY LAKE	05AJ002	X			X		X
24	DRAIN T-11 NEAR FINECASTLE	05AG025	X			X		X
25	DRAIN T-2 NEAR TABER	05AG023	X			X		X
26	DRY COULEE NEAR MAGRATH	05AE041	X			X		X
27	E.I.D. EAST BRANCH CANAL NEAR LATHOM	05CJ003	X			X		X
28	E.I.D. NORTH BRANCH CANAL NEAR BASSANO	05CJ001	X			X		X
29	E.I.D. SPRINGHILL CANAL NEAR LATHOM	05CJ004	X			X		X
30	EXPANSE COULEE NEAR THE MOUTH	05AG003	X			X		X
31	HIGHWOOD DIVERSION CANAL NEAR HEADGATES	05BL025	X			X		X
32	L.N.I.D. CANAL AT MENZAGHIES BRIDGE	05AB016	X			X		X
33	LITTLE BOW CANAL AT HIGH RIVER	05BL015	X				X	X
34	LITTLE BOW RIVER AT CARMANGAY	05AC003	X			X		X
35	LITTLE BOW RIVER BELOW TRAVERS DAM	05AC012	X			X		X
36	LITTLE BOW RIVER NEAR THE MOUTH	05AC023	X			X		X
37	M.I.D. CANAL NEAR SPRING COULEE	05AE021	X			X		X
38	MATZKIWIN CREEK ABOVE WARE COULEE	05CJ007	X			X		X
39	NEW WEST COULEE NEAR THE MOUTH	05BN006	X			X		X
40	NORTH SASKATCHEWAN RIVER AT EDMONTON	05DF001	X				X	X
41	NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE	05DC001	X			X		X
42	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	X		X		X	X
43	ONETREE CREEK NEAR PATRICIA	05CJ006	X			X		X
44	*PEACE RIVER AT PEACE POINT	07KC001	X				X	X
45	PIYANI DRAIN NEAR PICTURE BUTTE	05AD037	X			X		X
46	POTHOLE CREEK AT RUSSELL'S RANCH	05AE016	X			X		X
47	RED DEER RIVER NEAR BINDLOSS	05CK004	X		X		X	X
48	RONALDINE WASTEWAY NEAR HAYS	05BN007	X			X		X
49	ROSEBUD RIVER AT REDLAND	05CE005	X			X		X
50	SEVEN PERSONS CREEK AT MEDICINE HAT	05AH005	X			X		X



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	SED.	9M	12M	REARTE

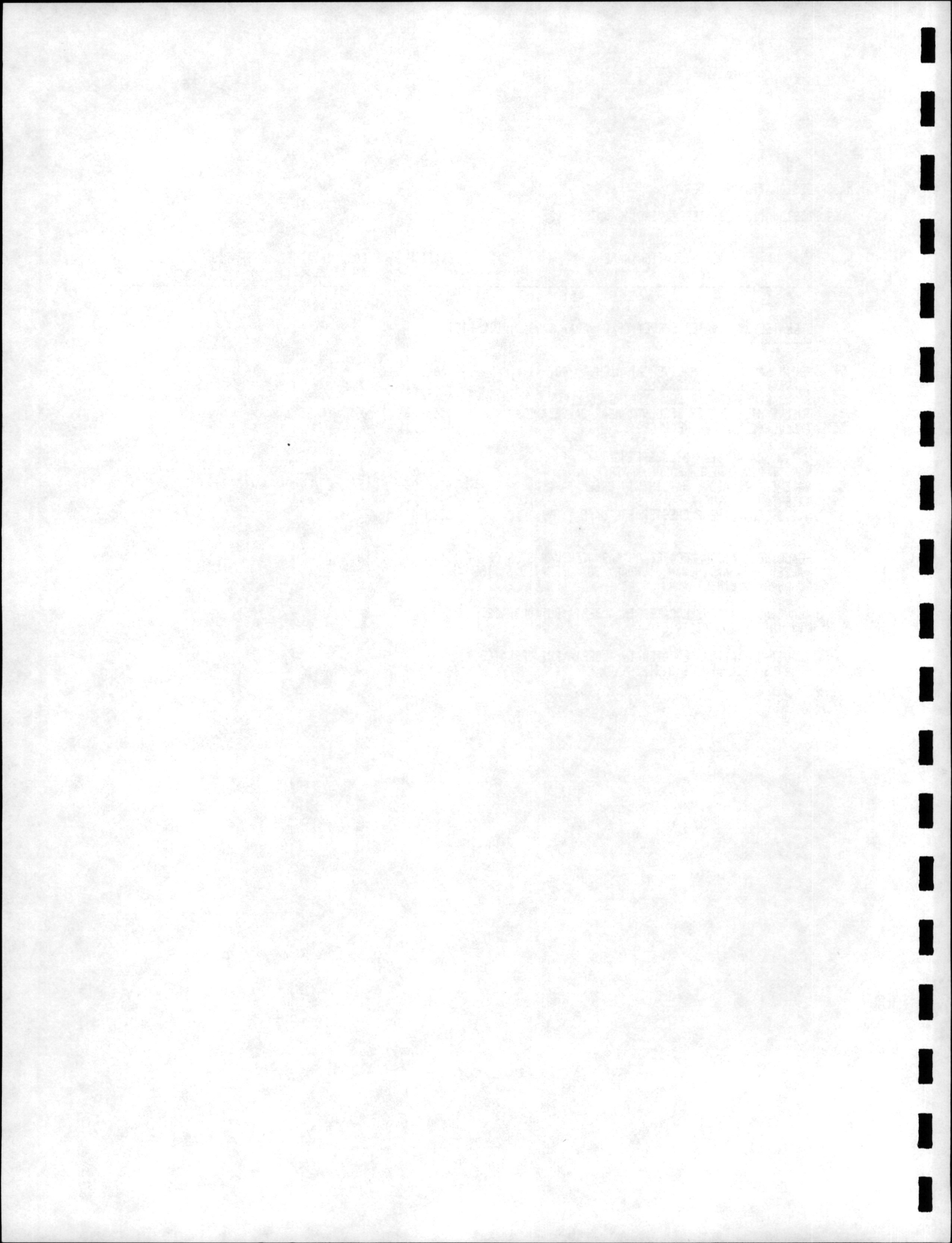
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

51	SOUTH SASKATCHEWAN RIVER AT HIGHWAY NO. 41	05AK001	X		X	X		X
52	*SLAVE RIVER AT FITZGERALD	07NB001	X		X		X	X
53	ST. MARY RESERVOIR NEAR SPRING COULEE	05AE025		X			X	X
54	TWELVE MILE COULEE SPILLWAY NEAR CARSELAND	05BM009	X			X		X
55	TWELVE MILE CREEK NEAR CECIL	05BN002	X			X		X
56	U.I.D. CANAL NEAR HILL SPRING	05AD013	X			X		X
57	WAPITI RIVER NEAR GRANDE PRAIRIE	07GE001	X				X	X
58	WARE COULEE ABOVE MATZIHWIN CREEK	05CJ008	X			X		X
59	WATERTON RESERVOIR	05AD026		X			X	X
60	W.I.D. CANAL NEAR CHESTERMERE LAKE	05BM003	X			X		X

-GAUGING STATION LOCATED ON SASKATCHEWAN SIDE OF ALBERTA-SASKATCHEWAN BOUNDARY BUT OPERATED BY THE CALGARY DISTRICT.

*GAUGING STATIONS LOCATED IN ALBERTA BUT OPERATED BY THE REGINA DISTRICT

*GAUGING STATIONS LOCATED IN ALBERTA BUT OPERATED BY THE YELLOWKNIFE DISTRICT



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERNATIONAL WATERS (3)

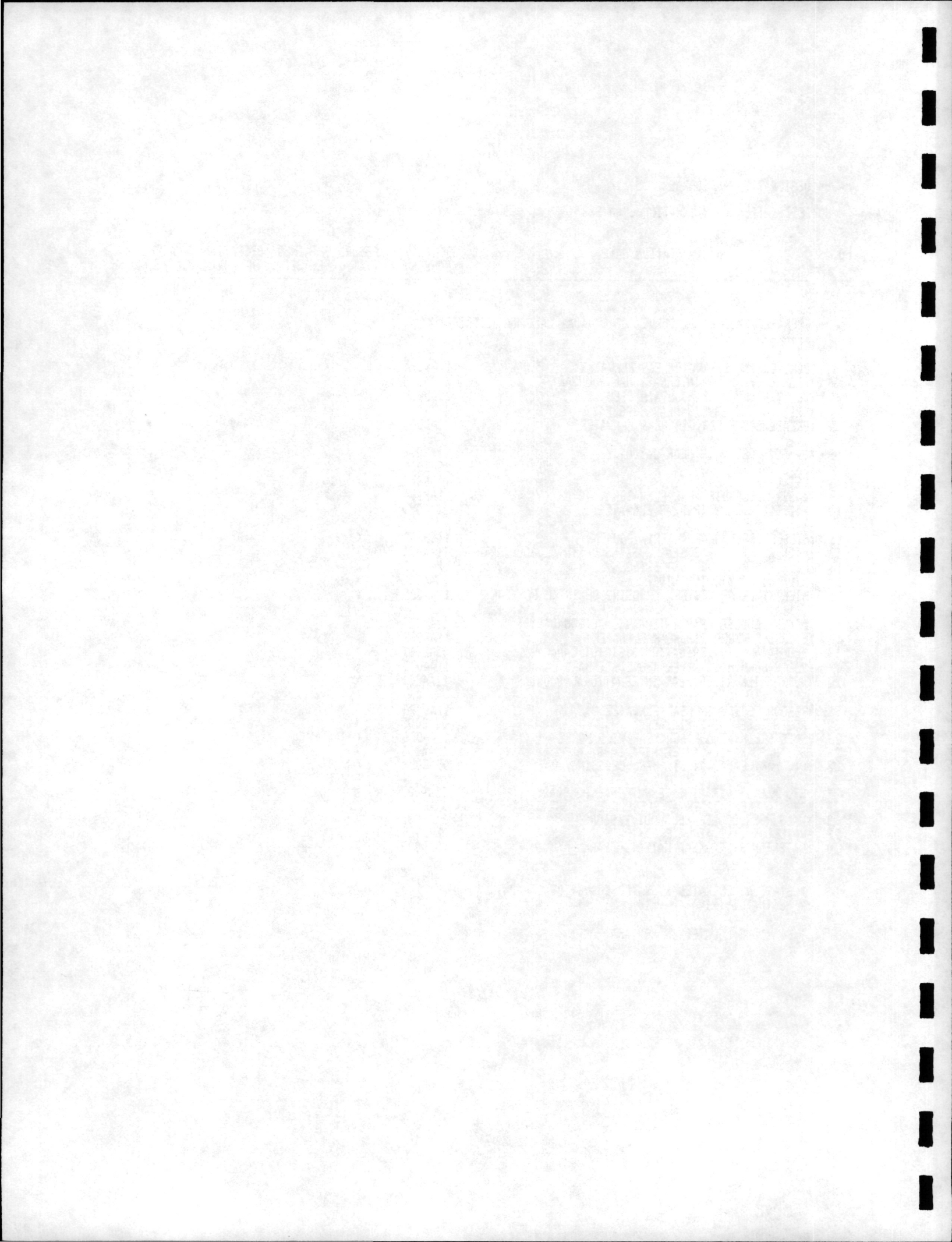
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	REMOTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

1	*DARE CREEK RESERVOIR NEAR ELKWATER	11AB094		X		X		X
2	BEAR CREEK NEAR INTERNATIONAL BOUNDARY	11AA028	X			X		X
3	BELLY RIVER NEAR MOUNTAIN VIEW	05AD005	X				X	X
4	*CRESSDAY RESERVOIR NEAR CRESSDAY	11AB097		X		X		X
5	*GREASEWOOD RESERVOIR NEAR ELKWATER	11AB092		X		X		X
6	*JAYDOT RESERVOIR NEAR JAYDOT	11AB098		X		X		X
7	+LAKE SHERBURNE	05AE036		X			X	X
8	LEE CREEK AT CARDSTON	05AE002	X				X	X
9	*MASSY RESERVOIR NEAR ELKWATER	11AB104		X		X		X
10	*MICHELE RESERVOIR NEAR ELKWATER	11AB091		X		X		X
11	*MIDDLE CREEK NEAR ALBERTA BOUNDARY	11AB009	X			X		X
12	+MILK RIVER AT EASTERN CROSSING OF INT'L BOUNDARY	11AA031	X			X		X
13	MILK RIVER AT HWY 880 BRIDGE	11AA036		X		X		X
14	MILK RIVER AT MILK RIVER	11AA005	X				X	X
15	MILK RIVER AT WESTERN CROSSING OF INT'L BOUNDARY	11AA025	X			X		X
16	MINERS COULEE NEAR INTERNATIONAL BOUNDARY	11AA029	X			X		X
17	*MITCHELL RESERVOIR NEAR ELKWATER	11AB099		X		X		X
18	MOUNTAIN VIEW IRRIGATION DISTRICT CANAL	05AD017	X			X		X
19	+NORTH FORK MILK RIVER ABOVE ST. MARY CANAL	11AA032	X			X		X
20	NORTH MILK RIVER NEAR INTERNATIONAL BOUNDARY	11AA001	X			X		X
21	*REESOR RESERVOIR NEAR ELKWATER	11AB090		X		X		X
22	ROLPH CREEK NEAR KIMBALL	05AE005	X			X		X
23	SAGE CREEK AT O RANCH NEAR WILD HORSE	11AA026	X			X		X
24	+SOUTH FORK MILK RIVER NEAR BABB	11AA033	X			X		X
25	+ST. MARY CANAL AT ST. MARY CROSSING	05AE029	X			X		X
26	ST. MARY RIVER AT INTERNATIONAL BOUNDARY	05AE027	X				X	X
27	+SWIFTCURRENT CREEK AT SHERBURNE	05AE033	X			X		X
28	*WALSBUFGER COULEE BELOW DIVERSIONS	11AB086	X			X		X
29	WATERTON LAKE AT WATERTON PARK	05AD025		X			X	X
30	WATERTON RIVER NEAR WATERTON PARK	05AD005	X				X	X

* STATIONS OPERATED BY WATER SURVEY OF CANADA,
REGINA DISTRICT

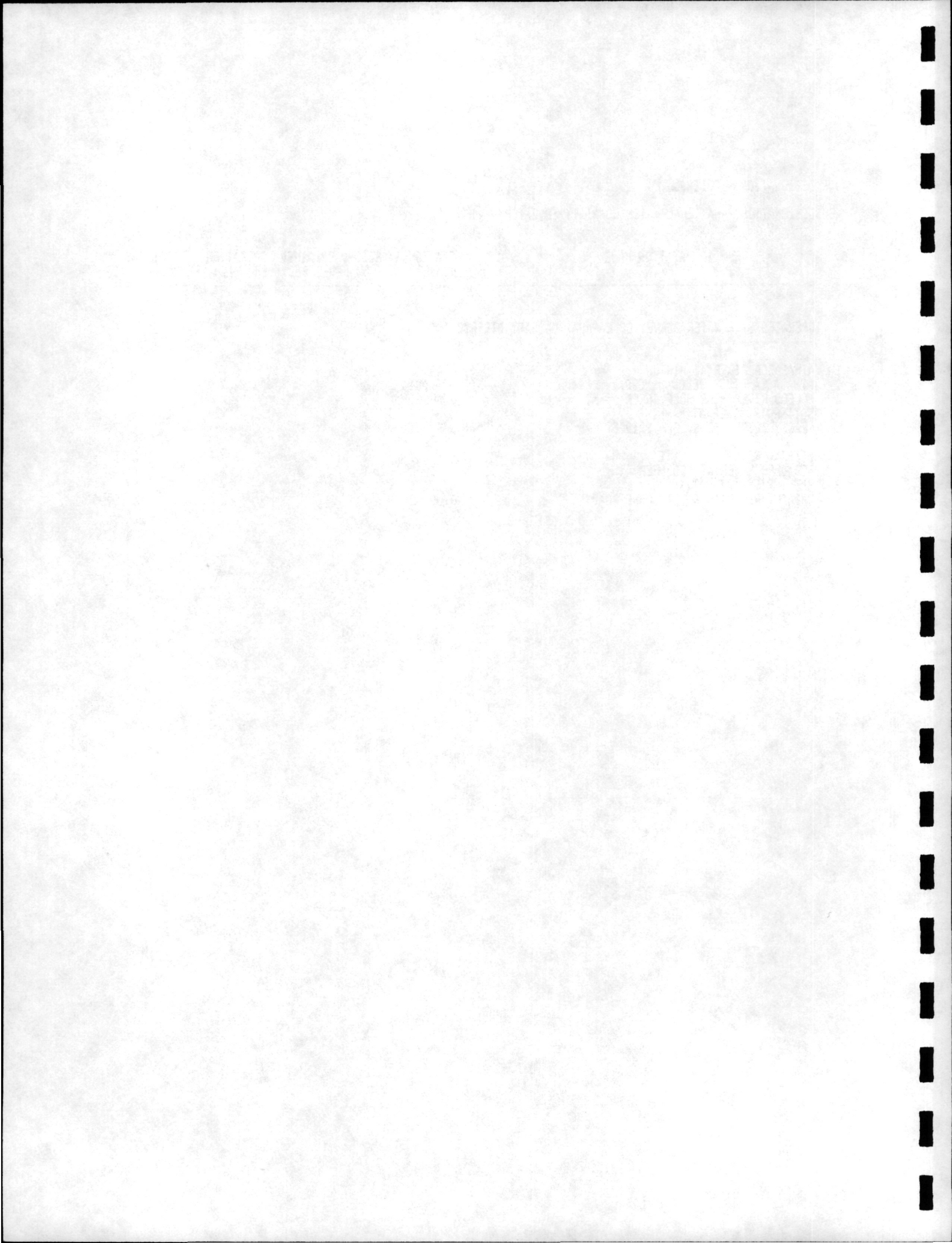
+ STATIONS LOCATED IN MONTANA



MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - NATIONAL WATER QUANTITY INVENTORY (4)

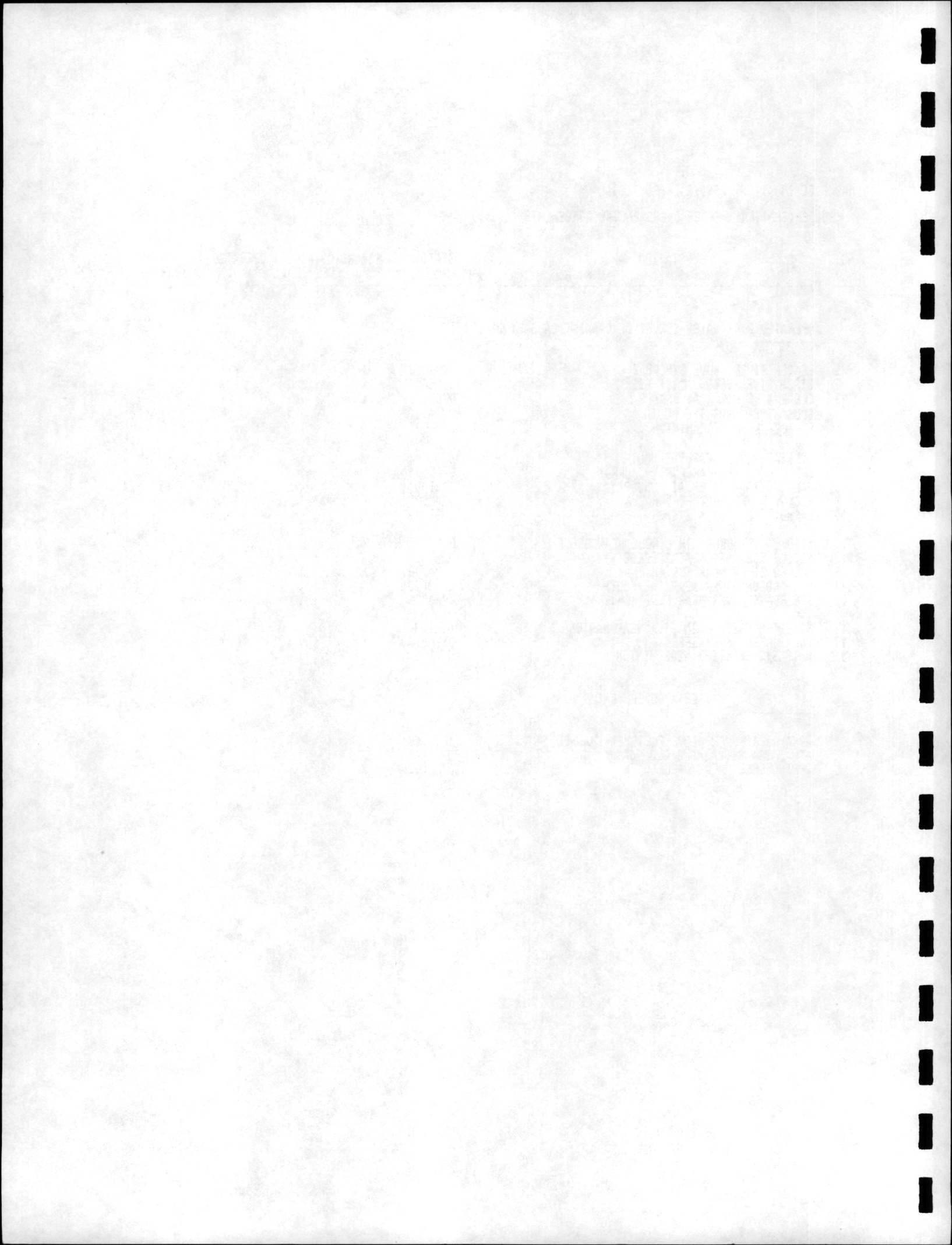
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								
1	ATHABASCA RIVER AT HINTON	07AD002	X			X		X
2	ATHABASCA RIVER BELOW MCMURRAY	07DA001	X	X		X	X	X
3	MCLEOD RIVER NEAR WOLF CREEK	07AG001	X			X		X
4	NOTIWEWIN RIVER AT MANNING	07HC001	X			X		X
5	PEACE RIVER AT DUNVEGAN BRIDGE	07FD003	X		X			X
6	PEMBINA RIVER AT JARVIE	07BC002	X			X		X
7	RED DEER RIVER AT RED DEER	05CC002	X	X		X		X
8	SMOKY RIVER AT WATINO	07GJ001	X			X		X
9	WABASCA RIVER AT WADLIN LAKE ROAD	07JD002	X			X		X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - FEDERAL-PROVINCIAL AGREEMENTS (1)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT									
1	BEAVER RIVER ABOVE SYNCRUDE	07DA018	X				X	X	
2	BIRCH RIVER BELOW ALICE CREEK	07KE001	X				X	X	
3	CLEARWATER RIVER AT DRAPER	07CD001	X		X		X	X	
4	ELLS RIVER NEAR THE MOUTH	07DA017	X				X	X	
5	EUNICE CREEK NEAR HINTON	07AF005	X		X		X		X
6	FIREBAG RIVER NEAR THE MOUTH	07DC001	X				X	X	
7	GREGOIRE LAKE NEAR FORT MCMURRAY	07CE001		X			X	X	
8	HANGINGSTONE RIVER AT MCMURRAY	07CD004	X				X	X	
9	MACKAY RIVER NEAR FORT MACKAY	07DB001	X				X	X	
10	MARMOT CREEK MAIN STEM	05BF016	X				X		X
11	MIDDLE FORK CREEK IN CIRQUE NEAR SEEBE	05BF020	X				X		X
12	MIDDLE FORK CREEK NEAR SEEBE	05BF017	X				X		X
13	MUSKEG RIVER NEAR FORT MACKAY	07DA008	X				X	X	
14	RICHARDSON RIVER NEAR THE MOUTH	07DD002	X				X	X	
15	STEEPBANK RIVER NEAR FORT MCMURRAY	07DA006	X				X	X	
16	STREETER CREEK MAIN STEM NEAR HANTON	05AB030	X				X		X
17	TWIN CREEK NEAR SEEBE	05BF018	X				X		X
18	WHISKEYJACK CREEK NEAR HINTON	07AD004	X				X		X
OPERATED BY - ALBERTA GOVERNMENT									
1	ATHABASCA RIVER ABOVE FLETCHER CHANNEL	07DD010			X		X		X
2	ATHABASCA RIVER NEAR OLD FORT	07DD011			X		X		X
3	SPRING CREEK NEAR VALLEYVIEW	07GF002	X		X		X		



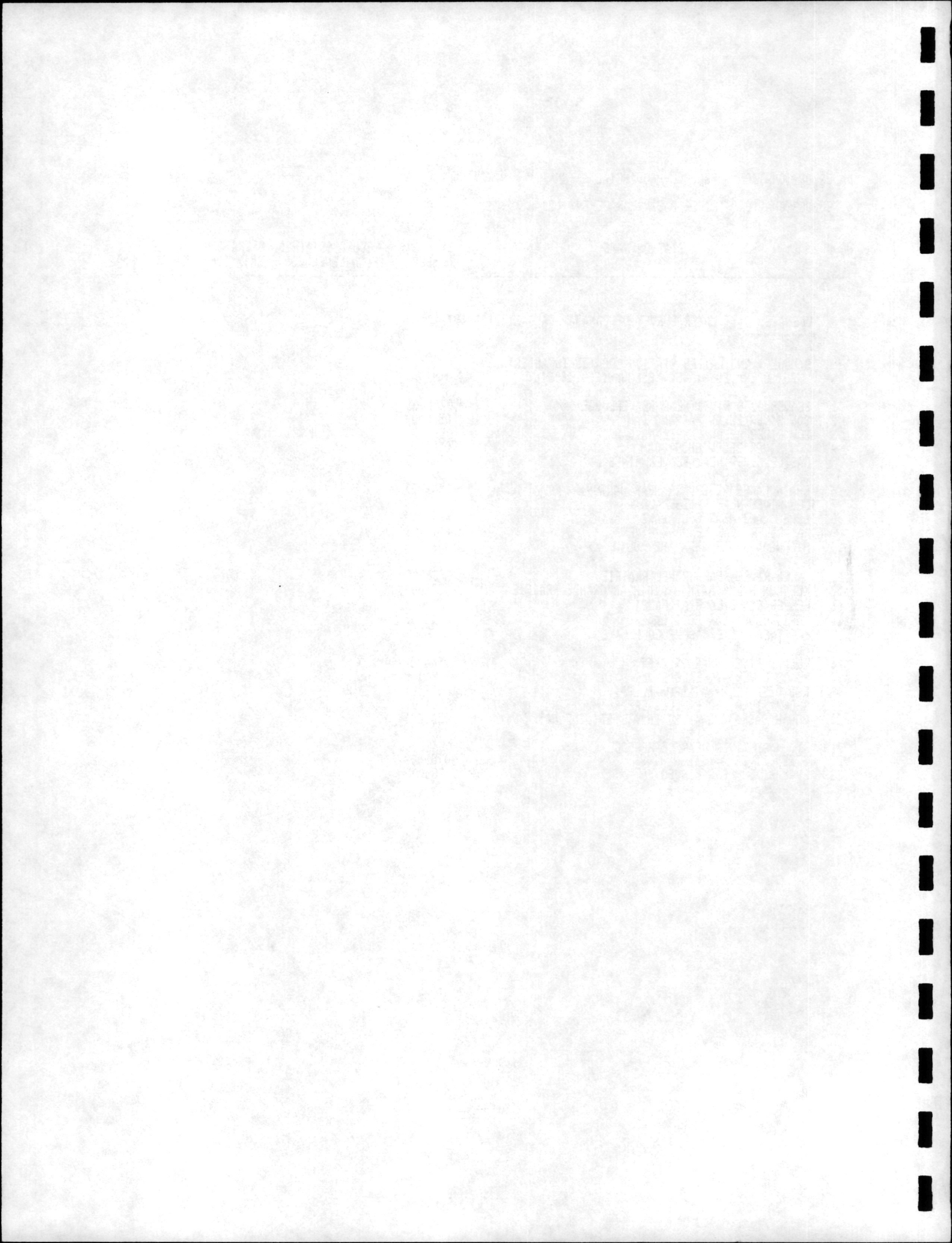
MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - RIVER BASIN MANAGEMENT (2)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	SED.	9M	12M	REMOTE

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

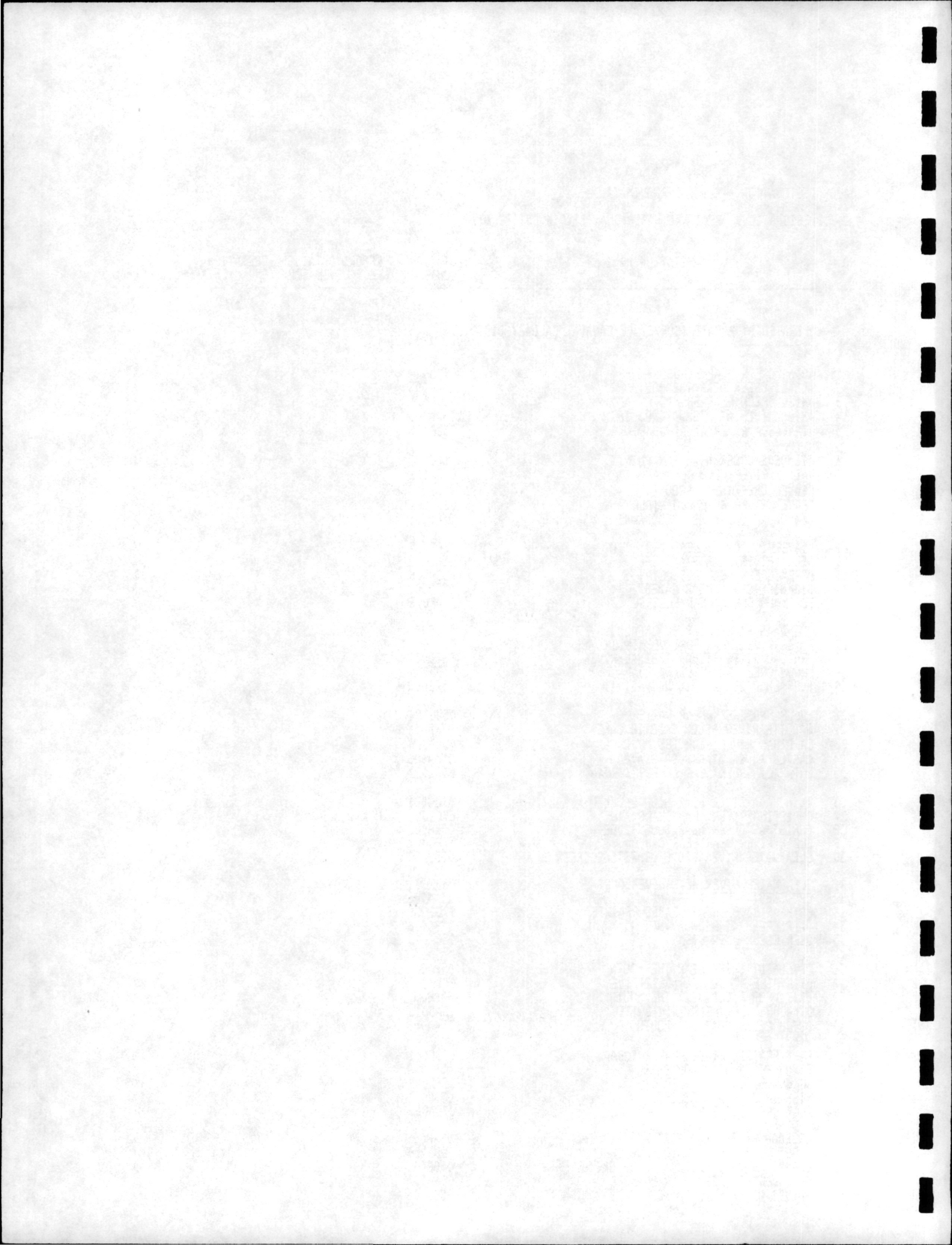
SYMBOL \$ INDICATING STATION LOCATED IN ALBERTA BUT OPERATED BY USC YELLOWKNIFE DISTRICT								
1	BEAVERLODGE RIVER NEAR BEAVERLODGE	07GD001	X				X	X
2	BOW RIVER BELOW BASSANO DAM	05BM004	X			X		X
3	BOW RIVER BELOW CARSELAND DAM	05BM002	X			X		X
4	BOW RIVER BELOW GHOST DAM	05BE006	X				X	X
5	CASTLE RIVER NEAR BEAVER MINES	05AA022	X				X	X
6	CHAIN LAKES RESERVOIR NEAR NANTON	05AB037		X		X		X
7	\$DOG RIVER NEAR FITZGERALD	07NB008	X				X	X
8	ETHEL LAKE NEAR COLD LAKE	06AC004		X		X		X
9	HAY RIVER NEAR MEANDER RIVER	070R003	X			X		X
10	HIGHWOOD RIVER NEAR THE MOUTH	05BL024	X				X	X
11	KAKWA RIVER NEAR GRANDE PRAIRIE	07GB002	X			X		X
12	KLESKUN HILLS MAIN DRAIN NEAR GRANDE PRAIRIE	07GE002	X			X		X
13	LESSER SLAVE LAKE AT FAUST	07BJ002		X		X		X
14	MARIE LAKE NEAR COLD LAKE	06AC005		X		X		X
15	MARTINEAU RIVER ABOVE COLD LAKE	06AF008	X				X	X
16	OLDMAN RIVER NEAR BROCKET	05AA024	X		X		X	X
17	PEACE RIVER AT PEACE RIVER	07HA001	X		X		X	X
18	RED DEER RIVER AT DRUMHELLER	05CE001	X		X		X	X
19	SMOXY RIVER ABOVE HELLS CREEK	07GA001	X				X	X
20	SOUTH SASKATCHEWAN RIVER AT MEDICINE HAT	05AJ001	X				X	X
21	ST. MARY RIVER NEAR LETHBRIDGE	05AE006	X				X	X
22	STEEN RIVER AT STEEN RIVER	070B004	X			X		X
23	SWAN RIVER NEAR KINUSO	07BJ001	X		X		X	X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								
1	ADAMS CREEK NEAR KINUSO	07BJ004	X		X			X
2	ALKALI CREEK NEAR THE MOUTH	05CK005	X		X			X
3	AMISK CREEK NEAR SHONTS	05EB016	X		X			X
4	AMISK RIVER AT HIGHWAY NO. 36	06AA002	X		X			X
5	ATHABASCA RIVER AT ATHABASCA	07BE001	X			X		X
6	ATIMOSWE CREEK NEAR ELK POINT	05ED002	X		X			X
7	BATTLE RIVER NEAR FONOKA	05FA001	X			X		X
8	BEAVER CREEK NEAR BROCKET	05AB013	X		X			X
9	BEAVER RIVER NEAR GOODRIDGE	06AA001	X		X			X
10	BEAVERDAM CREEK NEAR COCHRANE	05CB005	X		X			X
11	BEAVERHILL CREEK NEAR THE MOUTH	05EB015	X		X			X
12	BELLY RIVER NEAR STAND OFF	05AD002	X			X		X
13	BERRY CREEK NEAR ROSE LYNN	05CH008	X		X			X
14	BIGKNIFE CREEK NEAR GADSBY	05FC002	X		X			X
15	BLACKMUD CREEK NEAR ELLERSLIE	05DF003	X		X			X
16	BLINDMAN RIVER NEAR BLACKFALDS	05CC001	X			X		X
17	BOYER RIVER NEAR FORT VERMILION	07JF002	X		X			X
18	BRAZEAU RIVER BELOW CARDINAL RIVER	05DD007	X		X			X
19	BROWN CREEK AT FORESTRY ROAD	05DD004	X		X			X
20	BUFFALO CREEK AT HIGHWAY NO. 41	05FE002	X		X			X
21	BULLPOUND CREEK NEAR WATTS	05CG004	X		X			X
22	CADOTTE RIVER BELOW CADOTTE LAKE	07HB001	X		X			X
23	CARDINAL RIVER NEAR THE MOUTH	05DD008	X		X			X
24	CASTLE RIVER AT RANGER STATION	05AA028	X		X			X
25	CATARACT CREEK NEAR FORESTRY ROAD	05BL022	X			X		X
26	CHINCHAGA RIVER NEAR HIGH LEVEL	07DC001	X			X		X
27	CHRISTINA RIVER NEAR CHARD	07CE002	X		X		X	X
28	CHRISTMAS CREEK NEAR BLUE RIDGE	07AH002	X		X			X
29	CLEAR RIVER NEAR BEAR CANYON	07FD009	X		X			X
30	CLEARWATER RIVER ABOVE LIMESTONE CREEK	05DB003	X		X			X
31	CLEARWATER RIVER NEAR DOVERCOURT	05DB006	X			X		X
32	CROWNEST RIVER AT FRANK	05AA008	X			X		X
33	CUTBANK RIVER NEAR GRANDE PRAIRIE	07GB001	X		X			X
34	DAFF CREEK AT HIGHWAY NO. 44	07BC006	X		X			X
35	DEER CREEK MAIN STEM	05CA003	X		X			X
36	DRIEDMEAT CREEK NEAR THE MOUTH	05FA018	X		X			X
37	DRIFTPILE RIVER NEAR DRIFTPILE	07BH003	X	X	X			X
38	DRIFTWOOD RIVER NEAR THE MOUTH	07BK007	X			X		X
39	DRYWOOD CREEK NEAR TWIN BUTTE	05AD016	X		X			X
40	DUTCH CREEK NEAR THE MOUTH	05AA026	X		X			X
41	EAST PRAIRIE RIVER NEAR ENILDA	07BF001	X		X			X
42	ELBOW RIVER AT BRAGG CREEK	05BJ004	X			X		X
43	EUREKA RIVER NEAR WORSLEY	07FD013	X		X			X
44	FISH CREEK NEAR PFIDDIS	05BK001	X		X			X
45	FLAT CREEK NEAR BOYLE	07CA003	X		X			X
46	FREEMAN RIVER NEAR FORT ASSINIBOINE	07AH001	X		X			X
47	GHOST RIVER ABOVE WAIPGROUS CREEK	05BG010	X			X		X
48	GRANDE PRAIRIE CREEK NEAR SEXSMITH	07GE003	X		X			X
49	GROS VENTRE CREEK NEAR DUNMORE	05AH037	X		X			X
50	HAYNES CREEK NEAR HAYNES	05CD006	X		X			X



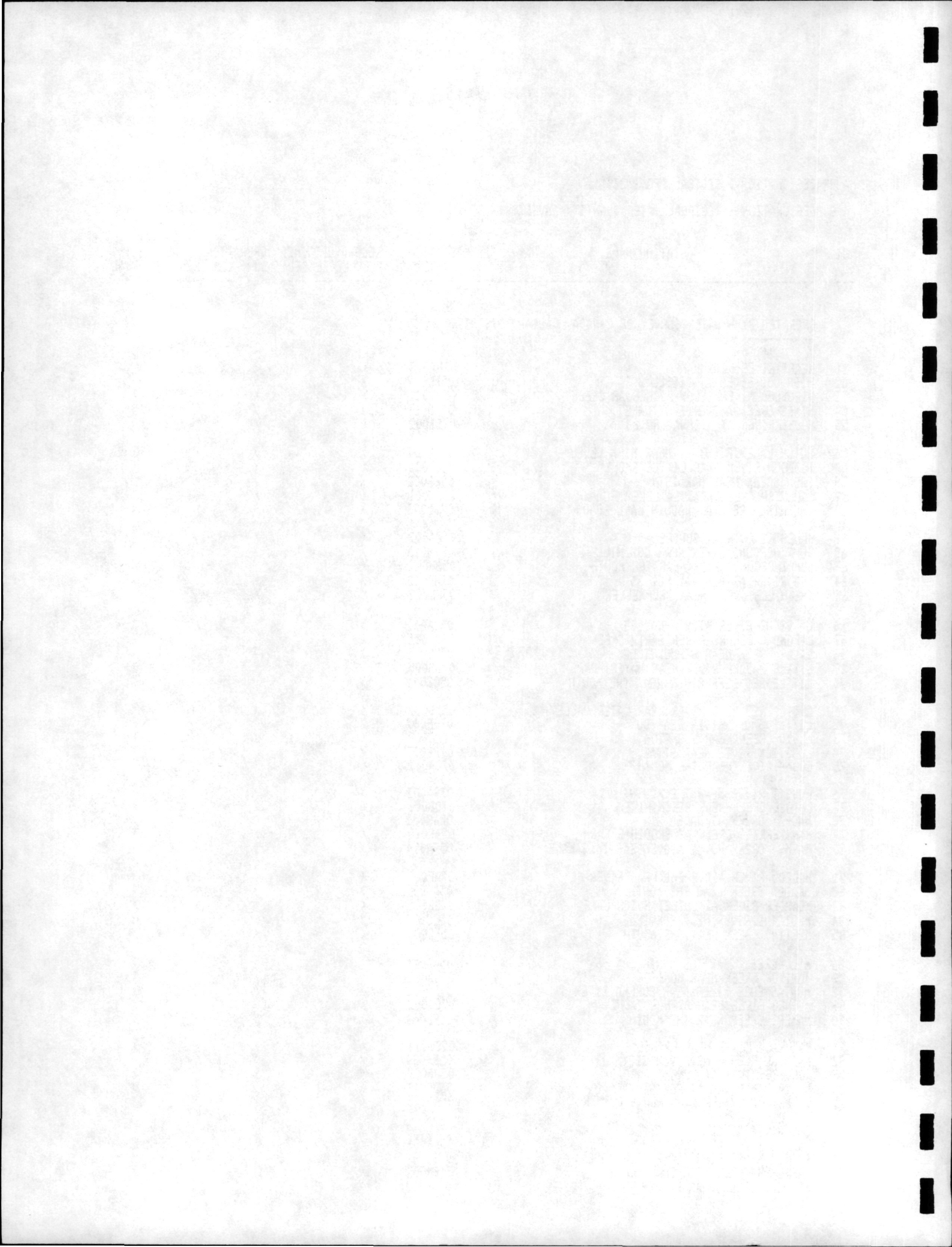
MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	5M	12M	REMOTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

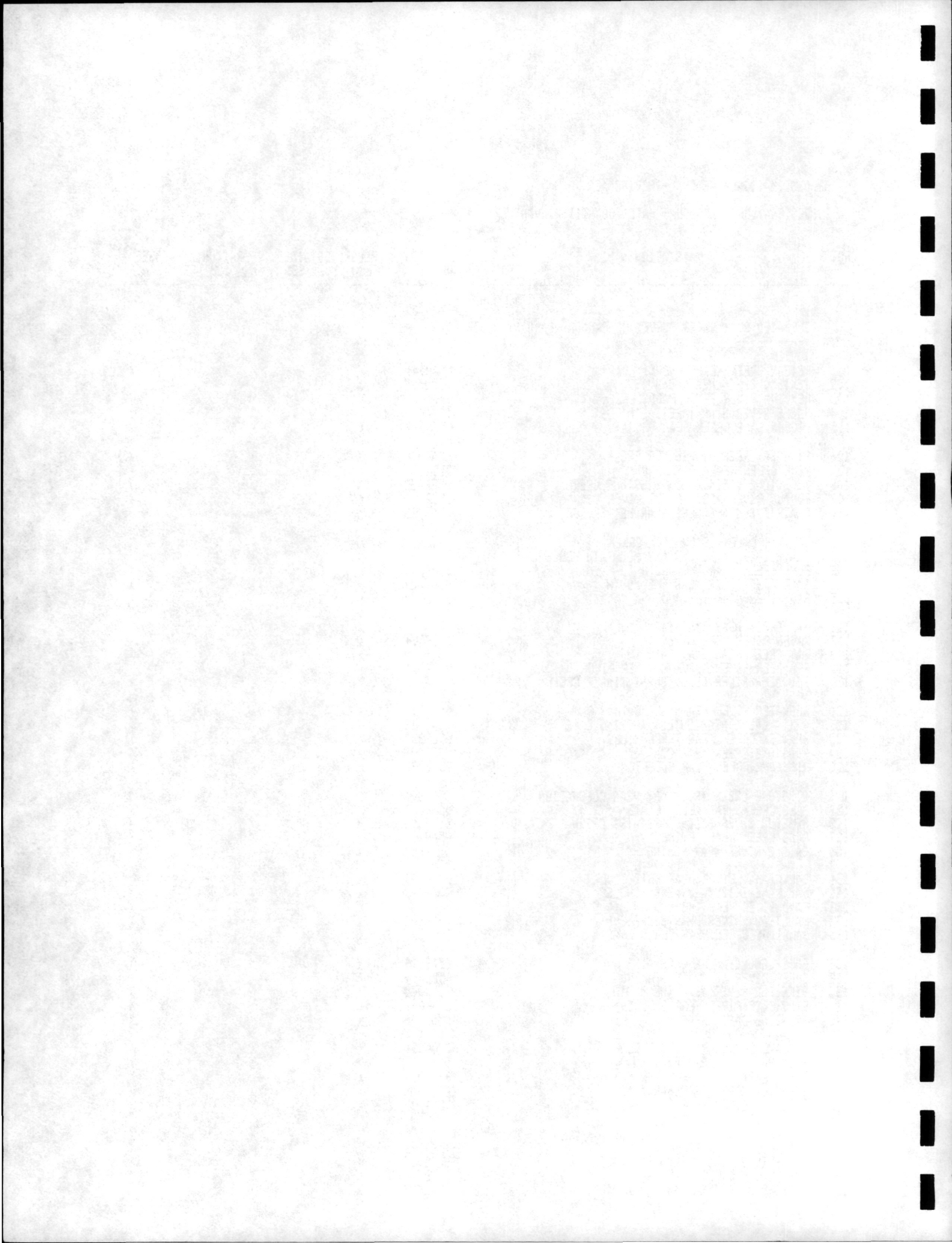
51	HEART RIVER NEAR NAMPA	07HA003	X			X		X
52	HIGHWOOD RIVER AT DIEBEL'S RANCH	05BL019	X		X			X
53	HIGHWOOD RIVER BELOW PICKLEJAR CREEK	05BL021	X		X			X
54	HINES CREEK ABOVE GERRY LAKE	07FD011	X		X			X
55	HOUSE RIVER AT HIGHWAY NO. 63	07CB002	X		X		X	
56	HUTCH LAKE TRIBUTARY NEAR HIGH LEVEL	070B007	X		X			X
57	IOSEGUN RIVER NEAR LITTLE SHOKY	07GG003	X		X			X
58	IRON CREEK NEAR HARDISTY	05FB002	X		X			X
59	JACKFISH CREEK NEAR LA COREY	06AC001	X		X			X
60	JACKPINE CREEK AT WADLIN LAKE ROAD	07JD003	X		X			X
61	JAMES RIVER NEAR SUNDRE	05CA002	X		X			X
62	JUMPINGPOUND CREEK NEAR COX HILL	05BH013	X		X			X
63	JUMPINGPOUND CREEK NEAR THE MOUTH	05BH009	X			X		X
64	KEG RIVER AT HIGHWAY NO. 35	07HF002	X		X			X
65	KNEEHILLS CREEK NEAR DRUMHELLER	05CE002	X		X			X
66	LA BICHE RIVER AT HIGHWAY 63	07CA011	X			X		X
67	LAFOND CREEK NEAR RED EARTH CREEK	07JC001	X		X			X
68	LALBY CREEK NEAR GIROUXVILLE	07GJ005	X		X			X
69	LITTLE PADDLE RIVER NEAR MAYERTHORPE	07BB005	X		X			X
70	LITTLE RED DEER RIVER NEAR THE MOUTH	05CB001	X			X		X
71	LITTLE RED DEER RIVER NEAR WATER VALLEY	05CB002	X		X			X
72	LITTLE SHOKY RIVER NEAR GUY	07GH002	X			X		X
73	LLOYD CREEK NEAR BLUFFTON	05CC009	X		X			X
74	LOBSTICK RIVER NEAR STYAL	07BB003	X			X		X
75	LOGAN RIVER NEAR THE MOUTH	07CA012	X		X		X	
76	LOVETT RIVER NEAR THE MOUTH	07BA003	X		X			X
77	LUTOSE CREEK NEAR STEEN RIVER	070B006	X		X			X
78	MACKAY CREEK AT WALSH	05AH002	X		X			X
79	MANYBERRIES CREEK AT BRODIN'S FARM	05AF010	X		X			X
80	MASKWA CREEK NO. 1 ABOVE BEARHILLS LAKE	05FA014	X		X			X
81	MCLEOD RIVER ABOVE EMBARRAS RIVER	07AF002	X			X		X
82	MEADOW CREEK NEAR THE MOUTH	05AB029	X		X			X
83	MEANDER RIVER AT OUTLET HUTCH LAKE	070B005	X		X			X
84	MEDICINE RIVER NEAR ECKVILLE	05CC007	X			X		X
85	MEETING CREEK NEAR THE MOUTH	05FC003	X		X			X
86	MILL CREEK NEAR THE MOUTH	05AA011	X		X			X
87	MONITOR CREEK NEAR MONITOR	05GA003	X		X			X
88	MONTAGNEUSE RIVER NEAR EUREKA RIVER	07FD012	X		X			X
89	MUSKEG RIVER NEAR GRANDE CACHE	07GA002	X			X		X
90	NAMEPI CREEK NEAR THE MOUTH	05EC004	X		X			X
91	NATURAL FLOW B NEAR PRINCESS	05CJ011	X		X			X
92	NATURAL FLOW C NEAR BOW CITY	05BN024	X		X			X
93	NORDEGG RIVER AT SUNCHILD ROAD	05DD009	X			X		X
94	NORTH RAM RIVER AT FORESTRY ROAD	05DC011	X		X			X
95	OLDMAN RIVER NEAR WALDRON'S CORNER	05AA023	X	X		X		X
96	OWL RIVER BELOW PICHE RIVER	07CA013	X		X		X	
97	PADDLE RIVER AT BARRHEAD	07BB006	X		X			X
98	PADDLE RIVER NEAR ROCHFORD BRIDGE	07BB004	X		X			X
99	PARFLESH CREEK NEAR CHANCELLOR	05BN007	X		X			X
100	PEAVINE CREEK NEAR FALHER	07GH004	X		X			X



MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	8H	12H	REMOTE	NORMAL
OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								
101	PEIGAN CREEK NEAR PAKOWKI ROAD	05AH041	X			X		X
102	PEKISKO CREEK NEAR LONGVIEW	05BL023	X			X		X
103	PEMUNA RIVER BELOW PADDY CREEK	07BA001	X			X		X
104	PICHE RIVER NEAR IMPERIAL MILLS	07CA010	X			X		X
105	PIGEDN LAKE CREEK NEAR USONA	05FA019	X			X		X
106	PINCHER CREEK AT PINCHER CREEK	05AA004	X			X		X
107	PINE CREEK NEAR GRASSLAND	07CA005	X			X		X
108	PIPESTONE CREEK BELOW BIGSTONE CREEK	05FA022	X			X		X
109	PONTON RIVER ABOVE BOYER RIVER	07JF003	X			X		X
110	PRAIRIE BLOOD COULEE NEAR LETHBRIDGE	05AD035	X			X		X
111	PRAIRIE CREEK BELOW LICK CREEK	05DB005	X			X		X
112	PRAIRIE CREEK NEAR ROCKY MOUNTAIN HOUSE	05DB002	X				X	X
113	PUNK CREEK NEAR THE MOUTH	06AB003	X			X		X
114	RACEHORSE CREEK NEAR THE MOUTH	05AA027	X			X		X
115	RAM RIVER NEAR THE MOUTH	05DC006	X				X	X
116	RAT CREEK NEAR CYNTHIA	07BA002	X			X		X
117	RAVEN RIVER NEAR RAVEN	05CB004	X				X	X
118	RAY CREEK NEAR INNISFAIL	05CE010	X			X		X
119	RED DEER RIVER ABOVE PANTHER RIVER	05CA004	X			X		X
120	RED DEER RIVER BELOW BURNT TIMBER CREEK	05CA009	X				X	X
121	REDWATER RIVER NEAR THE MOUTH	05EC005	X			X		X
122	REITA CREEK NEAR OUTLET ANGLING LAKE	06AD013	X				X	X
123	RENNICK CREEK NEAR THREE HILLS	05CE011	X			X		X
124	RIBSTONE CREEK NEAR CZAR	05FD005	X			X		X
125	RIBSTONE CREEK NEAR EDGERTON	05FD001	X			X		X
126	RIBSTONE CREEK TRIBUTARY NEAR CORONATION	05FD006	X			X		X
127	ROSE CREEK NEAR ALDER FLATS	05DE007	X			X		X
128	ROSEBUD RIVER BELOW CARSTAIRS CREEK	05CE006	X			X		X
129	ROSS CREEK NEAR IRVINE	05AH003	X			X		X
130	SADDLE RIVER NEAR WOKING	07FD006	X					X
131	SAGWATAMAU RIVER NEAR WHITECOURT	07AH003	X			X		X
132	SAG LAKE TRIBUTARY NEAR SCHULER	05AH047	X			X		X
133	SAND RIVER NEAR THE MOUTH	06AB001	X			X		X
134	SAULTEAUX RIVER NEAR SPURFIELD	07BK005	X			X		X
135	SAWRIDGE CREEK NEAR SLAVE LAKE	07BK009	X			X		X
136	SHEEP COULEE NEAR CARSTAIRS	05CE019	X			X		X
137	SHEEP RIVER AT BLACK DIAMOND	05BL014	X				X	X
138	SIFFLEUR RIVER NEAR THE MOUTH	05DA002	X			X		X
139	SIMONETTE RIVER NEAR GOODWIN	07GF001	X				X	X
140	SOUNDING CREEK NEAR OYEN	05GA008	X			X		X
141	SOUSA CREEK NEAR HIGH LEVEL	070A001	X			X		X
142	STIMSON CREEK NEAR PEKISKO	05BL007	X			X		X
143	STRAWBERRY CREEK NEAR THE MOUTH	05DF004	X			X		X
144	STRETTON CREEK NEAR MARWAYNE	05EE005	X			X		X
145	STURGEDON RIVER NEAR FORT SASKATCHEWAN	05EA001	X			X		X
146	SUNDANCE CREEK NEAR BICKERDIKE	07AF010	X			X		X
147	SWAN RIVER NEAR SWAN HILLS	07BJ003	X			X		X
148	THREEHILLS CREEK BELOW RAY CREEK	05CE018	X			X		X
149	THREEHILLS CREEK NEAR CARBON	05CE007	X			X		X
150	THREEPOINT CREEK NEAR MILLARVILLE	05BL013	X			X		X



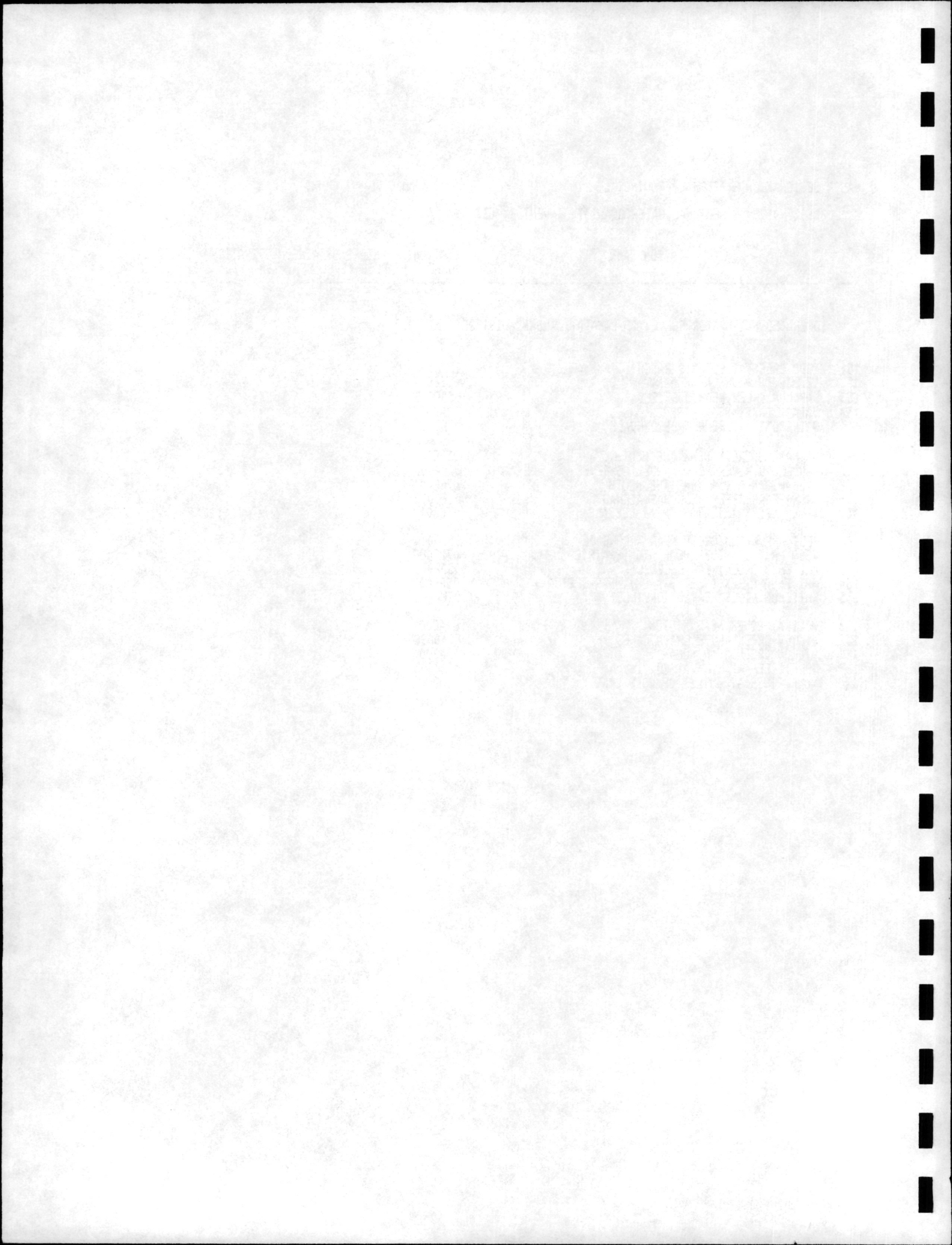
MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SED.	8M	12M	REMOTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

151	TODD CREEK AT ELTON'S RANCH	05AA006	X		X			X
152	VERMILION RIVER NEAR MARWAYNE	05EE007	X		X			X
153	WABAMUN CREEK NEAR DUFFIELD	05DE003	X		X			X
154	WABASH CREEK NEAR PIBROCH	07BC007	X		X			X
155	WAINSCOTT COULEE NEAR BROWNVALE	07FD014	X		X			X
156	WAIPAROUS CREEK NEAR THE MOUTH	05BG006	X			X		X
157	WANDERING RIVER NEAR WANDERING RIVER	07CA006	X			X		X
158	WASKAHIGAN RIVER NEAR THE MOUTH	07GG001	X			X		X
159	WASKATENAU CREEK NEAR WASKATENAU	05EC002	X		X			X
160	WELCH CREEK TRIBUTARY NEAR LEEDALE	05CC010	X		X			X
161	WEST ARROWWOOD CREEK NEAR ARROWWOOD	05EM014	X		X			X
162	WEST PRAIRIE RIVER NEAR HIGH PRAIRIE	07BF002	X			X		X
163	WHITEMUD CREEK NEAR ELLERSLIE	05DF006	X		X			X
164	WHITEMUD CREEK (WEST BRANCH) NEAR IRETON	05DF007	X		X			X
165	WHITEMUD RIVER NEAR DIXONVILLE	07HA005	X			X		X
166	WILDHAY RIVER NEAR HINTON	07AC001	X		X			X
167	WILLOW CREEK ABOVE CHAIN LAKES	05AB028	X			X		X
168	WILLOW CREEK NEAR NOLAN	05AB002	X		X			X
169	WOLF CREEK AT HIGHWAY NO. 16	07AG003	X			X		X
170	WOLF RIVER AT OUTLET OF WOLF LAKE	06AB002	X			X	X	X



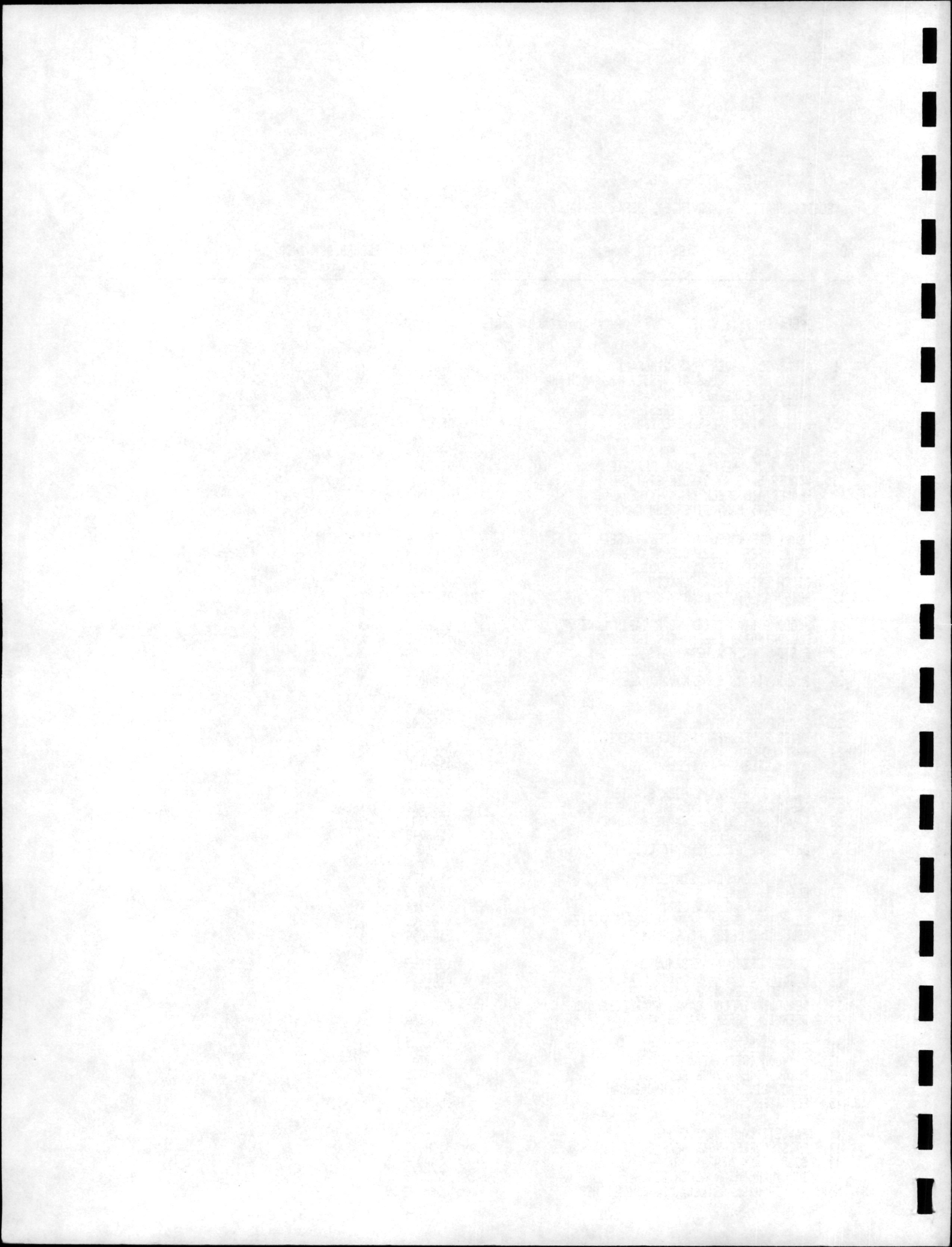
MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	SED.	2M	12M	REMOTE

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								

1	ATHABASCA RIVER NEAR WINDFALL	07AE001	X			X		X
2	ATLAS MINE COULEE AT WESTERN MONARCH	05CG005	X			X		X
3	BAPTISTE LAKE NEAR ATHABASCA	07BE002		X		X		X
4	BATTLE RIVER ABOVE PIPESTONE CREEK	05FA023	X			X		X
5	BATTLE RIVER NEAR FORESTBURG	05FC001	X			X		X
6	BEAR LAKE NEAR CLAIRMONT	07GE004		X		X		X
7	BEAR RIVER NEAR GRANDE PRAIRIE	07GE005	X				X	X
8	BEAVER LAKE AT RANGER STATION	06AA003		X		X		X
9	BEAVERTAIL CREEK NEAR HYTHE	07GD002	X			X		X
10	BELLY-ST. MARY DIVERSION CANAL	05AD021	X			X		X
11	BERRY CREEK BELOW DEADFISH CREEK	05CH016	X			X		X
12	BERRY CREEK RESERVOIR NEAR SUNNYNOOK	05CH014		X		X		X
13	BERRY CREEK RESERVOIR OUTLET	05CH011	X			X		X
14	BIRCH CREEK NEAR CONKLIN	07CE006	X			X		X
15	BLINDMAN RIVER NEAR BLUFFTON	05CC008	X			X		X
16	BLOOD INDIAN CREEK NEAR CABIN LAKE	05CK007	X			X		X
17	BLOOD INDIAN CREEK NEAR THE MOUTH	05CK001	X			X		X
18	B.R.D. DRAIN A NEAR HAYS	05AG004	X			X		X
19	B.R.D. DRAIN D NEAR VAUXHALL	05BN008	X			X		X
20	B.R.D. DRAIN E NEAR VAUXHALL	05BN023	X			X		X
21	B.R.D. DRAIN I NEAR HAYS	05AG005	X			X		X
22	BOW RIVER AT CANNORE	05BE008	X				X	X
23	BOYER RIVER NEAR FADDLE PRAIRIE	07JF004	X			X		X
24	BUFFALO LAKE NEAR ERSKINE	05CD005		X		X		X
25	CADWIN CREEK NEAR SEEBE	05BF019	X				X	X
26	CALLING LAKE AT RANGER STATION	07CS001		X		X		X
27	CANADIAN ST. MARY CANAL AT DROP NO. 1	05AF028	X			X		X
28	CAVAN LAKE DIVERSION NEAR DUNMORE	05AH044	X			X		X
29	CAVAN LAKE NEAR DUNMORE	05AH048		X		X		X
30	CHIP LAKE AT OUTLET TO LOSSTICK RIVER	07BB008		X		X		X
31	CLEAR BROOK NEAR STAVELY	05AC033	X			X		X
32	CLEAR LAKE NEAR STAVELY	05AC032		X		X		X
33	COAL CREEK AT BOW CITY	05BN014	X			X		X
34	COLQUHOUN CREEK NEAR GRANDE PRAIRIE	07GE006	X			X		X
35	COLUMBINE CREEK NEAR GLENDON	06AA004	X			X		X
36	CONNOR CREEK NEAR SANGUDO	07BB009	X			X		X
37	COOKING LAKE AT COOKING LAKE	05EB012		X		X		X
38	COYOTE CREEK NEAR CHERHILL	07BB014	X			X		X
39	DEADFISH INFLOW CANAL NEAR CESSFORD	05CH012	X			X		X
40	DEERLICK CREEK NEAR HINTON	07AF004	X		X	X		X
41	DICKSON DAM TUNNEL OUTLET	05CB007	X				X	X
42	DRYWOOD CREEK NEAR THE MOUTH	05AD010	X				X	X
43	ELBOW RIVER ABOVE ELBOW FALLS	05BJ006	X			X		X
44	ELBOW RIVER BELOW GLENMORE DAM	05BJ001	X				X	X
45	ELKWATER LAKE	05AH025		X		X		X
46	FAWCETT LAKE NEAR SMITH	07BK008		X		X		X
47	FORSTER RESERVOIR NEAR CESSFORD	05CH013		X		X		X
48	GOLD CREEK NEAR FRANK	05AA030	X			X		X
49	GULL LAKE NEAR ASPEN BEACH	05CC006		X		X		X
50	HAMMER HILL SPILLWAY NEAR GLEICHEN	05BN005	X			X		X



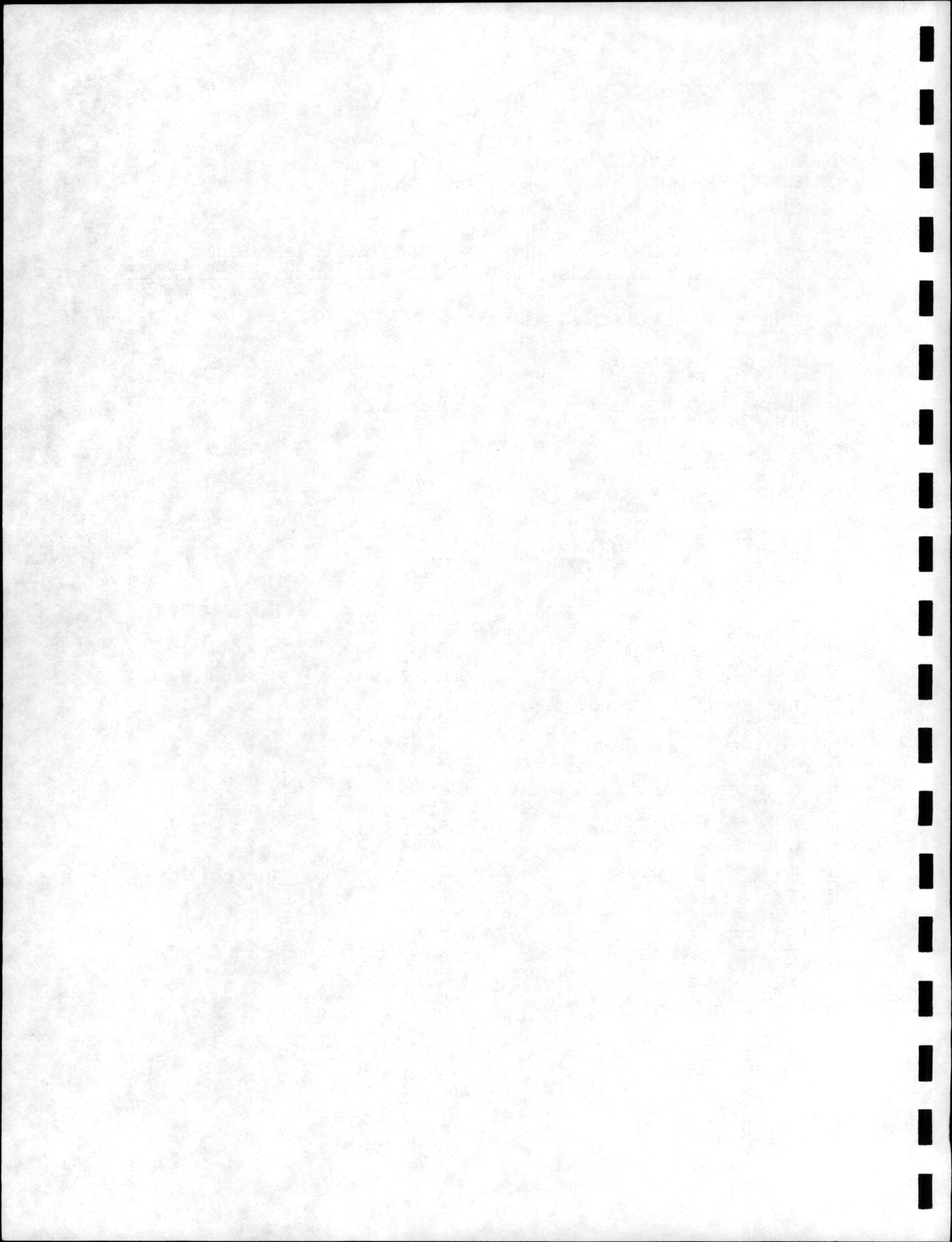
MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SED.	5M	12M	RENTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT									

51	HARTLEY CREEK NEAR FORT MACKAY	07DA009	X				X	X	
52	HASTINGS LAKE NEAR DEVILLE	05EB011		X		X			X
53	HIGHWOOD RIVER AT HIGH RIVER	05BL003	X				X		
54	HIGHWOOD RIVER NEAR ALDERSYDE	05BL009	X			X			X
55	HILDA LAKE NEAR COLD LAKE	06AC003		X		X			X
56	HINES CREEK NEAR FAIRVIEW	07FD008	X			X			X
57	IRON CREEK NEAR VIKING	05FB003	X			X			X
58	ISLE LAKE AT EUREKA BEACH	05EA008		X		X			X
59	JACKFISH RIVER BELOW CHRISTINA LAKE	07CE005	X			X		X	
60	JOSLYN CREEK NEAR FORT MACKAY	07DA016	X			X		X	
61	KENNEDY COULEE NEAR ACADIA VALLEY	05CK006	X			X			X
62	KILLARNEY LAKE TRIBUTARY NEAR CHAUVIN	05GA010	X			X			X
63	KIRKPATRICK LAKE TRIBUTARY NEAR SPONDIN	05GA009	X			X			X
64	KYISKAP CREEK NEAR GRANUM	05AB038	X			X			X
65	LAC LA BICHE AT LAC LA BICHE	07CA004		X		X			X
66	LAC LA NONNE AT LAC LA NONNE	07BB007		X		X			X
67	LAC STE. ANNE AT ALBERTA BEACH	05EA006		X		X			X
68	LATERAL 10 SPILLWAY NEAR CHIN	05AG007	X			X			X
69	LESSER SLAVE LAKE AT SLAVE LAKE	07BJ006		X			X		X
70	LITTLE ELBOW RIVER ABOVE NIHAHI CREEK	05BJ009	X			X			X
71	LITTLE SMOKY RIVER AT LITTLE SMOKY RIVER	07GG002	X			X			X
72	LONDON LATERAL NEAR HEADGATE	05AC017	X			X			X
73	MACKAY CREEK NEAR GRABURN GAP	05AH042	X			X			X
74	MACKAY RIVER ABOVE DUNKIRK RIVER	07DB005	X			X		X	
75	MANATOKAN RIVER NEAR IRON RIVER	06AC009	X			X			X
76	MICALPINE CREEK NEAR ELKWATER	05AH043	X			X			X
77	MCGILLIVRAY CREEK NEAR COLEMAN	05AA013	X			X			X
78	MCGREGOR LAKE INFLOW NEAR MILO	05AC024	X			X			X
79	MCGREGOR-TRAVERS CANAL NEAR CHAMPION	05AC025	X			X			X
80	MCLEOD RIVER NEAR WHITECOURT	07AG004	X			X			X
81	MICHICHI CREEK AT DRUMHELLER	05CE020	X			X			X
82	MILY RIVER RIDGE RESERVOIR	05AF030		X		X			X
83	MINISTIK LAKE NEAR NEW SAREPTA	05EB013		X		X			X
84	MIDVELON LAKE AT PROVINCIAL PARK	05EB014		X		X			X
85	MONITOR CREEK NEAR CONSORT	05GA011	X			X			X
86	MOOPE LAKE NEAR COLD LAKE	06AC002		X		X			X
87	MOOSEHILLS CREEK NEAR ELK POINT	05ED003	X			X			X
88	MOOSELAKE RIVER NEAR FRANCHERE	06AC006	X				X		X
89	MOSQUITO CREEK NEAR PARKLAND	05AC031	X			X			X
90	MURIEL LAKE NEAR GURNEYVILLE	06AC007		X			X		X
91	NINE MILE COULEE NEAR LETHBRIDGE	05AE042	X			X			X
92	NORTH SASKATCHEWAN RIVER NEAR LODGEPOLE	05DE006		X		X			X
93	NOSE CREEK AT CALGARY	05BH003	X			X			X
94	OLDMAN RIVER NEAR THE MOUTH	05AG006	X			X			X
95	PADDLE RIVER AT HWY. 764	07EB013		X		X			X
96	PADDLE RIVER NEAR ANSELMO	07EB011	X			X			X
97	PADDLE RIVER NEAR SANGUDO	07EB012		X		X			X
98	PAINT EARTH CREEK NEAR HALKAPK	05FC004	X			X			X
99	PARLBY CREEK NEAR ALIX	05CD007	X			X			X
100	PEACE RIVER AT FORT VERMILION	07HF001		X		X			X



MAJOR DESIGNATION - PROVINCIAL

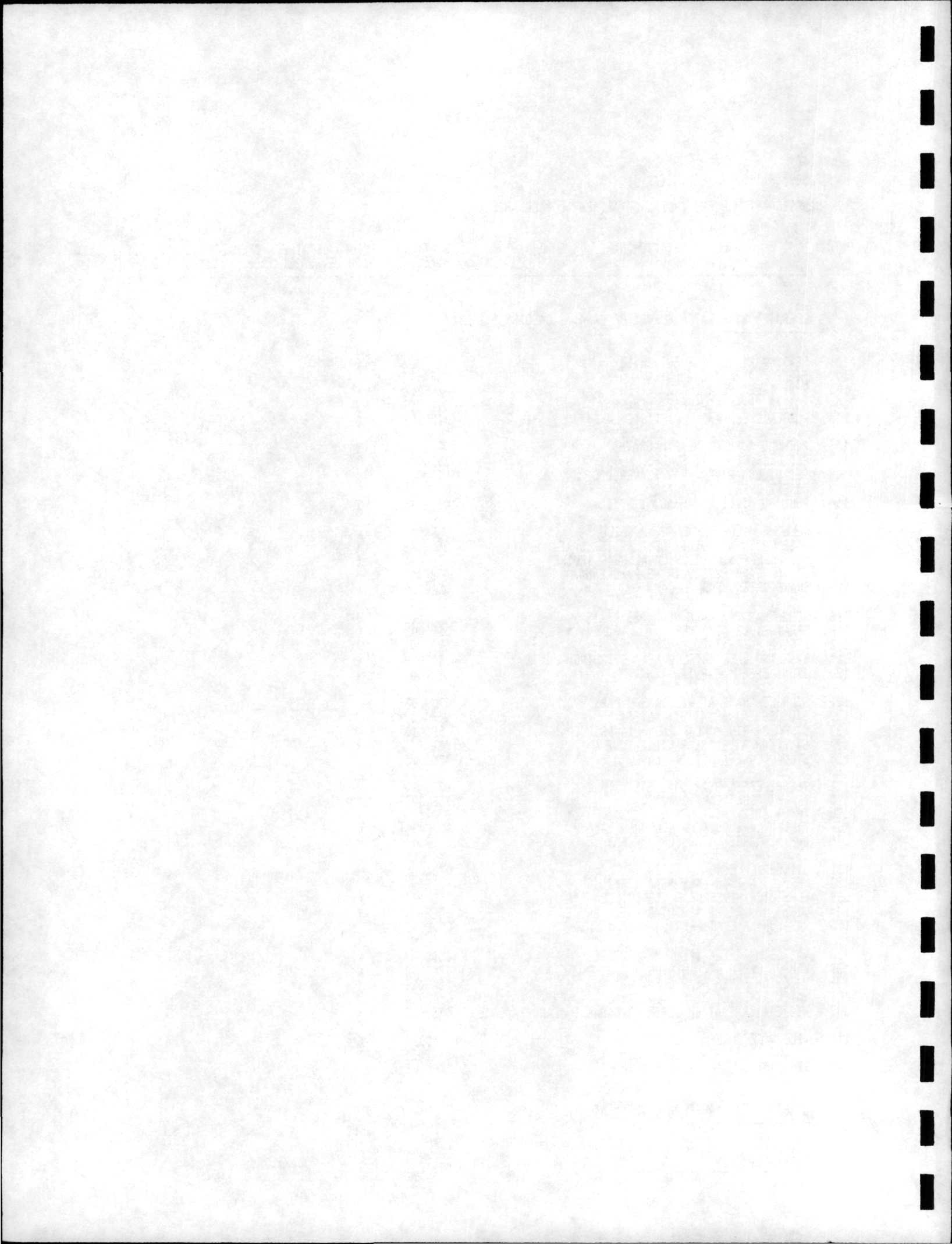
SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL SET.	8M	12M	REMOTE	NORMAL

OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT								
101	FEMINA RIVER NEAR ENTWISTLE	07BB002	X			X		X
102	PIGEON LAKE AT GRANDVIEW	05FA013		X	X			X
103	PONY CREEK NEAR CHARD	07CE003	X		X		X	
104	POPLAR CREEK NEAR FORT MCHURRAY	07DA007	X			X	X	
105	PORTER CREEK ABOVE BAPTISTE LAKE	07BE003	X		X			X
106	POTHOLE TURNOUT NEAR MAGRATH	05AE038	X		X			X
107	RED DEER RIVER AT SUNDRE	05CA010		X	X			X
108	RED WILLOW RIVER NEAR BEAVERLODGE	07GD003	X			X		X
109	ROBERT CREEK NEAR ANZAC	07CE004	X		X		X	
110	ROLLING HILLS CANAL NO. 1 SPILL	05BN015	X		X			X
111	ROLLING HILLS CANAL NO. 2 SPILL	05BN019	X		X			X
112	ROSS CREEK AT OUTLET OF ELKWATER LAKE	05AH046	X		X			X
113	FOSS CREEK DIVERSION CANAL NEAR IRVINE	05AH045	X		X			X
114	SOUTH HEART RESERVOIR NEAR MCLENNAN	07BF008		X	X			X
115	SNAKE CREEK NEAR VULCAN	05AC030	X		X			X
116	SOUTH WABASCA LAKE NEAR DESHARAI	07JA002		X	X			X
117	SPRAY RIVER AT BANFF	05BC001	X			X		X
118	STEELE LAKE NEAR JARVIE	07BC005		X	X			X
119	STIRLING LAKE OUTFLOW NEAR STIRLING	05AF029	X		X			X
120	STONY CREEK NEAR TAWATINAW	07BE004	X		X			X
121	STURGEON LAKE AT WILLIAMSON PARK	07GH003		X	X			X
122	STURGEON RIVER AT ST. ALBERT	05EA002	X		X			X
123	STURGEON RIVER NEAR MAGNOLIA BRIDGE	05EA010	X		X			X
124	STURGEON RIVER NEAR VILLENEUVE	05EA005	X			X		X
125	SYLVAN LAKE AT SYLVAN LAKE	05CC003		X	X			X
126	TEEPSEE CREEK NEAR LA CRETE	07JD004	X		X			X
127	TRAPP CREEK NEAR LONGVIEW	05BL027	X		X			X
128	TROUT CREEK NEAR GRANUM	05AB005	X		X			X
129	TYRELL LAKE OUTFLOW NEAR NEW DAYTON	05AF031	X		X			X
130	UNNAMED CREEK NEAR FORT MACKAY	07DA011	X		X		X	
131	UTINUMA LAKE NEAR NIPISI	07JA001		X	X			X
132	VERMILION PARK LAKE NEAR VERMILION	05EE008		X	X			X
133	VERMILION RIVER NEAR VEGREVILLE	05EE003	X		X			X
134	VERMILION RIVER TRIBUTARY NEAR BRUCE	05EE006	X		X			X
135	WABAMUN LAKE AT WABAMUN	05DE002		X		X		X
136	WATOGROUS CREEK BELOW MEADOW CREEK	05BG009	X		X			X
137	WAMPUS CREEK NEAR HINTON	07AF003	X	X	X			X
138	WATERTON RIVER NEAR GLENWOOD	05AD028	X			X		X
139	WATERTON-BELLY DIVERSION CANAL	05AD027	X		X			X
140	WESTERN IRRIGATION DISTRICT CANAL 8 NEAR HEADGATE	05BM017	X		X			X
141	WILLOW CREEK BELOW LAKE CREEK	05AB039	X		X			X
142	WILLOW CREEK NEAR CLARESHOLM	05AB021	X			X		X
143	WINAGAMI LAKE AT SPILLWAY GATES	07BF006		X	X			X

OPERATED BY - ALBERTA GOVERNMENT

1	BIG POINT CHANNEL BELOW DIVERGENCE	07DD006 MISC	X			X		X
2	BRIDLEBIT CREEK NEAR VALLEYVIEW	07GF005	X	X	X			X



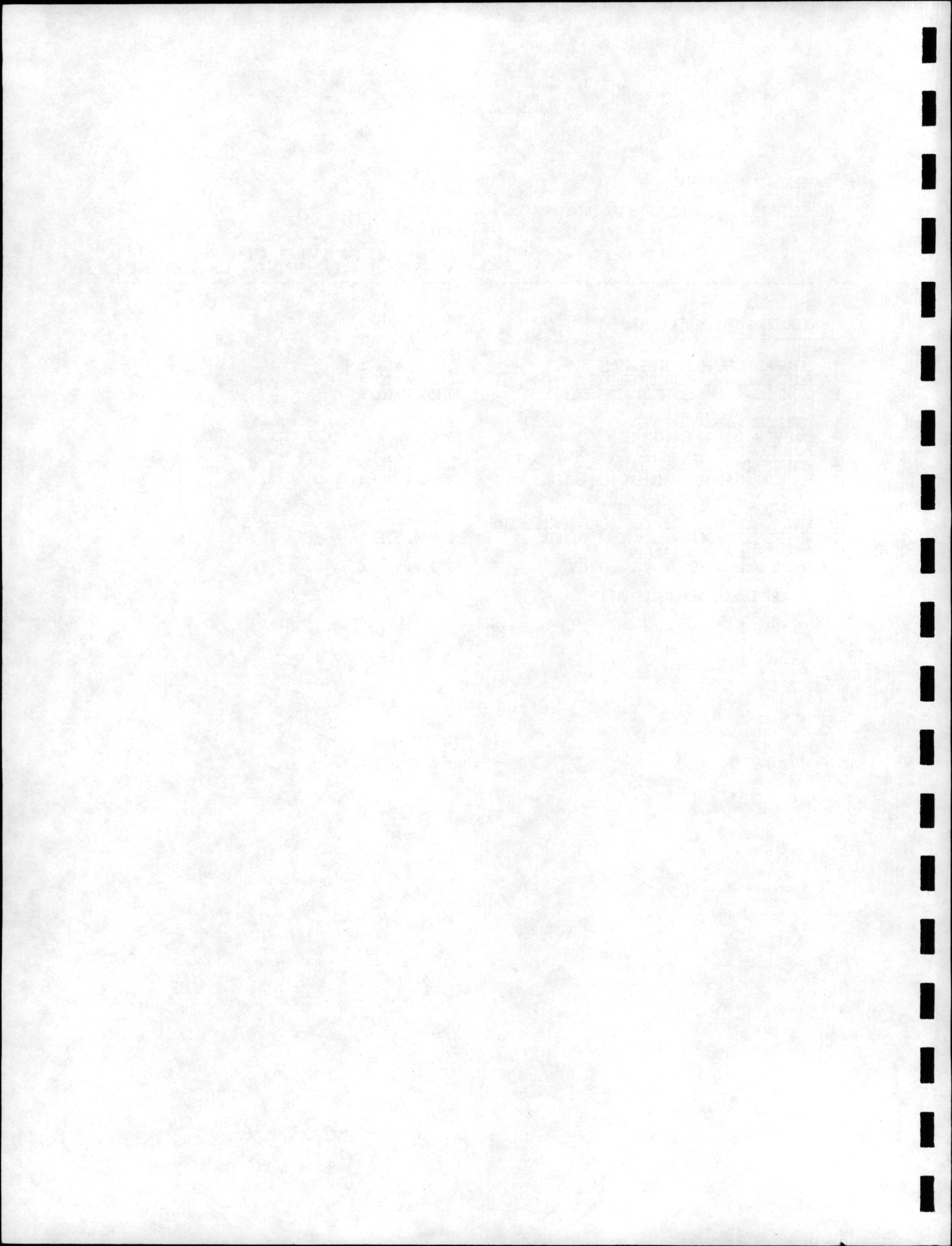
MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED			OPERATION		ACCESS	
			FLOW	LEVEL	SEC.	9M	12M	REMOTE	NORMAL

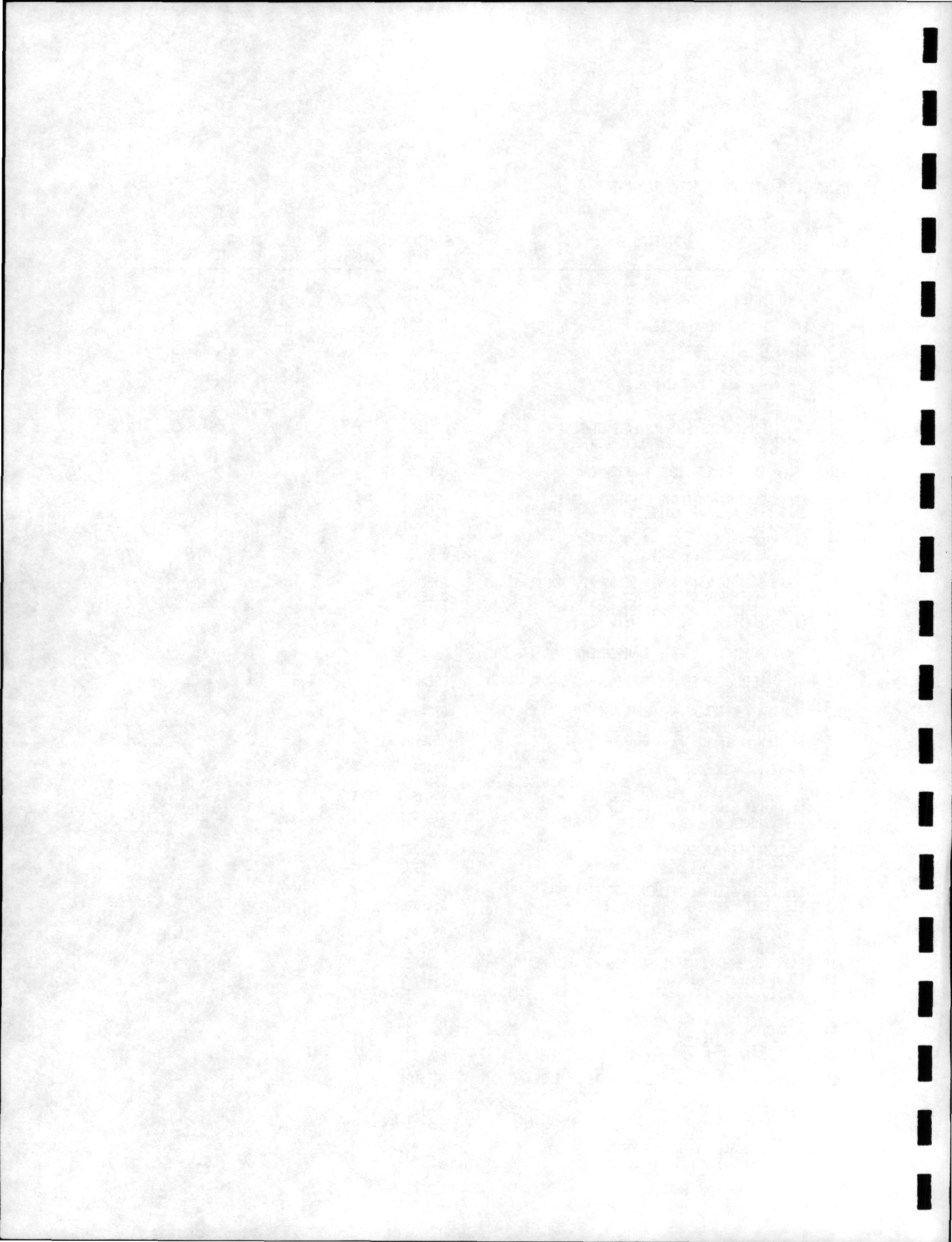
OPERATED BY - ALBERTA GOVERNMENT									

3	EMBARRAS RIVER BELOW DIVERGENCE	07DD003	MISC	X				X	X
4	FLETCHER CHANNEL BELOW DIVERGENCE	07DD004	MISC	X				X	X
5	GOOSE ISLAND CHANNEL BELOW DIVERGENCE	07DD005	MISC	X				X	X
6	HORSE CREEK NEAR VALLEYVIEW	07GF007		X	X	X			X
7	LAKE ATHASASCA AT BUSTARD ISLAND	07MD002		X			X	X	X
8	MAMAWI LAKE CHANNEL AT OLD DOG CAMP	07KF003		X			X	X	X
9	PRAIRIE RIVER NEAR LAKE CLAIRE	07KF014	MISC	X			X	X	X
10	REVILLON COUPE BELOW RIVIERE DES ROCHERS	07NA004	MISC	X				X	X
11	RICHARDSON LAKE AT THE OUTLET	07DD008		X			X	X	X
12	RIVIERE DES ROCHERS AB. CONFLUENCE REVILLON COUPE	07NA003		X			X	X	X
13	RIVIERE DES ROCHERS AT BEN HOULE'S CABIN	07NA002	MISC	X			X	X	X
14	ROCKY CREEK NEAR VALLEYVIEW	07GF006		X	X	X			X
15	SPRING CREEK (UPPER) NEAR VALLEYVIEW	07GF004		X	X	X			X
16	WOLVERINE CREEK NEAR VALLEYVIEW	07GF003		X	X	X			X



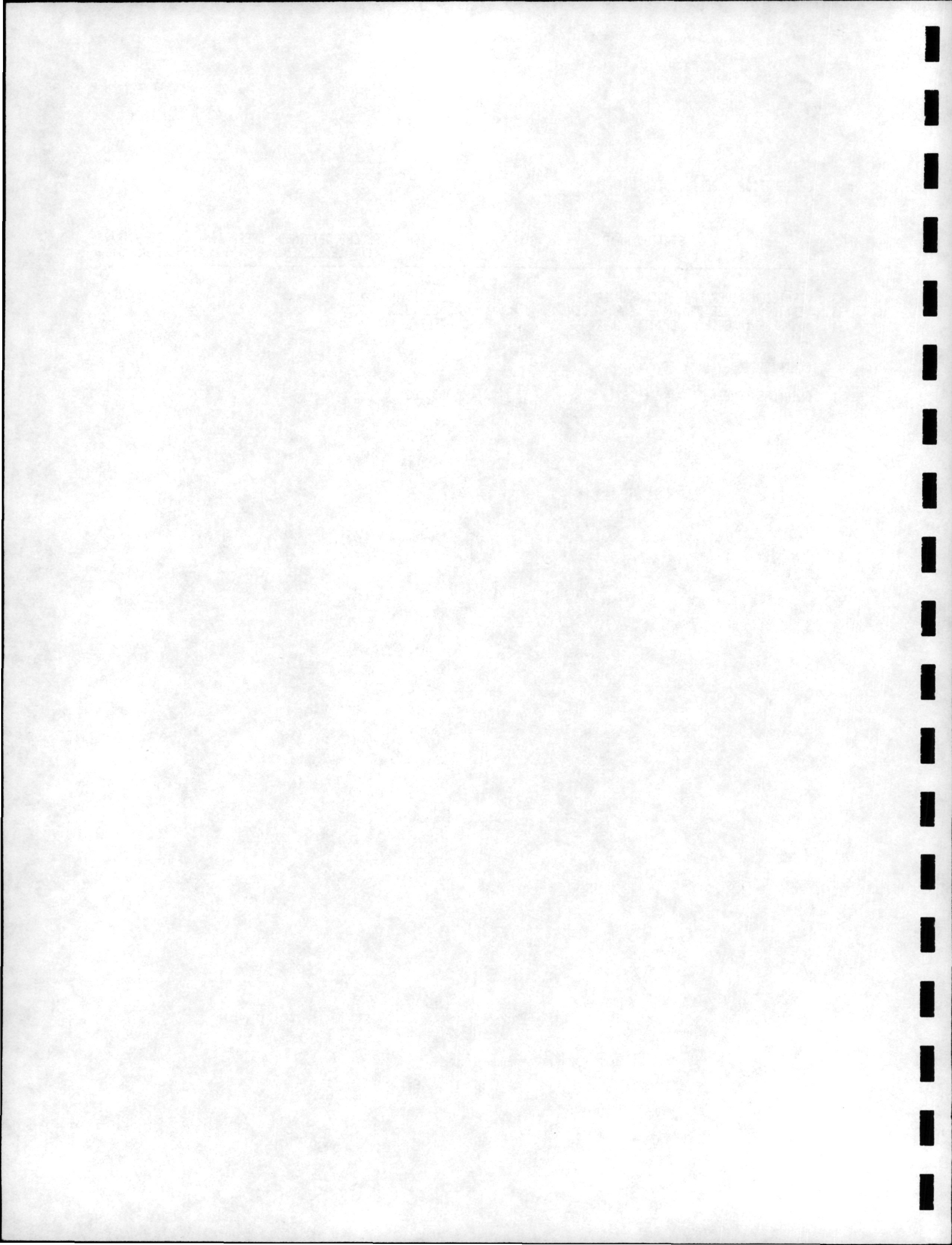
MAJOR DESIGNATION - CONTRIBUTED DATA

NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	SED.	8H	12H	REMOTE
CONTRIBUTED BY TRANS-ALTA UTILITIES								
1	BARRIER LAKE NEAR SEEBE	05BF024		X			X	X
2	BOW RIVER NEAR SEEBE	05BE004		X			X	X
3	BRAZEAU RESERVOIR	05DD006		X			X	X
4	BRAZEAU RIVER BELOW BRAZEAU PLANT	05DD005	X				X	X
5	CASCADE POWER DIVERSION NEAR BANFF	05BD004	X				X	X
6	GHOST LAKE NEAR COCHRANE	05BE005		X			X	Y
7	GHOST RIVER DIVERSION TO LAKE MINNEWANKA	05BG003	X				X	X
8	GHOST RIVER NEAR BLACK ROCK MOUNTAIN	05BG002	X			X	X	X
9	GOAT CREEK AT BANFF PARK BOUNDARY	05BC008	X				X	X
10	KANANASKIS RIVER BELOW BARRIER DAM	05BF025	X				X	X
11	KANANASKIS RIVER ABOVE POCATERRA CREEK	05BF003	X				X	X
12	LAKE ABRAHAM NEAR NORDEGG	05DC009		X			X	X
13	LAKE MINNEWANKA NEAR BANFF	05BD003		X			X	X
14	LOWER KANANASKIS LAKE AT POCATERRA DAM	05BF009		X			X	X
15	MUD LAKE DIVERSION CANAL	05BF013	X			X		X
16	NORTH SASKATCHEWAN RIVER BELOW BIGHORN PLANT	05DC010	X				X	X
17	SPRAY POWER DIVERSION AT CANMORE	05BE007	X				X	X
18	SPRAY RESERVOIR AT THREE SISTERS DAM	05BC006		X			X	X
19	UPPER KANANASKIS LAKE AT MAIN DAM	05BF005		X			X	X
CONTRIBUTED BY ALBERTA ENVIRONMENT								
1	ATIM CREEK NEAR SPRUCE GROVE	05EA009	X				X	X
2	BABETTE CREEK NEAR COLINTON	07CA008	X				X	X
3	BEARBERRY CREEK NEAR SUNDRE	05CA011	X				X	X
4	BEDDINGTON CREEK NEAR CALGARY	05BH904	X				X	X
5	RIGELCW RESERVOIR NEAR WIMBOURNE	05CE901		X			X	X
6	B.R.I.D. MAIN CANAL AT DROP NO. 3	05AC902	X				X	X
7	B.R.I.D. WESTERN BLOCK LATERAL A NEAR HEADGATES	05AC013	X				X	X
8	COTTONWOOD CREEK NEAR TWIN BUTTE	05AD903	X				X	X
9	DRIEDMEAT LAKE AT OUTFLOW	05FA020		X			X	X
10	ELBOW RIVER AT SARCEE BRIDGE	05BJ010	X				X	Y
11	FALLENTIMBER CREEK NEAR SUNDRE	05CA012	X				X	X
12	KRAWCHUK DRAINAGE NEAR MCLENNAN	07AH902	X				X	X
13	LEE CREEK AT BEAZER	05AE037	X				X	X
14	LEE CREEK BELOW CONFLUENCE OF EAST FORK	05AE905	X				X	Y
15	LEE CREEK (EAST BRANCH) NEAR BEAZER	05AE040	X				X	X
16	L.N.I.D. CANAL BELOW KEHO OUTFLOW	05AC026	X				X	X
17	L.N.I.D. CANAL BELOW MONARCH HEADGATES	05AC029	X				X	X
18	L.N.I.D. MONARCH BR CANAL BEL MONARCH HEADGATES	05AC028	X				X	X
19	LODGE CREEK AT HIGHWAY NO.41	11AB902	X				X	X
20	MUSKEG CREEK NEAR WESTROSE	05FA912	X				X	X
21	NOSE CREEK NEAR THE MOUTH	05BH901	X				X	X
22	PARLBY CREEK NEAR MIRROR	05CD902	X				X	X
23	PINE CREEK NEAR COLLINGTON	07CA901	X				X	X
24	POINTE-AUX-PINS CREEK NEAR ARDROSSAN	05EB902	X				X	Y
25	POINTE-AUX-PINS TRIBUTARY 1 NEAR ARDROSSAN	05EB909	X				X	X
26	POINTE-AUX-PINS TRIBUTARY 2 NEAR ARDROSSAN	05EB910	X				X	X
27	POINTE-AUX-PINS TRIBUTARY 3 NEAR ARDROSSAN	05EB911	X				X	X
28	ROMED CREEK ABOVE ROMED LAKE	07BB903	X				X	X
29	RYCROFT SURVEY #3 NEAR RYCROFT	07FD910	X				X	X
30	TODD CREEK NEAR HIGHWAY 22	05AA909	X				X	X
31	TOUGH CREEK NEAR BEAZER	05AE039	X				X	X



MAJOR DESIGNATION - CONTRIBUTED DATA

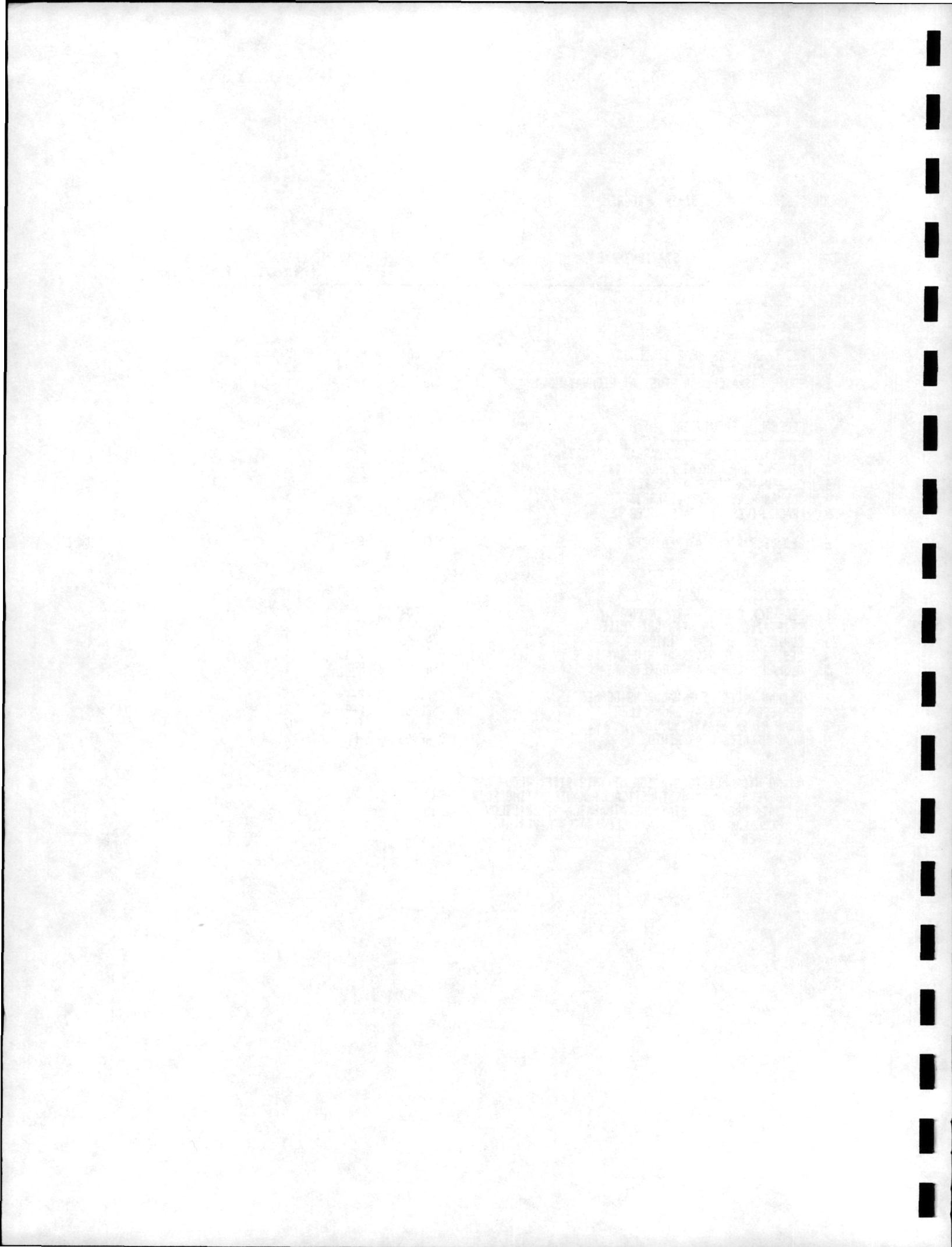
NO.	STATION NAME	STATION NUMBER	RECORD OBTAINED		OPERATION		ACCESS	
			FLOW	LEVEL	SEC.	8M	12M	REMOTE
32	VERMILION RIVER DRAINAGE NEAR BRUCE	05EE915	X			X		X
33	VERMILION RIVER DRAINAGE NEAR HOLDEN	05EE913	X			X		X
34	YOUNG DRAINAGE NEAR SPIRIT RIVER	07FD913	X			X		X
CONTRIBUTED BY CITY OF CALGARY								
1	GLENMORE RESERVOIR AT CALGARY	05BJ008		X			X	X



MAJOR DESIGNATION - SEDIMENT PROGRAM

NO.	STATION NAME	STATION NUMBER	HYDROMETRIC DESIGNATION	OPERATION		ACCESS	
				6M	12M	REMOTE	NORMAL
<u>FEDERAL</u>							
1	RED DEER RIVER NEAR BINDLOSS	05CK004	F-2	X			X
2	SLAVE RIVER AT FITZGERALD	07NB001	F-2	X		X	
3	SOUTH SASKATCHEWAN RIVER AT HIGHWAY NO.41	05AK001	F-2	X			X
<u>FEDERAL - PROVINCIAL</u>							
1	ATHABASCA RIVER AT EMBARRAS AIRPORT	07DD001	F-2	X		X	
2	ATHABASCA RIVER AT MCMURRAY***	07CC002	F-P	X		X	
3	CLEARWATER RIVER AT DRAPER	07CD001	F-P	X		X	
4	OLDMAN RIVER NEAR LETHBRIDGE	05AD007	F-2	X			X
5	PEACE RIVER AT PEACE RIVER	07HA001	F-4	X			X
6	RED DEER RIVER AT RED DEER	05CC002	F-4	X			X
<u>PROVINCIAL</u>							
1	DEERLICK CREEK NEAR HINTON	07AF004	P	X			X
2	DRIFTPILE RIVER NEAR DRIFTPILE	07BH003	F-P	X			X
3	EUNICE CREEK NEAR HINTON	07AF005	F-P	X			X
4	LESSER SLAVE RIVER AT HIGHWAY NO.2	07EK006	F-1	X			X
5	OLDMAN RIVER NEAR BROCKET	05AA024	F-P	X			X
6	OLDMAN RIVER NEAR WALDRONS CORNER	05AA023	F-P	X			X
7	RED DEER RIVER AT DRUMHELLER	05CE001	F-P	X			X
8	SWAN RIVER NEAR KINUSO	07BJ001	F-P	X			X
9	WAMPUS CREEK NEAR HINTON	07AF003	P	X			X

***NO HYDROMETRIC STATION AT THIS SITE. FLOWS ARE DETERMINED BY ARITHMETICALLY MANIPULATING FLOW DATA FROM THE STATIONS ATHABASCA RIVER BELOW MCMURRAY (07DA001) AND CLEARWATER RIVER AT DRAPER (07CD001).

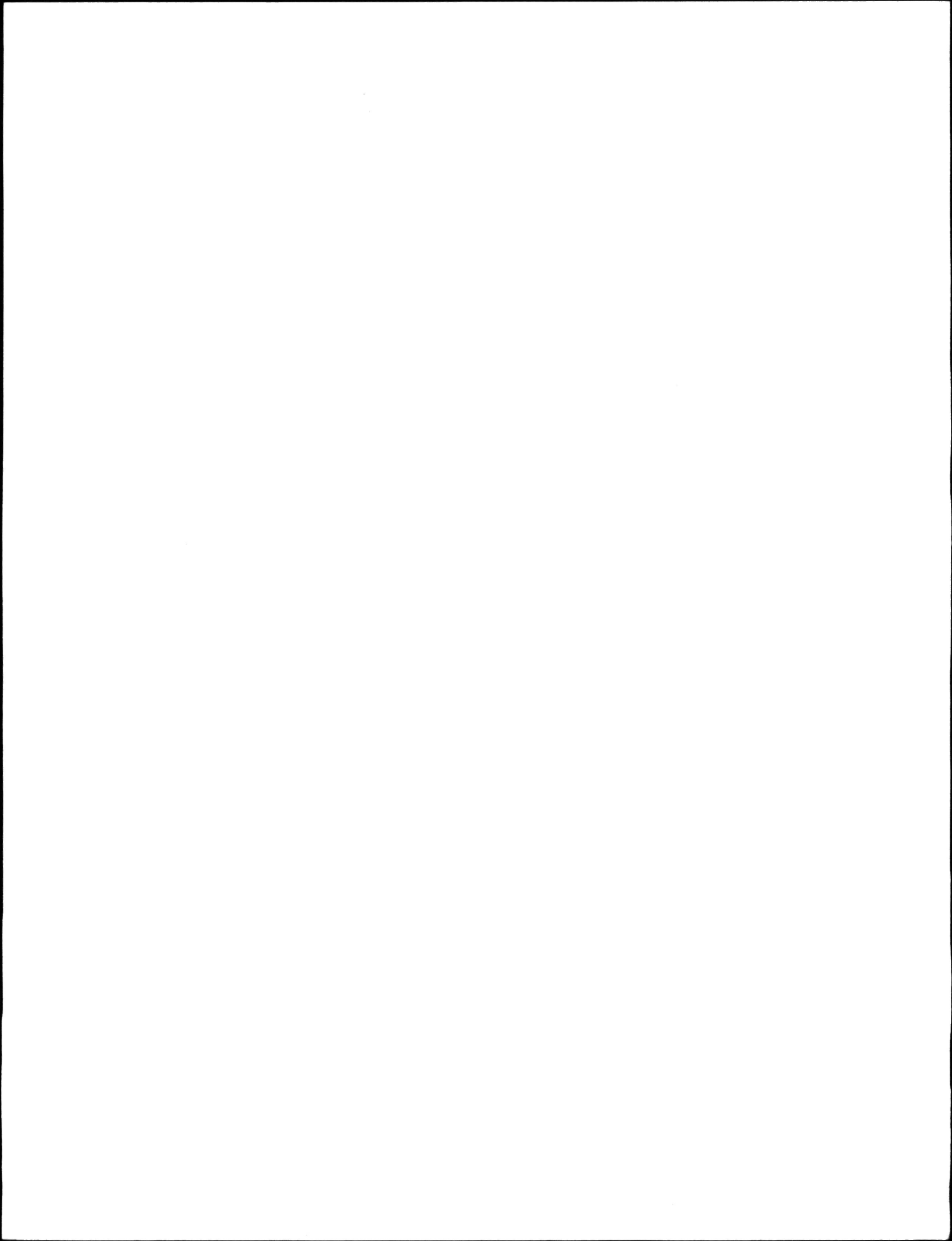


A P P E N D I X "B"

SCHEDULE "B"

COSTING PROCEDURE

COMPUTATION OF ALBERTA SHARE



CALCULATION OF ANNUAL PAYMENTS

A. COSTING PROCEDURE

Schedule "B" of the Memorandum of Agreement (included in the National Report) outlines the items to be included in the preparation of the annual report.

I. Water Quantity Stations

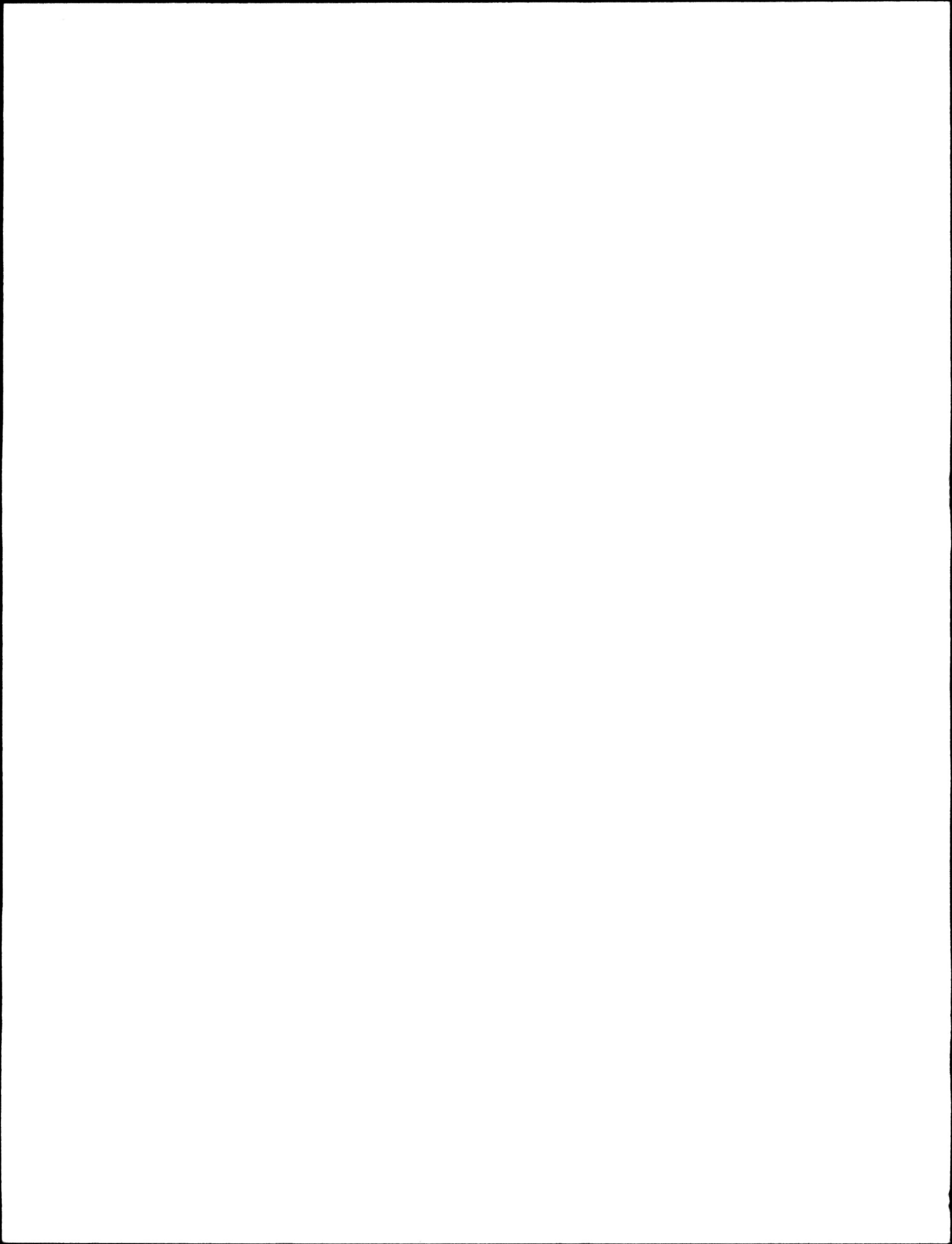
The costs shared include only the salaries and expenses of the staff directly involved in the field and office in the collection and compilation of water quantity data. Depreciation, operation, and maintenance of field transportation and equipment are included costs.

II. Sediment Stations

In the case of sediment stations, the cost of sample analysis is added to the costs outlined in I above.

III. New Construction, Major Maintenance, and Reconstruction

Construction costs include both new construction and major maintenance and are shared on the basis of station designation as being 'Federal', 'Federal-Provincial' or 'Provincial'. If a



station is designated as 'Federal-Provincial' the cost would be shared fifty-fifty; otherwise 100% to either Canada or Alberta. Water level instrumentation is at the expense of the agency operating the station irrespective of designation; special instrumentation (telemark, data platform) is a cost to the party requiring the service.

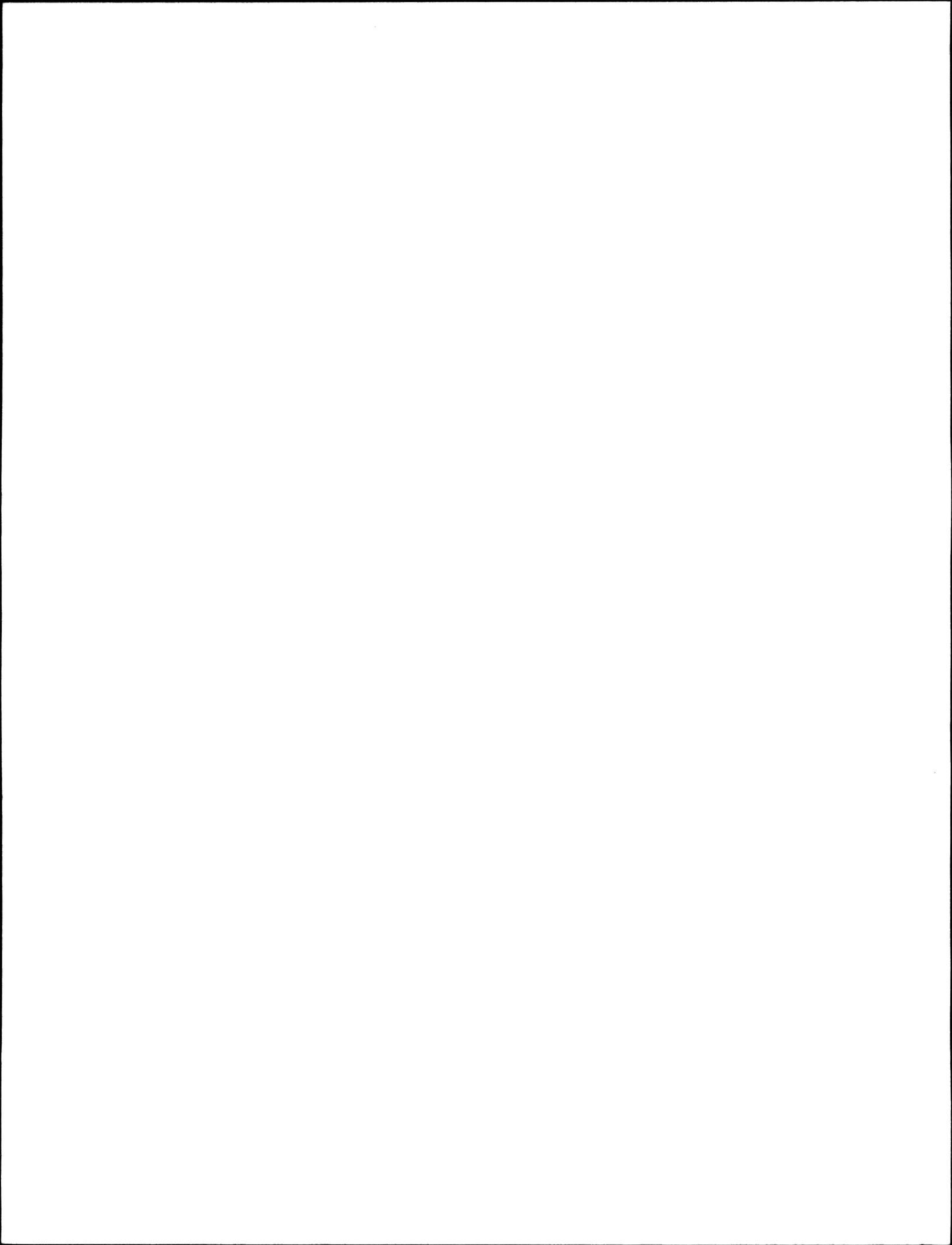
B. APPLICATION OF PROCEDURE

The cost of operations varies as to the type and duration of records so standard units have been developed and assigned. The figures used are based upon experience over the years and have been adopted as standards in the Western and Northern Region.

I. Normal Access

A 12 month discharge station defines the hydrology regime under both ice cover and open water. The period of operation for an 8 month discharge station is normally March 1 to October 31 and is intended to define the period beginning with snowmelt runoff to freeze-up in the fall.

<u>Weight Factor</u>	<u>Type of Station</u>
1.00	12 month discharge
0.75	8 month discharge
0.40	12 month water level
0.25	8 month water level



II. Remote Access

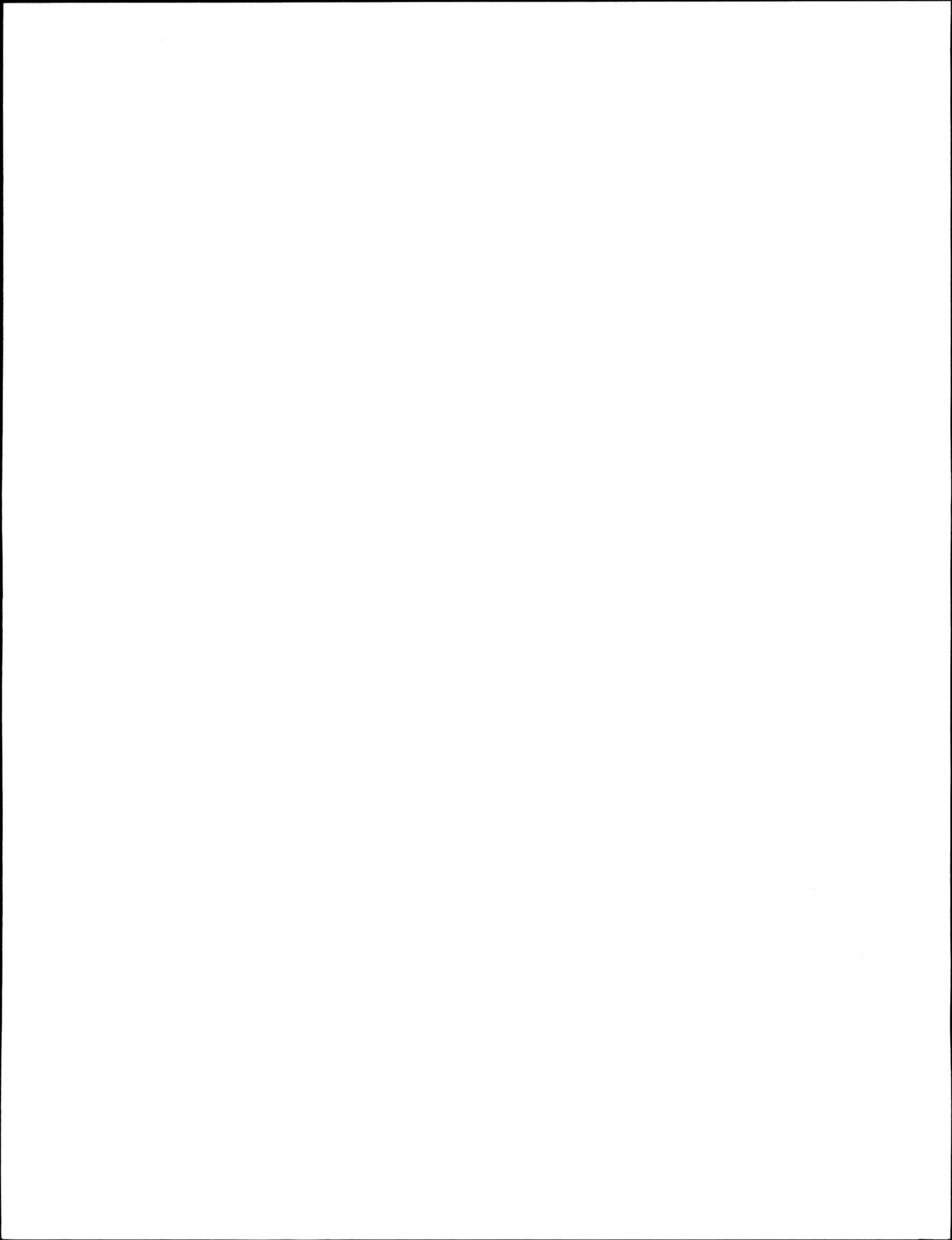
Salary and operation costs exceed those for normal access stations. This is to account for aircraft costs, additional preparation and travelling time on a field trip and maintenance problems in a sparse network located in a harsh environment. Weighting factors have, therefore, been assigned as follows:

<u>Weight Factor</u>	<u>Type of Station</u>
1.80	12 month discharge
1.50	8 month discharge
1.10	12 month water level
0.95	8 month water level

III. Sediment Stations

The third category of stations requiring weighting factors are sediment stations. A hydrometric station designated 'Federal' for the collection of streamflow data may be designated either 'Federal', 'Federal-Provincial' or 'Provincial' for sediment data. Therefore, the resultant sediment weighting factors, as listed, are only the incremental sediment costs.

<u>Weight Factor</u>	<u>Type of Station</u>
1.05	12 month normal access Q & 8 month sediment
1.05	8 month normal access
1.25	12 month remote access Q & 8 month sediment
1.25	8 month remote access
0.45	8 month research



C. SPECIAL CONSIDERATIONS

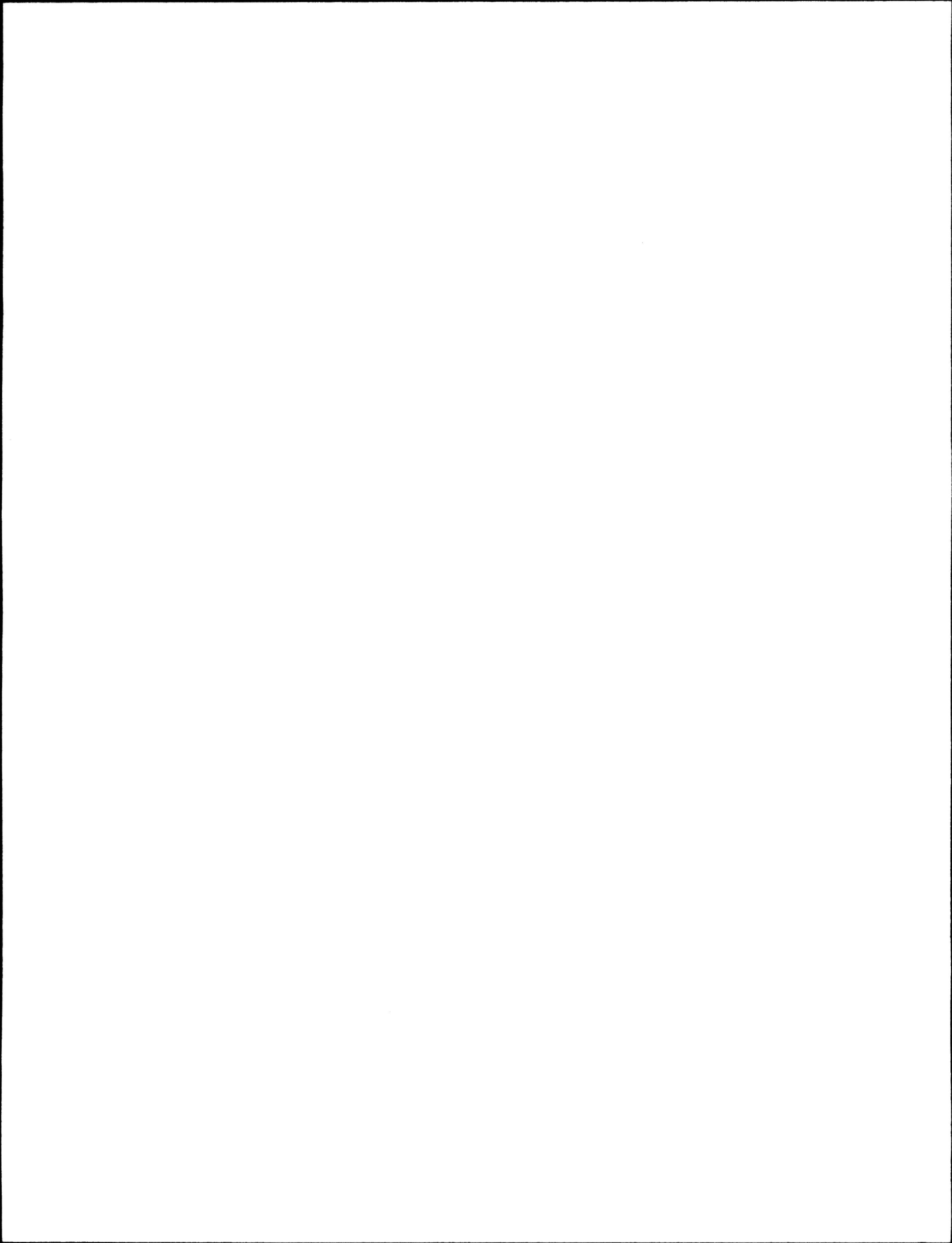
Due to the complexity of the operation it is necessary to apply a number of practical considerations which are described as follows:

I. Stations Operated by Regina

Twelve F stations in Alberta were operated by the Saskatchewan District. These stations and their operations costs have not been included in Table I of this Appendix as they are of no value in computing the provincial share. The effect of neglecting these stations is that the federal share shown is less than the actual share.

II. Stations Operated by Yellowknife

Three F stations and one FP station in Alberta are operated by the Northwest Territories District. The federal stations have not been included in Table I of this Appendix as they are of no value in computing the provincial share. Although these stations have not been utilized in the costing, they are included in Tables 1, 2 and 3 of the main body of this report. As the Yellowknife salaries and O&M to operate the FP station on 'Dog River near Fitzgerald' were not readily available from accounting statements, it was necessary to determine these costs based upon Alberta costs. The one FP station operated by Yellowknife isn't included in the 382.45



weighted units but comprises 1.80 weighted units. Based upon the unit cost of \$3,840.50 the cost of operating 'Dog River near Fitzgerald' is \$6,912.90. One-half of this amount was added to the share of each party in Table I to obtain the costs shown in 'Summary of Financial Considerations' and Tables 4 and 5 in the main body of the report.

III. Depreciation

Depreciation was determined by utilizing standard accounting and 'national' procedures. The total depreciation costs shown in the 'Summary of Financial Considerations' was pro rated, based on the respective Federal and Alberta shares of hydrometric and sediment operations.

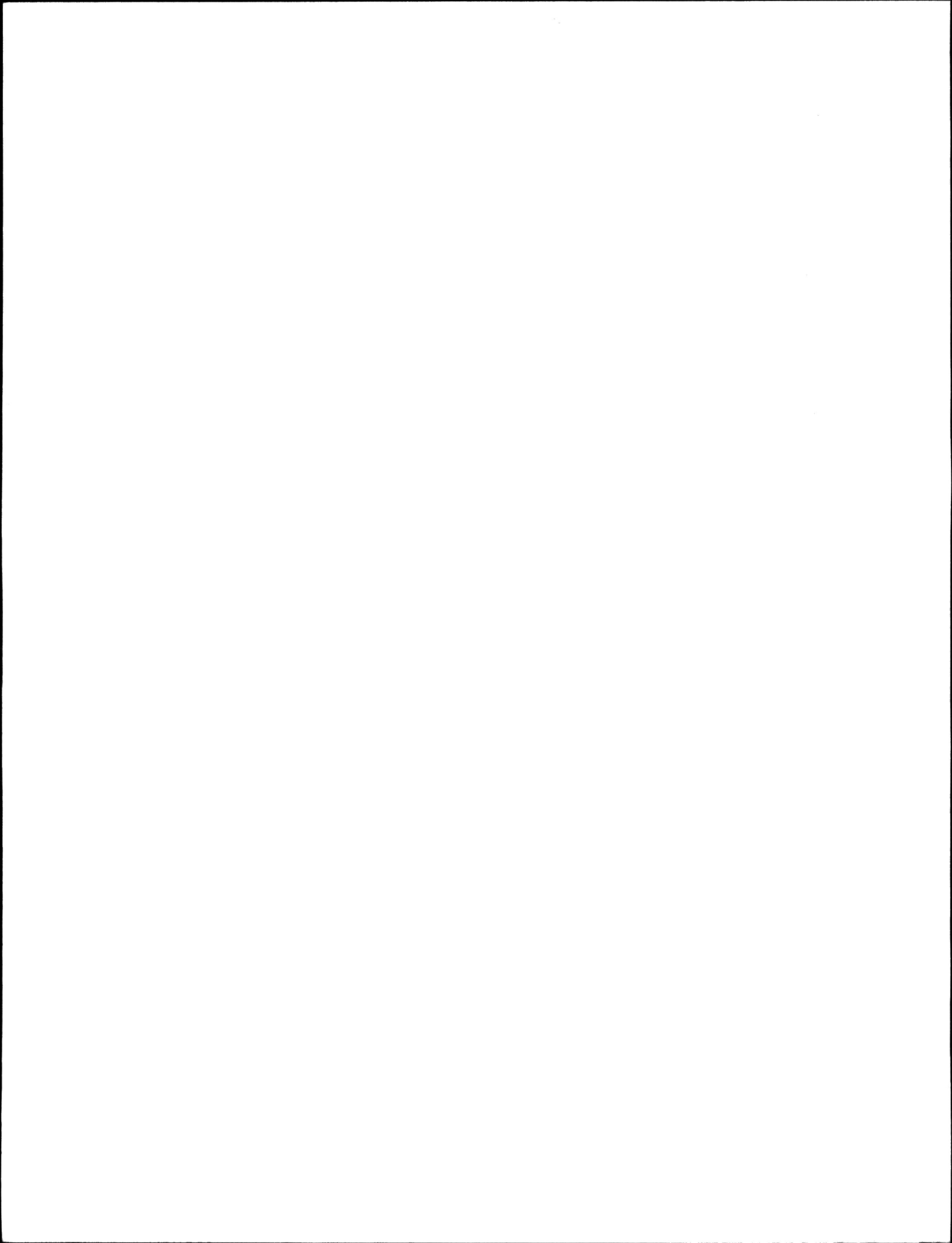


TABLE I

HYDROMETRIC AND SEDIMENT COSTINGS FOR 1984-85 (Stations Operated by WSC-Calgary)

Category	Month	Number of Stations	Weight Factor	Weighted Units	Salaries	O & M	TOTAL	Share	
								Federal	Provincial
FEDERAL									
Normal Access Flow	12	29	1.00	29.00					
	8	62	0.75	46.50					
Normal Access W.L.	12	7	0.40	2.80					
	8	1	0.25	0.25					
Remote Access Flow	12	3	1.80	5.40					
Normal Access Sediment	8	2	1.05	2.10					
Sub-total				86.05	209,445	121,016	330,471	330,471	-
FEDERAL-PROVINCIAL									
Normal Access Flow	12	50	1.00	50.00					
	8	139	0.75	104.25					
Normal Access W.L.	8	4	0.25	1.00					
Remote Access Flow	12	12	1.80	21.60					
	8	4	1.50	6.00					
Remote Access W.L.	8	1	0.95	0.95					
Normal Access (F) Sediment	8	3	1.05	3.15					
Remote Access (F and F-P) Sediment	8	3	1.25	3.75					
Sub-total				190.70	464,176	268,212	732,388	366,194	366,194
PROVINCIAL									
Normal Access Flow	12	14	1.00	14.00					
	8	79	0.75	59.25					
Normal Access W.L.	12	3	0.40	1.20					
	8	38	0.25	9.50					
Remote Access Flow	12	2	1.80	3.60					
	8	7	1.50	10.50					
Sediment Research	8	3	0.45	1.35					
Normal Access (F, F-P and P) Sediment	8	6	1.05	6.30					
Sub-total				105.70	257,279	148,662	405,941	-	405,941
TOTAL				382.45	930,900	537,900	1,468,800	696,665	772,135

Unit O&M = \$1,406.46 Unit Salary = \$2,434.04

One Unit = \$3,840.50

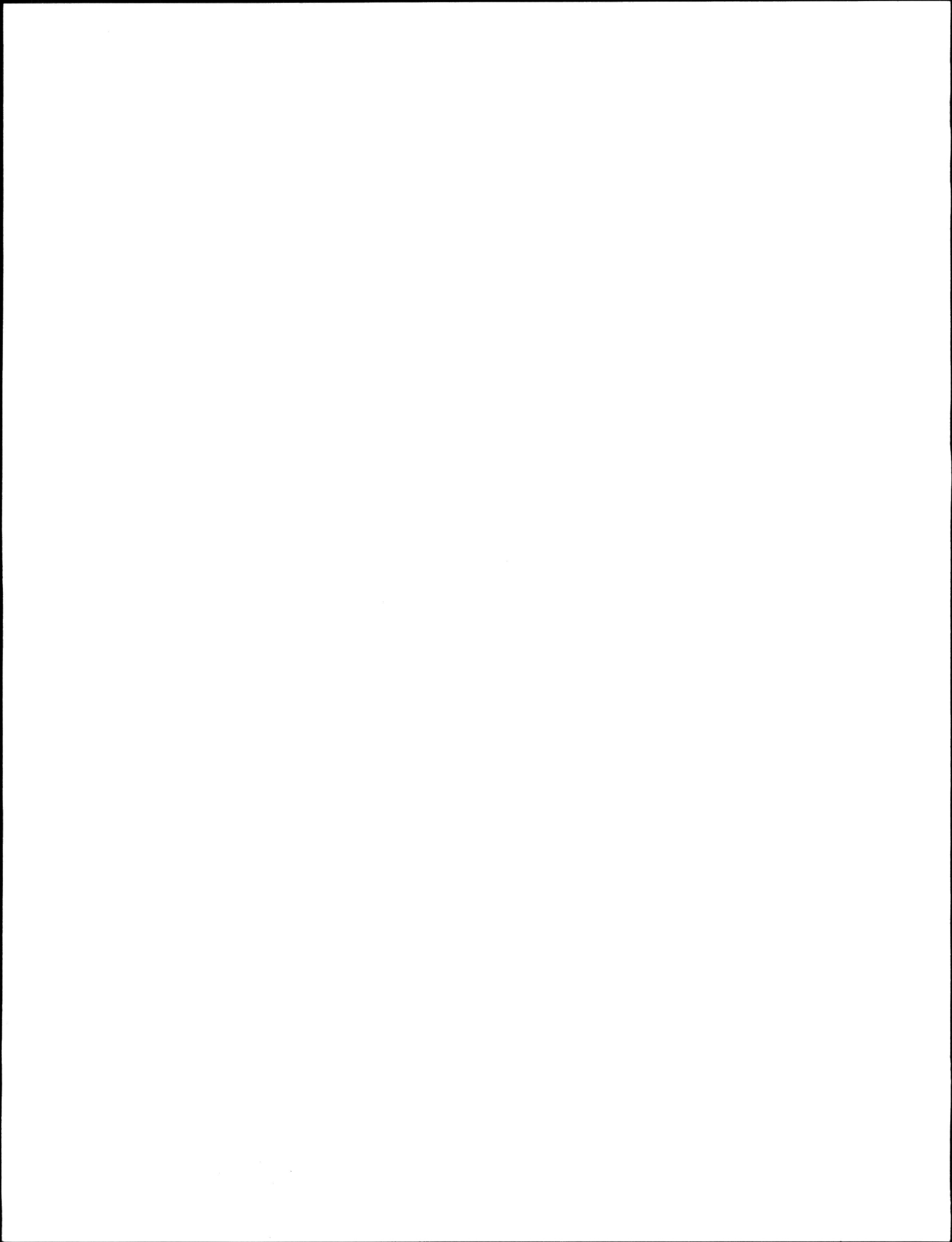


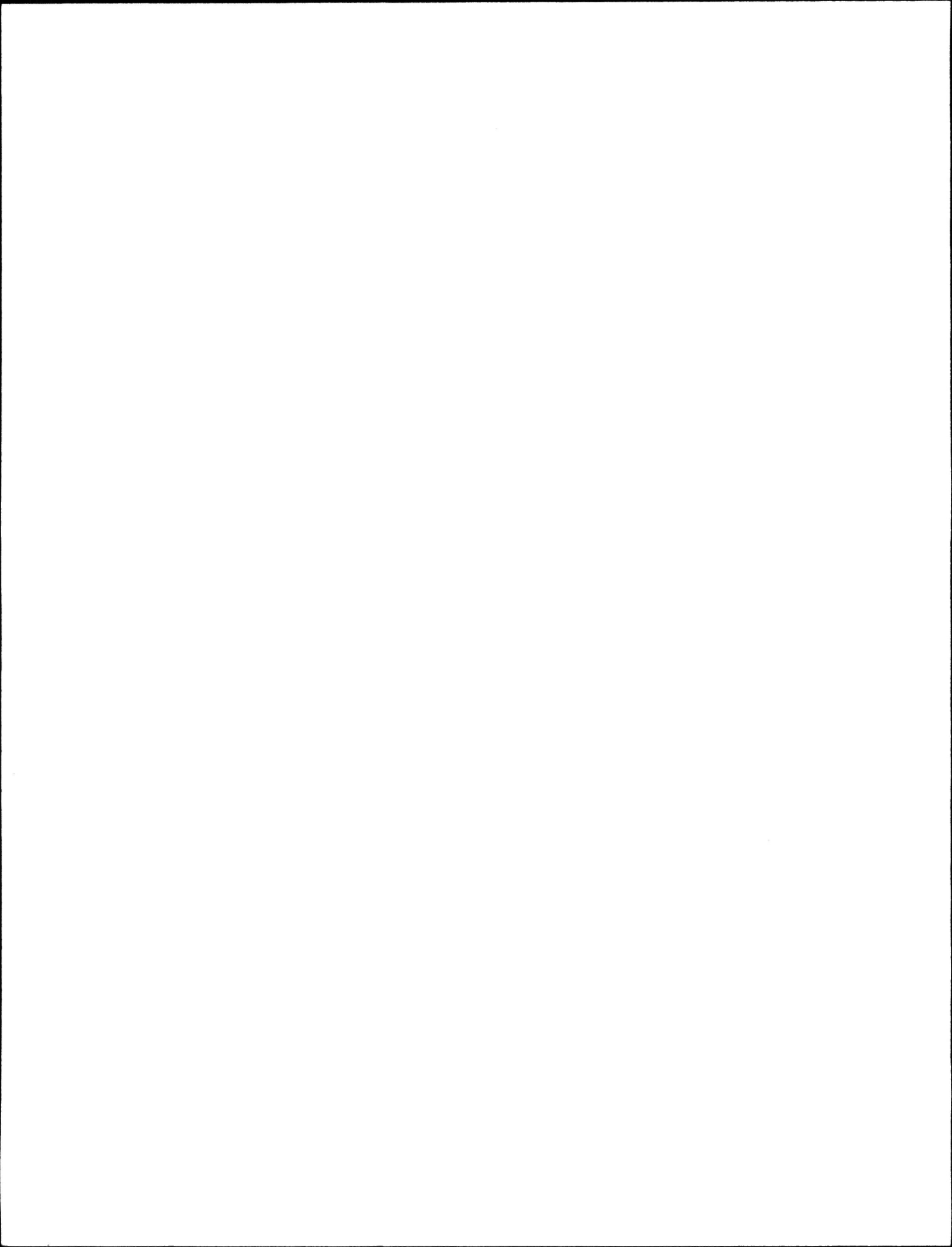
TABLE II

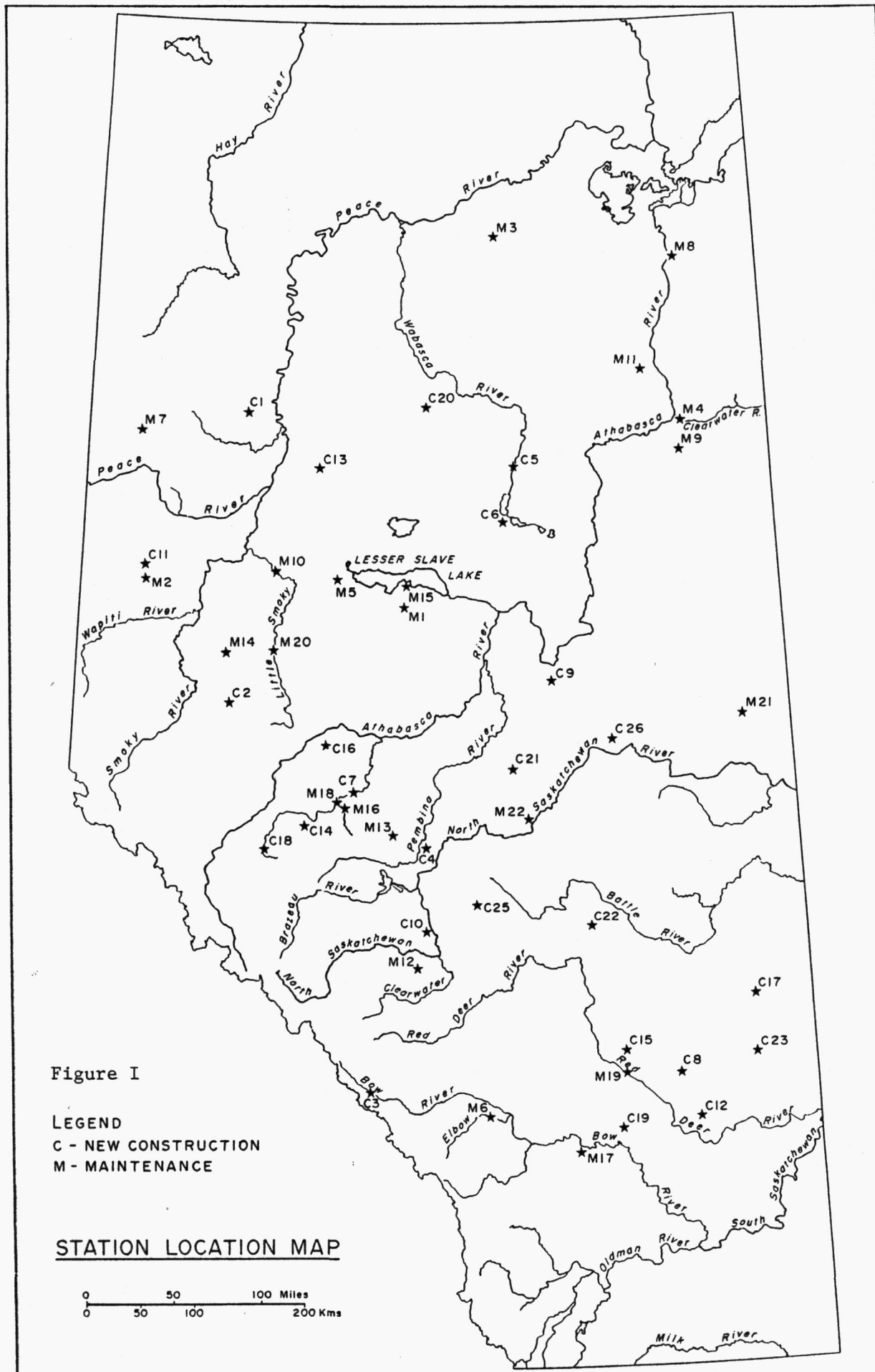
SUMMARY OF CONSTRUCTION COSTS - ALBERTA

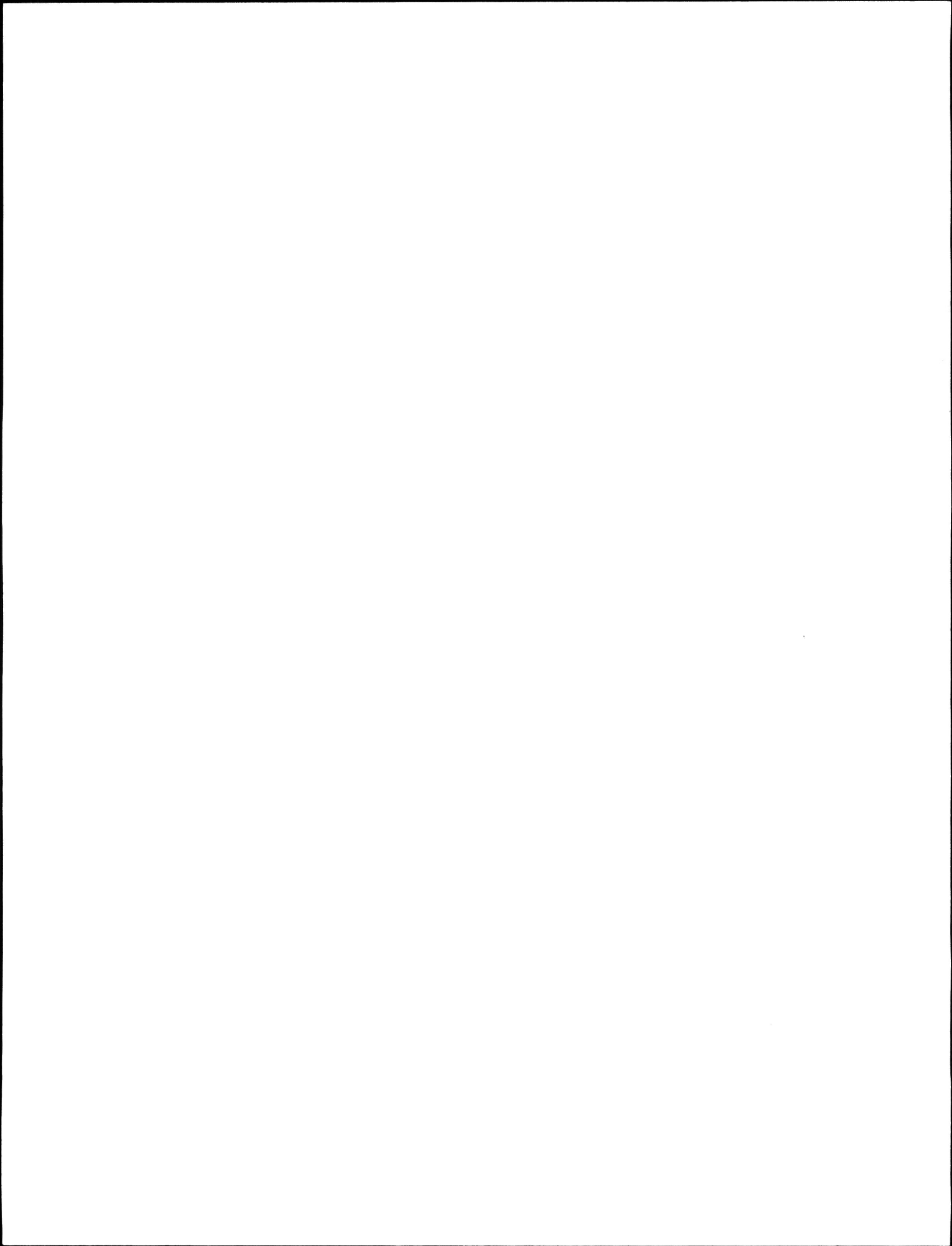
1984/85

Station	Construction Cost	Instrumentation		Share	
		Provincial	Federal	Provincial	Federal
Federal-Provincial					
C-1 Buchanan Creek near Manning (07HC002)	2,740.17	2,000.00	4,500.00		
C-2 Deep Valley Creek nr Valleyview (07GF008)			2,500.00		
C-3 Pipestone River nr Lake Louise (05BA002)	7,095.85		2,610.00		
C-4 Tomahawk Creek near Tomahawk (05DE009)	6,710.43		2,610.00		
C-5 Wabasca River below Trout River (07JB002)	18,106.72	2,000.00	4,500.00		
C-6 Willow River near Wabasca (07JA004)	7,718.34	2,000.00	4,500.00		
	<u>\$42,371.51</u>	<u>\$ 6,000.00</u>	<u>\$21,220.00</u>	<u>\$27,185.76</u>	<u>\$42,405.75</u>
M-1 Adams Creek near Kinuso (07BJ004)	3,195.54				
M-2 Beaverlodge River nr Beaverlodge (07GD001)	3,551.94				
M-3 Birch River below Alice Creek (07KE001)	16,543.14				
M-4 Clearwater River at Draper (07CD001)	10,165.97				
M-5 East Prairie River near Enilda (07BF001)	662.01				
M-6 Elbow River at Bragg Creek (05BJ004)	1,419.10				
M-7 Eureka River near Worsley (07FD013)	615.07				
M-8 Firebag River near the Mouth (07DC001)	12,534.90				
M-9 Gregoire Lake near Ft. McMurray (07CE001)	2,701.04				
M-10 Little Smoky River near Guy (07GH002)	789.17				
M-11 Mackay River nr Fort Mackay (07DB001)	2,287.24				
M-12 Prairie Creek below Lick Creek (05DB005)	807.76				
M-13 Rat Creek near Cynthia (07BA002)	421.21				
M-14 Spring Creek Main Stem near Valleyview (07GF002)	1,077.30				
M-15 Swan River near Kinuso (07BJ001)	797.49				
M-16 Wolf Creek at Highway 16 (07AG003)	2,021.79	2,000.00	4,500.00		
	<u>\$59,590.67</u>	<u>\$ 2,000.00</u>	<u>\$ 4,500.00</u>	<u>\$31,795.33</u>	<u>\$34,295.34</u>
Federal					
C-7 McLeod River near Rosevear (07AG007)	9,451.97		2,610.00		
	<u>\$ 9,451.97</u>		<u>\$ 2,610.00</u>		<u>\$12,061.97</u>
M-17 Bow River Development Main Canal (05AC004)	1,266.67				
M-18 McLeod River near Wolf Creek (07AG001)	894.93				
	<u>\$ 2,161.60</u>				<u>\$ 2,161.60</u>
Provincial					
C-8 APL Cooling Pond Outlet (05CH015)	1,040.05		2,610.00		
C-9 Babbette Creek near Colinton (07CA008)	1,192.59		2,500.00		
C-10 Baptiste River near the Mouth (05DC012)	2,981.08	4,000.00	2,500.00		
C-11 Bear Creek nr Valhalla Centre (07GE007)	5,042.55		2,610.00		
C-12 Berry Creek below Deadfish Creek (05CH016)	1,289.59		2,610.00		
C-13 Elder Creek at Highway No. 686 (07HB002)	4,493.14		2,610.00		
C-14 Embarras River near Weald (07AF014)	8,988.44		2,610.00		
C-15 Fish Creek ab Little Fish Lake (05CG006)	3,921.02		2,610.00		
C-16 Groat Creek near Whitecourt (07AG008)	2,749.14	4,000.00	2,500.00		
C-17 Loyalist Creek near Consort (05GA013)	4,085.44		2,610.00		
C-18 McLeod River near Cadomin (07AF013)	3,166.10	4,000.00	2,500.00		
C-19 North Branch Canal at Crawling Valley	7,302.06				
C-20 Peerless Lake at Peerless Lake (07JB001)	4,885.89	4,000.00	2,500.00		
C-21 Redwater River near Vimy (05EC007)	4,708.74		2,610.00		
C-22 Red Willow Creek nr Red Willow (05FC005)	4,921.22		2,610.00		
C-23 Sounding Creek near Chinook (05GA012)	3,612.61		2,610.00		
C-24 Waskasoo Creek at Red Deer (05CC011)	206.00				
C-25 Weiller Creek near Wetaskiwin (05FA024)	4,737.32		2,610.00		
C-26 White Earth Creek nr Smoky Lake (05EC006)	5,260.93		2,610.00		
	<u>\$74,583.91</u>	<u>\$16,000.00</u>	<u>\$43,820.00</u>	<u>\$90,583.91</u>	<u>\$43,820.00</u>
M-19 Atlas Mine Coulee at Western Monarch (05CG005)	3,995.31		2,610.00		
M-20 Little Smoky River at Little Smoky (07GG002)	2,659.44				
M-21 Manatokan Creek near Iron River (06AC009)	1,623.85				
M-22 Sturgeon River at St. Albert (05EA002)	944.20				
	<u>\$ 9,222.80</u>		<u>\$ 2,610.00</u>	<u>\$ 9,222.80</u>	<u>\$ 2,610.00</u>
TOTAL:	\$197,382.46	\$24,000.00	\$ 74,760.00	\$158,787.80	\$137,354.66

C = Construction
M = Maintenance



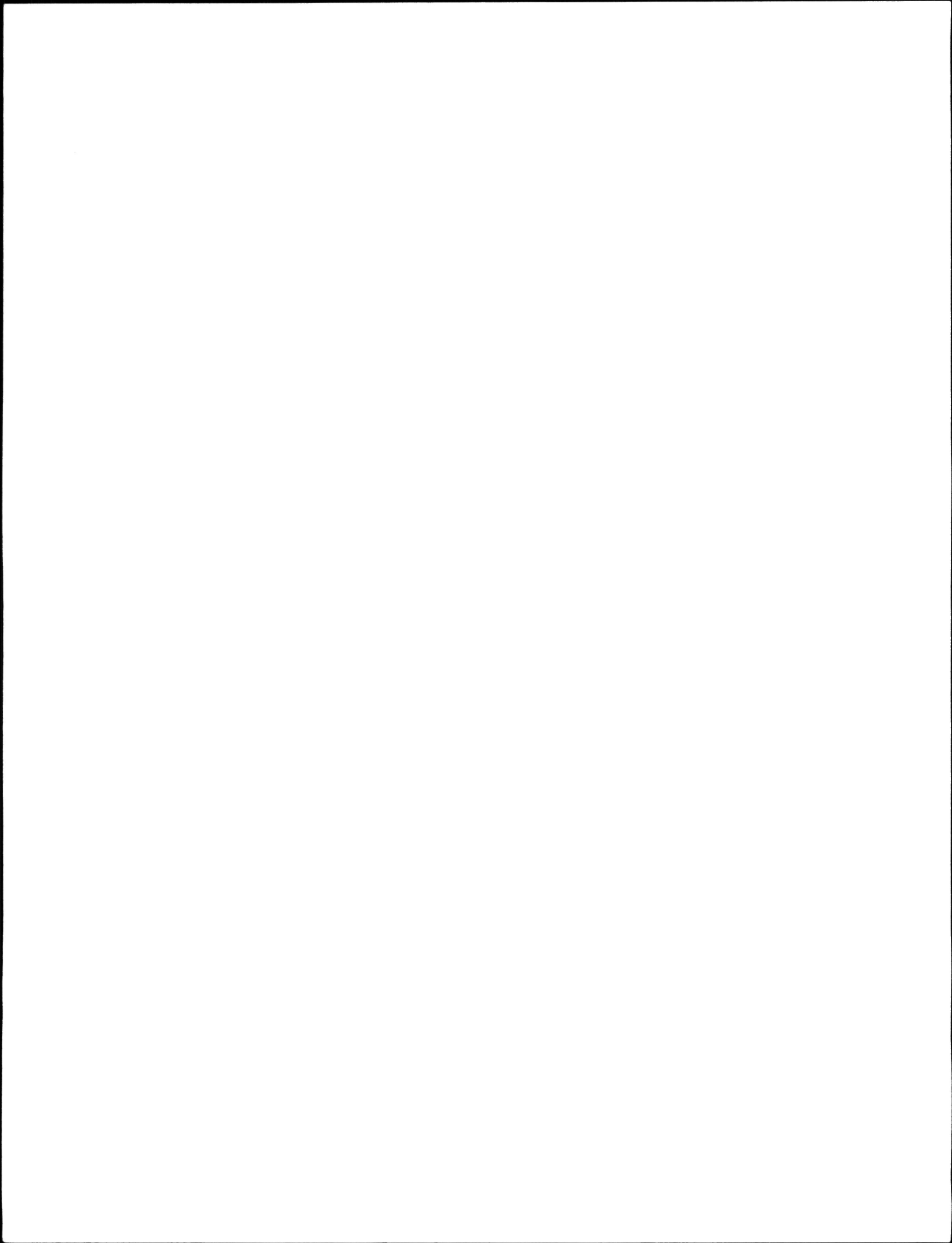




A P P E N D I X "C"

SCHEDULE "D"

1984-85



SCHEDULE "D"

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

ANNUAL PAYMENT FOR 1984-85 TO BE PAID TO CANADA BY ALBERTA:

	<u>Operation</u>	<u>Construction</u>	<u>Total</u>
a) Streamflow and water level installations	\$ 715.7K	\$ 168.6K	\$ 884.3K
b) Sediment installations	\$ 49.2K		\$ 49.2K
		ANNUAL PAYMENT:	\$ 933.5K

Administrator for Province

(Signature)

Assistant Deputy Minister

Water Resources Management Services

ALBERTA DEPARTMENT OF ENVIRONMENT

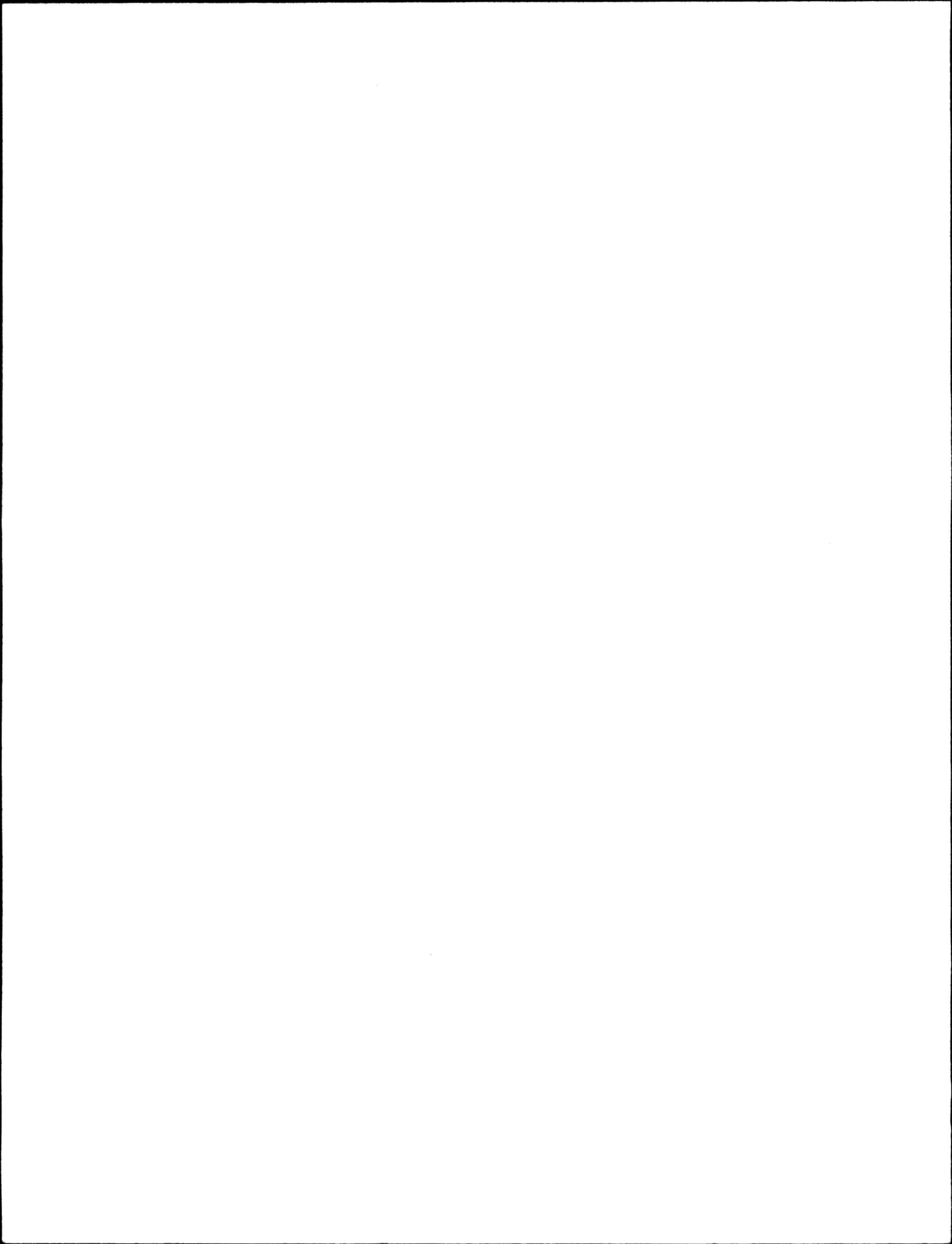
Administrator for Canada

(Signature)

Regional Director

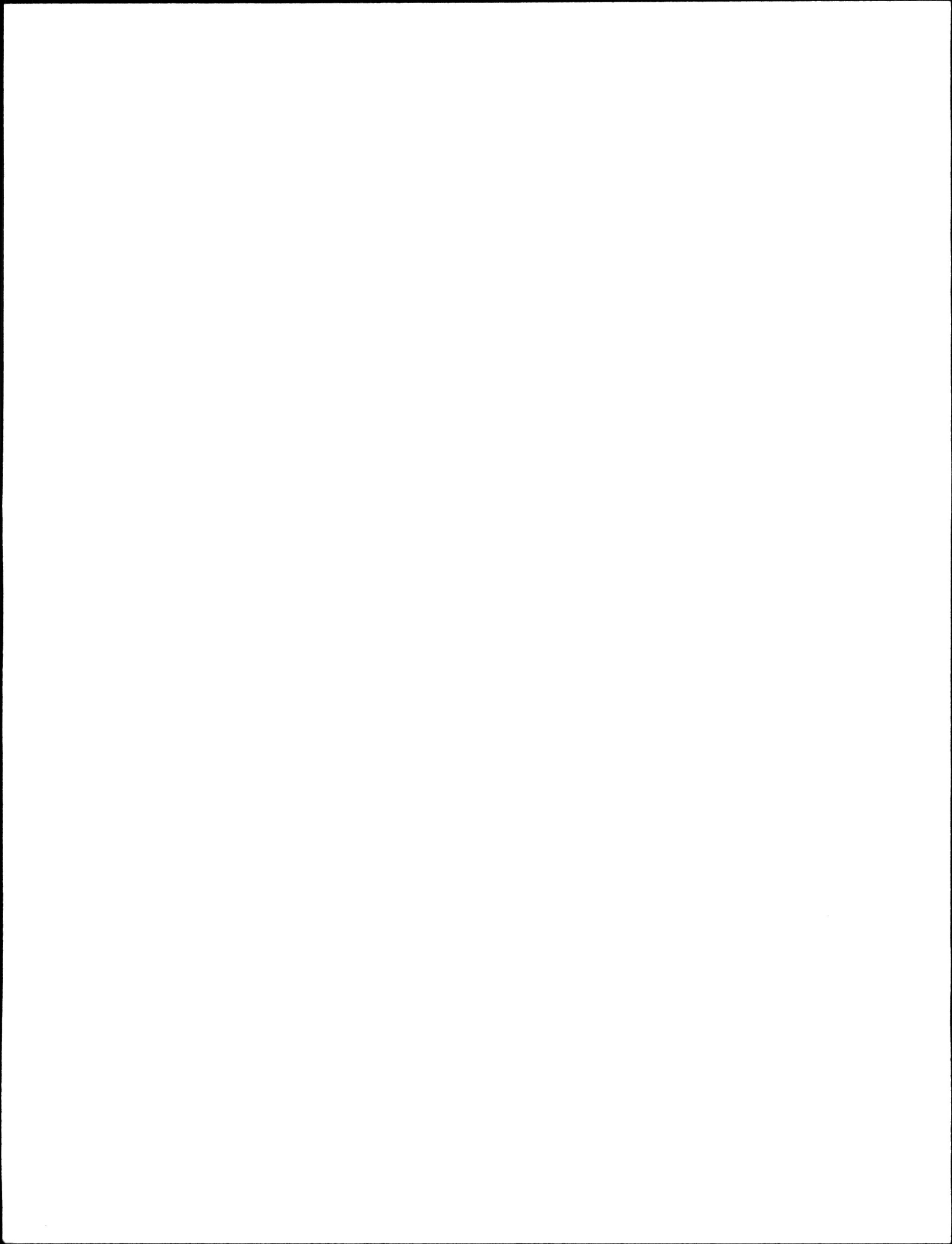
Inland Waters Directorate

ENVIRONMENT CANADA



A P P E N D I X "D"

ESTIMATE OF ALBERTA
ANNUAL PAYMENT FOR 1986-87
BASED ON PROCEDURES
FOR PREPARATION OF
ANNUAL PAYMENTS (SCHEDULE "C")



ESTIMATES FOR APPENDIX "D"
FOR 1986-87

1. Station Units Costs

Unit Cost for 1984-85	\$ 3,735.12
(Salary - \$2,434.04; O&M - \$1,301.08)	
(N.B. - Total O&M costs for estimating purposes were reduced from \$537,900 to \$497,600 as approximately \$40,300 in excess of normal expenditures was expended in 1984-85 to replace a depleted stock in parts and miscellaneous items).	
Estimated Unit Cost for 1985-86	\$ 3,884.52
(Assume 4% Cost Increase)	
4% of \$3,735.12 + \$3,735.12	
Estimated Unit Cost for 1986-87	\$ 4,039.90
(Assume 4% Cost Increase)	
4% of \$3,884.52 + \$3,884.52	

2. Provincial Station Units

Station Units in 1984-85

Hydrometric	189.95
Sediment	11.10

Station Units in 1985-86

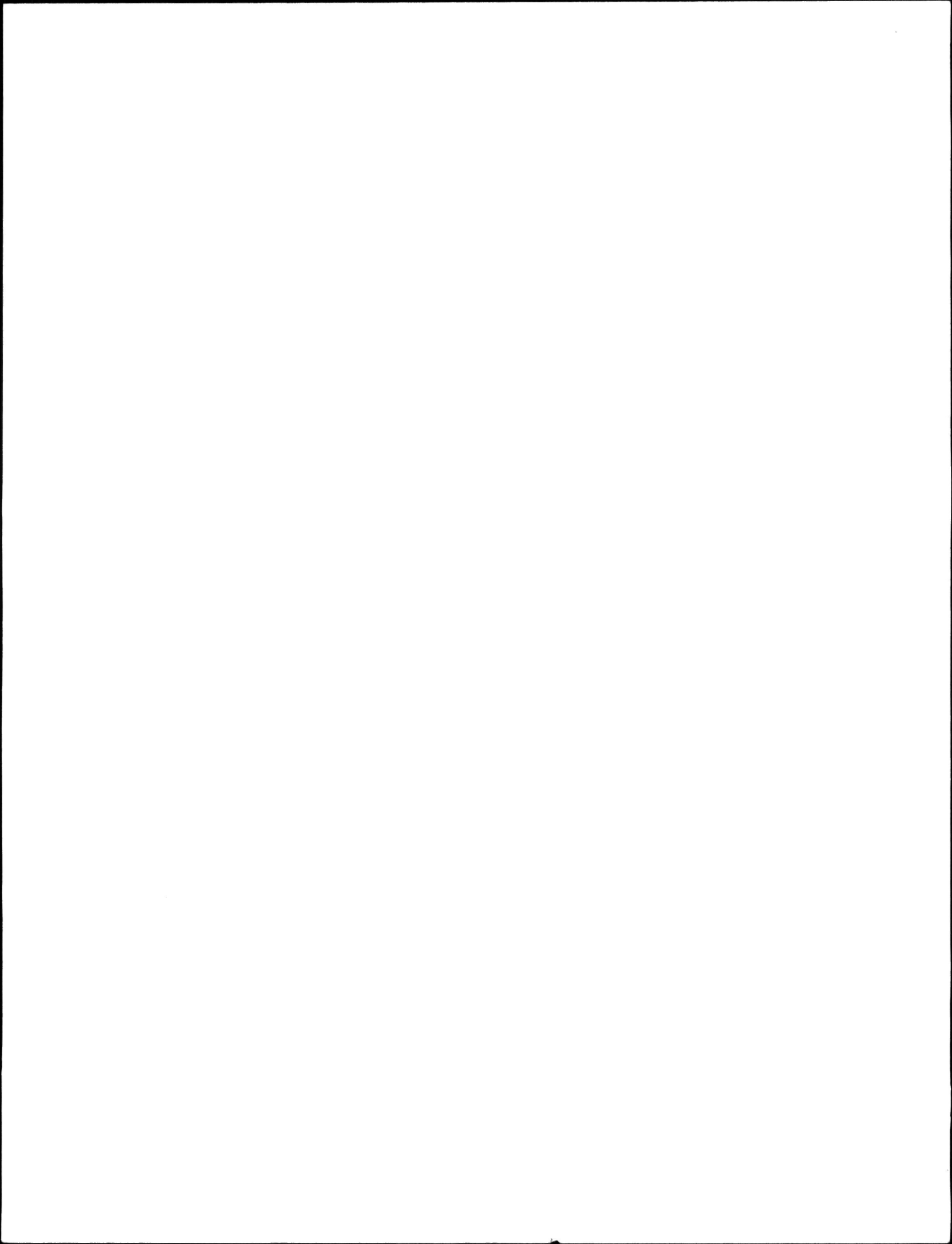
Hydrometric	201.775
Sediment	9.525

Known Changes to Units at end of 1985-86

Discontinue "Columbine Creek near Glendon"	
Provincial Units =	(-)0.75
Establish 8 Hydrometric Stations	
Provincial Units =	4.875
Federal Units =	1.125

Estimated Units in 1986-87

Hydrometric (201.775 + 4.875 - 0.75)	205.900
Sediment	9.525



3. Alberta Share of Maintenance

Average Maintenance for past 5 years was	\$40,000	
Estimated Alberta Maintenance in 1986-87		<u>\$40,000.00</u>

4. Alberta Credits for Network Operations (1986-87)

PAD Operations		
(10.4 Federal Units x 4,039.90)	\$42,014.96	
Spring Creek* (1/2 x 0.75 x 4,039.90)	<u>1,514.96</u>	
		\$43,529.92

*Sediment Costs not Supported by Federal Government		<u>\$43,529.92</u>
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5. Alberta Share of Depreciation of
Hydrometric Equipment and Vehicles

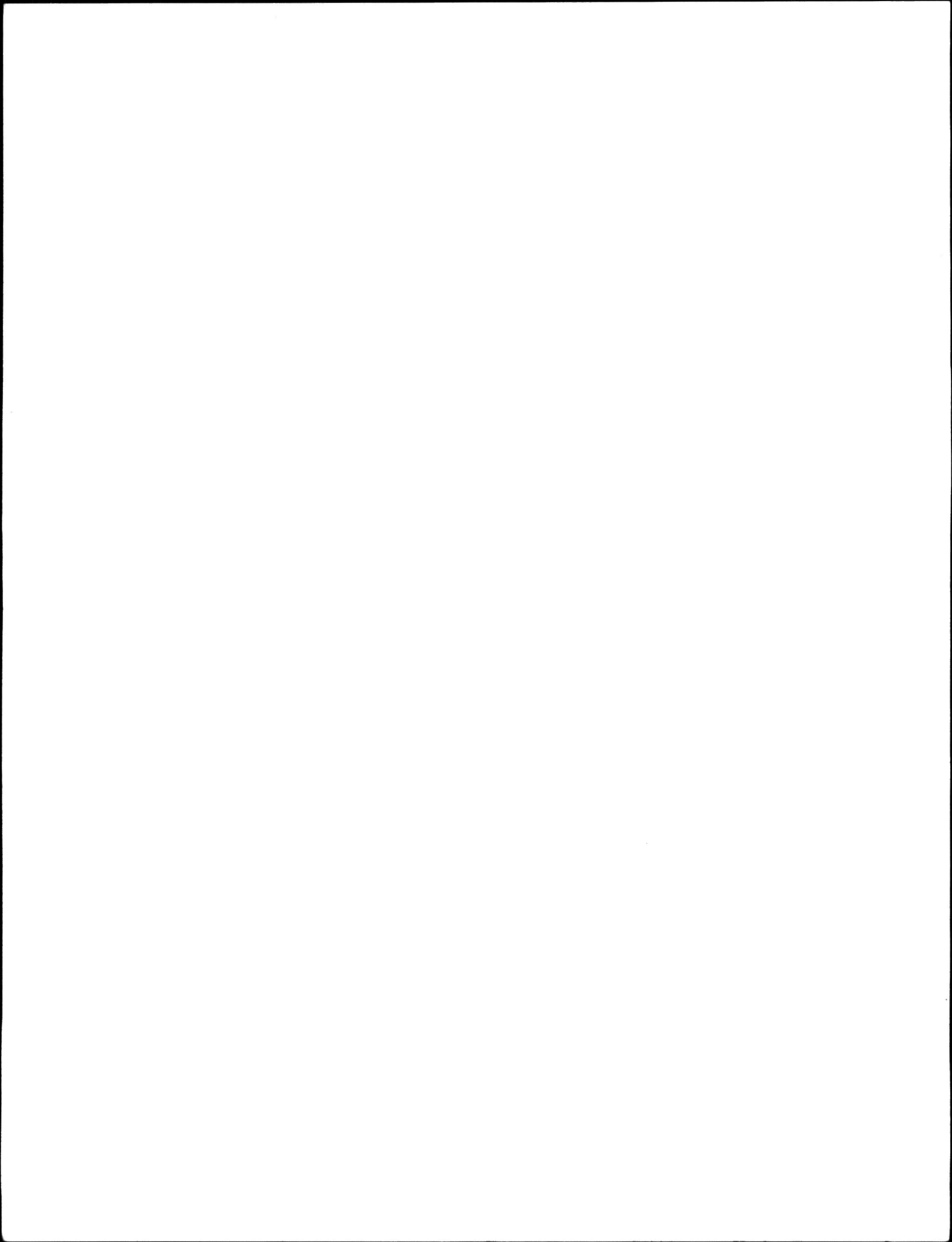
1984-85 Alberta Share	\$39,406.00	
Estimated. 1985-86 Alberta Share (201.775/190.10 x \$39,406) =	\$41,826.12	
Estimated 1986-87 Alberta Share (205.900/201.775 x \$41,826.12) =	<u>\$42,679.37</u>	<u>\$42,679.37</u>

6. Alberta Share of Depreciation Sediment Equipment

1984-85 Alberta Share	\$ 1,200.00	
Estimated Alberta Share 1985-86 (9.525/10.95 x \$1,200) =	\$ 1,043.84	
Estimated Alberta Share 1986-87 (Units same as 1985-86)	<u>\$ 1,043.84</u>	<u>\$ 1,043.84</u>

7. Additional Depreciation for DCPs

1985-86, 5 Add'n'l DCPs @ \$25,000		
10% Depreciation =	\$ 2,500.00	
Alberta Share =		
201.025/382.125 x \$2,500.00 =	\$ 1,315.18	
1986-87, 5 Addn'n'l DCPs		
(2 x \$1,315.18) =	\$ 2,630.36	



8. Estimated Alberta Share of Hydrometric Costs in 1985-86

Hydrometric Network Operations	
(201.775 x \$3,884.52) =	\$783,799.02
Alberta Credits [10.4 x \$3,884.52	
+ .5 (.75) \$3,884.52]	\$-41,855.71
Alberta Share of Hydrometric	
Depreciation	\$ 41,826.12
Alberta Share of Add'n'l DCPs	\$ 1,315.18
	<u>\$785,207.61</u>

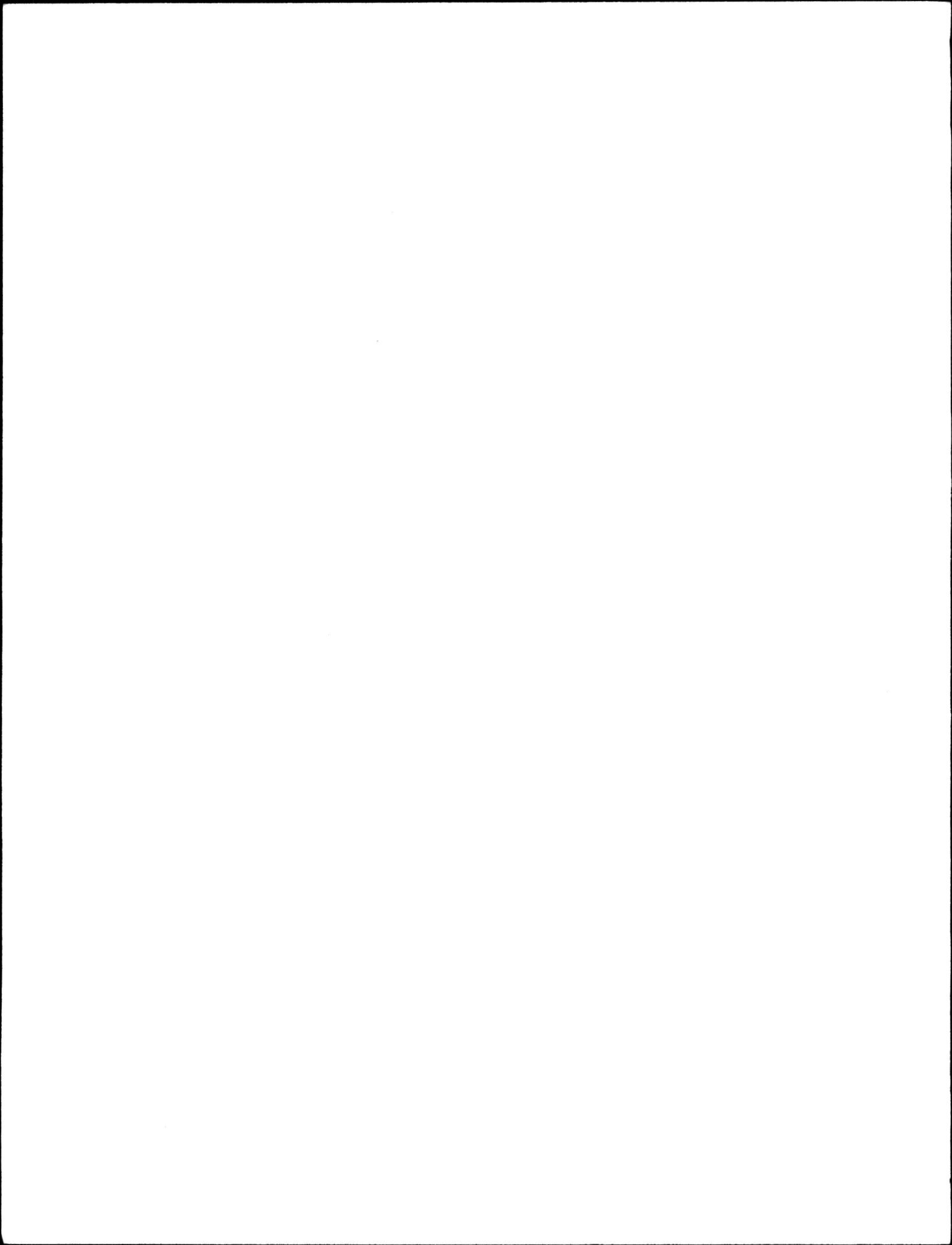
9. Estimated Alberta Share of Sediment Costs in 1985-86

Sediment Network Operations	
(9.525 x \$3,884.52) =	\$ 37,000.05
Sediment Equipment Depreciation	\$ 1,043.84
Analysis Costs for Alberta	
Sediment Operations =	<u>\$ 5,000.00E</u>
	\$ 43,043.89

10. Total Estimated Alberta Share (excl. new construction) in 1985-86

		<u>Est. on May 31/84</u>
Hydrometric	\$785,207.61	(\$796,862)
Sediment	\$ 43,043.89	(\$ 48,094)
Maintenance	\$ 40,000.00	(\$ 35,000)
Construction Eqpt.		
Depreciation		
(201.775/190.10		
x \$4,075)	<u>\$ 4,325.27</u>	<u>(\$ 4,708)</u>
	<u>\$872,576.77</u>	

Use: \$873,000



11. Estimated Alberta Share of
Hydrometric Costs in 1986-87

Hydrometric Network Operations (201.025 x 4,039.90) =	\$812,120.90
Hydrometric Network Operations for Stations Established in 1985-86 (4.875 x \$4,039.90) =	\$ 19,694.51
Alberta Credits = [10.4 (\$4,039.90) + (.5) (.75) (\$4,039.90)]	\$-43,529.92
Alberta Share of Hydrometric Depreciation	\$ 42,679.37
Alberta Share of DCP Expansion Depreciation (2)(\$1,315.18) = ...	<u>\$ 2,630.36</u>
	\$833,595.22

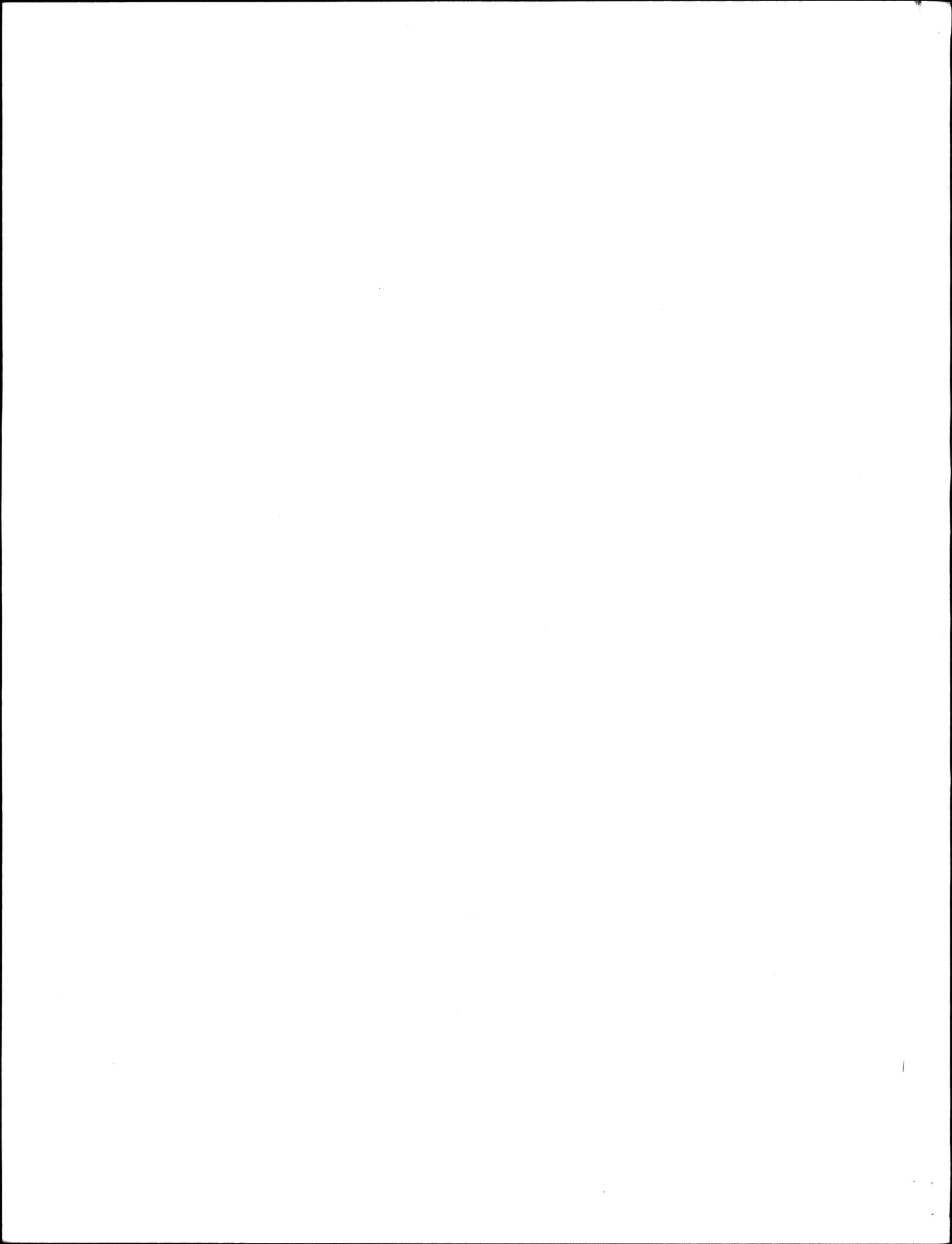
12. Estimated Alberta Share of
Sediment Costs in 1986-87

Sediment Network Operations (9.525 x \$4,039.90)	\$ 38,480.05
Sediment Equipment Depreciation ...	\$ 1,043.84
Analysis Costs for Alberta Sediment Operations	<u>\$ 6,000.00</u>
	\$ 45,523.89

13. Total Estimated Alberta Share
(excluding new construction in 1986-87)

Hydrometric	\$833,595.22
Sediment	\$ 45,523.89
Maintenance	\$ 40,000.00
Construction Eqpt. Depreciation (205.900/201.775 x \$4,325.27) ..	<u>\$ 4,413.51</u>
	\$923,532.62

Use: \$924,000



Agr-ALTA-10

AUTHOR

WRB - Calgary.

TITLE CANADA-ALBERTA MEMORANDUM OF
AGR. FOR WATER QUANTITY SURVEYS

DATE ~~BORROWED~~

BORROWER'S NAME

Borrowed

Annual Rept. 1984-85



