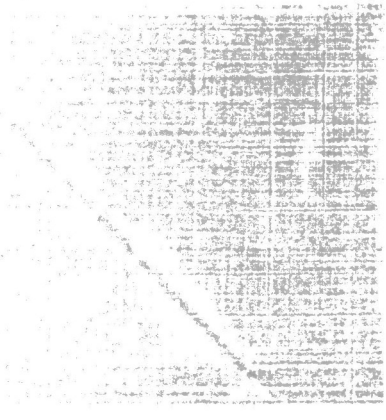
# CANADA - ALBERTA
# MEMORANDUM OF AGREEMENT
# FOR
# WATER QUANTITY SURVEYS
# ANNUAL REPORT 1986-87



# CANADA – ALBERTA

# MEMORANDUM OF AGREEMENT

# FOR

# WATER QUANTITY SURVEYS

## ANNUAL REPORT 1986-87

TO: R. A. Halliday
Administrator for Canada

R. K. Deeprose
Administrator for Alberta

We hereby submit an annual report for fiscal year 1986-87 covering activities under the Memorandum of Agreement for Water Quantity Surveys for the Province of Alberta.

Government of Canada

G. H. Morton
Environment Canada

M. O. Spitzer
Environment Canada

Province of Alberta

P. Valentine
Alberta Environment

G. Coles
Alberta Environment

Members

Alberta Co-ordinating Committee

August 1987.

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

The Canada-Alberta Co-ordinating Committee met once during the year and there was also one informal meeting to discuss funding and construction program revisions to accommodate major reconstruction of flood damaged stations. Frequent contact was maintained between the members of the committee and senior staff of both agencies. Major items discussed at the Co-ordinating Committee meeting were major program cutbacks due to a reduction in Alberta funding in 1987-88; funding arrangements for removal of hydrometric stations in the Marmot Creek Basin; 1987-88 construction and maintenance program; co-operative arrangements for network planning; real-time data acquisition; and advanced technology.

Hydrologic conditions during 1986-87 were highly variable. It was another dry summer for the Oldman River Basin, with July and August precipitation being much below average in southwestern Alberta. Heavy rainfall in mid-July caused extensive flooding in the North Saskatchewan and Pembina River basins. A late September storm hit southeastern Alberta, causing flooding in the Cypress Hills area.

During 1986-87, 10 new hydrometric stations were established and at the end of the season 33 stations were discontinued. Additionally, maintenance was carried out at 47 hydrometric stations, and major reconstruction was conducted at 6 stations. Major revisions were made to the construction

and maintenance program schedule at the end of July to enable repairs to be made to stations badly damaged or destroyed by the flood in the North Saskatchewan and Pembina River basins.

Alberta and Canada provided equal funding for a sediment source study on the Oldman River, with work being conducted by the Alberta Research Council. Also, Water Survey of Canada issued a contract for analysis of three long-term sediment stations on the Red Deer River.

During 1986-87 Alberta paid $962,700 to the hydrometric agreement. This was $7,900 less than the Schedule "D" amount and the reason for this underpayment was that 'specially funded' final flood damage maintenance costs were this amount less than originally estimated. The computed cost for the Alberta share of the program was $962,413, which resulted in an overrpayment of $287 by the province.

# C O N T E N T S

C O N T E N T S (cont'd)

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## 1.0 INTRODUCTION

This is the twelfth 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 station was designated either 'Federal', 'Federal-Provincial' or 'Provincial', the designation not only indicating the prime need, but also the financial responsibility.

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[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 1986-87 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, 1987 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. Figures are provided to indicate the financial responsibility and network changes from 1975 to 1987, and the history of the size of the hydrometric network. Histograms of gauging station maturity are also presented. The final subsection provides a description of program plans for 1987-88.

Section 3.0 summarizes the cost of operation for the 1986-87 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 1986-87 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 Canada-Alberta Co-ordinating Committee Meeting, February 13, 1987

##### 2.1.1.1 Program Cutbacks

This was the major item of discussion and was a subject on which discussions commenced in November 1986. At that time it was first recognized that Alberta may have a shortfall in funding for 1987-88. To achieve a reduction of approximately $80K in Schedule "D" Operation funding, it was agreed that the following action would be taken:

- discontinue 33 hydrometric stations at the end of 1986-87
- discontinue 4 sediment stations at the end of 1986-87
- change the operation period of 17 hydrometric stations from annual to seasonal
- reduce the number of trips to remote hydrometric stations
- reduce the amount of overtime hours

2.1.1.2 Marmot Creek Basin

It was agreed that the funding for removal of all stations, except Marmot Creek Main, in this watershed research station, would be 75% Federal and 25% Provincial. This agreement was reached on the basis that station designations in the basin had only changed during recent years and prior to that time all stations were designated Federal.

2.1.1.3 Construction and Maintenance Program in 1987-88

The requirement for new hydrometric stations on the Embarras River and Embarras River breakthrough, to accommodate future hydrodynamic modelling of the Peace-Athabasca Delta, was discussed. It was agreed that these stations would be designated FP and that construction and operation would be done by Alberta Environment.

2.1.1.4 Network Planning

As a followup to the WRB report entitled "Western and Northern Region Hydrometric Network Evaluation and Planning Activities", it was agreed that future

co-operative activities were required. These activities are to be co-ordinated by the Hydrology Branch of Alberta Environment and the Hydrology Division of Canada Water Resources Branch.

2.1.1.5 Real-Time Data Acquisition

In response to a request from WRB Headquarters, Alberta stated that they didn't have a letter from NESDIS guaranteeing accesss to DCP data for an indefinite period. The province noted that they didn't have an interest in an alternative system, if additional costs are involved.

2.1.1.6 Advanced Technology

A demonstration project, using a sonic device interfaced with an electronic data logger, was discussed. WRB indicated that they weren't interested in sponsoring this work as their head office was working on similar projects.

## 2.2 OPERATIONAL ACHIEVEMENTS

During 1986-87 operational problems were encountered due to staff vacancies and a major flood in west-central Alberta during July.

Although the November 1 deadline for the annual "Sediment Data" publication was met, the May 1 deadline for the annual "Surface Water Data" publication wasn't met. The July flood occurred at a time when many staff were on holidays and the problem of adequate field coverage was compounded by receiving inadequate warning from Atmospheric Environment Service that a major precipitation event was occurring. Due to the magnitude of the flood, discharge measurements couldn't be obtained at many sites, as measurement structures were destroyed or were inaccessible. Therefore, it was necessary to conduct slope-area surveys at 14 sites with field work and office calculations requiring one person-year of time to complete.

### 2.2.1 Training Program

The major training program during the year was that carried out for field surveys and office calculations of slope-area surveys. In the long-term, this training should be very beneficial, as all technical staff acquired a better knowledge of open channel hydraulics. Training was provided in modification and additions to software for the mini-computer by Headquarters and Alberta District data control staff.

### 2.2.2 Construction and Maintenance Program

The construction program was of a similar size to that carried out during 1985-86 and all aspects were completed with 10

stations added to the network. Due to the damage created by the July flood, it was necessary to make major adjustments to the construction and maintenance program schedule. With these program adjustments, it was possible to reactivate the majority of hydrometric stations destroyed or significantly damaged by the flood. Maintenance was carried out at 47 stations and major reconstruction was conducted at six stations. Localities where both maintenance and construction were carried out are shown 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, 1986-87".

## 2.3 WATER QUANTITY AND SEDIMENT NETWORKS

Changes which are reflected in Schedule "A", April 1, 1987 are summarized as follows:

### 2.3.1 New Stations Established during 1986-87

| Station Name | Station No. | Designation |
|---|---|---|
| 1. Boxelder Creek at Hargraves Ranch | 05AH050 | F2 |
| 2. Drain S-6 near Bow Island | 05AJ004 | F2 |
| 3. Hargraves Diversion from Boxelder Creek | 05AH051 | P1 |
| 4. Highwood River below Little Bow Canal* | 05BL004 | P1 |
| 5. Lily Creek near Slave Lake | 07BG004 | P1 |
| 6. Redearth Creek near Redearth | 07JC002 | FP3 |
| 7. Tindastall Creek near Markerville | 05CC012 | P1 |
| 8. Verdigris Lake Tributary near Milk River | 11AA039 | FP2 |
| 9. Vermilion River at Vegreville* | 05EE009 | P1 |
| 10. Young Creek near Castor | 05FC007 | P1 |

* These two hydrometric stations are relocations of Highwood River at High River and Vermilion River near Vegreville, shown in 2.3.2.

## 2.3.2 Discontinued Hydrometric Stations at end of 1986-87

| Station Name | Station No. | Designation |
|---|---|---|
| 1. Atlas Mine Coulee at Western Monarch | 05CG005 | P1 |
| 2. Battle River above Pipestone Creek | 05FA023 | P1 |
| 3. Bear Lake near Clairmont | 07GE004 | P1 |
| 4. Bear River near Grande Prairie | 07GE005 | P1 |
| 5. Beaverhill Creek near the Mouth | 05EB015 | FP3 |
| 6. Cabin Creek near Seebe | 05BF019 | P1 |
| 7. Clear Brook near Stavely | 05AC033 | P1 |
| 8. Coal Creek at Bow City | 05BN014 | P1 |
| 9. Connor Creek near Sangudo | 07BB009 | P1 |
| 10. Drain S-4 near Grassy Lake | 05AJ002 | F2 |
| 11. Driftpile River near Driftpile | 07DH003 | P1 |
| 12. Drywood Creek near Twin Butte | 05AD016 | FP3 |
| 13. Ells River near the Mouth | 07BA017 | FP1 |
| 14. Hammerhill Spillway near Gleichen | 05BM005 | P1 |
| 15. Highwood River at High River | 05BL003 | P1 |
| 16. Hutch Lake Tributary near High Level | 07OB007 | FP3 |
| 17. Kirkpatrick Lake Tributary near Spondin | 05GA009 | P1 |
| 18. Lobstick River near Styall | 07DB003 | FP3 |
| 19. McGillivray Creek near Coleman | 05AA013 | P1 |
| 20. Meander River at Outlet Hutch Lake | 07OB005 | FP3 |
| 21. Middle Fork Creek in Cirque near Seebe | 05BF020 | FP1 |
| 22. Middle Fork Creek near Seebe | 05BF017 | FP1 |
| 23. Mill Creek near the Mouth | 05AA011 | FP3 |
| 24. Nose Creek at Calgary | 05BH003 | P1 |
| 25. Piche River near Imperial Mills | 07CA010 | FP3 |
| 26. Poplar Creek near Fort McMurray | 07DA007 | P1 |
| 27. Rolling Hills Canal No. 1 Spill | 05BN015 | P1 |
| 28. Rolling Hills Canal No. 2 Spill | 05BN019 | P1 |
| 29. Streeter Creek Main Stem near Nanton | 05AB030 | FP1 |
| 30. Sturgeon River at St. Albert | 05EA002 | P1 |
| 31. Twin Creek near Seebe | 05BF018 | P1 |
| 32. Vermilion River near Vegreville | 05EE003 | P1 |
| 33. W.I.D. Canal B near Headgate | 05BM017 | P1 |

## 2.3.3 Changes to Sediment Program (Sediment Program Discontinued)

| Station Name | Sediment Program Station No. | Designation |
|---|---|---|
| 1. Deerlick Creek near Hinton | 07AF004 | P2 |
| 2. Driftpile River near Driftpile | 07DH003 | P1 |
| 3. Eunice Creek near Hinton | 07AF005 | P2 |
| 4. Wampus Creek near Hinton | 07AF003 | P2 |

### 2.3.4 Designation Changes

| Station Name | Station Number | Former Designation | Present Designation |
|---|---|---|---|
| 1. Drywood Creek near the Mouth | 05AD010 | P1 | FP3 |
| 2. Pipestone River nr Lake Louise | 05BA002 | FP3 | F1 |
| **Operated by ADOE** | | | |
| 1. Athabasca River above Jackfish Creek | 07DD007 | F1 | P1 |
| 2. Chenal des Quatre Fourches below Four Forks | 07KF006 | F1 | P1 |

### 2.3.5 Operation Period Changes

#### 2.3.5.1 From Annual to Seasonal

| Station Name | Station No. | Designation |
|---|---|---|
| 1. Beaver River above Syncrude | 07DA018 | FP1 |
| 2. Beaverlodge River near Beaverlodge | 07GD001 | FP2 |
| 3. Birch River below Alice Creek | 07KE001 | FP1 |
| 4. Bow River at Lake Louise | 05BA001 | F1 |
| 5. Firebag River near the Mouth | 07DC001 | FP1 |
| 6. Hangingstone River at Ft. McMurray | 07CD004 | FP1 |
| 7. Hartley Creek near Ft. Mackay | 07DA009 | P1 |
| 8. Mackay River near Ft. Mackay | 07DB001 | FP1 |
| 9. Mooselake River near Franchere | 06AC006 | P1 |
| 10. Muskeg River near Ft. Mackay | 07DA008 | FP1 |
| 11. Muskeg River near Grande Cache | 07GA002 | FP3 |
| 12. Reita Creek near Outlet Angling Lake | 06AD013 | FP3 |
| 13. Richardson River near the Mouth | 07DD002 | FP1 |
| 14. Simeonette River near Goodwin | 07GF001 | FP3 |
| 15. Smoky River above Hells Creek | 07GA001 | FP2 |
| 16. Steepbank River near Ft. McMurray | 07DA006 | FP1 |
| 17. Whitemud River near Dixonville | 07HA005 | FP3 |

2.3.5.2 From Seasonal to Annual

| Station Name | Station No. | Designation |
|---|---|---|
| 1. Lac La Biche at Lac La Biche | 07CA004 | P1 |
| 2. Wabasca River below Trout River | 07JB002 | FP3 |

Table 1 indicates additions and deletions to the hydrometric network during 1986-87 and the station designation effective April 1, 1986. For the first time in many years the number of stations discontinued far outweighed the additions to the network. As previously noted, this action was due to a significant reduction in Alberta funding commencing in 1987-88. The number of Provincial and Contributed stations shown in Table 1 are significantly different than those shown in the 1985-86 report. This is because thirty-eight of the stations operated by Alberta and previously considered Contributed, were transferred to the Provincial designation as of April 1, 1986.

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, 1986. Table 3 provides detailed gauging station data as of April 1, 1986. The 'Change' in provincial stations in tables 2 and 3 is forty-one greater than the change shown in the annual report for 1985-86. However, as previously noted, thirty-eight of these stations were considered 'Contributed' prior to April 1, 1986.

## TABLE 1

## WATER QUANTITY SURVEYS

## GAUGING STATION DATA FOR 1986-87

| No. of Stations(1) | | No. of Stations Added 1986/87(2) | No. of Stations Discontinued 1986-87(2) | NET | Stn. Designation April 1, 1986 | | | |
|---|---|---|---|---|---|---|---|---|
| April 1/85 | April 1/86 | | | | FED. | FEDERAL PROV. | PROV. | CONTRI-BUTED |
| 571 | 573 | 10 | 33 | -23 | 123 (1) | 219 (4) | 210 (8) | 21 |

(1) Includes Contributed Data Stations
(2) Stations operated by WSC.
( ) Bracketed numbers are for sediment stations

## TABLE 2

## WATER QUANTITY SURVEYS

## COMPARATIVE GAUGING STATION DATA, APRIL 1/75 TO APRIL 1/86

| Federal Stations | | | Federal-Provincial Stations | | | Provincial Stations | | | Total Stations | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr 1/75 | Apr 1/86 | Change | Apr 1/75 | Apr 1/86 | Change | Apr 1/75 | Apr 1/86 | Change | Apr 1/75 | Apr 1/86 | Change |
| 157 | 123 | -34 | 221 | 219 | -2 | 46 | 210 | +164 | 424 | 552 | +128 |

## TABLE 3

## WATER QUANTITY SURVEYS

## DETAILED GAUGING STATION DATA, APRIL 1, 1986

| F1 | F2 | F3 | F4 | Total F | FP1 | FP2 | FP3 | Total FP | P1 | P2 | Total P | Contri-buted | Total All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 (0) | 57 (1) | 30 (0) | 10 (0) | 123 (1) | 20 (0) | 24 (0) | 175 (4) | 219 (4) | 210 (4) | 0(4) | 210 (8) | 21 (0) | 573 (13) |

( ) Bracketed numbers are for sediment stations.

## 2.4 NETWORK PLANNING ACTIVITIES

### 2.4.1 Sediment

Alberta Environment and WSC undertook joint funding of a sediment source study on the Oldman River. This work was undertaken by the Alberta Research Council and a draft report was completed.

Under a contract issued by WSC, a sediment station analysis was undertaken at three sites on the Red Deer River. This report was essentially finalized by March 31, 1987 and will be distributed early in 1987.

### 2.4.2 Network Planning Project

In August 1986 the "Summary Report - Western and Northern Region Hydrometric Network Evaluation and Planning Activities" was issued. The major recommendation of the report was to adjust the existing regional hydrology network to enable rigorous hydrologic analysis with a view to the eventual optimization of the network. Unfortunately, during the current era of downsizing, it is very difficult, if not impossible, to address this recommendation.

### 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:

| Year | New Stations Established | Stations Discontinued |
|---|---|---|
| 1975-76 | 33 | 15 |
| 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 | 3 |
| 1983-84 | 22 | 8 |
| 1984-85 | 27 | 14 |
| 1985-86 | 11 | 8 |
| 1986-87 | 10 | 33 |
| Total: | 206 | 139 |

The new stations established over this eleven-year period represent 39% of the hydrometric network operated by Water Survey of Canada and Alberta Environment, as of April 1, 1987 and the discontinued stations represent 26% of the network.

In addition to the 345 stations which have been added or deleted from the network, a large number of station designation changes have also occurred over the eleven-year period and these are summarized as follows:

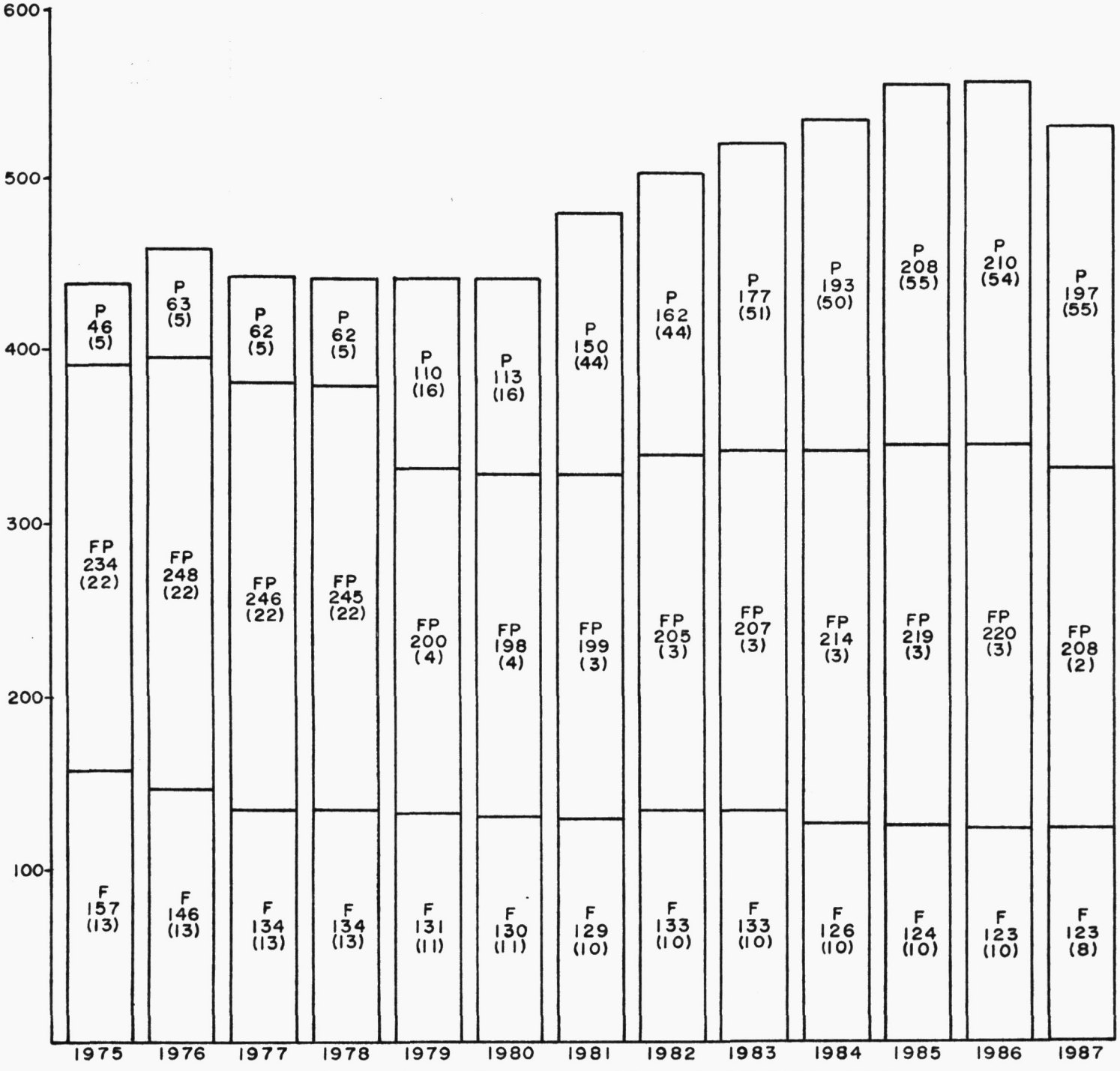
| Designation Change | Number of Stations |
|---|---|
| F to FP | 15 |
| F to P | 16 |
| FP to F | 8 |
| FP to P | 27 |
| FP to Contributed | 1 |
| P to F | 2 |
| P to FP | 2 |
| F to FP (Sediment) | 5 |
| FP to P (Sediment) | 5 |
| Total: | 81 |

These designation changes represent 14% of the network and therefore between designation changes, new station construction and station discontinuance, there has been a change of 75% 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 percentage of the federal financial contribution to the network and a significant increase in the percentage of the provincial contribution 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.

The history of the size of the hydrometric network in Alberta, which includes hydrometric stations operated by Water Survey of Canada, Alberta Environment, and TransAlta Utilities, 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 20% of the stations in the cost-sharing agreement occurring from April 1, 1975 to the end of 1986-87. The majority of this increase occurred during the few years preceding the Alberta hydrometric enhancement program and during the enhancement program period.




NETWORK AS OF APRIL 1 OF CORRESPONDING YEAR

**Figure 1**

**FINANCIAL RESPONSIBILITY AND NETWORK CHANGES IN ALBERTA 1975 – 1987**

NOTE: Bracketed values indicate the number of stations operated by Alberta Environment, and these are included in the non-bracketed value. Prior to 1981 only stations operated by Alberta Environment in the Peace-Athabasca Delta and Spring Creek Basin are shown in the bar graph.

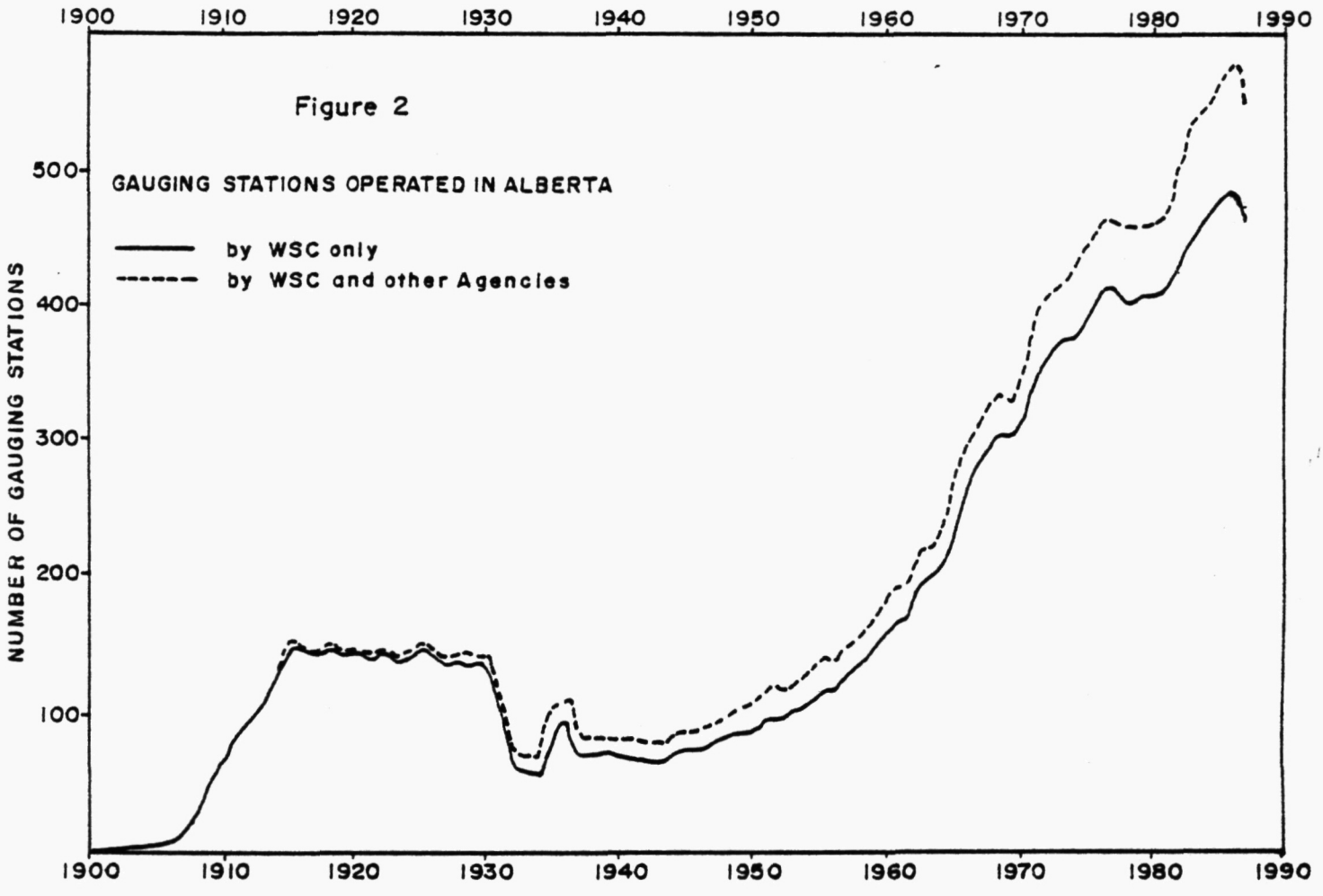
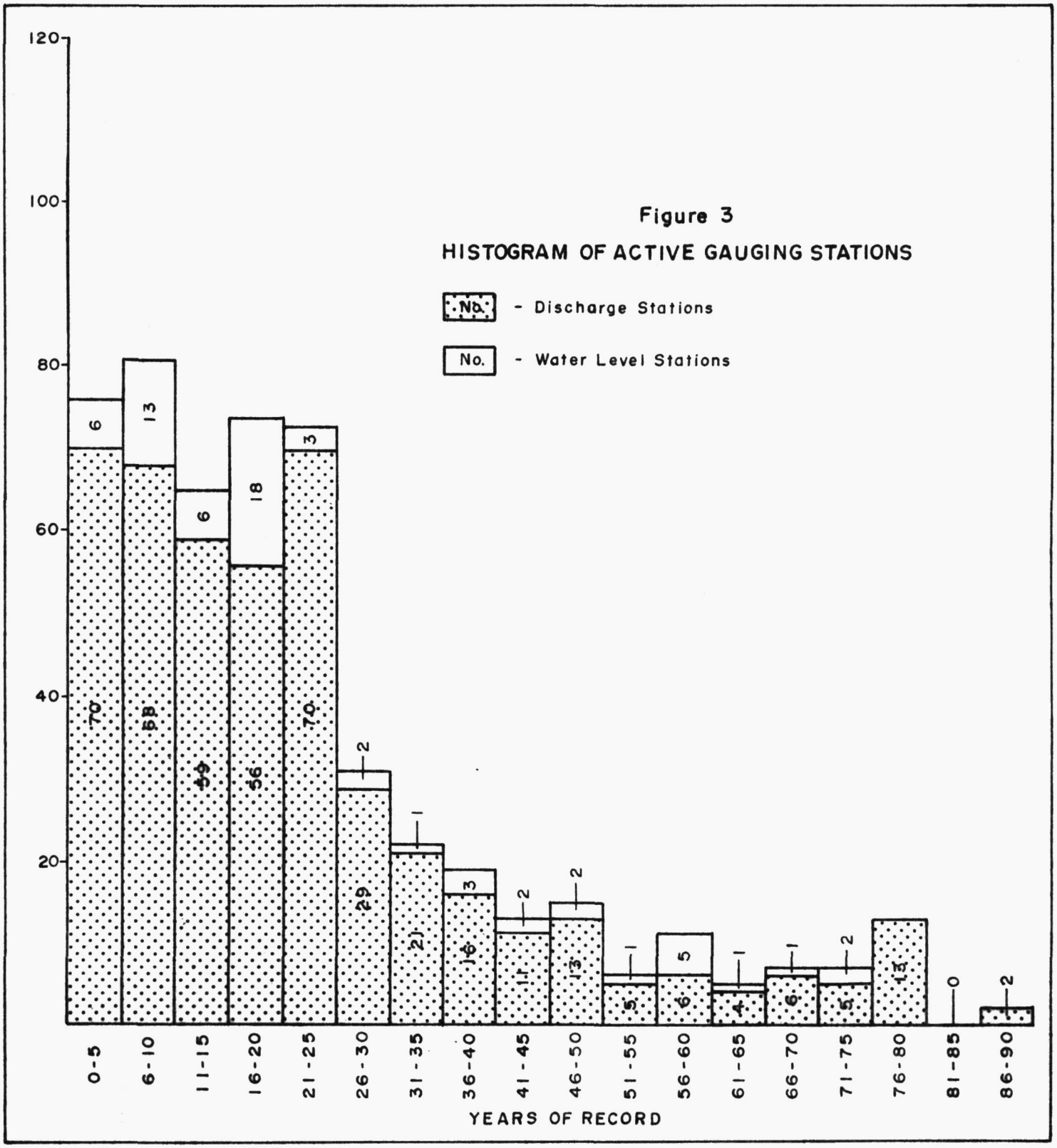



Figure 3 is a histogram of active gauging station maturity in Alberta, and Figure 4 is a similar histogram, which also includes discontinued gauging stations. The histogram of active gauging stations depicts the lack of maturity of the Alberta network. Thirty percent of the network has ten years or less of record and the median value of years of data for the active network is only 18.

## 2.5 PROGRAM PLANS FOR 1987-88

Program plans for 1987-88 are primarily directed at maintaining a satisfactory quality of data, with a significantly reduced component of staff. Office studies conducted by the federal Water Resources Branch pertaining to the hydrometric program will include continuing analysis of long-term sediment stations, and continuing network planning and evaluation studies.

The construction and maintenance program will be significantly reduced from previous years due to a reduction in funding. There will be no new construction and maintenance will be carried out at approximately 40 sites, with a significant portion of the maintenance program consisting of removing hydrometric stations discontinued at the end of 1986-87.


120
100
80
60
40
20
Figure 3
HISTOGRAM OF ACTIVE GAUGING STATIONS
No. - Discharge Stations
No. - Water Level Stations
6
13
6
18
3
70
68
59
56
70
2
29
1
21
3
16
2
11
2
13
1
5
5
6
1
4
1
6
2
5
13
0
2
0-5
6-10
11-15
16-20
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61-65
66-70
71-75
76-80
81-85
86-90
YEARS OF RECORD

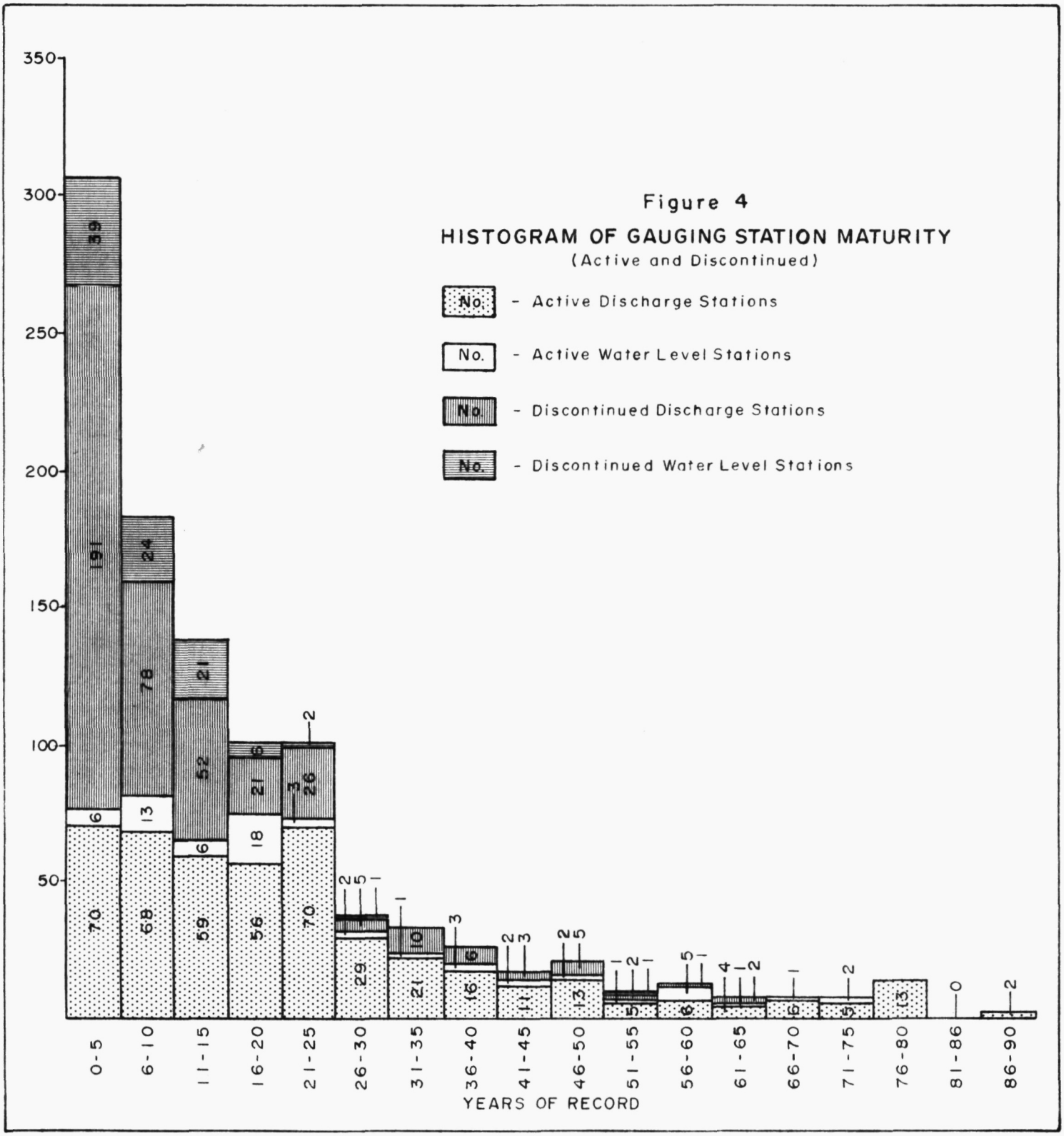


Figure 4
HISTOGRAM OF GAUGING STATION MATURITY
(Active and Discontinued)
No. - Active Discharge Stations
No. - Active Water Level Stations
No. - Discontinued Discharge Stations
No. - Discontinued Water Level Stations
350
300
250
200
150
100
50
0-5
6-10
11-15
16-20
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61-65
66-70
71-75
76-80
81-86
86-90
YEARS OF RECORD

## 3.0 COST OF OPERATION

The Summary of Financial Considerations 1986-87 (p. 23) 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 contruction and maintenance costs and a brief description of the procedure utilized for the calculation of depreciation. During 1986-87 Alberta paid the amount of $962,700 to the hydrometric agreement, whereas the Alberta net share was $962,413.

Alberta obtained 'special funding' in August 1987 for major reconstruction of stations damaged by the July flood. This 'special funding' was earmarked for that specific purpose and couldn't be used for other purposes. At the end of the construction and maintenance season the amount expended on flood damage maintenance was $7,900 less than estimated. Therefore, the annual payment received was $7,900 less than the Schedule "D" amount of $970,600.

During 1986-87 Alberta's share of hydrometric depreciation increased by $12,100 from 1985-86. The reason for this was that data collection platforms purchased by HQs were not transferred to the Alberta inventory in 1985-86, which resulted in a significant error in estimating Schedule "D" for 1986-87. Additionally, Alberta's share of 'Operation' costs for field coverage of the 1986-87 flood event in

# SUMMARY OF FINANCIAL CONSIDERATIONS

## 1986-87

| | No. of Stns. | Total Cost | Share | |
|---|---|---|---|---|
| | | | Federal | Alberta |
| 1. Hydrometric Network | | | | |
| Operated by Water Survey of Canada | 473 | 1,526,651 | 709,136 | 817,515 |
| Depreciation-Hydrometric Equipment and Vehicles | | 94,900 | 44,081 | 50,819 |
| 2. Sediment Stations | | | | |
| Full program operated by Water Survey of Canada(a) | 12 | 44,382 | 9,114 | 35,268 |
| Depreciation - Sediment Equipment | | 200 | 41 | 159 |
| Laboratory-Alberta Program | | 7,214 | - | 7,214 |
| 3. Construction & Maintenance | | | | |
| Construction of 10 hydrometric stations and maintenance of 53 hydrometric stations | 61 | 188,258 | 95,674 | 92,584 |
| Depreciation - Construction Equipment and Vehicles | | 7,400 | 3,761 | 3,639 |
| TOTAL: | | 1,869,005 | 861,807 | 1,007,198 |

Alberta Net Share: 1,007,198 - 43,299(b) - 1,486(c) = 962,413

(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 3,962.75) + (10.40 units x 200.63 per unit depreciation)

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

the North Saskatchewan and Athabasca River basins was approximately $16,200. Considering the foregoing error and extraordinary event, the 'Annual Payment Received' could have been considerably in excess of the 'Actual Cost' incurred during 1986-87.

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 1986-87 the units per staff rose above the 1980-81 level; however, it should be recognized that units/staff of 13.70 is excessive, with data collection and computations stretched to the limit in terms of providing quality data.

HYDROMETRIC UNITS VERSUS HYDROMETRIC STAFF

| Item \ Year | 1975-76 | 1976-77 | 1977-78 | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 | 1986-87 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hydrometric Units | 289.55 | 309.80 | 302.41 | 326.20 | 342.95 | 346.00 | 351.15 | 364.35 | 374.30 | 382.45 | 393.40 | 394.65 |
| Hydrometric Person-Years | 32.4 | 32.7 | 28.6 | 26.5 | 26.4 | 26.1 | 27.9 | 27.5 | 29.3 | 30.8 | 31.8 | 28.8 |
| Hydrometric Units/staff | 8.94 | 9.47 | 10.57 | 12.31 | 12.99 | 13.26 | 12.59 | 13.25 | 12.77 | 12.42 | 12.37 | 13.70 |

A similar type of summary for hydrometric station unit costs indicates 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's 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. The decrease which occurred in 1985-86 is unusual, and the increase of 4.9% can likely be considered a norm for future years; however, it should also be noted that the unit costs in 1986-87 were boosted by the expenditures incurred for the July 1986 flood event coverage.

UNIT COSTS PER HYDROMETRIC STATION

| Item \ Year | 1975-76 | 1976-77 | 1977-78 | 1978-79 | 1979-80 | 1980-81 | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 | 1986-87 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Cost per Station | $2,072 | $2,137 | $2,264 | $2,242 | $2,250 | $2,529 | $2,945 | $3,285 | $3,521 | $3,840 | $3,823 | $3,963 |
| % Increase from Previous Year | - | 3.1 | 5.9 | (-)1.0 | 0.4 | 12.4 | 16.4 | 11.5 | 7.2 | 9.1 | (-)0.4 | 3.7 |

The following summary of over and under annual payments by Alberta for the period of the agreement indicates that although Alberta had underpaid during 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 eleven-year period from 1975-76 to 1986-87 the underpayment by Alberta was 0.5% of the total payment Alberta made during this period.

CUMULATIVE PROVINCIAL
OVER OR UNDERPAYMENT
FOR PERIOD OF AGREEMENT (DOLLARS)

| Year | Actual Cost | Annual Payment | Overpayment (+) Underpayment(-) | % of Annual Payment |
|---|---|---|---|---|
| 1975-76 | 197,852 | 197,400 | (-) 452 | (-) 0.23 |
| 1976-77 | 231,000 | 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 | 935,664 | 933,500 | (-) 2,164 | (-) 0.23 |
| 1985-86 | 917,865 | 927,000 | (+) 9,135 | (+) 0.99 |
| 1986-87 | 962,413 | 962,700 | (+ 287 | (+) 0.03 |
| Total: | 6,653,639 | 6,623,325 | (-)30,314 | (-) 0.46 |

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 1988-89 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 1988-89, depreciation, a cost index factor, and an estimate of construction and maintenance costs for 1988-89 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 1988-89 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 vary 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 1986-87 ($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 | 49.6 | 1838.4 | 868.9 | 350.5 | 3057.8 | 28.8 | 1015.5 | 657.8 | 195.7 | 1869.0 | 861.8 | 1007.2 |

NOTE: [1] Operating costs are comprised of $555.5K as described in Appendix "B", $95.1K for depreciation and $7.2K for Alberta sediment laboratory costs, 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 $962.4K, as shown in Table 5.

TABLE 5

## WATER QUANTITY SURVEYS

### COMPARISON - SCHEDULE "D" COSTS WITH ACTUAL COSTS & PAYMENTS 1986-87 (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 | 858,900 | 866,190 | 111,700 | 96,223 | 970,600 | 962,413 | 8,187 | 962,700 | 287 |

# 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, 1986

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 | BOW RIVER AT BANFF | 05BB001 | X | | | | X | | X |
| 3 | BOW RIVER AT LAKE LOUISE | 05BA001 | X | | | | X | | X |
| 4 | BREWSTER CREEK NEAR BANFF | 05BB004 | X | | | X | | | X |
| 5 | CASCADE RIVER ABOVE LAKE MINNEWANKA | 05BD005 | X | | | X | | | X |
| 6 | JOHNSTON CREEK NEAR THE MOUTH | 05BA006 | X | | | X | | | X |
| 7 | LESSER SLAVE RIVER AT HIGHWAY NO. 2 | 07BK006 | X | | X | | X | | X |
| 8 | MALIGNE RIVER NEAR JASPER | 07AA004 | X | | | | X | | X |
| 9 | MIETTE RIVER NEAR JASPER | 07AA001 | X | | | | X | | X |
| 10 | MISTAYA RIVER NEAR SASKATCHEWAN CROSSING | 05DA007 | X | | | | X | | X |
| 11 | NORTH SASKATCHEWAN RIVER AT WHIRLPOOL POINT | 05DA009 | X | | | | X | | X |
| 12 | REDEARTH CREEK NEAR THE MOUTH | 05BB005 | X | | | X | | | X |
| 13 | SILVERHORN CREEK NEAR THE MOUTH | 05DA010 | X | | | | X | | X |
| 14 | SNAKE INDIAN RIVER NEAR THE MOUTH | 07AB002 | X | | | X | | | X |
| 15 | SUNWAPTA RIVER ATHABASCA GLACIER | 07AA007 | X | | | X | | | X |
| 16 | WHIRLPOOL RIVER NEAR THE MOUTH | 07AA009 | X | | | X | | | X |
| | OPERATED BY - ALBERTA GOVERNMENT | | | | | | | | |
| 1 | ATHABASCA RIVER ABOVE JACKFISH 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 | | | OPERATION | | ACCESS | |
|---|---|---|---|---|---|---|---|---|---|
| | | | FLOW | LEVEL | SED. | 8M | 12M | REMOTE | NORMAL |
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 1 | ANTELOPE COULEE SPILLWAY | 05BN010 | X | | | X | | | X |
| 2 | BATTERSEA DRAIN NEAR THE MOUTH | 05AD038 | X | | | X | | | X |
| 3 | *BATTLE RIVER NEAR THE SASKATCHEWAN BOUNDARY | 05FE004 | X | | | | X | | X |
| 4 | BEAVER RIVER AT COLD LAKE RESERVE | 06AD006 | X | | | | X | | X |
| 5 | BERRY CREEK NEAR THE MOUTH | 05CH007 | X | | | X | | | X |
| 6 | BOUNTIFUL COULEE INFLOW NEAR CRANFORD | 05AG026 | X | | | X | | | X |
| 7 | BOW RIVER AT CALGARY | 05BH004 | X | | | | X | | X |
| 8 | BOW RIVER NEAR THE MOUTH | 05BN012 | X | | | | X | | X |
| 9 | B.R.D. DRAIN K NEAR VAUXHALL | 05BN009 | X | | | X | | | X |
| 10 | B.R.D. MAIN CANAL | 05AC004 | X | | | X | | | X |
| 11 | -BOXELDER CREEK NEAR WALSH | 05AH001 | X | | | X | | | X |
| 12 | BULLPOUND CREEK NEAR THE MOUTH | 05CG003 | X | | | X | | | X |
| 13 | CAIRN HILL SPILLWAY NEAR THE MOUTH | 05BM012 | X | | | X | | | X |
| 14 | CANADIAN ST. MARY CANAL NEAR SPRING COULEE | 05AE026 | X | | | X | | | X |
| 15 | CLEARWATER RIVER ABOVE CHRISTINA RIVER | 07CD005 | X | | | | X | X | |
| 16 | COAL LAKE RESERVOIR NEAR WETASKIWIN | 05FA016 | | X | | | X | | X |
| 17 | COLD LAKE AT COLD LAKE | 06AF002 | | X | | | X | | X |
| 18 | CROWFOOT CREEK NEAR CLUNY | 05BM008 | X | | | X | | | X |
| 19 | DICKSON REVERVOIR NEAR DICKSON | 05CB006 | | X | | | X | | X |
| 20 | DRAIN L-5 NEAR DIAMOND CITY | 05AD040 | X | | | X | | | X |
| 21 | DRAIN S-4 NEAR GRASSY LAKE | 05AJ002 | X | | | X | | | X |
| 22 | DRAIN S-10 NEAR BOW ISLAND | 05AJ003 | X | | | X | | | X |
| 23 | DRAIN T-1 NEAR TABER | 05AG027 | X | | | X | | | X |
| 24 | DRY COULEE NEAR MAGRATH | 05AE041 | X | | | X | | | X |
| 25 | E.I.D. EAST BRANCH CANAL NEAR LATHOM | 05CJ003 | X | | | X | | | X |
| 26 | E.I.D. NORTH BRANCH CANAL NEAR BASSANO | 05CJ001 | X | | | X | | | X |
| 27 | E.I.D. SPRINGHILL CANAL NEAR LATHOM | 05CJ004 | X | | | X | | | X |
| 28 | EXPANSE COULEE NEAR THE MOUTH | 05AG003 | X | | | X | | | X |
| 29 | HIGHWOOD DIVERSION CANAL NEAR HEADGATES | 05BL025 | X | | | X | | | X |
| 30 | L.N.I.D. CANAL ABOVE OLDMAN RIVER FLUME | 05AB016 | X | | | X | | | X |
| 31 | LITTLE BOW CANAL AT HIGH RIVER | 05BL015 | X | | | | X | | X |
| 32 | LITTLE BOW RIVER AT CARMANGAY | 05AC003 | X | | | X | | | X |
| 33 | LITTLE BOW RIVER BELOW TRAVERS DAM | 05AC012 | X | | | X | | | X |
| 34 | LITTLE BOW RIVER NEAR THE MOUTH | 05AC023 | X | | | X | | | X |
| 35 | M.I.D. CANAL NEAR SPRING COULEE | 05AE021 | X | | | X | | | X |
| 36 | MATZHIWIN CREEK ABOVE WARE COULEE | 05CJ007 | X | | | X | | | X |
| 37 | NEW WEST COULEE NEAR THE MOUTH | 05BN006 | X | | | X | | | X |
| 38 | OLDMAN RIVER NEAR LETHBRIDGE | 05AD007 | X | | X | | X | | X |
| 39 | ONETREE CREEK NEAR PATRICIA | 05CJ006 | X | | | X | | | X |
| 40 | $PEACE RIVER AT PEACE POINT | 07KC001 | X | | | | X | X | |
| 41 | PIYAMI DRAIN NEAR PICTURE BUTTE | 05AD037 | X | | | X | | | X |
| 42 | POTHOLE CREEK AT RUSSELL'S RANCH | 05AE016 | X | | | X | | | X |
| 43 | RED DEER RIVER NEAR BINDLOSS | 05CK004 | X | | | | X | | X |
| 44 | RONALANE WASTEWAY NEAR HAYS | 05BN007 | X | | | X | | | X |
| 45 | ROSEBUD RIVER AT REDLAND | 05CE005 | X | | | X | | | X |
| 46 | ROSS CREEK AT MEDICINE HAT | 05AH049 | X | | | X | | | X |
| 47 | SEVEN PERSONS CREEK AT MEDICINE HAT | 05AH005 | X | | | X | | | X |
| 48 | SOUTH SASKATCHEWAN RIVER AT HIGHWAY NO. 41 | 05AK001 | X | | | X | | | X |
| 49 | $SLAVE RIVER AT FITZGERALD | 07NB001 | X | | X | | X | X | |
| 50 | ST. MARY RESERVOIR NEAR SPRING COULEE | 05AE025 | | X | | | X | | X |

MAJOR DESIGNATION - FEDERAL

SUBDESIGNATION - INTERPROVINCIAL WATERS (2)

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 51 | TWELVE MILE COULEE SPILLWAY NEAR CARSELAND | 05BM009 | X | | | X | | | X |
| 52 | TWELVE MILE CREEK NEAR CECIL | 05BN002 | X | | | X | | | X |
| 53 | U.I.D. CANAL NEAR HILL SPRING | 05AD013 | X | | | X | | | X |
| 54 | WAPITI RIVER NEAR GRANDE PRAIRIE | 07GE001 | X | | | | X | | X |
| 55 | WARE COULEE ABOVE MATZIHIWIN CREEK | 05CJ008 | X | | | X | | | X |
| 56 | WATERTON RESERVOIR | 05AD026 | | X | | | X | | X |
| 57 | 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 FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 1 | *BARE 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 THE SASKATCHEWAN BOUNDARY | 11AB009 | X | | | X | | | X |
| 12 | +MILK RIVER AT EASTERN CROSSING OF INT'L BOUNDARY | 11AA031 | X | | | X | | | X |
| 13 | MILK RIVER AT MILK RIVER | 11AA005 | X | | | | X | | X |
| 14 | MILK RIVER AT WESTERN CROSSING OF INT'L BOUNDARY | 11AA025 | X | | | X | | | X |
| 15 | MINERS COULEE NEAR INTERNATIONAL BOUNDARY | 11AA029 | X | | | X | | | X |
| 16 | *MITCHELL RESERVOIR NEAR ELKWATER | 11AB099 | | X | | X | | | X |
| 17 | MOUNTAIN VIEW IRRIGATION DISTRICT CANAL | 05AD017 | X | | | X | | | X |
| 18 | +NORTH FORK MILK RIVER ABOVE ST. MARY CANAL | 11AA032 | X | | | X | | | X |
| 19 | NORTH MILK RIVER NEAR INTERNATIONAL BOUNDARY | 11AA001 | X | | | X | | | X |
| 20 | *REESOR RESERVOIR NEAR ELKWATER | 11AB090 | | X | | X | | | X |
| 21 | ROLPH CREEK NEAR KIMBALL | 05AE005 | X | | | X | | | X |
| 22 | SAGE CREEK AT Q RANCH NEAR WILD HORSE | 11AA026 | X | | | X | | | X |
| 23 | +SOUTH FORK MILK RIVER NEAR BABB | 11AA033 | X | | | X | | | X |
| 24 | +ST. MARY CANAL AT ST. MARY CROSSING | 05AE029 | X | | | X | | | X |
| 25 | ST. MARY RIVER AT INTERNATIONAL BOUNDARY | 05AE027 | X | | | | X | | X |
| 26 | +SWIFTCURRENT CREEK AT SHERBURNE | 05AE033 | X | | | X | | | X |
| 27 | VERDIGRIS COULEE NEAR THE MOUTH | 11AA038 | X | | | X | | | X |
| 28 | *WALBURGER COULEE BELOW DIVERSIONS | 11AB086 | X | | | X | | | X |
| 29 | WATERTON LAKE AT WATERTON PARK | 05AD025 | | X | | | X | | X |
| 30 | WATERTON RIVER NEAR WATERTON PARK | 05AD003 | 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 FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS 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 | |
| 3 | McLEOD RIVER NEAR ROSEVEAR | 07AG007 | X | | | | X | | X |
| 4 | NORTH SASKATCHEWAN RIVER AT EDMONTON | 05DF001 | X | | | | X | | X |
| 5 | NOTIKEWIN RIVER AT MANNING | 07HC001 | X | | | | X | | X |
| 6 | PEACE RIVER AT DUNVEGAN BRIDGE | 07FD003 | X | | | X | | | X |
| 7 | PEMBINA RIVER AT JARVIE | 07BC002 | X | | | | X | | X |
| 8 | RED DEER RIVER AT RED DEER | 05CC002 | X | | | | X | | X |
| 9 | SMOKY RIVER AT WATINO | 07GJ001 | X | | | | X | | X |
| 10 | 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 FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS 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 NANTON | 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 NEAR OLD FORT | 07DD011 | | X | | | X | X | |
| 2 | SPRING CREEK NEAR VALLEYVIEW | 07GF002 | X | | X | X | | | X |

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - RIVER BASIN MANAGEMENT (2)

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| | SYMBOL $ INDICATING STATION LOCATED IN ALBERTA BUT OPERATED BY WSC 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 | 07OB003 | 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 | NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE | 05DC001 | X | | | X | | | X |
| 17 | OLDMAN RIVER NEAR BROCKET | 05AA024 | X | | X | | X | | X |
| 18 | PEACE RIVER AT PEACE RIVER | 07HA001 | X | | X | | X | | X |
| 19 | RED DEER RIVER AT DRUMHELLER | 05CE001 | X | | | | X | | X |
| 20 | SMOKY RIVER ABOVE HELLS CREEK | 07GA001 | X | | | | X | | X |
| 21 | SOUTH SASKATCHEWAN RIVER AT MEDICINE HAT | 05AJ001 | X | | | | X | | X |
| 22 | ST. MARY RIVER NEAR LETHBRIDGE | 05AE006 | X | | | | X | | X |
| 23 | STEEN RIVER AT STEEN RIVER | 07OB004 | X | | | X | | | X |
| 24 | 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 FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS 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 PONOKA | 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 GLENWOOD | 05AD041 | X | | | | X | | X |
| 13 | BERLAND RIVER NEAR THE MOUTH | 07AC007 | X | | | X | | | X |
| 14 | BERRY CREEK NEAR ROSE LYNN | 05CH008 | X | | | X | | | X |
| 15 | BIGKNIFE CREEK NEAR GADSBY | 05FC002 | X | | | X | | | X |
| 16 | BLACKMUD CREEK NEAR ELLERSLIE | 05DF003 | X | | | X | | | X |
| 17 | BLINDMAN RIVER NEAR BLACKFALDS | 05CC001 | X | | | | X | | X |
| 18 | BOYER RIVER NEAR FORT VERMILION | 07JF002 | X | | | X | | | X |
| 19 | BRAZEAU RIVER BELOW CARDINAL RIVER | 05DD007 | X | | | X | | | X |
| 20 | BROWN CREEK AT FORESTRY ROAD | 05DD004 | X | | | X | | | X |
| 21 | BUCHANAN CREEK NEAR MANNING | 07HC002 | X | | | X | | | X |
| 22 | BUFFALO CREEK AT HIGHWAY NO. 41 | 05FE002 | X | | | X | | | X |
| 23 | BULLPOUND CREEK NEAR WATTS | 05CG004 | X | | | X | | | X |
| 24 | CADOTTE RIVER AT OUTLET CADOTTE LAKE | 07HB001 | X | | | X | | | X |
| 25 | CARDINAL RIVER NEAR THE MOUTH | 05DD008 | X | | | X | | | X |
| 26 | CASTLE RIVER AT RANGER STATION | 05AA028 | X | | | X | | | X |
| 27 | CATARACT CREEK NEAR FORESTRY ROAD | 05BL022 | X | | | | X | | X |
| 28 | CHINCHAGA RIVER NEAR HIGH LEVEL | 07OC001 | X | | | | X | | X |
| 29 | CHRISTINA RIVER NEAR CHARD | 07CE002 | X | | | X | | X | |
| 30 | CHRISTMAS CREEK NEAR BLUE RIDGE | 07AH002 | X | | | X | | | X |
| 31 | CLEAR RIVER NEAR BEAR CANYON | 07FD009 | X | | | X | | | X |
| 32 | CLEARWATER RIVER ABOVE LIMESTONE CREEK | 05DB003 | X | | | X | | | X |
| 33 | CLEARWATER RIVER NEAR DOVERCOURT | 05DB006 | X | | | | X | | X |
| 34 | CROWSNEST RIVER AT FRANK | 05AA008 | X | | | | X | | X |
| 35 | CUTBANK RIVER NEAR GRANDE PRAIRIE | 07GB001 | X | | | X | | X | |
| 36 | DAPP CREEK AT HIGHWAY NO. 44 | 07BC006 | X | | | X | | | X |
| 37 | DEEP VALLEY CREEK NEAR VALLEYVIEW | 07GF008 | X | | | X | | | X |
| 38 | DEER CREEK MAIN STEM | 05CA003 | X | | | X | | | X |
| 39 | DRIEDMEAT CREEK NEAR THE MOUTH | 05FA018 | X | | | X | | | X |
| 40 | DRIFTPILE RIVER NEAR DRIFTPILE | 07BH003 | X | | X | X | | | X |
| 41 | DRIFTWOOD RIVER NEAR THE MOUTH | 07BK007 | X | | | | X | | X |
| 42 | DRYWOOD CREEK NEAR TWIN BUTTE | 05AD016 | X | | | X | | | X |
| 43 | DUTCH CREEK NEAR THE MOUTH | 05AA026 | X | | | X | | | X |
| 44 | EAST PRAIRIE RIVER NEAR ENILDA | 07BF001 | X | | | X | | | X |
| 45 | ELBOW RIVER AT BRAGG CREEK | 05BJ004 | X | | | | X | | X |
| 46 | EUREKA RIVER NEAR WORSLEY | 07FD013 | X | | | X | | | X |
| 47 | FISH CREEK NEAR PRIDDIS | 05BK001 | X | | | X | | | X |
| 48 | FLAT CREEK NEAR BOYLE | 07CA003 | X | | | X | | | X |
| 49 | FREEMAN RIVER NEAR FORT ASSINIBOINE | 07AH001 | X | | | X | | | X |
| 50 | GHOST RIVER ABOVE WAIPOROUS CREEK | 05BG010 | X | | | | X | | X |

MAJOR DESIGNATION - FEDERAL-PROVINCIAL

SUBDESIGNATION - REGIONAL WATER QUANTITY INVENTORY (3)

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 51 | GRANDE PRAIRIE CREEK NEAR SEXSMITH | 07GE003 | X | | | X | | | X |
| 52 | GROS VENTRE CREEK NEAR DUNMORE | 05AH037 | X | | | X | | | X |
| 53 | HAYNES CREEK NEAR HAYNES | 05CD006 | X | | | X | | | X |
| 54 | HEART RIVER NEAR NAMPA | 07HA003 | X | | | | X | | X |
| 55 | HIGHWOOD RIVER AT DIEBEL'S RANCH | 05BL019 | X | | | X | | | X |
| 56 | HINES CREEK ABOVE GERRY LAKE | 07FD011 | X | | | X | | | X |
| 57 | HOUSE RIVER AT HIGHWAY NO.63 | 07CB002 | X | | | X | | X | |
| 58 | HUTCH LAKE TRIBUTARY NEAR HIGH LEVEL | 07OB007 | X | | | X | | | X |
| 59 | IOSEGUN RIVER NEAR LITTLE SMOKY | 07GG003 | X | | | X | | | X |
| 60 | IRON CREEK NEAR HARDISTY | 05FB002 | X | | | X | | | X |
| 61 | JACKFISH CREEK NEAR LA COREY | 06AC001 | X | | | X | | | X |
| 62 | JACKPINE CREEK AT WADLIN LAKE ROAD | 07JD003 | X | | | X | | | X |
| 63 | JAMES RIVER NEAR SUNDRE | 05CA002 | X | | | X | | | X |
| 64 | JUMPINGPOUND CREEK NEAR COX HILL | 05BH013 | X | | | X | | | X |
| 65 | JUMPINGPOUND CREEK NEAR THE MOUTH | 05BH009 | X | | | | X | | X |
| 66 | KEG RIVER AT HIGHWAY NO. 35 | 07HF002 | X | | | X | | | X |
| 67 | KNEEHILLS CREEK NEAR DRUMHELLER | 05CE002 | X | | | X | | | X |
| 68 | LA BICHE RIVER AT HIGHWAY 63 | 07CA011 | X | | | | X | | X |
| 69 | LAFOND CREEK NEAR RED EARTH CREEK | 07JC001 | X | | | X | | | X |
| 70 | LALBY CREEK NEAR GIROUXVILLE | 07GJ005 | X | | | X | | | X |
| 71 | LITTLE PADDLE RIVER NEAR MAYERTHORPE | 07BB005 | X | | | X | | | X |
| 72 | LITTLE RED DEER RIVER NEAR THE MOUTH | 05CB001 | X | | | | X | | X |
| 73 | LITTLE RED DEER RIVER NEAR WATER VALLEY | 05CB002 | X | | | X | | | X |
| 74 | LITTLE SMOKY RIVER NEAR GUY | 07GH002 | X | | | | X | | X |
| 75 | LLOYD CREEK NEAR BLUFFTON | 05CC009 | X | | | X | | | X |
| 76 | LOBSTICK RIVER NEAR STYAL | 07BB003 | X | | | | X | | X |
| 77 | LOGAN RIVER NEAR THE MOUTH | 07CA012 | X | | | X | | X | |
| 78 | LOVETT RIVER NEAR THE MOUTH | 07BA003 | X | | | X | | | X |
| 79 | LUTOSE CREEK NEAR STEEN RIVER | 07OB006 | X | | | X | | | X |
| 80 | MACKAY CREEK AT WALSH | 05AH002 | X | | | X | | | X |
| 81 | MANYBERRIES CREEK AT BRODIN'S FARM | 05AF010 | X | | | X | | | X |
| 82 | MASKWA CREEK NO. 1 ABOVE BEARHILLS LAKE | 05FA014 | X | | | X | | | X |
| 83 | McLEOD RIVER ABOVE EMBARRAS RIVER | 07AF002 | X | | | | X | | X |
| 84 | MEADOW CREEK NEAR THE MOUTH | 05AB029 | X | | | X | | | X |
| 85 | MEANDER RIVER AT OUTLET HUTCH LAKE | 07OB005 | X | | | X | | | X |
| 86 | MEDICINE RIVER NEAR ECKVILLE | 05CC007 | X | | | | X | | X |
| 87 | MEETING CREEK NEAR DONALDA | 05FC006 | X | | | X | | | X |
| 88 | MILL CREEK NEAR THE MOUTH | 05AA011 | X | | | X | | | X |
| 89 | MONITOR CREEK NEAR MONITOR | 05GA003 | X | | | X | | | X |
| 90 | MONTAGNEUSE RIVER NEAR HINES CREEK | 07FD012 | X | | | X | | | X |
| 91 | MUSKEG RIVER NEAR GRANDE CACHE | 07GA002 | X | | | | X | | X |
| 92 | NAMEPI CREEK NEAR THE MOUTH | 05EC004 | 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 ROCHFORT BRIDGE | 07BB004 | X | | | X | | | X |
| 99 | PARFLESH CREEK NEAR CHANCELLOR | 05BM007 | 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 FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS 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 | PEMBINA RIVER BELOW PADDY CREEK | 07BA001 | X | | | X | | | X |
| 104 | PICHE RIVER NEAR IMPERIAL MILLS | 07CA010 | X | | | X | | | X |
| 105 | PIGEON 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 | PINTO CREEK NEAR GRANDE PRAIRIE | 07GC002 | X | | | X | | | X |
| 109 | PIPESTONE CREEK BELOW BIGSTONE CREEK | 05FA022 | X | | | X | | | X |
| 110 | PIPESTONE RIVER NEAR LAKE LOUISE | 05BA002 | X | | | | X | | X |
| 111 | PONTON RIVER ABOVE BOYER RIVER | 07JF003 | X | | | X | | | X |
| 112 | PRAIRIE BLOOD COULEE NEAR LETHBRIDGE | 05AD035 | X | | | X | | | X |
| 113 | PRAIRIE CREEK BELOW LICK CREEK | 05DB005 | X | | | X | | | X |
| 114 | PRAIRIE CREEK NEAR ROCKY MOUNTAIN HOUSE | 05DB002 | X | | | | X | | X |
| 115 | PUNK CREEK NEAR THE MOUTH | 06AB003 | X | | | X | | | X |
| 116 | RACEHORSE CREEK NEAR THE MOUTH | 05AA027 | X | | | X | | | X |
| 117 | RAM RIVER NEAR THE MOUTH | 05DC006 | X | | | | X | | X |
| 118 | RAT CREEK NEAR CYNTHIA | 07BA002 | X | | | X | | | X |
| 119 | RAVEN RIVER NEAR RAVEN | 05CB004 | X | | | | X | | X |
| 120 | RAY CREEK NEAR INNISFAIL | 05CE010 | X | | | X | | | X |
| 121 | RED DEER RIVER ABOVE PANTHER RIVER | 05CA004 | X | | | X | | | X |
| 122 | RED DEER RIVER BELOW BURNT TIMBER CREEK | 05CA009 | X | | | | X | | X |
| 123 | REDWATER RIVER NEAR THE MOUTH | 05EC005 | X | | | X | | | X |
| 124 | REITA CREEK NEAR OUTLET ANGLING LAKE | 06AD013 | X | | | | X | | X |
| 125 | RENWICK CREEK NEAR THREE HILLS | 05CE011 | X | | | X | | | X |
| 126 | RIBSTONE CREEK NEAR CZAR | 05FD005 | X | | | X | | | X |
| 127 | RIBSTONE CREEK NEAR EDGERTON | 05FD001 | X | | | X | | | X |
| 128 | RIBSTONE CREEK TRIBUTARY NEAR CORONATION | 05FD006 | X | | | X | | | X |
| 129 | ROSE CREEK NEAR ALDER FLATS | 05DE007 | X | | | X | | | X |
| 130 | ROSEBUD RIVER BELOW CARSTAIRS CREEK | 05CE006 | X | | | X | | | X |
| 131 | ROSS CREEK NEAR IRVINE | 05AH003 | X | | | X | | | X |
| 132 | SADDLE RIVER NEAR WOKING | 07FD006 | X | | | X | | | X |
| 133 | SAKWATAMAU RIVER NEAR WHITECOURT | 07AH003 | X | | | X | | | X |
| 134 | SAM LAKE TRIBUTARY NEAR SCHULER | 05AH047 | X | | | X | | | X |
| 135 | SAND RIVER NEAR THE MOUTH | 06AB001 | X | | | X | | | X |
| 136 | SAULTEAUX RIVER NEAR SPURFIELD | 07BK005 | X | | | X | | | X |
| 137 | SAWRIDGE CREEK NEAR SLAVE LAKE | 07BK009 | X | | | X | | | X |
| 138 | SHEEP COULEE NEAR CARSTAIRS | 05CE019 | X | | | X | | | X |
| 139 | SHEEP RIVER AT BLACK DIAMOND | 05BL014 | X | | | | X | | X |
| 140 | SIFFLEUR RIVER NEAR THE MOUTH | 05DA002 | X | | | X | | | X |
| 141 | SIMONETTE RIVER NEAR GOODWIN | 07GF001 | X | | | | X | | X |
| 142 | SOUNDING CREEK NEAR OYEN | 05GA008 | X | | | X | | | X |
| 143 | SOUSA CREEK NEAR HIGH LEVEL | 07OA001 | X | | | X | | | X |
| 144 | STIMSON CREEK NEAR PEKISKO | 05BL007 | X | | | X | | | X |
| 145 | STRAWBERRY CREEK NEAR THE MOUTH | 05DF004 | X | | | X | | | X |
| 146 | STRETTON CREEK NEAR MARWAYNE | 05EE005 | X | | | X | | | X |
| 147 | STURGEON RIVER NEAR FORT SASKATCHEWAN | 05EA001 | X | | | X | | | X |
| 148 | SUNDANCE CREEK NEAR BICKERDIKE | 07AF010 | X | | | X | | | X |
| 149 | SWAN RIVER NEAR SWAN HILLS | 07BJ003 | X | | | X | | | X |
| 150 | THREEHILLS CREEK BELOW RAY CREEK | 05CE018 | 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 | THREEHILLS CREEK NEAR CARBON | 05CE007 | X | | | X | | | X |
| 152 | THREEPOINT CREEK NEAR MILLARVILLE | 05BL013 | X | | | X | | | X |
| 153 | TODD CREEK AT ELTON'S RANCH | 05AA006 | X | | | X | | | X |
| 154 | TOMAHAWK CREEK NEAR TOMAHAWK | 05DE009 | X | | | X | | | X |
| 155 | VERMILION RIVER NEAR MARWAYNE | 05EE007 | X | | | X | | | X |
| 156 | WABAMUN CREEK NEAR DUFFIELD | 05DE003 | X | | | X | | | X |
| 157 | WABASCA RIVER BELOW TROUT RIVER | 07JB002 | X | | | X | | X | |
| 158 | WABASH CREEK NEAR PIBROCH | 07BC007 | X | | | X | | | X |
| 159 | WAINSCOTT COULEE NEAR BROWNVALE | 07FD014 | X | | | X | | | X |
| 160 | WAIPAROUS CREEK NEAR THE MOUTH | 05BG006 | X | | | | X | | X |
| 161 | WANDERING RIVER NEAR WANDERING RIVER | 07CA006 | X | | | | X | | X |
| 162 | WASKAHIGAN RIVER NEAR THE MOUTH | 07GG001 | X | | | | X | | X |
| 163 | WASKATENAU CREEK NEAR WASKATENAU | 05EC002 | X | | | X | | | X |
| 164 | WELCH CREEK TRIBUTARY NEAR LEEDALE | 05CC010 | X | | | X | | | X |
| 165 | WEST ARROWWOOD CREEK NEAR ARROWWOOD | 05BM014 | X | | | X | | | X |
| 166 | WEST PRAIRIE RIVER NEAR HIGH PRAIRIE | 07BF002 | X | | | | X | | X |
| 167 | WHITEMUD CREEK NEAR ELLERSLIE | 05DF006 | X | | | X | | | X |
| 168 | WHITEMUD CREEK (WEST BRANCH) NEAR IRETON | 05DF007 | X | | | X | | | X |
| 169 | WHITEMUD RIVER NEAR DIXONVILLE | 07HA005 | X | | | | X | | X |
| 170 | WILDHAY RIVER NEAR HINTON | 07AC001 | X | | | X | | | X |
| 171 | WILLOW CREEK ABOVE CHAIN LAKES | 05AB028 | X | | | | X | | X |
| 172 | WILLOW CREEK NEAR NOLAN | 05AB002 | X | | | X | | | X |
| 173 | WILLOW RIVER NEAR WABASCA | 07JA003 | X | | | X | | | X |
| 174 | WOLF CREEK AT HIGHWAY NO. 16A | 07AG003 | X | | | | X | | X |
| 175 | WOLF RIVER AT OUTLET OF WOLF LAKE | 06AB002 | X | | | | X | X | |

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

| 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 | APL COOLING POND OUTLET | 05CH015 | X | | | X | | | X |
| 2 | ATHABASCA RIVER NEAR WINDFALL | 07AE001 | X | | | X | | | X |
| 3 | ATLAS MINE COULEE AT WESTERN MONARCH | 05CG005 | X | | | X | | | X |
| 4 | BABETTE CREEK NEAR COLINTON | 07CA008 | X | | | X | | | X |
| 5 | BAPTISTE LAKE NEAR ATHABASCA | 07BE002 | | X | | X | | | X |
| 6 | BAPTISTE RIVER NEAR THE MOUTH | 05DC012 | X | | | | X | | X |
| 7 | BATTLE RIVER ABOVE PIPESTONE CREEK | 05FA023 | X | | | X | | | X |
| 8 | BATTLE RIVER NEAR FORESTBURG | 05FC001 | X | | | X | | | X |
| 9 | BEAR CREEK NEAR VALHALLA CENTRE | 07GE007 | X | | | X | | | X |
| 10 | BEAR LAKE NEAR CLAIRMONT | 07GE004 | | X | | X | | | X |
| 11 | BEAR RIVER NEAR GRANDE PRAIRIE | 07GE005 | X | | | | X | | X |
| 12 | BEAVER LAKE AT RANGER STATION | 06AA003 | | X | | X | | | X |
| 13 | BEAVERTAIL CREEK NEAR HYTHE | 07GD002 | X | | | X | | | X |
| 14 | BELLY-ST. MARY DIVERSION CANAL | 05AD021 | X | | | X | | | X |
| 15 | BERRY CREEK BELOW DEADFISH CREEK | 05CH016 | X | | | X | | | X |
| 16 | BERRY CREEK RESERVOIR NEAR SUNNYNOOK | 05CH014 | | X | | X | | | X |
| 17 | BERRY CREEK RESERVOIR OUTLET | 05CH011 | X | | | X | | | X |
| 18 | BIRCH CREEK NEAR CONKLIN | 07CE006 | X | | | X | | X | |
| 19 | BLINDMAN RIVER NEAR BLUFFTON | 05CC008 | X | | | X | | | X |
| 20 | BLOOD INDIAN CREEK NEAR CABIN LAKE | 05CK007 | X | | | X | | | X |
| 21 | BLOOD INDIAN CREEK NEAR THE MOUTH | 05CK001 | X | | | X | | | X |
| 22 | B.R.D. DRAIN D NEAR VAUXHALL | 05BN008 | X | | | X | | | X |
| 23 | B.R.D. DRAIN T NEAR HAYS | 05AG005 | X | | | X | | | X |
| 24 | BOYER RIVER NEAR PADDLE PRAIRIE | 07JF004 | X | | | X | | | X |
| 25 | BUFFALO LAKE NEAR ERSKINE | 05CD005 | | X | | X | | | X |
| 26 | CABIN CREEK NEAR SEEBE | 05BF019 | X | | | | X | | X |
| 27 | CALLING LAKE AT RANGER STATION | 07CB001 | | X | | X | | | X |
| 28 | CANADIAN ST. MARY CANAL AT DROP NO. 1 | 05AF028 | X | | | X | | | X |
| 29 | CAVAN LAKE DIVERSION NEAR DUNMORE | 05AH044 | X | | | X | | | X |
| 30 | CAVAN LAKE NEAR DUNMORE | 05AH048 | | X | | X | | | X |
| 31 | CHIP LAKE AT OUTLET TO LOBSTICK RIVER | 07BB008 | | X | | X | | | X |
| 32 | CLEAR BROOK NEAR STAVELY | 05AC033 | X | | | X | | | X |
| 33 | COAL CREEK AT BOW CITY | 05BN014 | X | | | X | | | X |
| 34 | COLQUHOUN CREEK NEAR GRANDE PRAIRIE | 07GE006 | X | | | X | | | X |
| 35 | CONNOR CREEK NEAR SANGUDO | 07BB009 | X | | | X | | | X |
| 36 | COOKING LAKE AT COOKING LAKE | 05EB012 | | X | | X | | | X |
| 37 | COYOTE CREEK NEAR CHERHILL | 07BB014 | X | | | X | | | X |
| 38 | DEADFISH INFLOW CANAL NEAR CESSFORD | 05CH012 | X | | | X | | | X |
| 39 | DEERLICK CREEK NEAR HINTON | 07AF004 | X | | X | X | | | X |
| 40 | DICKSON DAM TUNNEL OUTLET | 05CB007 | X | | | | X | | X |
| 41 | DRYWOOD CREEK NEAR THE MOUTH | 05AD010 | X | | | | X | | X |
| 42 | ELBOW RIVER ABOVE ELBOW FALLS | 05BJ006 | X | | | X | | | X |
| 43 | ELBOW RIVER BELOW GLENMORE DAM | 05BJ001 | X | | | | X | | X |
| 44 | ELDER CREEK AT HIGHWAY NO. 686 | 07HB002 | X | | | X | | | X |
| 45 | ELKWATER LAKE AT ELKWATER | 05AH025 | | X | | X | | | X |
| 46 | EMBARASS RIVER NEAR WEALD | 07AF014 | X | | | X | | | X |
| 47 | FAWCETT LAKE NEAR SMITH | 07BK008 | | X | | X | | | X |
| 48 | FISH CREEK ABOVE LITTLE FISH LAKE | 05CG006 | X | | | X | | | X |
| 49 | FORSTER RESERVOIR NEAR CESSFORD | 05CH013 | | X | | X | | | X |
| 50 | GOLD CREEK NEAR FRANK | 05AA030 | X | | | X | | | X |

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 51 | GREGG RIVER NEAR THE MOUTH | 07AF015 | X | | | X | | | X |
| 52 | GROAT CREEK NEAR WHITECOURT | 07AG008 | X | | | X | | | X |
| 53 | GULL LAKE AT ASPEN BEACH | 05CC006 | | X | | X | | | X |
| 54 | HAMMER HILL SPILLWAY NEAR GLEICHEN | 05BM005 | X | | | X | | | X |
| 55 | HARTLEY CREEK NEAR FORT MACKAY | 07DA009 | X | | | | X | X | |
| 56 | HASTINGS LAKE NEAR DEVILLE | 05EB011 | | X | | X | | | X |
| 57 | HIGHWOOD RIVER AT HIGH RIVER | 05BL003 | X | | | | X | | X |
| 58 | HIGHWOOD RIVER NEAR ALDERSYDE | 05BL009 | X | | | X | | | X |
| 59 | HILDA LAKE NEAR COLD LAKE | 06AC003 | | X | | X | | | X |
| 60 | HINES CREEK NEAR FAIRVIEW | 07FD008 | X | | | X | | | X |
| 61 | IRON CREEK NEAR VIKING | 05FB003 | X | | | X | | | X |
| 62 | ISLE LAKE AT EUREKA BEACH | 05EA008 | | X | | X | | | X |
| 63 | JACKFISH RIVER BELOW CHRISTINA LAKE | 07CE005 | X | | | X | | X | |
| 64 | JOSLYN CREEK NEAR FORT MACKAY | 07DA016 | X | | | X | | X | |
| 65 | KENNEDY COULEE NEAR ACADIA VALLEY | 05CK006 | X | | | X | | | X |
| 66 | KILLARNEY LAKE TRIBUTARY NEAR CHAUVIN | 05GA010 | X | | | X | | | X |
| 67 | KIRKPATRICK LAKE TRIBUTARY NEAR SPONDIN | 05GA009 | X | | | X | | | X |
| 68 | KYISKAP CREEK NEAR GRANUM | 05AB038 | X | | | X | | | X |
| 69 | LAC LA BICHE AT LAC LA BICHE | 07CA004 | | X | | X | | | X |
| 70 | LAC LA NONNE AT LAC LA NONNE | 07BB007 | | X | | X | | | X |
| 71 | LAC STE. ANNE AT ALBERTA BEACH | 05EA006 | | X | | X | | | X |
| 72 | LATERAL 10 SPILLWAY NEAR CHIN | 05AG007 | X | | | X | | | X |
| 73 | LESSER SLAVE LAKE AT SLAVE LAKE | 07BJ006 | | X | | | X | | X |
| 74 | LITTLE BERLAND RIVER AT HIGHWAY NO. 40 | 07AC008 | X | | | X | | | X |
| 75 | LITTLE ELBOW RIVER ABOVE NIHAHI CREEK | 05BJ009 | X | | | X | | | X |
| 76 | LITTLE SMOKY RIVER AT LITTLE SMOKY | 07GG002 | X | | | X | | | X |
| 77 | LOMOND LATERAL NEAR HEADGATE | 05AC017 | X | | | X | | | X |
| 78 | LOYALIST CREEK NEAR CONSORT | 05GA013 | X | | | X | | | X |
| 79 | MACKAY CREEK NEAR GRABURN GAP | 05AH042 | X | | | X | | | X |
| 80 | MACKAY RIVER ABOVE DUNKIRK RIVER | 07DB005 | X | | | X | | X | |
| 81 | MANATOKAN RIVER NEAR IRON RIVER | 06AC009 | X | | | X | | | X |
| 82 | McALPINE CREEK (EAST FORK) NEAR ELKWATER | 05AH043 | X | | | X | | | X |
| 83 | McGILLIVRAY CREEK NEAR COLEMAN | 05AA013 | X | | | X | | | X |
| 84 | McGREGOR LAKE INFLOW NEAR MILO | 05AC024 | X | | | X | | | X |
| 85 | McGREGOR-TRAVERS CANAL NEAR CHAMPION | 05AC025 | X | | | X | | | X |
| 86 | McLEOD RIVER NEAR CADOMIN | 07AF013 | X | | | X | | | X |
| 87 | McLEOD RIVER NEAR WHITECOURT | 07AG004 | X | | | X | | | X |
| 88 | MICHICHI CREEK AT DRUMHELLER | 05CE020 | X | | | X | | | X |
| 89 | MILK RIVER RIDGE RESERVOIR | 05AF030 | | X | | X | | | X |
| 90 | MINISTIK LAKE NEAR NEW SAREPTA | 05EB013 | | X | | X | | | X |
| 91 | MIQUELON LAKE AT PROVINCIAL PARK | 05EB014 | | X | | X | | | X |
| 92 | MONITOR CREEK NEAR CONSORT | 05GA011 | X | | | X | | | X |
| 93 | MOORE LAKE NEAR COLD LAKE | 06AC002 | | X | | X | | | X |
| 94 | MOOSEHILLS CREEK NEAR ELK POINT | 05ED003 | X | | | X | | | X |
| 95 | MOOSELAKE RIVER NEAR FRANCHERE | 06AC006 | X | | | | X | | X |
| 96 | MOSQUITO CREEK NEAR THE MOUTH | 05AC031 | X | | | X | | | X |
| 97 | MURIEL LAKE NEAR GURNEYVILLE | 06AC007 | | X | | | X | | X |
| 98 | NINE MILE COULEE NEAR LETHBRIDGE | 05AE042 | X | | | X | | | X |
| 99 | NORTH SASKATCHEWAN RIVER NEAR LODGEPOLE | 05DE006 | | X | | X | | | X |
| 100 | NOSE CREEK AT CALGARY | 05BH003 | X | | | X | | | X |

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | |
| 101 | OLDMAN RIVER NEAR THE MOUTH | 05AG006 | X | | | | X | | X |
| 102 | PADDLE RIVER AT HWY. 764 | 07BB013 | | X | | X | | | X |
| 103 | PADDLE RIVER NEAR ANSELMO | 07BB011 | X | | | X | | | X |
| 104 | PADDLE RIVER NEAR SANGUDO | 07BB012 | | X | | X | | | X |
| 105 | PAINTEARTH CREEK NEAR HALKIRK | 05FC004 | X | | | X | | | X |
| 106 | PARLBY CREEK AT ALIX | 05CD007 | X | | | X | | | X |
| 107 | PEACE RIVER AT FORT VERMILION | 07HF001 | | X | | X | | | X |
| 108 | PEERLESS LAKE AT PEERLESS LAKE | 07JB001 | | X | | X | | X | |
| 109 | PEMBINA RIVER NEAR ENTWISTLE | 07BB002 | X | | | | X | | X |
| 110 | PIGEON LAKE AT GRANDVIEW | 05FA013 | | X | | X | | | X |
| 111 | PONY CREEK NEAR CHARD | 07CE003 | X | | | X | | X | |
| 112 | POPLAR CREEK NEAR FORT McMURRAY | 07DA007 | X | | | | X | X | |
| 113 | PORTER CREEK ABOVE BAPTISTE LAKE | 07BE003 | X | | | X | | | X |
| 114 | POTHOLE TURNOUT NEAR MAGRATH | 05AE038 | X | | | X | | | X |
| 115 | REDWATER RIVER NEAR VIMY | 05EC007 | X | | | X | | | X |
| 116 | REDWILLOW CREEK NEAR RED WILLOW | 05FC005 | X | | | X | | | X |
| 117 | REDWILLOW RIVER NEAR BEAVERLODGE | 07GD003 | X | | | | X | | X |
| 118 | ROBERT CREEK NEAR ANZAC | 07CE004 | X | | | X | | X | |
| 119 | ROLLING HILLS CANAL NO. 1 SPILL | 05BN015 | X | | | X | | | X |
| 120 | ROLLING HILLS CANAL NO. 2 SPILL | 05BN019 | X | | | X | | | X |
| 121 | SALT CREEK NEAR GROUARD | 07BF009 | X | | | X | | | X |
| 122 | SNAKE CREEK NEAR VULCAN | 05AC030 | X | | | X | | | X |
| 123 | SOUNDING CREEK NEAR CHINOOK | 05GA012 | X | | | X | | | X |
| 124 | SOUTH HEART RESERVOIR NEAR McLENNAN | 07BF008 | | X | | X | | | X |
| 125 | SOUTH WABASCA LAKE NEAR DESMARAIS | 07JA002 | | X | | X | | | X |
| 126 | SPRAY RIVER AT BANFF | 05BC001 | X | | | | X | | X |
| 127 | STEELE LAKE NEAR JARVIE | 07BC005 | | X | | X | | | X |
| 128 | STIRLING LAKE OUTFLOW NEAR STIRLING | 05AF029 | X | | | X | | | X |
| 129 | STONY CREEK NEAR TAWATINAW | 07BE004 | X | | | X | | | X |
| 130 | STURGEON LAKE AT WILLIAMSON PARK | 07GH003 | | X | | X | | | X |
| 131 | STURGEON RIVER AT ST. ALBERT | 05EA002 | X | | | X | | | X |
| 132 | STURGEON RIVER NEAR MAGNOLIA BRIDGE | 05EA010 | X | | | X | | | X |
| 133 | STURGEON RIVER NEAR VILLENEUVE | 05EA005 | X | | | | X | | X |
| 134 | SYLVAN LAKE AT SYLVAN LAKE | 05CC003 | | X | | X | | | X |
| 135 | TEEPEE CREEK NEAR LA CRETE | 07JD004 | X | | | X | | | X |
| 136 | TRAP CREEK NEAR LONGVIEW | 05BL027 | X | | | X | | | X |
| 137 | TROUT CREEK NEAR GRANUM | 05AB005 | X | | | X | | | X |
| 138 | TYRELL LAKE OUTFLOW NEAR NEW DAYTON | 05AF031 | X | | | X | | | X |
| 139 | UNNAMED CREEK NEAR FORT MACKAY | 07DA011 | X | | | X | | X | |
| 140 | UTIKUMA LAKE NEAR NIPISI | 07JA001 | | X | | X | | | X |
| 141 | VERMILION PARK LAKE NEAR VERMILION | 05EE008 | | X | | X | | | X |
| 142 | VERMILION RIVER NEAR VEGREVILLE | 05EE003 | X | | | X | | | X |
| 143 | VERMILION RIVER TRIBUTARY NEAR BRUCE | 05EE006 | X | | | X | | | X |
| 144 | WABAMUN LAKE AT WABAMUN | 05DE002 | | X | | | X | | X |
| 145 | WABATANISK RIVER AT HIGHWAY NO. 676 | 07GH005 | X | | | X | | | X |
| 146 | WAMPUS CREEK NEAR HINTON | 07AF003 | X | | X | X | | | X |
| 147 | WASKASOO CREEK AT RED DEER | 05CC011 | X | | | X | | | X |
| 148 | WATERTON RIVER NEAR GLENWOOD | 05AD028 | X | | | | X | | X |
| 149 | WATERTON-BELLY DIVERSION CANAL | 05AD027 | X | | | X | | | X |
| 150 | WEILLER CREEK NEAR WETASKAWIN | 05FA024 | X | | | X | | | X |

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

| NO. | STATION NAME | STATION NUMBER | | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - WATER SURVEY OF CANADA, CALGARY DISTRICT | | | | | | | | | |
| 151 | WEST ARROWWOOD CREEK NEAR ENSIGN | 05BM018 | | X | | | X | | | X |
| 152 | WESTERN IRRIGATION DISTRICT CANAL B NEAR HEADGATE | 05BM017 | | X | | | X | | | X |
| 153 | WHITE EARTH CREEK NEAR SMOKY LAKE | 05EC006 | | X | | | X | | | X |
| 154 | WILLOW CREEK BELOW LANE CREEK | 05AB039 | | X | | | X | | | X |
| 155 | WILLOW CREEK NEAR CLARESHOLM | 05AB021 | | X | | | | X | | X |
| 156 | WINAGAMI LAKE AT PROVINCIAL PARK | 07BF006 | | | X | | X | | | X |
| | OPERATED BY - ALBERTA GOVERNMENT | | | | | | | | | |
| | PAD AREA | | | | | | | | | |
| 1 | BIG POINT CHANNEL BELOW DIVERGENCE | 07DD006 | MISC | X | | | | X | X | |
| 2 | EMBARRAS RIVER BELOW DIVERGENCE | 07DD003 | MISC | X | | | | X | X | |
| 3 | EMBARRAS RIVER DIVERGENCE TO CREED CREEK | 07KF901 | 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 | LAKE ATHABASCA AT BUSTARD ISLAND | 07MD002 | | | X | | | X | X | |
| 7 | MAMAWI LAKE CHANNEL AT OLD DOG CAMP | 07KF003 | | | X | | | X | X | |
| 8 | PRAIRIE RIVER NEAR LAKE CLAIRE | 07KF014 | MISC | X | | | X | | X | |
| 9 | REVILLON COUPE BELOW RIVIERE DES ROCHERS | 07NA004 | MISC | X | | | | | X | |
| 10 | RICHARDSON LAKE AT THE OUTLET | 07DD008 | | | X | | X | | X | |
| 11 | RIVIERE DES ROCHERS AT BEN HOULE'S CABIN | 07NA002 | MISC | X | | | | X | X | |
| | OTHER AREAS OF ALBERTA | | | | | | | | | |
| 1 | ATIM CREEK NEAR SPRUCE GROVE | 05EA009 | | X | | | X | | | X |
| 2 | BEARBERRY CREEK NEAR SUNDRE | 05CA011 | | X | | | X | | | X |
| 3 | BEDDINGTON CREEK NEAR CALGARY | 05BH904 | | X | | | X | | | X |
| 4 | BIGELOW RESERVOIR NEAR WIMBOURNE | 05CE901 | | | X | | X | | | X |
| 5 | B.R.I.D. MAIN CANAL AT DROP NO. 3 | 05AC902 | | X | | | X | | | X |
| 6 | B.R.I.D. WESTERN BLOCK LATERAL A NEAR HEADGATES | 05AC013 | | X | | | X | | | X |
| 7 | BRIDLEBIT CREEK NEAR VALLEYVIEW | 07GF005 | | X | | X | X | | | X |
| 8 | COLUMBINE CREEK NEAR THE MOUTH | 06AA004 | | X | | | X | | | X |
| 9 | COTTONWOOD CREEK NEAR TWIN BUTTE | 05AD903 | | X | | | X | | | X |
| 10 | DRIEDMEAT LAKE AT OUTFLOW | 05FA020 | | | X | | X | | | X |
| 11 | ELBOW RIVER AT SARCEE BRIDGE | 05BJ010 | | X | | | X | | | X |
| 12 | EMBARRAS RIVER AT ROBB | 07AF909 | | X | | | X | | | X |
| 13 | ERITH RIVER BELOW HANLAN CREEK | 07AF907 | | X | | | X | | | X |
| 14 | ETZIKOM COULEE NEAR NEMISKAM | 05AF905 | | X | | | X | | | X |
| 15 | FALLENTIMBER CREEK NEAR SUNDRE | 05CA012 | | X | | | X | | | X |
| 16 | FOOTHILLS CREEK NEAR PINCHER CREEK | 05AD901 | | X | | | X | | | X |
| 17 | GALWEY BROOK NEAR WATERTON PARK | 05AD904 | | X | | | X | | | X |
| 18 | GREGG RIVER NEAR HINTON | 07AF906 | | X | | | X | | | X |
| 19 | HORSE CREEK NEAR VALLEYVIEW | 07GF007 | | X | | X | X | | | X |
| 20 | KRAWCHUK DRAINAGE NEAR McLENNAN | 07HA902 | | X | | | X | | | X |
| 21 | LEE CREEK BELOW CONFLUENCE OF EAST FORK | 05AE905 | | X | | | X | | | X |
| 22 | L.N.I.D. CANAL AT DROP NO. 6 | 05AC918 | | X | | | X | | | X |
| 23 | L.N.I.D. CANAL BELOW KEHO OUTFLOW | 05AC026 | | X | | | X | | | X |
| 24 | L.N.I.D. CANAL BELOW MONARCH HEADGATES | 05AC029 | | X | | | X | | | X |
| 25 | LODGE CREEK AT HIGHWAY NO.41 | 11AB902 | | X | | | X | | | X |

MAJOR DESIGNATION - PROVINCIAL

SUBDESIGNATION - PROVINCIAL DEPARTMENTAL PROGRAMS

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - ALBERTA GOVERNMENT | | | | | | | | |
| 26 | MUSKEG CREEK NEAR WESTROSE | 05FA912 | X | | | X | | | X |
| 27 | NOSE CREEK NEAR THE MOUTH | 05BH901 | X | | | X | | | X |
| 28 | PARLBY CREEK NEAR MIRROR | 05CD902 | X | | | X | | | X |
| 29 | POINTE-AUX-PINS CREEK NEAR ARDROSSAN | 05EB902 | X | | | X | | | X |
| 30 | POINTE-AUX-PINS TRIBUTARY 1 NEAR ARDROSSAN | 05EB909 | X | | | X | | | X |
| 31 | POINTE-AUX-PINS TRIBUTARY 2 NEAR ARDROSSAN | 05EB910 | X | | | X | | | X |
| 32 | POINTE-AUX-PINS TRIBUTARY 3 NEAR ARDROSSAN | 05EB911 | X | | | X | | | X |
| 33 | ROCKY CREEK NEAR VALLEYVIEW | 07GF006 | X | | X | X | | | X |
| 34 | ROMEO CREEK ABOVE ROMEO LAKE | 07BB903 | X | | | X | | | X |
| 35 | RYCROFT SURVEY #3 NEAR RYCROFT | 07FD910 | X | | | X | | | X |
| 36 | SPRING CREEK (UPPER) NEAR VALLEYVIEW | 07GF004 | X | | X | X | | | X |
| 37 | SQUAW COULEE DIVERSION BELOW SQUAW COULEE DAM | 05AC917 | X | | | X | | | X |
| 38 | TODD CREEK NEAR HIGHWAY 22 | 05AA909 | X | | | X | | | X |
| 39 | TOUGH CREEK NEAR BEAZER | 05AE039 | X | | | X | | | X |
| 40 | VERMILION RIVER DRAINAGE NEAR HOLDEN | 05EE913 | X | | | X | | | X |
| 41 | VIXEN CREEK NEAR BELLOY | 07FD921 | X | | | X | | | X |
| 42 | WOLVERINE CREEK NEAR VALLEYVIEW | 07GF003 | X | | X | X | | | X |
| 43 | YOUNG DRAINAGE NEAR SPIRIT RIVER | 07FD913 | X | | | X | | | X |

MAJOR DESIGNATION - CONTRIBUTED DATA

| NO. | STATION NAME | STATION NUMBER | RECORD OBTAINED FLOW | LEVEL | SED. | OPERATION 8M | 12M | ACCESS REMOTE | NORMAL |
|---|---|---|---|---|---|---|---|---|---|
| | OPERATED BY - TRANSALTA UTILITIES LTD. | | | | | | | | |
| 1 | BARRIER LAKE NEAR SEEBE | 05BF024 | | X | | | X | | X |
| 2 | BOW RIVER BELOW BEARSPAW DAM | 05BH008 | X | | | | X | | X |
| 3 | BOW RIVER NEAR SEEBE | 05BE004 | X | | | | X | | X |
| 4 | BRAZEAU RESERVOIR | 05DD006 | | X | | | X | | X |
| 5 | BRAZEAU RIVER BELOW BRAZEAU PLANT | 05DD005 | X | | | | X | | X |
| 6 | CASCADE POWER DIVERSION NEAR BANFF | 05BD004 | X | | | | X | | X |
| 7 | GHOST LAKE NEAR COCHRANE | 05BE005 | | X | | | X | | X |
| 8 | GHOST RIVER DIVERSION TO LAKE MINNEWANKA | 05BG003 | X | | | | X | | X |
| 9 | GHOST RIVER NEAR BLACK ROCK MOUNTAIN | 05BG002 | X | | | X | | | X |
| 10 | GOAT CREEK AT BANFF PARK BOUNDARY | 05BC008 | X | | | | X | | X |
| 11 | KANANASKIS RIVER ABOVE POCATERRA CREEK | 05BF003 | X | | | | X | | X |
| 12 | KANANASKIS RIVER BELOW BARRIER DAM | 05BF025 | X | | | | X | | X |
| 13 | LAKE ABRAHAM NEAR NORDEGG | 05DC009 | | X | | | X | | X |
| 14 | LAKE MINNEWANKA NEAR BANFF | 05BD003 | | X | | | X | | X |
| 15 | LOWER KANANASKIS LAKE AT POCATERRA DAM | 05BF009 | | X | | | X | | X |
| 16 | MUD LAKE DIVERSION CANAL | 05BF013 | X | | | X | | | X |
| 17 | NORTH SASKATCHEWAN RIVER BELOW BIGHORN PLANT | 05DC010 | X | | | | X | | X |
| 18 | SPRAY POWER DIVERSION AT CANMORE | 05BE007 | X | | | | X | | X |
| 19 | SPRAY RESERVOIR AT THREE SISTERS DAM | 05BC006 | | X | | | X | | X |
| 20 | UPPER KANANASKIS LAKE AT MAIN DAM | 05BF005 | | X | | | X | | X |
| | OPERATED 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 8M | OPERATION 12M | ACCESS REMOTE | ACCESS NORMAL |
|---|---|---|---|---|---|---|---|
| | FEDERAL - 4 | | | | | | |
| 1 | SLAVE RIVER AT FITZGERALD | 07NB001 | F-2 | X | | X | |
| | FEDERAL - PROVINCIAL - 3 | | | | | | |
| 1 | ATHABASCA RIVER AT McMURRAY*** | 07CC002 | FP-1 | X | | X | |
| 2 | CLEARWATER RIVER AT DRAPER | 07CD001 | FP-1 | X | | X | |
| 3 | OLDMAN RIVER NEAR LETHBRIDGE | 05AD007 | F-2 | X | | | X |
| 4 | PEACE RIVER AT PEACE RIVER | 07HA001 | F-4 | X | | | X |
| | PROVINCIAL - 1 | | | | | | |
| 1 | DRIFTPILE RIVER NEAR DRIFTPILE | 07BH003 | FP-3 | X | | | X |
| 2 | LESSER SLAVE RIVER AT HIGHWAY NO.2A | 07BK006 | F-1 | X | | | X |
| 3 | OLDMAN RIVER NEAR WALDRONS CORNER | 05AA023 | FP-3 | X | | | X |
| 4 | SWAN RIVER NEAR KINUSO | 07BJ001 | FP-2 | X | | | X |
| | PROVINCIAL - 2 | | | | | | |
| 1 | DEERLICK CREEK NEAR HINTON | 07AF004 | P-1 | X | | | X |
| 2 | EUNICE CREEK NEAR HINTON | 07AF005 | FP-1 | X | | | X |
| 3 | OLDMAN RIVER NEAR BROCKET | 05AA024 | FP-2 | X | | | X |
| 4 | WAMPUS CREEK NEAR HINTON | 07AF003 | P-1 | 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.

| Weight Factor | Type of Station |
|---|---|
| 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:

| Weight Factor | Type of Station |
|---|---|
| 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.

| Weight Factor | Type of Station |
|---|---|
| 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 staions 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 394.65

weighted units but comprises 1.80 weighted units. Based upon the unit cost of $3,962.75 the cost of operating 'Dog River near Fitzgerald' is $7,132.95. 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 1986-87 (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 | | | | | |
| Remote Access Flow | 12 | 2 | 1.80 | 3.60 | | | | | |
| Sub-total | | | | 81.90 | 209,788 | 114,762 | 324,550 | 324,550 | - |
| FEDERAL-PROVINCIAL | | | | | | | | | |
| Normal Access Flow | 12 | 51 | 1.00 | 51.00 | | | | | |
| | 8 | 141 | 0.75 | 105.75 | | | | | |
| Normal Access W.L. | 8 | 4 | 0.25 | 1.00 | | | | | |
| Remote Access Flow | 12 | 12 | 1.80 | 21.60 | | | | | |
| | 8 | 8 | 1.50 | 12.00 | | | | | |
| Remote Access W.L. | 8 | 1 | 0.95 | 0.95 | | | | | |
| Normal Access Sediment | 8 | 2 | 1.05 | 2.10 | | | | | |
| Remote Access Sediment | 8 | 2 | 1.25 | 2.50 | | | | | |
| Sub-total | | | | 196.90 | 504,361 | 275,904 | 780,265 | 390,133 | 390,132 |
| PROVINCIAL | | | | | | | | | |
| Normal Access Flow | 12 | 15 | 1.00 | 15.00 | | | | | |
| | 8 | 92 | 0.75 | 69.00 | | | | | |
| Normal Access W.L. | 12 | 3 | 0.40 | 1.20 | | | | | |
| | 8 | 36 | 0.25 | 9.00 | | | | | |
| Remote Access Flow | 12 | 2 | 1.80 | 3.60 | | | | | |
| | 8 | 7 | 1.50 | 10.50 | | | | | |
| Remote Access W.L. | 8 | 1 | 0.95 | 0.95 | | | | | |
| Sediment Research | 8 | 3 | 0.45 | 1.35 | | | | | |
| Normal Access Sediment | 8 | 5 | 1.05 | 5.25 | | | | | |
| Sub-total | | | | 115.85 | 296,751 | 162,334 | 459,085 | - | 459,085 |
| TOTAL | | | | 394.65 | 1,010,900 | 553,000 | 1,563,900 | 714,683 | 849,217 |

Unit O&M = $1,401.24 Unit Salary = $2,561.51 One Unit = $3,962.75

TABLE II

SUMMARY OF CONSTRUCTION COSTS - ALBERTA

1986/87

| Station | | | Construction Cost | Instrumentation | | Share | |
|---|---|---|---|---|---|---|---|
| | | | | Provincial | Federal | Provincial | Federal |
| **Federal-Provincial** | | | | | | | |
| C-1 | Redearth Creek near Redearth | (07JC002) | $ 4,338.82 | | $ 2,635.00 | | |
| C-2 | Verdigris Lake Trib. nr Milk River | (11AA039) | 4,351.37 | | 2,635.00 | | |
| | TOTAL F/P NEW CONSTRUCTION COSTS ..... | | $ 8,690.19 | | $ 5,270.00 | $ 4,345.09 | $ 9,615.10 |
| M-1 | Bow River below Ghost Dam | (05BE006) | $ 2,091.51 | | | | |
| M-2 | Bullpound Creek near Watts | (05CG004) | 944.66 | | | | |
| M-3 | Castle River near Beaver Mines | (05AA022) | 4,230.51 | | | | |
| M-4 | Clear River near Bear Canyon | (07FD009) | 878.00 | | | | |
| M-5 | Clearwater River above Limestone Creek | (05DB003) | 3,800.42 | | | | |
| M-6 | Highwood River below Picklejar Creek | (05BA021) | 887.51 | | | | |
| M-7 | Jumpingpound Creek near the Mouth | (05BH009) | 2,541.76 | | | | |
| M-8 | Keg River at Highway 35 | (07HF002) | 1,311.35 | | | | |
| M-9 | Little Smoky River near Guy | (07GH002) | 738.72 | | | | |
| M-10 | Medicine River near Eckville | (05CC007) | 4,253.98 | | | | |
| M-11 | Middle Fork Creek near Seebe | (05BF017) | 175.00 | | | | |
| M-12 | Peace River at Peace River | (07HA001) | 3,400.00 | | | | |
| M-13 | Peigan Creek near Pakowki Road | (05AH041) | 3,283.38 | | | | |
| M-14 | Pekisko Creek near Longview | (05BL023) | 2,137.02 | | | | |
| M-15 | Smoky River above Hell's Creek | (07GA001) | 3,147.76 | | | | |
| M-16 | Spring Creek near Valleyview | (07GF002) | 3,906.78 | | | | |
| M-17 | Stretton Creek near Marwayne | (05EE005) | 3,385.50 | | | | |
| M-18 | St. Mary River near Lethbridge | (05AE006) | 6,500.18 | | | | |
| M-19 | Twin Creek near Seebe | (05BF018) | 175.00 | | | | |
| M-20 | Welsh Creek Tributary near Leedale | (05CC010) | 3,740.04 | | | | |
| M-21 | Whitemud Creek near Dixonville | (07HA005) | 2,148.33 | $ 2,136.50 | $ 2,136.50 | | |
| M-22 | Wildhay River near Hinton | (07AC001) | 1,233.73 | | | | |
| | | | $54,911.14 | $ 2,136.50 | $ 2,136.50 | | |
| MFD-1 | Brown Creek at Forestry Road | (05DD004) | $ 2,433.00 | | $ 2,635.00 | | |
| MFD-2 | James River near Sundre | (05CA002) | 3,479.85 | | | | |
| MFD-3 | Rat Creek near Cynthia | (07BA002) | 2,559.68 | 2,136.50 | 4,636.50 | | |
| MFD-4 | Wolf Creek @ Highway 16A | (07AG003) | 1,526.46 | | | | |
| | | | $ 9,998.99 | $ 2,136.50 | $ 7,271.50 | | |
| | TOTAL F/P MAINTENANCE COSTS ..... | | $64,910.13 | $ 4,273.00 | $ 9,408.00 | $36,728.06 | $41,863.07 |
| **Federal** | | | | | | | |
| C-3 | Boxelder Creek at Hargraves Ranch | (05AH050) | $ 7,120.83 | | $ 2,635.00 | | |
| | TOTAL F NEW CONSTRUCTION COSTS ..... | | $ 7,120.83 | | $ 2,635.00 | | $ 9,755.83 |
| M-23 | Athabasca River at Hinton | (07AD002) | $ 668.47 | | | | |
| M-24 | Athabasca River at Jasper | (07AA002) | 1,645.62 | | | | |
| M-25 | Bow River at Lake Louise | (05BA001) | 3,167.27 | | | | |
| M-26 | Little Bow River at Carmangay | (05AC003) | 257.73 | | | | |
| M-27 | L.N.I.D. Canal above Flume | (05AD016) | 1,412.14 | | | | |
| M-28 | L.U.C.I.A. Project No. 4 nr Lethbridge | | 323.12 | | | | |
| M-29 | Magrath I.D. Canal nr Spring Coulee | (05AE021) | 3,393.71 | | 135.00 | | |
| M-30 | North Milk River nr Int'l Boundary | (11AA001) | 5,121.71 | | | | |
| M-31 | Pembina River near Jarvie | (07BC002) | 761.82 | | | | |
| M-32 | Waterton River near Waterton Park | (05AD003) | 669.55 | | | | |
| M-33 | Whirlpool River near the Mouth | (07AA009) | 646.73 | | | | |
| | TOTAL F MAINTENANCE COSTS ..... | | $18,067.87 | | $ 135.00 | | $18,202.87 |
| **Provincial** | | | | | | | |
| C-4 | Highwood River bel. Little Bow Canal | (05BL004) | $ 3,622.57 | | $ 2,635.00 | | |
| C-5 | Lily Creek near Slave Lake | (07BG004) | 8,341.67 | | 2,635.00 | | |
| C-6 | Tindastoll Creek nr Markerville | (05CC012) | 4,151.32 | | 2,635.00 | | |
| C-7 | Vermilion River near Vegreville | (05EE009) | 3,592.92 | $ 4,273.00 | | | |
| C-8 | Young Creek near Castor | (05FC007) | 3,829.21 | | 2,635.00 | | |
| | TOTAL P CONSTRUCTION COSTS ..... | | $23,537.69 | $ 4,273.00 | $10,540.00 | $27,810.69 | $10,540.00 |

... continued

TABLE II (cont'd.)

SUMMARY OF CONSTRUCTION COSTS - ALBERTA

1986/87

| Station | | | Construction Cost | Instrumentation | | Share | |
|---|---|---|---|---|---|---|---|
| | | | | Provincial | Federal | Provincial | Federal |
| Provincial (continued) | | | | | | | |
| M-34 | Atlas Mine Coulee at Western Monarch | (05CG005) | $ 762.37 | | | | |
| M-35 | Battle River near Forestburg | (05FC001) | 2,693.96 | | | | |
| M-36 | Berry Creek below Deadfish Creek | (05CH016) | 605.95 | | | | |
| M-37 | McGregor Travers Canal near Champion | (05AC025) | 450.82 | | | | |
| M-38 | North Saskatchewan River nr Lodgepole | (05DE006) | 1,270.46 | | | | |
| M-39 | Paddle River near Sangudo | (07BB012) | 298.64 | | | | |
| M-40 | Waterton River near Glenwood | (05AD028) | 290.15 | | | | |
| M-41 | Willow Creek near Claresholm | (05AB021) | 2,277.62 | | | | |
| | | | $ 8,649.97 | | | | |
| MFD-5 | Baptiste River near the Mouth | (05DC012) | $ 977.00 | $ 4,273.00 | $ 2,500.00 | | |
| MFD-6 | McLeod River near Whitecourt | (07AG004) | 3,423.47 | | | | |
| MFD-7 | Pembina River near Entwistle | (07BB002) | 747.97 | | | | |
| | | | $ 5,148.44 | $ 4,273.00 | $ 2,500.00 | | |
| | TOTAL P MAINTENANCE COSTS ..... | | $13,798.41 | $ 4,273.00 | $ 2,500.00 | $18,071.41 | $ 2,500.00 |
| | SUB-TOTAL | | $136,125.12 | $12,819.00 | $30,488.00 | $86,955.25 | $92,476.87 |
| POWER INSTALLATIONS | | | | | | | |
| Federal-Provincial | | | | | | | |
| E-1 | Redearth Creek near Redearth | (07JC002) | $ 2,379.00 | | | | |
| E-2 | Threepoint Creek near Millarville | (05BL013) | 3,165.00 | | | | |
| | | | $ 5,544.00 | | | $ 2,772.00 | $ 2,772.00 |
| Federal | | | | | | | |
| E-3 | Boxelder Creek at Hargraves Ranch | (05AH050) | $ 425.00 | | | | |
| | | | $ 425.00 | | | | $ 425.00 |
| Provincial | | | | | | | |
| E-4 | Highwood River below Little Bow Canal | (05BL004) | $ 2,556.50 | | | | |
| E-5 | Vermilion River at Vegreville | (05EE009) | 300.00 | | | | |
| | | | $ 2,856.50 | | | $ 2,856.50 | |
| | SUB-TOTAL ..... | | $ 8,825.50 | | | $ 5,628.50 | $ 3,197.00 |
| | TOTALS ..... | | $144,950.62 | $12,819.00 | $30,488.00 | $92,583.75 | $95,673.87 |

C = New Construction
M = Maintenance
MFD = Flood Damage Maintenance
E = Electric Power Installation

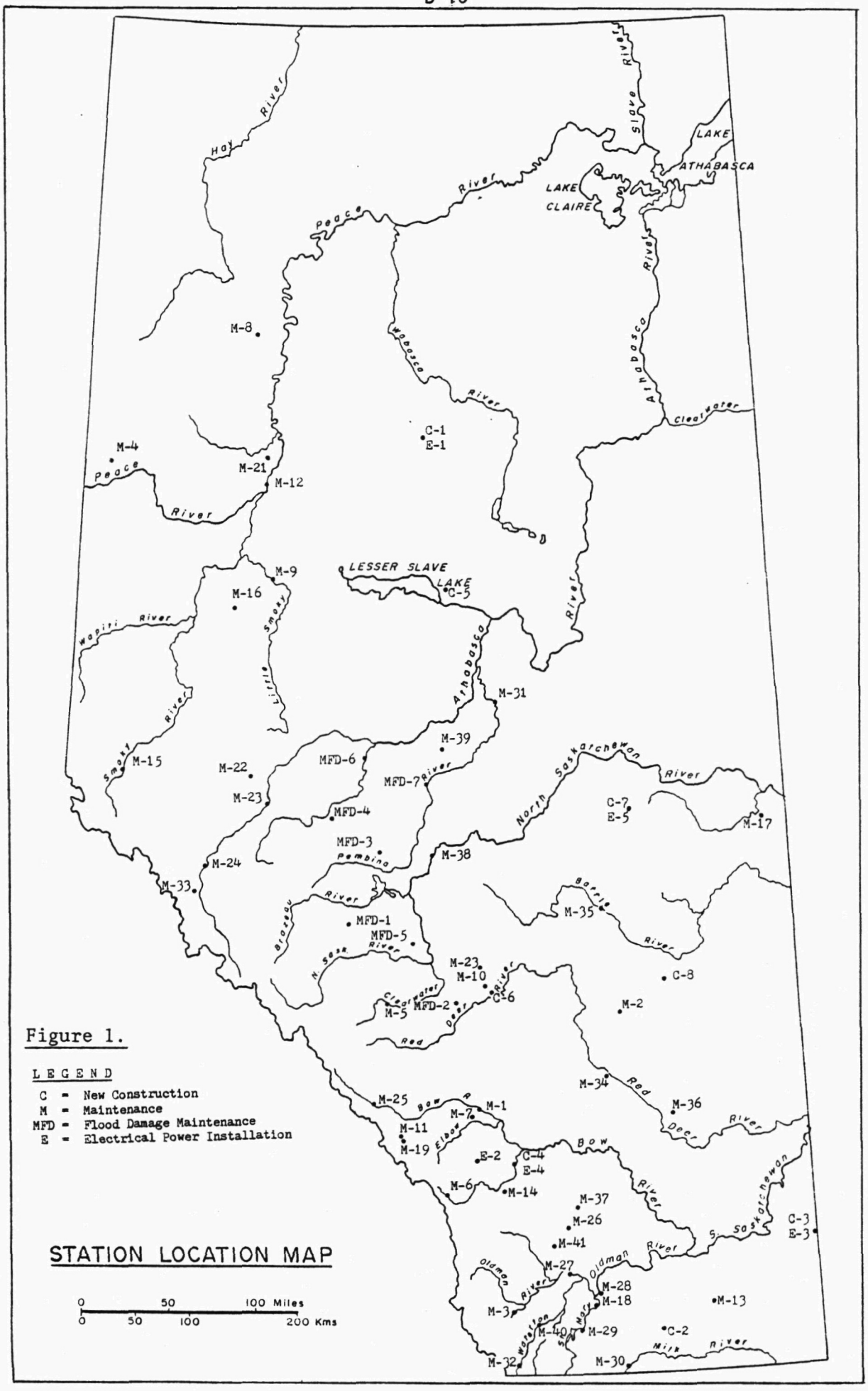



Figure 1.

LEGEND

C = New Construction
M = Maintenance
MFD = Flood Damage Maintenance
E = Electrical Power Installation

STATION LOCATION MAP

0 50 100 Miles
0 50 100 200 Kms

# A P P E N D I X  "C"

## SCHEDULE "D"

## 1986-87

The original Schedule "D", approved by the Administrators of the Agreement, is shown on page C-3. It was apparent that after the major flood event during July 1986, it would be necessary to increase the Construction component of the Schedule. The revised Schedule "D", approved by the Administrators in September 1986, is shown as page C-4.

## 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 1986/87 TO BE PAID TO CANADA BY ALBERTA:

| | Operation | Construction | Total |
|---|---|---|---|
| a) Streamflow and water level installations | $ 816.8K | $ 88.1K | $ 904.9K |
| b) Sediment installations | $ 42.1K | | $ 42.1K |
| | | ANNUAL PAYMENT: | $ 947.0K |

Administrator for Canada

(Signature)

Regional Director
Inland Waters Directorate
ENVIRONMENT CANADA

Administrator for Alberta

R. K. Deepwater

(Signature)

Director
Technical Services Division
Water Resources Management Services
ALBERTA ENVIRONMENT

## 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 1986/87 TO BE PAID TO CANADA BY ALBERTA:**

| | Operation | Construction | Total |
|---|---|---|---|
| a) Streamflow and water level installations | $ 816.8K | $ 111.7K | $ 928.5K |
| b) Sediment installations | $ 42.1K | | $ 42.1K |
| | | ANNUAL PAYMENT: | $ 970.6K |

Administrator for Canada

(Signature)

Regional Director
Inland Waters Directorate
ENVIRONMENT CANADA

Administrator for Alberta

(Signature)

Director
Technical Services Division
Water Resources Management Services
ALBERTA ENVIRONMENT

# A P P E N D I X  "D"

ESTIMATE OF ALBERTA

ANNUAL PAYMENT FOR 1988-89

BASED ON PROCEDURES

FOR PREPARATION OF

ANNUAL PAYMENTS (SCHEDULE "C")

# ESTIMATES FOR SCHEDULE "D" FOR 1988-89

## 1. Station Units Costs

1.1 Unit Cost for 1986-87 ..... $ 3,962.75
(Unit Salary = $2,561.51; Unit O&M $1,401.24)

1.2 Estimated Unit Cost for 1987-88 ..... $ 4,121.26
(Assume 4% Cost Increase)

1.3 Estimated Unit Cost for 1988-89 ..... $ 4,286.11
(Assume 4% Cost Increase)

## 2. Provincial Station Units (Operated by WSC)

### 2.1 Station Units in 1986-87

Hydrometric ..... 205.40
Sediment ..... 8.90

### 2.2 Station Units in 1987-88

Hydrometric ..... 184.75
Sediment ..... 6.50

### Hydrometric

Fed/Prov

| Type | No. | Unit | Total Units |
|---|---|---|---|
| 12MQN | 42 | 1.00 | 42.00 |
| 8MQN | 141 | 0.75 | 105.75 |
| 8MWLN | 4 | 0.25 | 1.00 |
| 12MQR | 4 | 1.80 | 7.20 |
| 8MQR | 13 | 1.50 | 19.50 |
| 8MWLR | 1 | 0.95 | 0.95 |
| | 205 | | 176.40 |

Prov. = 88.20

Provincial

| Type | No. | Unit | Total Units |
|---|---|---|---|
| 12MQN | 11 | 1.00 | 11.00 |
| 8MQN | 83 | 0.75 | 62.25 |
| 12MWLN | 4 | 0.40 | 1.60 |
| 8MWLN | 35 | 0.25 | 8.75 |
| 8MQR | 8 | 1.50 | 12.00 |
| 8MWLR | 1 | 0.95 | 0.95 |
| | 142 | | 96.55 |

Prov. = 96.55

Total: Prov. = 184.75

Sediment

Fed/Prov

2 - 8 Month Remote: 2 x 1.25 = 2.50
2 - 8 Month Normal: 2 x 1.05 = 2.10
4.60

Prov. = 2.30

Provincial

4 - 8 Month Normal: 4 x 1.05 = 4.20
4.20

Prov. = 4.20

Total: Prov. = 6.50

2.3 Estimated Provincial Units in 1988-89

There are no known changes which will be made during 1987-88. Therefore, the provincial units in 1988-89 are forecast to be the same as 1987-88.

Hydrometric ..... 184.75

Sediment ..... 6.50

3. Alberta Credit for Network Operations 1988-89

PAD Operations
(12.35 x 4,286.11) ..... $52,933.46

Spring Creek Basin
(1/2 x 0.75 x 4,286.11) ..... 1,607.29
54,540.75 $54,540.75

4. Alberta Share of Maintenance & Replacement of Hydrometric Equipment and Vehicles (1988-89)

Total depreciation during 1986-87 was $94,900 and it is estimated that this amount will remain relatively stable, excluding the addition of new DCP's, into 1988-89. The total 'Schedule A' hydrometric units for 1987-88 are 356.60 and Alberta's component of this is 184.75 station units. Therefore, Alberta estimated 1988-89 Share of Hydrometric Depreciation is:
184.75/356.60 x $94,900 = $49,166.50

5. Alberta Share of Depreciation Sediment Equipment (1988-89)

It is estimated that the Alberta share will remain similiar to that of 1986-87. $ 159.00

6. Additional Depreciation for DCPs and Memomarks

Boxelder Creek at Hargrave's Ranch

1 additional DCP ($6,355) and Memomark ($1,245)
50% depreciation = $ 3,800.00

1987-88

5 additional DCPs and Memomarks @ $7,600
10% depreciation = $ 3,800.00

Alberta Share:
184.75/356.60 x $3,800 = $ 1,968.73

7. Estimated Alberta Share of Hydrometric Costs in 1988-89

| | |
|---|---|
| Hydrometric Network Operations (184.75 x $4,286.11) = ..... | $791,858.82 |
| Alberta Credits (Item 3) ..... | (-)54,540.75 |
| Alberta Share of Hydrometric Depreciation ..... | 49,166.50 |
| Alberta Credit for Hydrometric Depreciation (49,166.50/184.75 x 12.725) ..... | (-) 3,386.43 |
| Alberta Share of Additional DCPs ..... | 5,768.73 |
| | $788,866.87 |

8. Estimated Share of Sediment Costs in 1988-89

| | |
|---|---|
| Sediment Network Operations (6.50 x 4,286.11) ..... | $ 27,859.72 |
| Sediment Equipment Depreciation ..... | 159.00 |
| Analysis Costs for Alberta Sediment Operations [1.04 x 5,413] ..... | 5,629.52 |
| | $ 33,648.24 |

9. Total Estimated Alberta Share for 1988/89 (excluding new construction)

| | |
|---|---|
| Hydrometric ..... | $788,866.87 |
| Sediment ..... | 33,648.24 |
| Sub-Total: | $822,515.11 |
| Construction Equipment Depreciation: (184.75/356.60 x 7,400) ..... | 3,833,79 |
| Sub-Total: | $826,348.90 |
| Maintenance Estimate (Maintenance estimate is based on upper provincial funding of $850K, and may be inadequate for maintenance work required) ..... | $ 23,651.10 |
| Total: | $850,000.00 |

7. Estimated Alberta Share of Hydrometric Costs in 1988-89

| | |
|---|---|
| Hydrometric Network Operations (184.75 x $4,286.11) = ..... | $791,858.82 |
| Alberta Credits (Item 3) ..... | (-)54,540.75 |
| Alberta Share of Hydrometric Depreciation ..... | 49,166.50 |
| Alberta Credit for Hydrometric Depreciation (49,166.50/184.75 x 12.725) ..... | (-) 3,386.43 |
| Alberta Share of Additional DCPs ..... | 5,768.73 |
| | $788,866.87 |

8. Estimated Share of Sediment Costs in 1988-89

| | |
|---|---|
| Sediment Network Operations (6.50 x 4,286.11) ..... | $ 27,859.72 |
| Sediment Equipment Depreciation ..... | 159.00 |
| Analysis Costs for Alberta Sediment Operations [1.04 x 5,413] ..... | 5,629.52 |
| | $ 33,648.24 |

9. Total Estimated Alberta Share for 1988/89 (excluding new construction)

| | |
|---|---|
| Hydrometric ..... | $788,866.87 |
| Sediment ..... | 33,648.24 |
| Sub-Total: | $822,515.11 |
| Construction Equipment Depreciation: (184.75/356.60 x 7,400) ..... | 3,833.79 |
| Sub-Total: | $826,348.90 |
| Maintenance Estimate (Maintenance estimate is based on upper provincial funding of $850K, and may be inadequate for maintenance work required) ..... | $ 23,651.10 |
| Total: | $850,000.00 |

Agr-ALTA-12

AUTHOR

WRB - Calgary, Alta.

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

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