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ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1985



PRAIRIE PROVINCES WATER BOARD

CANADA ALBERTA SASKATCHEWAN MANITOBA

ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1985



PRAIRIE PROVINCES WATER BOARD

306 - 1901 VICTORIA AVENUE REGINA, SASKATCHEWAN S4P 3R4

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INTRODUCTION

On October 30, 1969 Canada and the Provinces of Manitoba, Saskatchewan and Alberta entered into an agreement to share the flow and to consider the quality of eastward flowing interprovincial streams. Under Schedule C of that Master Agreement on Apportionment, the Prairie Provinces Water Board was reconstituted and was given the responsibility to administer the Agreement.

The Board met twice in the last fiscal year; on June 5-6, 1984 in Edmonton, Alberta and on December 11, 1984 in Regina, Saskatchewan. There was one change in Board membership in 1984. Mr. S.R. (Stan) Blackwell, the Member for Saskatchewan since June 1974, retired on September 30, 1984. His replacement is Mr. D.L. MacLeod, Vice President of the Saskatchewan Water Corporation. The Board was unanimous in expressing appreciation for the years of dedicated service that Mr. Blackwell gave to Board activities both as a member and as a provincial representative to various Board committees and task forces prior to 1974.

In the last fiscal year; the Committee on Hydrology met three times, the Committee on Water Quality met three times, the Committee on Interjurisdictional Agreements Administration did not meet, and the Committee on Groundwater met twice; a total of eight committee meetings.

This report summarizes the activities and the progress of the Prairie Provinces Water Board, its Committees, and the Secretariat for the period April 1, 1984 to March 31, 1985.

RECONSTITUTION OF BOARD ADMINISTRATION

The original Prairie Provinces Water Board was formed on July 28, 1948. During the next 22 years (1948 to 1969 inclusive), the Engineering Secretary to the Board was a Federal Government PFRA employee who served in this capacity as part of his regular duties. The support staff for studies and office accommodation during these 22 years were provided by the PFRA in Regina at no charge.

The Master Agreement on Apportionment was signed on October 30, 1969. Schedule C of that Agreement reconstituted the Prairie Provinces Water Board and provided for the necessary Board staff, accommodation and supplies to be jointly financed by the four governments party to the Agreement. Following the reconstitution of the PPWB the members also agreed to the establishment of a semi-autonomous Board Secretariat.

The Board's change in administration policy was implemented when an Executive Director was appointed on July 1, 1972. The Board, as shown in the organization chart on page 44, now operates through an Executive Director and his staff, supported by four committees. With the appointment of a permanent staff, the By-laws, Rules, and Procedures also became effective on July 1, 1972. The 1969 Master Agreement on Apportionment, the By-laws, and the Rules and Procedures are appended to this Annual Report.

The employees of the Secretariat, for administrative purposes, are classified as Federal Public Servants but receive their direction entirely from the Board and have no working connection with any part of the Federal Government. The Board directly controls the operation of the Secretariat through approval of an Annual Budget. It currently has Federal spending authority up to an annual maximum expenditure of \$625,000 from funds provided under the Canada Water Act. The Provincial Governments' shares of current expenditures are recovered after the current financial year is completed.

ADMINISTRATIVE DECISIONS

Several administrative decisions were made in the current fiscal year. They are summarized in the following sections:

Battle, Lodge and Middle Creek Basins

The Board, at Meeting No. 25, agreed that the Master Agreement on Apportionment should be amended as follows:

1. Paragraph 6 of the First Agreement is deleted and the following substituted therefor:

"6. Notwithstanding paragraph 3 hereof, with respect to each of the three watercourses known as Battle Creek, Lodge Creek, and Middle Creek, the annual flow shall be apportioned such that, in each of the said watercourses, Alberta permits a quantity of water equal to 75 percent of the natural flow to pass the interprovincial boundary from Alberta to Saskatchewan."
2. The fourth recital clause of the Master Agreement is amended by deleting the words "prior rights" in the second last line and substituting therefor the word "exceptions".

On July 5, 1984 the Amendments received agreement by all Member Agencies and came into effect as of that date. The Board agreed to implement formal monitoring for apportionment of Lodge, Middle and Battle Creeks in 1985.

Alberta agreed to develop an operational plan for reservoir releases that will ensure that natural flow is equitably apportioned at the Alberta-Saskatchewan boundary. The Board directed that the operational plan be reviewed by the Committee on Hydrology and submitted, for final review, to the Board. They also agreed that further problems attendant to meeting apportionment on these three creeks should be resolved by the Committee on Hydrology.

Apportionment of Boxelder Creek Basin

The Board reviewed, and approved, a report prepared by the Committee on Interjurisdictional Agreements Administration entitled "Boxelder Creek Apportionment Study - May, 1984". The recommendations of the report were that Boxelder Creek Basin be treated as a special interprovincial basin and, as

an interim measure, that Alberta and Saskatchewan jointly manage the basin and provide the Prairie Provinces Water Board with an annual report describing the management of the basin for the previous calendar year. The Board directed the Secretariat to implement these recommendations.

Continuing Consideration of Interprovincial Groundwater Management

The Board met with the Committee on Groundwater on the morning of June 6, 1984 to discuss interprovincial groundwater concerns. They reviewed the Committee's Terms of Reference and their concerns in connection with monitoring of groundwater. The Board agreed to publish the consultant's report entitled "Hydrogeologic Profile - Alberta-Saskatchewan Boundary" and instructed the Committee on Groundwater to prepare a similar contract to develop a groundwater profile for the Saskatchewan-Manitoba boundary.

Scheduled Meetings With Board Committees

The Board adopted a schedule for each standing committee of the Board to meet with the Board on a regular basis. The schedule directed the Committee on Water Quality to meet with the Board in the Spring of 1985, the Committee on Hydrology in the Fall of 1985, and the Committee on Groundwater in the Fall of 1986. The same meeting sequence will be repeated, with one of the Board's committees meeting with the Board in the fall of each subsequent year.

Westward Flowing Tributaries of Eastward Flowing Streams

The Board, at its two 1984 meetings, agreed to take no action on the Committee on Hydrology's report on "Westward Flowing Tributaries of Eastward Flowing Streams" until the provinces involved have had sufficient opportunity to assess its implications. The manner in which Martineau River is apportioned will directly affect Alberta's right to the use of that basin's water. The Provincial Members agreed to determine an appropriate arrangement for the apportionment of Cold River and its tributaries upstream of the outlet of Cold Lake and to report on the progress of their deliberations at subsequent Board Meetings.

Interprovincial Implications of Proposed Projects

The Board has agreed that a statement of the impact that a major project would have on the quality and quantity of water crossing interprovincial boundaries should be submitted through the appropriate provincial member and reviewed by the Secretariat in consultation with Board Committees. The Board, in the past fiscal year, has been active in the consideration of three such projects.

1) The Proposed Cold Lake Oil Sands Project.

The Committees on Hydrology, Water Quality and Groundwater maintain a watching brief on the development of the Cold Lake Oil Sands Project and keep the Board apprised of any plans that might affect the quantity and/or quality of water crossing the Alberta-Saskatchewan boundary. The Board members noted that, in the fiscal year 1984-85,

there was no necessity to make further reports to their respective governments on this project.

2) The Proposed Husky Oil Upgrader Project at Lloydminster, Saskatchewan

Some progress has been made in planning for a heavy oil upgrader plant at Lloydminster, Saskatchewan. Saskatchewan will keep the Board apprised of further developments. If there are considerations that affect the quantity, quality or groundwater resources in the area adjacent to the boundary, Saskatchewan will report these impacts to the Board for its further consideration.

3) The Nipawin Hydroelectric Power Project

Closure operations were undertaken in September and October of 1984. During the closure period, water releases from Tobin Reservoir were kept at a uniform level so that there would be no decrease in the rate of streamflow in the Saskatchewan River at the Saskatchewan-Manitoba boundary.

The PPWB Interprovincial Water Quality Contingency Plan

The Board approved a report from the Committee on Water Quality recommending that a "PPWB Interprovincial Water Quality Contingency Plan" be established to keep Members informed of any spills or unusual water conditions that might adversely affect the quality of eastward flowing interprovincial streams. The reporting procedure is summarized in a four page pamphlet and circulated to all Member Agencies. Any Agency involved in a spill situation will immediately inform all other Board Agencies that might be concerned by the results of that spillage.

Site Specific Water Quality Studies

The Board directed the Committee on Water Quality to continue to develop Site Specific Water Quality indicators for the South Saskatchewan, Red Deer, North Saskatchewan, Saskatchewan and Qu'Appelle Rivers at boundary sites, and agreed that each provincial agency would review the indicators established on the Beaver River to determine how equitable these are in terms of upstream benefits foregone, anticipated requirements of both upstream and downstream jurisdictions and downstream benefits protected.

The Board directed the Committee on Water Quality to prepare a Work Plan to facilitate approval of Site Specific Water Quality indicators at all eleven interprovincial water quality stations, for the Spring 1985 Board Meeting. It also accepted the method used to test the equitability of water quality indicators on the Beaver River at the Alberta-Saskatchewan boundary and directed the Committee on Water Quality to use a similar format at all Board sites following completion of the Site Specific documents. It directed that further site specific water quality tests should include specific details regarding each excursion to water quality.

Monitoring on Cumberland Marshes Project

The Board reviewed progress on the Cumberland Marshes Monitoring Project and directed the Committee on Water Quality to complete a summary report, with recommendations on further monitoring activities, for the Spring 1985 Board Meeting. Pending completion of this report, the Board agreed that Ducks Unlimited would not be asked to monitor the chemical quality of the water in 1985. Project monitoring requirements in future years will be determined by the recommendations in the COWQ report.

Brandon Hydrology Workshop

The Board approved a Committee on Hydrology recommendation to hold a workshop at Brandon in the Fall of 1984 to discuss, among member agencies, subjects directly related to Prairie Provinces Water Board activities.

At the November 1984 Meeting, the members noted that, based on the comments of their staff, the workshop held on October 16-17, 1984 in Brandon, Manitoba was a worthwhile technical exercise. They recommended that the Committee on Hydrology consider holding a similar workshop in two to three years time and agreed that the Secretariat should prepare a publication summarizing discussions at this workshop. The completed document has been circulated to workshop participants and Board members.

Apportionment of Water in Pipestone Creek at the Saskatchewan-Manitoba Boundary

The Board agreed to ask Water Resources Branch of Environment Canada to carry out a field reconnaissance to identify acceptable hydrometric monitoring locations on Pipestone Creek above Moosomin Reservoir. The Board Members also agreed not to conduct further studies until PFRA and Saskatchewan have agreed upon an acceptable operational procedure for Moosomin Dam.

Water Quality and Water Quantity Monitoring Programs for 1985-86

The water quality and water quantity monitoring programs for 1985-86 were reviewed and approved with the provision that monitoring costs will not exceed the cost of the same monitoring program in fiscal year 1984-85.

PPWB Budget for 1985-86

The Board approved a budget of \$352 000 for the fiscal year 1985-86. In accepting this budget, the Board Members agreed to enter into a contract with an individual to provide specific services to the Secretariat in the fiscal year 1985-86 for a sum not to exceed \$25 000. This contract will allow the Secretariat to, on a contract basis, retain the level of service previously provided by the Secretariat's Computations Technician.

BOARD STUDIES

The Secretariat, under the direction of the Board and with the cooperation of several Board committees, is involved in several ongoing studies. The progress made on these studies in the fiscal year 1984-85 is described in this section.

Site Specific Water Quality Objectives Study

The Committee on Water Quality is systematically reviewing water quality data collected at the eleven PPWB monitoring sites. It has, at the end of the fiscal year 1984-85 prepared reports defining water quality indicators for the Beaver, South Saskatchewan, Red Deer, and North Saskatchewan Rivers at the Alberta-Saskatchewan boundary and the Saskatchewan River at the Saskatchewan-Manitoba boundary. The Secretariat has also prepared the preliminary statistical data needed to define similar indicators for the Qu'Appelle River at the Saskatchewan-Manitoba boundary.

The Committee, as part of this same task, has prepared a study plan for the Board's consideration at the Spring 1985 Meeting. The proposed work plan recommends that draft Site Specific Water Quality Indicators at all eleven PPWB monitoring sites be presented to the Board by the November 1986 Meeting.

The Secretariat, under the direction of the Committee, has also developed a method to partially test the equitability of these water quality indicators at each site. This test has been completed for the Beaver River at the Alberta-Saskatchewan boundary and the Saskatchewan River at the Saskatchewan-Manitoba boundary. If the approach is acceptable to the Board, testing for all eleven sites will be carried out as part of the job of defining water quality indicators at interprovincial sites.

Interprovincial Groundwater Concerns at the Alberta-Saskatchewan and Saskatchewan-Manitoba Boundaries

A contract was awarded to Geoscience Consulting Ltd. of Edmonton to develop a Profile of Hydrogeology on the Alberta-Saskatchewan boundary from the International boundary to the northern edge of the Saskatchewan-Nelson Basin. That contract was completed at the end of the 1983-84 fiscal year. The contractor's report, and accompanying maps, were then reviewed by the Committee on Groundwater. Based on this final review, a PPWB report has been prepared. Five hundred copies of the report will be printed and circulated by the Secretariat in the 1985-86 fiscal year.

Geoscience was awarded a contract to develop a Hydrogeologic Profile along the Saskatchewan-Manitoba boundary from the International boundary to the northern edge of the Saskatchewan-Nelson Basin. The contract will be completed in September 1985. A similar sequence of Committee review will be followed by preparation of a second report. It is anticipated that this report will be published by the Secretariat in the summer of 1986.

Updating of PPWB Monthly Natural Streamflow Estimates

The Board has agreed that the Secretariat will assume the responsibility of updating the Saskatchewan-Nelson basin monthly natural streamflow estimates. The Secretariat has been instructed to bring these streamflow files up to date as soon as practical and to ensure that they are updated annually.

This activity coincides with an Alberta Environment Study to update monthly natural streamflow records for the South Saskatchewan River basin including the Red Deer River basin. Alberta Environment has updated streamflow in the South Saskatchewan River basin in Alberta to the end of 1982. This data has been added to the PPWB computerized data base and the Secretariat is updating the remaining monthly natural streamflow records for the Saskatchewan-Nelson Basin. The updating procedure, in subsequent years, will be a continuing process.

Water Quality Task Force

The Board, in fiscal year 1980-81, approved terms of reference for the Task Force on Water Quality Methodology. This Task Force, functioning under the direction of the Committee on Water Quality, reported to the Board in that fiscal year. The recommendations contained in the Committee's report were accepted, and the Board Chairman agreed to ask Inland Waters Directorate to provide the technical support services needed to implement these recommendations. In the fall of 1982, the Inland Waters Directorate provided additional support staff to work on this problem. Test samples have been circulated on a monthly basis since September 1982 to the three provincial and five federal laboratories involved with the Prairie Provinces Water Board. The Analytical Methods Task Force has met once during the past fiscal year to review the analytical results of this sampling program. Further data and more analysis of the results were required. It was agreed that preparation of the Task Force report should be postponed until the fall of 1985.

Natural Flow Studies on Small Interprovincial Basins

At the June 10, 1975 meeting of the Board, the Members recommended that a continuing effort be made by the Secretariat to define natural flow on small interprovincial river basins. A list of streams that fell into this category was prepared and the Board agreed that the speed with which the studies were completed would depend on the availability of participating agencies.

Studies have been completed in previous years on Pipestone Creek, Antler Creek, Assiniboine River, Boxelder Creek, Mackay Creek, Graham

Creek, Battle River and Gainsborough Creek. Studies were completed in fiscal year 1984-85 on Eyehill Creek, Big Gully Creek and the Beaver River. Additional studies are now underway on Swan River, Woody River and Birch (Saskeram) River.

No further commitments have been made to complete studies on small interprovincial basins but the need for such studies has been identified on an additional seven streams. These are: Overflowing River, Red Deer River (Saskatchewan), Gopher Creek, Bosshill Creek, Elm Creek, Jackson Creek, and Stony Creek. It was also agreed that a second report on the natural flow of Pipestone Creek should be prepared defining a more accurate method of calculating natural flow.

The Impact of Drainage on Downstream Watersheds

The Board approved a report from the Committee on Hydrology entitled "Recommended Procedures to Deal With the Impact of Artificial Drainage on Downstream Flows". It directed the COH to present progress reports at future Board meetings both on the current status of drainage works and on whether the approved method requires further modification. The Provincial Members on the COH have agreed upon a standard reporting format that may be used to record the status of drainage works that might have an effect on interprovincial flow. They will recommend its acceptance to the Board at the Spring 1985 Meeting.

The Board has also accepted a specific reference from the Provinces of Saskatchewan and Manitoba to deal with a problem involving artificial drainage in a series of small interprovincial streams that affect the Rural Municipalities of Churchbridge, Langenburg, Shellmouth and Russell. A Task Force consisting of the Executive Director of the Secretariat and one member each from Saskatchewan and Manitoba has been formed. The Task Force proposed, and the Board agreed, that the Province of Saskatchewan will determine firstly the effect of existing drainage works on the volume and intensity of flow at the affected boundary points and secondly the potential effect that future drainage might have on these same streams. A report summarizing the results of this study was forwarded to the Task Force Members by the Saskatchewan Water Corporation in March 1985. After Manitoba has prepared a report on the effect that these changes in flow have on downstream areas, the Task Force will report their findings to the Committee on Hydrology.

Monitoring Studies

The Committee on Hydrology and the Secretariat are involved in several continuing monitoring studies designed to update the quality of the natural flow estimates at the interprovincial boundary. In the past fiscal year, the Federal Water Resources Branch in Calgary has completed its study of "Irrigation Return Flow Index Stations" and incorporated the information into an updated model describing the natural flow of the South Saskatchewan River at the Alberta-Saskatchewan boundary. The report also includes the recommendation of an Atmospheric Environment Service study to determine parameters and methods to be used in estimating reservoir evaporation at Dickson Reservoir. The natural flow report will be submitted to the Board in

the Spring of 1985. Following its acceptance, the revised methodology will be used to calculate natural streamflow on the South Saskatchewan River at the Alberta-Saskatchewan boundary.

The SSARR (Streamflow Synthesis and Reservoir Regulation) model has been used to estimate natural flow in the Qu'Appelle River since 1976. A series of studies have been undertaken to update the model so that it will provide a more accurate estimate of natural flow in the Qu'Appelle River basin. It is anticipated that, by the end of 1985, studies in connection with this program will be completed and the SSARR model can be updated.

Groundwater Bibliography

The Committee on Groundwater has agreed to establish and maintain a bibliography of groundwater reports pertinent to interprovincial groundwater considerations. This continuing project utilizes the WATDOC facility in Ottawa to store report listings. Alberta has agreed to be the first province to transfer reports onto the WATDOC files. Based on Alberta's experience, it is planned that the remaining provinces, and federal agencies, will place their reports on similar files. No firm date has been set for completion of this study. The work is being done when time permits as it is not a high priority task.

Forest Management Study for Increased Water Yields

There has been considerable interest for several years in the Province of Alberta on the possibility of managing the eastern slopes of the Rockies to benefit water production and to control other uses of the forest area. Alberta Environment and the Alberta Forest Service, in cooperation with Federal Agencies, have the management responsibilities for this green zone. They will continue to keep the Board informed, through the Committee on Hydrology, of the status and results of these studies.

BOARD COMMITTEES

The committees of the Board are responsible for providing technical advice on the various subjects of interprovincial interest to the Board. The Board Secretariat works with each of these committees to provide the Board with the technical information needed to make decisions related to interprovincial water management. This section describes the work of the four Board committees in fiscal year 1984-85.

Committee on Hydrology

The Committee on Hydrology met three times in the last fiscal year. The meetings were held on May 10-11, 1984 in Winnipeg, Manitoba; September 18-19, 1984 in Regina, Saskatchewan; and February 27-28, 1985 in Edmonton, Alberta. At the May 1984 Meeting, the Committee discussed with members of the Federal Water Resources Branch, Winnipeg office, the measurement procedures developed for the Saskatchewan River at The Pas hydrometric station. It was agreed that the "VARSLIP" method provides a reasonable way to upgrade the quality of record and should be used to compute daily flow for the Saskatchewan River at The Pas.

The Committee reviewed the balance of streamflow in the Lodge, Battle and Middle Creek basins and suggested that more detailed procedures be established by Alberta Environment to ensure that future apportionment problems in these basins can be dealt with promptly. It noted that two computational changes should be made to the natural flow calculation procedure for Lodge Creek at the Interprovincial boundary. Any release made to Saskatchewan through Jaydot Reservoir should be credited to Alberta and channel losses below Bare-Creek Reservoir should be calculated separately from channel losses below Michel, Greasewood and Massy Reservoirs.

The list of PPWB stations used for water quality monitoring purposes was reviewed to ensure that water quantity and quality needs were co-ordinated. The COH also recommended, to the Board, a list of PPWB stations needed for monitoring purposes in the fiscal year 1985/86.

A Second Prairie Hydrology Workshop was held on October 16-17, 1984 in Brandon, Manitoba, under the direction of the COH. The following topics were discussed; Generation of Historic Natural Flow Data, Estimation of Probable Maximum Floods, Frequency Analysis for Flood and Drought and Operational Procedures for Reservoir Regulation. The participants also listed the type of subject that might be discussed at future workshops. The lists were collated as part of the workshop summary.

The Committee reviewed, and approved, the report entitled "Estimation of Evaporation from Dickson Reservoir for Natural Flow Calculations", prepared by Mr. Hopkinson of AES. AES agreed to provide the Water Resources Branch, Calgary office with a brief annual report summarizing Dickson Reservoir's net evaporation data. This information will be used in the final computation of South Saskatchewan River's natural flow at the Alberta-Saskatchewan boundary.

Natural flow reports for Big Gully Creek, Eyehill Creek, and Beaver River were approved. These reports were prepared, respectively, by the Hydrology Division of PFRA, Water Resources Branch in Calgary and the Board's Secretariat.

Monthly natural flows and the 1983 and 1984 flow balance data for Pipestone Creek at the interprovincial boundary were reviewed. It was agreed that the existing natural flow calculation procedure for Pipestone Creek at Saskatchewan-Manitoba boundary should be checked to determine if the natural flow data computed using the existing procedure is adequate for apportionment purposes. The COH established a task force to conduct a field investigation of the Pipestone Creek Basin in Saskatchewan to evaluate the natural flow calculation procedure and existing monitoring networks and to make recommendations to the COH on how existing monitoring procedures may be improved.

A field investigation was conducted on October 3, 1984 and the Pipestone Creek Sub-Committee reported to the February 1985 COH meeting. The task force made suggestions to improve the existing natural flow calculation procedures. The COH agreed that an additional hydrometric station should be established on Pipestone Creek above Moosomin Reservoir to estimate inflow to Moosomin Reservoir, and that the methodology used to estimate the natural flow balance at Moosomin Reservoir be revised to permit an inflow-outflow balance of flow at this site.

The COH reached agreement on a format to present, to the Board, annual lists of interprovincial drainage projects that may be of concern to downstream provinces. These lists may be used to determine the impact of artificial drainage on downstream flows.

Committee on Water Quality

The Committee on Water Quality met three times in the last fiscal year. The meetings were held on April 11-12, 1984 in Winnipeg, Manitoba; on September 6-7, 1984 in Regina, Saskatchewan; and on February 5-6, 1985 in Calgary, Alberta. The COWQ also held a conference call meeting on August 28, 1984 to review the Prairie Provinces Water Board 1984-85 Water Quality Monitoring Program. The Committee proposed a modified Water Quality Monitoring Program for the current fiscal year based on the limitations of Canada Water Act funds committed to monitoring for 1984-85. The modified program recommends that the collection frequency of several new organic compounds be reduced and that water from only eight of the eleven interprovincial stations be analysed for these new organic compounds.

The Committee on Water Quality held a second conference call on September 27, 1984 to review the Cumberland Marshes Monitoring Program. They agreed that the Water Quality Branch of Environment Canada would complete a summary report for the Board's consideration at the Spring 1985 Meeting and that interim water quality monitoring in the Cumberland Marshes in 1985 will not be necessary to meet the Board's requirements.

Three Work Sessions were held in the past fiscal year; June 25-26, 1984 in Regina, Saskatchewan; January 22-23, 1985 in Regina, Saskatchewan; and March 13-14, 1985 in Regina, Saskatchewan. The work group reviewed downstream designated uses, sample coverage, detailed statistics and proposed water quality indicators for the North Saskatchewan River, the Saskatchewan River, the South Saskatchewan River and the Red Deer River. Their work was reviewed by the Committee on Water Quality at subsequent committee meetings. The approach enabled the Committee to prepare and submit water quality indicators for the South Saskatchewan River, Red Deer River and North Saskatchewan River at the Alberta-Saskatchewan boundary and the Saskatchewan River at the Saskatchewan-Manitoba boundary.

The Committee completed two other jobs directly related to the preparation of water quality indicators. Firstly, they derived a methodology to test the water quality indicators against the historic data base. The method was used to partially test the indicators selected for the Beaver River at the Alberta-Saskatchewan boundary and the Saskatchewan River at the Saskatchewan-Manitoba boundary. The results will be presented to the Board and, if accepted, will be used to partially test the equitable nature of indicators at all sites. Secondly, the COWQ established a draft work schedule that could be used to facilitate final approval of Site Specific Water Quality indicators for all eleven sites. The proposed schedule will be presented to the Board at its June 1985 Meeting.

The Committee, at the request of the Board, reviewed the geographic location of water quality and water quantity monitoring stations on the Battle River. The COWQ noted that it would not be feasible or desirable to have the hydrometric and water quality sampling sites located at the same site on this stream. They also reviewed the 1984-85 hydrometric monitoring program and checked for compatibility with water quality monitoring sites. Lastly, the COWQ agreed that an intensive review of the overall PPWB water quality monitoring program should be carried out in the coming fiscal year.

At all three meetings, the members exchanged information on the Cold Lake Oil Sands Project, the Husky Oil Upgrading Project, the status of federal-provincial water quality agreements and related water quality study dossiers.

Committee on Groundwater

The Committee on Groundwater met twice in the last fiscal year. The meetings were held on June 6, 1984 in Edmonton, Alberta; and on January 23, 1985 in Regina, Saskatchewan. At the June 1984 Meeting the Committee met with the Board to discuss Committee on Groundwater's activities related to the Board.

The Committee, at the June 1984 Meeting, reviewed the consultant's report entitled "Hydrogeologic Profile Alberta-Saskatchewan Boundary, March 31, 1984". The COG agreed that a detailed review of the eight profile map sheets attached to the report should be conducted by the technical staffs of Alberta Hydrogeology Branch and Saskatchewan Water Corporation before the report was printed. A revised version of the eight map sheets showing a hydrogeological profile along the Alberta-Saskatchewan boundary was reviewed by COG Members at the January 1985 Meeting and agreement was reached on the format to be used for the published report.

At the January 1985 Meeting, the Members also reviewed a list of groundwater consultants that might be interested in bidding on the project to develop a hydrogeological profile along the Saskatchewan-Manitoba boundary, and agreed upon six groundwater consulting firms (two from each province) that would be invited to tender on the project.

Progress on the Bibliography of Groundwater reports in the prairie provinces was reviewed. It was agreed that the bibliography project is not a high priority task and that the project should be allowed to proceed as time and staff permits in each member agency.

At the January 1985 Meeting, the Committee discussed potential groundwater concerns in the prairie provinces, and agreed that each member should provide the Secretariat with a letter outlining the groundwater concerns in his own jurisdiction. The Secretariat will, based on these letters, prepare a brief report to the Board summarizing these concerns.

A proposal, prepared by the Saskatchewan COG member, to construct injection zone monitoring wells east of the Cold Lake projects was discussed. The COG agreed that deepwell waste disposal may not be a potential problem. To confirm this assumption, and to maintain creditability, there is a need to establish wells to monitor fluids in the injection zone. The Chairman agreed to prepare a letter to the Board Members describing the situation.

Committee on Interjurisdictional Agreements Administration

The Committee on Interjurisdictional Agreements Administration did not meet in the last fiscal year. The Secretariat, with the help of provincial Committee Members has prepared a report on water uses in the Boxelder Creek basin for the year 1984. A copy of the report will be presented to the Board for information at its Spring 1985 Meeting.

SECRETARIAT

Accommodation and Staff

The PPWB Secretariat is located in Room 306 of the Motherwell Building in Regina, Saskatchewan. The office is in the same building as the Western and Northern Regional Office of the Inland Waters Directorate of Environmental Conservation Services, Environment Canada and headquarters of Prairie Farm Rehabilitation Administration. Financial, Administrative and Personnel services are provided through the staff of the Inland Waters Directorate of the Environmental Conservation Services of Environment Canada.

There were no staff changes during the past fiscal year. The Secretariat hired a contractor, Mr. K.F. Born, from April 1984 to March 1985 to do the drafting and report preparation work required for Board purposes.

Reports

The following eight reports were published either by the Secretariat or under the direction of Board Committees.

- PPWB Report No. 68 - Eyehill Creek at Alberta-Saskatchewan Boundary - Natural Flow, July 1984 (Prepared by Water Resources Branch, Inland Waters Directorate, Environment Canada).
- PPWB Report No. 69 - Beaver River at Alberta-Saskatchewan Boundary - Natural Flow, May 1984 (Prepared by PPWB Secretariat).
- PPWB Report No. 71 - Boxelder Creek Basin Apportionment Study - May 1984 (Prepared by PPWB Committee on Interjurisdictional Agreements Administration).
- PPWB Report No. 72 - Return Flow From Irrigation Southern Alberta, November 1984 (Prepared by Water Resources Branch, Inland Waters Directorate, Environment Canada, Calgary).
- PPWB Report No. 73 - A Review of the SSARR Versus SIMPAK Models for the Qu'Appelle River Basin, May 1984 (Prepared by D.R. Richards, Hydrology Branch, Saskatchewan Environment).
- PPWB Report No. 74 - Big Gully Creek at Alberta-Saskatchewan Boundary - Natural Flow, October 1984 (Prepared by PFRA, Hydrology Division).

- PPWB Report No. 77 - Prairie Hydrology Workshop No. 2, Brandon, Manitoba, October 16-17, 1984 (Prepared by PPWB Secretariat).
- Interprovincial Water Quality Data at PPWB Monitoring Stations - April 1973 to December 1983 - July 1984 (Prepared by PPWB Secretariat).

Information

The work of the Secretariat is primarily connected with the apportionment of streamflow and with Committee and Board studies. These activities are reported under other sections in this report and will not be repeated in this section.

The correspondence files related to the PPWB Water Demand Study completed in 1982 were stripped and collated to provide a historic record of study activities. This work is part of a comprehensive review of all PPWB Secretariat files. All correspondence files will be culled, collated and revised to more adequately suit the needs of the Board's Secretariat.

The computerized files containing basic data related to the PPWB Water Demand Study have been updated to the end of 1982 using data made available from provincial agencies. Similarly, data connected with the Regional Economic Base and Industrial Uses was obtained from Environment Canada in Ottawa and will be filed on a computerized format. This updating process will be continued annually to maintain a current data base for Board Agencies.

When the report entitled "Administration of the Apportionment Agreement", PPWB Report No. 58 was published, it was agreed that a handbook would be prepared describing, in more detail, how the report's recommendations could be dealt with and implemented. A first draft of that handbook has been prepared by the Secretariat. That draft will be circulated to the COH for its review before forwarding the final report to the Board.

The Secretariat has prepared a History of the Committee on Hydrology summarizing both what was done and the decisions that were made in past years. Future committee members can use this history as a background document on which to base administrative decisions. A first draft of the report has been prepared and circulated to the COH members for their comments. The report, after being approved by the COH, will be forwarded to the Board.

The work of the Board was publicized through six speeches and one seminar presented by the Executive Director. Speeches were given on the following subjects; Interprovincial Aspects of Managing the South Saskatchewan River (Outlook in October 1984); Activities of the PPWB in Connection With Interprovincial Drainage (Winnipeg in October 1984); Municipal and Industrial Use of Water in the Prairies - An Overview (Regina in September 1984); The PPWB and Prairie Water Management (Alymer, Quebec in May 1984); Water Supply Shortages on the Prairies - Fact or Fiction (Regina in March 1985); and PPWB Past, Present and Future (Saskatoon in March 1985). A seminar describing the data made available in the PPWB Water Demand Study was also presented to Environment Canada staff in May 1984.

The Executive Director attended the Manitoba Surface Water Quality Objectives Hearings in Winnipeg on October 20-21, 1984 and reported to the Committee on Water Quality on the briefs presented to the hearings.

Mr. Chen and Mr. Dunn successfully completed a two-week Supervisory Orientation Course designed to enable the employees to more effectively plan, organize, control, delegate and improve their overall job performance.

Financial

Secretariat expenditures for the fiscal year 1984-85, are as shown on page 43. They indicate a total expenditure of \$362 668 of which \$218 174 was for salaries.

The accounts of the Prairie Provinces Water Board for the fiscal years 1982-83, 1983-84 and 1984-85 have been audited, as agreed in By-Law 15(c). No changes have been made to the previous two statements of expenditures (see page 42) and the audit certificate confirms that the current fiscal claim shown on page 43 is correct as audited. That statement indicates a total expenditures of \$1 068 778 of which \$641 962 was for salaries and \$426 816 for operating expenses.

MONITORING RESPONSIBILITIES

The 1969 Master Agreement on Apportionment directs "...that the Prairie Provinces Water Board shall monitor and report on the apportionment of waters set out in the provisions of the first and second agreement and ratified by this Master Agreement". In keeping with this, and with previous Board decisions, the following continuing action has been taken to monitor the quantity and quality of water at interprovincial boundaries.

Natural Flow Determination

The Water Resources Branch of Environment Canada continued to monitor streamflow at all hydrometric sites used to determine natural flow for apportionment purposes. Similarly, the Committee on Hydrology reviewed the list of hydrometric stations needed to determine natural flow for Board purposes in the fiscal year 1984-85 and that list was approved by the Board.

Quarterly Reports on natural flows, consumptive uses, and storage changes for the South Saskatchewan River Basin in Alberta and the Qu'Appelle River Basin in Saskatchewan, were prepared and distributed on a regular basis. The accumulated total annual recorded flow of 3 093 000 cubic decametres in the South Saskatchewan River below its junction with the Red Deer River is 59% of the total annual natural flow of 5 205 000 cubic decametres. Recorded discharge of the South Saskatchewan River at the apportionment point did not fall below 42.5 cubic metres per second or one-half of natural flow at any time during 1984, so the minimum flow criteria were met for the complete apportionment period. A summary of recorded and natural flows for 1984 at this site is shown on pages 28 and 29.

The natural flow of the Qu'Appelle River from April 1, 1984 to March 31, 1985 was 39 220 cubic decametres. Recorded flow, augmented by releases of 100 950 cubic decametres from Lake Diefenbaker and by "draw-down" water from lakes in the Qu'Appelle Valley, was 64 940 cubic decametres, 166% of natural flow. Recorded and natural flows covering the apportionment period of April 1984 to March 1985 are shown on page 31.

Natural flows on the South Saskatchewan River basin were calculated using the project depletion method and natural flows for the Qu'Appelle River basin were calculated using the Streamflow Synthesis and Reservoir Regulation (SSARR) model. Both procedures have been approved by the Board to calculate natural flow on these two specific basins. The SSARR model is now being reviewed by a Sub-committee of the Committee on Hydrology,

and the project depletion method has been updated by Federal Water Resources Branch staff and a report describing changes to the calculations procedure has been approved by the COH.

Natural flows were also calculated for the North Saskatchewan River at the Alberta-Saskatchewan boundary, the Saskatchewan River at the Saskatchewan-Manitoba boundary, and the Churchill River at the Saskatchewan-Manitoba boundary. Monthly recorded and natural flows for the apportionment period at these three sites are shown on pages 30 and 31. Recorded flows for five other boundary sites are also listed on pages 30, and 31.

PPWB Water Quality Monitoring Program

The Water Quality Branch of Environment Canada continued to monitor monthly and quarterly data collected at eleven PPWB monitoring stations for the 87 parameters listed on page 26. These water quality monitoring stations correspond with the interprovincial hydrometric locations mapped on the last pages of this report. The monitoring program for 1984-85 has been reviewed by the Committee on Water Quality and approved by the Board.

This monitoring program started in April 1974 and has continued since that time. All data obtained at the eleven PPWB stations from April 1974 to December 31, 1983 has been validated, published in the PPWB Annual Water Quality Reports, and was distributed to member agencies in July 1984.

Prairie Provinces Water Board Water Quality samples, requiring immediate analysis, such as nutrients, coliforms, and total alkalinities continue to be analyzed in the new regional Environment Canada laboratory located in Saskatoon, Saskatchewan. Analysis of all other constituents, major ions, trace metals, organochlorines, pesticides, etc., is done at the National Environment Canada laboratory in Burlington, Ontario.

Data from the PPWB monitoring stations is collected to define water quality characteristics of rivers crossing interprovincial boundaries and to estimate compliance with the "1973 PPWB Water Quality Objectives", and the "Interim PPWB Water Quality Requirements for the Beaver River at the Alberta-Saskatchewan Boundary" for the parameters marked with an asterisk on page 26. The Board, through the Secretariat, continually reviews Water Quality data from all eleven PPWB stations to identify present and potential water quality concerns. When site specific water quality indicators have been established they will be used for review purposes. Until that work is completed annual evaluations will be based on these objectives although the Board realizes that some may not be appropriate for prairie streams.

A review of the 1984 water quality data from PPWB monitoring stations indicates that the Water Quality Objectives were exceeded at least once at each site for one or more parameters. The PPWB station with the highest frequency of exceeded objectives was the Battle River near Unwin station, followed closely by the Assiniboine River below Kamsack, and the Qu'Appelle River near Welby stations.

The minimum dissolved oxygen level of 0.5 mg/L was maintained at most PPWB sites, but dissolved oxygen levels in the Carrot River, the

Battle River, and the Beaver River at the interprovincial boundary dropped below this minimum level during the winter period. The objective for manganese was exceeded at 5 of 11 PPWB stations (36 times in the past year). The objective for total phosphorus as P was exceeded at 8 of the 11 PPWB stations (25 times during 1984). The total nitrogen objective was exceeded 85 times in the last year at 9 of the 11 PPWB sites. The Churchill River at the outlet of Wasawakasik Lake PPWB monitoring site was the only PPWB station that experienced relatively low nutrient levels.

The Water Quality Objective for phenolic material (0.005 mg/L) was exceeded at least once at nine PPWB stations in 1984 (23 times in the past year). This is a significant decrease over 1983 when phenolic material requirement was exceeded a total of 42 times at 11 PPWB stations.

Several biocides were detected at PPWB Water Quality monitoring stations in 1984. Alpha BHC was detected in 97% of the samples collected between January, 1984, and December, 1984, and lindane was present in 45% of the samples. Twenty-five percent of the samples contained detectable levels of 2,4-D. The South Saskatchewan River at Highway 41 experienced the most number of biocide detections (28) for the 1984 year. The North Saskatchewan River near Deer Creek had 26 detections, the Assiniboine River had 22 biocide detections and the Battle River near Unwin had 21 biocide detections in the 1984 year.

Other Reports Dealing with Monitoring

The Board has accepted three reports that deal with quantity of water monitoring responsibilities. They are entitled "Report on the Administration of Apportionment Agreement", "Guidelines For Negotiating Equitable Apportionment", and "Procedures For Interprovincial Apportionment of the Waters of Battle, Lodge, and Middle Creeks". Similar documents are being prepared to establish more precise water quality procedures and water quality requirements that can be used to more equitably monitor the quality of water passing from upstream to downstream provinces. These studies have been reported on in the section entitled "Board Studies". The information in these reports will be used in future years to administer the 1969 Apportionment Agreement.

The computer programs used to calculate natural flow of the North Saskatchewan, Saskatchewan and Churchill rivers have been revised by the Secretariat so they may be processed more effectively by the Secretariat's IBM-PC computer and the SASKCOMP computer using data received from Federal Water Resources Branch.

PPWB WATER QUALITY MONITORING
1984 PARAMETER LIST

*Aldrin	*Lead, total
Alkalinity, phenol.	°Magnesium, diss.
Alkalinity, total	MCPA
Aluminum, extractable	*Mercury, total
N-Alkanes	P,P-methoxychlor
*Arsenic, diss.	Mirex
*Barium, total	Nickel, total
BHC-alpha	Nitrogen, diss., $\text{NO}_3 + \text{NO}_2$
BHC-gamma (Lindane)	Nitrogen, particulate
Bicarbonate, calc.	Nitrogen, total Ammonia as N
*Boron, diss.	*Nitrogen, total, calc.
*Cadmium, total	Nitrogen, total, diss.
°Calcium, diss.	*Oxygen, diss., DO
Carbon, diss., organic	PCB, Arochlor 1242
Carbon, organic, particulate	PCB, Arochlor 1254
Carbonate, calc.	PCB, Arochlor 1260
Chlordane-alpha	PCB, Arochlor total
Chlordane-gamma	*pH
°Chloride, diss.	*Phenolics
Chlorophyll A	Phosphorus Ortho as P
*Chromium, total	Phosphorus, particulate calc.
Cobalt, total	*Phosphorus, total, diss.
Coliforms, fecal	*Phosphorus, total, as P
Coliforms, total	#Picloram (Tordon)
*Color, true	°Potassium, diss.
*Copper, total	Residue, fixed, nonfilterable
*Cyanide, total	*Residue, nonfilterable
*P,P-DDD	*Selenium, diss.
*P,P-DDE	°Silica, reactive
*O,P-DDT	Silvex
*P,P-DDT	*Sodium, diss.
*Dieldrin	°Solids, total diss., calc.
Endosulfan-alpha	Specific Conductance
Endosulfan-beta	°Sulfide
*Endrin	°Sulphate, diss.
*Fluoride, diss.	*Temperature
Free CO_2	*Turbidity
Hardness, non carbonate	Vanadium, total
°Hardness, total, CaCO_3	*Zinc, total
*Heptachlor	2,4-D
*Heptachlor, expoxide	2,4-DB
Hexachloro-benzene	2,4-DP
Hydroxide, calc.	2,4,5-T
*Iron, diss.	

Collected at 5 sites only

* 1973 PPWB Objectives

° 1979 Interim PPWB Requirements for the Beaver River

1984 FLOW DATA



RECORDED AND NATURAL FLOWS,
CONSUMPTIVE USE, DIVERSION, AND STORAGE
(IN CUBIC DECAMETRES)

FOR THE YEAR 1984

SOUTH SASKATCHEWAN RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	154 000	215 000	221 000	186 000	113 000	413 000	269 000	120 000	85 500	87 400	151 000	153 000	2 167 900
CONSUMPTIVE USE	0	480	2 100	102 210	321 440	397 290	476 540	377 940	312 550	178 330	3 650	2 130	2 174 660
CHANGE IN RESERVOIRS	-99 470	-76 590	-50 230	-24 950	5 970	325 280	78 600	-73 400	-97 110	-6 680	-17 740	-62 260	-98 580
DIVERSION FROM BASIN	0	0	0	0	13 660	35 160	38 680	35 030	21 190	13 410	490	0	157 620
NATURAL FLOW ALTA. BDY.	46 520	140 040	162 600	205 070	420 680	1 139 240	868 310	506 600	311 820	303 160	191 890	97 790	4 393 720

RED DEER RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGES	34 900	42 100	61 300	113 000	117 000	133 000	69 200	108 000	95 000	84 000	36 900	30 900	925 300
CONSUMPTIVE USE	0	0	0	0	1 450	1 370	4 110	3 960	1 940	3 360	0	0	16 190
CHANGE IN RESERVOIRS	-18 430	-18 400	-15 500	-1 660	-34 240	103 190	43 140	2 760	2 640	-620	-13 940	-27 410	21 530
DIVERSION INTO BASIN	0	0	0	0	-13 660	-35 160	-38 680	-35 030	-21 190	-13 410	-490	0	-157 620
NATURAL FLOW ALTA. BDY.	20 010	24 500	41 590	112 440	72 640	179 070	100 160	78 570	76 820	73 990	27 690	3 690	811 170

SOUTH SASKATCHEWAN RIVER -- BELOW JUNCTION WITH RED DEER RIVER

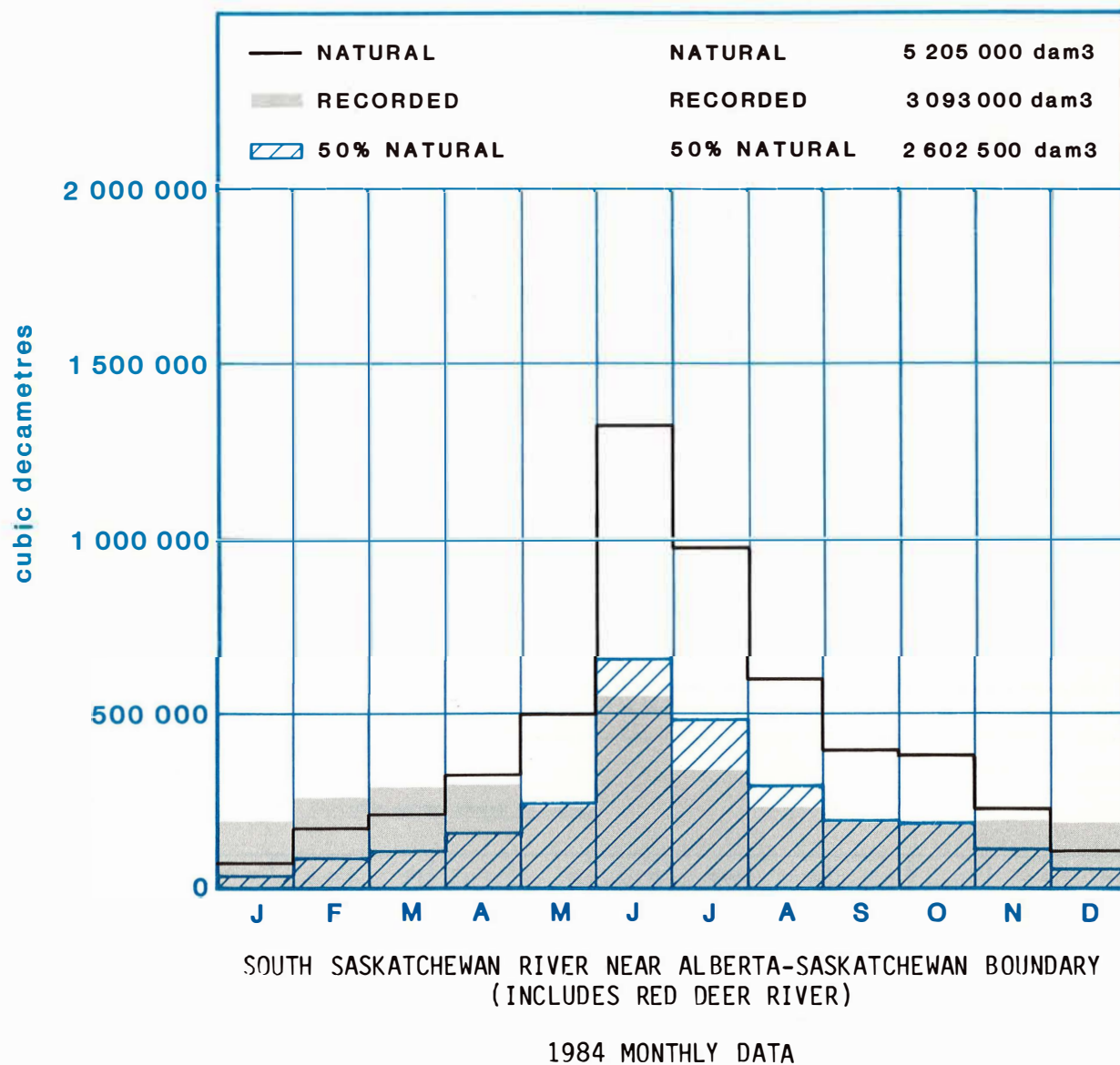
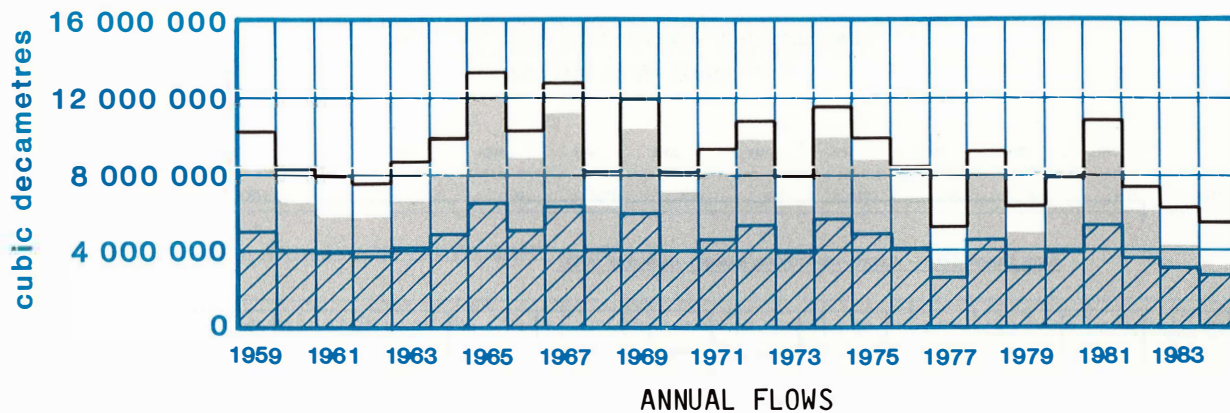
	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGES	189 000	257 000	282 000	299 000	230 000	546 000	338 000	228 000	181 000	171 000	188 000	184 000	3 093 000
NATURAL FLOW	67 000	165 000	204 000	318 000	493 000	1 318 000	968 000	585 000	389 000	377 000	220 000	101 000	5 205 000

Recorded flows for the years 1970 to 1978 inclusive are based on WSC's preliminary data.

Natural flow for the South Saskatchewan and Red Deer Rivers have been calculated using WSC's preliminary data and using the methodology described in "Natural Flow Report, South Saskatchewan River Below Red Deer River" March 1974 (PPMB Report No. 45).

Quantities shown in table have been routed to Alberta boundary.

84



RECORDED AND NATURAL FLOWS - SUMMARY
SELECTED INTERPROVINCIAL STREAMS CROSSING ALBERTA-SASKATCHEWAN BOUNDARY
(CUBIC DECAMETRES ROUNDED TO THREE SIGNIFICANT FIGURES)

SUMMARY FOR THE YEAR 1984

JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. TOTALS

NORTH SASKATCHEWAN -- ALBERTA-SASKATCHEWAN BOUNDARY (NEAR DEER CREEK)

RECORDED FLOW	306 000	275 000	304 000	651 000	420 000	594 000	488 000	368 000	414 000	433 000	419 000	325 000	5 000 000
NATURAL FLOW	72 500	65 500	101 000	429 000	366 000	1 030 000	960 000	728 000	551 000	371 000	195 000	90 300	4 960 000

BEAVER RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY (AT COLD LAKE)

RECORDED FLOW	5 240	5 200	10 400	40 700	44 600	120 000	40 300	17 600	14 700	20 800	18 400	11 600	350 000
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BATTLE RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY (NEAR UNWIN)

RECORDED FLOW	2 680	2 970	7 750	36 700	13 800	15 700	7 960	2 610	3 830	5 710	2 370	2 170	104 000
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RECORDED AND NATURAL FLOWS - SUMMARY
 SELECTED STREAMS CROSSING THE SASKATCHEWAN - MANITOBA BOUNDARY
 (CUBIC DECAMETRES ROUNDED TO THREE SIGNIFICANT FIGURES)
 FOR THE APPORTIONMENT PERIOD 1984-85

APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. TOTALS

CHURCHILL RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (AT SANDY BAY)

RECORDED FLOW	1 920 000	1 680 000	1 870 000	1 860 000	1 530 000	1 410 000	1 620 000	1 720 000	1 890 000	1 990 000	1 740 000	1 780 000	21 000 000
NATURAL FLOW	1 810 000	1 710 000	1 990 000	2 140 000	2 010 000	1 750 000	1 550 000	1 440 000	1 510 000	1 530 000	1 270 000	1 490 000	20 200 000

SASKATCHEWAN RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY

ESTIMATED FLOW	1 970 000	1 490 000	1 470 000	1 240 000	887 000	908 000	986 000	739 000	701 000	734 000	766 000	952 000	12 800 000
APPORTIONMENT FLOW	2 250 000	1 550 000	1 830 000	1 520 000	1 020 000	979 000	993 000	645 000	557 000	620 000	683 000	813 000	13 500 000

QU'APPELLE RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (NEAR WELBY)

RECORDED FLOW	5 690	5 210	3 850	2 660	259	9.50	3 650	15 600	7 720	3 830	1 860	14 600	64 900
NATURAL FLOW	10 800	8 070	2 280	433	0	0	0	0	0	0	0	17 600	39 200

CARROT RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (NEAR TURNBERRY)

RECORDED FLOW	154 000	225 000	239 000	115 000	20 000	13 100	46 900	19 800	9 120	5 790	4 250	5 530	857 000
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RED DEER RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (NEAR ERWOOD)

RECORDED FLOW	143 000	211 000	187 000	28 500	2 790	1 790	16 300	12 600	7 030	3 250	2 500	2 980	619 000
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ASSINIBOINE RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (AT KAMSACK)

RECORDED FLOW	39 900	19 900	21 800	5 640	291	165	529	2 040	1 770	1 090	774	922	94 800
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APPENDIX



APPENDIX INDEX

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PPWB MEMBERS

Chairman	Dr. W.B. Mountain	Assistant Deputy Minister Environmental Conservation Service Environment Canada
	Dr. H.M. Hill	Director General Prairie Farm Rehabilitation Administration Agriculture Canada
	Mr. P.G. Melnychuk	Assistant Deputy Minister Water Resources Management Service Alberta Environment
	Mr. S.R. Blackwell (June 1974 to Sept. 30, 1984)	Consultant Saskatchewan Water Corporation
	Mr. D.L. MacLeod (appointed October 1984)	Vice President Resource Management Saskatchewan Water Corporation
	Mr. T.E. Weber	Director Water Resources Branch Manitoba Department of Natural Resources
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Secretary	Mr. G.W. Dunn	Water Quality Specialist PPWB Secretariat

ALTERNATE MEMBERS

Mr. D.A. Davis (April 1, 1984 to Sept. 30, 1984)	Regional Director Western and Northern Region
R.A. Halliday (Appointed Acting Regional Director on October 1, 1984)	Inland Waters Directorate Environmental Conservation Service Environment Canada
Mr. A.F. Lukey	Director Engineering Branch Prairie Farm Rehabilitation Administration Agriculture Canada
Mr. C.L. Primus	Director, Planning Division Alberta Environment
Mr. D.L. MacLeod (June 1974 to September 1984)	Director Hydrology Branch Water Management Service Saskatchewan Environment
Mr. N. Mudry	Chief Water Management Water Resources Branch Manitoba Department of Natural Resources

COMMITTEE ON HYDROLOGY

Terms of Reference

At the request of, and under the direction of the PPWB, the Committee on Hydrology shall investigate, oversee, review, report and recommend on matters pertaining to hydrology of interprovincial or interjurisdictional basins.

The Committee may consider such things as natural flow; forecasting; network design; collection, processing and transmission of data; basin studies and other items of interprovincial interest involving hydrology.

Members

Chairman	R.B. Godwin	Executive Director Prairie Provinces Water Board
	G.H. Morton	Water Resources Branch Environment Canada
	F.R.J. Martin	Prairie Farm Rehabilitation Administration Agriculture Canada
	R.K. Deepprose	Environmental Engineering Support Services Alberta Environment
	V.M. Austford	Water Resources Branch Manitoba Department of Natural Resources
	D.L. MacLeod (Oct/72 - Dec/84)	Resource Management Saskatchewan Water Corporation
	A.B. Banga (Appointed Jan/85)	Resource Management Saskatchewan Water Corporation
	R.F. Hopkinson	Atmospheric Environment Service Environment Canada
Secretary	A.J. Chen	Operations Engineer PPWB Secretariat

COMMITTEE ON WATER QUALITY

Terms of Reference

At the request of and under the direction of the Prairie Provinces Water Board, the Committee on Water Quality shall investigate, oversee, review, report and recommend on matters pertaining to water quality of interprovincial and interjurisdictional basins.

Carrying out the above responsibilities may include such things as natural quality assessment; quality forecasting; network design; processing and dissemination of data; determination of implications of proposed projects that may significantly alter the water quality of interprovincial streams; consideration of special problems; establishment of procedures for emergency situations; and other items of interprovincial interest involving water quality.

Members

Chairman	R.B. Godwin	Executive Director Prairie Provinces Water Board
	W.D. Gummer	Water Quality Branch Environment Canada
	M. Morelli	Environmental Management Division Manitoba Department of Consumer and Corporate Affairs and the Environment
	D.A. Fast	Water Pollution Control Branch Saskatchewan Environment
	P.G. Shewchuk	Standards and Approvals Division Alberta Environment
	M. Mowchenko (Acting Member)	Prairie Farm Rehabilitation Administration Agriculture Canada
Secretary	G.W. Dunn	Water Quality Specialist PPWB Secretariat

COMMITTEE ON GROUND WATER

Terms of Reference

Recognizing the inter-relationship between surface and groundwater, the Committee on Groundwater shall, at the request of, and under the direction of the Prairie Provinces Water Board, investigate, oversee, review, report, and recommend on matters pertaining to quantity and quality of groundwater at or near interprovincial boundaries.

Responsibilities of the Committee will include: exchange of information; compilation and interpretation of existing data; recommendations on groundwater information and monitoring requirements; determination of implications of proposed projects which may impact the quantity and/or quality of waters at interprovincial boundaries; and other items of interjurisdictional interest involving groundwater.

Approved: November 18-19, 1981
PPWB Minute 26-25

Members

Chairman	R.B. Godwin	Executive Director Prairie Provinces Water Board
	J.A. Gilliland	National Hydrology Research Institute Environment Canada
	D.H. Pollock	Prairie Farm Rehabilitation Administration Agriculture Canada
	H.A. Kerr	Earth Sciences Division Alberta Environment
	R.J. Stewart	Resource Management Saskatchewan Water Corporation
	L. Gray	Water Resources Branch Manitoba Department of Natural Resources
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Secretary	A.J. Chen	Operations Engineer PPWB Secretariat

COMMITTEE ON

INTERJURISDICTIONAL AGREEMENTS ADMINISTRATION

Terms of Reference

It was agreed that a committee consisting of the Executive Director, one member from Saskatchewan, one member from Alberta, and Mr. E.F. Durrant be struck to handle the problem of developing a methodology for the efficient administration of interjurisdictional agreements, particularly as regards Battle and Lodge Creek Basins.

PPWB Minute 8-35: March 20, 1973

Note: Mr. B.N. Johnson replaced Mr. Durrant as the member for Environment Canada in September 1977.

Members

Chairman	R.B. Godwin	Executive Director Prairie Provinces Water Board
	B.N. Johnson	Inland Waters Directorate Environment Canada
	T.K. Olson	Watershed Management Saskatchewan Water Corporation
	A.J. Ferrett	Surface Water Rights Branch Alberta Environment
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Secretary	A.J. Chen	Operations Engineer PPWB Secretariat

STATEMENT OF EXPENDITURES

AUDITED STATEMENT PREPARED BY ENVIRONMENT CANADA
FOR THE PERIOD APRIL 1, 1982 TO MARCH 31, 1985

	<u>Submitted and Audited Amounts</u>		
	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
Salaries	\$210 458	\$213 330	\$218 174
Travel and removal	15 777	14 112	15 087
Postage, freight & express	1 069	503	437
Telephone & telegraph	5 921	3 867	5 299
Professional & special studies	20 552	38 755	30 963
Computing services	15 793	26 601	16 998
Stenographic & typing services	802	1 635	2 600
Miscellaneous special services	5 034	109	-
Accommodation rental	12 000	12 720	12 720
Computer equipment rentals	7 365	2 332	5 304
Photocopying & office equipment rentals	28	6 150	14 340
Furniture, fixtures and office equipment	(1 076)	301	11 432
Stationery, printed matter and office supplies	74 047	13 674	4 586
Miscellaneous	1 056	195	1 721
Special Services	-	-	25 600
Deduct miscellaneous revenue	-	-	2 593
	<u>\$368 826</u>	<u>\$337 284</u>	<u>\$362 668</u>
<u>Shares</u>			
Canada - one half	184 413	168 642	181 333
Alberta - one sixth	61 471	56 214	60 445
Manitoba - one sixth	61 471	56 214	60 445
Saskatchewan - one sixth	61 471	56 214	60 445

Previous Board Expenditures

Fiscal 1970-71	\$ 0
Fiscal 1971-72	105 174
Fiscal 1972-73	136 816
Fiscal 1973-74	158 274
Fiscal 1974-75	109 547
Fiscal 1975-76	143 805
Fiscal 1976-77	139 381
Fiscal 1977-78	163 008
Fiscal 1978-79	224 477
Fiscal 1979-80	500 387
Fiscal 1980-81	468 235
Fiscal 1981-82	436 785

FINAL CLAIM

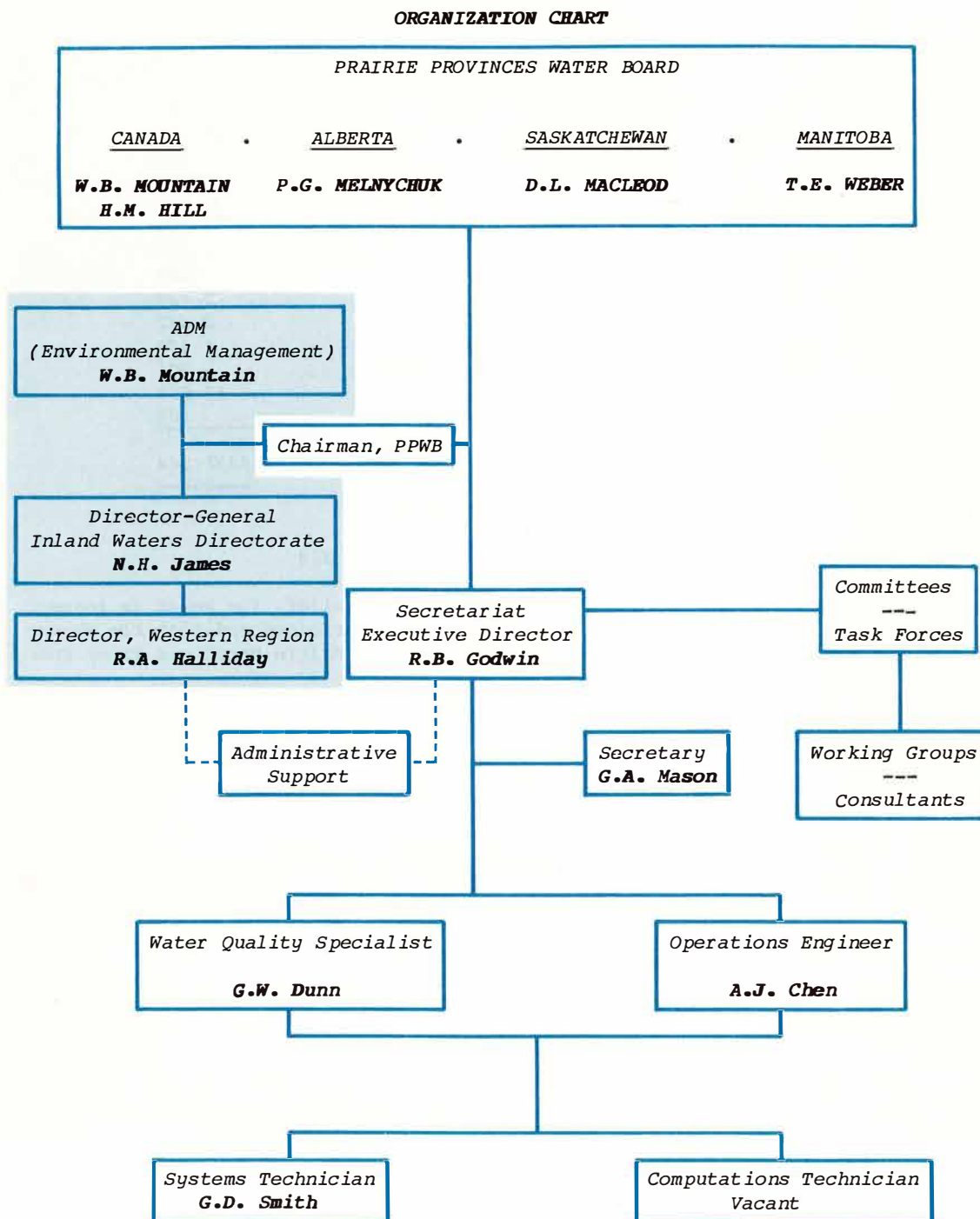
For expenditures in accordance with the Prairie Provinces Water Board Agreement dated October 30, 1969 (See Section 10, Schedule C and Section 15 of the By-laws).

Financial Year 1984-85

	<u>Expenditures</u>
1-Salaries	\$218 174
2-Travel & Removal	15 087
3-Postage, Freight	437
4-Telecommunication	5 299
5-Printing and Advertising	14 340
6-Stenographic Services	2 600
7-Special Services (Ken Born)	25 600
8-Computer Services	16 998
9-Other Professional and Special Services	30 963
10-Accommodation Rental	12 720
11-Other Equipment Rental	5 304
12-Equipment Repairs	1 721
13-Purchased Materials and Supplies	4 586
14-Purchased Equipment and Parts	<u>11 432</u>
TOTAL	\$365 261
April 1, 1982 - March 31, 1985 Credit on Sales	(\$2 593)
Adjusted Total	<u>\$362 668</u>
Each Province's share (one-sixth of the total amount of \$362 668) is \$ 60 445	

The Audit Services Bureau of the Federal Department of Supply and Services has examined the accounts and records of the Prairie Provinces Water Board and certified on June 27, 1985 that they agree with the audited total amount of \$362 668.

ORGANIZATION CHART



MASTER AGREEMENT ON APPORTIONMENT

MASTER AGREEMENT ON APPORTIONMENT

THIS AGREEMENT is made in quadruplicate this THIRTIETH day of OCTOBER, 1969, A.D.

BETWEEN:

HER Majesty, the Queen, in right of Canada, represented herein by the Minister of Energy, Mines and Resources

(Hereinafter called "Canada")

- and -

HER Majesty, the Queen, in right of Alberta, represented herein by the Minister in charge of Water Resources for Alberta

(Hereinafter called "Alberta")

- and -

HER Majesty, the Queen, in right of Saskatchewan, represented herein by the Minister in charge of The Water Resources Commission Act of the said Province

(Hereinafter called "Saskatchewan")

- and -

HER Majesty, the Queen, in right of Manitoba, represented herein by the Minister in charge of The Water Control and Conservation Branch Act of the said Province

(Hereinafter called "Manitoba")

WHEREAS under natural conditions the waters of the watercourses hereinafter referred to arising in or flowing through the Province of Alberta would flow into the Province of Saskatchewan and under the said conditions the waters of some of the said watercourses arising in or flowing through the Province of Saskatchewan would flow into the Province of Manitoba;

AND WHEREAS the Governor-in-Council has authorized Canada to enter into this agreement by Order-in-Council P.C. 1969-8/2051 dated October 29, 1969, and the Lieutenant Governors-in-Council for Alberta, Manitoba and Saskatchewan, respectively, have authorized them to enter into this agreement by the following Orders-in-Council:

Alberta	- O.C. 2053/69
Manitoba	- O.C. 1359/69
Saskatchewan	- O.C. 1612/69

AND WHEREAS the parties hereto deem it to be in their mutual interest that an agreement be reached among the four parties as to the apportionment as described in the schedules attached hereto of such interprovincial waters among the three Provinces;

AND WHEREAS Alberta and Saskatchewan have entered into an agreement, which agreement is attached to this agreement as Schedule A, that permits the Province of Alberta to make a net depletion of one-half the natural flow of water arising in or flowing through the Province of Alberta and that permits the remaining one-half of the natural flow of each such watercourse to flow into the Province of Saskatchewan, subject to certain *exceptions* as are set forth in the said agreement;

AND WHEREAS Saskatchewan and Manitoba have entered into an agreement, which agreement is attached to this agreement as Schedule B, that permits the Province of Saskatchewan to make a net depletion of one-half the natural flow of water arising in, and one-half of the water flowing into the Province of Saskatchewan, and that permits the remaining one-half of the flow of each such watercourse to flow into the Province of Manitoba, subject to such conditions and agreements as therein contained;

AND WHEREAS the parties are desirous that the Prairie Provinces Water Board (referred to herein as the Board), reconstituted by this agreement will be responsible for the administration of this agreement;

AND WHEREAS the parties hereto recognize the continuing need for consultation and co-operation as between themselves with respect to the matters herein referred to so that the interests of all the parties are best served;

NOW THEREFORE, THIS AGREEMENT (hereinafter known as the Master Agreement) witnesseth that each party agrees as follows:

Interprovincial Agreements

1. Alberta and Saskatchewan agree that the agreement between them (hereinafter called the First Agreement), a copy of which is set out in Schedule A to the Master Agreement, will become binding upon them upon the date that the Master Agreement is executed.
2. Saskatchewan and Manitoba agree that the agreement between them (hereinafter called the Second Agreement), a copy of which is set out in Schedule B to the Master Agreement, will become binding upon them upon the date that the Master Agreement is executed.
3. The parties agree to the apportionment of water between Alberta and Saskatchewan and Manitoba as provided in the First and Second Agreements and each party agrees to be bound by the said agreements as they relate to apportionment as if it were a party thereto.
4. The parties agree that the First or Second Agreement, or both, may be altered by an agreement in writing among the four parties to the Master Agreement, but not otherwise.
5. The parties agree that the First and Second Agreements will continue in force and effect until cancelled by an agreement in writing among the four parties to the Master Agreement.

Water Quality

6. The parties mutually agree to consider water quality problems; to refer such problems to the Board; and to consider recommendations of the Board thereon.

Monitoring

7. The parties agree that the monitoring of the quantity and quality of waters as specified in the First and Second Agreements, the collection, compilation and publication of water quantity and quality data required for the implementation and maintenance of the provisions of this agreement shall be conducted by Canada, subject to provision of funds being voted by the Parliament of Canada.

Administration

8. The parties agree, subject to Clause 9 of this agreement that if at any time, any dispute, difference or question arises between the parties with respect to this agreement or the construction, meaning and effect thereof, or anything therein, or the rights and liabilities of the parties thereunder or otherwise in respect thereto, then every such dispute, difference or question will be referred for determination to the Exchequer Court under the provisions of the Exchequer Court Act of Canada and each of the parties hereto agrees to maintain or enact the necessary legislation to provide the Exchequer Court with jurisdiction to determine any such dispute, difference, or question in the manner provided under the Exchequer Court Act.
9. The parties also agree that the Board, with the consent of the parties in dispute, may cause to be prepared, a factual report of the dispute for consideration by the parties hereto prior to the referral of the dispute to the Exchequer Court.
10. The parties agree that the Prairie Provinces Water Board shall monitor and report on the apportionment of waters as set out in the provisions of the First and Second Agreements and ratified by this Master Agreement.
11. The parties agree to revoke the agreement dated July 28, 1948, establishing the Prairie Provinces Water Board and to reconstitute the

Prairie Provinces Water Board in the form of Schedule C hereto and the said Schedule shall form and become part of this Master Agreement.

12. Because the Orders-in-Council referred to in Schedule D hereto will become redundant upon the execution of this Master Agreement, the parties agree to take steps to have them revoked.

13. The parties agree for the future application of the provisions of the Master Agreement (and the First and Second Agreements thereunder), to work together and to co-operate to the fullest extent each with the other for the integrated development and use of water and related resources to support economic growth according to selected social goals and priorities and to participate in the formulation and implementation of comprehensive planning and development programs according to their national, regional and provincial interest and importance.

14. No Member of the Parliament of Canada or Member of the Legislative Assemblies of the Provinces party to this agreement shall hold, enjoy, or be admitted to any share or part of any contract, agreement, commission or benefit arising out of this agreement.

IN WITNESS HEREOF Canada has caused its presents to be executed by its Minister of Energy, Mines and Resources, and Alberta has caused its presents to be executed by its Minister in charge of Water Resources, and Saskatchewan has caused its presents to be executed by its Minister in charge of The Water Resources Commission Act, and Manitoba has caused its presents to be executed by its Minister in charge of The Water Control and Conservation Branch Act on the day and year first mentioned above.

"A. Davidson"

Witness to the signature of the Minister
(Energy, Mines and Resources) for Canada

"J.J. Greene"

Minister (Energy, Mines and Resources) for
Canada

October 30, 1969

Date

"R. E. Bailey"

Witness to the signature of the Minister in
charge of Water Resources for Alberta

"Henry A. Ruste"

Minister in charge of Water Resources for
Alberta

October 30, 1969

Date

"Harold W. Pope"

Witness to the signature of the Minister in
charge of The Water Resources Commission
Act for Saskatchewan

"Allan R. Guy"

Minister in charge of The Water Resources
Commission Act for Saskatchewan

October 30, 1969

Date

"Thomas E. Weber"

Witness to the signature of the Minister in
charge of The Water Control and Conserva-
tion Branch Act for Manitoba

"Lenard S. Evans"

Minister in charge of The Water Control
and Conservation Branch Act for Manitoba

October 30, 1969

Date

SCHEDULE A

THIS AGREEMENT is made in quadruplicate this THIRTIETH day of OCTOBER, 1969, A.D.

BETWEEN:

HER Majesty, the Queen, in right of Alberta, represented herein by the Minister in charge of Water Resources for Alberta

(Hereinafter called "Alberta")

- and -

HER Majesty, the Queen, in right of Saskatchewan, represented herein by the Minister in charge of The Water Resources Commission Act of the said Province

(Hereinafter called "Saskatchewan")

WHEREAS under natural conditions the waters of the watercourses hereinafter referred to arising in or flowing through the Province of Alberta would flow into the Province of Saskatchewan and under the said conditions the waters of some of the said watercourses arising in or flowing through the Province of Saskatchewan would flow into the Province of Manitoba;

AND WHEREAS the parties hereto deem it to be in their mutual interest and in the interest of Manitoba that an agreement in principle be reached among the said three Provinces as to the apportionment of such interprovincial waters among them;

AND WHEREAS the parties hereto are of the opinion that an equitable apportionment of such waters as between the adjoining Provinces of Alberta and Saskatchewan would be to permit the Province of Alberta to make a net depletion of one-half the natural flow of water arising in or flowing through the Province of Alberta and to permit the remaining one-half of the natural flow of water of each such watercourse to flow into the Province of Saskatchewan, subject to certain

prior rights as are hereinafter set forth or may hereafter be mutually agreed upon in writing;

AND WHEREAS on the basis of the foregoing apportionment as between the Provinces of Alberta and Saskatchewan the parties hereto are of the opinion that in a similar manner, an equitable apportionment of the remainder of the natural flow of the said watercourses that flow into the Province of Manitoba after permitting the Province of Alberta to make its depletion of one-half thereof would be to permit the Province of Saskatchewan to make a net depletion of one-half of the said remainder and to permit the other one-half thereof to flow into the Province of Manitoba; and that the natural flow of any tributaries to the said watercourses which tributaries join the said watercourses in the Province of Saskatchewan without arising in or first flowing through the Province of Alberta could be apportioned one-half to the Province of Saskatchewan and one-half to the Province of Manitoba in a manner similar to the apportionment of waters as between the Provinces of Alberta and Saskatchewan, in all cases subject to such prior rights as may be mutually acknowledged by the said Provinces of Manitoba and Saskatchewan;

AND WHEREAS the parties hereto recognize the continuing need for consultation and co-operation as between themselves and with Manitoba with respect to the matters herein referred to so that the best and most beneficial use of the said waters may be made and the interests of all said provinces best served:

NOW THIS AGREEMENT witnesseth as follows:

1. IN THIS AGREEMENT:

- (a) "Natural flow" means the quantity of water which would naturally flow in any watercourse had the flow not been affected by human interference or human intervention, excluding any water which is part of the natural flow in Alberta but is not available for the use of Alberta because of the provisions of any international treaty which is binding on Alberta.

- (b) "Watercourse" means any river, stream, creek, or other natural channel which from time to time carries a flowing body of water from the Province of Alberta to the Province of Saskatchewan and includes all tributaries of each such river, stream, creek or natural channel which do not themselves cross the common boundary between the Provinces of Alberta and Saskatchewan. Such tributaries as do themselves cross the said common boundary between the Provinces of Alberta and Saskatchewan shall be deemed to be "watercourses" for the purpose of this agreement.
2. (a) The parties hereto shall mutually establish a method by which to determine the natural flow of each watercourse flowing across their said common boundary.
- (b) For the purpose of this agreement, the said natural flow shall be determined at a point as near as reasonably may be to their said common boundary.
- (c) Notwithstanding sub-paragraph (b) the point at which the natural flow of the watercourses known as the South Saskatchewan and Red Deer Rivers is to be determined may be, at the option of Alberta, a point at or as near as reasonably may be below the confluence of the said two rivers.
3. Alberta shall permit a quantity of water equal to one-half the natural flow of each watercourse to flow into the Province of Saskatchewan, and the actual flow shall be adjusted from time to time on an equitable basis during each calendar year, but this shall not restrict or prohibit Alberta from diverting or consuming any quantity of water from any watercourse provided that Alberta diverts water to which it is entitled of comparable quality from other streams or rivers into such watercourse to meet its commitments to Saskatchewan with respect to each watercourse.
4. Notwithstanding paragraph 3 hereof, the following special provisions shall apply as between the parties hereto with respect to the watercourse known as the South Saskatchewan River.
- (a) Alberta shall be entitled in each year to consume, or to divert or store for its consumptive use a minimum of 2,100,000 acre-feet net depletion out of the flow of the watercourse known as the South Saskatchewan River even though its share for the said year, as calculated under paragraph 3 hereof, would be less than 2,100,000 acre-feet net depletion, provided however Alberta shall not be entitled to so consume or divert, or store for its consumptive use, more than one-half the natural flow of the said South Saskatchewan watercourse if the effect thereof at any time would be to reduce the actual flow of the said watercourse at the common boundary of the said Provinces of Saskatchewan and Alberta to less than 1,500 cubic feet per second.
- (b) The consumption or diversion by Alberta provided for under the preceding subparagraph shall be made equitably during each year, depending on the actual flow of water in the said watercourse and the requirements of each Province, from time to time.
5. The parties hereto shall work together and co-operate to the fullest extent, each with the other, for the most effective, economical and beneficial use of waters flowing from the Province of Alberta into the Province of Saskatchewan, including the construction and operation of approved projects of mutual advantage to our Provinces on a cost-share basis proportionate to the benefits derived therefrom by each Province, (the approval of which projects shall not be unreasonably withheld by either of the parties hereto) and shall enter into such other arrangements, agreements or accords with each other, and with the Governments of Canada and other Provinces to best achieve the principles herein agreed upon.

6. *Notwithstanding paragraph 3 hereof, with respect to each of the three watercourses known as Battle Creek, Lodge Creek, and Middle Creek, the annual flow shall be apportioned such that, in each of the said watercourses, Alberta permits a quantity of water equal to 75 percent of the natural flow to pass the interprovincial boundary from Alberta to Saskatchewan.*
7. If at any time any dispute, difference or question shall arise between the parties or their representatives touching this agreement or the construction, meaning and effect thereof, or anything therein, or the rights or liabilities, of the parties or their representatives thereunder or otherwise in respect thereto then every such dispute, difference or question shall be referred for determination to the Exchequer Court under the provisions of The Exchequer Court Act of Canada, and each of the parties hereto agrees to enact the necessary legislation to provide the Exchequer Court with jurisdiction to determine any such dispute, difference or question in the manner provided under Section 30 of The Exchequer Court Act.
8. This agreement shall become effective upon the execution of an agreement by Canada, Alberta, Manitoba and Saskatchewan relative to the apportionment of waters referred to in this agreement.

IN WITNESS WHEREOF Alberta has caused these presents to be executed on its behalf by its Minister in charge of Water Resources, and Saskatchewan has caused these presents to be executed by its Minister in charge of The Water Resources Commission Act, both on the day and year first above mentioned.

"R. E. Bailey"

Witness to the signature of the Minister
in charge of Water Resources for Alberta

"Henry A. Ruste"

Minister in charge of Water Resources
for Alberta

"Harold W. Pope"

Witness to the signature of the Minister
in charge of The Water Resources Com-
mission Act

"Allan R. Guy"

Minister in charge of The Water Re-
sources Commission Act

Section 6 amended on July 5, 1984.

SCHEDULE B

THIS AGREEMENT is made in quadruplicate this THIRTIETH day of OCTOBER, 1969, A.D.

BETWEEN:

HER Majesty, the Queen, in right of Saskatchewan, represented herein by the Minister in charge of The Water Resources Commission Act of the said Province

(Hereinafter called "Saskatchewan")

- and -

HER Majesty, the Queen, in right of Manitoba, represented herein by the Minister in charge of The Water Control and Conservation Branch Act of the said Province

(Hereinafter called "Manitoba")

WHEREAS under natural conditions the waters of the watercourses hereinafter referred to arising in or flowing through the Province of Saskatchewan would flow into the Province of Manitoba;

AND WHEREAS the parties hereto deem it to be in their mutual interest and in the interest of Alberta that an agreement in principle be reached among the said three Provinces as to the apportionment of interprovincial waters among them;

AND WHEREAS the parties hereto are of the opinion that an equitable apportionment of such waters as between the adjoining Provinces of Saskatchewan and Manitoba would be to permit the Province of Saskatchewan to make a net depletion of one-half the natural flow of water arising in, and one-half the flow of water flowing into, the Province of Saskatchewan, and to permit the remaining one-half of the flow of water of each such watercourse to flow into the Province of Manitoba, subject to certain rights as may hereafter be mutually agreed upon in writing;

AND WHEREAS on the basis of the foregoing apportionment as between the Provinces of Saskatchewan and Manitoba, the parties hereto are of the opinion that in a similar manner, an equitable apportionment of the natural flow of the said watercourses arising in or flowing through the Province of Alberta would be to permit the Province of Alberta to make a net depletion of one-half thereof, subject to such prior rights as may be mutually acknowledged by the said Provinces of Alberta, Saskatchewan and Manitoba;

AND WHEREAS the parties hereto recognize the continuing need for consultation and co-operation as between themselves and with Alberta with respect to the matters herein referred to so that the interests of all said Provinces are best served;

NOW THIS AGREEMENT witnesseth as follows:

1. IN THIS AGREEMENT:

- (a) "Natural flow" means the quantity of water which would naturally flow in any watercourse had the flow not been affected by human interference or human intervention.
- (b) "Watercourse" means any river, stream, creek, or other natural channel which from time to time carries a flowing body of water from the Province of Saskatchewan to the Province of Manitoba and includes all tributaries of each such river, stream, creek or natural channel which do not themselves cross the common boundary between the Provinces of Saskatchewan and Manitoba. Such tributaries as do themselves cross the said common boundary between the Provinces of Saskatchewan and Manitoba shall be deemed to be "watercourses" for the purpose of this agreement.

2. (a) The parties hereto shall mutually establish a method by which to determine the natural flow of each watercourse flowing across their said common boundary.
- (b) For the purpose of this agreement, the said natural flow shall be determined at a point as near as reasonably may be to their said common boundary.
3. Saskatchewan shall permit in each watercourse the following quantity of water to flow into Manitoba during the period from April 1 of each year to March 31 of the year following: A quantity of water equal to the natural flow for that period determined at the point referred to in paragraph 2(b) hereof, less
 - (a) one-half the water flowing into Saskatchewan in that watercourse from Alberta, and
 - (b) any water which would form part of the natural flow in that watercourse but does not flow into Saskatchewan because of the implementation of any provision of any subsisting water apportionment agreement made between Alberta and Saskatchewan and approved by Manitoba, and
 - (c) one-half the natural flow arising in Saskatchewan.

The actual flow shall be adjusted from time to time by mutual agreement on an equitable basis during such period but this shall not restrict or prohibit Saskatchewan from diverting, storing or consuming any quantity of water from any watercourse provided that Saskatchewan diverts water to which it is entitled of comparable quality from other streams or rivers into such watercourse to meet its commitments to Manitoba with respect to each watercourse.
4. Saskatchewan shall be entitled during such period to consume or to divert or store for its consumptive use the water it is not required to permit to flow into Manitoba in each watercourse under paragraph 3 hereof, but such consumption or diversion shall be made equitably depending on the actual flow of water in each watercourse and the requirements of each Province from time to time, but Saskatchewan shall permit sufficient water to flow into Manitoba to meet its commitments during such period under paragraph 3 hereof.
5. The parties hereto shall work together and co-operate to the fullest extent, each with the other, for the use of waters flowing from the Province of Saskatchewan into the Province of Manitoba, including the construction and operation of approved projects of mutual advantage to the said Provinces on a cost-share basis proportionate to the benefits derived therefrom by each Province (the approval of which projects shall not be unreasonably withheld by either of the parties hereto) and shall enter into such other arrangements, agreements or accords with each other, and with the Governments of Canada and other Provinces to best achieve the principles herein agreed upon.
6. If at any time any dispute, difference or question shall arise between the parties or their representatives touching this agreement or the construction, meaning and effect thereof, or anything therein, or the rights or liabilities of the parties or their representatives thereunder or otherwise in respect thereto then every such dispute, difference or question shall be referred for determination to the Exchequer Court under the provisions of The Exchequer Court Act of Canada, and each of the parties hereto agrees to maintain or enact the necessary legislation to provide the Exchequer Court with jurisdiction to determine any such dispute, difference or question in the manner provided under The Exchequer Court Act.

7. This agreement shall become effective upon the execution of an agreement by Canada, Alberta, Manitoba and Saskatchewan relative to the apportionment of waters referred to in this agreement.

IN WITNESS WHEREOF Saskatchewan has caused these presents to be executed by its Minister in charge of The Water Resources Commission Act, and Manitoba has caused these presents to be executed by its Minister in charge of The Water Control and Conservation Branch Act on the day and year first above mentioned.

"Harold W. Pope"

Witness to the signature of the Minister in charge of The Water Resources Commission Act

"Allan R. Guy"

Minister in charge of The Water Resources Commission Act

"Thomas E. Weber"

Witness to the signature of the Minister in charge of The Water Control and Conservation Branch Act

"Leonard S. Evans"

Minister in charge of The Water Control and Conservation Branch Act.

SCHEDULE C

PRAIRIE PROVINCES WATER BOARD AGREEMENT

THIS AGREEMENT made this THIRTIETH day of OCTOBER, 1969, A.D.

BETWEEN:

THE GOVERNMENT OF CANADA,
hereinafter called "Canada"

- and -

THE GOVERNMENT OF MANITOBA,
hereinafter called "Manitoba"

- and -

THE GOVERNMENT OF SASKATCHEWAN,
hereinafter called "Saskatchewan"

- and -

THE GOVERNMENT OF ALBERTA,
hereinafter called "Alberta"

1. Manitoba, Saskatchewan, Alberta and Canada agree to establish and there is hereby established a Board to be known as the Prairie Provinces Water Board to consist of five members to be appointed as follows:

- (a) two members to be appointed by the Governor General in Council, one of whom shall be Chairman of the Board, on the recommendation of the Minister of Energy, Mines and Resources,
- (b) one member to be appointed by the Lieutenant Governor in Council of each of the Provinces of Manitoba, Saskatchewan and Alberta.

2. Functions

The Board shall oversee and report on the Master Agreement (including the First and

Second Agreements thereunder) executed by Canada, Alberta, Manitoba and Saskatchewan for the apportionment of waters flowing from one Province into another Province; shall take under consideration, comprehensive planning, water quality management and other questions pertaining to water resource management referred to it by the parties hereto; shall recommend appropriate action to investigate such matters and shall submit recommendations for their resolution to the parties hereto.

3. Composition of Board

The members of the Board shall be chosen from those engaged in the administration of water resources or related duties for Manitoba, Saskatchewan, Alberta or Canada, as the case may be, and shall serve as members of the Board in addition to their other duties.

4. Duties of the Board

In accordance with its functions, the duties of the Board shall be as follows:

- (a) to review, collate, and analyze stream-flow data and prepare reports and recommendations on the apportionment of water,
- (b) to review water quality problems, particularly such problems located at the interprovincial boundaries, and to recommend to the parties hereto, appropriate management approaches for their resolution including the establishment of new institutional arrangements,
- (c) to develop recommendations on other water matters, in addition to problems on water quality, referred to the Board by any party hereto including the review and analysis of existing information and the requesting of additional studies and assistance by appropriate governmental agencies to provide information for formulating its recommendations,

- (d) to promote through consultation and the exchange of information the integrated development of water resources of inter-provincial streams,
- (e) to cause to be prepared with the consent of the parties involved factual reports on disputes arising out of the water apportionment for consideration by the parties hereto,
- (f) to ensure the co-ordination of such technical programs as water quantity and quality monitoring and streamflow forecasting required for the effective apportionment of water.

5. Confirmation of the Board's Recommendations

A recommendation of the Board with respect to any matters referred to it under Section 2 shall, subject to the Master Agreement for the apportionment of water, become effective when adopted by Orders-in-Council passed by Canada and each of the Provinces.

6. Authority of Board

The Board shall have authority to correspond with all Governmental organizations and other sources of information in Canada or abroad concerned with the administration of water resources, and such other authority as may be conferred on the Board from time to time by agreement between the parties hereto; all agencies of the four governments having to do with the water and associated resources in the area covered by the Agreement shall be required to supply the Board with all data in their possession requested by the Board.

7. Records

The records relating to the water resources of the three provinces collected and compiled by the P.F.R.A. organization at Regina shall be made available to the Board.

8. Meetings of the Board

The Board shall meet at the call of the Chairman and meetings shall be called at least twice annually; the expenses of the members shall be borne by their respective governments.

9. Reports

The Board shall submit an annual progress report outlining work done and work contemplated in the agreed program to each of the responsible Ministers of the parties hereto and such other reports as may be requested by any one of such Ministers.

10. Operation of the Board

The Secretary for the Board and such other technical and clerical staff as may be required, with a headquarters at Regina, shall be Federal or Provincial public servants. The cost of administration, excluding the cost of monitoring as described in Section 7 of the Master Agreement, but including staff, accommodation, supplies and incidental expenses of the Board, shall be borne by the parties hereto on the basis of one-half by Canada and one-sixth by each of the Provinces. The Board shall prepare for approval of the parties hereto, work program, staff requirements, annual budgets and five-year forecasts and such other reports as may be required in the operation of the Board.

- 11. Any water development project already constructed or to be constructed by any one of the parties shall be so operated as to maintain the apportionment of water as set out in the Master Agreement (and the First and Second Agreements thereunder) for the apportionment of waters of interprovincial streams.

SCHEDULE D

PREVIOUS ALLOCATIONS OF INTERPROVINCIAL WATERS
 APPROVED BY ORDERS-IN-COUNCIL BY THE GOVERNMENTS OF
 CANADA, ALBERTA, MANITOBA, AND SASKATCHEWAN

<u>Item</u>	<u>Order-in-Council</u>			
	<u>Canada</u>	<u>Alberta</u>	<u>Saskatchewan</u>	<u>Manitoba</u>
Allocation of water for specific projects in Alberta	4030/49	857/49	1307/51	1121/49
Allocation of water for specific projects in Saskatchewan	1874/51	1091/51	1310/51	1264/51
Allocation of water for South Saskatchewan River Project in Sask- atchewan	973/53	991/53	1271/53	924/53

BY-LAWS

PART I

1. In these By-Laws:

- (a) "Agreement" means the Prairie Provinces Water Board Master Agreement (including the First and Second Agreements thereunder) executed the Thirtieth day of October, 1969, A. D. by Canada, Alberta, Saskatchewan and Manitoba.
- (b) "Alternate" means Alternate Member of the Prairie Provinces Water Board.
- (c) "Board" means the Prairie Provinces Water Board.
- (d) "By-Laws" means the ordinances adopted by the Board for the regulation of the Board's internal affairs.
- (e) "Chairman" means Chairman of the Prairie Provinces Water Board.
- (f) "Executive Director" means the senior officer of the Secretariat.
- (g) "Member" means Member of the Prairie Provinces Water Board.
- (h) "Ministers" means the responsible ministers of the governments which are party to the Agreement.
- (i) "Secretariat" means the operational unit established by the Board to carry out the day-to-day affairs of the Board.
- (j) "Schedule C" means the Prairie Provinces Water Board Agreement under the Master Agreement (1969) executed by Canada, Alberta, Saskatchewan and Manitoba establishing the Prairie Provinces Water Board.

PART II

The following shall be the By-Laws of the Prairie Provinces Water Board.

1. Objectives

The objectives of the Board shall be to promote the integrated development and use of water and related resources to support economic growth according to selected social goals and priorities, and to participate in the formulation and implementation of comprehensive planning and development programs according to their national, regional and provincial interest and importance.

In general, the Board will provide coordination and liaison between water resource agencies and will advise governments on the planning, development and management of interprovincial waters.

In particular, the Board will ensure the equitable apportionment of water flowing from one province into another province in accordance with the Agreement and will promote effective water quality management of interprovincial streams relative to standards and procedures adopted by the Board from time to time.

2. Membership

In accordance with Section 1 of Schedule "C", the Prairie Provinces Water Board shall consist of five Members to be appointed as follows:

- (a) two Members to be appointed by the Governor General in Council, one of whom shall be Chairman of the Board;
- (b) one Member to be appointed by the Lieutenant Governor in Council of each of the Provinces of Manitoba, Saskatchewan and Alberta.

3. Alternate Members

Each Member, including the Chairman, shall arrange for the appointment of an Alternate Member to act on his behalf during his absence, in which case the Alternate shall enjoy all the rights and privileges conferred on the Member.

4. Meetings and Notice

The Board shall meet at least twice a year by the call of the Chairman. Any Member may request a meeting of the Board at any time, in which case the Chairman must call the meeting within one month (30 days).

Meetings of the Board shall be called with at least 14 days notice unless every Member agrees otherwise.

5. Quorum

Meetings of the Board shall be official when all Members or their appointed Alternates are present.

6. Voting

All recommendations to government, all By-Laws and budgets-in-total shall require unanimous approval. The majority of votes determines a question on any other matter. In the event of a tie, the Chairman shall cast the deciding vote.

7. Powers

In accordance with the duties, functions and operations of the Board, as contained in Schedule "C", the Board shall have the power to authorize expenditures within the limits of approved budgets for the operations of the Secretariat, for the employment of staff, or for any other purposes necessary for administering the Agreement and furthering the objectives of the Board.

8. Authority

Within the general responsibilities given to it, the Board shall determine its technical and administrative functions from time to time and

shall decide all matters regarding the authority of the Board and the delegation thereof.

9. Financial Year

The financial year shall end on the 31st day of March in each year.

10. Budgets

The Chairman shall submit fiscal year program and budget estimates to the Board and to the parties to the Agreement for their approval. Such estimates shall be submitted not later than the first day of August preceding the financial year to which they pertain.

11. Secretariat

(a) There shall be a permanent Secretariat with offices at Regina, Saskatchewan.

(b) The Secretariat shall be the "operational arm" of the Board, charged with the responsibility of conducting programs approved by the Board for collating and analyzing data and reporting the apportionment and water quality of interprovincial streams; for conducting approved studies, and for furthering the policies and objectives of the Board.

(c) Except as otherwise provided for under subsection (f) herein, employees of the Secretariat shall be federal civil servants, subject to federal public service regulations and classification and collective agreements.

(d) The chief officer of the Secretariat shall be the Executive Director whose actions shall at all times be subject to the approval of the Board.

(e) The Board shall approve the establishment of salaried positions within the Secretariat and shall approve job descriptions prior to submission to the appropriate federal authority. The Board shall be consulted on the appointment of employees to the Secretariat which role may be delegated to the Executive Director.

- (f) The Board may arrange by agreement for secondment to the Secretariat, the employees of the agencies of those party to the Agreement, at cost, whenever in the opinion of the party concerned the services of such employees are available. Such employees shall remain under the administrative control and public service regulations of the appropriate party.

12. Assignments to Associated Agencies and Consultants

- (a) The Board shall have the authority to engage agencies of those party to the Agreement, at cost, to undertake assignments from the Board, whenever in the opinion of the party concerned, the services of such agencies are available.
- (b) Agencies may enter into sub-contracts with consultants for purposes of professional interpretation subject to the approval of the Executive Director. Sub-contracts for the collection of basic data shall not require the approval of the Executive Director.
- (c) The Board may engage consultants to undertake assignments from the Board where such services are deemed necessary.
- (d) The services of consultants and of agencies of those party to the Agreement shall be engaged under a contractual arrangement. Contracts shall be entered into by the Chairman and/or the Executive Director subject to delegated authorities under the federal government contract regulations. Contracts for services shall also be subject to budgetary appropriations and any other controls imposed by the Board for the conduct of the work.

13. Terms of Payment for Services Provided by Associated Agencies

- (a) Canada, through the Board, shall reimburse the Provinces of Alberta, Saskatchewan and Manitoba on a monthly basis, for expenditures made pursuant to the Agreement and approved by the Board. Payment for such expenditures will be made by Canada upon the submission of a claim in a mutually agreed manner and form.

- (b) Canada, and the Provinces of Alberta, Saskatchewan and Manitoba shall keep complete records of all expenditures made severally pursuant to the Agreement and shall support such expenditures with proper documentation. Canada and the Provinces of Alberta, Saskatchewan and Manitoba shall make these records and documents available to auditors appointed by the other.

14. Cost of Administration of the Board

- (a) In accordance with Section 10 of Schedule "C", all budgeted expenditures, which shall not include the cost of monitoring, as described in Section 7 of the Master Agreement, but including staff, accommodation, supplies and incidental expenses of the Board, shall be borne by the parties to the Agreement on the basis of one-half by Canada and one-sixth by each of the Provinces.

15. Financing the Operations of the Board

- (a) Canada shall assume responsibility for financing the operations of the Board.
- (b) Subject to the cost sharing provisions of the Agreement, the Provinces of Alberta, Saskatchewan and Manitoba shall pay to Canada their shares of approved expenditures made by Canada for the operations of the Board.
- (c) *On or before July 1st of each year, Canada shall prepare and submit to each of the provinces party to the Agreement, statements of claim respecting provincial shares of monies due Canada for financing the operations of the Board during the previous financial year. Statements of claim shall be certified by a senior official of Canada. Once every three years, commencing with fiscal 1981-82, these claims shall be audited and shall bear a Canada audit certificate. (Amended 1980)*

- (d) Within sixty (60) days after receipt of a claim by Canada, submitted as prescribed in Article 15(c), the Provinces of Alberta, Saskatchewan and Manitoba shall reimburse Canada for their shares of expenditures incurred during the previous financial year for the operations of the Board.

16. Annual Report

Within six (6) months after the end of the financial year, the Chairman shall submit to the Ministers the Annual Report of the Board. (Amended 1980)

17. Amendment of By-Laws

~~By-Laws may be enacted,~~ amended or repealed by unanimous approval of the Board. "Notice of Motion" to enact, amend or repeal By-Laws must be served on Members at least sixty (60) days prior to a vote on such issue.

18. Rules and Procedures

~~The Board shall formulate~~ and adopt "Rules and Procedures" governing the day-to-day affairs of the Board and the operations of the Secretariat. These "Rules and Procedures" may be amended, adopted or repealed in accordance with Article 6 of these By-Laws.

PART III

EXECUTIVE DIRECTOR

I. Functions

- (a) The Executive Director shall be the senior employee of the Secretariat; subject to the Board's direction, he shall be responsible for the technical and administrative activities of the Secretariat and the day-to-day management of the Board.
- (b) He shall record or cause to be recorded all votes and minutes of all proceedings in books to be kept for that purpose.
- (c) He shall give or cause to be given notice of all meetings of the Board.
- (d) He shall keep the Board informed at all times of matters pertinent or relevant to the programs and operations of the Board.
- (e) He shall have charge of all records of the Board, together with copies of all reports made by the Board and such other books or papers as the Board may direct.
- (f) He shall implement all orders and resolutions of the Board and perform any other duties that the Board may prescribe.

Approved at PPWB Meeting No. 5
- November 2nd, 1971

*Section 15(c) amended at
PPWB Meeting No. 23 - May 5, 1980.*

*Section 16 amended at
PPWB Meeting No. 24 - Nov. 3, 1980.*

RULES AND PROCEDURES

SECRETARIAT

The Prairie Provinces Water Board hereby adopts the following Rules and Procedures governing the operations of the Prairie Provinces Water Board Secretariat.

Financial Administration

1. The Executive Director is authorized to make disbursements of funds in conformity with the main items of expenditure allotted in the budget estimates approved by the Board, subject to those restrictions specified elsewhere in these Rules and Procedures.
2. The Executive Director shall prepare the annual program and budget estimates for the operations of the Prairie Provinces Water Board. Such estimates shall be submitted to the Chairman not later than the first day of July preceding the financial year to which they pertain.
3. Contracts with private consultant firms and individuals shall conform to accepted practices and procedures of the Federal Treasury Board.
4. A contract for services with a person or persons may be undertaken by the Executive Director providing that no such contract is made with a single person, a single firm of persons, or government agency exceeding \$5,000 without the approval of the Board.
5. Contracts not exceeding \$5,000 shall be executed on behalf of the Board under the signature of the Executive Director. Contracts exceeding \$5,000 shall be executed under the signature of the Chairman of the Board.
6. Payment of accounts will be made only after they have been approved by the Executive Director.

Establishment of Salaried Positions, Appointments and Administration of Salaries

7. The establishment of salaried positions in the Secretariat shall be approved by the Board.
8. The Board shall approve the duties of all positions in the Secretariat including those of Executor Director.
9. The classification and remuneration of salaried positions within the Secretariat shall be governed by the appropriate federal authority.
10. The financial and personnel administration of the Secretariat shall be carried out in accordance with federal government practices.
11. To facilitate the operations of the Secretariat, personnel and financial administrative support services shall be provided, at cost, by the Federal Department of the Environment.

Board Offices

12. The Executive Director is authorized to lease and maintain property within which to conduct Board affairs providing that terms of such leasing shall be sanctioned by the Board.
13. Costs for the operation of the Board offices shall include, but shall not necessarily be limited to, expenditures for the following items:
 - (a) Salaries and wages and related benefits of Board employees or personnel seconded to the Board offices, including removal expenses, both at the commencement and termination of the appointment, where applicable, and living expenses for seconded personnel where approved by the Board.

- (b) Field surveys and investigations including travel and living expenses when applicable, by personnel engaged in conducting studies or field investigations.
- (c) Rentals for office space and equipment and charges for utilities and related services for the operation of Board offices.
- (d) Purchases of furniture, and equipment not available on a rental basis.
- (e) Operating, maintenance and transportation expenses for equipment.
- (f) Contracts awarded by the Board including, where applicable, arbitration, settlements, legal fees and other matters, made in accordance with the provisions of the contract.
- (g) Settlement and legal fees arising out of property damaged or public liability made or incurred by an employee of the Secretariat or a party to the Agreement working for the Secretariat and engaged in the activities of the Board offices.
- (h) Other items required for conducting the work and for operations of the Board offices which have been approved by the Board.

- (c) Normal operating maintenance and transportation expenses for equipment where such expenses are not included in the rental rate.
- (d) All contracts as provided under the provisions of Article 12(b) of the By-Laws.
- (e) Other items required for conducting the work of the Board and approved by the Executive Director.

Board Members, Alternates and Advisory Committees

15. The costs incurred by Board Members and their Alternates in representing their respective governments at Board functions shall be paid for by the appropriate government. The salaries and travelling expenses of government officials appointed to represent those party to the Agreement on Committees established to advise the Board and/or the Executive Director shall be paid by the appropriate party.

Approved at PPWB Meeting No. 5
- November 2nd, 1971

Payment for Services Provided by Participating Government Agencies

14. Costs of participating government agencies for services, field investigations, planning studies, etc., specifically requested by the Board shall include the following items:
 - (a) Salaries, wages, travel and living expenses for employees engaged in providing the service.
 - (b) Rental charges for equipment and operators.

MAP



