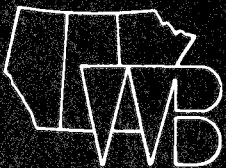


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ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1984



PRAIRIE PROVINCES WATER BOARD

CANADA ALBERTA SASKATCHEWAN MANITOBA

1983-84

ANNUAL REPORT

FOR THE YEAR ENDING MARCH 31, 1984



PRAIRIE PROVINCES WATER BOARD

306 - 1901 VICTORIA AVENUE REGINA, SASKATCHEWAN S4P 3R4

CANADA

ALBERTA

SASKATCHEWAN

MANITOBA

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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 May 16-17, 1983 in Winnipeg, Manitoba and on November 8, 1983 in Regina, Saskatchewan.

In the last fiscal year; the Committee on Hydrology met three times, the Committee on Water Quality met four times, the Committee on Interjurisdictional Agreements Administration met twice, and the Committee on Groundwater met twice; a total of eleven 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, 1983 to March 31, 1984.

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 now operates through an Executive Director and his staff, supported by committees as shown in the organization chart on page 44. 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 and Lodge Basins Apportionment Study

The Board at their meeting on May 6-7, 1981, accepted a report entitled "Battle and Lodge Basins Apportionment Study - PPWB Report No. 61". The Board agreed that Article 6, Schedule A of the Master Agreement be amended to reflect the recommendations with respect to apportionment and that the amendment be finalized by Ministerial approval. An agreement to amend Article 6 was submitted to legal counsel for each member agency, for their consideration. It was then forwarded to the governments for Order-In-Council approval. Finally, in March 1984, it was circulated to the member agencies for ministerial signature. When the agreement has been signed by all member agencies, interprovincial apportionment of the waters of Lodge, Middle and Battle Basins will become a reality.

Site-Specific Water Quality Studies

The Board agreed that the Beaver River Interim Requirements will remain in effect until the newly proposed approach for establishing water quality requirements at interprovincial boundaries has been tested and approved. They directed the Committee on Water Quality to apply the proposed approach to develop site-specific water quality requirements to the Beaver, South Saskatchewan, Red Deer, and Saskatchewan Rivers monitoring sites, and requested the Committee to document any problems encountered in applying that approach to specific sites and to report any modifications needed to ensure that the approach is equitable. They further directed that, in calculating water quality requirements on the South Saskatchewan River basin, requirements should be based on historic data gathered at the South Saskatchewan River at Highway No. 41 and Red Deer River near Bindloss monitoring sites.

Two reports were presented in support of this proposed approach. They were "PPWB Water Quality Administrative Procedures" and "Water Quality Requirements for the Beaver River at the Alberta-Saskatchewan Boundary". The Board, in tabling these reports, agreed that agency review was necessary before they could be approved by the Board.

Continuing Consideration of Interprovincial Groundwater Management

The Board, directed the Committee on Groundwater to consider the feasibility of hydrogeologic mapping of interprovincial aquifers to

delineate areas where interprovincial groundwater may become a problem. The Committee, as part of this work, recommended that a contract be awarded to develop a profile of hydrogeology along the Alberta-Saskatchewan boundary, from the International Boundary to the northern edge of the Saskatchewan-Nelson River Basin. This profile will be used to delineate potential groundwater problem areas. The Board specified that the contract be carried out under the direction of the Committee on Groundwater and that it be completed in the current fiscal year. The Board also directed the committee to continue their compilation of a bibliography of groundwater publications related to interprovincial groundwater management.

The Impact of Artificial Drainage on Downstream Flows

The Board approved a report from the Committee on Hydrology entitled "Recommended Procedure to Deal With the Impact of Artificial Drainage on Downstream Flows". The members directed the Committee on Hydrology to present progress reports at future Board meetings, on the status of constructed and proposed drainage works and on whether the approved method requires further modification based on its practical application to specific streams.

1983-1984 Hydrometric and Water Quality Interprovincial Monitoring for Apportionment Purposes

The Board approved the recommended PPWB Hydrometric Stations requirement list and water quality parameters listing for 1983-84 and directed the Executive Director to, on behalf of the Board, recommend to Environment Canada that this monitoring be carried out for the current year.

Monitoring on Cumberland Marshes Project

The Board reviewed the annual report prepared on the Cumberland Marshes Monitoring program and noted that the report included a summary of water quantity and quality monitoring for the past five years. The Committee on Water Quality was directed to establish a Task Force to report to the Board on the results of the monitoring program up to the end of the calendar year 1984. This Task Force will report to the Board at the fall 1985 meeting. The Board agreed that the PPWB water quality monitoring of the Ducks Unlimited Marshes Project should continue until the Task Force report has been reviewed.

Westward Flowing Tributaries of Eastward Flowing Streams

A report, recommending a method that may be used to individually apportion westward flowing tributaries, was presented to the Board at the November 17, 1982 meeting. The Board agreed to defer discussion on the report. At subsequent meetings in the spring and fall of 1983, they agreed to continue to defer approval of this report until the provinces involved have had sufficient opportunity to discuss its implications with their staff.

Interprovincial Implications of Proposed Projects

The Board has agreed that a statement of the impact that any major project would have on the quantity and quality of water crossing inter-provincial boundaries should be submitted through the appropriate provincial member, and reviewed by the Secretariat in consultation with Board Committees. The Board, in the past financial year, has been active in the evaluation of one such project.

The Proposed Cold Lake Oil Sands Project

It has been agreed that the Committees on Hydrology, Water Quality and Groundwater will maintain a watching brief on the development of the Cold Lake Oil Sands and that they should keep the Board apprised of any plans that will affect the quantity and/or quality of water crossing the Alberta-Saskatchewan boundary. Reports have been made at both Board meetings and the Board noted that in the fiscal year 1983-84 there was no necessity to make a further report to their respective governments on this project.

Implementation of the First Order Long Term Water Quality Network

The systematic implementation of a permanent network of water quality stations continues to be a matter of concern to the Board. Board Members have investigated alternatives within their own agencies to free resources and to establish agreements to expedite the implementation and maintenance of such a network. They have also directed the Committee on Water Quality to continue monitoring the implementation process and to report the network's current status to the Board on a regular basis.

Moosomin Dam and Its Effect on the Apportionment of Pipestone Creek Flows

The Board agreed that concerns expressed by Manitoba residents about the availability of Pipestone Creek water could best be examined, initially, by the Saskatchewan and Manitoba members. It was further agreed that PFRA (the agency controlling Moosomin Dam) and the Board Secretariat would provide whatever support is needed to further these negotiations.

PPWB Budget for 1984-85

The Board approved a budget of \$352 000 for the fiscal year 1984-85. 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 1984-85 in a sum not to exceed \$25 000. This contract will allow the Secretariat to, on a contract basis, have the services previously performed by the Computations Technician, done under direct contact with the Prairie Provinces Water Board.

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 1983-84 is described in this section.

Apportionment of Boxelder and Mackay Creeks Basins

A study has been made, under the direction of the COIAA, of the apportionment problems related to the Boxelder Creek Basin. The basin's supplies are limited and extensively developed throughout the entire basin, particularly in the Walsh Flats area where the users with the highest use priority irrigate relatively large acreages. The committee has prepared a draft report on the basin with conclusions and recommendations for the consideration of the Board. The report will be submitted to the Board at its spring 1984 meeting.

Site-Specific Water Quality Objective Study

The Committee on Water Quality and the Secretariat are systematically reviewing Water Quality data collected at the eleven PPWB monitoring sites. As a first step in this review, the Committee has prepared a report entitled "Water Quality Administrative Procedures". The report was presented to the Prairie Provinces Water Board in November 1982, and was tabled pending more definitive information on how Water Quality Requirements would be equitably administered at specific sites.

The Committee on Water Quality has also prepared a report entitled "Water Quality Requirements for the Beaver River at the Alberta-Saskatchewan Boundary." This is the first of a series of Water Quality reports to be prepared, one for each of the eleven interprovincial PPWB monitoring sites. The report was tabled by the Board pending further agency review and information on the equitable nature of the methodology used. The committee is now preparing similar reports on the South Saskatchewan River at the Alberta-Saskatchewan boundary and the Red Deer River at the Alberta-Saskatchewan boundary. They will use the same approach to prepare reports for the remaining eight PPWB sites. A method has also been developed for testing the equitability of the Water Quality Requirements proposed for the Beaver River at the Alberta-Saskatchewan boundary.

Implementation of the Recommendations in the PPWB Water Demand Study

The Prairie Provinces Water Board Water Demand Study of

"Historical and Current Water Uses in the Saskatchewan-Nelson Basin" was released to the public on February 10, 1983. There were six recommendations in that study. The Secretariat of the Prairie Provinces Water Board in 1983-84 concentrated on implementing recommendation no. 1. This recommendation was:

"Member agencies should supply available updated information to the Prairie Provinces Water Board in the format established during the Water Demand Study. The Board should assume responsibility for the storage and retrieval of this information."

The Board agreed that it is not necessary to form a Water Use Committee to implement this recommendation. They agreed that each province would appoint one contact person to be responsible for supplying water use data to the Secretariat in the proper format. These appointments were made as follows:

Alberta.....	W.J. Barlishen
Saskatchewan.....	N.E. Parsons
Manitoba.....	L.J. Whitney

The problems attendant to updating this information have been discussed in a conference call with the Secretariat and each of the three provincial coordinators has agreed to furnish available information up to the end of 1982 (1983 where available) to update the Water Demand Study information from each current level of 1976. It is the intension of the Board that this updating procedure be continued so that an up-to-date computerized data base, capable of being used in future studies, will be maintained by the Prairie Provinces Water Board.

Updating of PPWB Monthly Natural Streamflow Estimates

The Board has agreed that the Secretariat should assume responsibility for updating the Saskatchewan-Nelson basin monthly natural streamflow estimates. It instructed the Executive Director to bring the 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 information will be added to the computerized data base of Prairie Provinces Water Board. It is planned that the remaining monthly natural steamflow records for the Saskatchewan-Nelson Basin will be updated to 1982 in the fiscal year 1984-85. The updating procedure will then become a continuing process, similar to that being developed for the Water Demand data.

Interprovincial Groundwater Concerns at the Alberta-Saskatchewan Boundary

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. The contract was completed at the end of the 1983-84 fiscal year. The final report and accompanying maps will be reviewed by the Committee on Groundwater. Based on this review the final report will be prepared and published by the Secretariat in the 1984-85 fiscal year.

Impact of Drainage on Downstream Watersheds

The Board approved a report from the Committee on Hydrology entitled "A Recommended Procedure to Deal with the Impact of Artificial Drainage on Downstream Flows". They directed the committee to present progress reports at future Board meetings on the status of drainage works and on whether the approved method will require further modification. The provincial members on the committee have agreed to design a standard reporting form that can be used to record the status of drainage works that might have an effect on interprovincial flow.

The Board has also accepted a reference from the provinces of Saskatchewan and Manitoba to deal with a specific 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 Environment and Manitoba Department of Natural Resources has been formed. The Task Force proposed, and the Board agreed, that the Province of Saskatchewan will determine the effect of existing drainage works on the volume and intensity of flow at the affected boundary points and the potential effect that future drainage might have on these same streams. Manitoba will then determine both the physical effect that the changes in flow will have on streams entering into the Assiniboine River and whether that effect will increase flooding downstream from Shellmouth reservoir. Finally, the Task Force, under the direction of the Committee on Hydrology, will recommend a solution acceptable to both provinces.

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 twice during the past fiscal year to review the analytical results of this sampling program and to prepare an initial report on the compatibility of agency methodologies. They will present their report on the compatibility of results to the Committee on Water Quality in November, 1984.

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.

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, Assininboine River, Boxelder Creek, Mackay Creek, Graham Creek, Battle River and Gainsborough Creek. Studies are presently underway, under the direction of the Secretariat and the Committee on Hydrology, on Eyehill Creek, Big Gully Creek, and the Beaver River.

The Hydrology Division of PFRA has agreed to undertake similar studies on Swan River and Woody River after they have completed the study on Big Gully Creek. No further commitment has been made to complete further studies on small interprovincial basins, but the need for such studies has been identified on an additional eight streams:

Birch (Saskeram) River	Overflowing River
Jackson Creek	Red Deer River (Saskatchewan)
Elm Creek	Gopher Creek
Stony Creek	Bosshill Creek

Monitoring Studies

The Committee on Hydrology and the Secretariat are involved in four continuing studies to update the quality of the natural flow estimates made at interprovincial boundaries. They are:

- a) Irrigation return flow index stations - A study has been made by Water Resources Branch, Calgary to determine what index stations should be used to estimate return flow from major irrigation projects in southern Alberta. A draft of the study results has been presented to the Committee on Hydrology and has been returned to Water Resources Branch personnel for final editing. Their report will be published in the coming fiscal year.
- b) Reservoir evaporation at major reservoirs - The Atmospheric Environment Service, Regina has undertaken a study to determine what parameters and methods should be used to estimate reservoir evaporation, both as currently used at reservoirs such as St. Mary's, Waterton and Dickson reservoirs and at future reservoirs. It is anticipated that this study will be completed in the fall of 1984.

- c) Updating the natural flow model for the South Saskatchewan River - The natural flow model now used employs English units and uses several parameters that, based on ten years experience, can be improved to provide more accurate estimates. This improvement is being done on a continuing basis. The results from studies a) and b) will be inserted into this model to give an improved estimate of both return flow and reservoir evaporation. Similar changes are made on a continuing basis. Also the computerized configuration will then be revised to a metric format.
- d) The Qu'Appelle River Natural Flow Model - The SSARR (Streamflow and Simulation and Reservoir Regulation) model has been used to estimate natural flow in the Qu'Appelle River basin for several years based on procedures approved by the Board in 1976 to calculate natural streamflow. Some improvements based on the practical experience gained in using this model can now be made. A continuing series of studies are being made to update the model so that it may be used to provide a better estimate of natural flow. One such study has now been completed and will be published early in 1984. It compares the SSARR model to the SIMPAK model in the Qu'Appelle River Basin, and illustrates that the SIMPAK model may be operated more cheaply than the current SSARR model if there are sufficient facts available to quantify the additional parameters needed to implement the SIMPAK model.

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 their 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 study.

Moosomin Dam and Its Effect on the Apportionment of Pipestone Creek Flows

The Secretariat, at the request of the Manitoba and Saskatchewan members of the Board, has prepared a draft report describing the effect that Moosomin Reservoir can have on the availability of flow for Manitoba. It is based on water supply studies performed by the Hydrology Division of PFRA, and supporting text prepared by the Secretariat. The report includes an evaluation of the feasibility of releasing additional water in the fall or winter of each year to supplement Pipestone creek streamflow in Manitoba, both at the present level of development and assuming that more consumptive use is made of the water stored in Moosomin Reservoir.

The report, after review by the Saskatchewan, Manitoba, and PFRA members of the COH, will be forwarded to the Manitoba and Saskatchewan Board members for their use in addressing the interprovincial concerns of Manitoba and Saskatchewan residents concerning the availability of Pipestone Creek water.

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 1983-84.

Committee on Hydrology

The Committee on Hydrology met three times in the last fiscal year. The meetings were held on June 7-8, 1983 in Regina, Saskatchewan; September 15-16, 1983 in Calgary, Alberta; and January 24-25, 1984 in Regina, Saskatchewan. At the June 1983 meeting they reviewed an IWD report entitled "Hydrologic Evaluation - Blackfoot Creek Near the Saskatchewan Boundary". The members agreed that the Blackfoot Creek hydrometric station (05FE004) is not required for PPWB purposes and WRB Regina office may discontinue the operation of the station by October 1983.

After reviewing a report entitled "South Saskatchewan River Basin Historical Natural Flows - 1912 to 1978" and its Appendices, the committee agreed that updating of natural flow data for the Alberta portion of the South Saskatchewan River basin should be done on a regular basis. The next updating should cover the period 1979-1982 and flows should be updated every two years thereafter.

The AES Regina office was asked to conduct a study to evaluate reservoir evaporation for the St. Mary's, Waterton and Dickson reservoirs. The study will provide recommendations on the method to be used to compute reservoir evaporation for natural flow computation purposes.

At its September meeting, the Committee discussed a report prepared by the WRB, Winnipeg office, entitled "Saskatchewan River Monitoring Study". Based on this report, the Committee has recommended to the Board that the PPWB hydrometric station on the Saskatchewan River near the Manitoba Boundary be discontinued, and the frequency of discharge measurement for the Saskatchewan River at The Pas hydrometric station be increased to improve the accuracy of the streamflow record.

A proposal to hold a PPWB hydrology workshop at Brandon, Manitoba was reviewed and finalized, and a brief report entitled "A Recommended Procedure to Deal With the Impact of Artificial Drainage on Downstream Flows" was approved.

At the January 1984 meeting, the Committee reviewed, and approved, a report entitled "Natural Flow - Beaver River at Alberta-Saskatchewan Boundary". The above report will be presented to the Board at its Spring 1984 meeting.

The Committee discussed the transmittal of hydrometric and meteorologic information in the prairie provinces. The newly-established computer system established by the WRB in Calgary transmits daily flow and water level information to concerned agencies, and will be beneficial to all users. The Committee also discussed the system recently set up by AES Winnipeg office to transmit meteorological information in the prairie provinces to Saskatchewan Environment, and suggested that a computer tape containing historical meteorologic information in the prairie provinces be created, so that all PPWB member agencies will have direct access to historical meteorologic information in the prairie provinces.

Committee on Water Quality

The Committee on Water Quality met four times in the last fiscal year. The meetings were held on May 16, 1983 in Winnipeg, Manitoba; on August 30-31, 1983 in Regina, Saskatchewan; on October 18-19, 1983 in Calgary, Alberta; and on January 31-February 1, 1984 in Regina, Saskatchewan. The Committee developed a new Two-Level approach for establishing Water Quality Requirements at interprovincial boundaries and established a basic format to be used in applying the approach to various water quality sites. They reviewed detailed seasonal water quality statistics of the Beaver River at the Alberta-Saskatchewan boundary and submitted recommendations for Site-specific Water Quality Requirements for this river to the Board. The members also agreed to a method that may be used to test Beaver River Water Quality Requirements against historical records.

The Committee made final revisions to the report entitled "PPWB Water Quality Administrative Procedures", and forwarded the document to the Board.

The members reviewed the Ducks Unlimited Water Quality Monitoring Program and agreed that Water Quality Monitoring in this area be continued until five years of data have been obtained and evaluated.

The 1983-84 Water Quality Monitoring Program was reviewed and approved by the Committee and forwarded to the Board for their approval. They also discussed the Committee's responsibilities concerning groundwater quality and the impact of groundwater quality on total water use in the prairies.

The Committee approved designated water uses for the South Saskatchewan and Red Deer Rivers. They reviewed the detailed statistical data results needed to establish Water Quality Requirements in the South Saskatchewan River at the Alberta-Saskatchewan boundary. The Committee discussed approaches that could be used to establish nutrient requirements on the South Saskatchewan River and the Red Deer River at the Alberta-Saskatchewan boundary that would protect downstream water storage uses in Lake Diefenbaker. A work session was held on March 12-13, 1984 in Edmonton, Alberta, to review and test nutrient models designed to determine the trophic state of Lake Diefenbaker

under various nutrient load conditions. The working group developed an approach that may be used to establish nutrient requirements on the South Saskatchewan and Red Deer Rivers.

A PPWB Water Quality Contingency Plan was developed and approved to facilitate the transfer of water quality information regarding spills and unusual water quality conditions to member agencies.

Water quality dossiers were also developed to facilitate exchange of agency information on activities of mutual interest. They also exchanged information on the Alberta South Saskatchewan River study, the Edmonton Journal's North Saskatchewan River study, the Cold Lake Oil Sands project, and the Key Lake uranium mine spill.

Committee on Groundwater

The Committee on Groundwater met twice in the last fiscal year. The meetings were held on July 12, 1983 in Regina, Saskatchewan, and on January 18, 1984 in Winnipeg, Manitoba. At the July 1983 meeting, they reviewed a consultant report entitled "Impact of Subsurface Fluid Disposal on Aquifer Systems in Northeastern Alberta and Northwestern Saskatchewan, Part 2: The Impact of Heavy Oil Development in the Cold Lake Area on Groundwater in Saskatchewan". They agreed with the report's findings that wastewater disposal into the McMurray Formation by the Esso Cold Lake Project would have no measurable impact in Saskatchewan, that the monitoring proposal suggested by the consultant is reasonable, and that further implementation of the monitoring networks in Alberta should be decided by Alberta.

As requested by the Board, the Committee reconsidered the feasibility of a proposal to establish cross-sections and hydrogeological mapping of interprovincial aquifers. A draft proposal outlining the concepts and specification for profiles of hydrogeology along interprovincial boundaries was also discussed, and the Committee agreed to recommend to the Board that a consultant be hired to undertake this study. A contract was subsequently awarded, with the Board's approval, to Geoscience Consulting Ltd. of Edmonton. At the January meeting, primarily draft hydrogeological profiles and map sheets prepared by Geoscience Consulting Ltd. were reviewed, and agreement was reached on the type of information to be included in the consultant's report.

Alberta is listing their groundwater reports on WATDOC as part of the preparation of a bibliography of groundwater reports in the prairie provinces. The Committee agreed that Saskatchewan, Manitoba and PFRA will take no further action in entering groundwater reports to WATDOC until Alberta has entered their data into WATDOC.

The Committee took a field trip to the Whiteshell Nuclear Research Establishment (WNRE) on January 17, 1984. They toured the groundwater monitoring system used to measure the effect that deep excavation in the Canadian Shield granite has on the surrounding area with special reference to the effect that it might have on groundwater.

Committee on Interjurisdictional Agreements Administration

The Committee on Interjurisdictional Agreements Administration met twice during the last fiscal year. Their meetings were held on October 12-13, 1983 in Regina, Saskatchewan; and on February 14-15, 1984 in Edmonton, Alberta. The primary topic at both meetings was the draft report entitled "Boxelder Creek Basin Apportionment Study". The Committee concluded that the available flow in the Boxelder Creek basin is fully allocated to existing projects and there is no water available at this time for additional development. After reviewing five alternative water management strategies, the Committee members recommended that the Boxelder Creek basin be treated as a special interprovincial basin. Available flow in the basin may be jointly managed by Alberta and Saskatchewan on a continuing basis. A final draft of the report will be submitted to the Board at the Spring 1984 meeting.

With respect to the interprovincial apportionment of Battle and Lodge Creek basins, the Committee discussed the problem associated with the date of the first audit period and agreed that the first audit period should be as soon as possible after runoff has started.

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. Personnel and financial administrative services are provided through the staff of the Inland Waters Directorate of the Environmental Conservation Services of Environment Canada.

There were two staff changes in the past year, one temporary and one permanent. Glenda Mason, Secretary to the Executive Director, took a temporary position acting as Secretary to the Regional Director of Inland Waters Directorate, Environment Canada from September 26, 1983 to March 31, 1984. At the conclusion of this assignment, Mrs. Mason returned to the position of Secretary to the PPWB Secretariat. During the six month period the Secretariat, through Manpower Temporary, employed two people; one working from 8:00 a.m. to 12:00 and the second from 12:30 to 4:30 p.m. The second change was made to the position of Computations Technician. Ken Born could not be supported as temporary staff of the Secretariat and as of September 30, 1983 he was laid off. The Secretariat hired Mr. Born as a contractor for the six month period from October 1983 to March 1984 so that the work normally done by the Computations Technician could be done on a contractual basis.

Reports

The Secretariat published, and distributed to Member Agencies, three reports in the past fiscal year. These were:

- PPWB Report No. 67 - Procedures for Interprovincial Apportionment of the Waters of Battle, Lodge and Middle Creeks - Natural Flow - February 1983 (prepared by Water Resources Branch, Inland Waters Directorate, Environment Canada, Calgary).
- The Water Quantity/Quality Monitoring Program - Cumberland Marhes Project - 1982 Annual Report - July 1983 (Prepared for the PPWB by Water Resources Branch).
- Interprovincial Water Quality Data at PPWB Monitoring Stations - April 1973 to December 1982 - July 1983.

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 Secretariat has continued to distribute copies of the Water Demand Study to private individuals and consultants. Demand for these copies decreased by the end of 1983 and it is anticipated that only occasional copies will be requested in the future. The Secretariat has an adequate supply on hand of both Water Demand Study and Saskatchewan-Nelson Basin Study reports to meet this demand.

The work of the Board was publicized through talks and speeches given at several meetings by the Executive Director. In June 1983 he presented a paper entitled "Historic and Current Water Use on the Prairies - Water Demand Study" to the annual conference of the Canadian Water Resources Association in Saskatoon. A copy of the paper will be published in the CWRA Journal. On November 1, 1983 a talk was given to a conference in Hanna, Alberta entitled "Prairie Water - A Limited Supply". Another talk describing the Water Demand Study was given to a group of professional engineers in Winnipeg on November 15, 1983. On March 28, 1984 at a conference in Saskatoon, the Executive Director gave a talk entitled "Water Diversions as They Affect Saskatchewan".

Seven half-day seminars designed to acquaint working level staff on Board agencies with the detailed data available in the recently published Water Demand Study were also presented. These seminars emphasized both the content of the main report and the wealth of data contained in the six appendices of this report. Lastly, A paper describing the Water Demand Study was prepared for the newsletter entitled "Exchange" published by Public Affairs, Environment Canada, Edmonton. The title of this article was "Water Use on the Prairies".

Financial

Secretariat expenditures for the financial year 1983-84, are as shown on page 43. They indicate a total expenditure of \$337 284 of which \$213 330 was for salaries.

The accounts of the Prairie Provinces Water Board have been certified by a Senior Officer of Canada as agreed in Section 15C of the Prairie Provinces Water Board Bylaws.

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 1983-84 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 4 175 800 cubic decametres in the South Saskatchewan River below its junction with the Red Deer River is 69% of the total annual natural flow of 6 058 800 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 1983, so the minimum flow criteria was met for the complete apportionment period. A summary of recorded and natural flows for 1983 at this site is shown on pages 28 and 29.

The natural flow of the Qu'Appelle River from April 1, 1983 to March 31, 1984 was 246 084 cubic decametres. Recorded flow augmented by releases of 56 417 cubic decametres from Diefenbaker Lake, and by "draw-down" water from lakes in the Qu'Appelle Valley, was 327 000 cubic decametres, 133% of natural flow. Recorded and natural flow for the period April 1983 to March 1984 is shown on page 31. This covers the apportionment period of April 1983 to March 1984.

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 is being reviewed by Water Resources Branch

staff. When these reviews have been completed both models will be recalibrated to metric units.

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 year at these three sites are shown on pages 30 and 31. Recorded flow for 1983 at 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 86 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 1983-84 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, 1982 has been validated, published in the PPWB Annual Water Quality Reports, and was distributed to member agencies in August 1983.

Federal laboratory centralization has resulted in a transfer of the majority of duties from the Environment Canada laboratory in Calgary to the National Environment Canada laboratory in Burlington, Ontario. Prairie Provinces Water Board Water Quality samples, requiring immediate analysis, such as nutrients, coliforms, and total alkalinities are now 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. During the transition period, reports on data results have been slower than normal but it is hoped that this problem will be eliminated in the near future.

The 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" for the parameters marked with an asterisk on page 26. The Board, through the Secretariat, continually reviews Water Quality data from the eleven PPWB stations to identify present and potential water quality concerns. When site-specific water quality requirements have been established they will be used for review purposes. Until that work is completed annual evaluations will be based on the 1973 objectives although the Board realizes that some are not appropriate for prairie streams.

A review of the 1983 water quality data from PPWB monitoring stations indicates that the "1973 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 Assiniboine River below

Kamsack station, followed closely by the Battle River near Unwin, and the Beaver River at Beaver Crossing stations.

The minimum dissolved oxygen level of 0.5 mg/L was maintained at most PPWB sites, but dissolved oxygen levels in the Beaver River, the Battle River, and the Carrot River at the interprovincial boundary dropped below this minimum level during the winter period. The objective for manganese was exceeded at 7 of 11 PPWB stations (72 times in the past year). The objective for total phosphorus of 0.15 mg/L as P was exceeded at 10 of the 11 PPWB stations (78 times during 1983). The total nitrogen objective (0.5 mg/L) was exceeded 96 times in the last year at 10 of the 11 PPWB sites. The Churchill River at the outlet of Wasawakasik Lake PPWB monitoring site was the only PPWB station which did not experience high nutrient levels.

The Water Quality Objective for phenolic material (0.005 mg/L) was exceeded at least once at all PPWB stations in 1983 (42 times in the past year). This is a significant increase over 1982 when phenolic material was recorded at only 4 of the 11 PPWB stations.

Several biocides were detected at PPWB Water Quality monitoring stations in 1983. Alpha BHC was detected in 73% of the samples collected between January, 1983, and December, 1983, and 2,4-D was present in 36% of the samples. Twenty-six percent of the samples contained detectable levels of lindane. The South Saskatchewan River at Highway 41 experienced the most number of biocide detections (27) for the 1983 year. The North Saskatchewan River near Deer Creek, the Battle River near Unwin, and the Saskatchewan River near the Manitoba boundary each experienced 21 detections of biocides in the 1983 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". The material contained in these three reports will be used in future years to maintain and establish new guidelines to administer the 1969 Apportionment Agreement.

Similar documents are now 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".

PPWB WATER QUALITY MONITORING
1983 PARAMETER LIST

*Aldrin
Alkalinity, phenol.
Alkalinity, total
Aluminum, extractable
N-Alkanes
*Arsenic, diss.
*Barium, total
BHC-alpha
BHC-gamma (Lindane)
Bicarbonate, calc.
*Boron, diss.
*Cadmium, total
Calcium, diss.
Carbon, diss., organic
Carbon, organic, particulate
Carbonate, calc.
Chlordane-alpha
Chlordane-gamma
Chloride, diss.
Chlorophyll A
*Chromium, ext.
Cobalt, total
Coliforms, fecal
Coliforms, total
*Color, true
*Copper, total
*Cyanide, total
*P,P-DDD
*P,P-DDE
*O,P-DDT
*P,P-DDT
*Dieldrin
Endosulfan-alpha
Endosulfan-beta
*Endrin
*Fluoride, diss.
Free CO₂
Hardness, non carbonate
Hardness, total, CaCO₃
*Heptachlor
*Heptachlor, expoxide
Hexachloro-benzene
Hydroxide, calc.
*Iron, diss.

*Lead, total
Magnesium, diss.
MCPA
*Mercury, total
P,P-methoxychlor
Mirex
Nickel, total
Nitrogen, diss., NO₃+NO₂
Nitrogen, particulate
Nitrogen, total Ammonia as N
*Nitrogen, total, calc.
Nitrogen, total, diss.
*Oxygen, diss., DO
PCB, Arochlor 1242
PCB, Arochlor 1254
PCB, Arochlor 1260
PCB, Arochlor total
*pH
*Phenolics
Phosphorus Ortho as P
Phosphorus, particulate calc.
*Phosphorus, total, diss.
*Phosphorus, total, as P
#Picloram (Tordon)
Potassium, diss.
Residue, fixed, nonfilterable
*Residue, nonfilterable
*Selenium, diss.
Silica, reactive
Silvex
*Sodium, diss.
Solids, total diss., calc.
Specific Conductance
Sulphate, diss.
*Temperature
*Turbidity
Vanadium, total
*Zinc, total
2,4-D
2,4-DB
2,4-DP
2,4,5-T

*Objectives exist
#Collected at 5 sites only

1983 FLOW DATA



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

FOR THE YEAR 1983

SOUTH SASKATCHEWAN RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED FLOW	191 000	199 000	275 000	260 000	390 000	578 000	363 000	167 000	106 000	98 600	194 000	117 000	2 938 600
CONSUMPTIVE USE	-700	-1 000	8 200	132 100	243 300	360 700	368 800	341 700	251 000	113 700	1 400	-1 700	1 817 500
CHANGE IN RESERVOIRS	-96 900	-81 300	-84 100	-134 000	96 300	268 700	191 500	-49 300	-95 100	-12 500	-39 800	-78 700	-113 200
DIVERSION FROM BASIN	0	0	0	0	12 000	35 400	40 700	33 300	21 800	16 800	3 600	0	163 600
NATURAL FLOW ALTA. BDRY.	88 800	109 500	199 000	225 400	653 500	1 239 700	979 000	525 100	308 600	215 000	209 100	51 400	4 804 100

RED DEER RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGES	20 700	27 300	75 900	191 000	189 900	134 000	259 000	119 000	72 200	75 200	43 300	29 700	1 237 200
CONSUMPTIVE USE	0	0	0	0	0	0	2 600	4 900	5 500	6 500	1 400	0	20 900
DIVERSION INTO BASIN	0	0	0	0	-12 000	-35 400	-40 700	-33 300	-21 800	-16 800	-3 600	0	-163 600
NATURAL FLOW ALTA. BDRY.	20 700	27 300	75 900	206 200	196 200	173 800	292 300	117 300	63 500	51 200	26 800	3 500	1 254 700

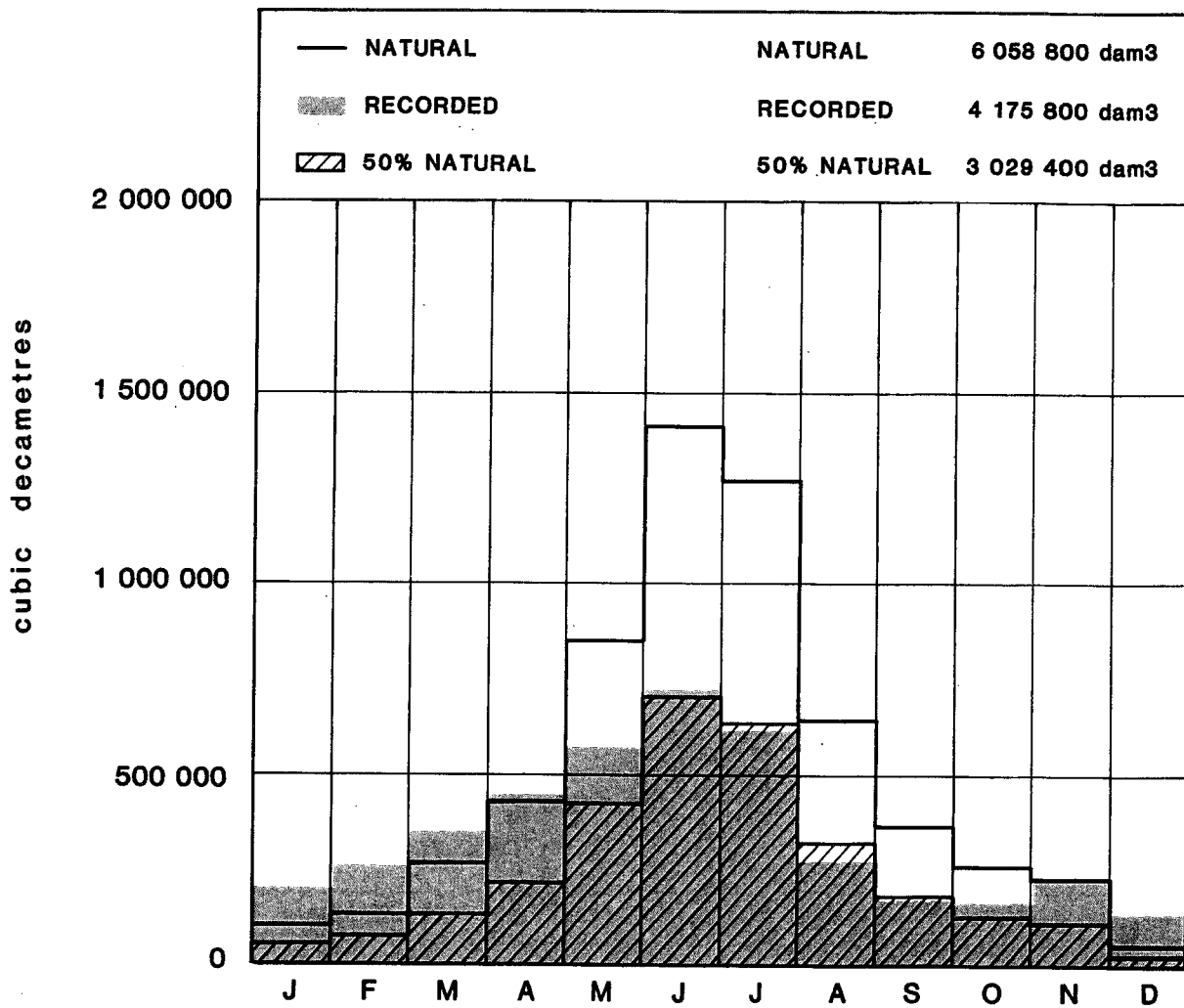
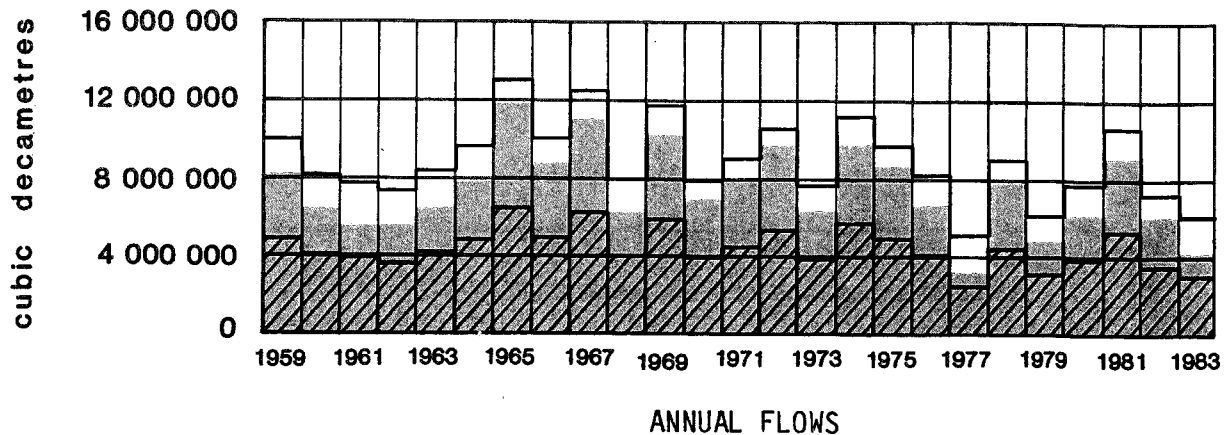
SOUTH SASKATCHEWAN RIVER -- BELOW JUNCTION WITH RED DEER RIVER

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
RECORDED DISCHARGES	211 700	266 300	350 900	451 000	579 900	712 000	622 000	286 000	178 200	173 800	237 300	146 700	4 175 800
NATURAL FLOW	109 500	136 800	274 900	431 600	849 700	1 413 500	1 271 300	642 400	372 100	266 200	235 900	54 900	6 058 800

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 (PPWB Report No. 45).

Quantities shown in table have been routed to Alberta boundary.



SOUTH SASKATCHEWAN RIVER NEAR ALBERTA-SASKATCHEWAN BOUNDARY
(INCLUDES RED DEER RIVER)

1983 MONTHLY DATA

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

SUMMARY FOR THE YEAR 1983

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

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

RECORDED FLOW	390 000	258 000	309 000	752 000	791 000	675 000	1 000 000	399 000	329 000	321 000	299 000	280 000	5 800 000
NATURAL FLOW	113 000	61 700	108 000	506 000	721 000	957 000	1 480 000	808 000	448 000	260 000	151 000	23 800	5 640 000

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

RECORDED FLOW	5 590	4 660	5 700	22 600	23 000	18 800	49 100	30 200	14 900	17 500	12 800	8 150	213 000
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BATTLE RIVER -- ALBERTA-SASKATCHEWAN BOUNDARY (NEAR UNWIN)

RECORDED FLOW	6 050	4 500	11 900	69 800	45 600	20 800	135 000	34 400	12 100	7 630	6 200	4 720	359 000
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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 1983-84

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

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

RECORDED FLOW	1 600 000	1 320 000	1 410 000	1 450 000	1 230 000	1 930 000	1 870 000	1 820 000	1 890 000	1 930 000	1 850 000	1 910 000	20 200 000
NATURAL FLOW	1 300 000	1 520 000	2 020 000	2 330 000	2 020 000	2 290 000	2 250 000	1 920 000	1 760 000	1 650 000	1 470 000	1 450 000	22 000 000

SASKATCHEWAN RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY

RECORDED FLOW	1 520 000	2 460 000	1 590 000	1 980 000	1 220 000	988 000	1 090 000	1 000 000	729 000	892 000	947 000	929 000	15 300 000
APPORTIONMENT FLOW	1 810 000	2 750 000	2 070 000	2 420 000	1 470 000	993 000	1 010 000	752 000	340 000	660 000	830 000	840 000	15 900 000

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

RECORDED FLOW	60 500	83 000	29 100	21 900	27 000	12 700	22 100	18 100	12 700	10 500	11 600	17 800	327 000
NATURAL FLOW	71 100	69 400	12 400	25 500	40 700	13 100	744	22	0	0	0	13 100	246 000

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

RECORDED FLOW	42 000	165 000	173 000	131 000	40 000	40 800	34 800	18 500	5 720	3 680	3 650	4 510	665 000
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RED DEER RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (NEAR ERWOOD)

RECORDED FLOW	81 600	105 000	106 000	148 000	22 100	30 100	18 700	13 000	5 750	2 660	2 670	3 670	539 000
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ASSINIBOINE RIVER -- SASKATCHEWAN-MANITOBA BOUNDARY (AT KAMSACK)

RECORDED FLOW	66 200	94 000	21 200	30 300	7 410	699	481	1 520	1 660	1 010	920	12 100	237 000
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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	Executive Director Water Management Service Saskatchewan Environment
	Mr. T.E. Weber	Director Water Resources Branch Manitoba Department of Natural Resources
Secretary	Mr. G.W. Dunn	Water Quality Specialist PPWB Secretariat

ALTERNATE MEMBERS

Mr. D.A. Davis

*Regional Director
Western and Northern Region
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
(appointed March/1984)*

*Director,
Planning Division
Alberta Environment*

Mr. D.L. MacLeod

*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	Hydrology Branch Saskatchewan Environment
	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 inter-provincial 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 GROUNDWATER

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	Groundwater Division Saskatchewan Environment
	L. Gray	Water Resources Branch Manitoba Department of Natural Resources
Secretary	A.J. Chen	Operations Engineer PPWB Secretariat

COMMITTEE ON INTERJURISDICTIONAL AGREEMENTS ADMINISTRATION

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

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

STATEMENT OF EXPENDITURES

	FINAL CLAIMS		
	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>
Salaries	\$245 689	\$210 458	\$213 330
Travel and Transportation	18 624	15 777	14 112
Postage, Freight and Express	671	1 069	503
Telephone and Telegraph	7 318	5 921	3 867
Professional and Special Studies	56 987	20 552	38 755
Computing Services	18 027	15 793	29 601
Stenographic and Typing Services	663	802	1 635
Miscellaneous Special Services	---	5 034	109
Accommodation Rental	12 000	12 000	12 720
Computer Equipment Rentals	---	7 365	2 332
Photocopying and Other Equipment Rentals	73 040	28	6 150
Furniture, Fixtures and Office Equipment	---	1 076	301
Stationery, Printed Matter & Office Supplies	3 703	74 047	13 674
Miscellaneous	63	1 056	195
	<u>\$436 785</u>	<u>\$368 826</u>	<u>\$337 284</u>
	=====	=====	=====

Final Claim includes Water Demand Study expenditures.

<u>Shares:</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>
Canada: one half	\$218 391	\$184 413	\$168 642
Alberta: one sixth	72 798	61 471	56 214
Manitoba: one sixth	72 798	61 471	56 214
Saskatchewan: one sixth	72 798	61 471	56 214

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
Fiscal 1982-83	368 826

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 1983-84

	<u>TOTALS</u>
1. Salaries	\$213 330
2. Travel and Transportation	14 112
3. Postage, Freight and Express	503
4. Telephone and Telegraph	3 867
5. Professional and Special Services	38 755
6. Computing Services	29 601
7. Stenographic Services	1 635
8. Miscellaneous Special Services	109
9. Accommodation Rental	12 720
10. Computer Equipment Rentals	2 332
11. Photocopying and Other Equipment Rentals	6 150
12. Furniture and Fixtures	301
13. Stationery, Printed Matter and Supplies	13 674
14. Miscellaneous	<u>195</u>
TOTAL	<u>\$337 284</u> =====

Each Province's Share of Expenditures (one-sixth) = \$56 214

I hereby certify that to the best of my knowledge and belief, the works in respect of which this claim is made have been satisfactorily performed and that the amount claimed is properly chargeable under the terms of the Prairie Provinces Water Board Agreement dated October 30, 1969.

Original signed by R.B. Godwin

Executive Director
Prairie Provinces Water Board

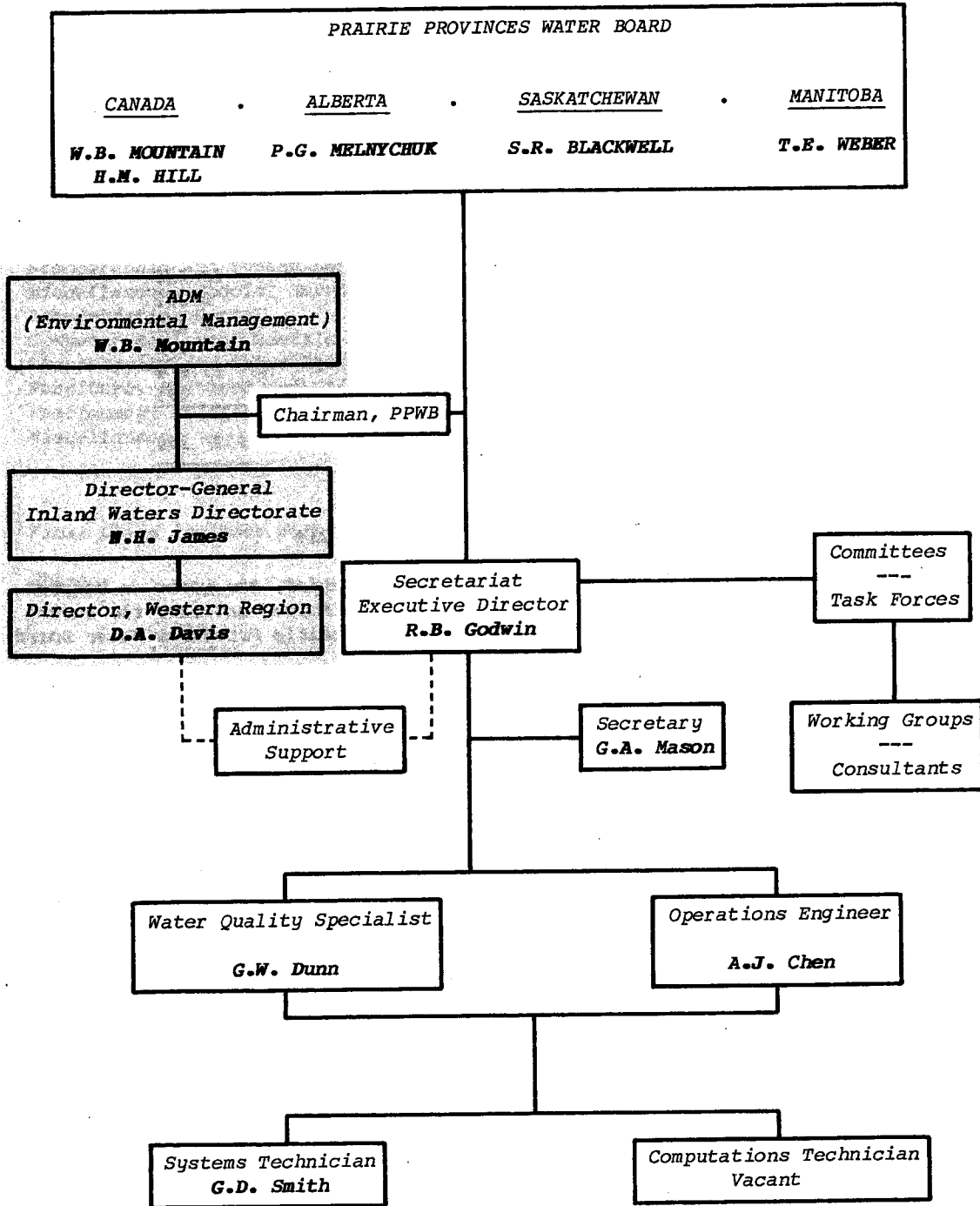
I hereby certify the amounts shown are appropriately documented by the Federal Department of Environment and represent expenditures for PPWB purposes.

Original signed by D.A. Davis

D.A. Davis
Regional Director
EMS - Environment Canada

ORGANIZATION CHART

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 prior rights 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 cooperate 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 cooperation 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 sub-paragraph 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. This agreement shall not adversely affect any right to water in Battle or Lodge Creeks which has been given by the Government of Canada prior to the transfer of the natural resources to the Provinces and is still subsisting, or any right to such water given by either Province heretofore which has been recognized and approved by both Provinces.
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

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

1. 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.

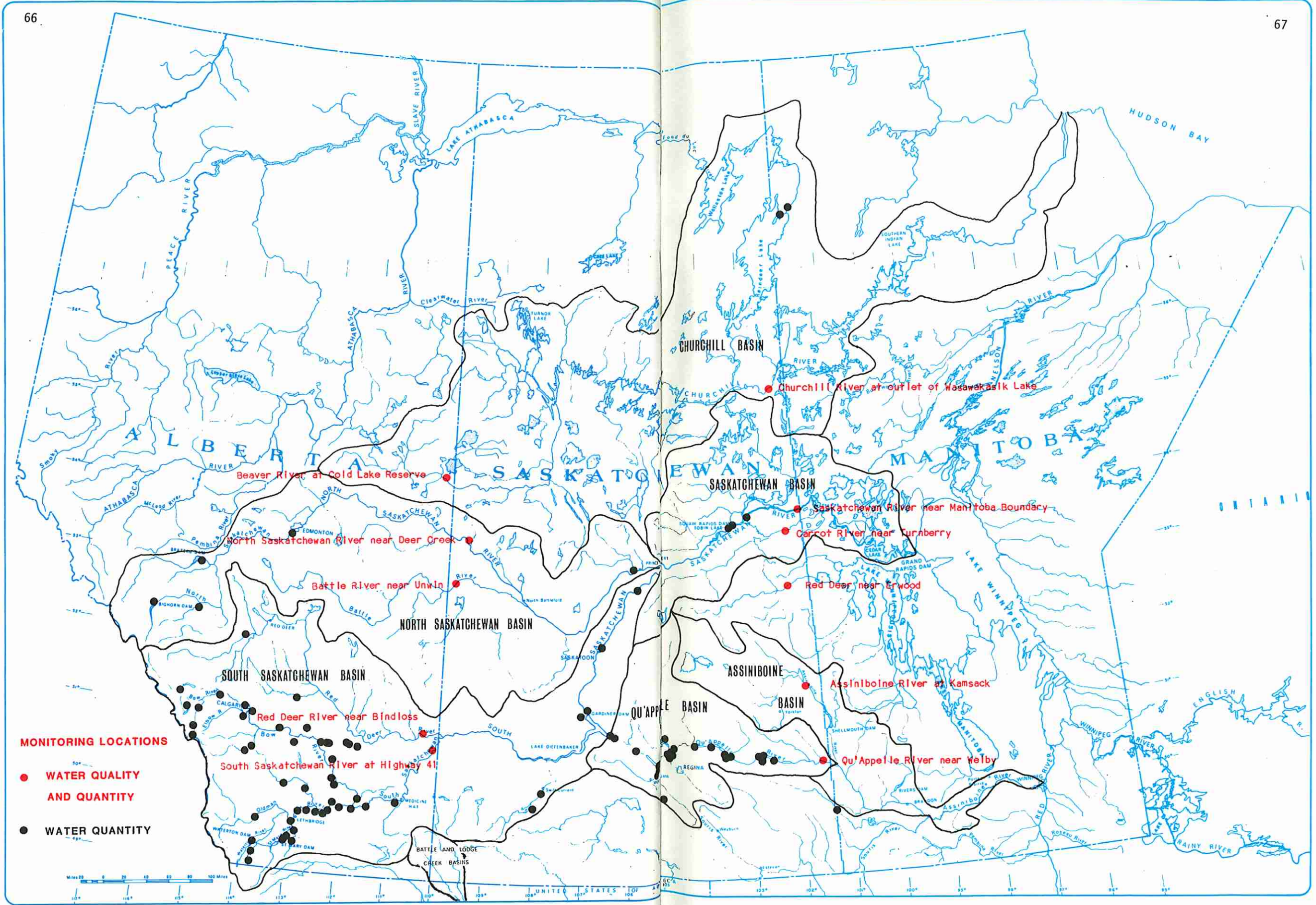
Approved at PPWB Meeting No. 5
- November 2nd, 1971

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





MONITORING LOCATIONS

● WATER QUALITY AND QUANTITY

● WATER QUANTITY



UNITED STATES