

PRAIRIE PROVINCES WATER BOARD

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A N N U A L   R E P O R T

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Regina, Saskatchewan,  
413 Post Office Building,  
January, 1953.

PRAIRIE PROVINCES WATER BOARD

Fifth Annual Report - 1952

WARRANT AND FUNCTION OF THE BOARD

Under date of July 28, 1948, the Prairie Provinces Water Board was established by the Governments of Canada, Manitoba, Saskatchewan and Alberta, consisting of two members appointed by Canada and one from each of the three provinces.

The Board's functions are: to recommend the best use to be made of interprovincial waters in relation to associated resources in Manitoba, Saskatchewan and Alberta; upon the request of any one of the three provinces or Canada, to recommend the allocation of water as between each such province of streams flowing from one province into another province; and to report on any questions relating to specific projects for the utilization or control of common river or lake systems at the request of one or more of the Ministers or authorities charged with the administration of such river or lake systems.

To assist the Board in its studies, the Government of Canada, through the Prairie Farm Rehabilitation Administration, has made available the part-time services of a small technical staff under the direction of its Engineering Secretary. This staff does not gather basic data, does not conduct field surveys nor duplicate the work of any existing services; it does co-ordinate, appraise and interpret such information for the use of the Board.

MEMBERSHIP OF THE BOARD

There has been one change this year in the membership of the Board, necessitated by the resignation of Mr. Norman Marr, former Board member. By Order-in-Council P.C. 3448/52, the Government of Canada appointed Mr. I. R. Strome to the Board. The membership is now as follows:

- Dr. L. B. Thomson, Chairman of the Board: Director of  
Prairie Farm Rehabilitation Administration, Regina.
- Mr. I. R. Strome: Chief, Water Resources Division, Department of  
Resources and Development, Ottawa.
- Mr. B. B. Hogarth: Director, Manitoba Water Resources Branch,  
Winnipeg.
- Mr. E. J. Scammell: Chief Engineer, Saskatchewan Water Rights  
Office, Regina.
- Mr. Ben Russell: Director, Alberta Department of Water Resources,  
Edmonton.

REVIEW OF ACTIVITIES

Meetings           The members of the Water Board have held meetings  
at the following places and dates:

In Regina	-	November 1, 1948
In Regina	-	February 2, 1949
In Regina	-	May 6, 1949
In Winnipeg	-	January 26, 1950
In Ottawa	-	April 25, 1950
In Winnipeg	-	December 18, 1950
In Regina	-	September 5, 1951
In Regina	-	December 17, 1952.

Organization    The initial meeting of the Board was convened in Regina on November 1, 1948, where an acting secretary was appointed, tentative rules of procedure were adopted and subcommittees were set up to gather information on various matters. The Board carried on their studies using this combination of acting secretary and subcommittees until April 25, 1950, when they appointed Mr. W. M. Berry, P.F.R.A. Engineer, Regina, as Engineering Secretary. In accordance with Article 10 of the Agreement, the P.F.R.A. supplied the Engineering Secretary with technical (one engineer) and clerical staff, office accommodation and office supplies. This secretariat has carried out various studies under the Board's direction since that date. There has only been one additional change since then: in the early summer of 1952 the P.F.R.A. created an Hydrology Division, using the Water Board secretariat as its nucleus, to carry out flood and water studies for the P.F.R.A. This Hydrology Division continues to act, when required, as the Board's secretariat exactly as it did before.

Allocations By a letter dated March 24, 1949, the Honorable D. A. Ure of Alberta requested the Board to recommend suitable allocations for certain fully developed and partially developed irrigation projects in that province. On May 6, 1949, the Board recommended the allocation of waters for these projects: this allocation was subsequently ratified when the four governments passed appropriate orders-in-council as follows:

Canada Order-in-Council	4030/49
Alberta Order-in-Council	857/49
Manitoba Order-in-Council	1121/49
Saskatchewan Order-in-Council	1307/51

By a letter dated November 8, 1950, the Honorable I. C. Nollet of Saskatchewan requested the Board to recommend suitable allocations for certain existing and proposed projects in that province. On December 18, 1950, the Board recommended the allocations of waters for most of these projects: this recommendation was subsequently ratified when the four governments passed appropriate Orders-in-Council as follows:

Canada Order-in-Council	1874/51
Alberta Order-in-Council	1091/51
Manitoba Order-in-Council	1264/51
Saskatchewan Order-in-Council	1310/51

By a letter dated May 4, 1949, amended November 8, 1950 and again on December 18, 1950, the Honorable I. C. Nollet of Saskatchewan requested the Board to recommend a suitable allocation for the proposed South Saskatchewan River Project. The Board first considered this request on May 6, 1949, and due to insufficient supporting data the requested water was placed in the "reservation" class. The application was considered again on December 18, 1950, but action was postponed pending detailed water supply studies that would show all interprovincial effects of this proposal. With the receipt of Water Board Report #3 containing the requested water supply study, the Board again considered the application on September 5, 1951, when it was decided to postpone further action until the report of the Royal Commission, appointed by the Canadian

Government to investigate this project, became available and could be treated as additional evidence: meanwhile, the requested water was retained in the "reservation" class.

See Appendix A for the priorities and classifications under which applications for water are treated as set up by the Board in May, 1949. See Appendix B for details of the ratified allocations.

Studies            The initial work undertaken by the Board's subcommittees consisted of studying the requirements for a drainage map, additional gauging stations, estimates of the natural flow of the Saskatchewan River and its major tributaries, estimates of return flows for irrigation projects and the possibilities of navigation on the South, North and main Saskatchewan Rivers. The Water Board drainage map was completed and distributed by the end of 1950; certain new gauging stations were recommended on January 26, 1950, and are now in operation; gauging stations on wasteways of certain irrigation districts were placed in operation in 1951; review of the navigation possibilities of the Saskatchewan River and its major tributaries was initiated but, pending clarification of the perplexing Navigable Waters Protection Act, completion of this study has been left in abeyance.

The establishment of the secretariat permitted the completion of the study of natural flows at several points in the Saskatchewan River Basin, see Water Board Report #1. The interprovincial downstream effect of the recommended allocation of water to Alberta was investigated and reported on in Report #2. A detailed water study of the interprovincial effects of various Alberta projects and the proposed South Saskatchewan River Project was incorporated in Report #3, while Report #4 compares the interprovincial effects of both separate and combined Red Deer-South Saskatchewan projects. In accordance with the Board's duty to "collate and analyze the data now available relating to the water and associated resources of interprovincial streams---", the Board has issued, in Report #5, the results of a study entitled "Evaporation from Lakes and Reservoirs on the Canadian Prairies".

As a matter of interest, Appendix C shows typical results taken from the Board's studies, while Appendix D lists the Board's publications.

WORK IN PROGRESS

At present the secretariat is engaged in making a complete water supply and water use study of the Qu'Appelle River Basin, the Bow River basin and on certain drainage basins south of the Cypress Hills. In the latter case, a report on the Battle Creek Drainage Basin is very close to completion.

WORK CONTEMPLATED

It is planned to continue the studies outlined in the preceding paragraph. In addition, and in accordance with a decision reached at the last Board meeting, a resolution and brief will be prepared outlining the necessity of greatly expanding the existing hydrometric service (Water Resources Division of the Department of Resources and Development - Canada): this resolution and brief will be presented to the provinces and the Federal Government.

The Board has encouraged the Economics Service (Canada) to proceed with their proposed study designed to collate and analyze all available data relating to the economic aspects of water development.

L. B. Thomson

Chairman

A. E. McBean

Engineering Secretary

## APPENDIX A - PRIORITIES & CLASSIFICATIONS

In May, 1949, the Board set out the following general principles to guide them in considering applications for allocation of water to serve developed or partially developed irrigation projects, which will, in effect, constitute priorities:

1. Projects which are fully developed and for which water had been appropriated by the Federal Government prior to the Natural Resources-Transfer-Agreement.
2. Projects which are fully developed and for which water had been appropriated by the Province concerned prior to July 28, 1948.
3. The completion of projects which are partially developed and which can be fully and beneficially developed within the appropriation as in #1 or #2 above.
4. The completion of projects with respect to which substantial works are now in existence and which works could, by the use of additional water and as shown by complete investigation, be made to serve larger areas in a beneficial manner--involving allocations over and above those provided for by prior Dominion and Provincial allocations.
5. Projects which are now under development by the Dominion and Provincial Governments and with respect to which an immediate beneficial use must be established in order to secure or protect an international allocation.

The Board also agreed to establish four separate classifications under which applications for water for individual projects will be treated, and the procedure to be followed is to be in accordance with the following:

Recording - shall be a procedure under which the Board may be informed of potential and possible water uses or developments within the jurisdictions represented in the Agreement. It is understood that each such recording shall not in any way constitute or be an undertaking by the Board to recommend the allocation of water or the granting of any rights for such purpose.

Reservation - shall be a procedure under which the Board may make a "reservation" of probable water requirements of specific projects. This will not comprise an allocation but shall represent an undertaking by the Board to the effect that, while the reservation is in good standing, no subsequent action will be taken by the Board which will have a detrimental effect upon the stipulated water without first thoroughly reviewing the status and requirements of the project for which the reservation was made and without affording to the representatives of the interested jurisdictions ample opportunity to make representations and to be heard. The Board shall, in making such a reservation, fix a period of time during which sufficiently complete plans and reports are to be prepared to enable the Board to consider further the allocation of water for this purpose: provided first, that if further information is not forthcoming in the stipulated period of time the reservation will lapse, and second, that the Board may, in its discretion, from time to time extend any period fixed for the production of such further information.



Tentative Allocation - shall be a procedure under which the Board may be requested to recommend to the Governments represented in the Agreement a tentative allocation of water for a specific project; such an allocation to be subject to review and possible subsequent modification or cancellation, either in whole or in part, prior to final allocation.

Final Allocation - shall be a procedure under which the Board may be requested to recommend to the Governments represented in the Agreement a final allocation of water for a specific project.

APPENDIX B - DETAILS OF ALLOCATIONS

ALLOCATION TO ALBERTA - recommended May, 1949

<u>Project</u>	<u>Irrigable acres</u>	<u>Allocations in acre-feet</u>
St. Mary & Milk River Development	465,000	796,000
Western Irrigation District	50,000	85,700
Eastern Irrigation District	281,000	562,000
Bow River Irrigation Development	240,000	478,534
United Irrigation District	34,000	51,000
Lethbridge Northern District	96,135	150,000
Mountain View Irrigation District	3,600	6,000
Leavitt Irrigation District	4,400	7,000
Aetna Irrigation District	7,300	13,000
Macleod Irrigation District	5,000	8,000
Private projects	70,000	80,000
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TOTAL	1,256,435	2,237,234

(for Saskatchewan allocations, see over)

ALLOCATION TO SASKATCHEWAN - recommended December, 1950

<u>Project</u>	<u>Classifi- cation</u>	<u>Acro-feet (annually)</u>
<u>South Sask. Drainage Basin</u>		
Small projects		
- main stem	1 & 2	1,500
- tributaries	1 & 2	4,500
City of Saskatoon		
- municipal	1	11,426
- steam plant	1	31,260
Caron-Moose Jaw Diversion	2	12,600
Swift Current Irr. Project	3	55,000
Swift Current small projects	1 & 2	5,600
<u>Qu'Appelle Drainage Basin</u>		
Small projects	1 & 2	20,000
<u>Battle Creek Drainage Basin</u>		
Small projects		
- main stem	1 & 2	7,536
- tributaries	1 & 2	3,410
Richardson-McKinnon project	1	3,054
<u>Middle Creek Drainage Basin</u>		
Small projects	1 & 2	1,027
Middle Creek Reservoir losses	2	2,335
<u>Lodge Creek Drainage Basin</u>		
Small projects	1 & 2	600
Spangler project	1 & 2	2,970

Tentative Allocation

<u>South Sask. Drainage Basin</u>		
Regina-Moose Jaw Diversion		29,000
French Flats-Valley Park Projects		11,140
<u>Battle Creek Drainage Basin</u>		
Small irrigation development		
- main stem		1,000
- tributaries		1,000
Vidora Irrigation Project		3,360
Consul Irrigation Project extension		2,400

APPENDIX C - TYPICAL EXAMPLE FROM BOARD'S STUDIES

(Taken from Report #3)

AVERAGE ANNUAL FLOWS IN ACRE-FEET: 1923-1948

<u>Flow Type</u>	<u>Alta-Sask Boundary</u>	<u>Saskatoon</u>	<u>Below The Forks</u>	<u>Sask-Man. Boundary</u>
Natural	6,966,000	7,141,000	13,196,000	16,278,000
Recorded	6,305,000	6,477,000	12,531,000	15,620,000
Condition A <sup>a/</sup>	5,008,000	5,185,000	11,239,000	14,318,000
Condition B <sup>b/</sup>	4,869,000	5,047,000	10,568,000	13,644,000
Condition C <sup>c/</sup>	-	4,192,000	10,246,000	13,302,000
Condition D <sup>d/</sup>	-	4,055,000	9,571,000	12,632,000
<u>Decrease due to -</u>				
Allocation to Alta <sup>a/</sup>	1,958,000			
" " + Red Deer <sup>b/</sup>	2,097,000			1,960,000
South Sask. R. Proj. <sup>c/</sup>	-			2,634,000
Total Alta & Sask uses <sup>d/</sup>	-			1,012,000
				3,646,000

AVERAGE ANNUAL FLOWS IN ACRE-FEET FOR LOWEST 7-YEAR PERIOD

<u>Flow Type</u>	<u>Alta.-Sask. Bdry. (1934-1941)</u>	<u>Sask.-Man. Bdry. (1935-1942)</u>
Natural	5,300,000	13,058,000
Recorded	4,480,000	12,217,000
Condition A <sup>a/</sup>	3,442,000	11,169,000
Condition B <sup>b/</sup>	3,261,000	10,496,000
Condition C <sup>c/</sup>	-	10,338,000
Condition D <sup>d/</sup>	-	9,727,000
<u>Decrease due to -</u>		
Allocation to Alberta <sup>a/</sup>	1,858,000	1,889,000
Allocation + Red Deer <sup>b/</sup>	2,039,000	2,562,000
South Sask. R. Project <sup>c/</sup>	-	769,000
Total Alta. & Sask. uses <sup>d/</sup>	-	3,331,000

- <sup>a/</sup> Assuming the water allocated to Alberta (see Appendix B) is fully used - 1,256,000 acres irrigated.
- <sup>b/</sup> Assuming 1,700,000 acres irrigated in Alberta - same as above plus proposed Red Deer Project, extension of the St. Mary Project, etc.
- <sup>c/</sup> Same as <sup>a/</sup> (Condition A) plus full development of the South Saskatchewan River Project.
- <sup>d/</sup> Same as <sup>b/</sup> (Condition B) plus full development of the South Saskatchewan River Project.
- <sup>e/</sup> Assuming that only the South Saskatchewan River Project and the Swift Current Irrigation Project are fully developed.

APPENDIX D - PUBLICATIONS

- Report #1<sup>a</sup>/ - "Summary Report of Recorded and Natural Monthly Flows at Certain Points on the Saskatchewan River System", November, 1950.
- Report #2<sup>a</sup>/ - "Stream Flow at Three Selected Points on South and Main Saskatchewan Rivers After Alberta's 1949 Request", December, 1950.
- Report #3<sup>a</sup>/ - "Preliminary Report on Effects of Certain Major Projects in the Saskatchewan River Drainage Basin", March, 1951.
- Report #3<sup>a</sup>/ (Appendix to) - Period of study 1911-23, December, 1951.
- Report #4<sup>a</sup>/ - "Comparison of Two Alternate Developments in Saskatchewan River Basin, October, 1951.
- Report #5<sup>b</sup>/ - "Evaporation from Lakes and Reservoirs on the Canadian Prairies", December, 1952.
- Memorandum #1<sup>a</sup>/ - "Memorandum on Commercial Power Potential of South Saskatchewan River Project", January, 1951.
- Memorandum #2<sup>a</sup>/ - "Memorandum on Effect of Alberta Developments on South Saskatchewan River Project", March, 1951.
- Memorandum #3<sup>a</sup>/ - "Water Supply Study for South Saskatchewan River Project," March, 1951.
- First Annual Report of P.P.W.B. - 1948<sup>b</sup>/
- Second Annual Report of P.P.W.B. - 1949<sup>b</sup>/
- Third Annual Report of P.P.W.B. - 1950<sup>b</sup>/
- Fourth Annual Report of P.P.W.B. - 1951<sup>b</sup>/
- Fifth Annual Report of P.P.W.B. - 1952<sup>b</sup>/
- Drainage Map - "P.P.W.B. Map of Alberta, Saskatchewan and Manitoba",  
Scale: 1 inch = 25 miles.
- Types: one-color map on linen<sup>a</sup>/  
two-color map on paper<sup>a</sup>/  
four-color map on paper<sup>c</sup>/  
five-color map on paper<sup>c</sup>/

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<sup>a</sup>/ Not available for public distribution.

<sup>b</sup>/ Available for limited public distribution.

<sup>c</sup>/ Available for limited distribution - free to public agencies  
- 75¢ per copy to private agencies.