

PRAIRIE PROVINCES WATER BOARD

SEVENTEENTH

ANNUAL REPORT

FOR THE CALENDAR YEAR 1964

Prepared by

E.F. Durrant,  
Engineering Secretary,  
c/o P.F.R.A., Motherwell Bldg.,  
Regina, Saskatchewan.

January 18, 1965.

(1)

10. Staff and Location of Board Office

The Board shall employ a Secretary, who shall be a qualified engineer, with headquarters at Regina; if he is a Dominion Government employee he shall serve as Secretary as part of his regular duties; otherwise two-fifths of the salary of the Secretary shall be provided by Canada and one-fifth by each of the Provinces of Manitoba, Saskatchewan and Alberta; such technical and clerical staff, office accommodation and supplies as may be necessary shall be provided by the P.F.R.A. organization.

11. Each of the parties hereto agrees that it will not within the limits of its jurisdiction construct or permit the construction of any project that will interfere with the allocation of waters resulting from a recommendation of the Board duly adopted pursuant to Section 5 hereof.

12. Any water development project already constructed or to be constructed by any one of the parties hereto shall be so operated as to maintain as far as possible the allocation of water determined by the Board.

Signed on behalf of the Government of Canada  
by the Right Honourable James G. Gardiner, Minister  
of Agriculture and the Honourable James A. MacKinnon,  
Acting Minister of Mines and Resources, on behalf  
of the Government of Manitoba by the Minister of  
Mines and Natural Resources, on behalf of the  
Government of Saskatchewan by the Minister of  
Natural Resources and Industrial Development and  
on behalf of the Government of Alberta by the  
Minister of Agriculture.

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MEMBERSHIP OF THE BOARD

The Prairie Provinces Water Board is composed of five members. The three provincial members represent the Provinces of Alberta, Saskatchewan, and Manitoba, and the two federal members represent the Department of Agriculture, and the Department of Northern Affairs and National Resources. The Engineering Secretary for the Board is employed by the Prairie Farm Rehabilitation Administration (Canada Department of Agriculture). During 1964, the following persons served on the Board:-

M.J. Fitzgerald (Chairman)	Director, P.F.R.A., Regina, Saskatchewan.
R.H. Clark	Chief Hydraulic Engineer, Water Resources Branch, Ottawa, Ontario.
F.L. Grindley	Director, Water Resources Branch, Edmonton, Alberta.
B.W. Boyson	Director, Water Rights Branch, Regina, Saskatchewan.
J.A. Griffiths	Director, Water Control and Conservation Branch, Winnipeg, Manitoba.
E.F. Durrant	Engineering Secretary to the Board, Chief, Hydrology Division, P.F.R.A., Regina, Saskatchewan.

WARRANT AND FUNCTION OF THE BOARD

The Prairie Provinces Water Board was established July 28, 1948, by agreement between the governments of Canada, Manitoba, Saskatchewan, and Alberta. A copy of that agreement will be found in Appendix 1 to the Sixteenth Annual Report.

The Board's function, as expressed in that agreement, is "to recommend the best use to be made of interprovincial waters in relation to associated resources in Manitoba, Saskatchewan and Alberta and to recommend the allocation of water as between each such province of streams flowing from one province into another province."

The duties of the Board are set out in detail in the agreement. Briefly they are:-

- (a) to collate and analyze existing data;
- (b) to determine what other data are required from time to time;
- (c) to recommend the allocation of waters of any interprovincial stream; and
- (d) to report on any questions relating to projects for the utilization or control of common river or lake systems.

REVIEW OF ACTIVITIES

IN 1964

MEETINGS IN 1964

The Board held four meetings in 1964 on the dates and at the places mentioned below.

March 4.....Regina, Saskatchewan  
 June 16.....Winnipeg, Manitoba  
 August 20.....Edmonton, Alberta  
 November 10....Saskatoon, Saskatchewan

ALBERTA REQUEST FOR REVISED ALLOCATIONS

In January 1964, the Board received a request from the Honourable H.E. Strom, Minister of Agriculture for Alberta, for a revision to the Alberta allocations recommended by the Board in 1949. The report of the Underhill Committee on Irrigation Water Use, and the November 6th, 1963, Irrigation Hearing sponsored by the Board, had indicated that changing cropping patterns and irrigation factors were resulting in greater water use per irrigable acre.

The report submitted by Alberta in support of this request and entitled, "Submission to Prairie Provinces Water Board for Reconsideration of Alberta's Allocations for its Irrigation Projects," employed improved computation methods approved by the Board in 1963.

As a result of subsequent discussion the Board has prepared a draft resolution which, at the close of 1964, was being reviewed by legal personnel. In this draft resolution the Board expresses the wish that the allocation revisions be considered interim pending the development and adoption of procedures for allocating waters as between provinces rather than to specific projects.

APPORTIONMENT COMMITTEE

To date the Board has recommended a number of allocations to specific projects (see Table 1). However, there are administrative problems associated with this method of allocation. For example, the issuance of licenses for all water uses is a function administered by provincial agencies. The day-by-day control of these licenses is also a matter for provincial control. Hence the Board has no authority to order the operation of specific works so as to maintain the allocations it has recommended.

To overcome this and related problems the Board is investigating the feasibility of recommending apportionment as between provinces rather than to specific projects. The Board has named a committee to study this possibility and to report on:-

- (a) methods of apportioning the water of interprovincial streams among the Provinces of Alberta, Saskatchewan, and Manitoba;
- (b) methods of determining natural flow, depletions and any other factors necessary for apportionment of the waters of the Saskatchewan-Nelson River system;
- (c) methods and administrative arrangements necessary to implement apportionment;
- (d) a draft document for apportioning the waters of the Saskatchewan-Nelson River system among the three Prairie Provinces;
- (e) complete the assignment by November 1965.

The members of this Committee are R.D. May (Chairman), A.G. Underhill, R.B. Godwin, N. Mudry, E.F. Durrant.

#### QU'APPELLE-ASSINIBOINE STUDY

In 1962, the Board agreed that a study should be undertaken to provide a basis for apportioning the waters of the Qu'Appelle and Assiniboine Rivers, and to arrive at a figure for Manitoba's and Saskatchewan's future needs for water from the South Saskatchewan Reservoir. In 1963 the Secretary prepared and distributed a report entitled, "Compilation and Reconstruction of Monthly Streamflow Records for the Qu'Appelle-Assiniboine Study." This was followed in February 1964 by a supplementary report covering the Swan and Dauphin River Basins.

During 1964, Manitoba and Saskatchewan agreed on criteria to be used for estimating future consumptive uses and waste disposal requirements. The results of their computations were compiled by the P.P.W.B. Secretariat and issued as P.P.W.B. Report No. 9, "Estimated Water Requirements Qu'Appelle and Assiniboine River Basins." In order to explain more fully how some of these computations were made, a supplementary report was prepared entitled, "Saskatchewan and Manitoba Estimates of Future Water Requirements in the Assiniboine-Qu'Appelle Watershed."

At the close of 1964, the Secretariat had begun water accounting studies which will be the next-to-final step in the Assiniboine-Qu'Appelle study. The final step will be the joint preparation of a report on the study.

POLLUTION COMMITTEE

Preliminary results from the Qu'Appelle-Assiniboine studies have suggested that waste disposal could become a predominant water use in the near future. The Board's concern is well-expressed by the following excerpt from the minutes of the March 1964 meeting:-

"Mr. Boyson pointed out that the withdrawal of water from one stream to another for waste disposal, or the permanent reservation of certain flows for dilution (hence no longer available for upstream consumptive use) could represent a major water use. In this light he felt the Board must have a better understanding of water requirements for dilution and of alternative means for solving pollution problems."

To pursue this matter, the Board named a Pollution Committee, (Messrs. B.W. Boyson, N. Mudry, and A.G. Underhill) to present a situation report to the Board including:-

- (a) recommendations as to the development of common criteria to be used in interprovincial pollution studies;
- (b) the general magnitude of the present pollution problem in the Assiniboine and other interprovincial basins and the approximate quantities of dilution water needed;
- (c) observations as to future problems; and
- (d) recommendations as to action the Board might take.

SASKATCHEWAN-NELSON TECHNICAL ADVISORY COMMITTEE

In December 1963, a meeting of Ministers, representing water and land resources in the three Prairie Provinces and Canada, was convened to discuss a joint study of the water resources of the Saskatchewan-Nelson Basin. The Ministers requested the Chairman of the Prairie Provinces Water Board to describe the Water Board's interest in the study and to review events leading up to the meeting.

The Ministers established a Technical Advisory Committee and instructed it:-

"to prepare the necessary inventory of available information, to identify deficiencies, draft terms of reference, and prepare a draft report for submission to all Ministers involved-----."

At the close of 1964 the Committee had completed and submitted its report. The Board awaits with interest further developments in this matter.



### RED DEER PROJECT

The Board renewed the reservation of 700,000 acre-feet for the Red Deer project. In requesting this renewal the Alberta member stated that the project is still under active investigation and noted that the purpose of the project may be broadened to include supplemental water supply for several purposes other than irrigation in east central Alberta.

### BRIEF ON IRRIGATION RESEARCH NEEDS

On behalf of the Board, the Chairman submitted a brief to the Federal Department of Agriculture entitled, "Research Needs Relating to Estimates of Irrigation Water Use." The brief was discussed at an irrigation workshop in Penticton, B.C. during August. Messrs. Fitzgerald, Durrant, and Underhill attended the workshop on behalf of the Board.

One result of these discussions was the formation of a Departmental Committee to promote liaison between P.F.R.A. and the Research Branch in the field of irrigation research. The Board has requested the Chairman to represent the Board in addition to the P.F.R.A. on this Committee.

### GLOSSARY OF TERMS

The Secretary prepared and distributed to the Board members a glossary of terms drawn from standard works and to be used in writing and interpreting Board documents. The glossary is being revised in accordance with comments received from the members and is not yet in final form.

### HYDROMETRIC AND METEOROLOGICAL NETWORKS

During 1964 the Board devoted considerable time to the discussion of the role it should take in supporting the orderly augmentation of the hydrometeorological network in the Prairie Provinces. To facilitate these discussions the Secretariat prepared a brief entitled, "Prairie Provinces Inter Board Requirements for Meteorological Data and Services."

No decision was reached as to what the Board's role should be, but the matter has been scheduled for further discussion.

OTHER REPORTS AND STUDIES

1. In February 1964, the Board published a report by Dr. A.H. Laycock entitled, "Water Deficiency Patterns in the Prairie Provinces." A companion report on "Water Surplus Patterns in the Prairie Provinces" has been submitted to the Board by Dr. Laycock and will be published in 1965.
2. The unit runoff study, conducted by the Board Secretariat over a period of several years, was completed and in September 1964 a report was published entitled, "The Distribution and Variability of Runoff in Alberta, Saskatchewan and Manitoba."
3. An estimate of streamflow depletions is kept current by the Secretariat for the Saskatchewan River System. A chart on the following page provides a graphical comparison between these depletions and the recorded flows at Saskatoon and The Pas.
4. A tabulation of "Acres Actually Irrigated" in the Alberta portion of the South Saskatchewan Basin has been prepared and may be found immediately following the flows and depletions graph. The tabulation is based primarily on material supplied by the Alberta Water Resources Branch.



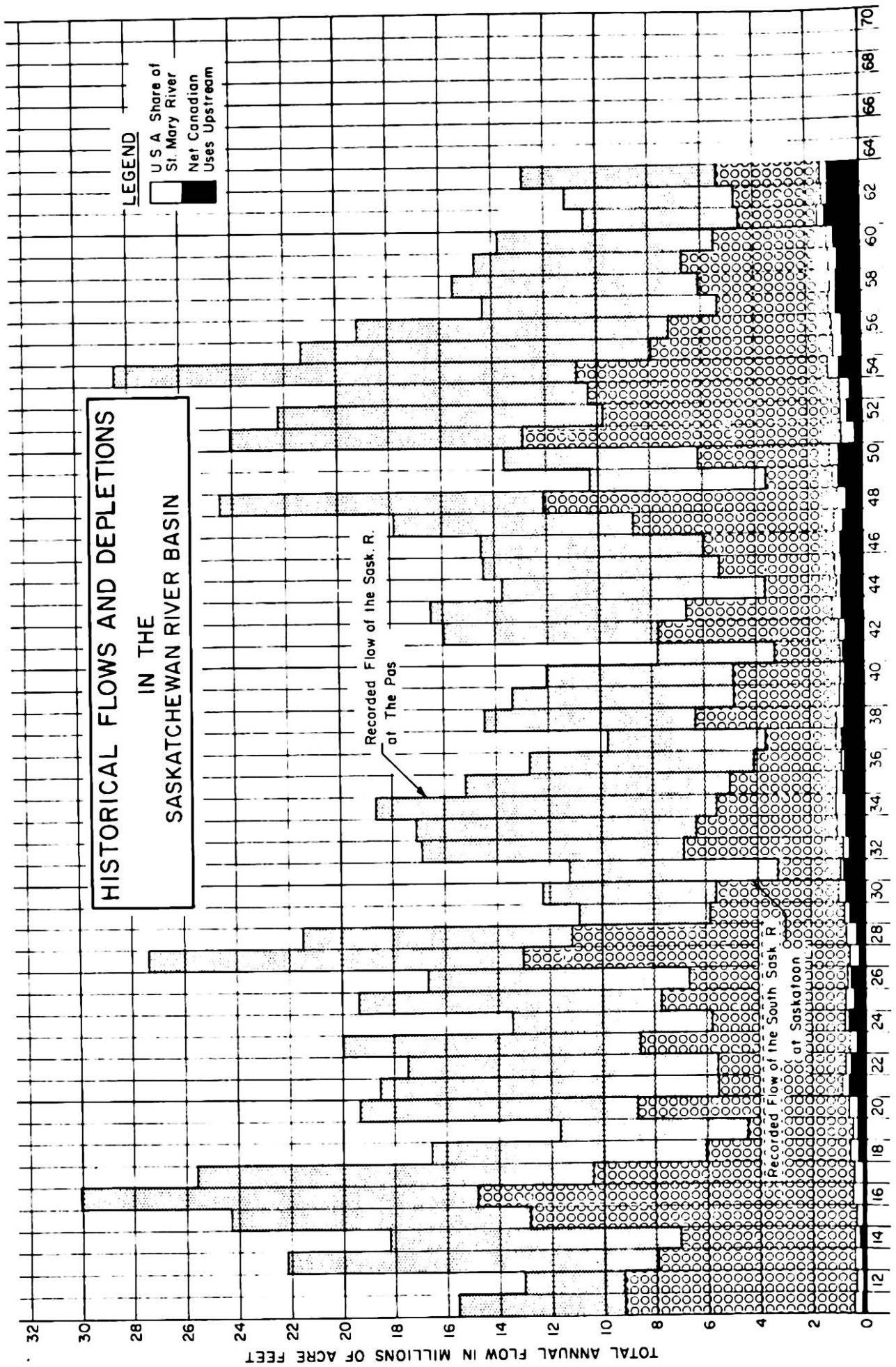
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M.J. Fitzgerald,  
Chairman.



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E.F. Durrant,  
Engineering Secretary.



**ACREAGE ACTUALLY IRRIGATED IN ALBERTA 1911 - 1963**

YEAR	ST. MARY	WESTERN I.D.	EASTERN I.D.	BOW RIV. DEVELOP.	L. N. I.D.	U.I.D.	M. V. I.D.	L.I.D.	A.I.D.	MACLEOD I.D.	ROSS CR. I.D.	TOTAL
1911	47,000	500										47,500
12	76,200	500										76,700
13	76,200	2,600										78,800
14	76,200	8,448	7,806									92,454
15	76,200	512	7,800									84,512
16	71,281	859	1,497									73,637
17	91,780	3,657	9,005									104,442
18	102,900	25,191	24,440									152,531
19	112,569	31,908	43,460									187,937
1920	62,893	4,083	60,762	4,240								131,978
21	85,902	33,619	88,299	9,400								217,220
22	88,680	49,752	93,375	9,509								241,316
23	75,968	3,074	42,928	11,249	6,963							140,182
24	84,751	24,297	84,200	9,720	29,991	5,264						238,223
25	94,582	5,384	72,994	13,252	43,628	10,000						239,840
26	92,782	19,561	74,401	13,467	56,395	10,026						266,632
27	22,176	1,273	7,921	810	10,012	41						42,233
28	31,924	3,892	45,677	19,361	33,436	2,576						136,866
29	46,441	37,395	78,610	29,260	61,231	3,102						256,039
1930	98,483	41,570	89,913	27,102	70,007	5,847						332,922
31	100,403	47,593	90,724	29,803	70,408	12,983	300					352,214
32	99,788	8,680	90,651	26,379	41,842	11,500	800					279,640
33	104,854	40,812	96,019	21,917	62,416	10,500	1,168					337,686
34	105,490	31,131	101,566	22,208	54,200	10,000	1,950					326,545
35	93,471	19,109	143,997	22,694	73,022	12,000	3,000					367,293
36	111,397	44,614	111,781	26,660	62,790	18,000	2,900					378,142
37	113,546	50,866	124,645	30,107	70,020	17,500	3,500					410,184
38	112,629	35,755	133,928	33,326	73,297	10,000	3,500					402,435
39	110,677	11,647	141,688	34,984	56,712	10,000	3,200					368,908
1940	115,030	20,134	138,462	37,906	76,492	10,500	3,000					401,524
41	109,148	21,144	156,501	35,312	63,575	11,000	3,300					399,980
42	103,183	9,194	166,453	32,946	31,102	12,000	3,400					358,278
43	112,142	7,666	168,496	35,143	67,777	14,000	3,254					408,478
44	112,550	20,000	167,094	37,266	75,927	13,000	3,400	526				429,763
45	112,484	20,000	167,100	38,838	57,126	13,000	3,300	1,000				412,848
46	112,734	19,000	166,326	42,457	64,894	7,453	3,300	1,300				417,464
47	110,848	20,000	168,580	43,594	57,434	7,453	3,300	1,300				412,509
48	109,571	12,000	172,200	44,160	55,374	2,970	3,700	1,500				401,475
49	107,150	26,197	180,000	44,050	72,807	21,000	3,300	1,500				456,004
1950	111,513	23,079	180,000	36,508	78,721	9,758	3,500	2,500				445,579
51	104,571	1,000	153,804	24,283	21,979	1,869	(100)	200		0	0	307,806
52	117,261	700	149,289	40,416	35,314	6,072	3,350	940		1,600	850	355,792
53	112,779	500	114,776	(40,000)	37,409	8,894	3,380	980		1,800	1,100	321,618
54	152,489	1,900	156,884	(40,000)	58,745	10,033	3,392	254		2,600	2,100	428,397
55	123,679	2,500	148,892	(40,000)	31,753	10,115	3,132	423			1,500	361,994
56	142,156	6,000	190,976	109,400	31,588	11,082	2,773	852			1,800	496,627
57	161,292	4,500	189,928	65,000	51,803	15,886	2,773	2,779	0	0	1,685	495,652
58	168,794	9,870	189,845	60,165	51,916	11,032	2,759	1,542	0	0	(1,500)	497,443
59	241,090	9,330	163,993	54,514	46,459	17,761	2,789	1,542	360		(1,400)	539,238
1960	179,477	12,000	167,597	71,392	71,006	16,536	2,789	1,542	440	0	405	523,184
61	208,547	23,200	170,413	78,260	73,637	23,095	2,760	1,542	1,800	0	200	583,454
62	217,029	30,000	176,695	83,910	73,317	28,465	2,760	4,187	2,178	0	200	618,741
63	229,652	25,000	170,776	78,695	64,510	27,012	2,789	4,511	2,315	0	200	605,460
64												
65												
66												
67												
68												
69												
1970												
71												
72												

**NOTE** Acreage figures from early Irrigation Company annual reports, except as noted below

(1) From "Report on Return Flows from Irrigation Districts in Alberta, 1951 to 1962" by Water Resources Branch, Department of Northern Affairs and National Resources, Calgary, March 7, 1963

(2) Information by letter from Alberta Water Resources Office, Edmonton.

E No records - estimated -

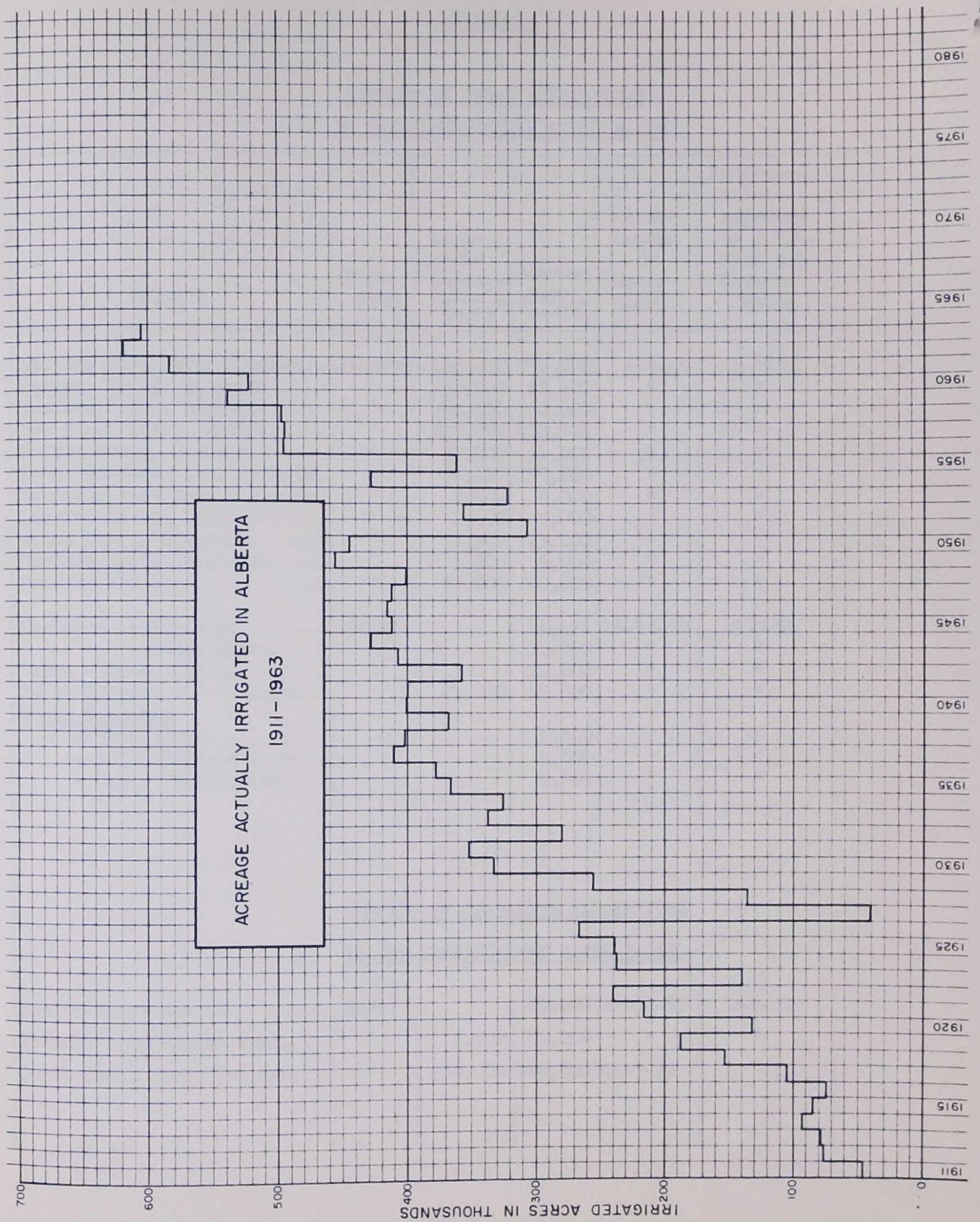


TABLE 1

<u>SUMMARY OF FINAL ALLOCATIONS</u>						
<u>IN THE SASKATCHEWAN RIVER BASIN</u>						
PROJECT	PROV- INCE	Irrig- able	Alloca- tion	Recom- mended by Water Board	Recommen- dation approved by O.I.C. from all Govern- ments	
		Acreage				
St. Mary-Milk River Project..	Alberta.	465,000	796,000	6-5-49	4-7-51	
Western Irrig. District.....	"	50,000	85,700	"	"	
Eastern Irrig. District.....	"	281,000	562,000	"	"	
Bow River Irrig. District...	"	240,000	478,534	"	"	
United Irrig. District.....	"	34,000	51,000	"	"	
Leth. Northern Irr. District	"	96,135	150,000	"	"	
Mountain View Irr. District.	"	3,600	6,000	"	"	
Leavitt Irrig. District.....	"	4,400	7,000	"	"	
Aetna Irrig. District.....	"	7,300	13,000	"	"	
MacLeod Irrig. District.....	"	5,000	8,000	"	"	
Private Projects.....	"	70,000	80,000	"	"	
Saskatoon - Municipal.....	Sask.		11,426	18-12-50	8-8-51	
- Steam Plant.....	"		31,260	"	"	
Caron - Moose Jaw Div.....	"		12,600	"	"	
Swift Current Irr. Project..	"	21,000	55,000	"	"	
<u>Small Projects</u>						
- Main Stem.....			1,500	"	"	
- Swift Current Basin..			5,600	"	"	
- Other Tributaries....			4,500	"	"	
<u>SUMMARY OF TENTATIVE ALLOCATIONS</u>						
<u>IN THE SASKATCHEWAN RIVER BASIN</u>						
Regina-Moose Jaw Div.....	Sask.		29,000	18-12-50	8-8-51	
French Flats-Valley Park....	"	6,502	11,140	"	"	
South Sask. River Project...	"	470,000	960,000	15-5-53	-53	

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TABLE 1 (Cont'd)

SUMMARY OF RESERVATIONS IN GOOD STANDING  
IN THE SASKATCHEWAN RIVER BASIN

PROJECT	PROV- INCE	Irri- gable Acreage Acres	Alloca- tion Ac.Ft.	Recom- mended by Water Board	Recommend- ation approved by O.I.C. from all Govern- ments	
Red Deer (Wm. Pearce).....	Alberta	250,000	700,000	18-12-58	(Original Reservation)	EXPIRED Dec.1960
				1-12-60	(Renewed)	EXPIRED Dec.1962
				16-1-63	(Renewed)	EXPIRED Dec. 1964
				10-11-64	(Renewed)	EXPIRES Dec. 1966
Small Projects.....	Alberta & Sask.		1,000,000	2-12-59	(Original reservation)	EXPIRED Dec. 1960
				1-12-60	(Renewed)	EXPIRED Dec. 1961
				6-12-61	(Renewed)	EXPIRED Dec.1962
				16-1-63	(Renewed)	EXPIRED Dec. 1963
				6-11-63	(Renewed)	EXPIRED Dec. 1964

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TABLE 1 (Cont'd)

BATTLE CREEK BASIN

PROJECT	Province	Irrigable acres	Allocation Ac.Ft.	Recommended by Water Board	Recommendation approved
<u>FINAL ALLOCATIONS</u>					
Small Projects	Sask.	-	10,946	18-12-50	8-8-51
Richardson-MacKinnon Project	Sask.	-	3,054	18-12-50	8-8-51
<u>TENTATIVE ALLOCATIONS</u>					
Small Projects	Sask.	-	2,000	18-12-50	8-8-51
Vidora Project	Sask.	2,136	3,360	18-12-50	8-8-51
Consul Project	Sask.	1,500	2,400	18-12-50	8-8-51

MIDDLE CREEK BASIN

PROJECT	Province	Irrigable acres	Allocation Ac.Ft.	Recommended by Water Board	Recommendation approved
<u>FINAL ALLOCATIONS</u>					
Small Projects	Sask.	-	1,027	18-12-50	8-8-51
Middle Cr. Reservoir Losses	Sask.	-	2,335	18-12-50	8-8-51

LODGE CREEK BASIN

PROJECT	Province	Irrigable acres	Allocation Ac.Ft.	Recommended by Water Board	Recommendation approved
<u>FINAL ALLOCATIONS</u>					
Small Projects	Sask.	-	600	18-12-50	8-8-51
Spangler Project	Sask.	1,322	2,970	18-12-50	8-8-51

QU'APPELLE RIVER BASIN

PROJECT	Province	Irrigable acres	Allocation Ac.Ft.	Recommended by Water Board	Recommendation approved
<u>FINAL ALLOCATIONS</u>					
Small Projects	Sask.	-	20,000	18-12-50	8-8-51