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Report to
THE INTERNATIONAL JOINT COMMISSION

on

**THE DIVISION AND USE MADE OF THE WATERS OF
ST. MARY AND MILK RIVERS**

by

E. L. HENDRICKS
representing United States

and

J. D. McLEOD
representing Canada

1967

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International Joint Commission
Washington, D.C. and Ottawa, Ontario

Gentlemen:

In compliance with the provisions of Clause VIII (c) of your Order of October 4, 1921, directing the division of the waters of St. Mary and Milk Rivers between the United States and Canada, we are transmitting herewith a report on the operations during the irrigation season ended October 31, 1967.

Respectfully submitted,

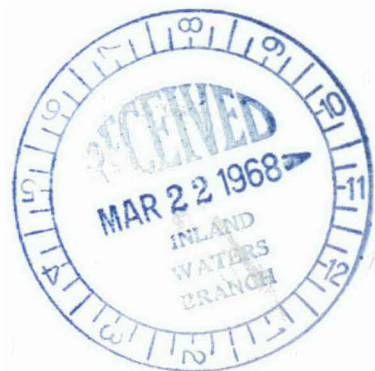


E. L. Hendricks
Accredited Officer of the United States



J. D. McLeod
Accredited Officer of Her Majesty

March 19, 1968



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INTRODUCTION

The field work incidental to the division and administration of the waters of the St. Mary and Milk Rivers in Alberta, Saskatchewan and Montana was conducted during the irrigation season of 1967 by representatives of the United States Geological Survey and the Inland Waters Branch of Canada.

Mr. E. L. Hendricks, Chief Hydrologist, United States Geological Survey, as Accredited Officer of the United States was represented in the field by Mr. C. W. Lane, District Chief, Helena, Montana. Mr. J. D. McLeod, Senior Engineer, Inland Waters Branch, Department of Energy, Mines and Resources, acting in the capacity of Accredited Officer of Her Majesty, was represented in the field by Mr. R. D. May, District Engineer, Calgary, Alberta.

This report has been prepared jointly by Mr. C. W. Lane and Mr. R. D. May.

The waters of the two rivers were divided between the two countries in accordance with the Order of the International Joint Commission dated at Ottawa, Canada, on the 4th day of October, 1921.

The hydrometric data upon which this report is based was collected and compiled jointly for 46 international stations. Data for another 34 stations in Canada and 7 stations in the United States were collected independently by the same engineers in their respective countries. The United States Bureau of Reclamation furnished data for 8 canal and 2 reservoir stations and the United States Bureau of Indian Affairs furnished data for one other canal station in Montana.

St. Mary River

The natural flow of the St. Mary River at the International Boundary during the irrigation season, April 1 to October 31, was 681,400 acre-feet or 116 per cent of average of the previous 64 years of record. The usage by the United States was 118,000 acre-feet during this period. No problems of apportionment of natural flow between the United States and Canada were encountered. The United States St. Mary Canal was placed in operation on June 21 and was closed on October 5.

Milk River

The estimated natural flow of the Milk River at its eastern crossing of the International Boundary during the period March 1 to October 31 was 250,000 acre-feet or 219 per cent of average of the previous 55 years of record.

Eastern Tributaries of Milk River

A prolonged runoff from snowmelt occurred during 1967 with runoff in the lower reaches of the basin beginning near the end of March and continuing in the Cypress Hills area until the end of May. The large and prolonged spring runoff offset the dry summer and satisfactory irrigation prevailed in both countries. No problems were encountered in the division of the natural flow of these tributaries.

Records were again collected at the index domestic projects and tentative computations were made as to the total usage of all the domestic projects within the Battle Creek and Frenchman River basins during 1966 and 1967. The tentative computations indicate the usage of these projects is a small percentage of the total natural flow but records have not been collected

in a low runoff year and possibly usages during these years may be significant. The question of contributing drainage areas within the Battle Creek and Frenchman River basins has as yet not been resolved and thus final computations of domestic usages cannot be made.

The supplementary gauging stations on the Frenchman River and on Battle Creek were again operated but the data are insufficient to make an adequate analysis of channel losses and return flows.

Lodge Creek

The natural flow of Lodge Creek at the International Boundary was 73,270 acre-feet during the March through October period or 206 per cent of the average of the previous 17 years of record. Large excess deliveries were made to the United States during spring runoff with no deficit deliveries occurring throughout the year.

The natural flows for the period 1950 to 1960 were determined by adding the total diversions to the total flow at the International Boundary as reported in the St. Mary - Milk River reports of the same period.

Battle Creek

The natural flow of Battle Creek at the International Boundary was 65,230 acre-feet during the irrigation season or 235 per cent of average of the previous 27 years of record. Deficit deliveries were recorded only twice during the season, these being immediately made up in the following division period.

Natural flows for the period 1940 to 1957 were determined by adding total flow at the International Boundary to the total diversions, as given in the corresponding St. Mary - Milk River reports.

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The peak flow of May was the highest recorded flow on record for the Upper Battle Creek basin. During the peak flow a total of about 100 acre-feet overflowed the Battle Creek basin and found its way into the Lodge Creek basin.

Frenchman River

The natural flow of Frenchman River at the International Boundary during the irrigation season was 105,600 acre-feet or 138 per cent of average of the previous 27 years of record. Only four small deficit deliveries were recorded during the season.

TABLE 1
SUMMARY OF DIVISIONS DURING 1967 IRRIGATION SEASON

Lodge Creek during 1967 (March to October)

Period at International Boundary	Natural Flow cfs	U. S. A. Share cfs	Received by U. S. A. cfs	Received by U. S. A.	
				Above (+) Share cfs	Below (-) Share cfs
Mar. 1 - Mar. 10	8	4	8	4	
Mar. 11 - Mar. 20	6	3	6	3	
Mar. 21 - Mar. 31	325	162	325	163	
Apr. 1 - Apr. 10	1,976	988	1,349	361	
Apr. 11 - Apr. 20	9,008	4,504	7,371	2,867	
Apr. 21 - Apr. 30	4,909	2,454	4,489	2,035	
May 1 - May 10	11,295	5,648	9,732	4,084	
May 11 - May 20	5,747	2,874	3,820	946	
May 21 - May 31	2,840	1,420	1,950	530	
June 1 - June 10	555	278	399	121	
June 11 - June 20	222	111	341	230	
June 21 - June 30	0	0	55	55	
July 1 - July 10	0	0	53	53	
July 11 - July 20	49	24	27	3	
July 21 - July 31	0	0	0	0	
Aug. 1 - Aug. 10	0	0	14	14	
Aug. 11 - Aug. 20	0	0	2	2	
Aug. 21 - Aug. 31	0	0	0	0	
Sep. 1 - Sep. 10	0	0	0	0	
Sep. 11 - Sep. 20	0	0	0	0	
Sep. 21 - Sep. 30	0	0	0	0	
Oct. 1 - Oct. 10	0	0	0	0	
Oct. 11 - Oct. 20	0	0	0	0	
Oct. 21 - Oct. 31	0	0	0	0	

Battle Creek during 1967 (March to October)

Period at International Boundary	Natural Flow cfs	U. S. A. Share cfs	Received by U. S. A. cfs	Received by U. S. A.	
				Above (+) Share cfs	Below (-) Share cfs
Feb. 23 - Mar. 4	109	54	105	51	
Mar. 5 - Mar. 14	101	50	98	48	
Mar. 15 - Mar. 25	235	118	227	109	
Mar. 26 - Apr. 4	1,688	844	1,631	787	
Apr. 5 - Apr. 14	4,573	2,287	3,576	1,289	
Apr. 15 - Apr. 24	3,439	1,720	1,123		597
Apr. 25 - May 4	2,296	1,148	1,899	751	
May 5 - May 14	5,136	2,568	3,272	704	
May 15 - May 25	8,890	4,445	9,802	5,357	
May 26 - June 4	2,788	1,394	3,111	1,717	
June 5 - June 14	1,482	741	966	225	
June 15 - June 24	751	376	438	62	
June 25 - July 4	374	187	257	70	
July 5 - July 14	277	138	179	41	
July 15 - July 25	14	7	116	109	
July 26 - Aug. 4	0	0	20	20	
Aug. 5 - Aug. 14	77	38	143	105	
Aug. 15 - Aug. 25	36	18	133	115	
Aug. 26 - Sep. 4	34	17	12		5
Sep. 5 - Sep. 14	0	0	0	0	
Sep. 15 - Sep. 24	143	72	138	66	
Sep. 25 - Oct. 4	73	36	50	14	
Oct. 5 - Oct. 14	141	71	137	66	
Oct. 15 - Oct. 25	141	70	136	66	
Oct. 26 - Oct. 31	90	45	87	42	

TABLE 1 (cont'd.)

SUMMARY OF DIVISIONS DURING 1967 IRRIGATION SEASON

Frenchman River during 1967 (March to October)

Period at International Boundary	Natural Flow cfs	U. S. A. Share cfs	Received by U. S. A. cfs	Received by U. S. A.	
				Above (+) Share cfs	Below (-) Share cfs
Mar. 1 - Mar. 10	97	48	95	47	
Mar. 11 - Mar. 20	87	44	85	41	
Mar. 21 - Mar. 31	1,418	709	1,386	677	
Apr. 1 - Apr. 10	3,825	1,912	2,234	322	
Apr. 11 - Apr. 20	13,336	6,668	11,960	5,292	
Apr. 21 - Apr. 30	6,367	3,184	4,074	890	
May 1 - May 10	5,573	2,787	4,522	1,735	
May 11 - May 20	9,278	4,639	8,477	3,838	
May 21 - May 31	7,425	3,712	5,937	2,225	
June 1 - June 10	1,617	808	2,411	1,603	
June 11 - June 20	960	480	648	168	
June 21 - June 30	791	396	462	66	
July 1 - July 10	354	177	215	38	
July 11 - July 20	405	203	166		37
July 21 - July 31	256	128	312	184	
Aug. 1 - Aug. 10	202	101	209	108	
Aug. 11 - Aug. 20	128	64	108	44	
Aug. 21 - Aug. 31	100	50	25		25
Sep. 1 - Sep. 10	29	15	28	13	
Sep. 11 - Sep. 20	412	206	309	103	
Sep. 21 - Sep. 30	37	18	18	0	
Oct. 1 - Oct. 10	350	175	276	101	
Oct. 11 - Oct. 20	77	38	20		18
Oct. 21 - Oct. 31	127	64	21		43

St. Mary River during 1967 (April to October)

Period at International Boundary	Natural Flow cfs	Canada's Share cfs	Received by Canada cfs	Received by Canada	
				Above (+) Share cfs	Below (-) Share cfs
Apr. 1 - Apr. 15	3,968	2,976	3,330	354	
Apr. 16 - Apr. 30	4,388	3,291	3,345	54	
May 1 - May 15	11,270	7,599	16,478	8,879	
May 16 - May 31	65,228	35,283	67,200	31,917	
June 1 - June 15	70,252	37,627	66,780	29,153	
June 16 - June 30	66,058	35,530	47,530	12,000	
July 1 - July 15	49,442	27,222	30,230	3,008	
July 16 - July 31	27,005	16,170	15,964		206
Aug. 1 - Aug. 15	14,724	9,864	9,953	89	
Aug. 16 - Aug. 31	10,047	7,430	7,602	172	
Sep. 1 - Sep. 15	6,358	4,770	4,745		25
Sep. 16 - Sep. 30	5,248	3,930	4,166	236	
Oct. 1 - Oct. 15	4,455	3,340	3,368	28	
Oct. 16 - Oct. 31	5,093	3,819	3,357		462

WATER SUPPLY

St. Mary River

The total natural flow of the St. Mary River at the International Boundary for the year November 1, 1966, to October 31, 1967, was 747,400 acre-feet. The natural flow during the irrigation season, April 1 to October 31, was 681,400 acre-feet, or 116 per cent of 589,200 acre-feet, the average of the previous 64 years of record. 613,800 acre-feet were delivered to Canada during the year November 1, 1966, to October 31, 1967, with 563,400 being delivered during the irrigation season. During the irrigation season the Canadian and United States shares respectively were 394,400 acre-feet and 287,000 acre-feet.

The forty-sixth annual international survey of snow conditions in the St. Mary River drainage basin was conducted on May 2 and 3, 1967. The survey provided advance information on the probable runoff during the irrigation season. The tabulated results of the forecasts and measured discharge or computed natural flow at three locations are shown below.

Location	Period of Correlation	Forecast of 1967 Runoff		Measured Runoff	
		Acre-Feet	% of Average	Acre-Feet	% of Average
Swiftcurrent Creek at Many Glacier	1923-65	96,600 (May to July)	(1923-66) 141	80,090 (May to July)	(1923-66) 117
Natural Flow Swiftcurrent Creek at Sherburne	1922-65	166,000 (May to Sept.)	(1922-66) 144	132,600 (May to Sept.)	(1922-66) 115
Natural Flow St. Mary River at International Boundary	1922-65	756,000 (May to Sept.)	(1922-66) 149	645,900 (May to Sept.)	(1922-66) 127

Milk River

The estimated natural flow of Milk River at its eastern crossing of the International Boundary during the period March 1 to October 31, 1967, was 250,000 acre-feet or 219 per cent of 114,100 acre-feet, the average of estimated natural flows of the previous 55 years of record. The United States and Canadian shares were 156,000 acre-feet and 94,000 acre-feet respectively.

Eastern Tributaries of Milk River

The total quantity of water delivered to the United States by the eastern tributaries of Milk River during the period March 1 to October 31, 1967, was 264,200 acre-feet or 193 per cent of 136,800 acre-feet, the average of the previous 40 years. The quantities delivered to the United States by the various tributaries are listed in Table 6.

During the season, water was diverted from the eastern tributaries or stored in reservoirs in Canada as listed in Tables 11, 12 and 13 of Appendix A. Measured diversions in Montana were 17,870 acre-feet as listed in Table 5.

The fifteenth annual snow survey in the basins of the eastern tributaries of Milk River was conducted by the Inland Waters Branch, Canada, during the period February 25 to 28, 1967. The tabulated results of the forecasts and measured discharge or computed natural flow are shown below.

Location	Period of Correlation	Forecast of 1967 Runoff		Measured Runoff	
		Acre-Feet	% of Average	Acre-Feet	% of Average
Natural Flow Lodge Creek at International Boundary	1953-66	30,700 (Mar. to Apr.)	(1953-66) 158	32,200 (Mar. to Apr.)	(1953-66) 166
Natural Flow Battle Creek at International Boundary	1953-66	26,830 (Mar 5 to May 4)	(1953-66) 170	24,460 (Mar 5 to May 4)	(1953-66) 155
Natural Flow Frenchman River at International Boundary	1953-66	58,300 (Mar. to May)	(1940-66) 91	94,030 (Mar. to May)	(1940-66) 147

DIVISION OF WATER

St. Mary River

The division of the waters of the St. Mary River was carried out in accordance with the Order of the International Joint Commission dated October 4, 1921.

During the irrigation season, April 1 to October 31, field engineers of both countries made semi-monthly computations of the daily natural flow of the river and each country's share thereof, in order that any appropriation by the United States in excess of their share could be adjusted by a subsequent delivery to Canada of an equivalent amount at the earliest opportunity.

Regular interim reports on the progress of the division of the natural flow at the International Boundary were made to interested agencies throughout the irrigation season.

During the non-irrigation season, November 1, 1966, to March 31, 1967, no interim reports were made as the only United States use during this period was storage in Lake Sherburne where the contributing drainage area is about 14 per cent of the total area of the St. Mary River drainage basin in the United States.

Storage in Lake Sherburne was 6,050 acre-feet on October 31, 1966, and had increased to 21,490 acre-feet by March 31, 1967, and to 63,830 acre-feet by July 19, 1967. On October 31, 1967, the storage was 9,010 acre-feet.

The St. Mary Canal was operated between June 21 and October 5 and water was delivered to the North Milk River from June 22 to October 7.

Seepage from the canal between the point of diversion and the crossing of the St. Mary River is assumed to return to the river and eventually become available to Canada. The discharge of 129,200 acre-feet which

passed the gauging station on the St. Mary Canal at St. Mary Crossing near Babb between June 21 and October 5 was considered to be the quantity diverted from the St. Mary River by the United States.

Canada diverted 252,300 acre-feet of water from the St. Mary River Reservoir in 1967 as measured at the Canadian St. Mary Canal and Magrath Irrigation District Canal gauging stations near Spring Coulee as listed in Table 3.

Milk River

No division of the flow of Milk River at Eastern Crossing is made. Except for a few small unmeasured diversions above the eastern crossing of the International Boundary, the entire natural flow of the Milk River at that point was delivered to the United States.

Joint collection of records was continued on the South Fork Milk River near Babb to assist in studying the utilization of waters in the Milk River basin within the Blackfeet Indian Reservation.

During 1967 a substantial flow was recorded in the Milk River at the western crossing of the International Boundary for the entire season. Consequently, there were no complaints by Canadian ranchers this year.

Eastern Tributaries of Milk River

The division of the waters of the eastern tributaries of the Milk River was carried out in accordance with the Order of the International Joint Commission dated October 4, 1921, which stipulates under Rule III that "The natural flow of the eastern (otherwise known as the Saskatchewan or northern) tributaries of the Milk River at the points where they cross the International Boundary shall be divided equally between the two countries."

The rule concerning this subject might well be interpreted as requiring that the division of water be made on a daily basis. It was recognized early in operation under this rule that daily division was impracticable and compilation of the natural flow at the International Boundary by ten-day periods was begun many years ago.

During the irrigation season, March 1 to October 31, field engineers of both countries make ten-day computations of the natural flows of Lodge Creek, Battle Creek and Frenchman River and each country's share thereof, in order that any appropriation by Canada in excess of its share can be adjusted at the earliest opportunity by a subsequent delivery to the United States of an equivalent amount.

Regular interim reports on the progress of the division of the natural flows of Lodge Creek, Battle Creek and Frenchman River at the International Boundary were made to interested agencies throughout the irrigation season.

Minor Diversions: Estimates for a number of small diversions from the eastern tributaries of Milk River in Saskatchewan and Alberta were provided by the Water Resources Commission of the Province of Saskatchewan and the Water Resources Branch of the Province of Alberta, and are based on reports from the individual licensed irrigators. The Saskatchewan Water Resources Commission has introduced a system whereby they receive results from the irrigators at the time of irrigation rather than the end of the season. This has resulted in a higher quality of estimated diversions. The percentage figure used in computing the interim report is based on the snow survey forecast and thus there is some discrepancy between the final and interim reports on the division. The estimated quantities reported to date

for 1967 are detailed in Appendix B to this report.

Lodge Creek: The computed natural flow of Lodge Creek at the International Boundary for the period March 1 to October 31, 1967, was 73,270 acre-feet, of which each country was entitled to fifty per cent (36,635). The details of this division are summarized on page 3, and shown in Table 11 of Appendix A.

A total of 59,390 acre-feet was recorded at the International Boundary, which is 162 per cent of the United States share.

The recording station on Squaw Coulee which was established in 1966 was used to determine the return flow from the Spangler Irrigation Project in the computation of natural flow.

Battle Creek: The computed natural flow of Battle Creek at the International Boundary for the period February 23 to October 31, 1967, was 65,230 acre-feet, of which each country was entitled to fifty per cent (32,615). The details of this division are summarized on page 3, and shown in Table 12 of Appendix A.

A total of 54,860 acre-feet was recorded at the International Boundary, which is 168 per cent of the United States share.

Frenchman River: The computed natural flow of the Frenchman River at the International Boundary for the period March 1 to October 31, 1967, was 105,600 acre-feet, of which each country was entitled to fifty per cent (52,800). The details of this division are summarized on page 4, and shown in Table 13 of Appendix A.

A total of 87,260 acre-feet was recorded at the International Boundary, which is 165 per cent of the United States share.

APPENDICES

Appendices A and B are submitted with this report under separate cover. Appendix A contains natural flow of St. Mary and its division; historical summary of mean monthly, United States share and Canadian share of St. Mary River; determination of natural flow of Lodge Creek, Battle Creek and Frenchman River at International Boundary. Appendix B contains the summary of monthly discharge and the daily gauge height and discharge data for 63 gauging stations operated during 1967 in the St. Mary and Milk River drainage basins. Details of the Canadian minor diversions are also included.

Table 2

Summary of Division of St. Mary River
and Diversion to Milk River
1967
Quantities in acre-feet

Month	St. Mary River at Int. Boundary				Excess Received by Canada	Storage Lake Sherburne	Total Available for Diversions	St. Mary Canal at St. Mary Crossing	Milk River at Eastern Crossing*
	Recorded Flow	Natural Flow	United States Share	Canadian Share					
April	13,240	16,574	4,143 ^x	12,430	+ 809	+ 3,334 ^x	809	0	41,410
May	165,973	151,732	66,676	85,055	+80,918	-11,241 ^r	80,917	0	107,700
June	226,731	270,367	125,262	145,105	+81,626	+33,142	92,120	10,495	48,700
July	91,624	151,630	65,564	86,067	+ 5,558	+18,518	47,046	41,488	44,630
Aug.	34,820	49,133	14,830	34,302	+ 518	-27,673 ^r	42,503	41,986	41,880
Sept.	17,675	23,020	5,764	17,256	+ 419	-29,808 ^r	35,572	35,153	38,580
Oct.	13,339	18,938	4,739	14,200	- 861	+ 5,558	- 819	42	6,790
Total Irrig. Season	563,402	681,394	286,978	394,415	168,987	-11,170 ^r	298,148	129,164	329,690
For Year Nov. to Oct.	613,802	747,440	320,001	427,438					

r Negative sign indicates a release from Lake Sherburne.

* Represents natural flow of Milk River and diversion from St. Mary River Basin.

Lake Sherburne quantities are corrected for evaporation.

Storage in Lake Sherburne on October 31, 1966 = 6,050 acre-feet
 March 31, 1967 = 21,490 acre-feet
 October 31, 1967 = 9,010 acre-feet

Storage in Fresno Reservoir on October 31, 1966 = 85,920 acre-feet
 March 31, 1967 = 134,900 acre-feet
 October 31, 1967 = 76,040 acre-feet

Table 3
DIVISION OF FLOW OF ST. MARY RIVER
1967

Water Available to Canada at Spring Coulee from St. Mary River
Quantities in acre-feet

Month	St. Mary River Int. Boundary	Rolph Creek Kimball	Lee Creek Cardston	Total Avail- able at Spring Coulee
April	13,240	1,420	4,130	18,790
May	165,973	5,280	31,000	202,253
June	226,731	2,920	28,500	258,151
July	91,624	532	5,410	97,566
August	34,820	348	1,380	36,548
September	17,675	314	750	18,739
October	13,339	260	637	14,236
Total	563,402	11,074	71,807	646,283

DISPOSITION OF WATER AVAILABLE TO CANADA
Water Used in St. Mary and Milk Rivers Development

Quantities in acre-feet

Month	Canada's Share Natural Flow: Int. Boundary	Canadian St. Mary Canal: Spring Coulee	Magrath I.D. Canal: Spring Coulee	Total Diverted to S.M.R.D.
April	12,430	12	5	17
May	85,055	44	53	97
June	145,105	284	57	341
July	86,067	66,570	2,950	69,520
August	34,302	42,890	2,080	44,970
September	17,256	77,650	1,660	79,310
October	14,200	56,600	1,470	58,070
Total	394,415	244,050	8,275	252,325

Storage in St. Mary Reservoir October 31, 1966 = 223,300 acre-feet
March 31, 1967 = 254,800 acre-feet
October 31, 1967 = 136,500 acre-feet

TABLE 4
MAJOR DIVERSIONS FROM MILK RIVER
IN THE UNITED STATES

1967

Quantities in acre-feet

Month	Fort Belknap Canal	Paradise Canal	Harlem Canal	Harlem No. 2	Agency Canal	Dodson North	Dodson South	Vandalia Canal	Wiota Pumping Plant
March	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	5,550	0	0
May	0	0	0	0	0	1,190	4,410	0	0
June	17,600	7,840	4,240	1,710	6,500	8,250	19,540	12,550	1,220
July	19,740	9,620	5,750	1,750	7,060	8,180	20,780	15,450	3,820
Aug.	21,250	8,580	5,040	1,590	5,990	6,190	19,390	12,950	2,920
Sept.	12,830	3,620	2,140	476	3,680	2,620	17,210	10,320	1,280
Oct.	4,080	0	1,230	0	0	119	12,200	5,990	776
Nov.	3,270	0	873	0	0	0	2,480	0	0
Dec.	1,090	0	0	0	0	0	0	0	0
Total	79,860	29,660	19,273	5,526	23,230	26,549	101,560	57,260	10,016

Total of Major Diversions from Milk River in the United States - 352,900

Storage in Nelson Reservoir on October 31, 1966	54,270
on March 31, 1967	49,840
on October 31, 1967	43,640

TABLE 5

MEASURED DIVERSIONS FROM THE EASTERN TRIBUTARIES
OF MILK RIVER IN THE UNITED STATES

1967

Quantities in acre-feet

Month	Lodge Creek Basin	Battle Creek Basin	Frenchman River Basin
	North Chinook Canal	Matheson Canal Pumping	Frenchman Canal
March	940		0
April	4,190		788
May	2,240		711
June	1,740		2,450
July	47		2,390
Aug.	0		1,280
Sept.	0		254
Oct.	0		0
Total	9,157	840a	7,873

Total of Measured Diversions from the Eastern Tributaries of
Milk River in the United States = 17,870 acre-feet

a - Estimated use by pumping from Battle Creek to land under
Matheson Canal.

Table 6

Measured Run-off of Eastern Tributaries of Milk River
at International Boundary for period March to October

1967

Quantities in acre-feet

Month	Lodge Creek	Battle Creek	Woodpile Coulee	East Fork Battle Creek	Lyons Creek	Whitewater Creek	Frenchman River	Rock Cr. below Horse Cr.	McEachern Creek
March	673	2,680	599	1,190	849	1,360	3,110	1,720	1
April	26,200	12,700	2,250	2,510	2,700	3,170	36,230	23,940	12,720
May	30,750	32,360	1,050	1,220	1,250	164	37,560	2,440	2,650
June	1,580	4,490	4	0	0	15	6,980	562	29
July	158	844	0	0	0	0	1,370	104	0
Aug.	32	578	0	0	0	0	678	7	0
Sept.	0	361	0	0	0	1	704	88	0
Oct.	0	725	0	0	0	6	628	196	0
Totals	59,393	54,738	3,903	4,920	4,799	4,716	87,260	29,057	15,400

Total measured run-off of Eastern Tributaries of Milk River
at International Boundary from March to October = 264,186 acre-feet

GAUGING STATIONS OPERATED JOINTLY BY
CANADA AND UNITED STATES
IN ST. MARY AND MILK RIVER DRAINAGE BASINS

- 1967 -

Map Index	Stream and Location	Remarks
<u>St. Mary River Basin</u>		
5AE-27	St. Mary River at International Boundary	Int. ^a
5AE-36	Lake Sherburne at Sherburne, Montana	Int. R ^a
5AE-33	Swiftcurrent Creek at Sherburne, Montana	Int. ^a
5AE-29	St. Mary Canal at St. Mary Crossing near Babb, Montana	Int. ^a
<u>Milk River Basin</u>		
11AA-25	Milk River at Western Crossing of International Boundary	Int. ^a
11AA-5	Milk River at Milk River	Int. ^a
11AA-31	Milk River at Eastern Crossing of International Boundary	Int. ^a
11AA-33	South Fork Milk River near Babb, Montana	Int. ^a
11AA-32	North Fork Milk River above St. Mary Canal near Browning, Montana	Int. ^a
11AA-1	North Milk River near International Boundary	Int. ^a
<u>Lodge Creek Tributary Basin</u>		
11AB-89	Altawan Reservoir near Govenlock	Int. R ^a
11AB-83	Lodge Creek below McRae Creek at International Boundary	Int. ^a
11AB-86	Walburger Coulee below Diversions	Int. ^a
11AB-60	Spangler Ditch near Govenlock	Int. ^a
11AB-9	Middle Creek near Alberta Boundary	Int. ^a
11AB-80	Middle Creek Reservoir	Int. R ^a

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Map Index	Stream and Location	Remarks
11AB-87	Middle Creek near Battle Creek	Int. ^a
<u>Battle Creek Tributary Basin</u>		
11AB-27	Battle Creek at International Boundary	Int. ^a
11AB-78	Cypress Lake West Inflow Canal	Int. ^a
11AB-85	Cypress Lake West Inflow Canal Drain	Int. ^a
11AB-77	Cypress Lake West Outflow Canal	Int. ^a
11AB-84	Vidora Ditch near Consul	Int. ^a
11AB-58	Richardson Ditch near Consul	Int. ^a
11AB-44	McKinnon Ditch near Consul	Int. ^a
11AB-18	Stirling and Nash Ditch near Consul	Int. ^a
11AB-105	Woodpile Coulee near International Boundary	Int. ^a
11AB-107	East Fork Battle Creek near International Boundary	Int. ^a
11AB-75	Lyons Creek at International Boundary	Int. ^a
<u>Whitewater Creek Tributary Basin</u>		
11AD-1	Whitewater Creek near International Boundary	Int. ^a
<u>Frenchman River Tributary Basin</u>		
11AC-55	Eastend Reservoir	Int. R ^a
11AC-1	Frenchman River below Eastend Reservoir	Int. ^a
11AC-57	Frenchman River below Eastend Irrigation Project	Int. ^a
11AC-63	Val Marie West Reservoir	Int. R ^a
11AC-56	Val Marie Reservoir	Int. R ^a
11AC-51	Frenchman River below Val Marie	Int. ^a
11AC-41	Frenchman River at International Boundary	Int. ^a

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Map Index	Stream and Location	Remarks
11AC-60	Cypress Lake East Outflow Canal	Int. ^a
11AC-37	Cypress Lake	Int. R ^a
11AC-64	Belanger Creek Diversion to Cypress Lake	Int. ^a
11AC-52	Eastend Canal	Int. ^a
11AC-66	Val Marie West Pumping Canal	Int. ^a
11AC-65	Val Marie West Gravity Canal	Int. ^a
11AC-54	Val Marie Main Canal	Int. ^a
11AC-25	Denniel Creek near Val Marie	Int. ^a
<u>Rock Creek Tributary Basin</u>		
11AE-9	Rock Creek below Horse Creek near International Boundary	Int. ^a
11AE-7	McEachern Creek at International Boundary	Int. ^a

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GAUGING STATIONS OPERATED INDEPENDENTLY
BY CANADA OR UNITED STATES
IN ST. MARY AND MILK RIVER DRAINAGE BASINS

- 1967 -

Map Index	Stream and Location	Remarks
<u>St. Mary River Basin</u>		
175	St. Mary River near Babb, Montana	U.S.A. ^c
5AE-25	St. Mary Reservoir near Spring Coulee ✓	Canada R ^a
5AE-6	St. Mary River near Lethbridge	Canada ^c
139	Grinnell Creek at Grinnell Glacier near Many Glacier, Montana	U.S.A. ^c
140	Grinnell Creek near Many Glacier, Montana	U.S.A. ^c
5AE-32	Swiftcurrent Creek at Many Glacier, Montana	U.S.A. ^a
5AE-5	Rolph Creek near Kimball ✓	Canada ^a
5AE-2	Lee Creek at Cardston ✓	Canada ^a
5AE-26	Canadian St. Mary Canal near Spring Coulee ✓	Canada ^a
5AE-21	Magrath Irrigation District Canal near Spring Coulee ✓	Canada ^a
<u>Milk River Basin - Southern Tributaries</u>		
11AA-29	Miners Coulee near International Boundary	Canada ^c
11AA-28	Bear Creek near International Boundary	Canada ^c
<u>Lodge Creek Tributary Basin</u>		
11AB-82	Lodge Creek at Alberta Boundary	Canada ^a
11AB-91	Michele Reservoir near Elkwater	Canada R ^a
11AB-92	Greasewood Reservoir near Elkwater	Canada R ^a
11AB-104	Massy Reservoir near Elkwater	Canada R ^a

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Map Index	Stream and Location	Remarks
11AB-93	Yeast Reservoir near Elkwat	Canada R ^a
11AB-94	Bare Creek Reservoir near Elkwat	Canada R ^a
11AB-97	Cressday Reservoir near Cressday	Canada R ^a
11AB-98	Jaydot Reservoir near Jaydot	Canada R ^a
11AB-99	Mitchell Reservoir near Elkwat	Canada R ^a
11AB-8	Middle Creek above Lodge Creek	Canada ^a
11AB-103	Squaw Coulee near Willow Creek	Canada ^a
1460	North Chinook Canal near Havre, Montana	U.S.A. ^b

Battle Creek Tributary Basin

11AB-81	Battle Creek at Ranger Station	Canada ^c
11AB-100	Battle Creek above Cypress Lake West Outflow Canal	Canada ^c
11AB-96	Battle Creek near Consul	Canada ^c
11AB-101	Battle Creek below Nashlyn Project	Canada ^c
11AB-95	Adams Lake	Canada R ^a
11AB-90	Reesor Reservoir	Canada R ^a
11AB-102	Gaff Ditch near Merryflat	Canada ^c
1525	Matheson Canal near Chinook, Montana	U.S.A. ^b

Frenchman River Tributary Basin

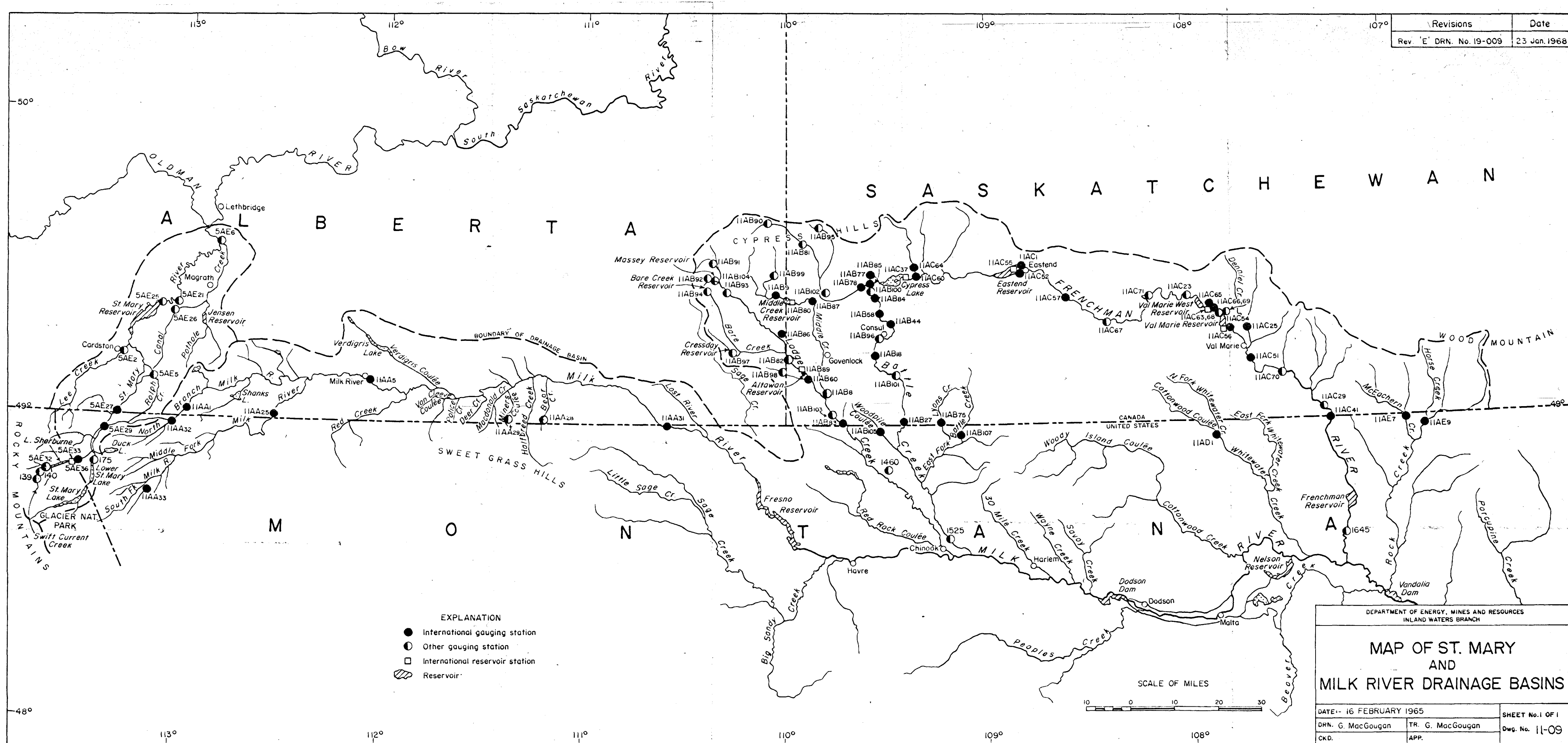
11AC-67	Frenchman River at No. 37 Highway	Canada ^c
11AC-71	Frenchman River below Mule Creek	Canada ^c
11AC-23	Frenchman River at 50 Mile	Canada ^c
11AC-62	Frenchman River below Val Marie Reservoir	Canada ^c
11AC-70	Frenchman River near Rosefield	Canada ^c

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Map Index	Stream and Location	Remarks
11AC-29	Frenchman River at Walker's	Canada c
11AC-68	Val Marie Electric Pump No. 1	Canada c
11AC-69	Val Marie Electric Pump No. 2	Canada c
1645	Frenchman Canal near Saco, Montana	U.S.A. b

SYMBOL CODE

- Int. - International Gauging Station
- Int. R - International Station on Reservoir
- U.S.A. - Operation by United States Geological Survey
- Canada - Operation by Inland Waters Branch, Canada
- a - Monthly and daily discharge data and stream measurements
or month-end contents contained in Appendix B
- b - Monthly discharge data only tabulated in this report
- c - Data not included in this report or appendices



Revisions	Date
Rev. 'E' DRN. No. 19-009	23 Jan. 1968

- EXPLANATION
- International gauging station
 - Other gauging station
 - International reservoir station
 - ▨ Reservoir

DEPARTMENT OF ENERGY, MINES AND RESOURCES
INLAND WATERS BRANCH

**MAP OF ST. MARY
AND
MILK RIVER DRAINAGE BASINS**

DATE: 16 FEBRUARY 1965		SHEET No. 1 OF 1
DRN. G. MacGougan	TR. G. MacGougan	Dwg. No. 11-09
CKD.	APP.	

HD
1694
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Report to the International Joint
Commission on the division and use
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