Report to
THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

J. D. McLEOD
representing Canada

and

E. L. HENDRICKS
representing United States

1966

International Joint Commission,

Ottawa, Ontario, and Washington, D.C.

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, 1966.

Respectfully submitted,

J. D. McLeod
Accredited Officer of Her Majesty

E. L. Hendricks

E. L. Hendricks
Accredited Officer of the United States

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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 1966 by representatives of the United States Geological Survey and the Water Resources Branch of Canada.

Mr. J. D. McLeod, Deputy Director, Water Resources 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. Mr. E. L. Hendricks, Chief Hydrologist, United States Geological Survey, as accredited officer of the United States, was represented in the field by Mr. Frank Stermitz, Helena, Montana.

This report has been prepared jointly by Mr. R. D. May and Mr. C. W. Lane, District Chief, Helena, Montana (successor to Mr. Frank Stermitz, retired).

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 53 international stations. Data for another 31 stations in Canada and 6 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 577,300 acre-feet or 98 per cent of average of the previous 63 years of record. The usage by the United States was 178,200 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 May 2 and was closed on September 29.

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 119,000 acre-feet or 104 per cent of average of the previous 54 years of record.

Eastern Tributaries of Milk River

The runoff from snowmelt began near the end of March and was essentially complete by the first of May. The streamflow, however, remained relatively well sustained throughout the year and a satisfactory irrigation prevailed in both countries. No problems were encountered in the division of the natural flow of these tributaries.

Records were collected at the index reservoirs selected in 1965 but no computation of minor storage was made as the final delineation of the contributing drainage areas has not been resolved. A field inspection of the questionable drainage areas was made by Canadian personnel during 1966 and a joint inspection will be made in 1967.

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

Lodge Creek

The natural flow of Lodge Creek at the International Boundary was 35,860 acre-feet during the March through October period or 150 per cent of the average of the previous 5 years of record. A large excess delivery to the United States occurred during the spring runoff period but small deficits were recorded in May, June and August. These deficits were made up gradually through the year.

Battle Creek

The natural flow of Battle Creek at the International Boundary was 37,180 acre-feet during the irrigation season or 136 per cent of average of the previous 26 years of record. Deficit deliveries were recorded several times throughout the season but were made up in the following division periods.

Frenchman River

The natural flow of Frenchman River at the International Boundary during the irrigation season was 73,930 acre-feet or 97 per cent of average of the previous 26 years of record.

A large excess delivery to the United States occurred during spring runoff. A few small deficits occurred during the season but these were made up in the following division period.

TABLE 1

SUMMARY OF DIVISIONS DURING 1966 IRRIGATION SEASON

Lodge Creek during 1966 (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	Received by U. S. A. Below (-) Share cfs
Mar. 1 - Mar. 10	0	0	0	0	
Mar. 11 - Mar. 20	469	234	386	152	
Mar. 21 - Mar. 31	8,588	4,294	7,182	2,888	
Apr. 1 - Apr. 10	6,439	3,220	3,256	36	
Apr. 11 - Apr. 20	801	400	546	146	
Apr. 21 - Apr. 30	464	232	234	2	
May 1 - May 10	339	170	73		97
May 11 - May 20	170	85	112	27	
May 21 - May 31	54	27	171	144	
June 1 - June 10	170	85	135	50	
June 11 - June 20	151	76	48		28
June 21 - June 30	179	89	26		63
July 1 - July 10	130	65	16		49
July 11 - July 20	20	10	40	30	
July 21 - July 31	12	6	23	17	
Aug. 1 - Aug. 10	0	0	0	0	
Aug. 11 - Aug. 20	0	0	0	0	
Aug. 21 - Aug. 31	76	38	4		34
Sep. 1 - Sep. 10	3	1	0		1
Sep. 11 - Sep. 20	0	0	40	40	
Sep. 21 - Sep. 30	16	8	1		7
Oct. 1 - Oct. 10	0	0	0	0	
Oct. 11 - Oct. 20	0	0	0	0	
Oct. 21 - Oct. 31	0	0	43	43	

Battle Creek during 1966 (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	Received by U. S. A. Below (-) Share cfs
Feb. 23 - Mar. 4	21	10	20	10	
Mar. 5 - Mar. 14	104	52	98	46	
Mar. 15 - Mar. 25	2,181	1,090	1,584	494	
Mar. 26 - Apr. 4	6,046	3,023	2,344		679
Apr. 5 - Apr. 14	2,773	1,386	1,545	159	
Apr. 15 - Apr. 24	1,360	680	999	319	
Apr. 25 - May 4	806	403	295		108
May 5 - May 14	1,336	668	354		314
May 15 - May 25	643	322	280		42
May 26 - June 4	386	193	269	76	
June 5 - June 14	525	262	365	103	
June 15 - June 24	427	214	330	116	
June 25 - July 4	495	248	247		1
July 5 - July 14	341	170	150		20
July 15 - July 25	171	86	116	30	
July 26 - Aug. 4	36	18	140	122	
Aug. 5 - Aug. 14	82	41	176	135	
Aug. 15 - Aug. 25	167	84	119	35	
Aug. 26 - Sep. 4	219	110	160	50	
Sep. 5 - Sep. 14	164	82	115	33	
Sep. 15 - Sep. 24	31	16	33	17	
Sep. 25 - Oct. 4	49	24	60	36	
Oct. 5 - Oct. 14	114	57	108	51	
Oct. 15 - Oct. 25	171	86	162	76	
Oct. 26 - Oct. 31	97	48	91	43	

SUMMARY OF DIVISIONS DURING 1966 IRRIGATION SEASON

Frenchman River during 1966 (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	135	68	130	62	
Mar. 11 - Mar. 20	7,481	3,740	4,835	1,095	
Mar. 21 - Mar. 31	6,943	3,472	6,271	2,799	
Apr. 1 - Apr. 10	9,925	4,962	8,211	3,249	
Apr. 11 - Apr. 20	2,640	1,320	1,140		180
Apr. 21 - Apr. 30	1,592	796	1,109	313	
May 1 - May 10	1,150	575	1,064	489	
May 11 - May 20	1,408	704	1,078	374	
May 21 - May 31	762	381	514	133	
June 1 - June 10	717	358	331		27
June 11 - June 20	656	328	282		46
June 21 - June 30	691	346	363	17	
July 1 - July 10	772	386	187		199
July 11 - July 20	436	218	193		25
July 21 - July 31	151	76	291	215	
Aug. 1 - Aug. 10	556	278	377	99	
Aug. 11 - Aug. 20	339	170	109		61
Aug. 21 - Aug. 31	670	335	119		216
Sep. 1 - Sep. 10	49	24	36	12	
Sep. 11 - Sep. 20	76	38	204	166	
Sep. 21 - Sep. 30	20	10	244	234	
Oct. 1 - Oct. 10	34	17	33	16	
Oct. 11 - Oct. 20	18	9	16	7	
Oct. 21 - Oct. 31	54	27	34	7	

St. Mary River during 1966 (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	11,502	8,250	8,425	175	
Apr. 16 - Apr. 30	12,052	8,528	9,708	1,180	
May 1 - May 15	27,733	16,330	19,593	3,263	
May 16 - May 31	38,270	21,801	24,700	2,899	
June 1 - June 15	60,825	32,913	43,170	10,257	
June 16 - June 30	40,626	22,813	23,120	307	
July 1 - July 15	33,671	19,335	22,490	3,155	
July 16 - July 31	21,084	13,210	14,476	1,266	
Aug. 1 - Aug. 15	11,213	8,065	8,306	241	
Aug. 16 - Aug. 31	9,333	6,982	7,146	164	
Sep. 1 - Sep. 15	7,163	5,371	5,179		192
Sep. 16 - Sep. 30	6,391	4,793	5,539	746	
Oct. 1 - Oct. 15	6,104	4,576	5,568	992	
Oct. 16 - Oct. 31	5,072	3,804	3,772		32

WATER SUPPLY

St. Mary River

The total natural flow of the St. Mary River at the International Boundary for the year November 1, 1965 to October 31, 1966 was 648,300 acre-feet. The natural flow during the irrigation season, April 1 to October 31, was 577,300 acre-feet, or 98 per cent of 589,400 acre-feet, the average of the previous 63 years of record. Four hundred and sixty thousand seven hundred acre-feet were delivered to Canada during the year, with 399,100 being delivered during the irrigation season. During the irrigation season the Canadian and United States shares respectively were 350,600 acre-feet and 226,600 acre-feet.

The forty-fifth annual international survey of snow conditions in the St. Mary River drainage basin was conducted on May 3 and 4, 1966. 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 1966 Runoff		Measured Runoff	
		Acre-Feet	% of Average	Acre-feet	% of Average
Swiftcurrent Creek at Many Glacier	1923-65	73,800 (May to July)	(1923-65) 107	64,940 (May to July)	(1923-65) 94
Natural Flow Swiftcurrent Creek at Sherburne	1922-65	125,000 (May to Sept.)	(1922-65) 109	111,500 (May to Sept.)	(1922-65) 97
Natural Flow St. Mary River at International Boundary	1922-65	553,000 (May to Sept.)	(1922-65) 109	508,400 (May to Sept.)	(1922-65) 100

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, 1966 was 119,000 acre-feet or 104 per cent of 114,000 acre-feet, the average of estimated natural flows of the previous 54 years of record. The United States and Canadian shares were 80,000 acre-feet and 39,000 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, 1966 was 118,300 acre-feet or 86 per cent of 137,300 acre-feet, the average of the previous 39 years. The quantities delivered to the United States by the various tributaries are listed on page 2 of Table 3.

During the season, water was diverted from the eastern tributaries or stored in reservoirs in Canada as listed in Tables 8, 9 and 10 of Appendix A. Measured diversions in Montana were 14,870 acre-feet as listed on page 1 of Table 3.

The fourteenth annual snow survey in the basins of the eastern tributaries of Milk River was conducted by the Water Resources Branch, Canada during the period February 28 to March 3, 1966. The tabulated results of the forecasts and measured discharge or computed natural flow are shown below.

Location	Period of Correlation	Forecast of 1966 Runoff		Measured Runoff	
		Acre-feet	% of Average	Acre-feet	% of Average
Lodge Creek at Alberta Boundary	1953-64	9,400 (Mar. to Apr.)	(1951-65) 62	15,460 (Mar. to Apr.)	(1951-65) 102
Battle Creek Above Cypress Lake West Inflow Canal	1953-64	6,220 (Mar. to Apr.)	(1939-65) 68	14,540 (Mar. to Apr.)	(1939-65) 159
Natural Flow Frenchman River at International Boundary	1953-64	45,090 (Mar. to May)	(1940-65) 71	63,540 (Mar. to May)	(1940-65) 100

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, 1965 to March 31, 1966, 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 5,300 acre-feet on October 31, 1965 and had increased to 15,170 acre-feet by March 31, 1966 and to 66,570 acre-feet by July 11, 1966. On October 31, 1966 the storage was 6,050 acre-feet.

The St. Mary Canal was operated between May 2 and September 29 and water was delivered to the North Milk River from May 3 to October 1.

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 185,300 acre-feet which

passed the gauging station on the St. Mary Canal at St. Mary Crossing near Babb between May 2 and September 29 was considered to be the quantity diverted from the St. Mary River by the United States. A total of 181,000 acre-feet was delivered to the North Milk River at Hudson Bay Divide during the season, from where it was conveyed to irrigation projects in Montana via the Milk River.

Canada diverted 186,000 acre-feet of water from the St. Mary River Reservoir in 1966 as measured at the Canadian St. Mary Canal and Magrath Irrigation District Canal gauging stations near Spring Coulee as listed on page 2 of Table 2.

Milk River

No division of the flow of Milk River at Eastern Crossing was made in 1966. 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.

Records were continued to be collected jointly 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 1966 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. Any shortage in the share received by the downstream country in any ten-day period is adjusted, if possible, by the upstream country in the succeeding ten-day period.

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 recieve 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 1966 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, 1966 was 35,860 acre-feet, of which each country was entitled to 50 per cent (17,930). The details of this division are summarized on page 3, and shown in Table 8 of Appendix A.

A total of 24,470 acre-feet was recorded at the International Boundary, which is 136 per cent of the United States share.

A new recording station was established on Squaw Coulee to help in determining the return flow from the Spangler irrigation project.

Battle Creek: The computed natural flow of Battle Creek at the International Boundary for the period March 1 to October 31, 1966 was 37,180 acre-feet, of which each country was entitled to fifty per cent (18,590). The details of this division are summarized on page 3, and shown in Table 9 of Appendix A.

A total of 20,150 acre-feet was recorded at the International Boundary, which is 108 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, 1966 was 73,930 acre-feet, of which each country was entitled to 50 per cent (36,965). The details of this division are summarized on page 3, and shown in Table 10 of Appendix A.

A total of 53,890 acre-feet was recorded at the International Boundary, which is 146 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 result of discharge measurements, summary of monthly discharge and the daily gauge height and discharge data for 67 gauging stations operated during 1966 in the St. Mary and Milk River drainage basins. Details of the Canadian minor diversions are also included.

Table 2
Page 1

Summary of Division of St. Mary River
and Diversion to Milk River
1966
Quantities in acre-feet

Month	St. Mary River at Int. Boundary				Excess Received by Canada	Storage Lake Sherburne	Total Available for Diversion	St. Mary Canal at St. Mary Crossing	Milk River at Eastern Crossing *
	Recorded Flow	Natural Flow	United States Share	Canadian Share					
April	35,966	46,719	13,440	33,279	+ 2,688	+10,752	2,688	0	23,800
May	87,854	130,915	55,283	75,632	+12,222	+ 6,667	48,616	36,395	39,660
June	131,484	201,225	90,694	110,531	+20,953	+29,772	60,922	39,969	65,470
July	73,321	108,605	44,053	64,552	+ 8,769	- 860r	44,913	36,145	45,150
Aug.	30,649	40,752	10,907	29,845	+ 803	-32,467r	43,374	42,571	43,150
Sept.	21,259	26,884	6,724	20,160	+ 1,099	-24,593r	31,317	30,218	36,660
Oct.	18,526	22,167	5,546	16,621	+ 1,904	+ 3,642	1,904	0	7,040
Total Irrig. Season	399,059	577,267	226,647	350,620	48,438	- 7,087r	233,734	185,298	260,930
For Year Nov. to Oct.	460,699	648,349	262,188	386,161					

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, 1965 = 5,300 acre-feet
March 31, 1966 = 15,170 acre-feet
October 31, 1966 = 6,050 acre-feet

Storage in Fresno Reservoir on October 31, 1965 = 96,300 acre-feet
March 31, 1966 =119,900 acre-feet
October 31, 1966 = 85,920 acre-feet

Table 2
Page 2

DIVISION OF FLOW OF ST. MARY RIVER
1966

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 Available at Spring Coulee
April	35,966	844	6,970	43,780
May	87,854	527	8,870	97,251
June	131,484	2,760	19,520	153,764
July	73,321	798	4,790	78,909
August	30,649	401	1,880	32,930
September	21,259	285	1,060	22,604
October	18,526	319	1,670	20,515
Total	399,059	5,934	44,760	449,753

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	33,279	6	3	9
May	75,632	12,460	620	13,080
June	110,531	40,000	610	40,610
July	64,552	35,230	1,640	36,870
August	29,845	42,220	1,950	44,170
September	20,160	18,760	872	19,632
October	16,621	31,570	185	31,755
Total	350,620	180,246	5,880	186,126

Storage in St. Mary Reservoir October 31, 1965 = 252,700 acre-feet
March 31, 1966 = 268,300 acre-feet
October 31, 1966 = 223,300 acre-feet

Table 2
Page 3

MAJOR DIVERSIONS FROM MILK RIVER
IN THE UNITED STATES

1966

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	595	198	238	0	0	615	15,470	984	0
May	17,340	6,740	5,200	873	5,470	5,250	13,880	8,200	1,750
June	16,580	6,140	5,120	1,230	7,140	5,670	19,340	12,080	2,000
July	14,650	5,360	2,980	516	7,380	5,310	20,230	7,420	1,790
Aug.	19,570	7,730	5,590	1,270	6,680	4,900	21,520	12,150	836
Sept.	14,880	4,560	1,670	0	4,170	1,880	14,330	11,170	0
Oct.	10,150	1,700	1,230	0	893	476	14,130	11,790	619
Nov.	2,880	0	0	0	0	0	1,980	0	0
Total	96,645	32,428	22,028	3,889	31,733	24,101	120,880	63,794	6,995

Total of Major Diversions from Milk River

in the United States = 402,500

Storage in Nelson Reservoir	on October 31, 1965	58,010
	on March 31, 1966	47,870
	on October 31, 1966	54,270

Table 3
Page 1

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

1966

Quantities in acre-feet

Month	Lodge Creek Basin North Chinook Canal	Battle Creek Basin Matheson Canal	Frenchman River Basin Frenchman Canal
March	2,390		--
April	2,370		--
May	578		947
June	404		2,540
July	27		1,770
Aug.	0		1,590
Sept.	0		870
Oct.	0		340
Total	5,769	1,040[a]	8,057[b]

Total of Measured Diversions from the Eastern Tributaries of Milk River in the United States = 14,870 acre-feet

a Estimated gravity and pumping diversion from Battle Creek to land under Matheson Canal.

b No records for March and April. Some natural runoff in the Canal during these months. Total for May to October representative of irrigation usage.

Table 3
Page 2

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

1966

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	15,010	7,100	958	1,970	740	4,180	22,290	6,720	2,530
April	8,010	6,350	61	51	235	67	20,750	706	82
May	704	1,780	7	0	2	60	5,270	767	20
June	414	1,860	4	0	0	6	1,940	260	0
July	158	902	1	0	0	4	1,330	273	0
Aug.	9	901	0	0	0	0	1,200	36	0
Sept.	82	455	0	0	0	1	961	9	0
Oct.	84	782	0	0	0	1	165	59	0
Totals	24,471	20,130	1,031	2,021	977	4,319	53,906	8,830	2,632

Total measured run-off of Eastern Tributaries of Milk River
at International Boundary from March to October = 118,317

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

- 1966 -

Map Index	Stream and Location	Remarks
	St. Mary River Basin	
5AE-27	St. Mary River at International Boundary	Int.[a]
5AE-0.5	Swiftcurrent Creek at Many Glacier, Montana	Int.[a]
5AE-0.9	Lake Sherburne at Sherburne, Montana	Int. R[a]
5AE-0.6	Swiftcurrent Creek at Sherburne, Montana	Int.[a]
5AE-0.2	St. Mary Canal at St. Mary Crossing, near Babb, Montana	Int.[a]
5AE-0.3	St. Mary Canal at Hudson Bay Divide, near Browning, Mont.	Int.[a]
	Milk River Basin	
11AA-25	Milk River at Western Crossing of International Boundary	Int.[a]
11AA-5	Milk River at Milk River	Int.[a]
11AA-0.2	Milk River at Eastern Crossing of International Boundary	Int.[a]
11AA-0.4	South Fork Milk River near Babb, Montana	Int.[a]
11AA-0.3	North Fork Milk River above St. Mary Canal, near Browning, Montana	Int.[a]
11AA-1	North Milk River near International Boundary	Int.[a]
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11AB-82	Lodge Creek at Alberta Boundary	Int.[a]
11AB-89	Altawan Reservoir near Govenlock	Int. R[a]
11AB-88	Lodge Creek below Spangler Project	Int.[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]

Map Index	Stream and Location	Remarks
11AB-80	Middle Creek Reservoir	Int. R[a]
11AB-87	Middle Creek near Battle Creek	Int. [a]
11AB-8	Middle Creek above Lodge Creek	Int. [a]
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11AB-76	Battle Creek above Cypress Lake West Inflow Canal	Int. [a]
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-0.1	Woodpile Coulee near International Boundary	Int. [a]
11AB-0.3	East Fork Battle Creek near International Boundary	Int. [a]
11AB-75	Lyons Creek at International Boundary	Int. [a]
	Whitewater Creek Tributary Basin	
11AD-0.1	Whitewater Creek near International Boundary	Int. [a]
	Frenchman River Tributary Basin	
11AC-18	Frenchman River above Eastend Reservoir	Int. [a]
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]

Map Index	Stream and Location	Remarks
11AC-51	Frenchman River below Val Marie	Int.[a]
11AC-41	Frenchman River at International Boundary	Int.[a]
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]
	Rock Creek Tributary Basin	
11AE-0.6	Rock Creek below Horse Creek near International Boundary	Int.[a]
11AE-0.4	McEachern Creek at International Boundary	Int.[a]

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

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Map Index	Stream and Location	Remarks
	St. Mary River Basin	
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-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]
	Milk River Basin	
	Southern Tributaries	
11AA-29	Miners Coulee near International Boundary	Canada [c]
11AA-28	Bear Creek near International Boundary	Canada [c]
	Lodge Creek Tributary Basin	
11AB-91	Michele Reservoir near Elkwater	Canada R[a]
11AB-92	Greasewood Reservoir near Elkwater	Canada R[a]
11AB-93	Yeast Reservoir near Elkwater	Canada R[a]
11AB-94	Bare Creek Reservoir near Elkwater	Canada R[a]
11AB-97	Cressday Reservoir near Cressday	Canada R[a]
11AB-98	Jaydot Reservoir near Jaydot	Canada R[a]

Map Index	Stream and Location	Remarks
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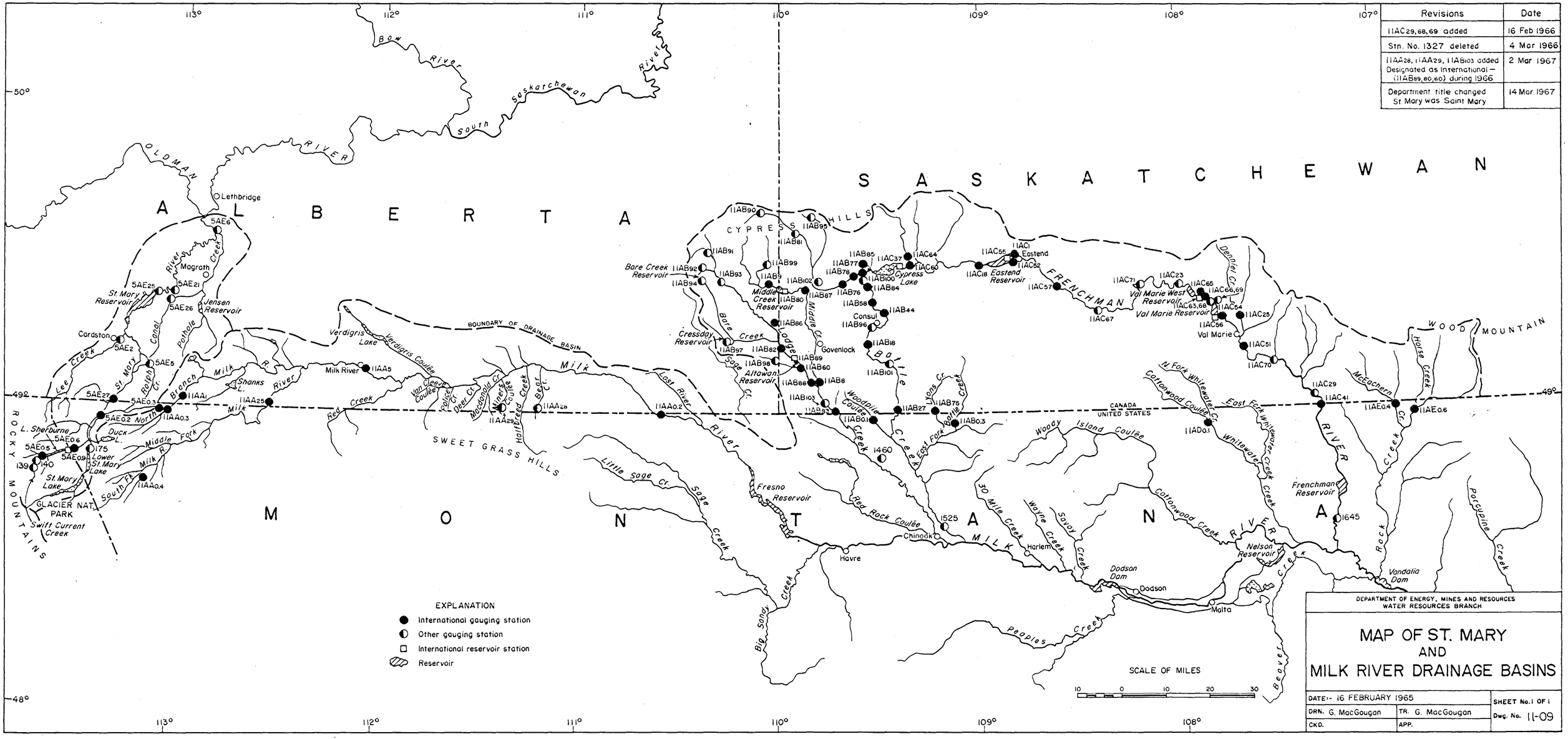
11AB-103	Squaw Coulee near Willow Creek	Canada [c]
1460	North Chinook Canal near Havre, Montana	U.S.A. [b]
	Battle Creek Tributary Basin	
11AB-81	Battle Creek at Ranger Station	Canada [c]
11AB-100	Battle Creek above Cypress Lake West Outflow Canal	Canada [c]
11AB-96	Battle Creek near Consul	Canada [c]
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]
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 Water Resources Branch, Canada.
a	-	Monthly and daily discharge data and stream measurements contained in Appendix B.
b	-	Monthly discharge data only tabulated in this report.
c	-	Data not included in this report or appendices.



Revisions	Date
11AC29, 68, 69 added	16 Feb 1966
Stn. No. 1327 deleted	4 Mar 1966
11AA28, 11AA29, 11AB103 added Designated as International – (11AB89, 80, 60) during 1966	2 Mar 1967
Department title changed St Mary was Saint Mary	14 Mar 1967

DEPARTMENT OF ENERGY, MINES AND RESOURCES
WATER RESOURCES 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
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Report to the International Joint Commission on the division and use of the waters of the St. Mary and Milk Rivers...