

Report to
THE INTERNATIONAL JOINT COMMISSION

on

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

1983

by

Philip Cohen

representing the United States

and

D.A. Davis

representing Canada

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March 1984

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

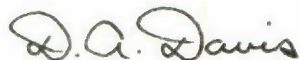
Gentlemen:

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, 1983.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Philip Cohen". The signature is fluid and cursive, with the first name "Philip" being more prominent than the last name "Cohen".

Philip Cohen
Accredited Officer of the United States

A handwritten signature in dark ink, appearing to read "D.A. Davis". The signature is written in a cursive style, with the initials "D.A." and the name "Davis" clearly visible.

D.A. Davis
Accredited Officer of Her Majesty

SYNOPSIS

During the 1983 irrigation season the natural flow of the St. Mary and Milk Rivers was 71 percent and 32 percent, respectively, of the long-term average.

The natural flow of the St. Mary River at the International Boundary during the irrigation season, April 1 to October 31, 1983, was 518 000 cubic decametres (dam³) (420,000 acre-feet). Under the terms of the Treaty, the Canadian share was 324 000 dam³ (263,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was slightly less than 100 percent of the Canadian allotment. The remainder of this allotment was delivered by way of the St. Mary Canal to Canadian water users along the Milk River.

The computed natural flow of the Milk River at the Eastern Crossing of the International Boundary from March 1 to October 31, 1983, was 46 600 dam³ (37,800 acre-feet) with no adjustments applied for upstream use by Canada and the United States. Under the terms of the Treaty, the United States' allotment was 32 600 dam³ (26,400 acre-feet). An accurate determination of natural flow and apportionment of the flow of the Milk River historically has not been made, as it was assumed that United States and Canadian uses generally are less than their respective shares. However, increasing use in both countries has resulted in a joint study to derive methods for more accurately determining natural flow at the Eastern Crossing of the International Boundary. The report now being prepared will include a more comprehensive natural flow computation and water-division procedure.

The Field Representatives of the Accredited Officers authorized adjustments to the normal operating procedures to the mutual benefit of both countries. Refund of the April deficit delivery to Canada on the St. Mary River was delayed until after the snowmelt runoff had peaked to allow a complete first irrigation on the lower Milk River in the United States. In exchange, the United States again transferred a portion of the Canadian share of the St. Mary River to the Milk River using the United States St. Mary Canal. This transfer was used to offset Canadian withdrawals along the Milk River at times of zero or low natural flows.

The natural flow of the three eastern tributaries of the Milk River that are apportioned, Lodge Creek, Battle Creek, and Frenchman River, was 13 percent, 57 percent, and 51 percent, respectively, of the long-term averages. The combined natural flow of these tributaries was 67 500 dam³ (54,700 acre-feet), of which the United States received 35 100 dam³ (28,500 acre-feet). All deficits that occurred within individual apportionment periods were refunded by the end of the irrigation season.

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INTRODUCTION

Article VI of the Boundary Waters Treaty of 1909 between Great Britain and the United States governs the apportionment of the waters of the St. Mary and Milk Rivers. The terms of the Treaty were further clarified by the 1921 Order of the International Joint Commission. Copies of Article VI and the 1921 Order are contained in Annex A of this report. To comply with this Treaty, Field Representatives of the United States and Canada collected and compiled hydro-metric data at 38 international gauging stations on a cooperative basis. An additional 37 gauging stations were operated independently by Canada or the United States to obtain data on diversions, reservoir contents, return flows, and index runoff. Most of this additional information is used to improve the accuracy of natural-flow computations.

This report summarizes the natural-flow computations of 1983, mentions apportionment of the natural flow, and explains unusual occurrences of the year as well as procedural modifications designed to increase the accuracy of the natural-flow computations. Summary natural-flow tables are included. Detailed natural-flow computations are included in Appendix A; daily discharge and other related data are included in Appendix B. Appendices A and B are submitted with this report under separate cover.

In accordance with the SI conversion schedule established by the International Joint Commission, this report uses SI units first, followed by inch-pound units in parentheses. Data in tables are shown in SI units first, followed by the respective inch-pound units, for example Tables 1 and 1A.

The format for Appendices A and B of the report is SI units only. All Canadian data are published in SI units. United States data computed in inch-pound

units were converted to SI units using the appropriate conversions. A summary of the conversion factors is contained in Annex B.

Mr. Philip Cohen, Chief Hydrologist, United States Geological Survey, as Accredited Officer of the United States, was represented in the field by Mr. G. M. Pike, District Chief, United States Geological Survey, Helena, Montana. Mr. D. A. Davis, Regional Director, Western and Northern Region, Inland Waters Directorate, as Accredited Officer of Her Majesty, was represented in the field by Mr. G. H. Morton, Regional Chief, Water Resources Branch, Calgary, Alberta and Mr. J. G. Way, Acting Regional Chief, Water Resources Branch, Regina, Saskatchewan. This report was prepared jointly by personnel of the United States Geological Survey and the Water Survey of Canada under the supervision of Messrs. Pike, Morton, and Way.

The annual conference of Field Representatives was held in Regina, Saskatchewan, on February 1, 1984. Streamflow records collected jointly by the United States and Canada were reviewed and approved. Mutual problems and changes in computational procedures were discussed and a schedule of field operations for 1984 adopted.

ST. MARY RIVER

During the irrigation season, April 1 to October 31, Canada's share of the natural flow of the St. Mary River at the International Boundary, as stipulated by the 1921 Order, is three-fourths of the natural flow when that flow is 666 cubic feet per second (18.86 cubic metres per second) or less. Flows in excess of that quantity are divided equally between Canada and the United States. During the non-irrigation season, November 1 to March 31, the flow is divided equally between the two countries.

To comply with the above order, representatives of both countries make twice-monthly computations of the daily natural flow of the St. Mary River during the irrigation season. If use by the United States is in excess of its share, then at the earliest opportunity, a delivery of an equivalent quantity of water is made to Canada. Regular interim reports of these computations are sent to all agencies involved in the water use and management of the flow of the St. Mary River. The interim reports keep these agencies informed as to the quantity of water available.

Tentative computations and interim reports are not made during the non-irrigation season when use by the United States is limited to storage in Lake Sherburne. The flow into Lake Sherburne is considerably less than 50 percent of the natural flow. Occasionally, diversion into the St. Mary Canal extends beyond the irrigation season, necessitating additional tentative computations.

Lake Sherburne, the only storage reservoir within the St. Mary River basin in the United States, is used to store a portion of the United States' share of flows for diversion to the Milk River. This water, which passes through Canada, is used by the United States for irrigation in the eastern Milk River valley.

Storage in Lake Sherburne was 31 900 dam³ (25,900 acre-feet) on October 31, 1982, and had decreased to 24 200 dam³ (19,600 acre-feet) just prior to the irrigation season on March 31, 1983. Maximum storage was 50 600 dam³ (41,000 acre-feet) on June 25 and storage decreased to 20 000 dam³ (16,200 acre-feet) by the end of the irrigation season on October 31, 1983.

Water was diverted from the St. Mary River into the St. Mary Canal leading to the Milk River from March 10 to September 2, 1983. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 05AE029) was 220 000 dam³ (178,000 acre-feet). Any 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.

Construction on the Lake Sherburne outlet structure continued this year as part of a dam safety upgrading program by the U.S. Bureau of Reclamation. However, operation of the dam for irrigation purposes was normal.

The total natural flow of the St. Mary River at the International Boundary from November 1, 1982, to October 31, 1983, was 558 000 dam³ (452,000 acre-feet), of which 518 000 dam³ (420,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 1983. For the irrigation season, Canada's and the United States' shares were 324 000 dam³ (263,000 acre-feet) and 194 000 dam³ (157,000 acre-feet), respectively. A total discharge of 323 000 dam³ (262,000 acre-feet) was recorded at the International Boundary, which was slightly less than 100 percent of the Canadian share. The computed natural flow during the irrigation season was 71 percent of the average of the previous 81 years of record.

Deficit deliveries were recorded in 7 of the 14 division periods during the 1983 irrigation season. The large deficit which accumulated in April resulted in a request by the United States for a delay in refunding this deficit until after the mountain snowpack runoff peaked. This delay would allow the irrigators on the lower Milk River in the United States to obtain a complete first irrigation. Canada granted this request provided that it be notified prior to the refund and that it have the option of taking all or part of the delivery from the Milk River rather than the St. Mary River. Canada chose to take 2 270 dam³ (1,840 acre-feet) of the refund from the Milk River during July and August to permit the Canadian users to continue irrigating during late summer. During this period the Canadian share of the Milk River natural flow was often less than the demand by water users along the Milk River in Canada. This

volume of water offset the apparent shortages on the St. Mary River in July, August, and the 1983 irrigation season. The mutual cooperation of both countries during this water-short year allowed irrigators on both sides of the International Boundary to make the best use of available water supplies and avoid significant financial losses.

The division of the St. Mary River natural flow is summarized in Tables 1 and 1A, which follow. The detailed computation of the natural flow is given in Table 5 and the historical summary in Table 6 of Appendix A.

TABLE 1
SUMMARY OF DIVISION OF ST. MARY RIVER AND DIVERSION TO MILK RIVER
1983
 QUANTITIES IN CUBIC DECAMETRES

MONTH	ST. MARY RIVER AT INTERNATIONAL BOUNDARY				EXCESS REC'D BY CANADA	CHANGE IN STORAGE - LAKE SHERBURNE	TOTAL AVAILABLE FOR DIVERSION	ST. MARY CANAL AT ST. MARY CROSSING	MILK RIVER AT EASTERN CROSSING
	RECORDED FLOW	NATURAL FLOW	U.S. SHARE	CANADA'S SHARE					
APR.	12 416	26 915	7 262	19 654	-7 237	-14 406	21 667	28 904	36 648
MAY	74 452	113 750	44 227	69 523	4 930	16 429	27 798	22 868	28 483
JUN.	94 199	164 027	69 777	94 250	- 51	22 968	46 809	46 860	44 991
JUL.	74 235	119 908	47 310	72 598	1 637	- 6 748	54 058	52 421	51 760
AUG.	36 687	52 406	14 981	37 426	- 739	-33 076	48 056	48 795	45 893
SEP.	20 894	27 157	6 784	20 373	521	6 151	634	113	10 136
OCT.	10 440	13 747	3 435	10 312	127	3 308	127	0	1 299
TOTAL IRRIGATION SEASON	323 323	517 910	193 776	324 136	- 812	- 5 374	199 149	199 961	219 210

QUANTITIES FOR ST. MARY RIVER DIVISION PERIODS, IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR. 1 TO APR. 15	6 804	5 099	4 888		210
APR. 16 TO APR. 30	20 111	14 555	7 528		7 027
MAY 1 TO MAY 15	31 069	21 652	22 934	1 282	
MAY 16 TO MAY 31	82 680	47 870	51 518	3 648	
JUN. 1 TO JUN. 15	98 566	55 403	55 367		37
JUN. 16 TO JUN. 30	65 461	38 847	38 832		15
JUL. 1 TO JUL. 15	61 221	36 728	38 527	1 798	
JUL. 16 TO JUL. 31	58 687	35 870	35 708		161
AUG. 1 TO AUG. 15	31 872	22 056	22 103	46	
AUG. 16 TO AUG. 31	20 534	15 370	14 584		785
SEP. 1 TO SEP. 15	16 573	12 434	12 845	411	
SEP. 16 TO SEP. 30	10 584	7 939	8 049	110	
OCT. 1 TO OCT. 15	7 621	5 718	5 659		59
OCT. 16 TO OCT. 31	6 126	4 595	4 781	186	

¹This is a summary of data from Table 5, Appendix A.

TABLE 1A
SUMMARY OF DIVISION OF ST. MARY RIVER AND DIVERSION TO MILK RIVER¹
1983

QUANTITIES IN ACRE-FEET

MONTH	ST. MARY RIVER AT INTERNATIONAL BOUNDARY				EXCESS REC'D BY CANADA	CHANGE IN STORAGE- LAKE SHERBURNE	TOTAL AVAILABLE FOR DIVERSION	ST. MARY CANAL AT ST. MARY CROSSING	MILK RIVER AT EASTERN CROSSING
	RECORDED FLOW	NATURAL FLOW	U.S. SHARE	CANADA'S SHARE					
APR.	10,066	21,820	5,887	15,933	-5,867	-11,679	17,566	23,433	29,711
MAY	60,360	92,219	35,856	56,363	3,997	13,319	22,537	18,540	23,092
JUN.	76,369	132,980	56,569	76,410	-42	18,621	37,948	37,990	36,475
JUL.	60,183	97,211	38,355	58,856	1,327	- 5,471	43,825	42,498	41,963
AUG.	29,743	42,487	12,145	30,342	-599	-26,815	38,960	39,559	37,206
SEP.	16,939	22,017	5,500	16,517	422	4,986	513	91	8,218
OCT.	8,464	11,145	2,785	8,360	103	2,682	103	0	1,053
TOTAL IRRIGATION SEASON	262,124	419,879	157,097	262,781	-659	-4,357	161,452	162,111	177,718

QUANTITIES FOR ST. MARY RIVER DIVISION PERIODS , IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
APR. 1 TO APR. 15	5,516	4,134	3,963		171
APR. 16 TO APR. 30	16,304	11,800	6,103		5,697
MAY 1 TO MAY 15	25,188	17,554	18,593	1,039	
MAY 16 TO MAY 31	67,030	38,809	41,767	2,957	
JUN. 1 TO JUN. 15	79,909	44,916	44,887		30
JUN. 16 TO JUN. 30	53,071	31,494	31,482		12
JUL. 1 TO JUL. 15	49,633	29,776	31,234	1,458	
JUL. 16 TO JUL. 31	47,578	29,080	28,949		131
AUG. 1 TO AUG. 15	25,839	17,881	17,919	38	
AUG. 16 TO AUG. 31	16,648	12,460	11,824		637
SEP. 1 TO SEP. 15	13,436	10,080	10,413	333	
SEP. 16 TO SEP. 30	8,581	6,436	6,526	89	
OCT. 1 TO OCT. 15	6,179	4,635	4,588		48
OCT. 16 TO OCT. 31	4,967	3,725	3,876	151	

¹This table was prepared from computed data and may not agree with exact conversions from table 1.

MILK RIVER

During the irrigation season, April 1 to October 31, the United States' share of the natural flow of the Milk River at the Eastern Crossing of the International Boundary, as stipulated by the 1921 Order, is three-fourths of the natural flow when that flow is 666 cubic feet per second (18.86 cubic metres per second) or less. Flows in excess of that quantity are divided equally between the United States and Canada. During the non-irrigation season, November 1 to March 31, the flow is divided equally between the two countries.

To comply with the above order, representatives of both countries make monthly computations of the natural flow of the Milk River during the irrigation season. This computation includes adjustment for the water diverted from the St. Mary River basin and evapotranspiration losses but does not include a computation of water used or stored by Canada or the United States within the Milk River basin itself. Historically, Canada's and the United States' uses have been assumed to be less than their respective shares and no formal apportionment has been made. However, several consecutive dry years and the increasing use of sprinkler-irrigation systems have resulted in increased use by Canadian and United States irrigators. To evaluate the significance of the increased use, a natural-flow study is being conducted by Canada and the United States. A more comprehensive natural-flow computation and water-division procedure will be proposed as part of the final report now being prepared. Ground water and evapotranspiration studies within the basin will continue in 1984.

The natural flow of the Milk River at Eastern Crossing of the International Boundary from March 1 to October 31, 1983, was 46 600 dam³ (37,800 acre-feet).

This is 32 percent of the average natural flow of the previous 71 years of record. The respective shares of the United States and Canada were 32 600 dam³ (26,400 acre-feet) and 13 900 dam³ (11,300 acre-feet) from March 1 to October 31, 1983. The computations for determining the natural flow of the Milk River at its eastern crossing are given in Table 7 in Appendix A.

The total flow recorded at the gauging station on the Milk River at Eastern Crossing of the International Boundary (station 11AA031) from March 1 to October 31, 1983, was 240 000 dam³ (195,000 acre-feet). The recorded flow is composed of the unused natural flow of the Milk River, plus diverted St. Mary River water, which is used by downstream Milk River users in the United States.

EASTERN TRIBUTARIES OF THE MILK RIVER

The waters of the eastern tributaries of the Milk River are divided 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." This order might well be interpreted as requiring that the division of water be made on a continuing basis. However, the physical limitation due to transit time in the flow system was recognized. Further analyses showed that the minimum practical time frame for compilation of the natural flows at the International Boundary was every 10 days.

Prior to 1937, Canadian use along the eastern tributaries consisted of domestic irrigation and the Canadian share of the natural flow was not fully used.

The construction of Eastend Reservoir (station 11AC055), Huff Lake (station 11AC063), and Newton Lake (station 11AC056) by the Government of Canada on the Frenchman River during the late 1930's made an operational division of flow on this tributary necessary by 1937.

The redevelopment of several private irrigation projects and the construction of the Vidora Irrigation Project during the early 1950's resulted in increased use of Battle Creek water in Canada and made an operational division of flow on this tributary necessary by 1957.

Construction of Altawan Reservoir (station 11AB089) and Spangler Irrigation Project on Lodge Creek in 1960 made an operational division of flow on this tributary necessary by 1961.

During the runoff season, March 1 to October 31, 10-day computations of the natural flows of Lodge Creek, Battle Creek, and Frenchman River are made to determine each country's share. If use by Canada is in excess of its share, then at the earliest opportunity a delivery of an equivalent quantity of water is made to the United States. During some years the United States may request that delivery of deficit water on Battle Creek be delayed to allow more efficient use by United States irrigators. Canada may honor this request if no regulation problems are anticipated by delaying the delivery of water to refund the deficit. 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 are distributed to interested agencies throughout the irrigation season. No division of flow is made during the winter, as flow and use generally are small and streamflow records are impractical to obtain.

Lyons Creek is monitored but does not have sufficient use in Canada at this time to warrant an operational division of flow. A flow of 74 dam³ (60 acre-feet) was recorded on this tributary from March 1 to October 31, 1983. During 1983 no changes were made to the network of hydrometric stations in the eastern tributaries. However, dredging work on Nashlyn Canal in the fall of 1983 necessitated the lowering of the sheet pile weir at the station Nashlyn Canal near Consul (11AB018).

Estimates of unmeasured diversions to private irrigation projects in the Lodge Creek, Battle Creek, and Frenchman River basins in Saskatchewan were provided by Saskatchewan Environment, and for the Lodge Creek basin in Alberta by Alberta Environment. These estimates are based on reports received from the operators of individual projects and by onsite inspections. An additional adjustment is made for domestic projects in the Battle Creek and Frenchman River basins based on the results of studies conducted by Canada on domestic use.

For the interim reports prepared at the end of apportionment periods, an estimate of minor diversion use is made based on a correlation between annual natural flows and reported use for previous years. The total natural flow for the current year is derived from computed natural flow to date plus an estimate of runoff volume for the rest of the year dependent on runoff conditions. At the end of the year, the actual flow is known and a final estimate of minor diversions is made based on reported use; consequently, some discrepancy exists between interim and final division computations. Lists of reported and estimated diversions for 1983 are contained in Appendix B.

The combined usable storage of the six major Canadian reservoirs listed in table 15, Appendix A, decreased from 35 100 dam³ (28,500 acre-feet) or 25 percent, to 24 700 dam³ (20,000 acre-feet) or 18 percent, of the total usable storage from March 1 to October 31, 1983.

LODGE CREEK

The computed natural flow of Lodge Creek below McRae Creek at the International Boundary (station 11AB083) from March 1 to October 31, 1983, was 4 660 dam³ (3,780 acre-feet) or 13 percent of the average natural flow of the previous 33 years of record. Each country is entitled to 50 percent of the natural flow. A total flow of 2 480 dam³ (2,010 acre-feet) was recorded at the International Boundary.

Deficit deliveries were recorded in 8 of the 24 division periods during the season. A cumulative deficit lasted nearly the entire season, but was refunded by the end of the irrigation season with a release from Altawan Reservoir.

A return flow of 42 dam³ (34 acre-feet) was recorded at Squaw Coulee near Willow Creek (station 11AB103) from the 3 170 dam³ (2,570 acre-feet) diverted from Lodge Creek by Spangler Ditch (station 11AB060).

The division of the Lodge Creek natural flow is summarized in Tables 2 and 2A, which follow. The detailed computation of the natural flow is given in Table 9 and the historical summary in Table 10 of Appendix A.

TABLE 2
SUMMARY OF LODGE CREEK DIVISION ¹
1983
QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 10	7	4	0		4
MAR. 11 - MAR. 20	1 007	504	0		504
MAR. 21 - MAR. 31	118	59	372	313	
APR. 1 - APR. 10	118	59	83	24	
APR. 11 - APR. 20	113	57	276	219	
APR. 21 - APR. 30	38	19	15		4
MAY 1 - MAY 10	129	65	6		59
MAY 11 - MAY 20	1 141	571	17		554
MAY 21 - MAY 31	1 027	514	19		495
JUN. 1 - JUN. 10	0	0	756	756	
JUN. 11 - JUN. 20	57	29	117	88	
JUN. 21 - JUN. 30	0	0	3	3	
JUL. 1 - JUL. 10	0	0	3	3	
JUL. 11 - JUL. 20	381	191	404	213	
JUL. 21 - JUL. 30	462	231	66		165
AUG. 1 - AUG. 10	38	19	3		16
AUG. 11 - AUG. 20	0	0	0	0	
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	314	314	
OCT. 1 - OCT. 10	21	11	21	10	
OCT. 11 - OCT. 20	1	1	1	0	
OCT. 21 - OCT. 31	1	1	1	0	

TOTAL 4 659 2 335 2 477

¹This is a summary of data from table 9, Appendix A.

TABLE 2A
SUMMARY OF LODGE CREEK DIVISION¹
1983
QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 10	6	3	0		3
MAR. 11 - MAR. 20	816	409	0		409
MAR. 21 - MAR. 31	96	48	302	254	
APR. 1 - APR. 10	96	48	67	19	
APR. 11 - APR. 20	92	46	224	178	
APR. 21 - APR. 30	31	15	12		3
MAY 1 - MAY 10	105	53	5		48
MAY 11 - MAY 20	925	463	14		449
MAY 21 - MAY 31	833	417	15		401
JUN. 1 - JUN. 10	0	0	613	613	
JUN. 11 - JUN. 20	46	23	95	71	
JUN. 21 - JUN. 30	0	0	2	2	
JUL. 1 - JUL. 10	0	0	2	2	
JUL. 11 - JUL. 20	309	155	328	173	
JUL. 21 - JUL. 30	375	187	54		134
AUG. 1 - AUG. 10	31	15	2		13
AUG. 11 - AUG. 20	0	0	0	0	
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	255	255	
OCT. 1 - OCT. 10	17	9	17	8	
OCT. 11 - OCT. 20	1	1	1	0	
OCT. 21 - OCT. 31	1	1	1	0	

TOTAL 3,780 1,893 2,009

¹All values are conversions of data from table 2. Totals and shares may not add or subtract correctly as a result of rounding.

BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 1983, was 18 600 dam³ (15,100 acre-feet) or 57 percent of the average natural flow the previous 43 years of record. Each country is entitled to 50 percent of the natural flow. A total flow of 9 660 dam³ (7,830 acre-feet) was recorded at the International Boundary.

Deficit deliveries were recorded in 8 of the 24 division periods during the season. These deficits were refunded during several division periods. A return flow of 35 percent of diversion, based on a 1972-76 study, was used for the Gaff Ditch diversion from Battle Creek. The recorded flow at Gaff Ditch near Merryflat from March 1 to October 31, 1983, was 2 080 dam³ (1,690 acre-feet) with the return flow computed at 35 percent, or 726 dam³ (589 acre-feet). During the irrigation period the return flow was computed to be 22 percent for Vidora, Richardson, and McKinnon Ditches and 23 percent for Nashlyn Canal.

A supplementary gauging station has been operated since 1981 on Shepherd Ditch, a private diversion on Battle Creek, located downstream from Gaff Ditch. A total diversion of 935 dam³ (758 acre-feet) was recorded at this station during 1983, and is included in the list of minor diversions for Battle Creek in Appendix B.

The division of the Battle Creek natural flow is summarized in Tables 3 and 3A, which follow. The detailed computation of the natural flow is given in Table 11 and the historical summary in Table 12 of Appendix A.

TABLE 3
SUMMARY OF BATTLE CREEK DIVISION¹
1983

QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 14	1 099	550	689	139	
MAR. 15 - MAR. 25	1 754	877	805		72
MAR. 26 - APR. 4	828	414	484	70	
APR. 5 - APR. 14	1 496	748	597		151
APR. 15 - APR. 24	973	487	232		255
APR. 25 - MAY 4	1 067	534	128		406
MAY 5 - MAY 14	977	489	796	307	
MAY 15 - MAY 25	3 264	1 632	538		1 094
MAY 26 - JUN. 4	1 558	779	666		113
JUN. 5 - JUN. 14	661	331	800	469	
JUN. 15 - JUN. 24	307	154	492	338	
JUN. 25 - JUL. 4	505	253	851	598	
JUL. 5 - JUL. 14	979	490	789	299	
JUL. 15 - JUL. 25	1 216	608	468		140
JUL. 26 - AUG. 4	627	314	275		39
AUG. 5 - AUG. 14	250	125	210	85	
AUG. 15 - AUG. 25	121	61	102	41	
AUG. 26 - SEP. 4	27	14	23	9	
SEP. 5 - SEP. 14	2	1	2	1	
SEP. 15 - SEP. 24	0	0	0	0	
SEP. 25 - OCT. 4	7	4	6	2	
OCT. 5 - OCT. 14	233	117	196	79	
OCT. 15 - OCT. 25	386	193	325	132	
OCT. 26 - OCT. 31	225	113	189	76	

TOTAL

18 562

9 288

9 663

¹This is a summary of data from table 11, Appendix A.

TABLE 3A
SUMMARY OF BATTLE CREEK DIVISION ¹
1983

QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 14	891	446	559	113	
MAR. 15 - MAR. 25	1,422	711	653		58
MAR. 26 - APR. 4	671	336	392	57	
APR. 5 - APR. 14	1,213	606	484		122
APR. 15 - APR. 24	789	395	188		207
APR. 25 - MAY 4	865	433	104		329
MAY 5 - MAY 14	792	396	645	249	
MAY 15 - MAY 25	2,646	1,323	436		887
MAY 26 - JUN. 4	1,263	632	540		92
JUN. 5 - JUN. 14	536	268	649	380	
JUN. 15 - JUN. 24	249	125	399	274	
JUN. 25 - JUL. 4	409	205	690	485	
JUL. 5 - JUL. 14	794	397	640	242	
JUL. 15 - JUL. 25	986	493	379		113
JUL. 26 - AUG. 4	508	255	223		32
AUG. 5 - AUG. 14	203	101	170	69	
AUG. 15 - AUG. 25	98	49	83	33	
AUG. 26 - SEP. 4	22	11	19	7	
SEP. 5 - SEP. 14	2	1	2	1	
SEP. 15 - SEP. 24	0	0	0	0	
SEP. 25 - OCT. 4	6	3	5	2	
OCT. 5 - OCT. 14	189	95	159	64	
OCT. 15 - OCT. 25	313	156	263	107	
OCT. 26 - OCT. 31	182	92	153	62	

TOTAL	15,048	7,530	7,834
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¹ All values are conversions of data from table 3. Totals and shares may not add or subtract correctly as a result of rounding.

FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 1983, was 44 200 dam³ (35,800 acre-feet) or 51 percent of the average natural flow of the previous 43 years of record. Each country is entitled to 50 percent of the natural flow. A total flow of 23 000 dam³ (18,600 acre-feet) was recorded at the International Boundary.

Deficit deliveries were recorded in 10 of the 24 division periods during the season. Early season deficits were advantageous to both countries, because Canada was attempting to fill its mainstem reservoirs and the lone United States reservoir was full. These deficits were refunded by early June. Late season deficits were the result of construction on the outlet of Newton Lake, the most downstream reservoir in Canada. The construction was completed in time to refund the cumulative deficit by October 31.

The division of the Frenchman River natural flow is summarized in Tables 4 and 4A, which follow. The detailed computation of the natural flow is given in Table 13 and the historical summary in Table 14 of Appendix A.

TABLE 4
SUMMARY OF FRENCHMAN RIVER DIVISION¹
1983
 QUANTITIES IN CUBIC DECAMETRES

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 10	2 646	1 323	1 502	179	
MAR. 11 - MAR. 20	3 518	1 759	1 214		545
MAR. 21 - MAR. 31	5 977	2 989	2 416		573
APR. 1 - APR. 10	9 393	4 697	3 401		1 296
APR. 11 - APR. 20	2 265	1 133	2 194	1 061	
APR. 21 - APR. 30	1 280	640	455		185
MAY 1 - MAY 10	1 079	540	217		323
MAY 11 - MAY 20	4 839	2 420	3 782	1 362	
MAY 21 - MAY 31	4 949	2 475	2 530	55	
JUN. 1 - JUN. 10	1 142	571	1 116	545	
JUN. 11 - JUN. 20	857	429	727	298	
JUN. 21 - JUN. 30	376	188	214	26	
JUL. 1 - JUL. 10	608	304	201		103
JUL. 11 - JUL. 20	2 477	1 239	624		615
JUL. 21 - JUL. 31	877	439	709	270	
AUG. 1 - AUG. 10	805	403	793	390	
AUG. 11 - AUG. 20	363	182	260	78	
AUG. 21 - AUG. 31	29	15	26	11	
SEP. 1 - SEP. 10	0	0	6	6	
SEP. 11 - SEP. 20	0	0	0	0	
SEP. 21 - SEP. 30	64	32	0		32
OCT. 1 - OCT. 10	352	176	0		176
OCT. 11 - OCT. 20	336	168	0		168
OCT. 21 - OCT. 31	0	0	607	607	

TOTAL 44 232 22 122 22 994

¹This is a summary of data from table 13, Appendix A.

TABLE 4A
SUMMARY OF FRENCHMAN RIVER DIVISION¹
1983
 QUANTITIES IN ACRE-FEET

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	U.S.A. SHARE	RECEIVED BY U.S.A.	RECEIVED BY U.S.A.	
				ABOVE SHARE	BELOW SHARE
MAR. 1 - MAR. 10	2,145	1,073	1,218	145	
MAR. 11 - MAR. 20	2,852	1,426	984		442
MAR. 21 - MAR. 31	4,846	2,423	1,959		465
APR. 1 - APR. 10	7,615	3,808	2,757		1,051
APR. 11 - APR. 20	1,836	919	1,779	860	
APR. 21 - APR. 30	1,038	519	369		150
MAY 1 - MAY 10	875	438	176		262
MAY 11 - MAY 20	3,923	1,962	3,066	1,104	
MAY 21 - MAY 31	4,012	2,006	2,051	45	
JUN. 1 - JUN. 10	926	463	905	442	
JUN. 11 - JUN. 20	695	348	589	242	
JUN. 21 - JUN. 30	305	152	173	21	
JUL. 1 - JUL. 10	493	246	163		84
JUL. 11 - JUL. 20	2,008	1,004	506		499
JUL. 21 - JUL. 31	711	356	575	219	
AUG. 1 - AUG. 10	653	327	643	316	
AUG. 11 - AUG. 20	294	148	211	63	
AUG. 21 - AUG. 31	24	12	21	9	
SEP. 1 - SEP. 10	0	0	5	5	
SEP. 11 - SEP. 20	0	0	0	0	
SEP. 21 - SEP. 30	52	26	0		26
OCT. 1 - OCT. 10	285	143	0		143
OCT. 11 - OCT. 20	272	136	0		136
OCT. 21 - OCT. 31	0	0	492	492	

TOTAL 35,859 17,934 18,641

¹All values are conversions of data from table 4. Totals and shares may not add or subtract correctly as a result of rounding.

ANNEX A

TREATY BETWEEN THE UNITED STATES AND GREAT BRITAIN
RELATING TO BOUNDARY WATERS; AND QUESTIONS ARISING
BETWEEN THE UNITED STATES AND CANADA - ARTICLE VI

INTERNATIONAL JOINT COMMISSION
1921 Order

TREATY
BETWEEN THE UNITED STATES AND GREAT
BRITAIN RELATING TO BOUNDARY WATERS;
AND QUESTIONS ARISING BETWEEN THE
UNITED STATES AND CANADA

ARTICLE VI

The High Contracting Parties agree that the St. Mary and Milk Rivers and their tributaries (in the State of Montana and the Provinces of Alberta and Saskatchewan) are to be treated as one stream for the purposes of irrigation and power, and the waters thereof shall be apportioned equally between the two countries, but in making such equal apportionment more than half may be taken from one river and less than half from the other by either country so as to afford a more beneficial use to each. It is further agreed that in the division of such waters during the irrigation season, between the 1st of April and 31st of October, inclusive, annually, the United States is entitled to a prior appropriation of 500 cubic feet per second of the waters of the Milk River, or so much of such amount as constitutes three-fourths of its natural flow, and that Canada is entitled to a prior appropriation of 500 cubic feet per second of the flow of St. Mary River, or so much of such amount as constitutes three-fourths of its natural flow.

The Channel of the Milk River in Canada may be used at the convenience of the United States for the conveyance, while passing through Canadian territory, of waters diverted from the St. Mary River. The provisions of Article II of this treaty shall apply to any injury resulting to property in Canada from the conveyance of such waters through the Milk River.

The measurement and apportionment of the water to be used by each country shall from time to time be made jointly by the properly constituted reclamation officers of the United States and the properly constituted irrigation officers of His Majesty under the direction of the International Joint Commission.

INTERNATIONAL JOINT COMMISSION

ORDER

IN THE MATTER OF THE MEASUREMENT AND APPORTIONMENT OF THE WATERS OF THE ST. MARY AND MILK RIVERS AND THEIR TRIBUTARIES IN THE STATE OF MONTANA AND THE PROVINCES OF ALBERTA AND SASKATCHEWAN.

Whereas by Article VI of the Treaty entered into between the United States of America and His Majesty, the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, signed at Washington on the 11th of January, 1909;

And whereas the said Reclamation and Irrigation Officers have been unable to agree as to the manner in which the waters mentioned in the said Article VI should be measured and apportioned;

And whereas, before giving directions as to the measurement and apportionment of the said waters, the International Joint Commission deemed it proper to hear such representations and suggestions thereon as the Governments of the United States and Canada, the Provinces of Alberta and Saskatchewan, and the State of Montana, and as corporations and persons interested might see fit to make, and for such purposes sittings of the Commission were held at the following times and places: At the city of St. Paul, in the State of Minnesota, on the 24th, 25th, 26th, 27th, and 28th days of May, 1915; at the city of Detroit, in the State of Michigan, on the 15th, 16th, and 17th days of May, 1917; at the city of Ottawa, in the Province of Ontario, on the 3rd, 4th, and 5th days of May, 1920; at the village of Chinook, in the State of Montana, on the 15th day of September, 1921; and at the city of Lethbridge, in the Province of Alberta, on the 17th day of September, 1921, when counsel and representatives of the said Governments, corporations, and persons appeared and presented their views;

And whereas, pending final decision as to the proper method of measuring and apportioning said waters, interim orders with reference thereto have been made by the International Joint Commission from time to time, the last of such orders bearing the date of 5th day of April, 1921;

And whereas the members of the International Joint Commission have unanimously determined that the said Reclamation and Irrigation Officers should be guided in the measurement and apportionment of said waters by the directions and instructions hereinafter set forth:

IT IS THEREFORE ORDERED AND DIRECTED by the Commission in pursuance of the powers conferred by the said Article VI of the said Treaty that the Reclamation and Irrigation Officers of the United States and Canada shall, until this order is varied, modified, or withdrawn by the Commission, make jointly the measurement and apportionment of the water to be used by the United States and Canada in accordance with the following rules:

St. Mary River.

I. (a) During the irrigation season when the natural flow of the St. Mary River at the point where it crosses the international boundary is six hundred and sixty-six (666) cubic feet per second or less Canada shall be entitled to three-fourths and the United States to one-fourth of such flow.

(b) During the irrigation season when the natural flow of the St. Mary River at the point where it crosses the international boundary is more than six hundred and sixty-six (666) cubic feet per second Canada shall be entitled to a prior appropriation of five hundred (500) cubic feet per second, and the excess over six hundred and sixty-six (666) cubic feet per second shall be divided equally between the two countries.

(c) During the non-irrigation season the natural flow of the St. Mary River at the point where it crosses the international boundary shall be divided equally between the two countries.

Milk River.

II. (a) During the irrigation season when the natural flow of the Milk River at the point where it crosses the international boundary for the last time (commonly and hereafter called the Eastern Crossing) is six hundred and sixty-six (666) cubic feet per second or less, the United States shall be entitled to three-fourths and Canada to one-fourth of such natural flow.

(b) During the irrigation season when the natural flow of the Milk River at the Eastern Crossing is more than six hundred and sixty-six (666) cubic feet per second the United States shall be entitled to a prior appropriation of five hundred (500) cubic feet per second and the excess over six hundred and sixty-six (666) cubic feet per second shall be divided equally between the two countries.

(c) During the non-irrigation season the natural flow of the Milk River at the Eastern Crossing shall be divided equally between the two countries.

Eastern Tributaries of Milk River.

III. 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.

Waters not naturally crossing the boundary.

IV. Each country shall be apportioned such waters of the said rivers and of any tributaries thereof as rise in that country but do not naturally flow across the international boundary.

V. For the purpose of carrying out the apportionment directed in Paragraphs I, II, and III hereof the said Reclamation and Irrigation Officers shall jointly take steps:

(a) To ascertain and keep a daily record of the natural flow of the St. Mary River at the international boundary, of the Milk River at the Eastern Crossing, and of the eastern tributaries of the Milk River at the international boundary by measurement in each case:

(1) At the gauging station at the international boundary;

(2) At all places where any of the waters which would naturally flow across the international boundary at that particular point are diverted in either country prior to such crossing;

(3) At all places where any of the waters which would naturally flow across the international boundary at that particular point are stored, or the natural flow thereof increased or decreased prior to such crossing.

(b) To fix the amount of water to which each country is entitled in each case by applying the directions contained in paragraphs 1, 2, and 3 hereof to the total amount of the natural flow so ascertained in each case.

(c) To communicate the amount so fixed to all parties interested, so that the apportionment of the said waters may be fully carried out by both countries in accordance with the said directions.

VI. Each country may receive its share of the said waters as so fixed at such point or points as it may desire. A gauging station shall be established and maintained by the Reclamation or Irrigation Officers of the country in which any diversion, storage, increase, or decreases of the natural flow shall be made at every point where such diversion, storage, increase, or decrease takes place.

VII. International gauging stations shall be maintained at the following points:

St. Mary River near international boundary; the north branch of Milk River near international boundary; the south branch of Milk River near international boundary; Milk River at Eastern Crossing; Lodge Creek, Battle Creek, and Frenchman River, near international boundary; and gauging stations shall be established and maintained at such other points as the Commission may from time to time approve.

VIII. The said Reclamation and Irrigation Officers are hereby further authorized and directed:

(a) To make such additional measurements and to take such further and other steps as may be necessary or advisable in order to insure the apportionment of the said waters in accordance with the directions herein set forth.

(b) To operate the irrigation works of either country in such a manner as to facilitate the use by the other country of its share of the said waters and subject hereto to secure to the two countries the greatest beneficial use thereof.

(c) To report to the Commission the measurements made at all international and other gauging stations established pursuant to this order.

IX. In the event of any disagreement in respect to any matter or thing to be done under this order the said Reclamation and Irrigation Officers shall report to the Commission, setting forth fully the points of difference and the facts relating thereto.

X. The said order of the Commission, dated the 6th day of April 1921, is hereby withdrawn, except with respect to the report to be furnished to the Commission thereunder.

Dated at Ottawa, Canada, this 4th day of October, 1921.

O. GARDNER,
C. A. MACGRATH,
C. D. CLARK,
HENRY A. POWELL,
W. H. HEARST,
MARK A. SMITH.

ANNEX B

International System of Units

(SI) Conversions

INCH-POUND TO INTERNATIONAL SYSTEM OF UNITS

(SI) CONVERSION

The 1982 Report to the International Joint Commission on the Division of the Waters of the St. Mary and Milk Rivers uses dual units (SI and inch pound).

The two inch-pound units that have been used in previous reports are cfs-days and acre-feet.

$$1 \text{ cfs-day} = 86,400 \text{ cubic feet}$$

$$1 \text{ acre-foot} = 43,560 \text{ cubic feet}$$

$$1 \text{ cfs-day} = 1.9835 \text{ acre-feet}$$

The SI unit replacing the inch-pound units is the cubic decametre (dam^3)

$$1 \text{ dam}^3 = 1000 \text{ cubic metres}$$

$$1 \text{ cubic metre} = 35.315 \text{ cubic feet}$$

$$1 \text{ dam}^3 = 35,315 \text{ cubic feet}$$

$$1 \text{ acre-foot} = 1.2335 \text{ dam}^3$$

$$1 \text{ cfs-day} = 2.4466 \text{ dam}^3$$

ANNEX C

List of Gauging Stations

INTERNATIONAL GAUGING STATIONS OPERATED JOINTLY

BY

CANADA AND UNITED STATES

ST. MARY AND MILK RIVER DRAINAGE BASINS

1983

Map Index

Station Name

ST. MARY RIVER BASIN

05AE027	St. Mary River at International Boundary
05AE029	St. Mary Canal at St. Mary Crossing near Babb, Montana
05AE036	Lake Sherburne at Sherburne, Montana

MILK RIVER BASIN

11AA001	North Milk River near International Boundary
11AA005	Milk River at Milk River
11AA025	Milk River at Western Crossing of International Boundary
11AA031	Milk River at Eastern Crossing of International Boundary
11AA032	North Fork Milk River above St. Mary Canal near Browning, Montana
11AA033	South Fork Milk River near Babb, Montana

LODGE CREEK TRIBUTARY BASIN

11AB001	Middle Creek below Middle Creek Reservoir
11AB009	Middle Creek near Saskatchewan Boundary
11AB060	Spangler Ditch near Govenlock
11AB080	Middle Creek Reservoir
11AB083	Lodge Creek below McRae Creek at International Boundary
11AB089	Altawan Reservoir near Govenlock

BATTLE CREEK TRIBUTARY BASIN

11AB018	Nashlyn Canal near Consul
11AB027	Battle Creek at International Boundary
11AB044	McKinnon Ditch near Consul
11AB058	Richardson Ditch near Consul
11AB075	Lyons Creek at International Boundary
11AB077	Cypress Lake West Outflow Canal
11AB078	Cypress Lake West Inflow Canal
11AB084	Vidora Ditch near Consul
11AB085	Cypress Lake West Inflow Canal Drain
11AB102	Gaff Ditch near Merryflat

FRENCHMAN RIVER TRIBUTARY BASIN

11AC001	Frenchman River below Eastend Reservoir
11AC037	Cypress Lake
11AC041	Frenchman River at International Boundary
11AC052	Eastend Canal near Eastend
11AC054	Newton Lake Main Canal
11AC055	Eastend Reservoir
11AC056	Newton Lake
11AC060	Cypress Lake East Outflow Canal
11AC062	Frenchman River below Newton Lake
11AC063	Huff Lake
11AC064	Belanger Creek Diversion to Cypress Lake
11AC065	Huff Lake Gravity Canal
11AC066	Huff Lake Pumping Canal

GAUGING STATIONS OPERATED INDEPENDENTLY

BY EITHER

CANADA OR UNITED STATES

IN THE

ST. MARY AND MILK RIVER DRAINAGE BASINS

1983

Map Index	Station Name	Operated By
<u>ST. MARY RIVER BASIN</u>		
5-0145*	Swiftcurrent Creek at Many Glacier, Montana	U.S.A.
5-0175*	St. Mary River near Babb, Montana	U.S.A.
05AE002*	Lee Creek at Cardston	Canada
05AE005*	Rolph Creek near Kimball	Canada
05AE006*	St. Mary River near Lethbridge	Canada
05AE016*	Pothole Creek at Russell's Ranch	Canada
05AE021*	Magrath Irrigation District Canal near Spring Coulee	Canada
05AE025*	St. Mary Reservoir near Spring Coulee	Canada
05AE026*	Canadian St. Mary Canal near Spring Coulee	Canada
05AE038*	Pothole Turnout near Magrath	Canada
05AE041*	Dry Coulee near Magrath	Canada

MILK RIVER BASIN

11AA028*	Bear Creek near International Boundary	Canada
11AA029*	Miners Coulee near International Boundary	Canada

LODGE CREEK TRIBUTARY BASIN

11AB008*	Middle Creek above Lodge Creek	Canada
11AB082*	Lodge Creek at Alberta Boundary	Canada
11AB091	Michele Reservoir near Elkwater	Canada
11AB092	Greasewood Reservoir near Elkwater	Canada
11AB094	Bare Creek Reservoir near Elkwater	Canada
11AB097	Cressday Reservoir near Cressday	Canada
11AB098	Jaydot Reservoir near Jaydot	Canada
11AB099	Mitchell Reservoir near Elkwater	Canada
11AB103	Squaw Coulee near Willow Creek	Canada
11AB104	Massy Reservoir near Elkwater	Canada
11AB108*	Middle Creek near Govenlock	Canada
11AB113	Middle Creek Reservoir Main Outlet	Canada
11AB114	Middle Creek Reservoir Bedford Outlet	Canada
11AB115	Middle Creek Reservoir Flood Spillway	Canada

BATTLE CREEK TRIBUTARY BASIN

11AB020*	Shepherd Ditch near Consul	Canada
11AB090	Reesor Reservoir near Elkwater	Canada
11AB095	Adams Lake	Canada
11AB096*	Battle Creek near Consul	Canada
11AB101*	Battle Creek below Nashlyn Project	Canada
11AB117*	Battle Creek at Alberta Boundary	Canada
11AB118*	Battle Creek below Wilson's Weir	Canada

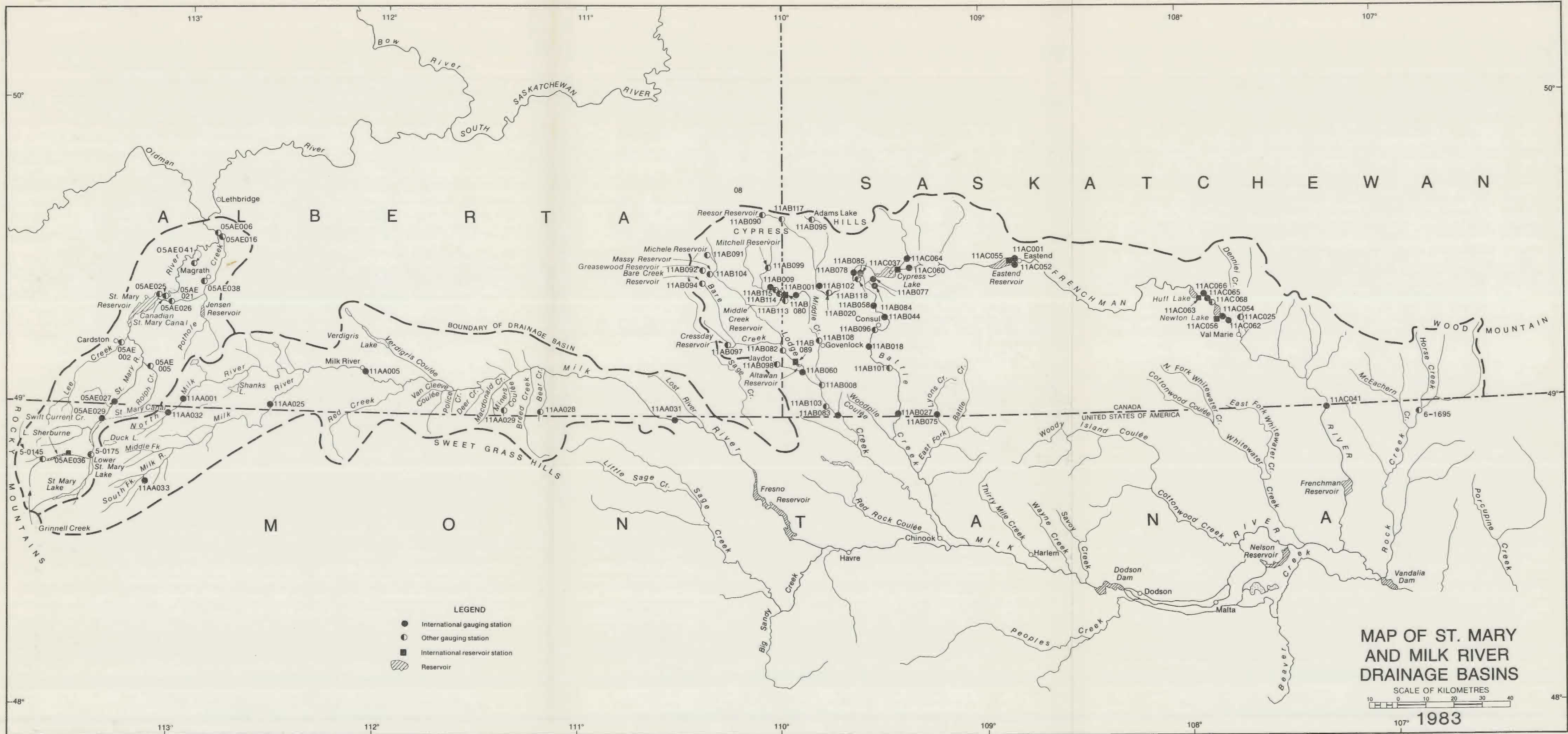
FRENCHMAN RIVER TRIBUTARY BASIN

11AC025*	Denniel Creek near Val Marie	Canada
11AC068	Val Marie Pump No. 1	Canada

ROCK CREEK TRIBUTARY BASIN

6-1695*	Rock Creek below Horse Creek near International Boundary	U.S.A.
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* Data not included in this report or appendices



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

MAP OF ST. MARY
AND MILK RIVER
DRAINAGE BASINS

SCALE OF KILOMETRES

10 0 10 20 30 40

1983

HD
1694
.A2
R424
1983

Report to the International Joint
Commission on the division and use
of the waters of the St. Mary and
Milk Rivers...

HD
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R424
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