Report to

THE INTERNATIONAL JOINT COMMISSION

On

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

2010

Cover Photos:

Left Side: Norm Midtlyng (USGS) conducting streamflow measurement Milk River at Eastern Crossing using conventional mechanical current meter.

Photograph by Aroscott Whiteman, USGS, Montana Water Science Center, Helena, Montana

Right Side: Aroscott Whiteman (USGS) conducting streamflow measurement Milk River at Milk River (Town) using hydro-acoustic equipment, acoustic doppler current profiler (ADCP).

Photograph by Don Bischoff, USGS, Montana Water Science Center, Helena, Montana

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REPORT TO

THE INTERNATIONAL JOINT COMMISSION

ON

THE DIVISION OF THE WATERS OF

THE ST. MARY AND MILK RIVERS

FOR THE YEAR 2010

Submitted By

Russell G. Boals

Representing Canada

And

Dr. Randall G. Updike

Representing the United States

November 2011

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

Commissioners:

In compliance with the provisions of Article VI of the Boundary Waters Treaty of 1909 and Clause VIII(c) of your Order of October 4, 1921, directing the division of the waters of the 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, 2010.

Respectfully submitted,

Russell Boals

Russell G. Boals
Field Representative for the Accredited Officer of Her Majesty

Randall G. Updike

Dr. Randall G. Updike
Accredited Officer of the United States

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SYNOPSIS

During the 2010 irrigation season, the natural flow of the St. Mary River was 102 percent 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, 2010, was 725 000 cubic decametres (dam^3) (588,000 acre-feet). Under the terms of the Boundary Waters Treaty, the Canadian allotment was 438 000 dam^3 (355,000 acre-feet). The total flow recorded at the International Boundary during the irrigation season was 133 percent of the Canadian allotment.

The natural flow of the Milk River during the 2010 irrigation season was 207 percent of the long-term average.

The natural flow of the Milk River at the Eastern Crossing of the International Boundary from March 1 to October 31, 2010, was 278 000 dam^3 (225,000 acre-feet). Under terms of the Treaty, the United States' allotment was 187 000 dam^3 (152,000 acre-feet). The United States received 146 percent of its allotment at Eastern Crossing, in addition to its share of St. Mary River water diverted into the Milk River through the St. Mary Canal.

The March to October natural flows of the three apportioned tributaries of the Milk River were 149 percent of the long-term average for Lodge Creek at the International Boundary, 227 percent for Battle Creek at the International Boundary, and 94 percent for Frenchman River at the International Boundary. The total flow recorded at the International Boundary during the irrigation season for Lodge Creek, Battle Creek, and Frenchman River was 111 percent, 82 percent, and 106 percent, respectively, of the United States allotment. Deficits incurred by Canada due to late season diversions in the Battle Creek and Frenchman River basins necessitated the addition of an extra division period this year in order to determine the final flow apportionment in each basin.

The annual meeting of the Field Representatives was held at Medicine Hat, Alberta on February 17, 2011. Mutual problems, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2011 was adopted.

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INTRODUCTION

The apportionment of the waters of the St. Mary and Milk Rivers is governed by Article VI of the Boundary Waters Treaty of 1909 between Great Britain and the United States. The terms of the Treaty were further clarified by the 1921 Order of the International Joint Commission. A copy of the 1921 Order, including Article VI, is contained in Annex A of this report.

To comply with this Treaty, staff of the United States Geological Survey and Environment Canada, Water Survey Division collected, compiled, verified, and tabulated hydrometric data at 35 international gauging stations on a cooperative basis, under the direction of the Field Representatives of the United States and Canada. An additional 72 gauging stations were operated independently by the United States and Canada in the St. Mary and Milk River basins. Several of these stations were operated to obtain data on diversions, reservoir contents, return flows and index runoff which was used to improve the accuracy of natural-flow computations.

This report summarizes the year 2010 natural-flow computations, apportionment of the natural flow, unusual occurrences during the year, and 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 International System of Units (SI) conversion schedule adopted 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 collected, computed and published in SI units. The United States' data, which are collected and computed in inch-pound units, were converted to SI units using the appropriate conversion factors. A summary of the conversion factors is contained in Annex E.

The Accredited Officer of Her Majesty position was vacant in 2010 following the retirement of Mr. Timothy Goos. Mr. Russell G. Boals, as Field Representative to the Accredited Officer of Her Majesty, represented Canada's interest on behalf of the Accredited Officer of Her Majesty. Dr. Randall Updike, as the Accredited Officer of the United States, was represented in the field by Mr. John M. Kilpatrick, United States Geological Survey, Helena, Montana. This report was prepared jointly by personnel of Environment Canada, Water Survey Division, and the United States Geological Survey, under the supervision of Messrs. Boals and Kilpatrick.

The annual meeting of the Field Representatives was held in Medicine Hat, Alberta on February 17, 2011. Mutual concerns, future plans, and changes in computational procedures were discussed and a schedule of field operations for 2011 was 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. Flow in excess of that quantity is 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 to determine flow apportionment during the irrigation season. These 15 to 16 day periods are termed 'division periods' and serve to provide an opportunity to respond to varying use and flow conditions. For example, if use by the United States is in excess of its share during a division period, then a surplus delivery (or an amount in excess of its share in the subsequent division period) of an equivalent quantity of water is normally made to Canada at the earliest opportunity. 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 that is available and the status of apportionment.

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, water is diverted into the St. Mary Canal during the non-irrigation season, necessitating additional computations.

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

Storage in Lake Sherburne (station 5015500) was 22 100 dam^3 (17,900 acre-feet) on October 31, 2009. Storage increased to 36 900 dam^3 (29,900 acre-feet) on February 28, 2010, when the 2010 irrigation-season began. Maximum storage was 81 600 dam^3 (66,200 acre-feet) on July 19, 2010 and storage had decreased to 33 800 dam^3 (27,400 acre-feet) by the end of irrigation releases on September 21, 2010.

Water was diverted from the St. Mary River into the Milk River via the St. Mary Canal beginning on March 22, 2010 and continued through September 5, 2010. The total flow recorded at the gauging station on the St. Mary Canal at St. Mary Crossing (station 5018500) was 136 000 dam^3 (110,000 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.

The computed natural flow of the St. Mary River at the International Boundary (station 05AE027) from November 1, 2009 to October 31, 2010 was 799 000 dam^3 (648,000 acre-feet) of which 725 000 dam^3 (588,000 acre-feet) occurred during the irrigation season, April 1 to October 31, 2010. For the irrigation season, Canada's share was 438 000 dam^3 (355,000 acre-feet) and the United States' share was 286 000 dam^3 (232,000 acre-feet). During the irrigation season, a total discharge of 583 000 dam^3 (473,000 acre-feet) was recorded at the International Boundary, which was 133 percent of the Canadian share. The computed natural flow during the irrigation season was 102 percent of the average of the previous 107 years of record.

Deficit deliveries were recorded in 2 of the 16 division periods during the 2010 irrigation season. In accordance with the 2001 Letter of Intent respecting the St. Mary and Milk Rivers streamflow transfers (a copy is available in Annex B of this report), the United States is allowed to accumulate deficits on the St. Mary River of up to 4,000 cfs-days (9 800 dam^3) (7,940 acre-feet) between March 1 and May 31 of each year. At the discretion of the United States, the deficits may be reduced to no less than 2,000 cfs-days (4 900 dam^3) (3,970 acre-feet) between June 1 and July 15 of each year with surplus deliveries of St. Mary River water. The remaining deficits incurred by the United States on the St. Mary River may be offset by deficits incurred by Canada on the Milk River from June 1 through September 15. Any outstanding deficits remaining on September 15 are to be equalized by October 31 of each year.

For the year 2010, the United States accumulated a deficit on the St. Mary River of 9 520 dam^3 (7,720 acre-feet) as of May 15. The United States, using June 1-15 surplus deliveries, reduced the deficit to 4 900 dam^3 (3,970 acre-feet) which remained in effect until September 15. No deficit remained at the end of the irrigation season on October 31, 2010.

The division of St. Mary River natural flow is summarized in Tables 1 and 1A and Figure 1, which follow. The detailed computation of the natural flow is given in Table 6 and the historical summary is given in Table 7 of Appendix A.

Table 1: Summary of St. Mary River Division for 2010*

Quantities in Cubic Decametres

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	4,245	2,122	3,425	1,303	
MAR 16 - MAR 31	5,425	2,713	4,155	1,442	
APR 1 - APR 15	8,171	6,128	3,527		2,601
APR 16 - APR 30	27,102	18,466	11,548		6,918
MAY 1 - MAY 15	34,067	23,141	24,484	1,343	
MAY 16 - MAY 31	79,386	46,209	56,860	10,651	
JUNE 1 - JUNE 15	106,504	59,362	81,350	21,988	
JUNE 16 – JUNE 30	166,896	89,558	140,873	51,315	
JULY 1 - JULY 15	93,322	52,770	87,660	34,890	
JULY 16 – JULY 31	49,460	31,247	33,569	2,322	
AUG 1 - AUG 15	32,274	22,246	23,380	1,134	
AUG 16 - AUG 31	25,273	18,309	19,188	879	
SEP 1 - SEP 15	18,904	14,178	23,473	9,295	
SEP 16 - SEP 30	45,636	28,885	46,472	17,587	
OCT 1 - OCT 15	23,812	17,453	19,534	2,081	
OCT 16 - OCT 31	13,862	10,399	11,137	738	
TOTAL	734,339	443,186	590,635		

* This is a summary of data from Table 6, Appendix A.

Note:
Canadian share of St. Mary River waters deficit outstanding:
as of May 31, 2010: 9 520 dam^3 (7,720 acre-feet) (3,890 cfs-days)
as of June 15, 2010: 4 900 dam^3 (3,970 acre-feet) (2,000 cfs-days)
as of September 15, 2010: 4 900 dam^3 (3,970 acre-feet) (2,000 cfs-days)

U.S.A. share of Milk River waters outstanding as of September 15, 2010: 0 dam^3 (0 acre-feet) (0 cfs-days)

Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:
as of May 31, 2010: 9 800 dam^3 (7,940 acre-feet) (4,000 cfs-days)
as of July 15, 2010: 4 900 dam^3 (3,970 acre-feet) (2,000 cfs-days)

Any deficits outstanding as of September 15 are to be equalized by October 31 of each year.

Table 1A Summary of St. Mary River Division for 2010*

Quantities in Acre-Feet

DIVISION PERIOD AT INTERNATIONAL BOUNDARY	NATURAL FLOW	CANADA'S SHARE	RECEIVED BY CANADA	RECEIVED BY CANADA	
				ABOVE SHARE	BELOW SHARE
MAR 1 - MAR 15	3,441	1,720	2,777	1,056	
MAR 16 - MAR 31	4,398	2,199	3,368	1,169	
APR 1 - APR 15	6,624	4,968	2,859		2,109
APR 16 - APR 30	21,972	14,970	9,362		5,608
MAY 1 - MAY 15	27,618	18,760	19,849	1,089	
MAY 16 - MAY 31	64,358	37,462	46,096	8,635	
JUNE 1 - JUNE 15	86,343	48,125	65,951	17,826	
JUNE 16 – JUNE 30	135,303	72,605	114,206	41,601	
JULY 1 - JULY 15	75,656	42,781	71,066	28,285	
JULY 16 – JULY 31	40,097	25,332	27,214	1,882	
AUG 1 - AUG 15	26,165	18,035	18,954	919	
AUG 16 - AUG 31	20,489	14,843	15,556	713	
SEP 1 - SEP 15	15,325	11,494	19,030	7,535	
SEP 16 - SEP 30	36,997	23,417	37,675	14,258	
OCT 1 - OCT 15	19,304	14,149	15,836	1,687	
OCT 16 - OCT 31	11,238	8,430	9,029	598	
TOTAL	595,330	359,291	478,829		

* All values are conversions of data from Table 1. Totals and shares may not add or subtract exactly as a result of rounding.

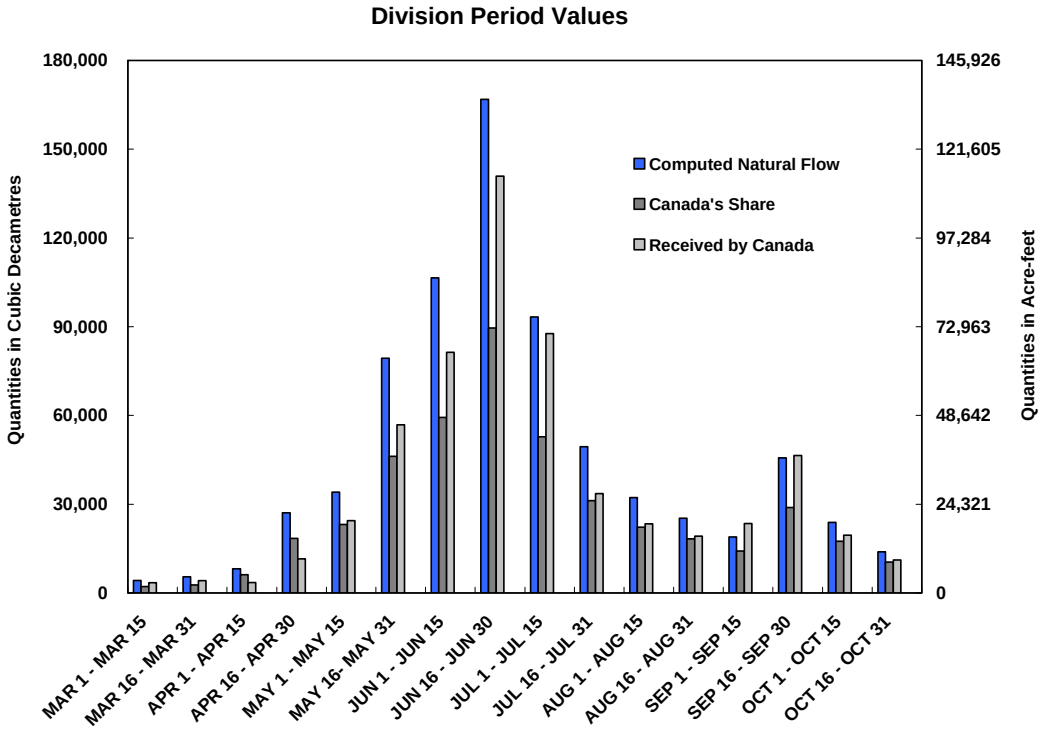
Note:
Canadian share of St. Mary R. waters deficit outstanding:
as of May 31, 2010: 7,720 acre-feet (9 520 dam^3) (3,890 cfs-days)
as of June 15, 2010: 3,970 acre-feet (4 900 dam^3) (2,000 cfs-days)
as of September 15, 2010: 3,970 acre-feet (4 900 dam^3) (2,000 cfs-days)

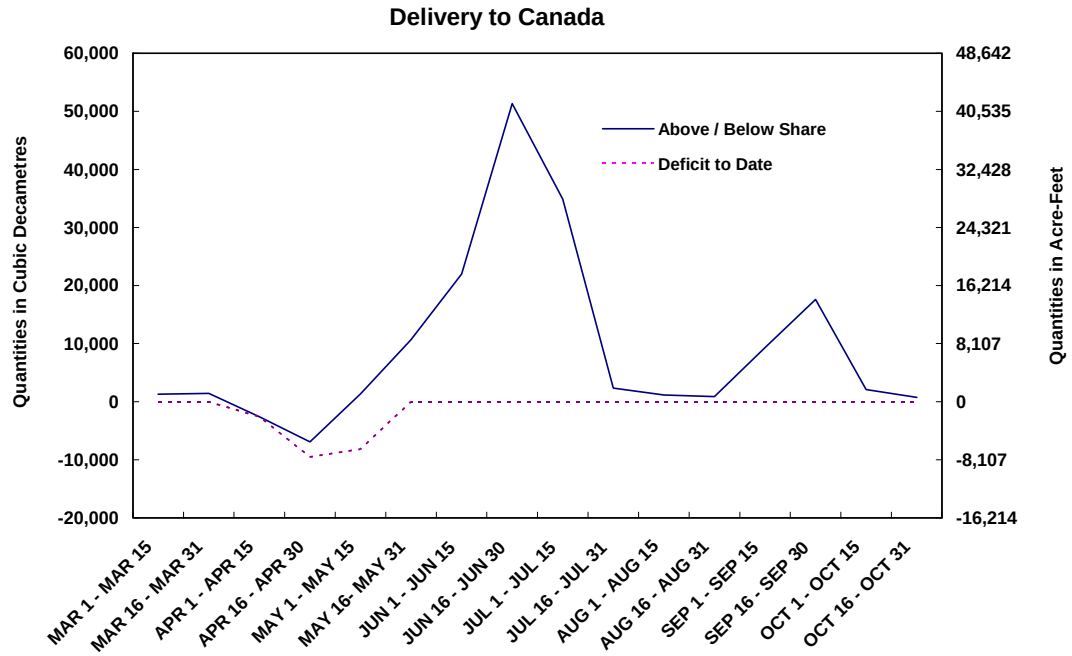
U.S.A. share of Milk River waters outstanding as of September 15, 2010: 0 acre-feet (0 dam^3) (0 cfs-days)

Allowable deficit carryovers, as per 2001 Letter of Intent respecting St. Mary-Milk Rivers streamflow transfers, are:
as of May 31, 2010: 7,940 acre-feet (9 800 dam^3) (4,000 cfs-days)
as of July 15, 2010: 3,970 acre-feet (4 900 dam^3) (2,000 cfs-days)

Any deficits outstanding as of September 15 are to be equalized by October 31 of each year.

Figure 1. St. Mary River Division, 2010





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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 entire flow is divided equally between the two countries.

Prior to the mid 1970's, uses of the natural flow of the Milk River by Canada and the United States upstream from Eastern Crossing were assumed to be less than their respective shares and no formal apportionment was made. By 1977, it became apparent that the increasing numbers of irrigation systems were capable of using all of the natural flow for long periods of time. Consequently, a more comprehensive natural-flow computation and water-division procedure was developed and has been used since 1985. The revised computation procedure includes an approximate accounting of irrigation consumptive uses in both countries, and the inter-basin transfer of water in Canada. An additional refinement was made in 1988 when F.I. Morton's evapo-transpiration model replaced the adjusted pan evaporation method in the natural flow computations.

Data required for Morton's model is resource intensive. The equipment used to collect the data is highly specialized, less than robust, and located in a remote area. Data collected at the evapo-transpiration monitoring site near Milk River, Alberta needed frequent supplementation from the Onefour, Alberta pan evaporation site due to equipment malfunction. This coupled with the fact that the analysis program required extensive re-writing to port it from the obsolete DEC-VMS computer operating system suggested that an alternative needed to be investigated.

Data from the results of Morton's model were found to have a strong linear correlation with the Onefour, Alberta Class A evaporation pan results. Therefore, again for the year 2010, evapo-transpiration was estimated using the Onefour pan evaporation data as an index of Morton's model results.

During 2010, the United States' estimated consumptive use was 5 050 dam^3 (4,090 acre-feet) and Canada's estimated consumptive use was 5 160 dam^3 (4,180 acre-feet). No inter-basin transfers from Verdigris Coulee near the Mouth (station 11AA038) were credited to the Canadian consumptive use.

The computed natural flow of the Milk River at the Eastern Crossing of the International Boundary (station 6135000) from March 1 to October 31, 2010 was 278 000 dam^3 (225,000 acre-feet). This flow was 207 percent of the average computed natural flow of the previous 98 years of record. It is important to note, however, that natural-flow computations prior to 1985 did not account for consumptive use. Consequently, natural-flow values after 1985 are not directly comparable with natural-flow values of previous years. For the period March 1 to October 31, 2010, the United States' share was 187 000 dam^3 (152,000 acre-feet) and Canada's share was 91 300 dam^3 (74,000 acre-feet). The United States received 146 percent of its allotment at Eastern Crossing, in addition to its share of St. Mary River water diverted into the Milk River through the St. Mary Canal.

There were no deficit deliveries recorded in any of the 16 division periods during the irrigation season on the Milk River. At present, Canada does not have facilities to store and release water into the Milk River Basin. Deficits are made up by transfer of Canada's share of St. Mary River water if excess capacity exists both in the stream and in the American St. Mary Canal, or as allowed by the 2001 Letter of Intent respecting the St. Mary and Milk Rivers streamflow transfers (a copy of which is available in Annex B of this report) whereby Canada is allowed to accumulate a deficit on the Milk River of up to 2,000 cfs-days (4 900 dam^3) (3,970 acre-feet) between June 1 and September 15 of each year. The incurred deficits on the St. Mary and Milk Rivers may be offset and the outstanding deficits as of September 15 are to be equalized by October 31 of each year.

The division of Milk River natural flow is summarized in Table 2 and 2A and Figure 2, which follow. The detailed computation of the natural flow is given in Table 8 and the historical summary is given in Table 9 of Appendix A.

Table 2: Summary of Milk River Division for 2010*
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 15	3,787	1,893	3,787	1,893	
MAR 16 - MAR 31	12,877	6,438	12,877	6,438	
APR 1 - APR 15	8,776	6,582	8,776	2,194	
APR 16 - APR 30	14,251	10,688	14,251	3,563	
MAY 1 - MAY 15	24,667	17,396	24,667	7,271	
MAY 16 - MAY 31	32,977	22,342	31,996	9,654	
JUNE 1 - JUNE 15	28,573	19,616	27,615	7,999	
JUNE 16 – JUNE 30	69,719	40,632	69,356	28,724	
JULY 1 - JULY 15	23,541	17,015	22,880	5,866	
JULY 16 – JULY 31	15,269	11,452	14,564	3,112	
AUG 1 - AUG 15	7,761	5,821	7,217	1,396	
AUG 16 - AUG 31	11,678	8,759	11,098	2,339	
SEP 1 - SEP 15	7,064	5,298	6,702	1,403	
SEP 16 - SEP 30	7,521	5,641	7,521	1,880	
OCT 1 - OCT 15	4,842	3,631	4,842	1,211	
OCT 16 - OCT 31	4,765	3,574	4,765	1,191	
TOTAL	278,068	186,778	272,912		

* This is a summary of data from Table 8, Appendix A.

Note:
U.S.A. share of Milk River waters deficit outstanding:
as of September 15, 2010: 0 dam^3 (0 acre-feet) (0 cfs-days).

Canadian share of St. Mary River waters deficit outstanding:
as of May 31, 2010: 9 520 dam^3 (7,720 acre-feet) (3,890 cfs-days).

Allowable deficit carryover from June 1 and September 15 as per 2001 Letter of Intent respecting St. Mary - Milk River streamflow transfers can not be less than the outstanding deficit to Canada on St. Mary River Division as of May 31st, nor exceeding 4 900 dam^3 (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Table 2A: Summary of Milk River Division for 2010*
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 15	3,070	1,535	3,070	1,535	
MAR 16 - MAR 31	10,439	5,220	10,439	5,220	
APR 1 - APR 15	7,114	5,336	7,114	1,779	
APR 16 - APR 30	11,553	8,665	11,553	2,888	
MAY 1 - MAY 15	19,997	14,103	19,997	5,894	
MAY 16 - MAY 31	26,734	18,113	25,939	7,826	
JUNE 1 - JUNE 15	23,164	15,902	22,387	6,485	
JUNE 16 - JUNE 30	56,521	32,940	56,227	23,286	
JULY 1 - JULY 15	19,085	13,794	18,549	4,755	
JULY 16 - JULY 31	12,379	9,284	11,807	2,523	
AUG 1 - AUG 15	6,292	4,719	5,851	1,132	
AUG 16 - AUG 31	9,468	7,101	8,997	1,896	
SEP 1 - SEP 15	5,727	4,295	5,433	1,138	
SEP 16 - SEP 30	6,097	4,573	6,097	1,524	
OCT 1 - OCT 15	3,925	2,944	3,925	981	
OCT 16 - OCT 31	3,863	2,897	3,863	966	
TOTAL	225,430	151,421	221,250		

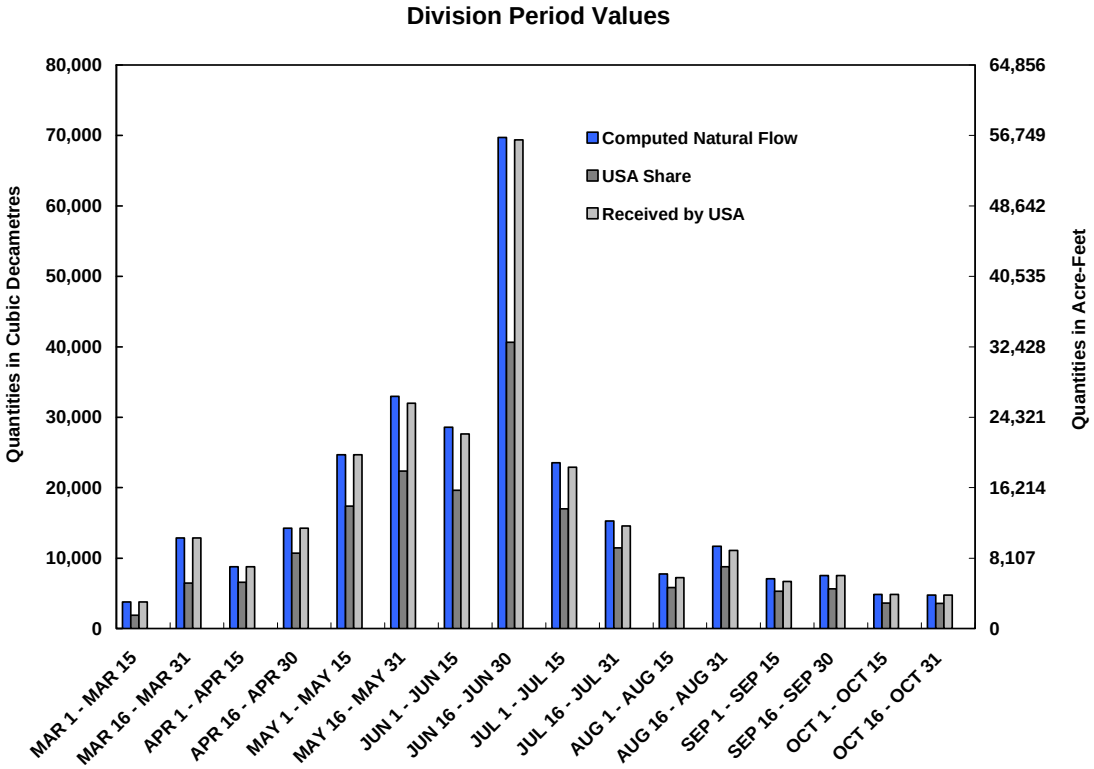
* All values are conversions of data from Table 2. Totals and shares may not add or subtract exactly as a result of rounding.

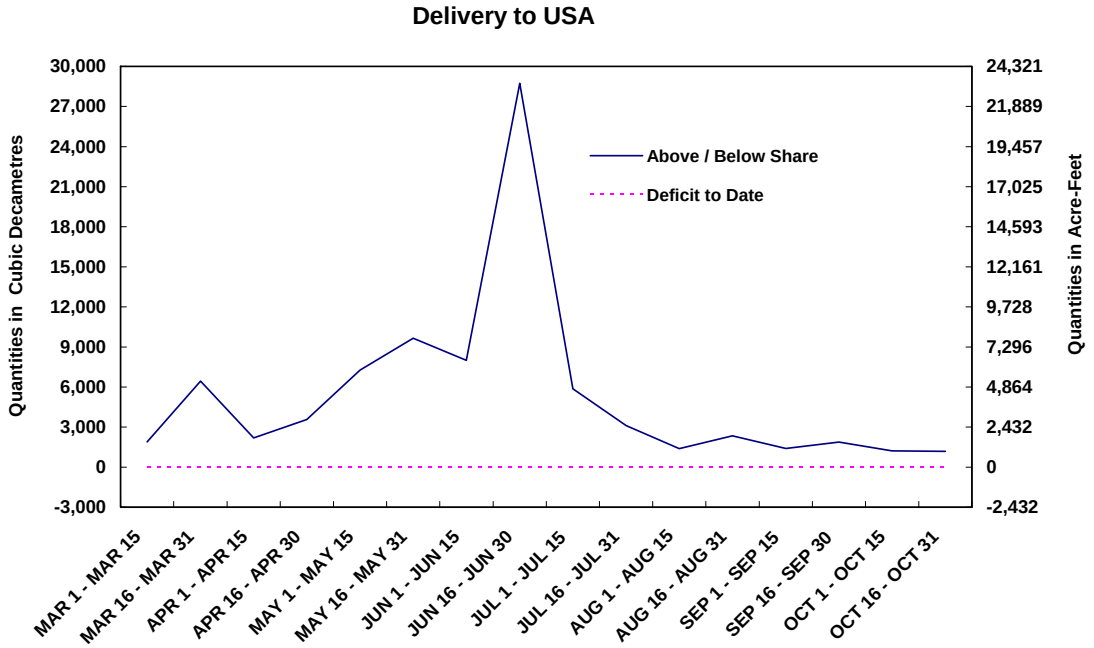
Note:
U.S.A. share of Milk River waters deficit outstanding:
as of September 15, 2010: 0 acre-feet (0 dam³) (0 cfs-days)

Canadian share of St. Mary R. waters deficit outstanding:
as of May 31, 2010: 7,720 acre-feet (9 520 dam^3) (3,890 cfs-days)

Allowable deficit carryover from June 1 and September 15 as per 2001 Letter of Intent respecting St. Mary - Milk River streamflow transfers can not be less than the outstanding deficit to Canada on St. Mary River Division as of May 31st, nor exceeding 4 900 dam^3 (2,000 cfs-days) (3,970 acre-feet), whichever is less.

Figure 2. Milk River Division, 2010





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SOUTHERN TRIBUTARIES OF THE MILK RIVER

Responding to concerns expressed by Canadian water users, the International Joint Commission at its executive session on December 8, 1986, agreed in principle that the issue of utilization of the southern tributaries should be addressed in an informal, pragmatic manner. The Commission instructed the Accredited Officers to proceed with discussions to resolve Canadian concerns. To assist them in implementing the Commission's instructions, the Accredited Officers established a four-member ad hoc task force composed of officials from the State of Montana and the Province of Alberta water-management agencies and the United States and Canadian Field Representatives for the St. Mary and Milk Rivers.

The task force met with United States and Canadian water users, conducted public meetings, toured water-use projects, compiled information on water availability and use, investigated ground-water supplies, and considered various options for resolving issues. The task force determined that United States water users were reluctant to participate in options that might limit their use of water and jeopardize their water claims in future adjudication of water rights. They also determined that basic Canadian water-user needs for domestic and stock-water use were being satisfied with wells and dugouts. Solutions to water-utilization problems were limited because the cost of storage facilities, pumpage from the Milk River, and formal apportionment of southern tributary waters would not be cost effective.

In September 1991, the Montana Department of Natural Resources and Conservation, in response to requests from the task force and others, issued an Order to close the southern tributaries to issuance of additional water permits.

The final report was forwarded to the International Joint Commission in May 1994. At its executive session on September 21, 1994, the Commission agreed that the task force should be terminated as recommended. The Commission also agreed not to act at that time on the three recommendations related to the adjudication process, but requested that the Accredited Officers continue to monitor the situation and report annually, or more frequently if appropriate, on such matters as complaints by Canadian ranchers and changes in the status of basin adjudication.

No Canadian complaints or changes in the Montana adjudication process were noted in 2010.

Flows for March through October 2010 for the southern tributaries were as follows:

- Bear Creek near International Boundary – 8 210 dam^3 (6,660 acre-feet)
- Miners Coulee near International Boundary – no flow data for 2010.

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EASTERN TRIBUTARIES OF THE MILK RIVER

The waters of the eastern tributaries of the Milk River are divided in accordance with the 1921 Order of the International Joint Commission, 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 daily basis; however, the physical limitation due to transit time in the flow system was recognized to be an impediment to the most beneficial use of the water if a daily apportionment were adopted. Further analysis showed that the minimum practical time frame for compilation of the natural flows at the International Boundary was every ten days. In 1994 the time frame was increased to twice monthly to reduce lag-time anomalies, reduce costs, and conform to St. Mary and Milk Rivers computation periods.

Prior to 1937, Canadian use along the eastern tributaries consisted of domestic projects, and the Canadian share of the natural flow was not fully used. In the late 1930's, the Government of Canada constructed three dams on the Frenchman River creating Eastend Reservoir (station 11AC055), Huff Lake (station 11AC063), and Newton Lake (station 11AC056) which necessitated an operational division of flow on this tributary by 1937. In 1938, dams were constructed at both ends of Cypress Lake (station 11AC037) near the Battle Creek-Frenchman River divide to allow inter-basin storage and transfers of water. In the early 1950's, the redevelopment of several private irrigation projects and the construction of the Vidora Irrigation Project resulted in increased use of Battle Creek water in Canada and made an operational division of the flow on this tributary necessary by 1957. In 1960, construction of Altawan Reservoir (station 11AB089) and Spangler Irrigation Project (station 11AB060) on Lodge Creek made an operational division of flow on this tributary necessary by 1961.

During the period March 1 to October 31, twice-monthly computations of the natural flow of Lodge Creek, Battle Creek, and the Frenchman River are made to determine each country's share. If use by Canada is in excess of its share, then a delivery of an equivalent quantity of water is made to the United States at the earliest opportunity. When mutually agreed to, the United States or Canada may request that deficit deliveries be delayed to allow for more efficient use of the water.

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 during the irrigation season. Additional computations may be made to account for

significant usages before October 31. Generally, no division of flow is made during winter as flow and use are low and streamflow records are impractical to obtain.

Lyons Creek (station 11AB075) is monitored by Canada, but does not have sufficient use in Canada at this time to warrant an operational division of flow. Total flows from March to October of 57 dam^3 (46 acre-feet) were recorded on Lyons Creek for the year 2010.

Volumes for unmeasured diversions to private irrigation projects in the Lodge Creek, Battle Creek, and Frenchman River basins in Saskatchewan were based on year-end reports provided by the Saskatchewan Watershed Authority, and by Alberta Environment for the Lodge Creek and Battle Creek basins located in Alberta. Lists of reported diversions are contained in Appendix B.

Cypress Hills precipitation for the winter 2009 –2010 was below normal to moderate and this led to a below normal runoff event in the spring of 2010 for the eastern tributaries.

In the Lodge Creek basin the upper reservoirs had capacity for storage, partly due to dam rehabilitation projects in previous years followed by low runoff events. The total combined storage of all seven upper reservoirs was approximately 3 600 dam^3 (2,920 acre-feet) by the end of April with Bare Creek Reservoir accounting for approximately 45% of that storage. Altawan Reservoir began the season nearly empty and was approximately 50% full by the end of April.

Cypress Lake achieved dead storage elevation by May 31 with a net diversion of 6 180 dam^3 (5,010 acre-feet) from Battle Creek. The net diversion to Cypress Lake during the March 1 to May 31 period was determined after accounting for 3 590 dam^3 (2,910 acre-feet) diverted to the West Outflow Canal via an excavated trench from the West Inflow Canal. The water diverted through the excavated trench provided a partial irrigation to Vidora and Consul projects. Another 8 800 dam^3 (7,130 acre-feet) was diverted to Cypress Lake by May 31 from the Frenchman River basin through the Belanger Creek Diversion Canal.

In the Frenchman River basin Huff Lake was at one third of its full supply level at the start of the spring season and Newton Lake was at 15% of its capacity. Both reservoirs were full by April 30 as was Eastend Reservoir.

Beginning in 2010 all net reservoir evaporation computations in the eastern tributaries of the Milk River were made using a modified Penman's equation. Also in 2010, an acoustic velocity meter

(AVM) was installed at Huff Lake Pumping Canal. The AVM results correlated well with the conventional methodology and will be used to compute records beginning in 2011.

Approximately one-half of a normal irrigation was achieved on the Vidora and Consul projects by utilizing water directly from Battle Creek with the Vidora, Richardson, and McKinnon projects all receiving some water in 2010. The low water levels in Cypress Lake at the end of May made irrigation by pump for the Consul Projects infeasible later in the 2010 season. The Frenchman River projects had enough water for two complete irrigations. The Spangler irrigation project in the Lodge Creek basin operated for one irrigation spanning periods 6 and 7.

Beginning in June, several significant rainfall events occurred in the Battle Creek basin. The basin recorded unseasonably high flow volumes during the summer of 2010 and these flow volumes persisted until the end of the apportionment period at the end of October. The upper Missouri River basin also had high flow volumes and users of Battle Creek water in the State of Montana thought it a misuse of this normally scarce resource to let these waters pass through the system with relatively no benefit or perhaps even a cost. The water could be managed in a more beneficial manner by storing it upstream in Cypress Lake with minimal consequence to present downstream interests in the United States and with potential for use of the water at a future time.

To this end, the State of Montana requested on September 16, 2010 that waters in excess of 25 ft^3/s (0.71 m^3/s) delivered at the International Boundary be stored in Cypress Lake, Saskatchewan, Canada. In keeping with the spirit of the “Letter of Intent” to provide the greatest benefit to both countries, the Field Representatives for the Accredited Officers provided a supplemental governance agreement for the eastern tributaries of the Milk River for the 2010 season.

The Battle Creek apportionment calculation, as shown in Table 12 of Appendix A, was modified to reflect the wishes of both countries for periods 13 through 16. As Battle Creek flow remained high at the end of the season, operators interpreted the supplemental governance agreement to apply for the entire calendar year and operated the Cypress Lake West Inflow Canal for another 19 days. An additional period 17, November 1-19, was included in the apportionment computations, reflecting the supplemental agreement. With no depletion in the Cypress Lake area and with no other depletions recorded in the remainder of the basin, the net depletion in Canada for periods 13 through 17 was zero.

An “Adjusted Deficit to Date” column was inserted into the summary page of the apportionment report for Battle Creek, Table 12 of Appendix A, to adjust the volume of water to meet the 25 ft^3/s

(0.71 m^3/s) flow requirement. Flows at the International Boundary below 25 ft^3/s (0.71 m^3/s) were considered a deficit and flows above 25 ft^3/s (0.71 m^3/s) were considered an excess. If the minimum flow requirement was not met, the difference was entered as a deficit and for flows exceeding the minimum flow requirement an excess was applied to the adjusted deficit to date. An equal sharing arrangement was used when the computed natural flow at the International Boundary was less than 50 ft^3/s (1.42 m^3/s). A deficit occurred in period 14 (September 25 – October 9) when warmer than anticipated temperatures resulted in more water use in the basin then predicted. Gate adjustments were made on October 2 to divert less water to Cypress Lake and provide excess flows to reduce or eliminate the 245 dam^3 (199 acre-feet) deficit. During period 15, the volume of water recorded at the International Boundary exceeded the minimum flow requirement by 181 dam^3 (147 acre-feet) and thereby reduced the deficit to 64 dam^3 (52 acre-feet). In periods 16 and 17, there was more water use in the basin then predicted resulting in an adjusted deficit of 143 dam^3 (116 acre-feet).

The “Letter of Intent” supplemental directive implemented this season permitted an additional volume of 5 870 dam^3 (4,760 acre-feet) to be stored in Cypress Lake for future use by November 30, 2010.

Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2009, 2010, and 2000-2009 Mean

Figure 3a. Altawan Reservoir

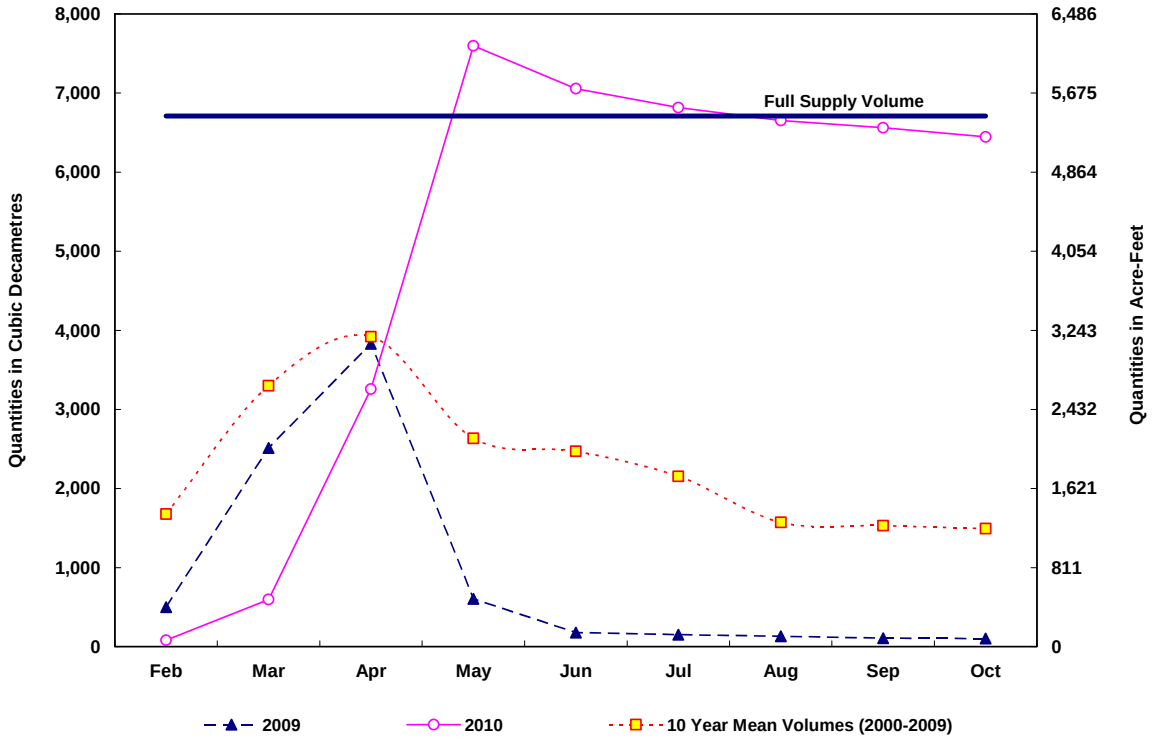


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2009, 2010, and 2000-2009 Mean

Figure 3b. Cypress Lake

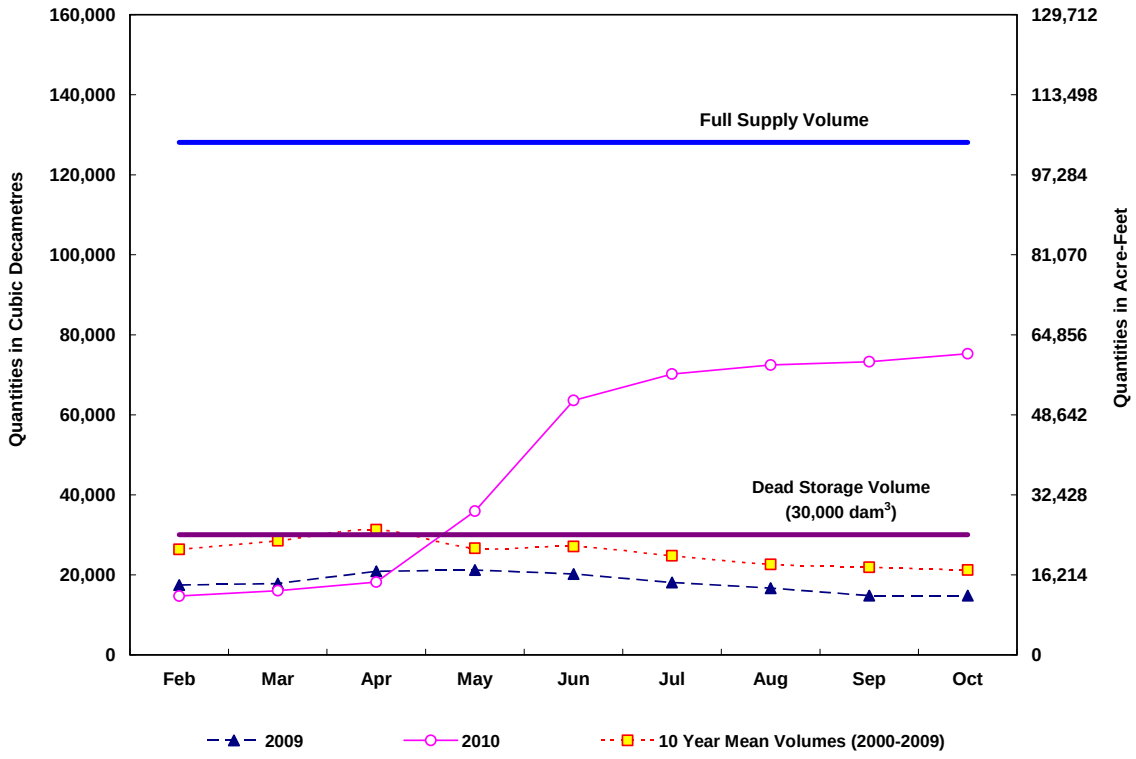


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2009, 2010, and 2000-2009 Mean

Figure 3c. Eastend Reservoir

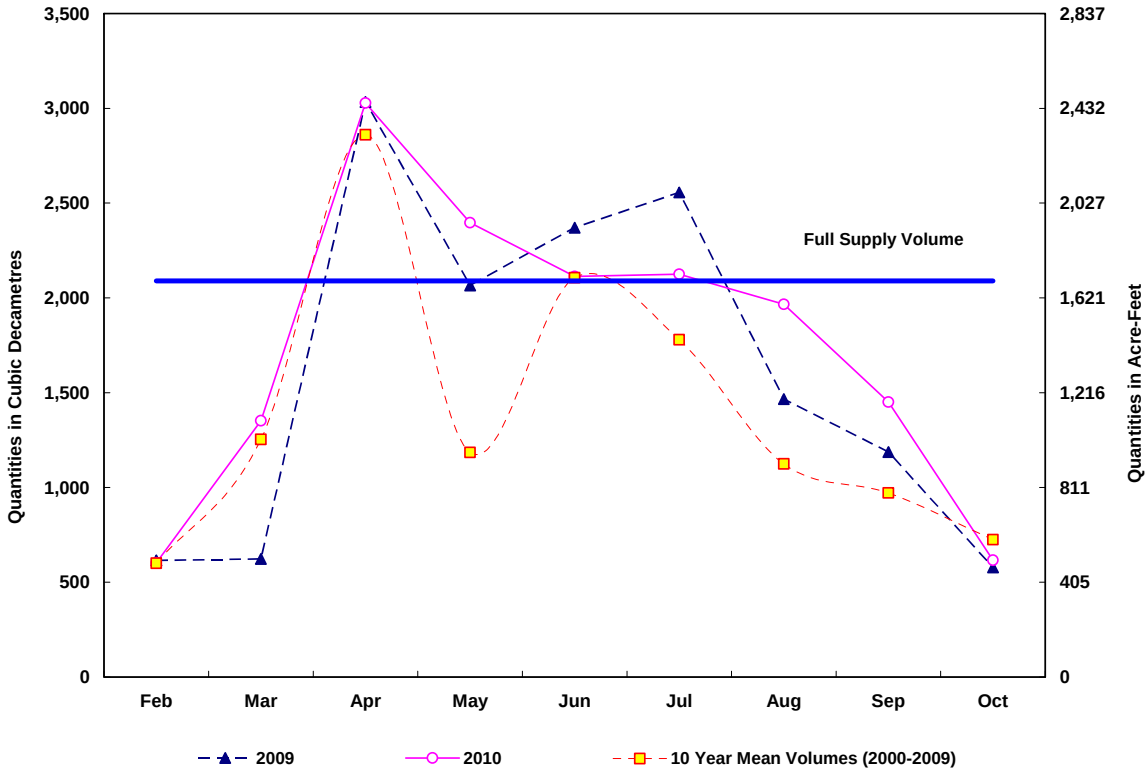
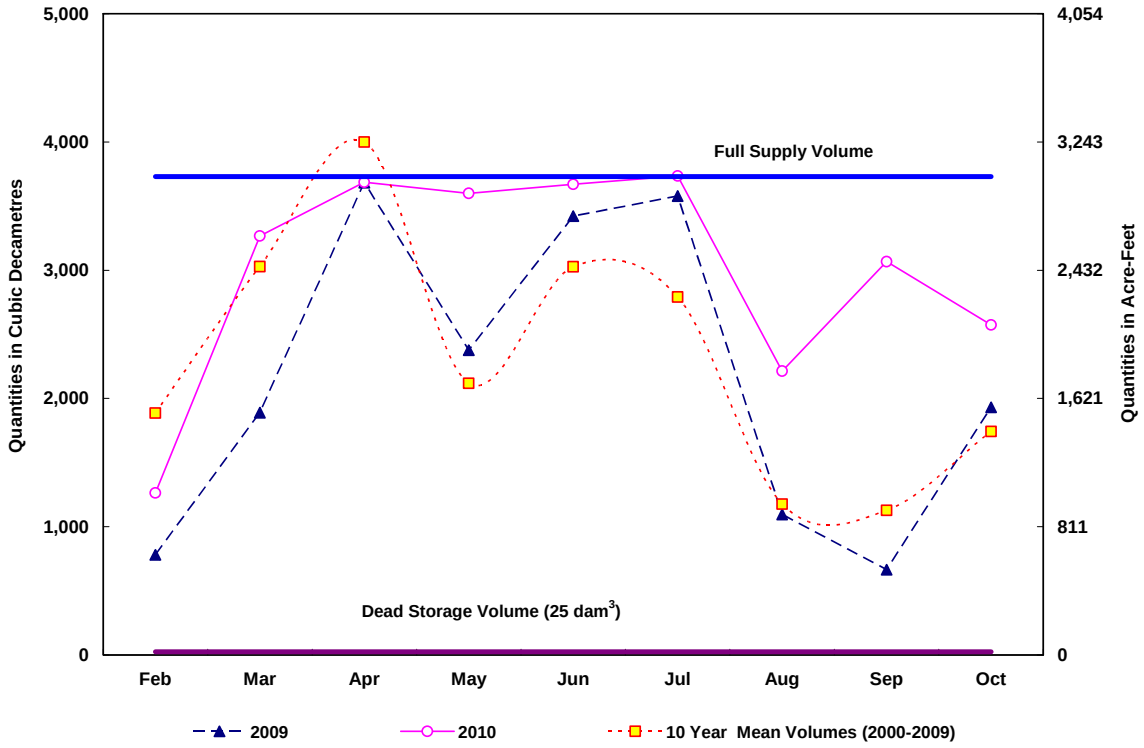


Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2009, 2010, and 2000-2009 Mean

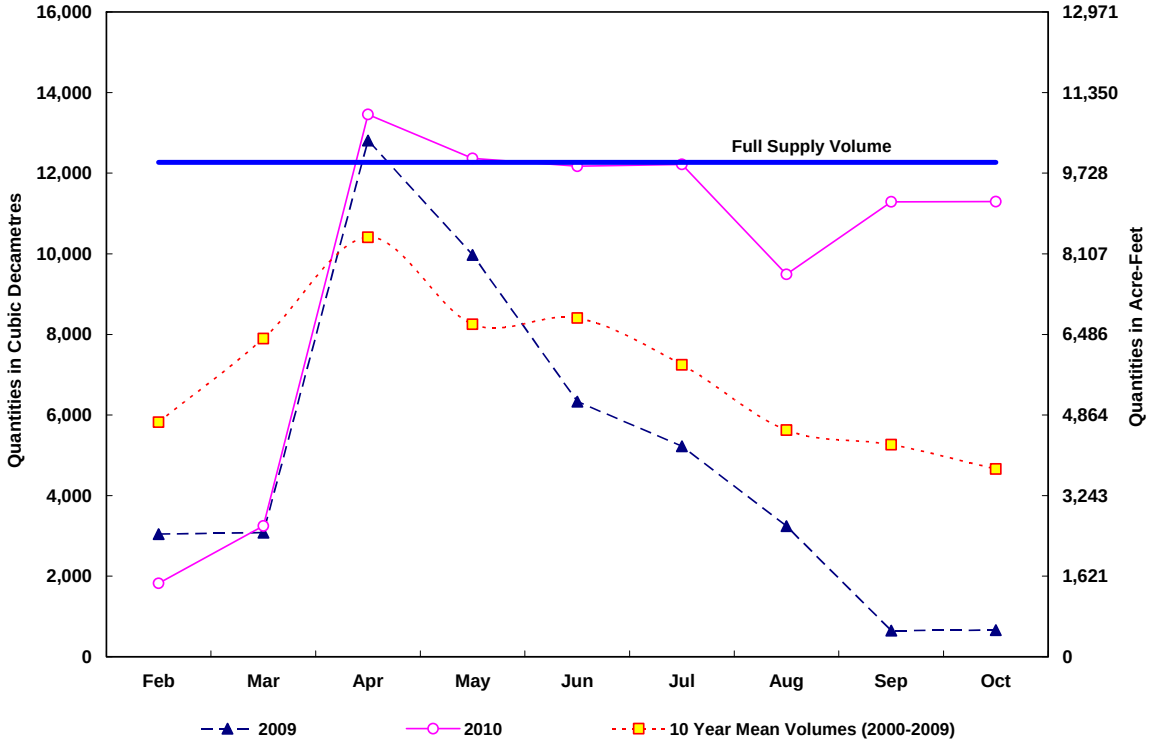
Figure 3d. Huff Lake



Huff Lake stage-storage table was revised in 2004, increasing the dead storage and decreasing the full supply storage volumes from previous years.

Figure 3. Reservoirs in Lodge Creek, Battle Creek, and Frenchman River Basins
Month-End Contents: 2009, 2010, and 2000-2009 Mean

Figure 3e. Newton Lake



LODGE CREEK

The computed natural flow of Lodge Creek at the International Boundary from March 1 to October 31, 2010 was 41 600 dam^3 (33,700 acre-feet). This volume is 149 percent of the average natural flow of the previous 60 years of record. Each country is entitled to 50 percent of the natural flow, or 20 800 dam^3 (16,900 acre-feet) for the irrigation season. A total flow of 23 000 dam^3 (18,600 acre-feet) was recorded at Lodge Creek below McRae Creek at the International Boundary (station 11AB083) from March 1 to October 31. This volume was 111 percent of the United States allotment.

Deficit deliveries were recorded for 6 of the 16 division periods during the irrigation season. An outstanding deficit of 3 dam^3 (2 acre-feet) remained at the end of October 2010.

The division of the Lodge Creek natural flow is summarized in Tables 3 and 3A and in Figure 4, which follow. The detailed computation of the natural flow is given in Table 10 and the historical summary is given in Table 11, both in Appendix A.

Table 3: Summary of Lodge Creek Division for 2010*
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 15	0	0	0		
MAR 16 – MAR 31	458	229	0		229
APR 1 - APR 15	1,124	562	0		562
APR 16 - APR 30	3,121	1,560	0		1,560
MAY 1 - MAY 15	8,012	4,006	1,008		2,998
MAY 16 - MAY 31	7,580	3,790	5,185	1,395	
JUNE 1 - JUNE 15	3,175	1,587	2,521	934	
JUNE 16 - JUNE 30	17,281	8,641	13,393	4,752	
JULY 1 - JULY 15	693	346	754	408	
JULY 16 – JULY 31	133	66	93	27	
AUG 1 - AUG 15	19	10	19	9	
AUG 16 - AUG 31	14	7	5		2
SEP 1 - SEP 15	2	1	2	1	
SEP 16 - SEP 30	1	1	1		
OCT 1 - OCT 15	5	2	0		2
OCT 16 - OCT 31	0	0	0		
TOTAL	41,617	20,808	22,981		

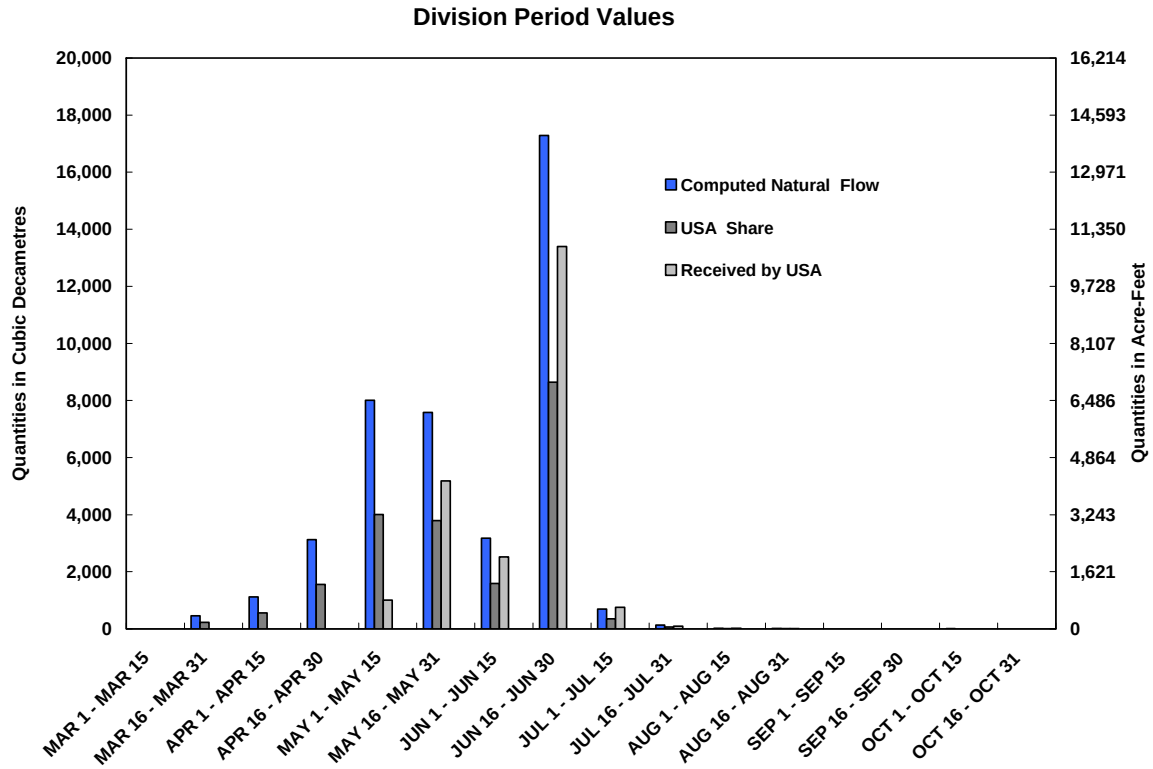
* This is a summary of data from Table 10, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

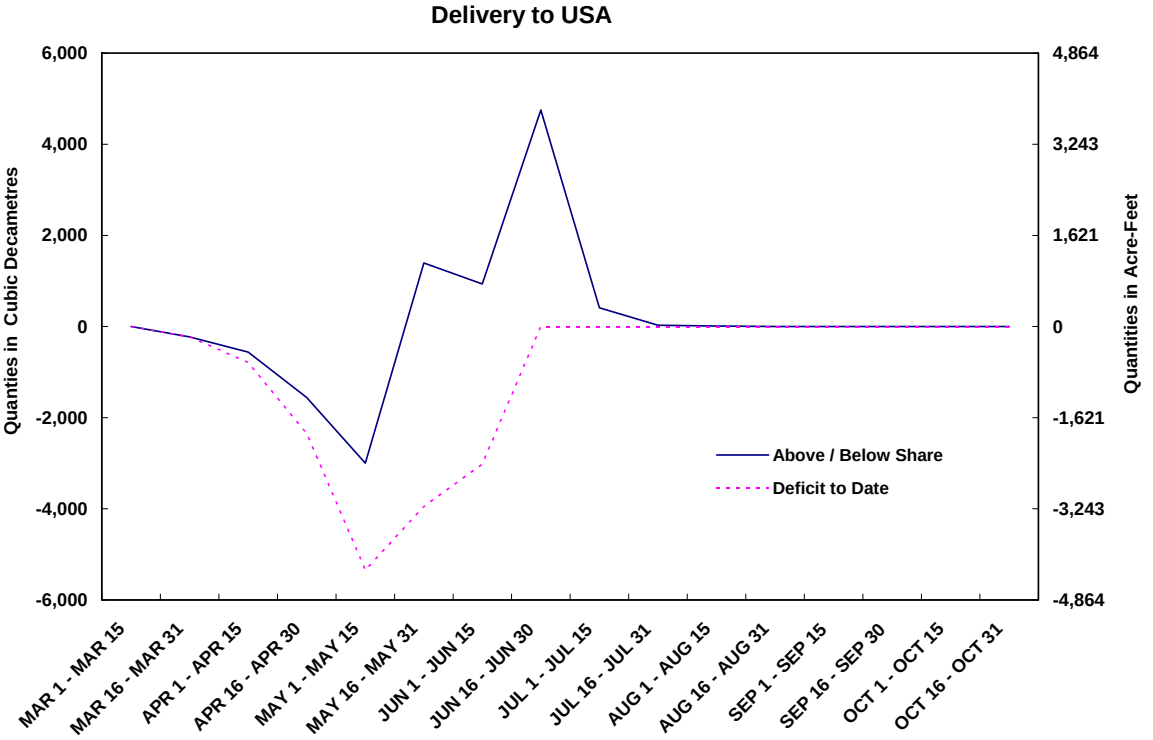
Table 3A: Summary of Lodge Creek Division for 2010*
Quantities in Acre-Feet

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 15	0	0	0		
MAR 16 - MAR 31	371	186	0		186
APR 1 - APR 15	911	456	0		456
APR 16 - APR 30	2,530	1,265	0		1,265
MAY 1 - MAY 15	6,495	3,248	817		2,430
MAY 16 - MAY 31	6,145	3,073	4,203	1,131	
JUNE 1 - JUNE 15	2,574	1,287	2,044	757	
JUNE 16 - JUNE 30	14,010	7,005	10,858	3,853	
JULY 1 - JULY 15	562	281	611	331	
JULY 16 - JULY 31	108	54	75	22	
AUG 1 - AUG 15	15	8	15	8	
AUG 16 - AUG 31	11	6	4		2
SEP 1 - SEP 15	2	1	2	1	
SEP 16 - SEP 30	1	1	1		
OCT 1 - OCT 15	4	2	0		2
OCT 16 - OCT 31	0	0	0		
TOTAL	33,739	16,869	18,631		

* All values are conversions of data from Table 3. Totals and shares may not add or subtract exactly as a result of rounding.

Figure 4. Lodge Creek Division, 2010





BATTLE CREEK

The computed natural flow of Battle Creek at the International Boundary from March 1 to October 31, 2010 was 66 300 dam^3 (53,700 acre-feet). This volume is 227 percent of the average natural flow of the previous 70 years of record. Each country is entitled to 50 percent of the natural flow or 33 150 dam^3 (26,850 acre-feet) for the irrigation season. A total flow volume of 27 300 dam^3 (22,100 acre-feet) was recorded at Battle Creek at International Boundary (station 11AB027) from March 1 to October 31. This volume was 82 percent of the United States allotment.

Deficit deliveries were recorded in 11 of the 16 division periods during the irrigation season. A late season diversion to Cypress Lake resulted in the addition of a November 1 to November 19 flow apportionment period this year.

Several of the deficit deliveries recorded this year resulted from requests by the State of Montana to divert Battle Creek flows into Cypress Lake to reduce the risk of flooding in Montana and to allow for most beneficial use of water by both countries, in keeping with the spirit of the 1909 Boundary Waters Treaty (see Annex D for details).

In consultation with water managers on both sides of the International Boundary, the Field Officers agreed to adjust the balance of surplus and deficit deliveries for the 2010 irrigation season as follows:

1) Accumulated deficit incurred by Canada at end of the June 9 division period was carried forward to July 25 at the State of Montana's request for flood protection.
2) Deficits incurred by Canada during division periods between September 10 and November 19 were adjusted based upon the State of Montana's assertion that flow in excess of 25 ft^3/s (0.71 m^3/s) at the international boundary should be diverted by Canada into Cypress Lake for three reasons:
    a. Montana could not store the water,
    b. Water stored in Cypress Lake would be of great benefit locally, and
    c. Volume of stored water would be insignificant to downstream users in the United States.
3) An equal sharing arrangement was used when the computed natural flow at the International Boundary was less than 50 ft^3/s (1.42 m^3/s).

As a result of the above adjustments, the deficit outstanding on November 19, 2010 was 143 dam^3 (116 acre-feet). An additional 976 dam^3 (791 acre-feet) was diverted to Cypress Lake after October 31, while 765 dam^3 (620 acre-feet) was delivered at the International Boundary.

The division of the Battle Creek natural flow is summarized in Tables 4 and 4A and in Figure 5, which follow. The detailed computation of the natural flow is given in Table 12 and the historical summary is given in Table 13, both in Appendix A.

Table 4: Summary of Battle Creek Division for 2010* 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 25	482	241	123		118
MAR 26 - APR 9	2,527	1,264	514		750
APR 10 - APR 24	2,597	1,299	958		341
APR 25 – MAY 9	4,572	2,286	2,045		241
MAY 10 - MAY 25	7,498	3,749	3,105		644
MAY 26 - JUNE 9	7,793	3,897	4,723	826	
JUNE 10 - JUNE 24	11,234	5,617	3,813		1,804
JUNE 25 - JULY 9	9,889	4,945	1,870		3,075
JULY 10 - JULY 25	3,799	1,900	904		996
JULY 26 – AUG 9	2,264	1,132	1,775	643	
AUG 10 - AUG 25	3,933	1,967	1,509		458
AUG 26 - SEP 9	2,183	1,092	1,934	842	
SEP 10 - SEP 24	2,622	1,311	1,931	620	
SEP 25 - OCT 9	2,211	1,106	672		434
OCT 10 - OCT 25	2,037	1,019	1,160	141	
OCT 26 - OCT 31	662	331	288		43
NOV 1 – NOV 19	1,602	801	765		36
TOTAL	67,905	33,957	28,089		

* This is a summary of data from Table 12, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

Note: The following is a summary of actual and adjusted Battle Creek deficit-to-date deliveries incurred by Canada from Table 12, Appendix A.

Period	Actual (dam^3)	Adjusted (dam^3)	
June 10 – June 24	-3 072	-1 268	*
June 25 – July 9	-6 147	-1 268	*
July 10 – July 25	-7 143	-1 268	*
July 26- Aug 9	-6 500	-625	
Aug 10 – Aug 24	-6 958	-1 083	
Aug 25 – Sep 9	-6 116	-241	
Sep 10 – Sep 24	-5 496	0	**
Sep 25 – Oct 9	-5 930	-245	**
Oct 10 – Oct 25	-5 789	-64	**
Oct 26 – Oct 31	-5 832	-107	**
Nov 1 – Nov 19	-5 868	-143	**

* The deficit incurred by Canada prior to June 10 was carried forward at the State of Montana's request for flood protection.

** The deficit incurred by Canada was adjusted at State of Montana's request for a minimum flow delivery of 25 ft^3/s (0.71 m^3/s) at the international boundary with intent that excess flows be diverted to Cypress Lake. An equal sharing arrangement was used when the computed natural flow was less than 50 ft^3/s (1.42 m^3/s).

Table 4A: Summary of Battle Creek Division for 2010*
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 25	391	195	100		96
MAR 26 – APR 9	2,049	1,025	417		608
APR 10 - APR 24	2,105	1,053	777		276
APR 25 – MAY 9	3,707	1,853	1,658		195
MAY 10 - MAY 25	6,079	3,039	2,517		522
MAY 26 - JUNE 9	6,318	3,159	3,829	670	
JUNE 10 - JUNE 24	9,107	4,554	3,091		1,463
JUNE 25 - JULY 9	8,017	4,009	1,516		2,493
JULY 10 - JULY 25	3,080	1,540	733		807
JULY 26 - AUG 9	1,835	918	1,439	521	
AUG 10 – AUG 25	3,188	1,595	1,223		371
AUG 26 - SEP 9	1,770	885	1,568	683	
SEP 10 - SEP 24	2,126	1,063	1,565	503	
SEP 25 - OCT 9	1,792	897	545		352
OCT 10 - OCT 25	1,651	826	940	114	
OCT 26 - OCT 31	537	268	233		35
NOV 1 – NOV 19	1,299	649	620		29
TOTAL	55,051	27,529	22,772		

* All values are conversions of data from Table 4. Totals and shares may not add or subtract exactly as a result of rounding.

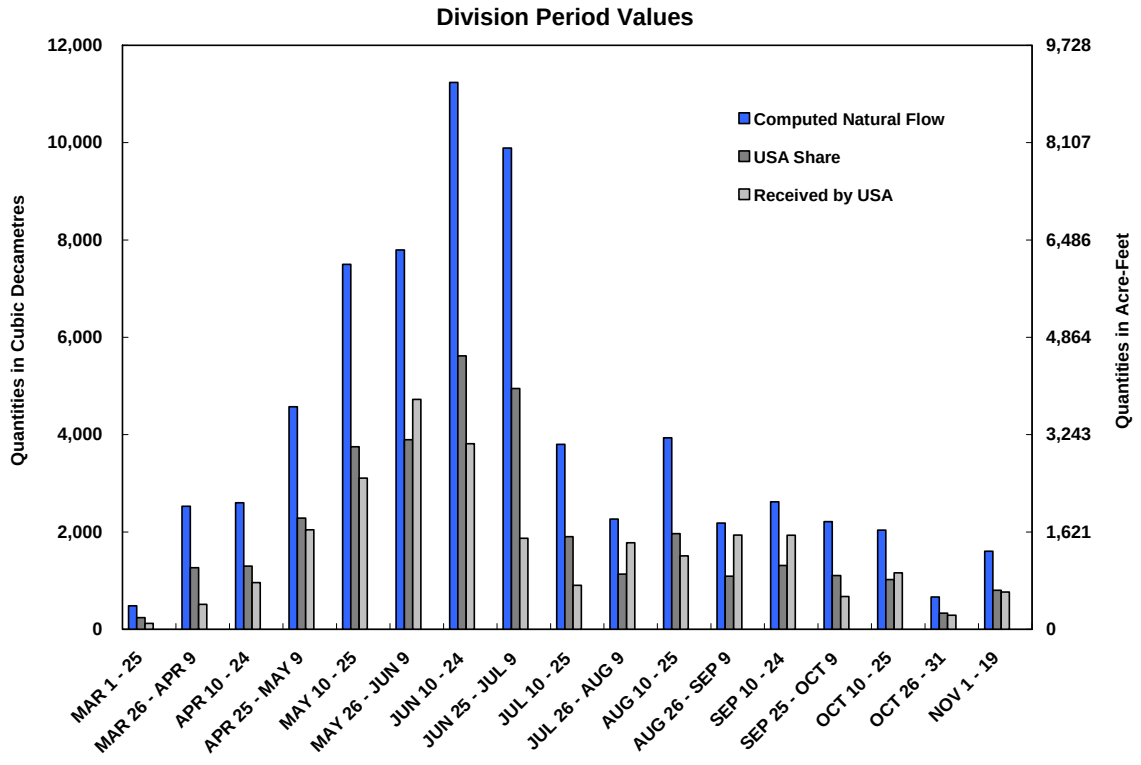
Note: The following are conversions of data from Table 4 summary of actual and adjusted Battle Creek deficit-to-date deliveries incurred by Canada.

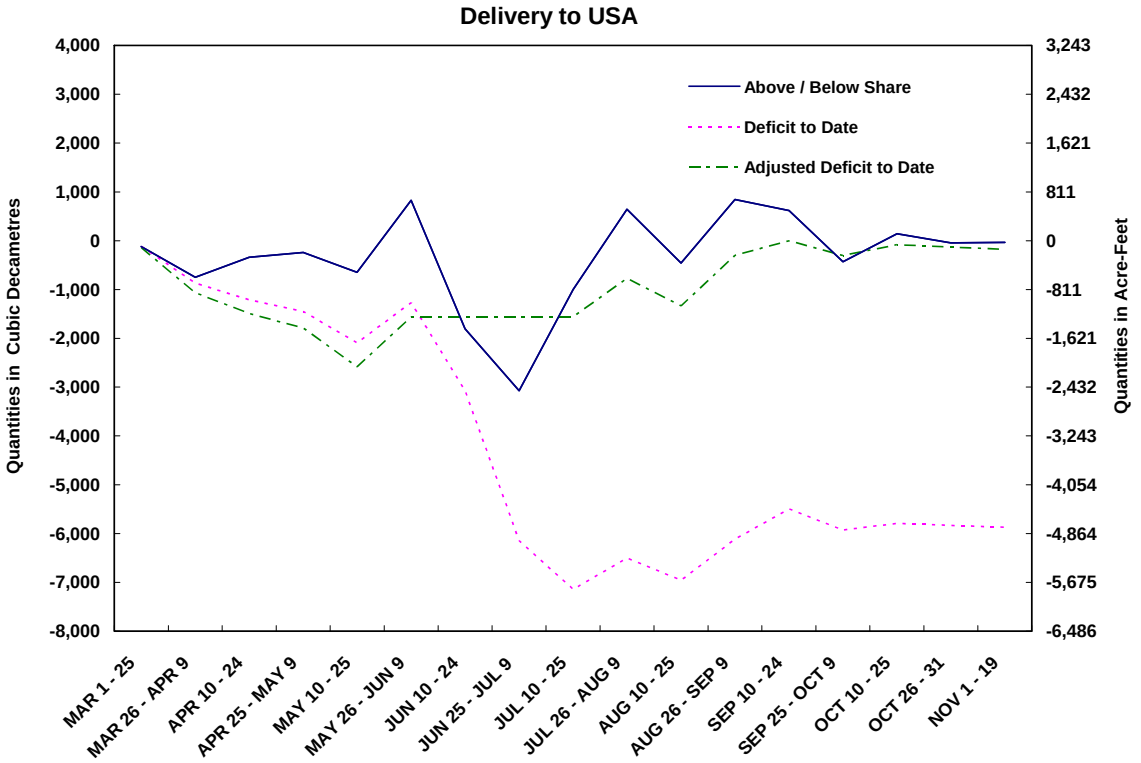
Period	Actual (acre-feet)	Adjusted (acre-feet)	
June 10 – June 24	-2,490	-1,028	*
June 25 – July 9	-4,983	-1,028	*
July 10 – July 25	-5,791	-1,028	*
July 26- Aug 9	-5,270	-507	
Aug 10 – Aug 24	-5,641	-878	
Aug 25 – Sep 9	-4,958	-195	
Sep 10 – Sep 24	-4,456	0	**
Sep 25 – Oct 9	-4,807	-199	**
Oct 10 – Oct 25	-4,693	-52	**
Oct 26 – Oct 31	-4,728	-87	**
Nov 1 – Nov 19	-4,757	-116	**

* The deficit incurred by Canada prior to June 10 was carried forward at the State of Montana's request for flood protection.

** The deficit incurred by Canada was adjusted at State of Montana's request for a minimum flow delivery of 25 ft^3/s (0.71 m^3/s) at the international boundary with intent that excess flows be diverted to Cypress Lake. An equal sharing arrangement was used when the computed natural flow was less than 50 ft^3/s (1.42 m^3/s).

Figure 5. Battle Creek Division, 2010





FRENCHMAN RIVER

The computed natural flow of the Frenchman River at the International Boundary from March 1 to October 31, 2010 was 71 000 dam^3 (57,600 acre-feet). This volume of natural flow is 94 percent of the average natural flow of the previous 70 years of record. Each country is entitled to 50 percent of the natural flow, or 35 500 dam^3 (28,800 acre-feet) for the irrigation season. A total flow of 37 500 dam^3 (30,400 acre-feet) was recorded at Frenchman River at International Boundary (station 11AC041) from March 1 to October 31. This volume was 106 percent of the United States allotment.

Deficit deliveries were recorded in 8 of 16 division periods during the irrigation season. Several late season diversions and reservoir releases warranted the addition of a November 1 to November 30, 2010 division period (period 17) this year.

Operators of Belanger Creek Diversion opened the diversion to Cypress Lake on October 9 while flows remained high at the International Boundary due to a release from Newton Lake. The diversion to Cypress Lake continued until November 25, well after the statutory October 31 apportionment period had ended. This resulted in an additional volume estimated to be 1 110 dam^3 (900 acre-feet) being stored in Cypress Lake.

The total computed natural flow from March 1 to November 30, 2010 was 73 500 dam^3 (59,600 acre-feet). An outstanding deficit of 0 dam^3 (0 acre-feet) remained at the end of November 2010.

The division of the Frenchman River natural flow is summarized in Tables 5 and 5A and in Figure 6, which follow. The detailed computation of the natural flow is given in Table 14 and the historical summary is given in Table 15, both in Appendix A.

Table 5: Summary of Frenchman River Division for 2010* 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 15	134	67	37		30
MAR 16 - MAR 31	3,094	1,547	891		656
APR 1 - APR 15	9,264	4,632	1,417		3,215
APR 16 - APR 30	4,391	2,195	37		2,158
MAY 1 - MAY 15	10,349	5,174	10,295	5,121	
MAY 16 - MAY 31	10,977	5,488	3,921		1,567
JUNE 1 - JUNE 15	7,367	3,684	2,954		730
JUNE 16 - JUNE 30	10,463	5,231	7,697	2,466	
JULY 1 - JULY 15	3,112	1,556	1,623	67	
JULY 16 - JULY 31	1,072	536	603	67	
AUG 1 - AUG 15	1,242	621	1,649	1,028	
AUG 16 - AUG 31	1,443	721	495		226
SEP 1 - SEP 15	3,577	1,789	2,223	434	
SEP 16 - SEP 30	1,502	751	382		369
OCT 1 - OCT 15	1,560	780	1,484	704	
OCT 16 – OCT 31	1,479	739	1,751	1,012	
NOV 1 – NOV 30	2,501	1,250	1,624	374	
TOTAL	73,525	36,761	39,083		

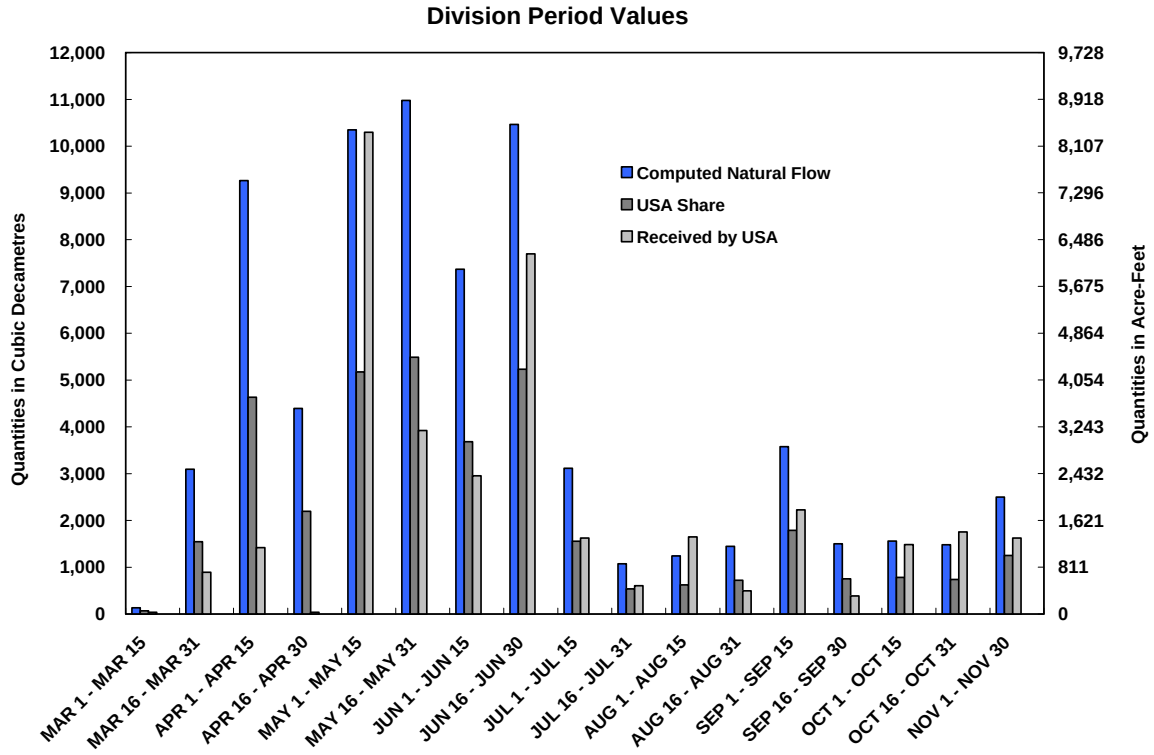
* This is a summary of data from Table 14, Appendix A. Totals and shares may not add or subtract exactly as a result of rounding.

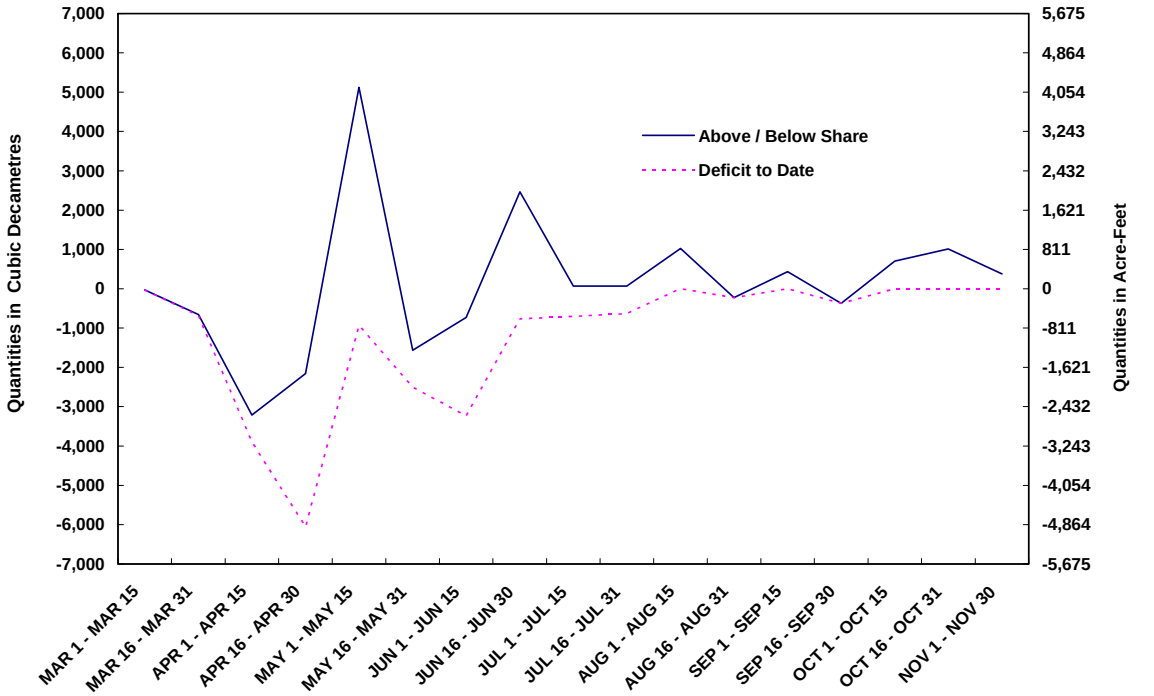
Table 5A: Summary of Frenchman River Division for 2010* Quantities in Acre-Feet

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 15	109	54	30		24
MAR 16 - MAR 31	2,508	1,254	722		532
APR 1 - APR 15	7,510	3,755	1,149		2,606
APR 16 - APR 30	3,560	1,779	30		1,749
MAY 1 - MAY 15	8,390	4,195	8,346	4,152	
MAY 16 - MAY 31	8,899	4,449	3,179		1,270
JUNE 1 - JUNE 15	5,972	2,987	2,395		592
JUNE 16 - JUNE 30	8,482	4,241	6,240	1,999	
JULY 1 - JULY 15	2,523	1,261	1,316	54	
JULY 16 - JULY 31	869	435	489	54	
AUG 1 - AUG 15	1,007	503	1,337	833	
AUG 16 - AUG 31	1,170	585	401		183
SEP 1 - SEP 15	2,900	1,450	1,802	352	
SEP 16 - SEP 30	1,218	609	310		299
OCT 1 - OCT 15	1,265	632	1,203	571	
OCT 16 – OCT 31	1,199	599	1,420	820	
NOV 1 – NOV 30	2,028	1,013	1,317	303	
TOTAL	59,607	29,802	31,685		

* All values are conversions of data from Table 5. Totals and shares may not add or subtract exactly as a result of rounding.

Figure 6. Frenchman River Division, 2010





ANNEX A

1921 Order of the International Joint Commission
Respecting the St. Mary-Milk Rivers

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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, it is provided as follows:

> 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.

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 decrease 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. MAGRATH,
C.D. CLARK,
HENRY A. POWELL,
W.H. HEARST,
MARK A. SMITH.

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ANNEX B

Letter of Intent Respecting the St. Mary - Milk Rivers
Streamflow Transfers

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LETTER OF INTENT
TO BETTER UTILIZE THE WATERS OF THE ST. MARY AND MILK RIVERS

Whereas Article VI of the Boundary Waters Treaty of 1909 states that the St. Mary and Milk Rivers and their tributaries are to be treated as one for the purposes of irrigation and power;

And whereas, the Boundary Waters Treaty of 1909 and the International Joint Commission Order of 1921 authorizes the Reclamation and Irrigation Officers of the United States and Canada (currently designated as the Accredited Officers of the United States and Canada) to make the greatest beneficial use of the waters of the St. Mary and Milk Rivers;

And whereas, Canada finds it beneficial to use more than its share of the Milk River in the June-September period each year to supply water to Canadian Milk River irrigators;

And whereas, the United States finds it beneficial to use more than its share of the St. Mary River in the March-May period each year to supply water to United States Milk River irrigators;

It is therefore ordered and directed by said Accredited Officers or their designates that the United States be allowed to accumulate a deficit on the St. Mary River of up to 4,000 cfs-days (9 800 dam^3) between March 1 and May 31 of each year which, at the discretion of the United States, may be reduced to no less than 2,000 cfs-days (4 900 dam^3) between June 1 and July 15 of each year with surplus deliveries of St. Mary River water, and that Canada be allowed to accumulate a deficit on the Milk River of up to 2,000 cfs-days (4 900 dam^3) between June 1 and September 15 of each year. The incurred deficits on the St. Mary and Milk Rivers can be offsetting and the outstanding deficits as of September 15 will be equalized by October 31 of each year under administration by Field Representatives of the Accredited Officers. Detailed accounting procedures for the computation of deficit and surplus deliveries under this Letter Of Intent are outlined in Appendix A, " Procedures for the Computation of Deficit and Surplus Deliveries to Better Utilize Waters of the St. Mary and Milk Rivers".

In signing this letter, the parties recognize this agreement is within the 1921 Order of the International Joint Commission. Additionally, the parties recognize that this Letter of Intent and Appendix A will form part of the St. Mary - Milk River Procedural Manual.

Termination of this Letter Of Intent will be allowed upon request by either the United States or Canada notifying the other party in writing two months prior to the commencement of the irrigation season (April 1st as specified by the 1921 Order).

Tim Goos
Accredited Officer of Her Majesty
Dated this 8th day of February, 2001

William J. Carswell, Jr. for the
Accredited Officer of the United States
Dated this 8th day of February, 2001

PROCEDURES FOR THE COMPUTATION OF DEFICIT AND SURPLUS DELIVERIES TO BETTER UTILIZE WATERS OF THE ST. MARY AND MILK RIVERS

ST. MARY RIVER

As of January 2001, the accounting procedures for the computation of deficit and surplus deliveries during March 1 through September 15 of each year on the St. Mary River are:

1. During March 1 through May 31 of each year, deficit deliveries from the United States to Canada at the end of each division period will carry over from one division period to another for the year, are cumulative for the year, and are allowed up to a cumulative total of 4,000 cfs-days (9 800 dam^3). Deficit deliveries greater than the allowed cumulative total of 4,000 cfs-days (9 800 dam^3) are to be refunded in the subsequent division period. Surplus deliveries at the end of a division period are not cumulative, cannot be used to reduce the accumulated deficit from previous division periods to below the allowed total deficit of 4,000 cfs-days (9 800 dam^3), and cannot be used as a credit to make up future deficits. Exceptions to these procedures for this period are allowed only if agreed upon in writing by the Field Representative for Canada.

2. During June 1 through July 15 of each year, the United States, at its discretion, may reduce the deficit accumulated in the March 1 through May 31 period to 2,000 cfs-days (4 900 dam^3) by making surplus deliveries of St. Mary River water. The remaining deficit is not refundable until after September 15 of that year unless agreed upon in writing by the Field Representative for Canada.

3. During June 1 through September 15 of each year, deficit deliveries from the United States to Canada at the end of each division are not to be incurred. However, if deficits are incurred, they are to be refunded by surplus deliveries in the subsequent division period or at a time agreed upon by both parties. Surplus deliveries do not carry over from one division period to another, are not cumulative, and cannot be used as a credit to make up future deficits.

4. On September 15 of each year, outstanding deficits are to be determined using the best available data, even though those data may be provisional. Any outstanding deficits as of September 15 are to be equalized by October 31 of each year. Deficit deliveries accumulated by Canada on the Milk River can be used to offset deficit deliveries accumulated by the United States on the St. Mary River.

5. The United States Bureau of Reclamation shall contact Canada (Environment Canada), the United States (U.S. Geological Survey), Montana (Montana Department of Natural Resources and Conservation), and Alberta (Alberta Environment) when they plan to begin deficit deliveries during the March 1 through May 31 period and when they plan to make surplus deliveries to reduce the accumulated deficits to 2,000 cfs-days (4 900 dam^3) during June 1 through July 15. On or about July 1, and again by September 15 of each year, the parties shall participate in a conference call or meeting to discuss refund of remaining deficit deliveries.

MILK RIVER

As of January 2001, the accounting procedures for the computation of deficit and surplus deliveries during March 1 through September 15 of each year on the Milk River are:

1. During March 1 through May 31 of each year, deficit deliveries from Canada to the United States at the end of each division period are not to be incurred. However, if deficits are incurred, they are to be refunded by surplus deliveries in the subsequent division period or at a time agreed upon by both parties. Surplus deliveries do not carry over from one division period to another, are not cumulative, and cannot be used as a credit to make up future deficits.

2. During June 1 through September 15 of each year, deficit deliveries from Canada to the United States at the end of each division period will carry over from one division period to another for the year, are cumulative for the year, and are allowed up to a cumulative total of 2,000 cfs-days (4 900 dam^3). Deficit deliveries greater than the allowed total of 2,000 cfs-days (4 900 dam^3) are to be refunded in the subsequent division period. Surplus deliveries at the end of a division period cannot be used to reduce the deficit accumulated during the June 1 through September 15 period to below the lesser of the allowed total deficit of 2,000 cfs-days (4 900 dam^3) or the outstanding United States' deficit accumulated on the St. Mary River in the March 1 through May 31 period, and cannot be used as credits to make up future deficits. The remaining deficit is not refundable until after September 15 of that year unless agreed upon in writing by the Field Representative for the United States.

3. On September 15 of each year, outstanding deficits are to be determined using the best available data, even though those data may be provisional. Any outstanding deficits as of September 15 are to be equalized by October 31 of each year. Deficit deliveries accumulated by Canada on the Milk River can be used to offset deficit deliveries accumulated by the United States on the St. Mary River.

4. Canada (Environment Canada), the United States (U.S. Bureau of Reclamation and U.S. Geological Survey), Alberta (Alberta Environment) and Montana (Montana Department of Natural Resources and Conservation) shall participate in a conference call or meeting on or about July 1, and again by September 15 of each year to decide on the approach to be used to reconcile outstanding deficit deliveries.

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ANNEX C

Letter of Intent Respecting the Eastern Tributaries of the Milk River Streamflow Transfers

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LETTER OF INTENT

TO
BETTER UTILIZE THE WATERS OF THE EASTERN TRIBUTARIES OF THE MILK RIVER

Whereas, the Boundary Waters Treaty of 1909 and the International Joint Commission Order of 1921 authorize the Accredited Officers of the United States and Canada to make the greatest beneficial use of the waters of the St. Mary and Milk Rivers, and the Eastern Tributaries of the Milk River;

And, whereas the Order of 1921 identifies an equal-sharing arrangement as the basis for apportionment on the Eastern Tributaries;

And, whereas apportionment procedures have been developed and accepted identifying the manner in which the equal-sharing arrangement is to be met;

And whereas, Canada and the United States have identified that beneficial use of the respective shares of the waters of both countries may be improved by providing for increased flexibility in the application of the accepted procedures;

It is therefore ordered and directed by the Accredited Officers that:

1. Acceptable means by which to provide increased flexibility and benefit may include:

   For all formally apportioned Eastern Tributaries

   a. Management of deficit deliveries to allow for prolonged periods of deficit storage in Canadian reservoirs in the Province of Saskatchewan, interim partial deficit discharge, and release rates coordinated with downstream Montana needs and uses where such operations would provide mutually determined and incidental benefits.

   For the Frenchman River Tributary

   b. Notwithstanding that reasonable water-management operations will be made by Canada to balance outstanding deficits, residual season-end deficits of less than 300 dam^3 (240 acre-feet) shall be allowed and forgiven if live-channel flow at the international boundary is anticipated to continue beyond the apportionment season.

For the Lodge/Middle Creek Tributary

c. Notwithstanding that reasonable water-management operations will be made by Canada to balance outstanding deficits, small deficits on the order of 200 dam^3 (160 acre-feet) which arise in the latter apportionment season shall be concluded by mutual agreement, giving due consideration to factors including, but not limited to, available Canadian storage in Saskatchewan reservoirs, existing channel conditions, and beneficial use of the deficit volume. Where it is concluded that a specified deficit volume cannot reasonably and beneficially be offset by a release from Canadian storage, the deficit volume shall be allowed and forgiven.

2. Mutual agreement for the extent and application of Clause 1 above shall be determined by designates of Montana Department of Natural Resources and Conservation (DNRC) and the Saskatchewan Watershed Authority. The intended actions determined by mutual agreement shall be communicated to the Field Representatives for the United States and Canada for approval.

3. Normally accepted calculations of deficit and surplus flows shall continue to determine the apportionment balance.

4. All apportionment balances within the general limits stated in Clause 1 shall be considered resolved at the end of the apportionment season and resulting deficits shall not be carried forward to the next apportionment season.

5. In the event operations arising from Clause 1 cannot be agreed upon between the Montana DNRC and the Saskatchewan Watershed Authority, the original terms of the procedures shall be the default position. Such default may be initiated by request of the Montana DNRC or the Saskatchewan Watershed Authority to the Field Representatives for the United States and Canada.

6. Environment Canada and the U.S. Geological Survey will provide apportionment information to all parties in a timely manner. A list of the parties is included as Annex A and will be updated annually, or more often as required.

7. Termination of this Letter of Intent will be allowed upon request by either the United States or Canada notifying the other party in writing by February 1 of the year of intended termination.

Tim Goos
Accredited Officer of Her Majesty
Dated this 23 day of August, 2007

William J. Carswell Jr. for the
Accredited Officer of the United States
Dated this 11 day of September 2007

ANNEX "A"

CONTACT LIST REGARDING

LETTER OF INTENT –
TO BETTER UTILIZE THE WATERS OF THE EASTERN TRIBUTARIES OF THE MILK RIVER

Name	Organization	Email/Fax	Phone
Sal Figliuzzi	AE	sal.figliuzzi@gov.ab.ca	(780) 427-2621
Werner Herrera	AE	werner.herrera@gov.ab.ca	(403) 381-5992
Russell Boals (F.R.)	ECan	russ.boals@ec.gc.ca	(306) 780-5338
Greg MacCulloch	ECan	greg.macculloch@ec.gc.ca	(403) 292-5409
Whit Wyatt	ECan	whit.wyatt@ec.gc.ca	(306) 780-5023
Marv Cross	Montana DNRC	mcross@mt.gov	(406) 265-5516
Bob L. Larson	Montana DNRC	blarson@mt.gov	(406) 265-5516
Larry Dolan	Montana DNRC	ldolan@mt.gov	(406) 444-6627
Ira Blakley	AESB	ira.blakley@agr.gc.caFax	(306) 299-2041 (306) 299-2040
Ron Magee	AESB	ron.magee@agr.gc.caFax	(306) 298-2050 (306) 298-2131
Larry Verpy	AESB	larry.verpy@agr.gc.caFax	(306) 295-3268 (306) 295-3252
Kevin Wingert	SWA	kevin.wingert@swa.ca	(306) 778-8335
Gord Hagen	SWA	gord.hagen@swa.ca	(306) 778-8266
Rob Wiebe	AESB	robert.wiebe@agr.gc.ca	(306) 778-5025
John Kilpatrick (F.R.)	USGS	jmkilpat@usgs.gov	(406) 457-5902
Norm Midtlyng	USGS	nmidtlyn@usgs.gov	(406) 457-5948

Legend

AE	Alberta Environment
ECan	Environment Canada
Montana DNRC	Montana Department of Natural Resources and Conservation
AESB	Agri-Environment Services Branch
SWA	Saskatchewan Watershed Authority
USGS	United States Geological Survey
F.R.	Field Representative

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ANNEX D

Correspondence Respecting
Flow Apportionment of Battle Creek Waters

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From: MacCulloch,Greg [Cal] [mailto:Greg.MacCulloch@ec.gc.ca]
Sent: Monday, September 13, 2010 4:15 PM
To: Boals.russ@gmail.com; jmkilpat@usgs.gov
Cc: MacCulloch,Greg [Cal]; Cross, Marvin; nmidtlyn; gord.hagen@swa.ca; kevin.wingert@swa.ca; sal.figliuzzi@gov.ab.ca; werner.herrera@gov.ab.ca; Wyatt,Whit [Reg]; Wagner-Watchel,Jerry [Cal]
Subject: Battle Creek deficit accounting for 2010

The Eastern Tributaries Technical Working Group (TWG) met today to discuss the Battle Creek allocation imbalance for the 2010 irrigation season.

Background:

A significant high water event beginning in period 7 resulted in action by Canadian water managers at the request of Montana to divert water into Cypress Lake. This action was undertaken to reduce the risk of flooding and to facilitate more beneficial use of the resource in the future by taking advantage of storage potential with the already low water levels in Cypress Lake.

Flows were so high that neither country could benefit from the water in the stream during the flooding; however, water users in both countries recognize the value in diverting water into storage for future use.

Storing water in excess of Canada's share resulted in significant deficits with respect to Canada's obligation to the United States in terms of shares of the natural flow.

At this time Canada is no longer diverting any water into storage and is sending approximately 70 cfs across the boundary in an effort to make up the current deficit.

Montana water users have stated that they only require 25 cfs to cross the border and consider that all flows in excess of that amount should be diverted into Cypress Lake. Montana water user consider it "irresponsible" to not divert water into Cypress Lake storage when the water cannot be put to good use and when storage is available.

Options to manage the most beneficial use of the water:

Montana water users have conveyed to Marv Cross that they would prefer to see water stored in Canadian reservoirs to guard against future water shortages rather than to see the water flow past to no ones' benefit. Montana considers that any water stored in Cypress Lake as being for the common good but does not expect any accounting of the shares of the stored resource; that is, Montana water users forgive any claim on this water.

It needs to be acknowledged that US entitlements to the Battle Creek water extends downstream of Montana in support of water supply and commerce (barge traffic, etc); although these flows are significant in the water scarce areas of the Eastern Tributaries, they may prove insignificant with regards to the Missouri River flow downstream of Montana.

Three options were proposed:
1. Meet obligations as specified in the treaty and clear all deficits.
2. Meet obligations minus flood flow. Flood flow deficits would forgiven by Montana water users in consideration for more beneficial use by placing the water in storage. Under this scenario, deficit would be computed by carrying forward the deficit existing at the end of period 6 (last period prior to the flooding) to the beginning of period 10 (first period following flooding). That is to ensure that deficit and surplus accounting is only considered for times when extraordinary measures were not undertaken to reduce flood risk.

3. Follow the same reasoning as per item 2 but continue to ensure most beneficial use by only releasing 25 cfs across the boundary and allow the deficit to continue to rise. The accrued deficit would be forgiven by Montana.

Actions implemented by the Technical Working Group today:
The Technical Working Group acknowledges that any action must be approved by the IJC Field Officers. However, in consideration of:

- the higher than normal flows currently in the basin,
- opportunities to reverse a decision and still meet Treaty obligations,
- the very real risk unseasonably cold weather that may preclude any decision to operate gates due to the risk of ice formation, (over night lows currently 40 F or 7 C)
- assurances from the State of Montana that their preference is to see the water placed in storage in Cypress Lake.
- the flow at Battle Creek is currently in the 70 cfs range.

In support of this proposal, a letter from the state of Montana to the Field Officers is forthcoming.

The TWG has directed the Co-Chairs to respectfully request approval from the IJC Field Officers to implement option 3 above.

As an interim measure pending your decision and to follow the wishes of the Montana water users, the TWG directed the Province of Saskatchewan to resume flow diversions into Cypress lake at a quantity sufficient to limit flows across the boundary to 25 cfs as long as this is operationally feasible. In absence of a directive from you that this action should be continued it was agreed that diversions would cease on Sept 30, 2010, so that deficits could be reduced with excess flows by the end of October, 2010.

Please feel free to contact us for additional information. We could also be available for a conference call Thursday or Friday this week.

Respectfully submitted on behalf of the Eastern Tributaries Technical Working Group:

Norm Midtlyng	Greg MacCulloch
U.S. Co-Chair	Canadian Co-Chair

Response from Russell Boals, Field Representative for the Accredited Officer of Her Majesty

September 13. 2010, 08:15 PM

Hello John

I have reviewed the discussion and recommendations of the Eastern Trib's Technical Working Group and support the proposed course of action as per Option 3.

I look forward to receiving your comments and considerations.

Sincere regards
Russell

Response from John Kilpatrick, Field Representative for the Accredited Officer of the United States

September 14. 2010, 09:56 AM

Russell,

I have also reviewed the discussion and recommendation from the Eastern Tributaries Technical Working Group (ETTWG). I understand that the recommendation of the ETTWG is the consensus of this group and the water users in Montana. I also understand that this recommendation for the use of the water in Battle Creek provides for the most beneficial use of this limited resource and the greatest benefit to water users in both countries.

I have also briefly reviewed the hydrologic conditions in the Milk and Missouri River Basins to which Battle Creek contributes flow. This review confirmed my impression that the Missouri River basin has been blessed with ample water this past year and flows in the Missouri River may be higher than normal this winter as the U.S. Army Corps of Engineers tries to ensure that ample storage is available to control runoff next spring. Additional flows from Battle Creek would likely not be stored in anticipation of next summer's water needs, but more likely would just be released to the Gulf of Mexico. In addition, flows in the Milk River are at least an order of magnitude larger than normal (median flow for this day). Therefore, Battle Creek flows are unlikely to be put to any beneficial use in the reach of Milk River downstream from its confluence with Battle Creek.

In view of these observations, I also support the proposed course of action recommended by the ETTWG, described in the document provided by the Co-Chairs as option 3.

As always, the cooperative spirit displayed by all parties involved in the ETTWG has led to a course of action that allows for the most beneficial use of the limited water resources in the area.

The ETTWG should be commended for their cooperative spirit and excellent work.

John

September 14, 2010, 09:04 PM

Gentlemen,

I received a phone call on yesterday's memo that demonstrates that the memo provides for some opportunity to be misconstrued so I want to clear this up. Two items:

1. We did state that Montana would forgive any deficits accumulated. Of course, as the treaty is between sovereign nations we should have written that "Montana recommends to the IJC that the deficits be forgiven".

2. The chronology of the discussion regarding Montana flood protection and approval of diversions was unclear and appears to say that the decision to store water in excess of Canadian entitlements was done solely at the request of the State of Montana. This was not the case. Had Canada's actions to store water in excess of entitlements solely at the request of the State of Montana, then the second option presented should be challenged as deficits accrued to the end of period six would have easily been paid from surplus flows due to the flood. What did occur was that the system was operated in Saskatchewan to first protect infrastructure and property in Canada during June 17-18, 2010. As time progressed and water remained high concern was raised that water need be released to Montana to make up the deficit incurred by Canadian operations to protect against domestic flood damage. Around June 25-26, 2010, the State of Montana was consulted and they advised that the best use of the water would be to continue to make use of the available storage in Cypress Lake rather than risk flooding in Montana particularly since no beneficial storage opportunities below the international boundary existed. This chronology of events is important to understand the proposed Option 2 but should not impact the decision to adopt Option 3.

I hope this clarifies the situation; I apologize for the confusion.

Best regards,

Greg MacCulloch
ETTWG
Co-Chair for Canada

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

BRIAN SCHWEITZER
GOVERNOR

DIRECTOR'S OFFICE (406) 444-2074
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STATE OF MONTANA

WATER RESOURCES DIVISION (406) 444-6601
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1424 9TH AVENUE
PO BOX 201601
HELENA, MONTANA 59620-1601

September 16, 2010

John Kilpatrick, Director
MT Water Science Center
U.S. Geological Survey
3162 Bozeman Ave.
Helena, MT 59601

Russell Boals
Prairie and Northern Region
Environment Canada
300-2365 Albert Street
Regina, Saskatchewan
Canada S4P 4K1

RE: Disbursement of Battle Creek Water

Dear John and Russell:

I am writing in support of the Eastern Tributaries Working Group's (ETTWG) recommendation that Battle Creek flows in excess of 25 cfs be diverted to Cypress Lake during the remainder of the 2010 water year. It is my understanding that the ETTWG's recommendation provides for the most beneficial use of this limited resource and the greatest benefit to water users in both countries. I also understand that Montana's Battle Creek water users believe 25 cfs is sufficient for any late irrigation and stock water needs and support the ETTWG's recommendation. The State of Montana is aware that this action would result in deficit water deliveries at the International Boundary by Saskatchewan and that these deficit deliveries would be forgiven.

Sincerely,

Paul Azevedo,
Water Management Bureau Chief

STATE WATER PROJECTS BUREAU (406) 444-6646
WATER MANAGEMENT BUREAU (406) 444-6637
WATER OPERATIONS BUREAU (406) 444-0860
WATER RIGHTS BUREAU (406) 444-6610

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ANNEX E

Conversion Factors

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FACTORS FOR CONVERSION BETWEEN INCH-POUND UNITS AND INTERNATIONAL SYSTEM (SI) UNITS

Since 1975, the Report to the International Joint Commission on the Division of the Waters of the St. Mary and Milk Rivers has used dual units (SI and inch-pound).

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

1 cfs-day = 86,400 cubic feet
1 acre-foot = 43,560 cubic feet
1 cfs-day = 1.9835 acre-feet

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

1 dam^3 = 1 000 cubic metres
1 cubic metre = 35.315 cubic feet
1 dam^3 = 35,315 cubic feet
1 acre-foot = 1.2335 dam^3
1 cfs-day = 2.4466 dam^3
1 dam^3 = 0.8107 acre-feet

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ANNEX F

List of Gauging Stations

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INTERNATIONAL GAUGING STATIONS OPERATED JOINTLY
BY
THE UNITED STATES AND CANADA
ST. MARY AND MILK RIVER BASINS
2010

Stations listed in downstream order

Map Index	Station Name
	ST. MARY RIVER BASIN
5015500	Lake Sherburne at Sherburne. Montana
5018000	St. Mary Canal at St. Mary Crossing near Babb, Montana
05AE027	St. Mary River at International Boundary
	MILK RIVER BASIN
6133500	N. Fork Milk River above St. Mary Canal near Browning, Montana
11AA001	North Milk River near International Boundary
11AA025	Milk River at Western Crossing of International Boundary
11AA005	Milk River at Milk River, Alberta
11AA031	Milk River at Eastern Crossing of International Boundary
	LODGE CREEK TRIBUTARY BASIN
11AB089	Altawan Reservoir near Govenlock
11AB060	Spangler Ditch near Govenlock
11AB009	Middle Creek near Saskatchewan Boundary
11AB001	Middle Creek below Middle Creek Reservoir
11AB108	Middle Creek near Govenlock
11AB008	Middle Creek above Lodge Creek
11AB083	Lodge Creek below McRae Creek at International Boundary
	BATTLE CREEK TRIBUTARY BASIN
11AB102	Gaff Ditch near Merryflat
11AB078	Cypress Lake West Inflow Canal
11AB085	Cypress Lake West Inflow Canal Drain
11AB077	Cypress Lake West Outflow Canal
11AB084	Vidora Ditch near Consul
11AB058	Richardson Ditch near Consul
11AB044	McKinnon Ditch near Consul
11AB018	Nashlyn Canal near Consul
11AB027	Battle Creek at International Boundary
	FRENCHMAN RIVER TRIBUTARY BASIN
11AC064	Belanger Creek Diversion to Cypress Lake
11AC037	Cypress Lake
11AC060	Cypress Lake East Outflow Canal
11AC052	Eastend Canal near Eastend
11AC055	Eastend Reservoir
11AC063	Huff Lake
11AC066	Huff Lake Pumping Canal
11AC065	Huff Lake Gravity Canal
11AC056	Newton Lake
11AC054	Newton Lake Main Canal
11AC041	Frenchman River at International Boundary

GAUGING STATIONS OPERATED INDEPENDENTLY
BY EITHER
THE UNITED STATES OR CANADA
ST. MARY AND MILK RIVER BASINS
2010

*Data for these stations are not included in this report or appendices
**Station not operated in 2010

Map Index	Station Name	Operated by
	ST. MARY RIVER BASIN	
5013900**	Grinnell Cr at Grinnell Glacier near Many Glacier, Montana	U.S.A.
5014300*	Swiftcurrent Creek above Swiftcurrent Lake, at Many Glacier, Montana	U.S.A.
5014500*	Swiftcurrent Creek at Many Glacier, Montana	U.S.A.
5017500*	St. Mary River near Babb, Montana	U.S.A.
5018000*	St. Mary Canal at intake, near Babb, Montana	U.S.A.
05AE043*	St. Mary River at Highway 501, near Kimball, Alberta	Canada
05AE005*	Rolph Creek near Kimball, Alberta	Canada
05AE002*	Lee Creek at Cardston, Alberta	Canada
05AE025*	St. Mary Reservoir near Spring Coulee, Alberta	Canada
05AE026*	Canadian St. Mary Canal near Spring Coulee, Alberta	Canada
05AE021*	MacGrath Irrigation District Canal near Spring Coulee, Alberta	Canada
	MILK RIVER BASIN	
6132200**	South Fork Milk River near Babb, Montana	U.S.A.
11AA028*	Bear Creek near International Boundary	Canada
11AA029*	Miners Coulee near International Boundary	Canada
11AA038	Verdigris Coulee near the Mouth	Canada
6137400**	Big Sandy Creek at reservation boundary, near Rocky Boy, Montana	U.S.A.
FRR*	Fresno Reservoir	U.S.A.
6139500*	Big Sandy Creek near Havre, Montana	U.S.A.
6140500*	Milk River at Havre, Montana	U.S.A.
6142400*	Clear Creek near Chinook, Montana	U.S.A.
FTBELKMT*	Fort Belknap Main Diversion Canal	U.S.A.
ALFVALMT*	Alfalfa Valley Diversion Canal	U.S.A.
ZURICHMT*	Zurich Main Diversion Canal	U.S.A.
PARDISMT*	Paradise Main Diversion Canal	U.S.A.
6151500*	Battle Creek near Chinook, Montana	U.S.A.
HARLEMMT*	Harlem Main Pump Diversion	U.S.A.
HSCM*	Harlem Secondary Pump Diversion	U.S.A.
6154100*	Milk River at Harlem, Montana	U.S.A.
FBCM*	BIA – Fort Belknap Main Diversion Canal	U.S.A.
6154400*	Peoples Creek near Hays, Montana	U.S.A.
6154410*	Little Peoples Creek near Hays, Montana	U.S.A.
6154550*	Peoples Creek below Kuhn Coulee, near Dodson, Montana	U.S.A.
DODM*	Dodson North Canal	U.S.A.
DSCM*	Dodson South Canal	U.S.A.
6155030*	Milk River near Dodson, Montana	U.S.A.
DPCM*	Dodson Pump Diversion	U.S.A.
6155900*	Milk River at Cree Crossing, near Saco, Montana	U.S.A.
NELFDRMT*	Nelson Reservoir Feeder Canal	U.S.A.
NELR*	Nelson Reservoir	U.S.A.
NSCM*	Nelson South Canal	U.S.A.
NNCM*	Nelson North Canal	U.S.A.
6164510*	Milk River at Juneburg Bridge, near Saco, Montana	U.S.A.
6166000*	Beaver Creek below Guston Coulee, near Saco, Montana	U.S.A.
BCHM*	Beaver Creek near Hinsdale, Montana	U.S.A.
GLASGOMT*	Glasgow Main Diversion Canal	U.S.A.
6172310*	Milk River at Tampico, Montana	U.S.A.
6174500*	Milk River at Nashua, Montana	U.S.A.

	LODGE CREEK TRIBUTARY BASIN	
11AB082*	Lodge Creek at Alberta Boundary	Canada
11AB091	Michel 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
11AB114	Middle Creek Reservoir Bedford Outlet	Canada
11AB115	Middle Creek Reservoir Flood Spillway	Canada
	BATTLE CREEK TRIBUTARY BASIN	
11AB020*	Shepherd Ditch near Consul	Canada
11AB075	Lyons Creek at International Boundary	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
6151500*	Battle Creek near Chinook, Montana	U.S.A.
	FRENCHMAN RIVER TRIBUTARY BASIN	
11AC025*	Denniel Creek near Val Marie	Canada
11AC062*	Frenchman River below Newton Lake	Canada
11AC068*	Val Marie Pump No. 1	Canada
	ROCK CREEK TRIBUTARY BASIN	
6169500*	Rock Creek below Horse Creek near International Boundary	U.S.A.
	SAGE CREEK TRIBUTARY BASIN	
11AA026*	Sage Creek at Q Ranch near Wildhorse	Canada

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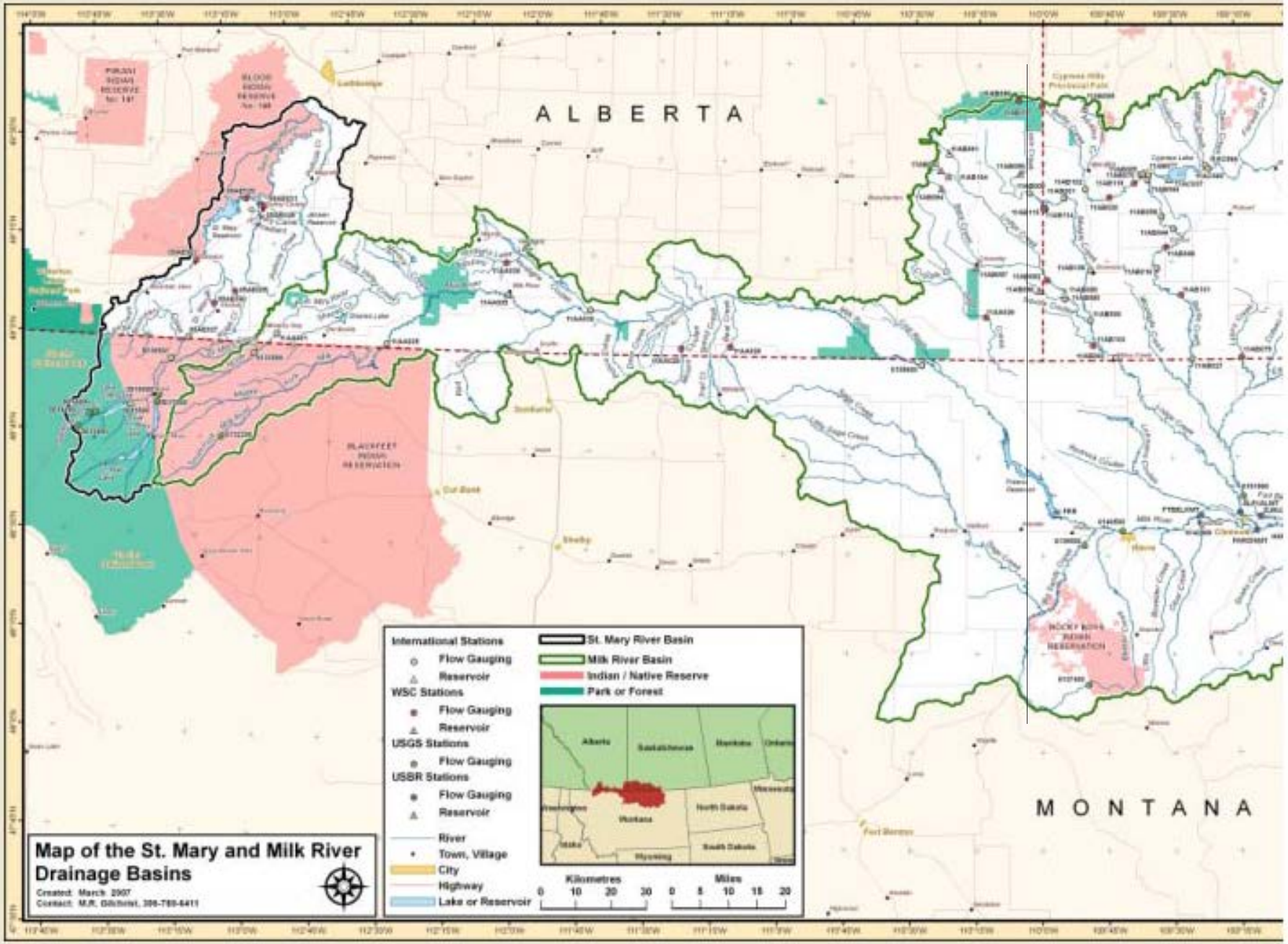
ALBERTA
MONTANA
BLACKFEET INDIAN RESERVATION
ROCKY BOY INDIAN RESERVATION
Map of the St. Mary and Milk River Drainage Basins
Created: March 2007
Contact: M.R. Gilchrist, 306-780-6411
International Stations
Flow Gauging
Reservoir
WSC Stations
Flow Gauging
Reservoir
USGS Stations
Flow Gauging
USBR Stations
Flow Gauging
Reservoir
River
Town, Village
City
Highway
Lake or Reservoir
St. Mary River Basin
Milk River Basin
Indian / Native Reserve
Park or Forest
Alberta
Saskatchewan
Manitoba
Ontario
Montana
North Dakota
Minnesota
Wyoming
South Dakota
Idaho
Washington
Kilometres
0 10 20 30
Miles
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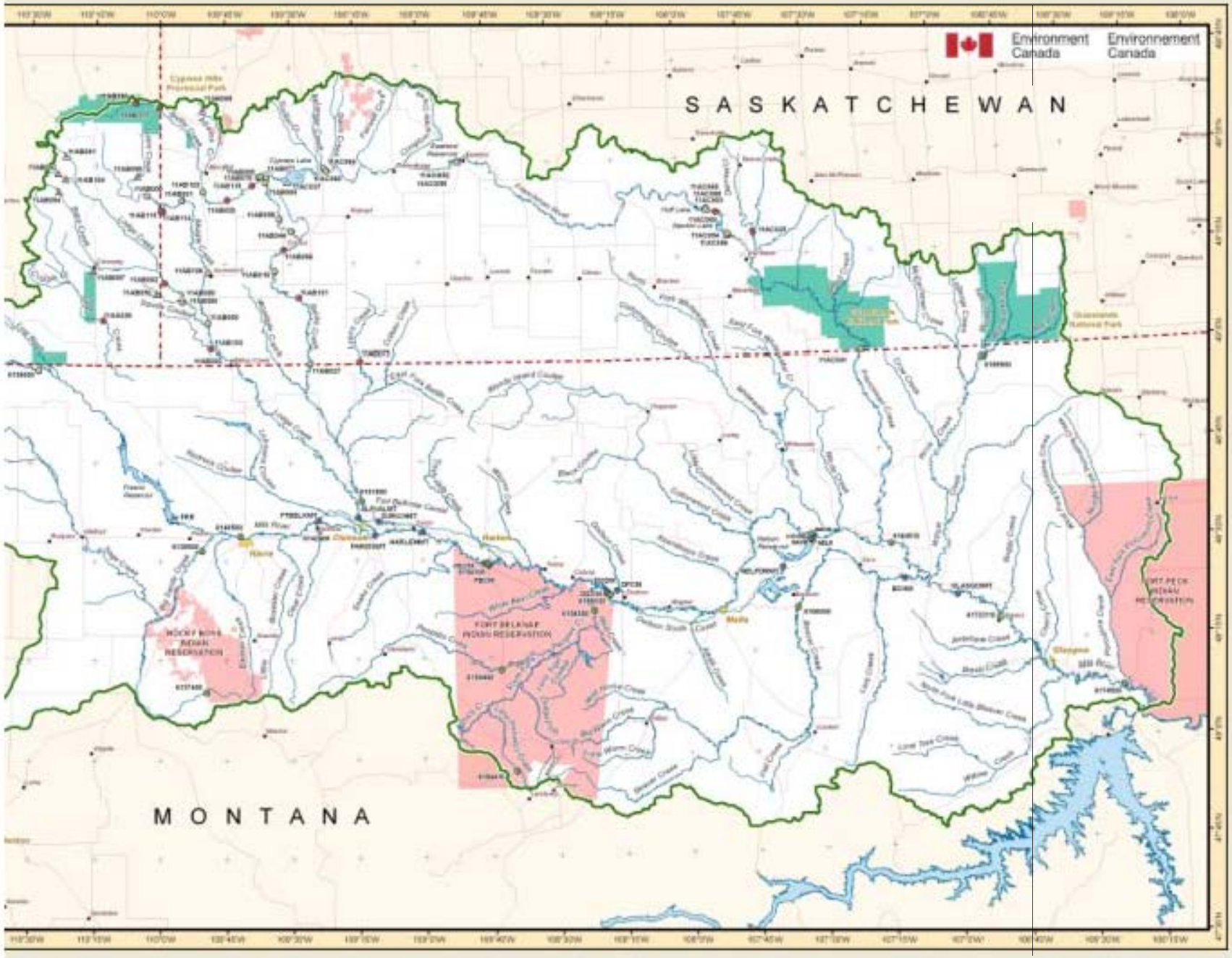
Environment Canada
Environnement Canada
SASKATCHEWAN
MONTANA
Cypress Hills Provincial Park
Grasslands National Park
ROCKY BOYS INDIAN RESERVATION
FORT BELKNAP INDIAN RESERVATION
FORT PECK INDIAN RESERVATION
Havre
Malta
Glasgow