D.N. Moore

Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

G. L. PARKER
representing the United States

and

VICTOR MEEK
representing Canada

1941

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The Honourable, The International Joint Commission,
Washington, D. C., and Ottawa, Canada.

Gentlemen:-

In compliance with the Provisions of Clause 10 of your Order of the 4th of October, 1921, directing the division of the waters of St. Mary and Milk Rivers between the United States and Canada, we are transmitting herewith a report on the operations during the irrigation season ended October 31st, 1941.

Respectfully submitted,

Accredited Officer of the United States.

Accredited Officer of His Majesty.

April 7th, 1942.

Introduction

The field work incidental to the division and administration of the waters of the St. Mary and Milk Rivers in Alberta, Saskatchewan and Montana was conducted, during the irrigation season of 1941, by the same groups of engineers as in previous years.

The Chief Hydraulic Engineer, United States Geological Survey, Mr. G. L. Parker, as accredited officer of the United States, was represented in the field by Mr. A. H. Tuttle, District Engineer, Helena, Montana. Mr. Victor Meek, Controller, Dominion Water and Power Bureau, as accredited officer of His Majesty, was represented by Mr. O. H. Hoover, Acting District Engineer, Calgary, Alberta.

The water of the two rivers was divided between the two countries in accordance with the Order of the Commission dated in Ottawa, Canada, on the 4th day of October, 1921.

The hydrometric data on which this report is based, were obtained in Montana by engineers of the United States Geological Survey under the supervision of Mr. Tuttle; while those from streams and ditches in Canada were collected by engineers of the Dominion Water and Power Bureau, under the direction of Mr. Hoover. The

joint international gauging stations were visited frequently by representatives of both countries.

The annual report was compiled and assembled by Mr. S. G. Dawson, Dominion Water and Power Bureau, Ottawa, Canada.

As the run-off from the St. Mary River basin, during the irrigation season of 1941, was the lowest on record and at all times below the combined capacity of the irrigation facilities on the river, the field engineers constantly kept closely informed as to the natural flow of the river, the water stored or released from storage and the quantity diverted by each country. Any discrepancy in the division was therefore discovered and adjustments made to allow each country its proper share as set forth in the Order of the Commission dated October 4th, 1921. Statements showing the daily division of water were prepared and forwarded to the Superintendent, Lethbridge Section, Canadian Pacific Irrigation System; to the Project Manager, United States Bureau of Reclamation, Malta, Montana; and to the Controller, Dominion Water and Power Bureau, Ottawa, Canada.

Division of Water

The United States St. Mary Canal was in operation from April 22nd to September 24th, water being delivered to the North Branch Milk River on April 23rd.

As the seepage from the canal between the intake and the crossing of the St. Mary River, which this year was 13% of the water diverted at the headgates, is assumed to return directly to the river and eventually become available to Canada, the discharge of 128,150 acre-feet passing in the canal at St. Mary Crossing, during the period April 22nd to September 24th, is considered as the actual quantity diverted from the St. Mary River by the United States. A total of 128,790 acre-feet was delivered to the North Branch Milk River and made available for irrigation in Montana. The slight increase of about 0.5% between the St. Mary River and the Hudson Bay Divide, the end of the canal, indicated that local inflow was practically equal to any losses due to evaporation and seepage.

On October 30th, 1940, 14,400 acre-feet of water remained in Sherburne Reservoir but 7,710 acre-feet were released during November. By March 30th, 1941, 14,360 acre-feet of water were in storage. The maximum storage was reached on June 20th, after which water was released to

supplement the flow of St. Mary River.

As only a small quantity of water was diverted in Canada from Milk River, the natural flow of the river, which is estimated at 16,000 acre-feet for the open water period, from March 1st to October 31st, is considered as being delivered to the United States at Eastern Crossing. The total diversion for irrigation from Milk River in Montana was 152,213 acre-feet.

The quantity delivered to the United States at the International Boundary from the Northern Tributaries of Milk River, during the open water period of 1941, was 112,200 acre-feet. This flow is 64% of that recorded in 1940 and about 84% of the average for the last 14 years.

During the open water period of 1941, Canada stored in Cypress Lake reservoir, 5,650 acre-feet of the flow of Battle Creek, while 16,910 acre-feet was delivered to Montana at the International Boundary; of this amount 13,480 acre-feet occurred before the end of April. In the Frenchman River Basin Canada stored in Cypress Lake reservoir about 6,100 acre-feet of the flow from Davis and Belanger Creeks, and 12,880 acre-feet from the main stream in the reservoirs at East End and Val Marie. From this storage 10,140 acre-feet was released to irrigate lands in the Frenchman River

valley in Canada, while 50,040 acre-feet of the natural flow of Frenchman River was delivered to Montana. The apportionment during the open water season is shown in Table 3.

The Canadian Pacific Railway Canal at Kimball, Alberta, diverted 159,030 acre-feet from the St. Mary River during the period of operation from the 15th of April to the 15th of October, and applied 140,110 acre-feet of this diversion to lands in Southern Alberta during the irrigation season.

The Dominion Water and Power Bureau is dependent to a large extent upon the irrigators themselves for records of the diversions in Canada from the Northern Tributaries of Milk River as, in the majority of cases, the diversions are too small to justify the expense of appointing and paying gauge observers. Consequently the records are believed to be incomplete and of doubtful value. The total diversions from these tributaries in Canada as reported and shown in Table 4 were: from Lodge Creek, 323 acre-feet; from Battle Creek, 8,447 acre-feet; from Frenchman River, 8,268 acre-feet.

Any question as to the proper share of St. Mary River being delivered to either country was decided in the following manner. Record of the daily flow was kept of Swiftcurrent Creek at Many Glacier, but the flow of the other

creeks entering Swiftcurrent Creek above the Sherburne dam were estimated. The total of these creeks gave the inflow into Sherburne reservoir. The losses by evaporation in the reservoir were considered when estimating the flow from the unrecorded small streams. A record of the outflow from the reservoir was kept at the gauging station just below the dam. The difference between the inflow and the outflow showed the quantity of water being stored or released from storage. A record of the daily flow of the United States St. Mary Canal at St. Mary crossing was kept to find the water diverted by the United States and a record of the daily flow of the St. Mary River at Kimball, near the International Boundary, was kept to determine the water being delivered to Canada.

If water was being stored in Sherburne reservoir the natural flow of St. Mary River at the Boundary was obtained by adding the quantity of water stored to that diverted by the St. Mary Canal and that delivered to Canada, a two-day lag was allowed for stored water to reach the Boundary. If stored water was being released, the quantity released was deducted from the combined flow of the St. Mary Canal and that in the river at Kimball to determine the natural flow.

The natural flow having been determined, the share to which each country was entitled was calculated on the following basis:-

(1) When the natural flow of the St. Mary River was 666 cubic-feet per second or less, Canada was entitled, by the ruling of the Commission, to three-fourths of that flow and the United States to one-fourth.

(2) When the natural flow of the St. Mary River was greater than 666 cubic-feet per second, Canada was entitled to 500 cubic-feet per second plus one-half of the increase over 666 cubic-feet per second and the United States was entitled to the remainder.

No actual division was made of the waters of Milk River or its Northern tributaries except those of Frenchman River and Battle Creek.

Water Supply

The precipitation on the foothills and in the mountainous areas forming the headwaters of the St. Mary and Milk Rivers was below normal again during 1941, while that on the prairies tributary to Milk River was also deficient.

In the mountainous areas tributary to the St. Mary River Basin, as shown by the twentieth annual international survey of the snow conditions on the headwaters of the Swiftcurrent Creek, an area considered typical of the head-

waters of St. Mary River, the snow cover was less than for any previous year of record, except 1926, and about 29% of the mean for the last 19 years, while the water content of this snow cover was 24% of the mean. The run-off of 43,220 acre-feet from the area surveyed, during May, June, and July, was about two-thirds of the average for the previous nineteen years.

The natural flow of 334,830 acre-feet of St. Mary River at the Boundary during the irrigation season of 1941, from the first of April to the end of October, was 59% of the average for 38 years of record.

The run-off from the prairies, as indicated by the Northern tributaries of Milk River, was 84% of the average for the last fifteen years.

Twenty-two gauging stations used in the determination of the natural flow of the streams in the St. Mary and Milk River Basins were operated jointly as international gauging stations. The construction of reservoirs and the formation of two irrigation districts in the valley of the Frenchman River in Canada, has necessitated the establishment of a number of new gauging stations on this stream and on Battle Creek.

An appendix to this report gives the results of current meter measurements, the daily gauge heights and the discharge at all the gauging stations operated in the two drainage basins during 1941.

Description of Tables

The Tables following have been prepared to summarize the data on the division and use made of the waters in the St. Mary and Milk River Basins.

Table No. 1 shows the method used to determine the natural flow of St. Mary River during the irrigation season of 1941, the water available for use and used by United States and Canada. In this Table there are four pages for each month from April to October, inclusive.

Page 1 (water stored or released from Sherburne reservoir) shows the daily inflow into and outflow from Sherburne reservoir. The difference gives the quantity of water stored or released from storage. On this sheet the unrecorded inflow is determined by comparison with the recorded flows in Swiftcurrent Creek and with the use of the water levels of Sherburne reservoir to give the gain or loss in storage, after direct application of the evaporation and seepage losses has been made. This estimate is put in the column headed "unrecorded inflow".

Page 2, (determination of the natural flow of the St. Mary River) shows the actual flow of St. Mary River at Kimball near the International Boundary, the quantity of water diverted, stored or released from storage, by the United States and the computed natural flow of St. Mary River, or that flow which would have crossed the Boundary had there been no interference. It has been determined that two days are required for stored water released from Sherburne reservoir, to influence the flow at the Boundary, consequently a two-day lag has been applied to the stored or released water.

Page 3, (water available for use and used by the United States) shows the water available for use and used by the United States under the ruling of the Order of October 4th, 1921, the water diverted and stored and the excess or deficit in the quantity used over the quantity available.

Page 4, (water available for use and used by Canada) shows the natural flow of St. Mary River at the International Boundary, Canada's share by the ruling of the Commission, the actual discharge of St. Mary River at Kimball, which is the quantity available for use by Canada, the quantity used by Canada and the excess or deficit of the quantity received by Canada as compared with the share.

Table 2 is a statement showing the quantity in acre-feet taken each month by each country and the quantity thereof applied to the land, the quantity diverted from the St. Mary River, the loss or waste from canals and the diversions from Milk River in the United States.

Table 3 shows the determination of the natural flow of Frenchman River at the International Boundary. This Table consists of three parts: part 1 shows the quantity used by Canada at East End and the loss or gain in the river between East End and Fifty-mile; part 2 shows the quantity used by Canada at Val Marie and the loss or gain between Fifty-mile and Val Marie; part 3 shows the loss or gain between Val Marie and the International Boundary and the natural flow of Frenchman River at the Boundary.

Table 4 shows the available information on the diversions from the Northern Tributaries of Milk River in Canada.

Table 5 gives the measured diversions from the Northern Tributaries of Milk River in the United States. Smaller diversions have not been measured.

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
APRIL - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	72	64	136	0.3	136	--
2	79	12	91	0.3	91	--
3	77	14	91	0.3	91	--
4	77	14	91	0.3	91	--
5	79	57	136	0.3	136	--
6	77	40	117	0.3	117	--
7	79	40	119	0.3	119	--
8	81	55	136	0.3	136	--
9	93	15	108	0.3	108	--
10	108	15	123	0.3	123	--
11	115	15	130	0.3	130	--
12	113	15	128	0.3	128	--
13	124	15	139	0.4	139	--
14	120	15	135	0.3	135	--
15	122	14	136	0.3	136	--
16	124	22	146	0.3	146	--
17	122	37	159	0.4	159	--
18	108	10	118	0.4	118	--
19	101	11	112	26.0	86	--
20	95	35	130	289.0	--	159
21	99	31	130	329.0	--	199
22	104	13	117	324.0	--	207
23	122	31	153	319.0	--	166
24	155	49	204	331.0	--	127
25	174	39	213	331.0	--	118
26	199	34	233	329.0	--	96
27	226	55	281	326.0	--	45
28	241	58	299	322.0	--	23
29	257	34	291	319.0	--	28
30	295	46	341	319.0	22	--
Total sec-ft.	3838	905	4743	3569.7	2347	1168
Mean	128	30	158	119	78	39
Ac-ft.	7610	1780	9390	7080	4640	2320

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
APRIL - 1941.

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	86	--	60	146	--	146
2	90	--	69	159	--	159
3	95	--	136	231	--	231
4	106	--	91	197	--	197
5	111	--	91	202	--	202
6	118	--	91	209	--	209
7	120	--	136	256	--	256
8	123	--	117	240	--	240
9	127	--	119	246	--	246
10	133	--	136	269	--	269
11	137	--	108	245	--	245
12	154	--	123	277	--	277
13	175	--	130	305	--	305
14	196	--	128	324	--	324
15	210	--	139	349	--	349
16	232	--	135	367	--	367
17	242	--	136	378	--	378
18	269	--	146	415	--	415
19	299	--	159	458	--	458
20	319	--	118	437	--	437
21	379	--	86	465	--	465
22	170	218	--	388	159	229
23	225	288	--	513	199	314
24	276	293	--	569	207	362
25	319	306	--	625	166	459
26	327	334	--	661	127	534
27	366	341	--	707	118	589
28	411	341	--	752	96	656
29	464	340	--	804	45	759
30	561	320	--	881	23	858
Total sec-ft.	6840	2781 (22-30)	2454	12075	1140	10935
Mean	228	309	82	402	38	364
Ac-ft.	13570	5520	4870	23960	2260	21690

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
APRIL - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	146	36	--	36	--	60	60	24	--
2	159	40	--	40	--	69	69	29	--
3	231	58	--	58	--	136	136	78	--
4	197	49	--	49	--	91	91	42	--
5	202	50	--	50	--	91	91	41	--
6	209	52	--	52	--	91	91	39	--
7	256	64	--	64	--	136	136	72	--
8	240	60	--	60	--	117	117	57	--
9	246	62	--	62	--	119	119	57	--
10	269	67	--	67	--	136	136	69	--
11	245	61	--	61	--	108	108	47	--
12	277	69	--	69	--	123	123	54	--
13	305	76	--	76	--	130	130	54	--
14	324	81	--	81	--	128	128	47	--
15	349	87	--	87	--	139	139	52	--
16	367	92	--	92	--	135	135	43	--
17	378	94	--	94	--	136	136	42	--
18	415	104	--	104	--	146	146	42	--
19	458	114	--	114	--	159	159	45	--
20	437	109	--	109	--	118	118	9	--
21	465	116	--	116	--	86	86	--	30
22	229	57	159	216	218	--	218	2	--
23	314	78	199	277	288	--	288	11	--
24	362	90	207	297	293	--	293	--	4
25	459	115	166	281	306	--	306	25	--
26	534	134	127	261	334	--	334	73	--
27	589	147	118	265	341	--	341	76	--
28	656	164	96	260	341	--	341	81	--
29	759	213	45	258	340	--	340	82	--
30	858	262	23	285	320	--	320	35	--
Total sec-ft.	10935	2801	1140	3941	2781 (22-30)	2454	5235	1328	34
Mean	364	93	38	131	309	82	174	44	1
Ac-ft.	21690	5560	2260	7820	5520	4870	10390	2640	70

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
APRIL - 1941

Day	Natural Flow of St. Mary R. at Boundary	Canada's Share Available	St. Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	146	110	86	--	--	24
2	159	119	90	--	--	29
3	231	173	95	--	--	78
4	197	148	106	--	--	42
5	202	152	111	--	--	41
6	209	157	118	--	--	39
7	256	192	120	--	--	72
8	240	180	123	--	--	57
9	246	184	127	--	--	57
10	269	202	133	--	--	69
11	245	184	137	--	--	47
12	277	208	154	--	--	54
13	305	229	175	--	--	54
14	324	243	196	--	--	47
15	349	262	210	57	--	52
16	367	275	232	23	--	43
17	378	284	242	17	--	42
18	415	311	269	12	--	42
19	458	344	299	87	--	45
20	437	328	319	136	--	9
21	465	349	379	135	30	--
22	229	172	170	88	--	2
23	314	236	225	171	--	11
24	362	272	276	222	4	--
25	459	344	319	229	--	25
26	534	400	327	255	--	73
27	589	442	366	312	--	76
28	656	492	411	352	--	81
29	759	546	464	399	--	82
30	858	596	561	425	--	35
Total sec-ft.	10935	8134	6840	2920 (15-30)	34	1328
Mean	364	271	228	182	1	44
Ac-ft.	21690	16130	13570	5790	70	2640

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
MAY - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	338	67	405	319	86	--
2	399	47	446	319	127	--
3	418	58	476	317	159	--
4	370	55	425	288	137	--
5	325	126	451	200	251	--
6	266	58	324	202	122	--
7	205	30	235	208	27	--
8	177	30	207	113	94	--
9	152	36	188	44	144	--
10	140	59	199	241	--	42
11	147	56	203	301	--	98
12	226	70	296	301	--	5
13	381	83	464	301	163	--
14	410	76	486	339	147	--
15	381	67	448	408	40	--
16	321	143	464	343	121	--
17	338	27	365	169	196	--
18	481	33	514	38	476	--
19	385	123	508	186	322	--
20	282	10	292	267	25	--
21	229	70	299	306	--	7
22	208	58	266	281	--	15
23	211	59	270	223	47	--
24	266	70	336	223	113	--
25	410	103	513	223	290	--
26	436	118	554	80	474	--
27	332	74	406	6	400	--
28	263	100	363	6	357	--
29	226	64	290	6	284	--
30	226	101	327	164	163	--
31	325	142	467	140	327	--
Total sec-ft.	9274	2213	11487	6562	5092	167
Mean	299	71	370	212	164	5
Ac-ft.	18390	4390	22780	13020	10090	330

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
MAY - 1941.

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	629	322	--	951	28	923
2	720	322	22	1064	--	1064
3	793	324	86	1203	--	1203
4	874	328	127	1329	--	1329
5	897	336	159	1392	--	1392
6	897	340	137	1374	--	1374
7	858	340	251	1449	--	1449
8	807	336	122	1265	--	1265
9	720	334	27	1081	--	1081
10	647	329	94	1070	--	1070
11	618	347	144	1109	--	1109
12	589	407	--	996	42	954
13	635	427	--	1062	98	964
14	665	483	--	1148	5	1143
15	659	600	163	1422	--	1422
16	707	641	147	1495	--	1495
17	727	645	40	1412	--	1412
18	689	639	121	1449	--	1449
19	659	636	196	1491	--	1491
20	659	639	476	1774	--	1774
21	653	638	322	1613	--	1613
22	635	639	25	1299	--	1299
23	583	643	--	1226	7	1219
24	522	638	--	1160	15	1145
25	544	638	47	1229	--	1229
26	624	643	113	1380	--	1380
27	635	645	290	1570	--	1570
28	629	653	474	1756	--	1756
29	572	656	400	1628	--	1628
30	533	653	357	1543	--	1543
31	647	662	284	1593	--	1593
Total sec-ft.	21026	15883	4624	41533	195	41338
Mean	678	512	149	1340	6	1330
Ac-ft.	41700	31500	9180	82380	387	81990

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
MAY - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	923	295	28	323	322	--	322	--	1
2	1064	365	--	365	322	22	344	--	21
3	1203	435	--	435	324	86	410	--	25
4	1329	498	--	498	328	127	455	--	43
5	1392	529	--	529	336	159	495	--	34
6	1374	520	--	520	340	137	477	--	43
7	1449	558	--	558	340	251	591	33	--
8	1265	466	--	466	336	122	458	--	8
9	1081	374	--	374	334	27	361	--	13
10	1070	368	--	368	329	94	423	55	--
11	1109	388	--	388	347	144	491	103	--
12	954	310	42	352	407	--	407	55	--
13	964	315	98	413	427	--	427	14	--
14	1143	405	5	410	483	--	483	73	--
15	1422	544	--	544	600	163	763	219	--
16	1495	581	--	581	641	147	788	207	--
17	1412	539	--	539	645	40	685	146	--
18	1449	558	--	558	639	121	760	202	--
19	1491	579	--	579	636	196	832	253	--
20	1774	720	--	720	639	476	1115	395	--
21	1613	640	--	640	638	322	960	320	--
22	1299	483	--	483	639	25	664	181	--
23	1219	443	7	450	643	--	643	193	--
24	1145	406	15	421	638	--	638	217	--
25	1229	448	--	448	638	47	685	237	--
26	1380	523	--	523	643	113	756	233	--
27	1570	618	--	618	645	290	935	317	--
28	1756	711	--	711	653	474	1127	416	--
29	1628	647	--	647	656	400	1056	409	--
30	1543	605	--	605	653	357	1010	405	--
31	1593	630	--	630	662	284	946	316	--
Total sec-ft.	41338	15501	195	15696	15883	4624	20507	4999	188
Mean	1330	500	6	506	512	149	661	161	6
Ac-ft.	81990	30750	387	31140	31500	9180	40680	9910	368

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
MAY - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share Delivered	Deficit of Share Delivered
1	923	628	629	449	1	--
2	1064	699	720	458	21	--
3	1203	768	793	466	25	--
4	1329	831	874	479	43	--
5	1392	863	897	479	34	--
6	1374	854	897	479	43	--
7	1449	891	858	493	--	33
8	1265	799	807	552	8	--
9	1081	707	720	616	13	--
10	1070	702	647	583	--	55
11	1109	721	618	576	--	103
12	954	644	589	538	--	55
13	964	649	635	597	--	14
14	1143	738	665	634	--	73
15	1422	878	659	621	--	219
16	1495	914	707	692	--	207
17	1412	873	727	723	--	146
18	1449	891	689	681	--	202
19	1491	912	659	644	--	253
20	1774	1054	659	644	--	395
21	1613	973	653	636	--	320
22	1299	816	635	619	--	181
23	1219	776	583	556	--	193
24	1145	739	522	497	--	217
25	1229	781	544	513	--	237
26	1380	857	624	583	--	233
27	1570	952	635	609	--	317
28	1756	1045	629	585	--	416
29	1628	981	572	522	--	409
30	1543	938	533	482	--	405
31	1593	963	647	583	--	316
Total sec-ft.	41338	25837	21026	17589	188	4999
Mean	1330	833	678	567	6	161
Ac-ft.	81990	51250	41700	34890	368	9910

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JUNE - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	421	156	577	3	574	--
2	462	127	589	3	586	--
3	425	127	552	3	549	--
4	356	97	453	3	450	--
5	315	55	370	3	367	--
6	285	86	371	3	368	--
7	279	62	341	3	338	--
8	269	87	356	3	353	--
9	248	43	291	2	289	--
10	251	31	282	2	280	--
11	257	147	404	2	402	--
12	263	66	329	2	327	--
13	289	59	348	2	346	--
14	308	21	329	2	327	--
15	295	83	378	2	376	--
16	251	83	334	1	333	--
17	229	69	298	1	297	--
18	214	60	274	4	270	--
19	196	46	242	140	102	--
20	177	33	210	217	--	7
21	150	54	204	250	--	46
22	137	46	183	271	--	88
23	158	29	187	483	--	296
24	205	30	235	528	--	293
25	279	39	318	518	--	200
26	235	45	280	521	--	241
27	196	57	253	576	--	323
28	199	122	321	496	--	175
29	315	82	397	130	267	--
30	338	201	539	4	535	--
Total sec-ft.	8002	2243	10245	4178	7736	1669
Mean	267	75	342	139	258	55
Ac-ft.	15870	4450	20320	8280	15350	3310

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER

JUNE - 1941

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	765	668	163	1596	--	1596
2	772	670	327	1769	--	1769
3	779	679	574	2032	--	2032
4	765	679	586	2030	--	2030
5	765	658	549	1972	--	1972
6	759	618	450	1827	--	1827
7	746	588	367	1701	--	1701
8	752	521	368	1641	--	1641
9	739	515	338	1592	--	1592
10	689	508	353	1550	--	1550
11	659	506	289	1454	--	1454
12	629	501	280	1410	--	1410
13	600	506	402	1508	--	1508
14	511	588	327	1426	--	1426
15	544	582	346	1472	--	1472
16	600	522	327	1449	--	1449
17	671	434	376	1481	--	1481
18	647	417	333	1397	--	1397
19	624	417	297	1338	--	1338
20	647	418	270	1335	--	1335
21	653	418	102	1173	--	1173
22	647	418	--	1065	7	1058
23	647	418	--	1065	46	1019
24	665	485	--	1150	88	1062
25	641	601	--	1242	296	946
26	659	605	--	1264	293	971
27	659	605	--	1264	200	1064
28	727	600	--	1327	241	1086
29	974	549	--	1523	323	1200
30	874	618	--	1492	175	1317
Total sec-ft.	20809	16312	7424	44545	1669	42876
Mean	694	544	247	1485	55	1430
Ac-ft.	41270	32350	14730	88350	3310	85040

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JUNE - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	1596	631	--	631	668	163	831	200	--
2	1769	718	--	718	670	327	997	279	--
3	2032	849	--	849	679	574	1253	404	--
4	2030	848	--	848	679	586	1265	417	--
5	1972	819	--	819	658	549	1207	388	--
6	1827	747	--	747	618	450	1068	321	--
7	1701	684	--	684	588	367	955	271	--
8	1641	654	--	654	521	368	889	235	--
9	1592	629	--	629	515	338	853	224	--
10	1550	608	--	608	508	353	861	253	--
11	1454	560	--	560	506	289	795	235	--
12	1410	538	--	538	501	280	781	243	--
13	1508	587	--	587	506	402	908	321	--
14	1426	546	--	546	588	327	915	369	--
15	1472	569	--	569	582	346	928	359	--
16	1449	558	--	558	522	327	849	291	--
17	1481	574	--	574	434	376	810	236	--
18	1397	532	--	532	417	333	750	218	--
19	1338	502	--	502	417	297	714	212	--
20	1335	501	--	501	418	270	688	187	--
21	1173	420	--	420	418	102	520	100	--
22	1058	362	7	369	418	--	418	49	--
23	1019	343	46	389	418	--	418	29	--
24	1062	364	88	452	485	--	485	33	--
25	946	306	296	602	601	--	601	--	1
26	971	319	293	612	605	--	605	--	7
27	1064	365	200	565	605	--	605	40	--
28	1086	376	241	617	600	--	600	--	17
29	1200	433	323	756	549	--	549	--	207
30	1317	492	175	667	618	--	618	--	49
Total sec-ft.	42876	16434	1669	18103	16312	7424	23736	5914	281
Mean	1430	548	55	603	544	247	791	197	9
Ac-ft.	85040	32600	3310	35910	32350	14730	47080	11720	557

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JUNE - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	1596	965	765	512	--	200
2	1769	1051	772	364	--	279
3	2032	1183	779	366	--	404
4	2030	1182	765	352	--	417
5	1972	1153	765	366	--	388
6	1827	1080	759	353	--	321
7	1701	1017	746	359	--	271
8	1641	987	752	375	--	235
9	1592	963	739	350	--	224
10	1550	942	689	353	--	253
11	1454	894	659	464	--	235
12	1410	872	629	460	--	243
13	1508	921	600	464	--	321
14	1426	880	511	433	--	369
15	1472	903	544	497	--	359
16	1449	891	600	554	--	291
17	1481	907	671	634	--	236
18	1397	865	647	614	--	218
19	1338	836	624	588	--	212
20	1335	834	647	609	--	187
21	1173	753	653	616	--	100
22	1058	696	647	616	--	49
23	1019	676	647	609	--	29
24	1062	698	665	619	--	33
25	946	640	641	600	1	--
26	971	652	659	624	7	--
27	1064	699	659	628	--	40
28	1086	710	727	692	17	--
29	1200	767	974	723	207	--
30	1317	825	874	738	49	--
Total sec-ft.	42876	26442	20809	15532	281	5914
Mean	1430	881	694	518	9	197
Ac-ft.	85040	52450	41270	30810	557	11720

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JULY - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	282	136	418	183	235	--
2	251	115	366	424	--	58
3	232	69	301	558	--	257
4	211	86	297	383	--	86
5	205	51	256	341	--	85
6	196	79	275	419	--	144
7	185	40	225	477	--	252
8	174	36	210	606	--	396
9	160	37	197	746	--	549
10	152	80	232	768	--	536
11	137	124	261	755	--	494
12	137	95	232	742	--	510
13	142	80	222	729	--	507
14	134	68	202	725	--	523
15	130	65	195	720	--	525
16	130	68	198	712	--	514
17	137	62	199	703	--	504
18	142	50	192	686	--	494
19	140	66	206	674	--	468
20	132	16	148	661	--	513
21	124	40	164	686	--	522
22	108	44	152	699	--	547
23	108	60	168	691	--	523
24	106	53	159	674	--	515
25	101	38	139	657	--	518
26	95	31	126	665	--	539
27	93	15	108	670	--	562
28	91	20	111	678	--	567
29	91	26	117	678	--	561
30	95	48	143	699	--	556
31	95	45	140	708	--	568
Total sec-ft.	4516	1843	6359	19517	235	13393
Mean	146	59	205	630	7	432
Ac-ft.	8960	3650	12610	38710	460	26560

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JULY - 1941

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	733	617	267	1617	--	1617
2	701	626	535	1862	--	1862
3	733	634	235	1602	--	1602
4	786	641	--	1427	58	1369
5	707	634	--	1341	257	1084
6	665	630	--	1295	86	1209
7	653	628	--	1281	85	1196
8	653	628	--	1281	144	1137
9	683	636	--	1319	252	1067
10	714	647	--	1361	396	965
11	727	649	--	1376	549	827
12	727	647	--	1374	536	838
13	714	645	--	1359	494	865
14	695	643	--	1338	510	828
15	671	641	--	1312	507	805
16	647	639	--	1286	523	763
17	629	639	--	1268	525	743
18	612	638	--	1250	514	736
19	589	639	--	1228	504	724
20	566	638	--	1204	494	710
21	544	636	--	1180	468	712
22	527	636	--	1163	513	650
23	506	634	--	1140	522	618
24	500	636	--	1136	547	589
25	490	634	--	1124	523	601
26	459	634	--	1093	515	578
27	440	638	--	1078	518	560
28	425	636	--	1061	539	522
29	425	638	--	1063	562	501
30	420	638	--	1058	567	491
31	416	638	--	1054	561	493
Total sec-ft.	18757	19737	1037	39531	12269	27262
Mean	605	637	33	1275	396	879
Ac-ft.	37200	39150	2060	78410	24340	54070

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JULY - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	1617	642	--	642	617	267	884	242	--
2	1862	764	--	764	626	535	1161	397	--
3	1602	634	--	634	634	235	869	235	--
4	1369	518	58	576	641	--	641	65	--
5	1084	375	257	632	634	--	634	2	--
6	1209	438	86	524	630	--	630	106	--
7	1196	431	85	516	628	--	628	112	--
8	1137	402	144	546	628	--	628	82	--
9	1067	367	252	619	636	--	636	17	--
10	965	316	396	712	647	--	647	--	65
11	827	247	549	796	649	--	649	--	147
12	838	252	536	788	647	--	647	--	141
13	865	266	494	760	645	--	645	--	115
14	828	247	510	757	643	--	643	--	114
15	805	236	507	743	641	--	641	--	102
16	763	215	523	738	639	--	639	--	99
17	743	205	525	730	639	--	639	--	91
18	736	201	514	715	638	--	638	--	77
19	724	195	504	699	639	--	639	--	60
20	710	188	494	682	638	--	638	--	44
21	712	189	468	657	636	--	636	--	21
22	650	162	513	675	636	--	636	--	39
23	618	154	522	676	634	--	634	--	42
24	589	147	547	694	636	--	636	--	58
25	601	150	523	673	634	--	634	--	39
26	578	144	515	659	634	--	634	--	25
27	560	140	518	658	638	--	638	--	20
28	522	130	539	669	636	--	636	--	33
29	501	125	562	687	638	--	638	--	49
30	491	123	567	690	638	--	638	--	52
31	493	123	561	684	638	--	638	--	46
Total sec-ft.	27262	8726	12269	20995	19737	1037	20774	1258	1479
Mean	879	281	396	677	637	33	670	41	48
Ac-ft.	54070	17310	24340	41650	39150	2060	41210	2500	2940

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JULY - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share Delivered	Deficit of Share Delivered
1	1617	975	733	718	--	242
2	1862	1098	701	686	--	397
3	1602	968	733	723	--	235
4	1369	851	786	783	--	65
5	1084	709	707	694	--	2
6	1209	771	665	638	--	106
7	1196	765	653	624	--	112
8	1137	735	653	626	--	82
9	1067	700	683	661	--	17
10	965	649	714	702	65	--
11	827	580	727	720	147	--
12	838	586	727	718	141	--
13	865	599	714	705	115	--
14	828	581	695	681	114	--
15	805	569	671	648	102	--
16	763	548	647	626	99	--
17	743	538	629	607	91	--
18	736	535	612	590	77	--
19	724	529	589	561	60	--
20	710	522	566	538	44	--
21	712	523	544	517	21	--
22	650	488	527	506	39	--
23	618	464	506	484	42	--
24	589	442	500	484	58	--
25	601	451	490	477	39	--
26	578	434	459	451	25	--
27	560	420	440	427	20	--
28	522	392	425	413	33	--
29	501	376	425	415	49	--
30	491	368	420	417	52	--
31	493	370	416	403	46	--
Total sec-ft.	27262	18536	18757	18243	1479	1258
Mean	879	598	605	588	48	41
Ac-ft.	54070	36770	37200	36180	2940	2500

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
AUGUST - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	87	33	120	699	--	579
2	79	20	99	691	--	592
3	72	17	89	678	--	589
4	70	10	80	657	--	577
5	70	10	80	613	--	533
6	70	10	80	508	--	428
7	70	15	85	373	--	288
8	68	10	78	283	--	205
9	68	10	78	246	--	168
10	70	10	80	200	--	120
11	75	10	85	225	--	140
12	79	5	84	232	--	148
13	79	5	84	208	--	124
14	79	5	84	179	--	95
15	75	5	80	152	--	72
16	70	5	75	133	--	58
17	68	5	73	117	--	44
18	66	21	87	107	--	20
19	65	5	70	101	--	31
20	63	5	68	94	--	26
21	65	10	75	88	--	13
22	66	5	71	83	--	12
23	63	7	70	83	--	13
24	61	16	77	82	--	5
25	58	7	65	72	--	7
26	56	16	72	72	--	--
27	51	22	73	73	--	--
28	50	24	74	73	1	--
29	47	20	67	72	--	5
30	44	18	62	68	--	6
31	44	16	60	67	--	7
Total sec-ft.	2048	377	2425	7329	1	4905
Mean	66	12	78	236	--	158
Ac-ft.	4060	750	4810	14540	--	9730

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
AUGUST - 1941

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	407	634	--	1041	556	485
2	402	634	--	1036	568	468
3	388	632	--	1020	579	441
4	366	630	--	996	592	404
5	348	622	--	970	589	381
6	339	596	--	935	577	358
7	366	508	--	874	533	341
8	357	417	--	774	428	346
9	353	340	--	693	288	405
10	344	277	--	621	205	416
11	375	202	--	577	168	409
12	344	199	--	543	120	423
13	331	197	--	528	140	388
14	307	193	--	500	148	352
15	339	142	--	481	124	357
16	323	135	--	458	95	363
17	288	133	--	421	72	349
18	269	131	--	400	58	342
19	280	104	--	384	44	340
20	265	97	--	362	20	342
21	280	86	--	366	31	335
22	265	86	--	351	26	325
23	262	82	--	344	13	331
24	258	71	--	329	12	317
25	245	70	--	315	13	302
26	248	71	--	319	5	314
27	248	70	--	318	7	311
28	242	70	--	312	--	312
29	232	70	--	302	--	302
30	222	67	1	290	--	290
31	225	60	--	285	5	280
Total sec-ft.	9518	7626	1	17145	6016	11129
Mean	307	246	--	553	194	359
Ac-ft.	18880	15130	--	34010	11940	22070

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
AUGUST - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	485	121	556	677	634	--	634	--	43
2	468	117	568	685	634	--	634	--	51
3	441	110	579	689	632	--	632	--	57
4	404	101	592	693	630	--	630	--	63
5	381	95	589	684	622	--	622	--	62
6	358	90	577	667	596	--	596	--	71
7	341	85	533	618	508	--	508	--	110
8	346	86	428	514	417	--	417	--	97
9	405	101	288	389	340	--	340	--	49
10	416	104	205	309	277	--	277	--	32
11	409	102	168	270	202	--	202	--	68
12	423	106	120	226	199	--	199	--	27
13	388	97	140	237	197	--	197	--	40
14	352	88	148	236	193	--	193	--	43
15	357	89	124	213	142	--	142	--	71
16	363	91	95	186	135	--	135	--	51
17	349	87	72	159	133	--	133	--	26
18	342	86	58	144	131	--	131	--	13
19	340	85	44	129	104	--	104	--	25
20	342	86	20	106	97	--	97	--	9
21	335	84	31	115	86	--	86	--	29
22	325	81	26	107	86	--	86	--	21
23	331	83	13	96	82	--	82	--	14
24	317	79	12	91	71	--	71	--	20
25	302	76	13	89	70	--	70	--	19
26	314	78	5	83	71	--	71	--	12
27	311	78	7	85	70	--	70	--	15
28	312	78	--	78	70	--	70	--	8
29	302	76	--	76	70	--	70	--	6
30	290	72	--	72	67	1	68	--	4
31	280	70	5	75	60	--	60	--	15
Total sec-ft.	11129	2782	6016	8798	7626	1	7626	--	1171
Mean	359	90	194	284	246	--	246	--	38
Ac-ft.	22070	5520	11940	17460	15130	--	15130	--	2330

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
AUGUST - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	485	364	407	382	43	--
2	468	351	402	379	51	--
3	441	331	388	366	57	--
4	404	303	366	346	63	--
5	381	286	348	326	62	--
6	358	268	339	315	71	--
7	341	256	366	345	110	--
8	346	260	357	334	97	--
9	405	304	353	331	49	--
10	416	312	344	321	32	--
11	409	307	375	350	68	--
12	423	317	344	323	27	--
13	388	291	331	314	40	--
14	352	264	307	293	43	--
15	357	268	339	317	71	--
16	363	272	323	306	51	--
17	349	262	288	278	26	--
18	342	256	269	258	13	--
19	340	255	280	268	25	--
20	342	256	265	257	9	--
21	335	251	280	269	29	--
22	325	244	265	258	21	
23	331	248	262	253	14	--
24	317	238	258	252	20	--
25	302	226	245	240	19	--
26	314	236	248	244	12	--
27	311	233	248	244	15	--
28	312	234	242	233	8	--
29	302	226	232	228	6	--
30	290	218	222	218	4	--
31	280	210	225	222	15	--
Total sec-ft.	11129	8347	9518	9070	1171	--
Mean	359	269	307	293	38	--
Ac-ft.	22070	16550	18880	17990	2330	--

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
SEPTEMBER - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	45	10	55	64	--	9
2	47	10	57	59	--	2
3	61	6	67	66	1	--
4	89	138	227	120	107	--
5	122	99	221	127	94	--
6	130	34	164	136	28	--
7	127	69	196	152	44	--
8	117	50	167	160	7	--
9	104	40	144	155	--	11
10	99	45	144	146	--	2
11	108	51	159	149	10	--
12	124	47	171	155	16	--
13	155	19	174	168	6	--
14	182	98	280	182	98	--
15	208	83	291	210	81	--
16	194	39	233	223	10	--
17	163	35	198	215	--	17
18	163	52	215	211	4	--
19	177	56	233	217	16	--
20	171	54	225	219	6	--
21	147	56	203	223	--	20
22	124	49	173	202	--	29
23	108	108	216	105	111	--
24	115	245	360	204	156	--
25	115	60	175	44	131	--
26	140	74	214	27	187	--
27	199	93	292	9	283	--
28	191	85	276	--	276	--
29	177	108	285	--	285	--
30	166	71	237	--	237	--
Total sec-ft.	4068	1984	6052	3948	2194	90
Mean	136	66	202	132	73	3
Ac-ft.	8070	3930	12000	7840	4160	180

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
SEPTEMBER - 1941

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	216	59	--	275	6	269
2	216	59	--	275	7	268
3	219	60	--	279	9	270
4	225	59	--	284	2	282
5	232	59	1	292	--	292
6	251	59	107	417	--	417
7	307	62	94	463	--	463
8	323	67	28	418	--	418
9	307	97	44	448	--	448
10	319	99	7	425	--	425
11	339	100	--	439	11	428
12	357	99	--	456	2	454
13	379	106	10	495	--	495
14	361	129	16	506	--	506
15	379	130	6	515	--	515
16	402	131	98	631	--	631
17	416	131	81	628	--	628
18	435	131	10	576	--	576
19	445	131	--	576	17	559
20	454	132	4	590	--	590
21	469	133	16	618	--	618
22	469	131	6	606	--	606
23	495	97	--	592	20	572
24	572	8	--	580	29	551
25	538	--	111	649	--	649
26	522	--	156	678	--	678
27	533	--	131	664	--	664
28	538	--	187	725	--	725
29	527	--	283	810	--	810
30	522	--	276	798	--	798
Total sec-ft.	11767	2269 (1-24)	1672	15708	103	15605
Mean	392	95	56	524	4	520
Ac-ft.	23340	4500	3310	31150	200	30950

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
SEPTEMBER - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	269	67	6	73	59	--	59	--	14
2	268	67	7	74	59	--	59	--	15
3	270	68	9	77	60	--	60	--	17
4	282	70	2	72	59	--	59	--	13
5	292	73	--	73	59	1	60	--	13
6	417	104	--	104	59	107	166	62	--
7	463	116	--	116	62	94	156	40	--
8	418	104	--	104	67	28	95	--	9
9	448	112	--	112	97	44	141	29	--
10	425	106	--	106	99	7	106	--	--
11	428	107	11	118	100	--	100	--	18
12	454	114	2	116	99	--	99	--	17
13	495	124	--	124	106	10	116	--	8
14	506	126	--	126	129	16	145	19	--
15	515	129	--	129	130	6	136	7	--
16	631	158	--	158	131	98	229	71	--
17	628	157	--	157	131	81	212	55	--
18	576	144	--	144	131	10	141	--	3
19	559	140	17	157	131	--	131	--	26
20	590	148	--	148	132	4	136	--	12
21	618	154	--	154	133	16	149	--	5
22	606	152	--	152	131	6	137	--	15
23	572	143	20	163	97	--	97	--	66
24	551	138	29	167	8	--	8	--	159
25	649	162	--	162	--	111	111	--	51
26	678	172	--	172	--	156	156	--	16
27	664	166	--	166	--	131	131	--	35
28	725	196	--	196	--	187	187	--	9
29	810	238	--	238	--	283	283	45	--
30	798	232	--	232	--	276	276	44	--
Total sec-ft.	15605	3987	103	4090	2269 (1-24)	1672	3941	372	521
Mean	520	133	4	137	95	56	131	12	17
Ac-ft.	30950	7910	200	8110	4500	3310	7810	740	1040

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
SEPTEMBER - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess of Share Delivered	Deficit of Share Delivered
1	269	202	216	215	14	--
2	268	201	216	215	15	--
3	270	202	219	218	17	--
4	282	212	225	219	13	--
5	292	219	232	228	13	--
6	417	313	251	244	--	62
7	463	347	307	297	--	40
8	418	314	323	300	9	--
9	448	336	307	289	--	29
10	425	319	319	289	--	--
11	428	321	339	318	18	--
12	454	340	357	334	17	--
13	495	371	379	352	8	--
14	506	380	361	340	--	19
15	515	386	379	352	--	7
16	631	473	402	380	--	71
17	628	471	416	392	--	55
18	576	432	435	392	3	--
19	559	419	445	413	26	--
20	590	442	454	425	12	--
21	618	464	469	437	5	--
22	606	454	469	405	15	--
23	572	429	495	392	66	--
24	551	413	572	352	159	--
25	649	487	538	328	51	--
26	678	506	522	331	16	--
27	664	498	533	340	35	--
28	725	529	538	348	9	--
29	810	572	527	345	--	45
30	798	566	522	346	--	44
Total sec-ft.	15605	11618	11767	9836	521	372
Mean	520	387	392	328	17	12
Ac-ft.	30950	23040	23340	19510	1040	740

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
OCTOBER - 1941

Day	Inflow to Sherburne Reservoir: Recorded Inflow: Swiftcurrent Creek	Un-recorded Inflow Est'd	Total Inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir Sec-ft. Gross	Released from Reservoir Sec-ft. Net
1	180	65	245	--	245	--
2	169	135	304	--	304	--
3	169	30	199	--	199	--
4	202	42	244	--	244	--
5	188	82	270	--	270	--
6	158	38	196	--	196	--
7	147	86	233	--	233	--
8	127	46	173	--	173	--
9	115	47	162	--	162	--
10	108	29	137	--	137	--
11	110	51	161	--	161	--
12	115	45	160	--	160	--
13	134	31	165	--	165	--
14	130	66	196	--	196	--
15	124	52	176	--	176	--
16	130	43	173	--	173	--
17	140	34	174	--	174	--
18	140	62	202	--	202	--
19	137	51	188	--	188	--
20	130	40	170	--	170	--
21	120	15	135	--	135	--
22	113	11	124	--	124	--
23	106	40	146	--	146	--
24	99	38	137	--	137	--
25	95	48	143	--	143	--
26	91	10	101	--	101	--
27	85	2	87	--	87	--
28	79	39	118	--	118	--
29	72	58	130	--	130	--
30	63	23	86	--	86	--
31	56	21	77	--	77	--
Total sec-ft.	3832	1380	5212	--	5212	--
Mean	124	44	168	--	168	--
Ac-ft.	7600	2740	10340	--	10340	--

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
OCTOBER - 1941

Day	St.Mary River at Kimball	Diverted by U.S.B.R.	Stored by U.S.B.R.	Total in Sec-ft.	Stored Water Released	Natural Flow St.Mary River
1	527	--	285	812	--	812
2	522	--	237	759	--	759
3	538	--	245	783	--	783
4	527	--	304	831	--	831
5	533	--	199	732	--	732
6	544	--	244	788	--	788
7	544	--	270	814	--	814
8	527	--	196	723	--	723
9	490	--	233	723	--	723
10	527	--	173	700	--	700
11	490	--	162	652	--	652
12	474	--	137	611	--	611
13	474	--	161	635	--	635
14	469	--	160	629	--	629
15	440	--	165	605	--	605
16	435	--	196	631	--	631
17	430	--	176	606	--	606
18	420	--	173	593	--	593
19	411	--	174	585	--	585
20	416	--	202	618	--	618
21	416	--	188	604	--	604
22	411	--	170	581	--	581
23	411	--	135	546	--	546
24	411	--	124	535	--	535
25	407	--	146	553	--	553
26	402	--	137	539	--	539
27	402	--	143	545	--	545
28	384	--	101	485	--	485
29	379	--	87	466	--	466
30	375	--	118	493	--	493
31	366	--	130	496	--	496
Total sec-ft.	14102	--	5571	19673	--	19676
Mean	455	--	180	635	--	635
Ac-ft.	27970	--	11050	39020	--	39020

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
OCTOBER - 1941

Day	Natural Flow St.Mary River	AVAILABLE FOR USE BY U.S.A. U.S. Share	Released Storage Net	Total Available	USED BY U.S.A. Diverted	Stored Gross	Total Used	Excess of Share	Deficit Used
1	812	239	--	239	--	285	285	46	--
2	759	213	--	213	--	237	237	24	--
3	783	225	--	225	--	245	245	20	--
4	831	249	--	249	--	304	304	55	--
5	732	199	--	199	--	199	199	--	--
6	788	227	--	227	--	244	244	17	--
7	814	240	--	240	--	270	270	30	--
8	723	195	--	195	--	196	196	1	--
9	723	195	--	195	--	233	233	38	--
10	700	183	--	183	--	173	173	--	10
11	652	163	--	163	--	162	162	--	1
12	611	153	--	153	--	137	137	--	16
13	635	159	--	159	--	161	161	2	--
14	629	157	--	157	--	160	160	3	--
15	605	151	--	151	--	165	165	14	--
16	631	158	--	158	--	196	196	38	--
17	606	152	--	152	--	176	176	24	--
18	593	148	--	148	--	173	173	25	--
19	586	146	--	146	--	174	174	28	--
20	618	154	--	154	--	202	202	48	--
21	604	151	--	151	--	188	188	37	--
22	581	145	--	145	--	170	170	25	--
23	546	136	--	136	--	135	135	--	1
24	535	134	--	134	--	124	124	--	10
25	553	138	--	138	--	146	146	8	--
26	539	135	--	135	--	137	137	2	--
27	545	136	--	136	--	143	143	7	--
28	485	121	--	121	--	101	101	--	20
29	466	116	--	116	--	87	87	--	29
30	493	123	--	123	--	118	118	--	5
31	496	124	--	124	--	130	130	6	--
Total sec-ft.	19673	5165	--	5165	--	5571	5571	498	92
Mean	635	167	--	167	--	180	180	16	3
Ac-ft.	39020	10240	--	10240	--	11050	11050	990	180

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
OCTOBER - 1941

Day	Natural Flow of St.Mary R. at Boundary	Canada's Share Available	St.Mary R. at Kimball Delivered	Diverted by Canada Used	Excess or Deficit of Share Delivered	
1	812	573	527	353	--	46
2	759	546	522	450	--	24
3	783	558	538	504	--	20
4	831	582	527	493	--	55
5	732	533	533	506	--	--
6	788	561	544	515	--	17
7	814	574	544	515	--	30
8	723	528	527	501	--	1
9	723	528	490	466	--	38
10	700	517	527	501	10	--
11	652	489	490	464	1	--
12	611	458	474	449	16	--
13	635	476	474	449	--	2
14	629	472	469	441	--	3
15	605	454	440	382	--	14
16	631	473	435	--	--	38
17	606	454	430	--	--	24
18	593	445	420	--	--	25
19	585	439	411	--	--	28
20	618	464	416	--	--	48
21	604	453	416	--	--	37
22	581	436	411	--	--	25
23	546	410	411	--	1	--
24	535	401	411	--	10	--
25	553	415	407	--	--	8
26	539	404	402	--	--	2
27	545	409	402	--	--	7
28	485	364	384	--	20	--
29	466	350	379	--	29	--
30	493	370	375	--	5	--
31	496	372	366	--	--	6
Total sec-ft.	19673	14508	14102	6989 (1-15)	92	498
Mean	635	468	455	466	3	16
Ac-ft.	39020	28780	27970	13860	180	990

DIVISION OF ST. MARY RIVER
CANADA
1941

Water Available in Acre-Feet

Month	St.Mary R. at Kimball	Rolph Creek	Lee Creek	Pothole Creek	Combined Flow
April	13,570	89	3,120	--	16,779
May	41,700	77	2,970	--	44,747
June	41,270	224	3,840	--	45,334
July	37,200	94	2,240	--	39,534
August	18,880	87	630	--	19,597
September	23,340	115	964	--	24,419
October	27,970	64	1,000	--	29,034
Total	203,930	750	14,764	--	219,444 [a]

DISPOSITION

Month	Diverted by A.R. & I. Co.	Gain or Loss	Wasted by A.R. & I. Co.	Applied to Land	St.Mary R. Lethbridge
April	5,790	- 1,120	1,230	3,440	10,840
May	34,890	- 913	4,031	29,946	14,810
June	30,810	+ 218	4,504	26,524	22,740
July	36,180	+ 90	1,440	34,830	6,540
August	17,990	+ 233	76	18,147	873
September	19,510	- 107	1,465	17,938	4,490
October	13,860	+ 4,154	8,733	9,281	
	b	c	d	f	x
Total	159,030	+ 2,555	21,479	140,106	

a - Computed. b - Diverted by A.R. & I.Co. at Kimball.
c - Loss or gain between Kimball and Magrath.
d - Wasted in Pinepound and Pothole Creeks.
e - Estimated.
f - Flow in canals at Magrath plus diversions by laterals.
x - Below all points of diversion.

DIVISION OF ST. MARY RIVER
UNITED STATES
1941

Water Available in Acre-Feet

Month	St. Mary River: U. S. Share	St. Mary River: Sherburne Res. Stored	St. Mary River: Sherburne Res. Released	St. Mary River: Total Available for Diversion	Diverted	Unused	Total Flow Milk River Eastern Crossing
April	5,560	4,870	2,260	7,820	5,520	2,300	6,080
May	30,750	9,180	387	31,137	31,500	- 363	29,220
June	32,600	14,730	3,310	35,910	32,350	3,560	36,600
July	17,310	2,060	24,340	41,650	39,150	2,500	37,850
August	5,520	--	11,940	17,460	15,130	2,330	20,240
September	7,910	3,310	200	8,110	4,500	3,610	6,550
October	10,240	11,050	--	10,240	--	10,240	1,990
Total	109,890	45,200	42,437	152,327	128,150	24,177	138,530

DIVERSIONS FROM MILK RIVER IN UNITED STATES
1941

Quantities in Acre-Feet

Month	Belknap Canal	Paradise Canal	Harlem Canal	Harlem No.2	Agency Canal	Dodson North	Dodson South	Vandalia Canal	Total
March	--	--	--	--	--	--	1696	--	1696
April	--	--	1457	--	--	657	4126	--	6240
May	5881	2984	2368	665	2344	2285	5706	5693	27926
June	7239	3020	814	190	2220	1499	11032	1656	27670
July	10621	4459	2083	729	2138	3802	11500	6069	41401
August	7457	3465	1604	982	1725	3404	8402	4274	31313
Sept.	2631	467	317	127	820	1692	2967	2479	11500
Oct.	--	--	--	--	--	413	1468	1240	3121
Nov.	--	--	--	--	--	--	554	792	1346
Total	33829	14395	8643	2693	9247	13752	47451	22203	152213

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY 1941

Quantities in Second-Feet

Date at Intern'l Boundary	Frenchman River below Belanger Creek	Used by Canada at East End: Corrected for Evaporation: Store	Release	Diverted	Return Flow	Total Used	Frenchman River at 50 Mile
1	2	3	4	5	6	7	8
March							
1 - 10	30.0	0	0	0.0		0.0	50.0
11 - 20	30.0	0	10	0.0		- 10.0	592.0
21 - 31	57.0	13	0	0.0		13.0	4646.0
April							
1 - 10	50.8	145	0	0.0		145.0	7938.0
11 - 20	13.6	525	0	0.0		525.0	756.0
21 - 30	10.6	0	272	0.0		-272.0	871.0
May							
1 - 10	13.9	42	0	0.0	--	42.0	417.1
11 - 20	5.5	167	0	15.5	--	182.5	276.3
21 - 31	6.3	40	0	151.7	12.4	179.3	212.9
June							
1 - 10	6.4	0	1	167.8	67.3	99.5	183.8
11 - 20	19.6	0	6	171.2	50.3	114.9	147.4
21 - 30	23.0	0	145	188.4	34.9	8.5	92.0
July							
1 - 10	12.9	0	97	270.7	30.3	143.4	79.8
11 - 20	18.9	0	87	302.3	30.9	184.4	70.7
21 - 31	13.7	0	146	289.5	30.2	113.3	37.4
August							
1 - 10	13.4	0	63	146.5	30.9	52.6	23.2
11 - 20	14.3	0	32	85.6	8.3	45.3	7.3
21 - 31	12.6	0	27	40.0	1.4	11.6	0.4
September							
1 - 10	17.1	47	0	22.4	9.1	60.3	0.3
11 - 20	17.0	36	0	0.0	--	36.0	0.0
21 - 30	21.8	6	0	0.0	--	6.0	0.0
October							
1 - 10	22.6	17	0	0.0		17.0	42.8
11 - 20	21.1	0	46	0.0		- 46.0	65.4
21 - 31	24.1	61	0	0.0		61.0	74.8
Total sec-ft.	476.2	1099	932	1851.6	3060	1712.6	16584.6
Daily Mean	1.9	4.5	3.8	7.6	1.2	7.0	67.7
Ac-ft.	940	2180	1840	3670	610	3400	32910

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY 1941

Quantities in Second-Feet

Gain or Loss Belanger to 50 Mile	Used by Canada at Val Marie: Corrected for Evaporation: Store	Release	Diverted	Return Flow	Total Used	Frenchman River below Val Marie	Gain or Loss 50 Mile to Val Marie
9	10	11	12	13	14	15	16
20.0	0	0	0.0	0.0	0.0	53.0	+ 3.0
552.0	521	0	0.0	0.0	521.0	60.1	- 10.9
4602.0	3650	0	0.0	0.0	3650.0	4590.4	+3594.4
8032.2	0	1276	0.0	0.0	-1276.0	7497.0	-1717.0
1267.4	239	322	0.0	0.0	- 83.0	839.4	+ 0.4
588.4	319	0	0.0	0.0	319.0	845.5	+ 293.5
445.2	444	0	0.0	0.0	444.0	194.4	+ 221.3
453.3	15	18	37.9	0.0	34.9	368.7	+ 127.3
385.9	19	81	195.5	50.0	83.5	246.8	+ 117.4
276.9	0	143	184.2	40.0	1.2	204.9	+ 22.3
242.7	116	229	120.2	25.0	- 8.8	169.2	+ 13.0
77.5	0	228	225.9	50.0	- 52.1	292.2	+ 148.1
210.3	0	379	299.0	50.0	- 130.0	325.8	+ 116.0
236.2	0	219	268.9	50.0	- 0.1	104.3	+ 33.5
137.0	0	291	246.3	50.0	- 94.7	81.7	- 50.4
62.4	0	206	197.9	50.0	- 58.1	127.9	+ 46.6
38.3	0	124	68.2	0.0	- 55.8	69.3	+ 6.2
- 0.6	0	50	45.0	40.0	- 45.0	53.8	+ 8.4
43.5	3	89	1.9	0.0	- 84.1	54.4	- 30.0
19.0	3	122	0.0	0.0	- 119.0	187.5	+ 68.5
- 15.8	3	119	0.0	0.0	- 116.0	124.8	+ 8.8
37.2	10	109	0.0	0.0	- 99.0	96.2	- 45.6
- 1.7	22	93	0.0	0.0	- 71.0	68.7	- 67.7
111.7	41	95	0.0	0.0	- 54.0	79.3	- 49.5

DETERMINATION OF NATURAL FLOW OF FRENCHMAN RIVER AT THE INTERNATIONAL BOUNDARY 1941

Quantities in Second-Feet

Frenchman River at Belanger Creek	Gain or Loss Belanger to 50 Mile	Gain or Loss 50 Mile to Val Marie	Gain or Loss Val Marie to Boundary	Natural Flow at Intern'l Boundary	United States Share	Frenchman River at Intern'l Boundary
17	18	19	20	21	22	23
30.0	20.0	3.0	65.5	118.5	59.2	118.5
30.0	552.0	- 10.9	209.4	780.5	390.2	269.5
202.0	4602.0	3594.4	7442.6	15841.0	7920.5	12033.0
1207.0	8032.2	-1717.0	687.0	8209.2	4104.6	8184.0
401.0	1267.4	0.4	- 156.8	1512.0	756.0	682.6
213.2	588.4	293.5	274.9	1370.0	685.0	1120.4
91.6	445.2	221.3	39.2	797.3	398.6	233.6
75.2	453.3	127.3	2.6	658.4	329.2	371.3
63.6	385.9	117.4	- 7.7	559.2	279.6	239.1
52.9	276.9	22.3	- 8.5	343.6	171.8	196.4
44.1	242.7	13.0	5.4	305.2	152.6	174.6
31.8	77.5	148.1	190.6	448.0	224.0	482.8
42.2	210.3	116.0	21.9	390.4	195.2	347.7
20.5	236.2	33.5	- 13.9	276.3	138.2	90.4
13.7	137.0	- 50.4	28.0	128.3	64.2	109.7
13.4	62.4	46.6	40.0	162.4	81.2	167.9
14.3	38.3	6.2	- 43.4	15.4	7.7	25.9
12.6	- 0.6	8.4	- 23.1	- 0.0	0.0	30.7
17.1	43.5	- 30.0	- 51.2	0.0	0.0	3.2
17.0	19.0	68.5	- 68.6	35.9	18.0	118.9
21.8	- 15.8	8.8	- 75.4	0.0	0.0	49.4
22.6	37.2	- 45.6	- 48.9	0.0	0.0	47.3
21.1	- 1.7	- 67.7	- 29.0	0.0	0.0	39.7
24.1	111.7	- 49.5	11.3	97.6	48.8	90.6
2682.8	17821.0	2857.6	8491.9	31853.3	15926.6	25227.2
11.0	72.5	11.7	34.7	130.0	65.0	103.0
5300	35370	5660	16810	63140	31570	50040

Table 4

ESTIMATED DIVERSION FROM THE NORTHERN TRIBUTARIES
OF MILK RIVER IN CANADA
1941

Quantities in Acre-Feet

Irrigator	Source of Supply	Estimated Diversion
Lodge Creek Basin		
Mitchell, Wm.	Lodge Creek	75
Hillman, W.	Thelma Creek	150
Trumpour, A.W.	Trumpour Coulee	60
Griffiths, G.	Lodge Creek	38
Total diverted from Lodge Creek		323
Flow of Lodge Creek at Boundary		17,490
Battle Creek Basin		
Lindner Bros.	Battle Creek	150
Marshall & Gaff	Battle Creek	75
Fondrick, G.	Battle Creek	35
Wilkes Bros.	Battle Creek	25
McKinnon, J.	Battle Creek	795
Stirling & Nash	Battle Creek	1,470
Spangler, J.M.	Sixmile Coulee	100
Shepherd Bros.	Halfway Coulee	50
Murray, J.	Swede Coulee	80
Galster, J.	Rough Coulee	7
Worthy, F.	Woodpile Coulee	10
Battle Creek diversion to Cypress Lake		5,650
Total diverted from Battle Creek		8,447
Flow of Battle Creek at Boundary		16,910

Table 4 (cont'd).

Quantities in Acre-Feet

Irrigator	Source of Supply	Estimated Diversion
Frenchman River Basin		
Gilchrist Bros.	Davis Creek	200
Caton, W. E.	Fairwell Creek	100
Armstrong Bros.	Armstrong Creek	35
Armstrong Bros.	Clarence Coulee	15
Hensman, S. A.	N. B. Frenchman River	100
Kokott, T.	Calf Creek	20
Pearse, S.	Concrete Coulee	80
Bolingbroke, J. E.	Bolingbroke Creek	5
Bate, A. E.	Garden Creek	22
Hewitt, S. W.	Lone Pine Creek	6
Morrison, M. A.	Eastbrook Coulee	187
White Bros.		8
Greenly, G. L.		21
Beck, M.		10
Bacon & Hillock		10
Guitter, F.		2
Lawrence, J. S.		7
East End Irrigation		3,670
Val Marie Irrigation		3,770
Total diverted from Frenchman River		8,268
Flow of Frenchman River at Boundary		50,040
Rock Creek Basin		
Dunn & Watt	McEachern Creek	65
Flow of Rock Creek at Boundary		13,560

Table 5

MEASURED DIVERSIONS FROM THE NORTHERN TRIBUTARIES

OF MILK RIVER IN THE UNITED STATES

1941

Quantities in Acre-Feet

Irrigator	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				Lodge Creek					
North Chinook Canal	1,430	1,010	46	412	1,820	0	0	0	4,718
				Battle Creek					
Matheson Canal	0	17	207	73	36	46	0	0	379
				Frenchman River					
Frenchman Canal	0	393	594	496	411	67	0	0	1,961
Total	1,430	1,420	847	981	2,267	113	0	0	7,058