Report to

THE INTERNATIONAL JOINT COMMISSION

on

THE DIVISION AND USE MADE OF THE WATERS OF

ST. MARY AND MILK RIVERS

by

N. C. GROVER
representing the United States

and

J. T. JOHNSTON
representing Canada

1936

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 of 1936.

Respectfully submitted,

Accredited Officer of the United States.

Accredited Officer of His Majesty.

April 6th, 1937.

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 1936, by the same engineers as in previous years.

Mr. N. C. Grover, Chief Hydraulic Engineer, United States Geological Survey, as accredited officer for the United States was represented in the field by Mr. W. A. Lamb, District Engineer, Helena, Montana. Mr. J. T. Johnston, Director, Dominion Water Power and Hydrometric Bureau, as accredited officer of His Majesty, was represented by Mr. S. G. Dawson, Ottawa, Canada.

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 personal supervision of Mr. Lamb; while those from streams and ditches in Canada were collected by Mr. W. T. McFarlane, under the direction of Mr. O. H. Hoover, Engineer in charge, Dominion Water Power and Hydrometric Bureau, Calgary, Alberta. The joint international gauging stations were visited frequently by representatives of both countries.

When the natural flow of St.Mary River fell below the combined capacity of the two canals diverting therefrom, and when the demand for water in each country was equivalent to or in excess of its share of the natural flow of St.Mary River, which, this season occured towards the end of June and continued until the closing of the season, the field engineers 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 Director, Dominion Water Power and Hydrometric Bureau.

Division of Water.

The United States St.Mary canal was opened at the headgates on April 18th and kept in continuous operation until November 6th, water being delivered to the North Branch Milk River on May 9th. After October 23, while a small flow was diverted through the head gates, no water passed the St.Mary crossing nor was delivered to Milk River. As the loss in the canal between the intake and the crossing of the St.Mary River,

which this year was about 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 154,300 acre-feet passing in the canal at the St.Mary River crossing is considered as the actual quantity diverted from the St.Mary River by the United States. Of this quantity 149,900 acre-feet were delivered to the North Branch Milk River and made available for irrigation in Montana. The slight 2.2% loss in the canal between St.Mary River crossing and Hudson Bay Divide, the end of the canal, was due to evaporation and seepage.

On November 1, 1935, a total of 1,866 acre-feet of water remained in storage in Sherburne reservoir. Approximately 5,900 acre-feet of water was in storage on April 1, 1936. The maximum storage reached during the season was 58,100 acre-feet on June 16. On October 31, the reservoir was practically empty.

As only a small quantity of water was diverted in Canada from Milk River, the natural flow of the river is considered as being delivered to the United States at Eastern Crossing. The total diversion for irrigation from the Milk River in Montana was 168,827 acre-feet.

The total recorded flow delivered to the United States at the International Boundary from the Northern tributaries of Milk River during the year 1936 was 81,300 acre-feet, which is 87% of the flow recorded in 1935 and about 48% of the average for the years of record.

The Canadian Pacific Railway canal at Kimball, Alberta, diverted 149,700 acre-feet from the St.Mary River during the period of operation from the 16th of April to the fourth of November, 118,800 acre-feet being used to irrigate lands in Southern Alberta.

The Dominion Water Power and Hydrometric 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. This year very little information on the total diversion from these tributaries is available however, the diversions reported in Canada are shown in table 3 and were; from Lodge Creek, 206 acre-feet; from Battle Creek, 440 acre-feet; from Frenchman River, 637 acre-feet. There were no diversions from the other tributaries.

Any question as to the proper share of the 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 and of Canyon Creek near 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 being 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 and its Northern tributaries.

Water Supply.

The precipitation on the prairies and foothills in the drainage basins of the St.Mary and Milk Rivers was considerably below normal during 1936, while that in the mountainous areas forming the headwaters of the St.Mary River was about the average.

In the mountainous areas tributary to the St.Mary River basin, as shown by the fifteenth annual international survey of the snow conditions on the headwaters of Swiftcurrent Creek, an area considered typical of the headwaters of St.Mary River, the snow cover was 89% of the mean of the fourteen years of record while the water content of this snow cover was 100% of the mean. The run-off of 66,400 acre-feet from the area surveyed, during May, June and July was about 95% of the average for the fourteen year period.

The natural flow of 414,800 acre-feet of St.Mary River at the boundary during the irrigation season of 1936, from the first of April to the end of October, was 66% of the average for the 34 years of records.

The run-off from the prairies, as indicated by the Northern tributaries of Milk River, was about 50% of the average for the years of record, while 87% of this run-off occured before the 1st of May.

The twenty-three international gauging stations previously used in the determination of the daily natural flow of the streams in the St.Mary and Milk River basins were maintained and operated under the joint supervision of the field engineers. Several stations previously discontinued by Canada on International streams and canals diverting therefrom were re-established.

Investigations.

A complaint was received from Canadian irrigators on Deer Creek, tributary to Milk River, protesting the diversion of the headwaters of the creek in Montana. A joint investigation by the field engineers determined that while a small flow from Deer Creek could be diverted into another water shed, the low flow in the creek at the Deer Creek irrigation scheme was then due to natural causes.

A complaint was received from Canadian water users on the South Branch Milk River protesting the diversion of water in Montana during July which, they claimed, caused the stream to cease flowing in Canada. Upon investigation, the field engineers determined that the low flow of the South Branch Milk River during the summer of 1936 was due to drought conditions prevailing in the area rather than to diversions from the stream in Montana.

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 1936.

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 the St.Mary River during the irrigation season of 1936, 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 and Canyon Creeks 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 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 St. Mary River, the loss or waste from the canals and the diversions from Milk River in the United States.

Table 3 shows the available information on the diversions from the Northern tributaries of Milk River in Canada.

Table 4 gives the diversions from the Northern tributaries of Milk River in the United States.

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
APRIL - 1936

Day	Inflow to Sherburne Reservoir				Outflow	Stored in Reservoir sec-ft. Gross	Released from Reservoir sec-ft. Net
	Recorded inflow		Un- recorded inflow est'd	Total inflow	Swiftcurrent Creek at Sherburne		
	Swift-current Creek	Canyon Creek					
1						11	
2						11	
3						11	
4						20	
5						32	
6						44	
7						62	
8						87	
9						97	
10						100	
11						110	
12	no records available	no records available	no records available	no records available	no records available	140	no stored water released
13						160	
14						160	
15						130	
16						170	
17						200	
18						240	
19						260	
20						290	
21						340	
22						435	
23						512	
24						418	
25						376	
26						309	
27						250	
28						278	
29						230	
30						234	
Total sec-ft.						5717	
Mean						191	
Ac-ft.						11365	

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
APRIL - 1936

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	115	--	9	124	--	124
2	114		10	124		124
3	113		11	124		124
4	122		11	133		133
5	130		11	141		141
6	168		20	188		188
7	206		32	238		238
8	254		44	298		298
9	302		62	364		364
10	402		87	489		489
11	398		97	495		495
12	484		100	584		584
13	437		110	547		547
14	416		140	556		556
15	342		160	502		502
16	267		160	427		427
17	274		130	404		404
18	308		170	478		478
19	345		200	545		545
20	394		240	634		634
21	464		260	724		724
22	564		290	854		854
23	682		340	1022		1022
24	770		435	1205		1205
25	826		512	1338		1338
26	878		418	1296		1296
27	878		376	1254		1254
28	886		309	1195		1195
29	863		250	1113		1113
30	834	--	278	1112	--	1112
Total sec-ft.	13236	--	5272	18508	--	18508
Mean	441	--	176	617	--	617
Ac-ft.	26250	--	10457	36707	--	36707

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
APRIL - 1936

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	124	31	--	31	--	9	9	--	22
2	124	31		31		10	10	--	21
3	124	31		31		11	11	--	20
4	133	33		33		11	11	--	22
5	141	35		35		11	11	--	24
6	188	47		47		20	20	--	27
7	238	60		60		32	32	--	28
8	298	74		74		44	44	--	30
9	364	91		91		62	62	--	29
10	489	122		122		87	87	--	35
11	495	124		124		97	97	--	27
12	584	146		146		100	100	--	46
13	547	137		137		110	110	--	27
14	556	139		139		140	140	1	--
15	502	126		126		160	160	34	--
16	427	107		107		160	160	53	--
17	404	101		101		130	130	29	--
18	478	120		120		170	170	50	--
19	545	136		136		200	200	64	--
20	634	158		158		240	240	82	--
21	724	195		195		260	260	65	--
22	854	260		260		290	290	30	--
23	1022	344		344		340	340	--	4
24	1205	436		436		435	435	--	1
25	1338	502		502		512	512	10	--
26	1296	481		481		418	418	--	63
27	1254	460		460		376	376	--	84
28	1195	431		431		309	309	--	122
29	1113	390		390		250	250	--	140
30	1112	389	--	389	--	278	278	--	111
Total sec-ft.	18508	5737	--	5737	--	5272	5272	418	883
Mean	617	191	--	191	--	176	176	13.9	29.4
Ac-ft.	36707	11365	--	11365	--	10457	10457	827	1749

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
APRIL - 1936

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	Excess or deficit of share delivered
1	124	93	115	--	22	--
2	124	93	114	--	21	--
3	124	93	113	--	20	--
4	133	100	122	--	22	--
5	141	106	130	--	24	--
6	188	141	168	--	27	--
7	238	178	206	--	28	--
8	298	224	254	--	30	--
9	364	273	302	--	29	--
10	489	367	402	--	35	--
11	495	371	398	--	27	--
12	584	438	484	--	46	--
13	547	410	437	--	27	--
14	556	417	416	--	--	1
15	502	376	342	--	--	34
16	427	320	267	86	--	53
17	404	303	274	148	--	29
18	478	358	308	202	--	50
19	545	409	345	241	--	64
20	634	476	394	287	--	82
21	724	529	464	290	--	65
22	854	594	564	256	--	30
23	1022	678	682	286	4	--
24	1205	769	770	275	1	--
25	1338	836	826	293	--	10
26	1296	815	878	294	63	--
27	1254	794	878	281	84	--
28	1195	764	886	263	122	--
29	1113	723	863	268	140	--
30	1112	723	834	278	111	--
Total sec-ft.	18508	12771	13236	3748 (16-30)	883	418
Mean	617	426	441	250	29.4	13.9
Ac-ft.	36707	25342	26250	7430	1749	827

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
MAY - 1936

Day	Inflow to Sherburne Reservoir: Recorded inflow: Swift-current Creek	Canyon 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	212		58	270	11	259	--
2	259		157	416	11	405	
3	305		159	464	11	453	
4	449		197	646	11	635	
5	743		242	985	11	974	
6	626		137	763	11	752	
7	437		184	621	11	610	
8	418		120	538	11	527	
9	445		147	592	5	587	
10	559		161	720	2	718	
11	568		420	988	2	986	
12	577		397	974	2	972	
13	586		273	859	14	845	
14	644		159	803	15	788	
15	943		296	1239	15	1224	
16	917		172	1089	15	1074	
17	672		142	814	15	799	
18	516		144	660	16	644	
19	465		155	620	18	602	
20	457		207	664	283	381	
21	410		117	527	416	111	
22	346	50	72	468	416	52	
23	315	50	30	395	267	128	
24	318	61	76	455	267	188	
25	399	77	77	553	267	286	
26	528	89	74	691	267	424	
27	654	95	56	805	267	538	
28	710	97	51	858	267	591	
29	753	96	10	859	267	592	
30	846	101	63	1010	416	594	
31	892	104	37	1033	416	617	--
Total sec-ft.	16969	820	4590	22379	4023	18356	--
Mean	547		149	722	130	592	--
Ac-ft.	33660	1570	9160	44390	7980	36410	--

no records

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
MAY - 1936

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	819	--	230	1049	--	1049
2	826	--	234	1060		1060
3	841	--	259	1100		1100
4	910	--	405	1315		1315
5	1120	--	453	1573		1573
6	1280	--	635	1915		1915
7	1360	--	974	2334		2334
8	1380	--	752	2132		2132
9	1250	171	610	2031		2031
10	1140	351	527	2018		2018
11	1190	437	587	2214		2214
12	1400	493	718	2611		2611
13	1560	538	986	3084		3084
14	1750	539	972	3261		3261
15	1890	598	845	3333		3333
16	2120	622	788	3530		3530
17	2100	656	1224	3980		3980
18	1970	660	1074	3704		3704
19	1750	691	799	3240		3240
20	1620	712	644	2976		2976
21	1630	715	602	2947		2947
22	1500	712	381	2593		2593
23	1300	723	111	2134		2134
24	1160	728	52	1940		1940
25	1040	726	128	1894		1894
26	982	754	188	1924		1924
27	1060	761	286	2107		2107
28	1170	761	424	2355		2355
29	1290	756	538	2584		2584
30	1540	752	591	2883		2883
31	1780	748	592	3120	--	3120
Total sec-ft.	42728	14604 (9-31)	17609	74941	--	74941
Mean	1378	635	568	2417	--	2417
Ac-ft.	84750	28967	34927	148643	--	148643

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
MAY - 1936

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	1049	358	--	358	--	230	230	--	128
2	1060	363		363	--	234	234	--	129
3	1100	383		383	--	259	259	--	124
4	1315	491		491	--	405	405	--	86
5	1573	620		620	--	453	453	--	167
6	1915	791		791	--	635	635	--	156
7	2334	1000		1000	--	974	974	--	26
8	2132	899		899	--	752	752	--	147
9	2031	849		849	171	610	781	--	68
10	2018	842		842	351	527	878	36	--
11	2214	940		940	437	587	1024	84	--
12	2611	1139		1139	493	718	1211	72	--
13	3084	1375		1375	538	986	1524	149	--
14	3261	1464		1464	539	972	1511	47	--
15	3333	1500		1500	598	845	1443	--	57
16	3530	1598		1598	622	788	1410	--	188
17	3980	1823		1823	656	1224	1880	57	--
18	3704	1685		1685	660	1074	1734	49	--
19	3240	1453		1453	691	799	1490	37	--
20	2976	1321		1321	712	644	1356	35	--
21	2947	1307		1307	715	602	1317	10	--
22	2593	1130		1130	712	381	1093	--	37
23	2134	900		900	723	111	834	--	66
24	1940	803		803	728	52	780	--	23
25	1894	780		780	726	128	854	74	--
26	1924	795		795	754	188	942	147	--
27	2107	887		887	761	286	1047	160	--
28	2355	1011		1011	761	424	1185	174	--
29	2584	1125		1125	756	538	1294	169	--
30	2883	1275		1275	752	591	1343	68	--
31	3120	1393	--	1393	748	592	1340	--	53
Total sec-ft.	74941	32300	--	32300	14604 (9-31)	17609	32213	1368	1455
Mean	2417	1042	--	1042	635	568	1039	44.1	46.9
Ac-ft.	148643	64066	--	64066	28967	34927	63894	2712	2884

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
MAY - 1936

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	Excess or deficit of share delivered
1	1049	691	819	254	128	--
2	1060	697	826	241	129	--
3	1100	717	641	266	124	--
4	1315	824	910	292	86	--
5	1573	953	1120	311	167	--
6	1915	1124	1280	287	156	--
7	2334	1334	1360	318	26	--
8	2132	1233	1380	326	147	--
9	2031	1182	1250	396	68	--
10	2018	1176	1140	407	--	36
11	2214	1274	1190	438	--	84
12	2611	1472	1400	475	--	72
13	3084	1709	1560	530	--	149
14	3261	1797	1750	554	--	47
15	3333	1833	1890	554	57	--
16	3530	1932	2120	550	188	--
17	3980	2157	2100	541	--	57
18	3704	2019	1970	506	--	49
19	3240	1787	1750	497	--	37
20	2976	1655	1620	534	--	35
21	2947	1640	1630	561	--	10
22	2593	1463	1500	528	37	--
23	2134	1234	1300	486	66	--
24	1940	1137	1160	501	23	--
25	1894	1114	1040	495	--	74
26	1924	1129	982	512	--	147
27	2107	1220	1060	619	--	160
28	2355	1344	1170	705	--	174
29	2584	1459	1290	778	--	169
30	2883	1608	1540	853	--	68
31	3120	1727	1780	918	53	--
Total sec-ft.	74941	42641	42728	15233	1455	1368
Mean	2417	1375.6	1378	491	46.9	44.1
Ac-ft.	148643	84577	84750	30210	2884	2712

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JUNE - 1936

Day	Inflow to Sherburne Reservoir: Recorded inflow: Swift-current Creek	Canyon Creek	Unrecorded inflow est'd	Total inflow	Outflow Swiftcurrent Creek at Sherburne	Stored in Reservoir sec-ft. Gross	Released from Reservoir sec-ft. Net
1	922	107	38	1067	757	310	--
2	841	104	39	984	757	227	--
3	569	100	35	694	569	125	--
4	366	82	35	483	290	193	--
5	298	57	43	398	290	108	--
6	315	58	30	403	290	113	--
7	332	60	25	417	290	127	--
8	349	63	28	440	290	150	--
9	366	65	30	461	290	171	--
10	403	66	37	506	290	216	--
11	422	68	50	540	290	250	--
12	434	81	16	531	290	241	--
13	457	83	88	628	290	338	--
14	426	72	50	548	290	258	--
15	396	69	40	505	569	--	64
16	407	74	50	531	569	--	38
17	407	73	50	530	569	--	39
18	414	75	50	539	572	--	33
19	342	64	55	461	444	17	--
20	288	56	32	376	373	3	--
21	269	50	69	388	371	17	--
22	285	57	71	413	482	--	69
23	311	61	92	464	580	--	116
24	342	60	72	474	590	--	116
25	388	70	114	572	604	--	32
26	384	68	56	508	611	--	103
27	349	56	99	504	615	--	111
28	325	48	58	431	611	--	180
29	249	41	23	313	604	--	291
30	203	38	49	290	536	--	246
Total sec-ft.	11849	2026	1524	15399	13973	2864	1438
Mean	395	68	51	513	466	95	38
Ac-ft.	23500	4030	3040	30540	27720	5650	2260

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
JUNE - 1936

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	2350	662	594	3606	--	3606
2	2720	756	617	4093	--	4093
3	2900	761	310	3971	--	3971
4	2560	756	227	3543	--	3543
5	1920	741	125	2786	--	2786
6	1610	734	193	2537	--	2537
7	1390	726	108	2224	--	2224
8	1230	704	113	2047	--	2047
9	1130	706	127	1963	--	1963
10	1070	723	150	1943	--	1943
11	1040	732	171	1943	--	1943
12	1020	737	216	1973	--	1973
13	1020	737	250	2007	--	2007
14	1050	717	241	2008	--	2008
15	1700	274	338	2312	--	2312
16	1390	502	258	2150	--	2150
17	1380	585	---	1965	64	1901
18	1200	732	---	1932	38	1894
19	1120	767	---	1887	39	1848
20	1020	765	---	1785	33	1752
21	925	756	17	1698	--	1698
22	856	750	3	1609	--	1609
23	856	754	17	1627	--	1627
24	886	756	---	1642	69	1573
25	910	759	--	1669	116	1553
26	966	761	--	1727	116	1611
27	991	763	--	1754	32	1722
28	982	767	--	1749	103	1646
29	957	754	--	1711	111	1600
30	863	752	--	1615	180	1435
Total sec-ft.	40012	21389	4075	65476	901	64575
Mean	1334	713	136	2183	30	2153
Ac-ft.	79360	42424	8090	129900	1785	128083

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JUNE - 1936

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	3606	1636	---	1636	662	594	1256	---	380
2	4093	1880	---	1880	756	617	1373	---	507
3	3971	1819	---	1819	761	310	1071	---	748
4	3543	1605	---	1605	756	227	983	---	622
5	2786	1226	---	1226	741	125	866	---	360
6	2537	1102	---	1102	734	193	927	---	175
7	2224	945	---	945	726	108	834	---	111
8	2047	857	---	857	704	113	817	---	40
9	1963	815	---	815	706	127	833	18	---
10	1943	805	---	805	723	150	873	68	---
11	1943	805	---	805	732	171	903	98	---
12	1973	820	---	820	737	216	953	133	---
13	2007	837	---	837	737	250	987	150	---
14	2008	837	---	837	717	241	958	121	---
15	2312	989	---	989	274	338	612	---	377
16	2150	908	---	908	502	258	760	---	148
17	1901	784	64	848	585	---	585	---	263
18	1894	780	38	818	732	---	732	---	86
19	1848	757	39	796	767	---	767	---	29
20	1752	709	33	742	765	---	765	23	---
21	1698	682	---	682	756	17	772	91	---
22	1609	638	---	638	750	3	753	115	---
23	1627	647	---	647	754	17	771	124	---
24	1573	620	69	689	756	---	756	67	---
25	1553	610	116	726	759	---	759	33	---
26	1611	639	116	755	761	---	761	6	---
27	1722	694	32	726	763	---	763	37	---
28	1646	656	103	759	767	---	767	8	---
29	1600	633	111	744	754	---	754	10	---
30	1435	551	180	731	752	---	752	21	---
Total sec-ft.	64575	27286	901	28187	21389	4075	25464	1123	3846
Mean	2153	910	30	940	713	136	849	37.4	128.2
Ac-ft.	128083	54121	1785	55906	42424	8090	50514	2226	7618

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JUNE - 1936

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	3606	1970	2350	873	380	---
2	4093	2213	2720	916	507	---
3	3971	2152	2900	887	748	---
4	3543	1938	2560	910	622	---
5	2786	1560	1920	907	360	---
6	2537	1435	1610	794	175	---
7	2224	1279	1390	336	111	---
8	2047	1190	1230	296	40	---
9	1963	1148	1130	318	---	18
10	1943	1138	1070	415	---	68
11	1943	1138	1040	400	---	98
12	1973	1153	1020	490	---	133
13	2007	1170	1020	510	---	150
14	2008	1171	1050	588	---	121
15	2312	1323	1700	580	377	---
16	2150	1242	1390	680	148	---
17	1901	1117	1380	691	263	---
18	1894	1114	1200	759	86	---
19	1848	1091	1120	845	29	---
20	1752	1043	1020	867	---	23
21	1698	1016	925	823	---	91
22	1609	971	856	804	---	115
23	1627	980	856	829	---	124
24	1573	953	886	842	---	67
25	1553	943	910	879	---	33
26	1611	972	966	951	---	6
27	1722	1028	991	972	---	37
28	1646	990	982	960	---	8
29	1600	967	957	936	---	10
30	1435	884	863	853	---	21
Total sec-ft.	64575	37289	40012	21911	3846	1123
Mean	2153	1243	1334	730	128.2	37.4
Ac-ft.	128083	73962	79360	43460	7618	2226

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
JULY - 1936

Day	Inflow to Sherburne Reservoir				Outflow	Stored in Reservoir	Released from Reservoir
	Recorded inflow		Un-		Swiftcurrent		
	Swift- current Creek	Canyon Creek	recorded inflow est'd	Total inflow	Creek at Sherburne	sec-ft. Gross	sec-ft. Net
1	185	34	64	283	533	---	250
2	188	36	69	293	586		293
3	197	40	30	267	663		396
4	197	40	35	272	733		461
5	194	38	28	260	765		505
6	191	36	70	297	753		456
7	185	33	56	274	745		471
8	176	31	51	258	737		479
9	168	28	55	251	737		486
10	162	27	34	223	729		506
11	162	26	48	236	737		501
12	150	23	62	235	753		518
13	140	22	73	235	798		563
14	140	22	33	195	790		595
15	142	23	61	226	769		543
16	145	24	83	252	769		517
17	145	25	68	238	786		548
18	150	25	58	233	806		573
19	148	25	47	220	811		591
20	148	24	63	235	794		559
21	148	23	57	228	790		562
22	148	23	13	184	798		614
23	145	23	87	255	802		547
24	142	23	29	194	811		617
25	131	22	24	177	811		634
26	119	20	27	166	815		649
27	109	19	59	187	806		619
28	104	18	67	189	786		597
29	100	17	74	191	778		587
30	102	17	45	164	782		618
31	104	18	40	162	786	---	624
Total sec-ft.	4665	805	1610	7080	23559	---	16479
Mean	150	26	52	288	760	---	532
Ac-ft.	9250	1600	3200	14050	46730	---	32860

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JULY - 1936

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	776	752	--	1528	291	1237
2	709	752		1461	246	1215
3	709	752		1461	250	1211
4	722	752		1474	293	1181
5	735	759		1494	396	1098
6	742	759		1501	461	1040
7	735	759		1494	505	989
8	715	756		1471	456	1015
9	689	756		1445	471	974
10	663	754		1417	479	938
11	650	754		1404	486	918
12	625	754		1379	506	873
13	588	752		1340	501	839
14	582	752		1334	518	816
15	564	752		1316	563	753
16	535	750		1285	595	690
17	529	750		1279	543	736
18	512	752		1264	517	747
19	524	752		1276	548	728
20	518	752		1270	573	697
21	507	752		1259	591	668
22	501	752		1253	559	694
23	501	752		1253	562	691
24	507	754		1261	614	647
25	490	752		1242	547	695
26	485	750		1235	617	618
27	464	750		1214	634	580
28	449	752		1207	649	552
29	430	750		1180	619	561
30	416	745		1161	597	564
31	394	748	--	1142	587	555
Total sec-ft.	17966	23328	--	41294	15774	25520
Mean	580	753	--	1333	509	824
Ac-ft.	35640	46270	--	81910	31287	50618

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
JULY - 1936

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	1237	452	291	743	752	--	752	9	--
2	1215	441	246	687	752		752	65	--
3	1211	439	250	689	752		752	63	--
4	1181	424	293	717	752		752	35	--
5	1098	382	396	778	759		759	--	19
6	1040	353	461	814	759		759	--	55
7	989	328	505	833	759		759	--	74
8	1015	341	456	797	756		756	--	41
9	974	320	471	791	756		756	--	35
10	938	302	479	781	754		754	--	27
11	918	292	486	778	754		754	--	24
12	873	270	506	776	754		754	--	22
13	839	253	501	754	752		752	--	2
14	816	241	518	759	752		752	--	7
15	753	210	563	773	752		752	--	21
16	690	178	595	773	750		750	--	23
17	736	201	543	744	750		750	6	--
18	747	207	517	724	752		752	28	--
19	728	197	548	745	752		752	7	--
20	697	182	573	755	752		752	--	3
21	668	167	591	758	752		752	--	6
22	694	180	559	739	752		752	13	--
23	691	179	562	741	752		752	11	--
24	647	162	614	776	754		754	--	22
25	695	181	547	728	752		752	24	--
26	618	154	617	771	750		750	--	21
27	580	145	634	779	750		750	--	29
28	552	138	649	787	752		752	--	35
29	561	140	619	759	750		750	--	9
30	564	141	597	738	745		745	7	--
31	555	139	587	726	748	--	748	22	--
Total sec-ft.	25520	7739	15774	23513	23328	--	23328	290	475
Mean	824	250	509	759	753	--	753	9.3	15.3
Ac-ft.	50618	15350	31287	46637	46270	--	46270	572	941

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JULY - 1936

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	1237	785	776	745	--	9
2	1215	774	709	667	--	65
3	1211	772	709	645	--	63
4	1181	757	722	653	--	35
5	1098	716	735	675	19	--
6	1040	687	742	683	55	--
7	989	661	735	678	74	--
8	1015	674	715	645	41	--
9	974	654	689	619	35	--
10	938	636	663	598	27	--
11	918	626	650	576	24	--
12	873	603	625	554	22	--
13	839	586	588	530	2	--
14	816	575	582	525	7	--
15	753	543	564	521	21	--
16	690	512	535	490	23	--
17	736	535	529	480	--	6
18	747	540	512	469	--	28
19	728	531	524	475	--	7
20	697	515	518	475	3	--
21	668	501	507	467	6	--
22	694	514	501	459	--	13
23	691	512	501	453	--	11
24	647	485	507	455	22	--
25	695	514	490	445	--	24
26	618	464	485	438	21	--
27	580	435	464	423	29	--
28	552	414	449	407	35	--
29	561	421	430	391	9	--
30	564	423	416	371	--	7
31	555	416	394	352	--	22
Total sec-ft.	25520	17781	17966	16364	475	290
Mean	824	574	580	528	15.3	9.3
Ac-ft.	50618	35268	35640	32460	941	572

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
AUGUST - 1936

Day	Inflow to Sherburne Reservoir				Outflow	Stored in Reservoir	Released from Reservoir
	Recorded inflow: Swift-current Creek	Canyon Creek	Unrecorded inflow est'd	Total inflow	Swiftcurrent Creek at Sherburne	sec-ft. Gross	sec-ft. Net
1	104	17	35	156	782	--	626
2	100	16	35	151	786		635
3	98	17	32	147	798		651
4	95	16	34	145	806		661
5	89	15	32	136	802		666
6	89	15	30	134	798		664
7	89	15	26	130	790		660
8	87	15	23	125	786		661
9	84	14	20	118	782		664
10	80	14	18	112	790		678
11	84	14	15	113	798		685
12	84	15	12	111	802		691
13	87	15	11	113	823		710
14	91	16	10	117	827		710
15	87	15	9	111	769		658
16	82	14	8	104	498		394
17	76	13	8	97	321		224
18	74	13	7	94	220		126
19	74	13	7	94	176		82
20	67	13	7	87	148		61
21	63	12	7	82	131		49
22	63	11	7	81	118		37
23	63	11	6	80	112		32
24	61	11	6	78	109		31
25	60	10	6	76	101		25
26	58	10	8	76	97		21
27	58	9	3	70	92		22
28	58	9	7	74	95		21
29	58	9	6	73	84		11
30	58	9	3	70	79		9
31	58	9	3	70	73	--	3
Total sec-ft.	2379	405	441	3225	14393	--	11168
Mean	76.7	13.1	14.2	104	464	--	360
Ac-ft.	4720	804	871	6395	28550	--	22155

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
AUGUST - 1936

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	382	748	--	1130	618	512
2	374	750		1124	624	500
3	394	756		1150	626	524
4	394	756		1150	635	515
5	386	756		1142	651	491
6	382	754		1136	661	475
7	374	754		1128	666	462
8	361	752		1113	664	449
9	349	752		1101	660	441
10	338	748		1086	661	425
11	338	748		1086	664	422
12	342	750		1092	678	414
13	338	750		1088	685	403
14	334	750		1084	691	393
15	338	750		1088	710	378
16	334	719		1053	710	343
17	357	574		931	658	273
18	345	457		802	394	408
19	403	329		732	224	508
20	315	318		633	126	507
21	270	273		543	82	461
22	361	160		521	61	460
23	334	156		490	49	441
24	290	148		438	37	401
25	290	130		420	32	388
26	277	122		399	31	368
27	264	120		384	25	359
28	258	112		370	21	349
29	245	105		350	22	328
30	239	98		337	21	316
31	227	96	--	323	11	312
Tatal sec-ft.	10233	15191	--	25424	12398	13026
Mean	330	490	--	820	400	420
Ac-ft.	20300	30131	--	50431	24591	25840

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
AUGUST - 1936

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	512	128	618	746	748	--	748	2	--
2	500	125	624	749	750		750	1	--
3	524	131	626	757	756		756	--	1
4	515	129	635	764	756		756	--	8
5	491	123	651	774	756		756	--	18
6	475	119	661	780	754		754	--	26
7	462	116	666	782	754		754	--	28
8	449	112	664	776	752		752	--	24
9	441	110	660	770	752		752	--	18
10	425	106	661	767	748		748	--	19
11	422	106	664	770	748		748	--	22
12	414	104	678	782	750		750	--	32
13	403	101	685	786	750		750	--	36
14	393	98	691	789	750		750	--	39
15	378	94	710	804	750		750	--	54
16	343	86	710	796	719		719	--	77
17	273	68	658	726	574		574	--	152
18	408	102	394	496	457		457	--	39
19	508	127	224	351	329		329	--	22
20	507	127	126	253	318		318	65	--
21	461	115	82	197	273		273	76	--
22	460	115	61	176	160		160	--	16
23	441	110	49	159	156		156	--	3
24	401	100	37	137	148		148	11	--
25	388	97	32	129	130		130	1	--
26	368	92	31	123	122		122	--	1
27	359	90	25	115	120		120	5	--
28	349	87	21	108	112		112	4	--
29	328	82	22	104	105		105	1	--
30	316	79	21	100	98		98	--	2
31	312	78	11	89	96	--	96	7	--
Total Sec-ft.	13026	3257	12398	15655	15191	--	15191	173	637
Mean	420	~~106~~ 105	400	506	490	--	490	5.6	20.6
Ac-ft.	25840	6460	24590	31050	30131	--	30131	347	1267

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
AUGUST - 1936

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	512	384	382	341	--	2
2	500	375	374	332	--	1
3	524	393	394	354	1	--
4	515	386	394	358	8	--
5	491	368	386	354	18	--
6	475	356	382	347	26	--
7	462	346	374	341	28	--
8	449	337	361	330	24	--
9	441	331	349	320	18	--
10	425	319	338	310	19	--
11	422	316	338	306	22	--
12	414	310	342	310	32	--
13	403	302	338	314	36	--
14	393	295	334	308	39	--
15	378	284	338	305	54	--
16	343	257	334	296	77	--
17	273	205	357	335	152	--
18	408	306	345	314	39	--
19	508	381	403	368	22	--
20	507	380	315	292	--	65
21	461	346	270	240	--	76
22	460	345	361	323	16	--
23	441	331	334	323	3	--
24	401	301	290	272	--	11
25	388	291	290	269	--	1
26	368	276	277	258	1	--
27	359	269	264	243	--	5
28	349	262	258	234	--	4
29	328	246	245	225	--	1
30	316	237	239	219	2	--
31	312	234	227	207	--	7
Total sec-ft.	13026	9769	10233	9348	637	173
Mean	420	315 ~~314~~	330	302	20.6	5.6
Ac-ft.	25840	19377	20300	18540	1267	347

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
SEPTEMBER - 1936

Day	Inflow to Sherburne Reservoir: Recorded inflow: Swiftcurrent Creek	Canyon Creek	Unrecorded inflow est'd	Total inflow	Outflow: Swiftcurrent Creek at Sherburne	Stored in Reservoir sec-ft. Gross	Released from Reservoir sec-ft. Net
1	56	8	3	67	69	--	2
2	56	9	3	68	68	--	--
3	56	9	3	68	68	--	--
4	58	9	3	70	70	--	--
5	65	13	0	78	71	7	--
6	70	16	0	86	74	12	--
7	70	16	0	86	80	6	--
8	65	15	1	81	82	--	1
9	55	13	4	72	85	--	13
10	49	11	11	71	84	--	13
11	46	9	12	67	80	--	13
12	45	9	10	64	76	--	12
13	40	8	12	60	72	--	12
14	35	8	11	54	66	--	12
15	34	7	15	56	68	--	12
16	31	6	19	56	68	--	12
17	28	5	13	46	56	--	10
18	27	5	6	38	48	--	10
19	26	5	4	35	44	--	9
20	26	5	1	32	40	--	8
21	26	4	5	35	42	--	7
22	28	4	2	34	39	--	5
23	31	5	2	38	34	4	--
24	31	3	1	35	39	--	4
25	36	5	1	42	37	5	--
26	36	5	0	41	41	--	--
27	33	5	2	40	43	--	3
28	30	5	4	39	42	--	3
29	28	5	7	40	43	--	3
30	28	6	2	36	40	--	4
Total sec-ft.	1245	233	157	1635	1769	34	168
Mean	41.5	7.8	5.2	54.5	59	1.1	5.6
Ac-ft.	2470	461	309	3240	3510	65	335

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
SEPTEMBER - 1936

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	215	92	--	307	9	298
2	210	92	--	302	3	299
3	212	90	--	302	2	300
4	212	81	--	293	0	293
5	242	84	--	326	0	326
6	264	84	--	348	0	348
7	245	81	7	333	--	333
8	242	81	12	335	--	335
9	239	80	6	325	--	325
10	233	75	--	308	1	307
11	224	74	--	298	13	285
12	215	74	--	289	13	276
13	207	74	--	281	13	268
14	196	74	--	270	12	258
15	185	73	--	258	12	246
16	180	73	--	253	12	241
17	169	73	--	242	12	230
18	164	72	--	236	12	224
19	160	65	--	225	10	215
20	158	64	--	222	10	212
21	154	64	--	218	9	209
22	149	57	--	206	8	198
23	145	57	--	202	7	195
24	141	57	--	198	5	193
25	140	58	4	202	--	202
26	138	57	--	195	4	191
27	134	56	5	195	--	195
28	133	55	--	188	--	188
29	129	55	--	184	3	181
30	128	55	--	183	3	180
Total sec-ft.	5563	2127	34	7714	173	7551
Mean	185	71	1.1	257	5.8	252
Ac-ft.	11030	4219	65	15314	343	14971

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
SEPTEMBER - 1936

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	298	74	9	83	92	--	92	9	--
2	299	75	3	78	92	--	92	14	--
3	300	75	2	77	90	--	90	13	--
4	293	73	0	73	81	--	81	8	--
5	326	82	0	82	84	--	84	2	--
6	348	87	0	87	84	--	84	--	3
7	333	83	--	83	81	7	88	5	--
8	335	84	--	84	81	12	93	9	--
9	325	81	--	81	80	6	86	5	--
10	297 307	74 7	1	75	75	--	75	--	--
11	285	71	13	84	74	--	74	--	10
12	276	69	13	82	74	--	74	--	8
13	268	67	13	80	74	--	74	--	6
14	258	64	12	76	74	--	74	--	2
15	246	62	12	74	73	--	73	--	1
16	241	60	12	72	73	--	73	1	--
17	230	58	12	70	73	--	73	3	--
18	224	56	12	68	72	--	72	4	--
19	215	54	10	64	65	--	65	1	--
20	212	53	10	63	64	--	64	1	--
21	209	52	9	61	64	--	64	3	--
22	198	50	8	58	57	--	57	--	1
23	195	49	7	56	57	--	57	1	--
24	193	48	5	53	57	--	57	4	--
25	202	50	--	50	58	4	62	12	--
26	191	48	4	52	57	--	57	5	--
27	195	49	--	49	56	5	61	12	--
28	188	47	--	47	55	--	55	8	--
29	181	45	3	48	55	--	55	7	--
30	180	45	3	48	55	--	55	7	--
Total sec-ft.	7541	1885 1888	173	2058	2127	34	2161	134	31
Mean	251	62.8	5.8	68.6	71	1.1	72.1	4.5	1.0
Ac-ft.	14951	3739	343	4082	4219	65	4284	262	60

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
SEPTEMBER - 1936

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	Deficit delivered
1	298	224	215	199	--	9
2	299	224	210	186	--	14
3	300	225	212	196	--	13
4	293	220	212	198	--	8
5	326	~~224~~ 244	242	227	--	2
6	348	261	264	251	3	--
7	333	250	245	232	--	5
8	335	251	242	225	--	9
9	325	244	239	222	--	5
10	~~297~~ 307	~~223~~ 230	223	218	--	--
11	285	214	224	208	10	--
12	276	207	215	202	8	--
13	268	201	207	192	6	--
14	258	194	196	182	2	--
15	246	184	185	172	1	--
16	241	181	180	164	--	1
17	230	172	169	152	--	3
18	224	168	164	144	--	4
19	215	161	160	139	--	1
20	212	159	158	128	--	1
21	209	157	154	118	--	3
22	198	148	149	127	1	--
23	195	146	145	112	--	1
24	193	145	141	109	--	4
25	202	152	140	129	--	12
26	191	143	138	128	--	5
27	195	146	134	121	--	12
28	188	141	133	115	--	8
29	181	136	129	112	--	7
30	180	135	128	108	--	7
Total sec-ft.	7541	~~5656~~ 5663	5553	5016	31	134
Mean	251	~~188~~ 189	185	167	1.0	4.5
Ac-ft.	14951	11219	11010	9950	60	262

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
WATER STORED OR RELEASED FROM SHERBURNE RESERVOIR
OCTOBER - 1936

Day	Inflow to Sherburne Reservoir				Outflow	Stored in Reservoir sec-ft. Gross	Released from Reservoir sec-ft. Net
	Recorded inflow: Swiftcurrent Creek	Canyon Creek	Unrecorded inflow est'd	Total inflow	Swiftcurrent Creek at Sherburne		
1	27	6	4	37	40	--	3
2	26	6	5	37	40	--	3
3	25	6	6	37	39	--	2
4	24	7	9	40	42	--	2
5	24	8	4	36	38	--	2
6	26	7	4	37	39	--	2
7	25	7	6	38	39	--	1
8	25	7	3	35	36	--	1
9	28	7	0	35	34	1	--
10	28	7	0	35	34	1	--
11	29	7	3	39	39	--	--
12	29	7	1	37	37	--	--
13	29	7	3	39	39	--	--
14	31	8	3	42	42	--	--
15	31	8	0	39	39	--	--
16	31	8	3	42	42	--	--
17	30	7	12	49	49	--	--
18	27	8	12	47	47	--	--
19	30	6	4	40	40	--	--
20	30	7	4	41	41	--	--
21	28	6	8	42	42	--	--
22	25	6	13	44	44	--	--
23	24	6	23	53	53	--	--
24	22	6	13	41	41	--	--
25	24	6	9	39	39	--	--
26	24	6	14	44	44	--	--
27	25	7	10	42	42	--	--
28	24	5	16	45	45	--	--
29	22	6	8	36	36	--	--
30	21	5	9	35	35	--	--
31	20	5	7	32	32	--	--
Total sec-ft.	814	205	216	1235	1249	2	16
Mean	26.3	6.6	7.1	40	40.3	0.1	0.5
Ac-ft.	1617	406	437	2450	2478	4	32

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
OCTOBER - 1936

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	126	55	--	181	3	178
2	123	55	--	178	4	174
3	119	54	--	173	3	170
4	118	55	--	173	3	170
5	118	53	--	171	2	169
6	118	43	--	161	2	159
7	116	41	--	157	2	155
8	116	40	--	156	2	154
9	116	41	--	157	1	156
10	115	41	--	156	1	155
11	113	41	1	155	-	155
12	112	40	1	153	-	153
13	110	41	-	151	-	151
14	108	40	-	148	-	148
15	106	41	-	147	-	147
16	105	41	-	146	-	146
17	112	41	-	153	-	153
18	119	40	-	159	-	159
19	123	41	-	164	-	164
20	123	38	-	161	-	161
21	120	38	-	158	-	158
22	128	19	-	147	-	147
23	164	0	-	164	-	164
24	167	0	-	167	-	167
25	180	1	-	181	-	181
26	180	1	-	181	-	181
27	187	1	-	188	-	188
28	177	1	-	178	-	178
29	134	36	-	170	-	170
30	131	35	-	166	-	166
31	123	30	-	153	-	153
Total sec-ft.	4007	1044	2	5053	23	5030
Mean	129.2	33.7	0.1	163	0.5	162
Ac-ft.	7950	2071	4	10021	46	9977

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY U.S.A.
OCTOBER - 1936

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	178	44	3	47	55	--	55	8	--
2	174	44	4	48	55	--	55	7	--
3	170	42	3	45	54	--	54	9	--
4	170	42	3	45	55	--	55	10	--
5	169	42	2	44	53	--	53	9	--
6	159	40	2	42	43	--	43	1	--
7	155	39	2	41	41	--	41	--	--
8	154	38	2	40	40	--	40	--	--
9	156	39	1	40	41	--	41	1	--
10	155	39	1	40	41	--	41	1	--
11	155	39	-	39	41	1	42	3	--
12	153	38	-	38	40	1	41	3	--
13	151	38	-	38	41	--	41	3	--
14	148	37	-	37	40	--	40	3	--
15	147	37	-	37	41	--	41	4	--
16	146	36	-	36	41	--	41	5	--
17	153	38	-	38	41	--	41	3	--
18	159	40	-	40	40	--	40	--	--
19	164	41	-	41	41	--	41	--	--
20	161	40	-	40	38	--	38	--	2
21	158	40	-	40	38	--	38	--	2
22	147	37	-	37	19	--	19	--	18
23	164	41	-	41	0	--	0	--	41
24	167	42	-	42	0	--	0	--	42
25	181	45	-	45	1	--	1	--	44
26	181	45	-	45	1	--	1	--	44
27	188	47	-	47	1	--	1	--	46
28	178	44	-	44	1	--	1	--	43
29	170	42	-	42	36	--	36	--	6
30	166	42	-	42	35	--	35	--	7
31	153	38	-	38	30	--	30	--	8
Total sec-ft.	5030	1256	23	1279	1044	2	1046	70	303
Mean	162	40.5	0.5	41	33.7	0.1	33.8	2.3	9.8
Ac-ft.	9977	2491	46	2537	2071	4	2075	141	603

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
OCTOBER - 1936

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	178	134	126	108	--	8
2	174	130	123	105	--	7
3	170	128	119	101	--	9
4	170	128	118	100	--	10
5	169	127	118	100	--	9
6	159	119	118	105	--	1
7	155	116	116	106	--	--
8	154	116	116	105	--	--
9	156	117	116	100	--	1
10	155	116	115	97	--	1
11	155	116	113	96	--	3
12	153	115	112	95	--	3
13	151	113	110	96	--	3
14	148	111	108	94	--	3
15	147	110	106	94	--	4
16	146	110	105	92	--	5
17	153	115	112	92	--	3
18	159	119	119	98	--	--
19	164	123	123	95	--	--
20	161	121	123	104	2	--
21	158	118	120	96	2	--
22	147	110	128	104	18	--
23	164	123	164	143	41	--
24	167	125	167	144	42	--
25	181	136	180	160	44	--
26	181	136	180	157	44	--
27	188	141	187	169	46	--
28	178	134	177	163	43	--
29	170	128	134	120	6	--
30	166	124	131	113	7	--
31	153	115	123	104	8	--
Total sec-ft.	5030	3774	4007	3456	303	70
Mean	162	121.5	129.2	111	9.8	2.3
Ac-ft.	9977	7486	7950	6850	603	141

Table 2

DIVISION OF ST.MARY RIVER

CANADA

Water Available in Acre-Feet

1936

Month	St.Mary R. at Kimball	Rolph Creek	Lee Creek	Pothole Creek	Combined Flow
April	26,250	1,500	3,810	2,700	34,260
May	84,750	118	3,040	28	87,916
June	79,360	62	2,230	--	81,652
July	35,640	--	120	--	35,760
August	20,300	44	31	--	20,375
September	11,030	2	118	--	11,150
October	7,950	36	333	--	8,319
Total	265,280	2,442	9,682	2,728	279,432 [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	7,430	+ 227	9,690	667	34,130
May	30,210	- 2,325	9,478	18,435	65,110
June	43,460	- 2,660	7,570	33,230	50,410
July	32,460	+ 1,049	289	33,220	1,500
August	18,540	- 1,223	36	17,281	1,100
September	9,950	- 366	46	9,538	902
October	6,850	- 384	33	6,433	1,470
Total	148,900 [b]	- 5,682 [c]	27,142 [d]	118,804 [f]	154,622 [x]

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

DIVISION OF ST.MARY RIVER

UNITED STATES

Water available in Acre-Feet

1936

Month	St.Mary River						Total Flow Milk River Eastern Crossing
	U. S. Share	Sherburne Res. Stored	Sherburne Res. Released	Total Available for Diversion	Diverted	Unused	
April	11,365	10,457		11,365	0	908	29,890
May	64,066	34,927		29,139	28,967	172	25,450
June	54,121	6,305		47,816	42,424	5,392	42,170
July	15,350		31,287	46,637	46,270	367	41,210
Aug.	6,460		24,590	31,050	30,131	919	34,750
Sept.	3,739		278	4,017	4,219	0	5,210
Oct.	2,491		42	2,533	2,071	462	3,090
Total	157,592	51,689	56,197	172,557	154,082	8,220	181,770

DIVERSIONS FROM MILK RIVER IN THE UNITED STATES

(Quantities in Acre-Feet)

Month	Ft. Belknap Canal	Paradise Canal	Harlem Canal	Agency Canal	Dodson North Canal	Dodson South Canal	Vandalia Canal	Total
March								
April	415		498	2,380	57	9,725		13,075
May	5,679	2,198	1,704	4,800	2,730	5,338	3,120	25,569
June	9,824	4,425	4,014	3,874	4,183	10,468	5,791	42,579
July	10,437	5,274	4,264	1,077	4,572	7,728	5,691	39,043
Aug.	9,049	3,828	2,743	2,696	3,010	12,600	3,670	37,596
Sept.	942	988	919	1,390	843	2,156	1,825	9,063
Oct.				313	50	101	1,438	1,902
Total	36,346	16,713	14,142	16,530	15,445	48,116	21,535	168,827

Table 3

DISPOSITION OF THE WATERS OF THE NORTHERN TRIBUTARIES OF MILK RIVER IN CANADA
1936

Quantities in Acre-Feet

Irrigator	Source of Supply	Estimated Diversion
Lodge Creek Drainage Basin		
Roth, R.L.	Lodge Creek	No data available
Mitchell, Wm.	Lodge Creek	No data available
Spangler, J.M.	Lodge Creek	No data available
Spangler, C.B.	Lodge Creek	100
Hillman, W.	Thelma Creek	80
Hartt, J.E.	Thelma Creek	10
Mitchell, Wm.	Shell Creek	No data available
Hartt, J.E.	Suiste Coulee	10
Hartt, J.E.	Cobblestone Coulee	No data available
Shock, J.J.	Shock Coulee	No data available
Read, J.	Read Creek	No data available
Mudie, H.	Sexton Creek	No data available
Clarke, T.S.	Sexton Creek	No data available
Jahn, B.A.	Middle Creek	6
Mitchell Bros.	Middle Creek	No data available
Legge, G.A.	Middle Creek	No data available
Sturm, A	Middle Creek	No data available
Legge, G.A.	Grant Creek	No data available
	Total from Lodge Creek Basin	206
Battle Creek Drainage Basin		
Lindner Bros.	Battle Creek	200
Patterson, W.G.	Battle Creek	40
Marshall & Gaff	Battle Creek	No water diverted
Gaff, J.A.	Battle Creek	No water diverted
Shepherd Bros.	Battle Creek	No data available
Gondrisk,	Battle Creek	No data available
Wilkes Bros.	Battle Creek	No data available
Wylie & Lindner	Battle Creek	No water diverted
McKinnon	Battle Creek	No data available
Stirling & Nash	Battle Creek	No data available

Quantities in Acre-Feet

Irrigator	Source of Supply	Estimated Diversion
Parsonage, E.J.	Shafer Creek	No water diverted
Wood & Anderson	Fort Walsh Creek	No water diverted
Wood & Anderson	Whitemud Coulee	No water diverted
Leslie, J.	Sixmile Coulee	No data available
Spangler, J.M.	Sixmile Coulee	200
Shepherd Bros.	Halfway Coulee	No data available
Total from Battle Creek Drainage		440
Frenchman River Drainage Basin		
Morrison, A.A.	Frenchman River	No water diverted
Morrison, G.N.	Frenchman River	No water diverted
Wylie, D.J.	Oxarart Creek	200
Gilchrist Bros.	Davis Creek	30
Gilchrist Bros.	Belanger Creek	200
Caton, W.A.	Fairwell Creek	No data available
Hensman, S.A.	N.B. Frenchman River	75
Armstrong	Clarence Coulee	30
Armstrong	Armstrong Creek	20
Kokott, T.	Calf Creek	No data available
Pearse, S.	Concrete Coulee	50
Bolingbroke, J.E.	Bolingbroke Creek	8
Bate, A.E.	Bate Creek	23
Bate, A.E.	Garden Creek	1
Total from Frenchman River		637
St.Mary River Basin		
Salt, Geo.	Boundary Creek	60
Vaughn	Rolph Creek	No data available
	Total	60
Milk River		
Deer Creek Cattle Company	Deer Creek	No water available

Table 4

DIVERSIONS FROM THE NORTHERN TRIBUTARIES

OF MILK RIVER IN THE UNITED STATES

1936

(Quantities in Acre-Feet)

Irrigator	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				Lodge Creek					
N. Chinook Canal	157	2,860	302	0	0	0	0	0	3,319
				Battle Creek					
Matheson Canal	0	233	323	114	39	0	0	0	709
				Frenchman River					
Frenchman Canal	8	106	953	703	63	0	0	0	1,833

Milk R - Milk R alto — A.F.

Yr. ending Sept. 30, 1932 222,000

Yr ending Oct 31, 1932 221,000

Milk R - Eastern Crossing

Mar 2 - Oct 31, 1932 223,000

Milk R. Tributaries - season ending Oct 31, 1932 - Canadian system of computations except Whitewater and Frenchman -

Stream		Run off a-f.
Lodge Cr -	Feb-June (no flow other months)	11,000
Mc Rae Coulee	Mar-Apr (")	41
Battle Cr	Mar-Oct	11,500
Woodpile Coulee	(Mar, Apr & June)	208
Lyons Coulee	do	113
E. Fk. Battle	do	739
Whitewater	Mar-Oct US computations	2287
Frenchman	Mar-Oct " "	43,400
Rock	Mar-Oct	3,020
Mc Eachern	"	1,280
Horse	Mar-June (July to Oct dry)	71
		72,299
	Total	72,299

Poplar Basin (Canada method)

East Poplar -	5880
Middle Poplar	6340
West Poplar	950
	13,170
	= 13,200

	Rock Cr	Lodge Creek	McRae Coulee	Woodpile Coulee	Battle Creek	Lyons Coulee	East Fk. Battle	Whitewater	Frenchman R	McEachern Cr	Horse	Total
1927	21,700	72,200	5,480	8860	96,200	10200	6070	14,100	198000	23600	10100	466,510
1928	12200	39 000	1,150	2450	48 700	3950	3660	12 400	108 000	13 000	5410	248,920
1929	2270	16 800	3840	148	24 700	239	524	246	35 100	992	377	85,236
1930	11800	20800	1940	3560	31 400	4280	4950	2450	79,900	9050	3890	174,020
1931	1440	490	86	0	3180	0	2	368	12800	358	141	18,805
1932	3020	11,000	41	208	11500	113	739	287	43400	1,280	711	72,299

Total. 6) 1,065,790

mean → 177,643

These are apt to be yrs ending Sept 30 c.s.d.

% 1932 $\frac{72299}{177643}$ = 40.7% mean

2333 - 2667
127 127
2460 2794

5606
5000
4) 606 = 151.5
3
454.5
2667
5121.5
498
2) 996

2333 2667
985 985
23315 27655

2333
319
2652

2667
319
2986

498 498
2333 2667
2831 3165

2333
5985
29315

2667
5985
32655

1349

674.5
2333
3007.5

674.5
2667
3341.5

5003

1.5
2333
2334.5

1355
3) 4065

2333
303
2636

2667

Sept 36

629
189
251.9