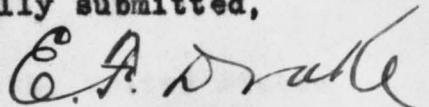


The Honourable, the International Joint Commission,
Washington, D.C., and Ottawa, Canada.

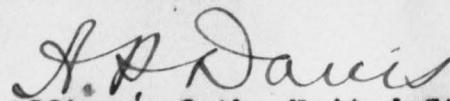
Gentlemen,

In compliance with the provisions of clause
11 of your order of the 6th April, 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 1921.

Respectfully submitted,



Accredited Reclamation Officer of His Majesty.



Accredited Reclamation Officer of the United States.

REPORT TO THE INTERNATIONAL JOINT COMMISSION
ON
DIVISION AND USE OF WATER OF ST. MARY AND MILK RIVERS
BY
E. F. DRAKE
representing Canada
AND
A. P. DAVIS
representing the United States

INTRODUCTION

The field work in the division and administration of the tributaries to the Milk river in 1921 was carried on by Mr. Geo. E. Stratton, Project Manager United States Reclamation Service, Malta, Montana, and that in connection with the waters of the St. Mary river by Mr. R. M. Snell, Project Manager U.S.R.S., Browning, Montana, on behalf of Mr. A. P. Davis, representing the United States.

Mr. S. G. Dawson carried on the field work on behalf of Mr. E. F. Drake, representing Canada.

The hydrometric data in Montana were obtained by the United States Geological Survey under the personal supervision of Mr. W. A. Lamb, while hydrometric data from Canadian streams were collected by the Dominion Water Power Branch under the supervision of Mr. A. L. Ford, District Chief Engineer.

The engineers in the field kept constantly in touch with the conditions relative to the flow of the different streams affected by the Treaty, the amount of water stored or released from storage, and the amounts diverted by each country. A table showing the use to which the waters of the St. Mary river were put was submitted weekly to the Director

of the Canadian Reclamation Service, to the project manager U.S.R.S. St.Mary canal, and to the project manager of the Alberta Railway & Irrigation project. Frequent trips of inspection were taken over the irrigated tracts in both countries to determine the use to which the diverted water was put.

DIVISION OF WATER

The U.S.R.S. St.Mary canal diverted 55,020 acre-feet of water from the St.Mary river during the period of operation from the opening of the headgates on the 8th May to the closing of them for the season on the 16th August. The opening of the canal was earlier than in previous years and water was delivered to the land in the Milk river valley about three weeks earlier than in 1920. Heavy rains in the Lower Milk river valley during June and July decreased the demand on the Milk river and allowed the early closing of the diversion canal from St.Mary river.

The A.R.& I. Company's canal diverted 222,637 acre-feet during the period of operation from the 12th April to the 28th October.

The proper share of the waters of the St.Mary river to be delivered to either country was determined by

the field engineers by making current meter measurements of the discharge of the headwaters of the St.Mary river, computing the inflow to and measuring the outflow from the Sherburne reservoir, the amount diverted by the U.S.R.S. St.Mary canal, and the amount delivered to Canada at the boundary; but as there was a very light demand by the U.S.R.S. on the waters of the St.Mary river during the low flow period, no question arose which required adjustment.

From these measurements and calculations the natural flow of St.Mary river was computed and the share to which each country was entitled was determined on the following basis:-

1. When the flow was less than 667 second-feet, one-fourth to the United States and three-fourths to Canada.
2. When the flow was between 667 and 1000 second-feet, 500 second-feet to Canada and the remainder to the United States.
3. When the flow was above 1000 second-feet, the water was divided equally between the two countries.

As the natural flow of the St.Mary river was above 1000 second-feet until the 4th of August, little difficulty was experienced in supplying each country with sufficient water to meet its requirements.

WATER SUPPLY

The precipitation on the St. Mary river drainage basin during the winter of 1920-1921 was sufficient to maintain an average flow in the river throughout the season. In the Milk river basin and the basins of the northern tributaries, the winter was the most open and mild that has been experienced for many years. The spring run-off, especially in the Milk river basin, was very light and much below the average.

An average season's flow was recorded on the northern tributaries of Milk river. Lodge creek maintained a discharge at the boundary until the 1st August, Battle creek went dry at the boundary on the 15th August but started to flow again on the 26th September. Frenchman river was dry from the 29th August to the 11th September. The flow of Swiftcurrent, Canyon and other small creeks in the basin above Sherburne was stored in Sherburne reservoir between the 20th June and the 9th July and this water was held until October. The heavy rains of June and July in the Milk river valley so decreased the demand for water that the United States' share of the natural flow of the St. Mary river, together

with that of Milk river, was sufficient without
drawing on this stored water.

HYDROMETRIC WORK

In the collection of the hydrometric data, the same gauging stations were maintained by Canada as in the previous season.

The gauging stations on Swiftcurrent and Canyon creeks at Many Glacier, on Swiftcurrent creek at Sherburne reservoir,

and on the North Branch of the Milk river above the outlet of the U.S.R.S. St.Mary canal, which heretofore were maintained and operated by the U.S.G.S. and the station on Milk river at Milk River, which has been maintained and operated by the C.R.S., were made international stations in June of this year on the joint recommendation of the Directors of the two Reclamation Services. These stations will in future be maintained and operated jointly by the two countries.

All the international gauging stations previously used in measuring the waters in the St.Mary and Milk river basins were maintained and operated under the joint supervision of the field engineers delegated to represent the undersigned.

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 the season of 1921.

DESCRIPTION OF TABLES AND DIAGRAMS

Several tables and diagrams have been prepared summarizing the data on the division and use of the waters

of the two rivers.

Table 1 - compares the estimated requirements for 1921 with the amount of water actually diverted.

Table 2 - shows the method of determining the natural flow of the St.Mary river during the irrigation season, the water available for use and diverted by the United States and the water available for use and diverted by Canada.

For periods of storing, the table consists of four sheets for the month. Sheet No. 1 shows the daily inflow into and out of Sherburne reservoir, the difference giving the amount of water stored or released from storage. On this sheet the inflow from streams other than those recorded is estimated by comparison with other streams and from personal investigations, and is put in the column headed "other streams". Sheet No. 2 shows the water diverted, stored or released from storage by the United States and the total natural flow of St.Mary river which would cross the boundary if undisturbed. Two days has been estimated as being the time for stored water to

reach the boundary from Sherburne reservoir.

Sheet No. 3 shows the water available for use by the United States, the water used and the excess or deficiency of this quantity over the quantity available. Sheet No. 4 shows the natural flow of St.Mary river at Kimball or the boundary, Canada's share and the actual discharge of the river at Kimball, which is the quantity of water received by Canada, the amount diverted by Canada and the excess or deficiency of the quantity received by Canada as compared with her share.

{During periods when there is no storing the first sheet}
(dealing with the Sherburne reservoir has been omitted.)

Table 3 - is the statement showing the quantity of water taken in each month by each country and the quantity thereof applied to the land, and also the quantity of water diverted from St.Mary to Milk river and stored or held back by either country, as requested by the Commission in paragraph 11 of its order of the 6th April, 1921. In addition this table shows for St.Mary and

Milk rivers the water available, diverted, used, stored, wasted and the losses in canals and reservoirs.

Table 4 - gives the available data on diversions from the principal northern tributaries of Milk river.

DEVELOPMENTS AND FUTURE REQUIREMENTS

During the season of 1921, some 17,000 acres, comprising the Taber Extension of the A.R.& I. project were watered for the first time. Water from the St.Mary river, which had been stored in Chin reservoir, was drawn to irrigate this tract.

ESTIMATED REQUIREMENTS AND ACTUAL DIVERSIONS
SEASON - 1921.

TABLE - 1.

CANADA

Month	Estimated		Diverted		Wasted		Balance		Percentage	
	Requirements								Estimated	Actual
	Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.				
April	2113		7725		5474		2251		1	3.4
May	25361		22320		3081		19239		12	10.0
June	52835		47663		6307		41356		25	21.4
July	52835		52019		5762		46257		25	23.4
August	42268		35294		2213		33081		20	15.9
September	31701		23683		1362		22321		15	10.7
October	4227		33933		10575		23358		2	15.2
TOTAL	211340		222637		34774		187863		100	100.0

UNITED STATES

Month	Estimated		Diverted		(c)		Balance		Percentage	
	Requirements				Wasted:				Estimated	Actual
	Ac.Ft.	(b)	(a) Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.	Ac.Ft.	(b)	
March	:	b	:	:	:	:	:	:	b	:
April	5000		3481				3481		2.1	3.7
May	2000	17000	16805		220		16585		1	6.9
June	24800	24800	15684		290		15394		12	10.1
July	51200	51200	24427		960		23467		25	20.6
August	51200	51200	16551		1210		15341		25	20.6
September	41000	52000	16225		1030		15195		20	21.1
October	30700	41700	3484		240		3244		15	16.9
November	4100	4100	1824		410		1414		2	1.7
TOTAL	204800	246800	98686		4470		94216		100	100.0

(a) Water diverted from Milk River plus St.Mary River water lost by seepage and evaporation in transit.

(b) This column is the total estimated requirements, including diversion to Nelson Reservoir and is comparable to the following column diverted Ac.Ft.

(c) Wasted from Dodson North, Dodson South, Bowdoin, Nelson Reservoir, and Vandalia canals. No figures are available on the waste from private canals.

TABLE II

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
APRIL - 1921

Day	St. Mary River : at Kimball : Sec.Ft.	Diverted by : U.S.R.S. : Sec.Ft.	Stored by : U.S.R.S. : Sec.Ft.	Total : Sec.Ft.	Stored Water : Released : Sec.Ft.	Natural Flow St. Mary R. at Kimball : Canada : Sec.Ft.	Diverted : Sec.Ft.
1	370	0	0	370	-	370	-
2	430	0	0	430	-	430	-
3	430	0	0	430	-	430	-
4	384	0	0	384	-	384	-
5	339			339		339	
6	402			402		402	
7	466			466		466	
8	471			471		471	
9	476			476		476	
10	476			476		476	
11	505			505		505	
12	548			548		548	
13	575			575		575	
14	593			593		593	
15	654			654		654	
16	687			687		687	
17	707			707		707	
18	761			761		761	
19	818			818		818	
20	908			908		908	
21	987			987		987	
22	1027			1027		1027	
23	1051			1051		1051	
24	870			870		870	
25	804			804		804	
26	700			700		700	
27	700			700		700	
28	720			720		720	
29	734			734		734	
30	787			787		787	
TOTAL	19380	0	0	19380	0	19380	
MEAN	646	0	0	646	0	646	
AC.FT.	38440	0	0	38440	0	38440	

DIVISION OF WATER OF ST.MARY RIVER
WATER USED BY UNITED STATES
APRIL - 1921

Day	AVAILABLE FOR USE BY U.S.:			USED					
	Natural Flow	U.S. Share	Stored Water at Kimball	Total	Diverted	Stored	Total	Excess	Deficiency
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	370	92	0	92	0	0	0	0	92
2	430	108		108					108
3	430	108		108					108
4	384	96		96					96
5	339	85		85					85
6	402	100		100					100
7	466	117		117					117
8	471	118		118					118
9	476	119		119					119
10	476	119		119					119
11	505	126		126					126
12	548	137		137					137
13	575	144		144					144
14	593	148		148					148
15	654	163		163					163
16	687	187		187					187
17	707	207		207					207
18	761	261		261					261
19	818	318		318					318
20	908	408		408					408
21	987	487		487					487
22	1027	513		513					513
23	1051	526		526					526
24	870	370		370					370
25	804	304		304					304
26	700	200		200					200
27	700	200		200					200
28	720	220		220					220
29	734	234		234					234
30	787	287	0	287					287
TOTAL	19380	6502	0	6502					6502
MEAN	646	217	0	217					217
AC.FT.	38440	12912	0	12912					12912

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE & USED BY CANADA
APRIL - 1921

Day	:Natural Flow St.Mary:	Canada's Share:	St.Mary River:	Diverted by:	Excess :	Deficiency
	: River at Kimball :	: Sec.Ft.	: at Kimball :	: Canada :	: Sec.Ft.	:
1	370	278	370		92	
2	430	322	430		108	
3	430	322	430		108	
4	384	288	384		96	
5	339	254	339		85	
6	402	302	402		100	
7	466	349	466		117	
8	471	353	471		118	
9	476	357	476		119	
10	476	357	476		119	
11	505	379	505		126	
12	548	411	548	8.5	137	
13	575	431	575	89.	144	
14	593	445	593	176	148	
15	654	491	654	168	163	
16	687	500	687	165	187	
17	707	500	707	180	207	
18	761	500	761	189	261	
19	818	500	818	200	318	
20	908	500	908	201	408	
21	987	500	987	192	487	
22	1027	514	1027	197	513	
23	1051	525	1051	227	526	
24	870	500	870	219	370	
25	804	500	804	227	304	
26	700	500	700	264	200	
27	700	500	700	277	200	
28	720	500	720	304	220	
29	734	500	734	310	234	
30	787	500	787	306	287	
TOTAL	19380	12878	19380	3899.5	6502	
MEAN	646	429	646	205	217	
AC.FT.	38440	25528	38440	7725	12912	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
 WATER STORED AND RELEASED BY UNITED STATES
 MAY - 1921

Day	INFLOW TO SILVERBURN RESERVOIR				Released	
	Swiftcurrent Cr.	Canyon	Other Creeks	Total	Swiftcurrent Cr.	Stored from
	at Many Glacier	Creek		: below Sherburne	: Storage	
	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.
1				156		
2	(Records not available)				155	
3				154		
4				154		
5				169		
6				177		
7				427		
8				539		
9				569		
10				615		
11				662		
12				678		
13				646		
14				584		
15				495		
16				467		
17				454		
18				518		
19				615		
20				788		
21				882		
22				926		
23				980		
24				1020		
25	962	142	110	1214	1040	174
26	1070	142	121	1333	1090	243
27	854	114	96	1064	643	421
28	610	72	68	750	826	-
29	446	62	50	558	1150	-
30	456	70	52	578	1100	-
31	532	82	61	675	793	-
TOTAL	4930	684	558	6172	19472	838
MEAN	704	98	80	882	628	279
AC.FT.	9774	1361	1107	12241	38614	1663
						2044

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
MAY - 1921

Day	St. Mary River:	Diverted by: at Kimball	Stored by: U.S.R.S.	Total	Stored Water: Released	Natural Flow: St. Mary River-Kimbal
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	840	-	-	840	-	840
2	804	-	-	804	-	804
3	768	-	-	768	-	768
4	804	-	-	804	-	804
5	840	-	-	840	-	840
6	840	-	-	840	-	840
7	1067	-	-	1067	-	1067
8	1345	-	-	1345	-	1345
9	1649	-	-	1649	-	1649
10	1923	-	-	1923	-	1923
11	2157	-	-	2157	-	2157
12	2197	138	-	2335	-	2335
13	2264	146	-	2410	-	2410
14	2197	155	-	2352	-	2352
15	2053	176	-	2229	-	2229
16	1949	177	-	2126	-	2126
17	1884	181	-	2065	-	2065
18	1884	161	-	2045	-	2045
19	2368	121	-	2489	-	2489
20	2958	148	-	3106	-	3106
21	3461	151	-	3612	-	3612
22	3835	156	-	3991	-	3991
23	4162	142	-	4304	-	4304
24	4450	177	-	4627	-	4627
25	4720	199	-	4919	-	4919
26	4908	187	-	5095	-	5095
27	4666	192	174	5032	-	5032
28	4270	197	243	4710	-	4710
29	4073	207	421	4701	-	4701
30	3903	220	-	4123	76	4047
31	3699	235	-	3934	592	3342
TOTAL	78938	3466	838	83242	668	82574
MEAN	2546	173	279	2685	334	2664
AC.FT.	156547	6863	1663	165073	1325	163748

DIVISION OF WATER OF ST.MARY RIVER
WATER USED BY UNITED STATES
MAY - 1921

Day	AVAILABLE FOR USE BY U.S.:			USED			Excess	Deficiency
	Natural Flow	U.S.	Stored	Total	Diverted	Stored		
	St. Mary River	Share	Water					
	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.
1	840	340		340				340
2	804	304		304				304
3	768	268		268				268
4	804	304		304				304
5	840	340		340				340
6	840	340		340				340
7	1067	533		533				533
8	1345	672		672				677
9	1649	825		825				825
10	1923	962		962				962
11	2157	1078		1078				1078
12	2335	1168		1168	138	-	138	1030
13	2410	1205		1205	146		146	1059
14	2352	1176		1176	155		155	1021
15	2229	1114		1114	176		176	938
16	2126	1059		1059	177		177	886
17	2065	1032		1032	181		181	851
18	2045	1022		1022	161		161	861
19	2489	1244		1244	121		121	1123
20	3106	1553		1553	148		148	1405
21	3612	1806		1806	151		151	1655
22	3991	1996		1996	156		156	1840
23	4304	2152		2152	142		142	2010
24	4627	2313		2313	177		177	2136
25	4919	2459		2459	199		199	2260
26	5095	2548		2548	187		187	2361
27	5032	2516		2516	192	174	366	2150
28	4710	2355		2355	197	243	440	1915
29	4701	2350		2350	207	421	628	1722
30	4047	2023	76	2099	220	-	220	1879
31	3342	1671	592	2263	235	-	235	2028
TOTAL	82574	40732	668	41400	3466	838	4304	37096
MEAN	2664	1314	334	1335	173	279	215	1197
AC.FT.	163748	80792	1325	82119	6863	1663	8529	73590

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
MAY - 1921

Day	Natural Flow of:		Canada's	St. Mary River	Diverted	Excess	Deficiency
	St. Mary River	Share		at Kimball	Canada		
	: at Kimball	:		Kimball	:		
	: Sec.Ft.	: Sec.Ft.		Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.
1	840	500		840	301	340	
2	804	500		804	313	304	
3	768	500		768	313	268	
4	804	500		804	318	304	
5	840	500		840	350	340	
6	840	500		840	367	340	
7	1067	534		1067	362	533	
8	1345	673		1345	375	677	
9	1649	824		1649	377	825	
10	1923	961		1923	367	962	
11	2157	1079		2157	360	1078	
12	2335	1167		2197	305	1030	
13	2410	1205		2264	18	1059	
14	2352	1176		2197	115	1021	
15	2229	1115		2053	259	938	
16	2126	1063		1949	304	886	
17	2065	1033		1884	316	851	
18	2045	1023		1884	315	861	
19	2489	1245		2368	320	1123	
20	3106	1553		2958	306	1405	
21	3612	1806		3461	326	1655	
22	3991	1995		3835	362	1840	
23	4304	2152		4162	394	2010	
24	4627	2314		4450	412	2136	
25	4919	2460		4720	428	2260	
26	5095	2547		4908	480	2361	
27	5032	2516		4666	514	2150	
28	4710	2355		4270	512	1915	
29	4701	2351		4073	565	1722	
30	4047	2024		3903	584	1876	
31	3342	1671		3699	602	2028	
TOTAL	82574	41843		78938	11240	37096	
MEAN	2664	1349		2546	363	1197	
AC. FT.	163748	82956		156547	22320	73590	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED AND RELEASED BY UNITED STATES
June - 1921

Day	INFLOW INTO SHERBURNE RESERVOIR					Released		
	Swiftcurrent Cr.	Canyon	Other Creeks	Total	Inflow	Swiftcurrent Cr.	Stored	from
	:at Many Glacier	:Creek	:	:Inflow	:below Sherburne	:	:Storage	
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	644	93	74	811	753	58	-	-
2	674	91	75	840	1080	-	240	240
3	565	77	64	706	1040	-	334	334
4	559	96	65	720	998	-	278	278
5	735	114	85	934	987	-	53	53
6	962	124	108	1194	1000	194	-	-
7	975	127	110	1212	1030	182	-	-
8	937	120	105	1162	1050	112	-	-
9	949	108	105	1162	1060	102	-	-
10	861	104	96	1061	1040	21	-	-
11	773	129	90	992	1040	-	48	48
12	686	110	80	876	1040	-	164	164
13	638	100	74	812	1040	-	228	228
14	735	88	82	905	1030	-	125	125
15	598	77	68	743	1000	-	257	257
16	501	72	57	630	962	-	332	332
17	435	68	50	553	916	-	363	363
18	442	77	50	569	882	-	313	313
19	466	79	50	595	858	-	263	263
20	506	86	59	651	314	337	-	-
21	559	96	65	720	5.4	715	-	-
22	639	112	75	826	4.2	822	-	-
23	686	108	80	874	4.0	870	-	-
24	570	96	66	732	3.6	728	-	-
25	656	116	77	849	1.0	848	-	-
26	598	100	70	768	1.2	767	-	-
27	511	93	60	664	0.8	663	-	-
28	491	89	58	638	0.6	637	-	-
29	451	87	54	592	0.5	591	-	-
30	446	86	53	585	0.8	584	-	-
TOTAL	19248	2923	2205	24376	19142.1	8231	2998	
MEAN	642	97	73	813	638	484	230	
AC.FT.	38202	5772	4374	48348	37964	16328	5946	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
JUNE - 1921

Day	St. Mary River	Diverted by	Stored by	Total	Stored water	Natural Flow St.
	: at Kimball	: U.S.R.S.	: U.S.R.S.	: Sec.Ft.	: Released	: Mary R. at Kimball
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	3359	252	-	3611	522	3089
2	3563	267	-	3830	118	3712
3	3665	269	58	3992	-	3992
4	3546	273	-	3819	240	3579
5	3665	288	-	3953	334	3619
6	3903	284	-	4187	278	3809
7	4108	286	-	4394	53	4341
8	4306	288	194	4788	-	4788
9	4396	311	182	4889	-	4889
10	4324	327	112	4763	-	4763
11	4234	349	102	4685	-	4685
12	4216	366	21	4603	-	4603
13	4126	376	-	4502	48	4454
14	4022	366	-	4388	164	4224
15	3852	366	-	4218	228	3990
16	3784	396	-	4180	125	4055
17	3495	408	-	3903	257	3646
18	3240	426	-	3666	332	3334
19	3038	428	-	3466	363	3103
20	2814	422	-	3236	313	2923
21	2475	376	-	2851	263	2588
22	2278	366	337	2981	-	2981
23	2251	364	715	3330	-	3330
24	2224	353	822	3399	-	3399
25	2210	353	870	3433	-	3433
26	2210	349	728	3287	-	3287
27	2197	349	848	3394	-	3394
28	2105	348	767	3220	-	3220
29	2066	344	663	3073	-	3073
30	1988	348	637	2973	-	2973
TOTAL	97660	10298	7056	115014	3638	111276
MEAN	3255	343	470	3833	242	3709
AC.FT.	193686	20410	13991	228087	7216	220871

20911

DIVISION OF WATER OF ST. MARY RIVER
WATER USED BY UNITED STATES
JUNE - 1921

Day	Natural Flow : AVAILABLE FOR USE BY U.S.			USED				Excess:Deficiency
	St. Mary River	U.S. Share	Stored Water	Total	Diverted	Stored	Total	
	at Kimball	Released						
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	3089	1545	522	2067	252	-	252	1815
2	3712	1856	118	1974	267	-	267	1707
3	3992	1996	-	1996	269	58	327	1669
4	3579	1789	240	2029	273	-	273	1756
5	3619	1810	334	2144	288	-	288	1856
6	3809	1904	278	2182	284	-	284	1898
7	4341	2170	53	2223	286	-	286	1937
8	4788	2394	-	2394	288	194	482	1912
9	4889	2445	-	2445	311	182	493	1952
10	4763	2381	-	2381	327	112	439	1942
11	4685	2342	-	2342	349	102	451	1891
12	4603	2302	-	2302	366	21	387	1915
13	4454	2227	48	2275	376	-	376	1899
14	4224	2112	164	2276	366	-	366	1910
15	3990	1995	228	2223	366	-	366	1857
16	4055	2028	125	2153	396	-	396	1757
17	3646	1823	257	2080	408	-	408	1672
18	3334	1667	332	1999	426	-	426	1573
19	3103	1552	363	1915	428	-	428	1487
20	2923	1461	313	1774	422	-	422	1352
21	2588	1294	263	1557	376	-	376	1181
22	2981	1490	-	1490	366	337	703	787
23	3330	1665	-	1665	364	715	1079	586
24	3399	1699	-	1699	353	822	1175	524
25	3433	1716	-	1716	353	870	1223	493
26	3287	1643	-	1643	349	728	1077	566
27	3394	1697	-	1697	349	848	1197	500
28	3220	1610	-	1610	348	767	1115	495
29	3073	1537	-	1537	344	663	1007	530
30	2973	1487	-	1487	348	637	985	502
TOTAL	111276	55638	3638	59275	10298	7056	17354	41920
MEAN	3709	1854	242	1976	343	470	578	1397
AC.FT.	220871	110435	7216	117651	20410	13991	34401	83250

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JUNE - 1921

Day	:Natural Flow Of :St.Mary R.at Kimball: : Sec.Ft.	: Canada's Share : Sec.Ft.	: St.Mary River: at Kimball : Sec.Ft.	:Diverted : Canada : Sec.Ft.	: Excess : : Sec.Ft. Sec.Ft.	: Deficiency
1	3089	1544	3359	645	1815	
2	3712	1856	3563	718	1707	
3	3992	1996	3665	705	1669	
4	3579	1790	3546	695	1756	
5	3619	1809	3665	705	1856	
6	3809	1905	3903	725	1898	
7	4341	2171	4108	702	1937	
8	4788	2394	4306	722	1912	
9	4889	2444	4396	740	1952	
10	4763	2382	4324	771	1942	
11	4685	2343	4234	795	1891	
12	4603	2301	4216	787	1915	
13	4454	2227	4126	790	1899	
14	4224	2112	4022	846	1910	
15	3990	1995	3852	863	1857	
16	4055	2027	3784	854	1757	
17	3646	1823	3495	846	1672	
18	3334	1667	3240	441	1573	
19	3103	1551	3038	596	1487	
20	2923	1462	2814	863	1352	
21	2588	1294	2475	854	1181	
22	2981	1491	2278	853	787	
23	3330	1665	2251	900	586	
24	3399	1700	2224	930	524	
25	3433	1717	2210	954	493	
26	3287	1644	2210	965	566	
27	3394	1697	2197	960	500	
28	3220	1610	2105	941	495	
29	3073	1536	2066	936	530	
30	2973	1486	1988	938	502	
TOTAL	111276	55638	97660	24040	41920	
MEAN	3709	1854	3255	801	1397	
AC.FT.	220871	110436	193686	47663	83250	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
 WATER STORED AND RELEASED BY UNITED STATES
 JULY - 1921

Day	INFLOW TO SHERBURNE RESERVOIR				Swiftcurrent Cr.	Stored	Released
	Swiftcurrent Cr.	Canyon	Other Creeks	Total	Sherburne	:from	:Storage
	Many Glacier	Creek	Estimated				
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	491	93	58	642	0.5	642	
2	446	77	50	573	1.2	572	
3	362	58	42	462	1.0	561	
4	318	54	37	409	0.8	408	
5	322	54	37	413	0.8	412	
6	327	53	38	418	0.7	417	
7	331	56	39	426	0.6	425	
8	358	62	40	460	0.6	459	
9	380	64	42	496	48.0	448	
10	344	54	39	437	255.0	182	
11	310	46	35	391	255.0	136	
12	284	41	32	357	255.0	102	
13	276	41	31	348	259.0	89	
14	276	42	30	348	259.0	89	
15	284	44	29	357	259.0	98	
16	276	45	25	346	264.0	82	
17	280	41	20	341	264.0	77	
18	264	36	19	319	266.0	53	
19	236	35	19	290	266.0	24	
20	270	40	20	330	262.0	68	
21	305	41	20	366	253.0	113	
22	268	36	19	323	255.0	68	
23	238	34	17	289	255.0	34	
24	214	34	16	264	257.0	07	
25	214	31	15	260	253.0	07	
26	197	30	14	241	253.0	-	12
27	194	29	13	236	255.0	-	19
28	197	29	13	239	255.0	-	16
29	197	30	14	241	255.0	-	14
30	190	28	13	231	255.0	-	24
31	184	28	13	225	255.0	-	30
TOTAL	8833	1386	849	11068	5719.2	5573	115
MEAN	285	45	27.4	357	184	223	19
AC. FT.	17524	2767	1685	21976	11314	11054	228

DETERMINATION OF NATURAL FLOW OF ST.MARY RIVER
JULY - 1921

Day	St.Mary River : Diverted by : Stored by : Total :	Day	Stored Water : Natural Flow St.Mary
	at Kimball : U.S.R.S. : U.S.R.S. : Released : River at Kimball		River at Kimball
	Sec.Ft. : Sec.Ft. : Sec.Ft. : Sec.Ft. : Sec.Ft.		Sec.Ft.
1	1962 346	591	2899
2	1988 346	584	2918
3	1949 344	642	2935
4	1793 348	572	2713
5	1627 346	561	2534
6	1462 348	408	2218
7	1336 353	412	2101
8	1288 349	417	2054
9	1241 348	425	2014
10	1278 342	459	2079
11	1365 335	448	2148
12	1375 335	182	1892
13	1345 333	136	1814
14	1316 333	102	1751
15	1278 333	89	1700
16	1260 322	89	1671
17	1241 319	98	1658
18	1205 319	82	1606
19	1152 319	77	1548
20	1134 322	53	1509
21	1092 319	24	1435
22	1067 322	68	1457
23	1035 321	113	1469
24	995 321	68	1384
25	971 321	34	1326
26	1027 324	07	1358
27	955 322	07	1284
28	892 321	-	1213
29	840 321	-	1161
30	818 322	-	1140
31	818 321	-	1139
TOTAL	39105 10275	6748	56127
MEAN	1261 331	250	1810
AG.FT.	77536 20352	13383	111291
			121
			111170

DIVISION OF WATER OF ST.MARY RIVER
WATER USED BY UNITED STATES
JULY - 1921

Day	AVAILABLE FOR USE BY U.S.:			USED			Excess	Deficiency
	Natural Flow	U.S.	Stored	Total	Diverted	Stored		
	St. Mary River	Share	Water					
	at Kimball		Released					
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	2899	1450	-	1450	346	591	937	513
2	2918	1459	-	1459	346	584	930	529
3	2935	1467	-	1467	344	642	986	481
4	2713	1357	-	1357	348	572	920	437
5	2534	1267	-	1267	346	561	907	360
6	2218	1109	-	1109	348	408	756	353
7	2101	1050	-	1050	353	412	765	285
8	2054	1027	-	1027	349	417	766	261
9	2014	1007	-	1007	348	425	773	234
10	2079	1039	-	1039	342	459	801	238
11	2148	1074	-	1074	335	448	783	291
12	1892	946	-	946	335	182	517	429
13	1814	907	-	907	333	136	469	438
14	1751	876	-	876	333	102	435	441
15	1700	850	-	850	333	89	422	428
16	1671	836	-	836	322	89	411	425
17	1658	829	-	829	319	98	417	412
18	1606	803	-	803	319	82	401	402
19	1548	774	-	774	319	77	396	378
20	1509	754	-	754	322	53	375	379
21	1435	718	-	718	319	24	343	375
22	1457	728	-	728	322	68	390	338
23	1469	734	-	734	321	113	434	300
24	1384	692	-	692	321	68	389	303
25	1326	663	-	663	321	34	355	308
26	1358	679	-	679	324	07	331	348
27	1284	642	-	642	322	07	329	313
28	1201	600	12	612	321	-	321	291
29	1142	571	19	590	321	-	321	269
30	1124	562	16	578	322	-	322	256
31	1125	563	14	577	321	-	321	256
TOTAL	56066	28033	61	28094	10275	6748	17023	11071
MEAN	1808	904	15	906	331	250	549	357
AC.FT.	111170	55585	121	55706	20352	13383	33735	21951

DIVISION OF WATER OF ST.MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
JULY - 1921

Day	:Natural Flow of:	Canada's Share	St.Mary River at Kimball	Diverted from Kimball	Excess Canada	Deficiency
	: St.Mary River	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	:
1	2899	1449	1962	949	513	
2	2918	1459	1988	952	529	
3	2935	1468	1949	938	481	
4	2713	1356	1793	903	437	
5	2534	1267	1627	863	360	
6	2218	1109	1462	897	353	
7	2101	1051	1336	918	285	
8	2054	1027	1288	860	261	
9	2014	1007	1241	846	234	
10	2079	1040	1278	860	238	
11	2148	1074	1365	873	291	
12	1892	946	1375	868	429	
13	1814	907	1345	865	438	
14	1751	875	1316	854	441	
15	1700	850	1278	838	428	
16	1671	835	1260	825	425	
17	1658	829	1241	828	412	
18	1606	803	1205	825	402	
19	1548	774	1152	825	378	
20	1509	755	1134	882	379	
21	1435	717	1092	887	375	
22	1457	729	1067	868	338	
23	1469	735	1035	849	300	
24	1384	692	995	828	303	
25	1326	663	971	798	308	
26	1358	679	1027	841	348	
27	1384	692	995	803	363	
28	1201	601	892	764	291	
29	1142	571	840	715	269	
30	1124	562	818	708	256	
31	1125	562	818	688	256	
TOTAL	56066	28033	39105	26218	11071	
MEAN	1808	904	1261	846	357	
AC.FT.	111170	55585	77536	52019	21951	

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED AND RELEASED BY UNITED STATES
AUGUST - 1921

Day	INFLOW TO SHERBURNE RESERVOIR				Swiftcurrent	Stored	Released
	Swiftcurrent Cr.	Canyon	Other Creeks	Total	Sherburne		from
	Many Glacier	Creek	Estimated				Storage
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	181	27	12	220	255	-	35
2	181	26	11	218	249	-	31
3	178	26	11	215	241	-	26
4	174	25	11	210	233	-	23
5	151	21	9	181	220	-	39
6	134	19	8	161	151	10	-
7	128	18	7	153	163	-	10
8	131	18	7	156	163	-	07
9	136	20	8	164	155	09	-
10	148	22	9	179	150	29	-
11	148	20	8	176	155	21	-
12	139	18	7	164	158	06	-
13	128	16	6	150	158	-	08
14	126	16	6	148	158	-	10
15	131	16	6	153	158	-	05
16	136	17	6	159	156	03	-
17	139	18	7	164	156	08	-
18	128	18	7	153	158	-	05
19	123	16	6	145	171	-	26
20	112	15	6	133	177	-	44
21	110	13	5	128	177	-	49
22	103	12	5	120	174	-	54
23	98	13	5	116	169	-	53
24	98	14	5	117	163	-	46
25	96	14	5	115	152	-	37
26	91	13	5	109	143	-	34
27	89	13	5	107	133	-	26
28	89	13	5	107	129	-	22
29	91	13	5	109	123	-	15
30	89	13	5	107	120	-	13
31	87	13	5	105	120	-	15
TOTAL	3893	536	213	4642	5188	86	633
MEAN	126	17.3	6.9	150	167	12	26
AC.FT.	7747	1064	412	9223	10268	171	1256

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
AUGUST - 1921

Day	: St. Mary River : Diverted by : Stored by : Total : Stored Water : Natural flow of St.	at Kimball	: U.S.R.S. : U.S.R.S. : : Released : Mary R. at Kimball	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	797	321	-	1118	24		1094	
2	775	322	-	1097	30		1067	
3	761	324	-	1085	35		1050	
4	734	321	-	1055	31		1024	
5	694	319	-	1013	26		987	
6	648	315	-	963	23		940	
7	617	295	-	912	39		873	
8	564	295	10	869	-		869	
9	526	312	-	838	10		828	
10	481	304	-	785	07		778	
11	500	267	09	776	-		776	
12	642	125	29	796	-		796	
13	668	107	21	796	-		796	
14	741	42	06	789	-		789	
15	727	29	-	756	08		748	
16	748	20	-	768	10		758	
17	768	-	-	768	05		763	
18	754	-	03	757	-		757	
19	720	-	08	728	-		728	
20	727	-	-	727	05		722	
21	707	--	-	707	26		681	
22	687	-	-	687	44		643	
23	661	-	-	661	49		612	
24	642	-	-	642	54		588	
25	623	-	-	623	53		570	
26	605	-	-	605	46		559	
27	593	-	-	593	37		556	
28	548	-	-	548	34		514	
29	548	-	-	548	26		522	
30	531	-	-	531	22		509	
31	520	-	-	520	15		505	
TOTAL	20257	3718	86	24061	659		23402	
MEAN	653	232	12	776	27		755	
AC.FT.	40151	7363	171	47685	1207		46478	

DIVISION OF WATER OF ST.MARY RIVER
WATER USED BY UNITED STATES
AUGUST - 1921

Day	Natural Flow: AVAILABLE FOR USE BY U.S. ::			USED ::			Excess:Deficiency
	St.Mary R.: U.S.	Stored Water:	Total:	Diverted:	Stored:	Total::	
	at Kimball: Share	Released :	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	1094	547	24	571	321	-	250
2	1067	533	30	563	322	-	241
3	1050	525	35	560	324	-	236
4	1024	512	31	543	321	-	222
5	987	487	26	513	319	-	194
6	940	440	23	463	315	-	148
7	873	373	39	412	295	-	117
8	869	369	-	369	295	10	64
9	828	328	10	338	312	-	26
10	778	278	07	285	304	-	-
11	776	276	-	276	267	09	-
12	796	296	-	296	125	29	142
13	796	296	-	296	107	21	168
14	789	289	-	289	42	06	241
15	748	248	08	256	29	-	227
16	758	258	10	268	20	-	248
17	763	263	05	268	-	-	268
18	757	257	-	257	-	03	254
19	728	228	-	228	-	08	220
20	722	222	05	227	-	-	227
21	681	181	26	207	-	-	207
22	643	161	44	205	-	-	205
23	612	153	49	202	-	-	202
24	588	147	54	201	-	-	201
25	570	142	53	195	-	-	195
26	559	140	46	186	-	-	186
27	556	139	37	176	-	-	176
28	514	128	34	162	-	-	162
29	522	130	26	156	-	--	156
30	509	127	22	149	-	-	149
31	505	126	15	141	-	-	141
TOTAL	23402	8599	659	9258	3718	86	3804
MEAN	755	277	27	299	232	12	123
AC.Y	46478	17090	1207	18297	7363	171	7534
						38	10801

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
AUGUST - 1921

Day	Natural Flow : Canada's		St. Mary River	Diverted	Excess	Deficiency
	St. Mary River	Share	at Kimball	by Canada	Sec.Ft.	Sec.Ft.
	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.	: Sec.Ft.
1	1094	547	797	683	250	
2	1067	534	775	656	241	
3	1050	525	761	633	236	
4	1024	512	734	624	222	
5	987	500	694	591	194	
6	940	500	648	560	148	
7	873	500	617	534	117	
8	869	500	564	488	64	
9	828	500	526	440	26	
10	778	500	481	414	-	19
11	776	500	500	424	-	-
12	796	500	642	555	142	
13	796	500	668	575	168	
14	789	500	741	647	241	
15	748	500	727	636	227	
16	758	500	748	652	248	
17	763	500	768	663	268	
18	757	500	754	652	254	
19	728	500	720	645	220	
20	722	500	727	640	227	
21	681	500	707	636	207	
22	643	482	687	620	205	
23	612	459	661	602	202	
24	588	441	642	589	201	
25	570	428	623	573	195	
26	559	419	605	550	186	
27	556	417	593	536	176	
28	514	386	548	514	162	
29	522	392	548	500	156	
30	509	382	531	506	149	
31	505	379	520	470	141	
TOTAL	23402	14803	20257	17808	5473	19
MEAN	755	478	653	574	176	19
ACFT.	46478	29388	40151	35294	10801	38

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
WATER STORED AND RELEASED BY UNITED STATES
SEPTEMBER - 1921

Day	INFLOW TO SHERBURNE RESERVOIR				Swiftcurrent	Stored	Released
	Swiftcurrent Cr.	Canyon	Other Creeks	Total	Sherburne	:	from
	Many Glacier	Creek	Estimated			:	Storage
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	103	23	7	133	120	13	-
2	98	15	6	119	120		1
3	89	15	6	110	120		10
4	85	14	5	104	119		15
5	74	13	5	92	119		27
6	66	12	5	83	119		36
7	61	11	5	77	118		41
8	62	14	5	81	118		37
9	66	14	5	85	119		34
10	62	17	5	84	118		34
11	58	10	5	73	119		46
12	58	7	5	70	119		49
13	55	9	5	69	118		49
14	51	11	5	67	119		52
15	48	11	5	64	119		55
16	45	10	5	60	119		59
17	45	11	5	61	119		58
18	45	13	5	63	119		56
19	44	15	5	64	119		55
20	42	15	5	62	119		57
21	33	21	5	59	119		60
22	35	23	5	63	119		56
23	40	23	5	68	119		51
24	40	20	5	65	119		54
25	38	20	5	63	118		55
26	55	30	6	91	129		38
27	78	31	7	116	143		27
28	76	29	7	112	192		80
29	76	28	7	111	248		137
30	72	27	7	106	365		259
TOTAL	1800	512	163	2475	4050	13	1588
MEAN	60	17	5.4	83	135	13	53
AC.FT.	3570	1018	321	4909	8033	26	3150

DETERMINATION OF NATURAL FLOW OF ST. MARY RIVER
SEPTEMBER - 1921

Day	St.Mary River:Diverted by		Stored by	Total :	Stored Water	Natural Flow of St.
	at Kimball	U.S.R.S.	U.S.R.S.		Released	Mary R.at Kimball
	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.	Sec.Ft.
1	548	0		548	13	535
2	520			520	15	505
3	515		13	528	-	528
4	505			505	1	504
5	500			500	10	490
6	491			491	15	476
7	476			476	27	449
8	486			486	36	450
9	505			505	41	464
10	481			481	37	444
11	466			466	34	432
12	460			460	34	426
13	454			454	46	408
14	448			448	49	399
15	432			432	49	383
16	416			416	52	364
17	398			398	55	343
18	394			394	59	335
19	394			394	58	336
20	384			384	56	328
21	394			394	55	339
22	380			380	57	323
23	394			394	60	334
24	398			398	56	342
25	398			398	51	347
26	427			427	54	373
27	448			448	55	393
28	491			491	38	453
29	526			526	27	499
30	548			548	80	468
TOTAL	15677	0	13	13690	1220	12470
MEAN	456	0	13	456	41	416
AC.FT.	27134	0	26	27160	2420	24740

DIVISION OF WATER OF ST. MARY RIVER
WATER USED BY UNITED STATES
SEPTEMBER - 1921

Day	Natural Flow : Available for Use by U.S.			USED			Excess	Deficiency
	St. Mary River: U.S.	Stored Water: Total	Diverted:	Stored:	Total			
	at Kimball	Share:	Released:	Sec. Ft.				
	Sec. Ft.	Sec. Ft.	Sec. Ft.	Sec. Ft.	Sec. Ft.	Sec. Ft.	Sec. Ft.	Sec. Ft.
1	535	134	13	147	-	-	-	147
2	505	126	15	141	-	-	-	141
3	528	132	-	132	-	13	13	119
4	504	126	01	127	-	-	-	127
5	490	122	10	132	-	-	-	132
6	476	119	15	134	-	-	-	134
7	449	112	27	139	-	-	-	139
8	450	112	36	148	-	-	-	148
9	464	116	41	157	-	-	-	157
10	444	111	37	148	-	-	-	148
11	432	108	34	142	-	-	-	142
12	426	106	34	140	-	-	-	140
13	408	102	45	147	-	-	-	147
14	399	100	49	149	-	-	-	149
15	383	96	49	145	-	-	-	145
16	364	91	52	143	-	-	-	143
17	343	86	55	141	-	-	-	141
18	335	84	59	143	-	-	-	143
19	336	84	58	142	-	-	-	142
20	328	82	56	138	-	-	-	138
21	339	85	55	140	-	-	-	140
22	323	81	57	138	-	-	-	138
23	334	84	50	134	-	-	-	134
24	342	85	57	142	-	-	-	142
25	347	87	51	138	-	-	-	138
26	373	93	54	147	-	-	-	147
27	393	98	55	153	-	-	-	153
28	453	113	38	151	-	-	-	151
29	499	125	27	152	-	-	-	152
30	468	117	80	197	-	-	-	197
TOTAL	12470	3117	1220	4327	0	13	13	4314
MEAN	416	104	40	144	0	13	13	144
AC. FT.	24740	6180	2420	8600	0	26	26	8574

DIVISION OF WATER OF ST. MARY RIVER
WATER AVAILABLE FOR USE AND USED BY CANADA
SEPTEMBER - 1921

Day	:Natural Flow of : Canada's :St.Mary River:	Diverted:	Excess :	Deficiency
	:St.Mary River at: Share : at : by :			
	: Kimball : : Kimball : Canada :			
	: Sec.Ft. : Sec.Ft. : Sec.Ft. : Sec.Ft. : Sec.Ft.			
1	535	401	548	147
2	505	379	520	141
3	528	396	515	119
4	504	378	505	127
5	490	368	500	132
6	476	357	491	134
7	449	337	476	139
8	450	338	486	148
9	464	348	505	157
10	444	333	481	148
11	432	324	466	142
12	426	320	460	140
13	408	306	454	147
14	399	299	448	149
15	383	287	432	145
16	364	273	416	143
17	343	257	398	141
18	335	251	394	143
19	336	252	394	142
20	328	246	384	138
21	339	254	394	140
22	323	242	380	138
23	334	250	394	136
24	342	257	398	142
25	347	260	398	138
26	373	280	427	147
27	393	295	448	153
28	453	340	491	151
29	499	374	526	152
30	468	351	548	197
TOTAL	12470	9356	13677	4316
MEAN	416	312	456	144
AC.FT.	24740	18560	27134	8574

DEPARTMENT OF THE INTERIOR, CANADA

1921-22 October.

Determination of Natural Flow

Daily Gauge Height and Discharge of St. Mary

River
Creek
Ditch

at International Boundary near Boundary

October 1921.

Year ending September 30, 1921.

Discharge

Natural Flow

St. Mary R
Int'l. Bdry.

DAY	St. Mary R. Int'l. Bdry.		Diverted by U.S.R.S. Canal		Stored in Sherburne Lake		Total		Released from Sherburne Lake		St. Mary R Int'l. Bdry.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
1	623						623		113		510	
2	680						680		236		444	
3	748						748		272		476	
4	782						782		303		479	
5	848						848		372		476	
6	892						892		397		495	
7	939						939		434		505	
8	923						923		453		470	
9	931						931		378		553	
10	947						947		452		495	
11	947						947		497		450	
12	931						931		483		448	
13	915						915		475		440	
14	900						900		467		433	
15	878						878		456		422	
16	862						862		437		425	
17	826						826		416		410	
18	826						826		413		413	
19	804						804		405		399	
20	848						848		429		419	
21	900						900		477		423	
22	908						908		434		474	
23	931						931		294		637	
24	987						987		197		790	
25	1,010						1,010		276		734	
26	1,000						1,000		342		658	
27	939						939		342		597	
28	908						908		368		540	
29	923						923		391		532	
30	908						908		468		440	
31	892						892		414		478	
TOTAL	27,356						27,356		11,891		15,465	
Mean	882						882		384		499	
Run-off per square mile												
Run-off, depth in inches												
Run off, acre feet	54,200						54,200		23,611		30,682	
Maximum	1,010						1,010		497		790	
Minimum	623						623		113		399	
Accuracy												

Gauge heights, checked from obs. book

Computed by

Checked by

Dist. Hyd.

Gauge hts., copied by

Gauge hts., checked by

NOTES :

DIVISION OF WATER OF ST.MARY RIVER
OCTOBER - 1921

:St.Mary River:Diverted by:
Day : at Kimball : Canada :
: Sec.Ft. : Sec.Ft. :

1	623	530
2	680	560
3	748	578
4	782	565
5	848	580
6	892	640
7	939	722
8	923	735
9	931	756
10	947	787
11	947	828
12	931	774
13	915	394
14	900	292
15	878	753
16	862	774
17	826	683
18	826	725
19	804	735
20	848	761
21	900	771
22	908	751
23	931	771
24	987	645
25	1011	236
26	1003	251
27	939	300
28	908	221
29	923	-
30	908	-
31	892	-

TOTAL	27360	17118
MEAN	883	611
AC.FT.	54294	33933

Note:- There was no diversion made by the U.S.R.S. during October.

Part of the flow of St.Mary River at Kimball is stored water released from Sherburne reservoir but, as the records are not available, the natural flow of St.Mary river has not been computed.

ST. MARY RIVER DIVISION - 1921

TABLE - 3

CANADAWATER AVAILABLE

Month	St. Mary River: at Kimball	Ralph Cr.: Ac.Ft.	Pothole Cr.: Ac.Ft.	Lee Creek: Ac.Ft.	Combined flow Ac.Ft.
April	38440	708	1190	6664	47002
May	156547	553	215	13097	170412
June	193686	286	26	8331	202329
July	77536	215	10	2152	79913
August	40151	172	-	560	40883
September	27134	38	-	655	27827
October	54294	38	-	700 e	55032
TOTAL	587788	2010 a	1141 b	32159	623398 c

DISPOSITION

Month	Diverted by A.R.& I. Co.	Wasted by A.R.& I. Co.: Ac.Ft.	Losses A.R.& I. Co.: Ac.Ft.	Stored in Chin Res.: Ac.Ft.	St. Mary R. Lethbridge: Ac.Ft.
April	7725	5474	gain	-	46651
May	22320	3081	gain	-	127890
June	47663	6307	gain	-	164588
July	52019	5762	2355	-	34003
August	35294	2213	2583	-	4489
September	23683	1362	1262	-	3689
October	33933	10575	2018	-	26440
TOTAL	222637	34774	8218 d	32591	407750 x

a - Includes seepage losses from St. Mary Canal U.S.R.S.

b - Natural flow only

c - Only includes evaporation and seepage between headgates & Spring Coulee

e - estimated

x - Below all points of diversion

ST. MARY AND MILK RIVERS
USE OF WATER FOR IRRIGATION
APRIL to OCTOBER, 1921.

TABLE - 3.

UNITED STATES
WATER AVAILABLE

Month			Total natural :			
	Actual flow	Diverted	flow north and:	Milk River:	Milk	River
	St. Mary River	St. Mary River	south Forks	at	Eastern	at
	at Kimball	to Milk River	Milk River at	Boundary	Crossing	Havre
	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet	Acre-feet
April	38400		13540	21700	30000	
May	157000	6860	13450	20500	25200	
June	194000	20400	6710	25300	28100	
July	77500	20400	2450	21500	25200	
August	40200	7360	1230	10900	12100	
September	27100		1040	1300	1940	
October	54000		1260	898	550	
TOTAL	588200	55020	39680	102098	123090	

DISPOSITION

Month	Diverted by	Applied to	Stored or released:		In
			Nelson Reservoir	(d)	
	Milk River	the land			Nelson Reservoir
	Canals (b)	gross (c)			at end of month
	Acre-feet	Acre-feet		Acre-feet	Acre-feet
March	3481	1441	plus	2775	17360
April	16805	4625	"	12290	28040
May	14744	13344	"	1260	26900
June	24547	21567	"	490	25240
July	13651	10461	"	410	22700
August	14865	7765	"	5540	25000
September	3484	2894	"	710	23800
October	1824	1414	"	20	21720
November	205	95	"	100	20720
TOTAL	93606	63606			

- (a) This total was obtained by adding the natural flow of the South Fork of the Milk River near the International Boundary, to the natural flow of the North Fork of the Milk river at the International Boundary. The rating station on the North Fork $\frac{1}{2}$ mile above the outlet of St. Mary Canal was used while St. Mary Canal was delivering water.
- (b) Fort Belknap Canal near Chinook; Agency Ditch near Harlem; Paradise Canal near Chinook; Harlem Canal near Harlem; Dodson North and South Canals near Dodson; Vandalia Canal near Vandalia.
- (c) Water diverted by the Milk River canals less that which was wasted or stored. It does not include losses of St. Mary water in passing down Milk River.
- (d) Water turned into the reservoir was assumed to include rainfall and tributary runoff. The column headed "stored or released" shows the difference between the inflow and outflow, including waste over the spillway for the month. This difference when combined with the losses, gives the changes in amount in the reservoir at the end of each month, as shown in the next column.

ST. MARY AND MILK RIVERS
USE OF WATER FOR IRRIGATION
APRIL TO OCTOBER - 1921.

TABLE - 3.

UNITED STATES

Month	Losses			Wasted		Milk River at Vandalia (g)
	Carriage losses in St. Mary Canal and Milk River (h)	Nelson Reservoir Seepage and Evaporation losses	Total losses	Milk River Canals (f)		
March	---	1675	1675			67000
April	---	1620	1620	220		53300
May	940	2390	3330	290		21100
June	(gain) 120	2630	2510	960		54700
July	2900	2950	5850	1210		5860
August	1360	3240	4600	1030		3860
September		1920	1920	240		2240
October		1860	1860	410		1020
November		1140	1140	110		3190
TOTAL	5080	19425	24505	4470		212270

(f) This water was returned to the river by the canals and includes the water wasted by Dodson North, Dodson South, Bowdoin, Nelson Reservoir, and Vandalia canals and waste from Nelson Reservoir.

(g) This column shows the flow below Vandalia Dam, which is the only water wasted in Milk River Valley without chance of further use.

(h) These losses occurred between the point of measurement of the St. Mary Canal at St. Mary Crossing and the diversion of water for irrigating purposes in the Upper Milk River Valley. The first important diversion is the Fort Belknap Canal at Lohman. The results given are based on stream-flow records of the St. Mary Canal at St. Mary Crossing, the St. Mary Canal at Hudson Bay Divide, North and South Forks of the Milk River near the International Boundary, North Fork of the Milk River above the mouth of the St. Mary Canal, Milk River at Harlem, Montana, and the estimated inflow not otherwise measured.

DIVERSIONS FROM NORTHERN TRIBUTARIES - MILK RIVER

QUANTITIES IN ACRE-FEET

LODGE CREEK

CANADA

<u>Irrigator</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>Total</u>
Hartt, J.E.	-	-	29					29
English, J.		9	16	10				35
Hammond, D.A.	32	73						105
Gregg,	51	-						51
Suiste, A.J. - South	53	39						92

United States

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DIVERSIONS FROM NORTHERN TRIBUTARIES - MILK RIVER

QUANTITIES IN ACRE-FEET

FRENCHMAN RIVER BASIN

CANADA

<u>Irrigator</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>Total</u>
Armstrong - West	-	63	-	-	-	-	-	63
Armstrong - East	-	-	small amt.	-	-	-	-	-
Bate, A.E.- South	-	-	-	1	2	-	-	3
Bull, V.J.	-	-	77	1	-	-	-	78
Cross, A.M.	-	-	74	51	-	-	-	135
Cross, F.	-	-	41	83	-	-	-	124
Drury, T.A.	-	-	small amount	-	-	-	-	-
Maple Creek Cattle Co.	-	-	small amount from June to October	-	-	-	-	-
Morrison Bros.	-	-	86	10	-	-	-	96
Morrison, G.N.	-	-	112	-	-	-	-	112
Pearse	-	-	24	20	-	-	-	64

United States

675

DIVERSIONS FROM NORTHERN TRIBUTARIES MILK RIVER
QUANTITIES IN ACRE-FEET
BATTLE CREEK

CANADA

Irrigator

	April	May	June	July	August	September	October	Total
Harmon & Henderson	87	16	40	131	-	-	-	274
Marshall & Gaff	-	-	230	142	-	56	117	545
Gaff	-	-	166	5	-	-	11	182
Wilson, W.S.	236	-	10	-	-	-	-	246
McKinnon, J.	23	214	-	1	-	-	-	238
Richardson, L.E. & S.J.	-	-		small amount in June				
Patterson, W.G.	3	-	-	7	-	-	-	10
Henry, F.W. (East)	45	-	-	-	-	-	-	45
" " (West)	-	118	85	-	-	-	-	203
Stirling & Nash	268	437	797	70	-	-	-	1572
Wood & Anderson (South)	41	14	-	-	-	-	-	55
Leslie, J. (East)	-	-	2	3	-	-	-	5
" (West)	-	-	15	4	-	-	-	19
Wilkes, R.W. & W.L.	-	-	72	-	-	-	2	74
Spangler, J.M.	33	18	-	21	-	-	-	72
United States								

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TABLE - 4.

DIVERSIONS FROM NORTHERN TRIBUTARIES OF MILK RIVER
QUANTITIES IN ACRE-FEET.

January 21, 1922.

Canal	Stream	April	May	June	July	August	Sept.	Oct.	Total
Chinook North Association	Lodge Creek	3110	1600	170					4880
Matheson	Battle Creek	370	180	80	60				690
Frenchman	Frenchman Creek		570	810	630	770	40		2820
Rock Creek	Rock Creek		620	1310		10			1940
		3480	2970	2370	690	780	40		10330