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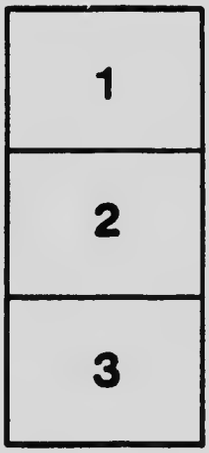

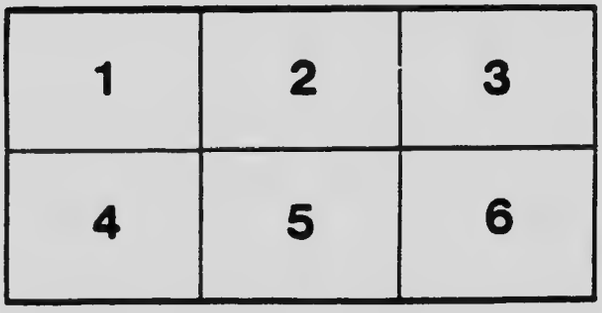

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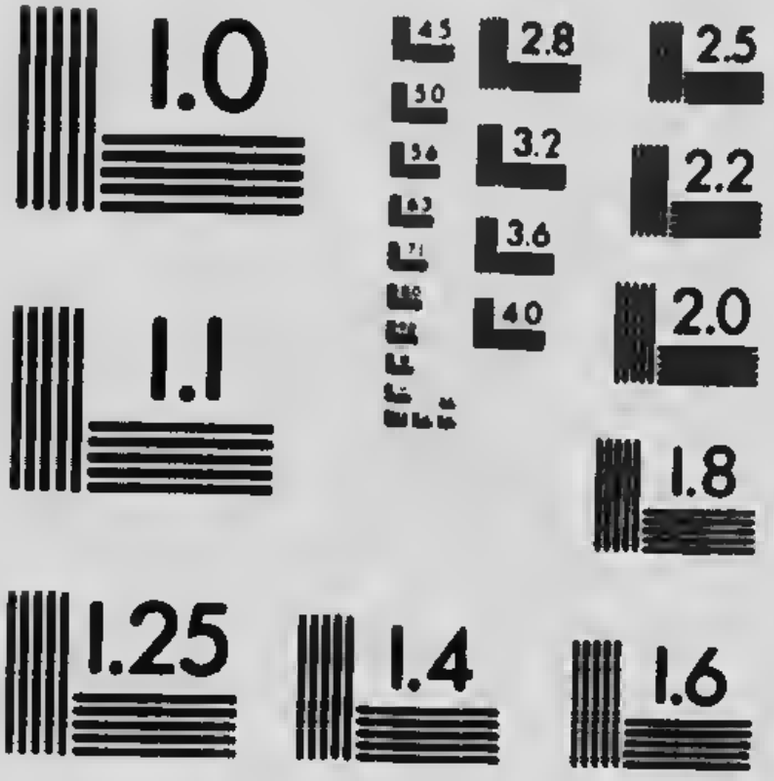

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Hon. A. MEIGHEN, Minister; W. W. CORY, Deputy Minister

DOMINION WATER POWER BRANCH
J. B. CHALLIES, C.E., Director.

WATER RESOURCES PAPER No. 26

HYDROMETRIC SURVEY

OF

MANITOBA

FOR THE

Climatic Year 1918-19.

OTTAWA
PRINTED BY THOMAS MULVEY
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1920

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WATER RESOURCES PAPER NO. 26

PROGRESS REPORT

OF THE

HYDROMETRIC SURVEY OF MANITOBA

FOR

THE CLIMATIC YEAR 1918-19

BY

C. H. ATTWOOD, A.M.E.I.C.
District Chief Engineer

Prepared under the supervision of the Director of Water Power

OTTAWA
THOMAS MULVEY
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1920

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PART I.

INTRODUCTION.

The following is a report of the Dominion Water Power Branch, Department of the Interior, Ottawa, containing the results of hydrological observations in the province of Manitoba during the period beginning October 1, 1918, and ending September 30, 1919.

Previous to 1917 the published reports covered the calendar year but for subsequent years the climatic year as given above has been adopted.

The data gathered by the district office is published as a water resource paper of the Dominion Water Power Branch. These publications may be had either on application to the Director of Water Power, Dominion Water Power Branch, Ottawa, or to the District Chief Engineer, Dominion Water Power Branch, Winnipeg, where a limited supply is available for local distribution.

Those publications dealing particularly with the stream flow and water powers in Manitoba are listed below:—

Water Resources Paper No. 3—Report on Power and Storage Investigations, Winnipeg River, by J. T. Johnston, C.E.

Water Resources Paper No. 4—Stream Measurement Report of the Manitoba Hydrometric Survey to the end of 1914, by M. C. Hendry, B.A.Sc.

Water Resources Paper No. 7—Report on the Manitoba Water Powers, by S. S. Scovil, B.Sc.

Water Resources Paper No. 19—Stream Measurement Report of the Manitoba Hydrometric Survey for 1915, by M. C. Hendry, B.A.Sc.

Water Resources Paper No. 22—Stream Measurement Report of the Manitoba Hydrometric Survey for 1916, by M. C. Hendry, B.A.Sc.

Water Resources Paper No. 24—Stream Measurement Report of the Manitoba Hydrometric Survey for the Climatic Years 1916-17, and 1917-18, by M. C. Hendry, B.A.Sc.

ORGANIZATION AND SCOPE.

Following the inception of the Winnipeg River Power Survey, the Dominion Water Power Branch in 1912 enlarged the scope of the work to embrace a Hydrometric Survey of Manitoba.

The energies of this Survey have been and are directed toward the gathering of stream flow data and the making of power and storage investigations.

The field covered by the district office in Winnipeg comprises the whole of Manitoba. In addition, there have been certain storage investigations outside the province which, however, have had a direct bearing on stream regulation and power development within the province.

For purposes of organization and for convenience of descriptions, the whole territory covered by the work of the Survey has been separated into several

main divisions. These conform generally to the several drainage systems covering the province. They may be enumerated as follows:—

1. Lake of the Woods Outlets.
2. Winnipeg River and Tributaries.
3. Red River and Tributaries (excepting the Assiniboine River).
4. Assiniboine River and Tributaries.
5. Saskatchewan River and District west of Lake Winnipegosis.
6. The East Shore of Lake Winnipeg.
7. Nelson River and Tributaries.

Below are listed the stations upon which data has been secured. Under the heading "Regular Metering Stations" are those for which records of discharge and gauge heights have been continuously secured. The stations where meterings have been made, but for which there are no continuous records, are listed under "Miscellaneous Metering Stations." The third list, that of "Gauging Stations," contains the names of stations at which gauge height records only have been obtained.

STATIONS IN MANITOBA.

Regular Metering Stations.

Station No.	River.	Location.	Period.	Water Resources Paper No.
5MH$_1$	Assiniboine	Brandon	1912-1919	4, 7, 19, 22, 24, 26.
5MJ$_1$	Assiniboine	Headingly	1913-1919	4, 7, 19, 22, 24, 26.
5ME$_1$	Assiniboine	Millwood	1912-1919	4, 7, 19, 22, 24, 26.
5MJ$_2$	Assiniboine	St. James	1912-1913	4, 7
5RD$_1$	Berens	Above Little Grand Rapids	1914-1919	4, 19, 22, 24, 26.
5RD$_2$	Berens	Below 1st Falls	1914	4.
5RD$_3$	Berens	Below Night Owl Falls	1916-1919	22, 26
5RD$_3$	Berens	Sinnot	1912-1919	4, 7, 19, 22, 24, 26.
5SA$_1$	Brokenhead	Birtle	1914 1917	4, 19, 22, 24.
5ME$_2$	Birdtail Creek	Near Carman	1915.1919	19, 22, 26.
5OF$_3$	Boyne	Near Homewood	1918-1919	26.
5OF$_4$	Boyne Channel	Cypress River	1912-1915	4, 19, 22.
5MH$_2$	Cypress	Near Mouth	1915	19.
5MF$_2$	Clear Creek	Kenyon's Farm	1918-1919	26
5OF^5	Elm Creek	Fairford	1912-1919	4, 7, 19, 22, 24, 26.
5LM$_1$	Fairford	Fork river	1913-1914	4.
5LJ$_3$	Fork	Sanford	1915-1919	19, 22, 24, 26
5OG$_1$	La Salle	Above Wood Falls	1912.1919	4, 7, 19, 22, 24, 26.
5RA$_1$	Manigotagan	Morris	1912	4.
5OF$_1$	Morris	Rosenort	1915-1916	19, 22.
5OF$_2$	Morris	Lacey's farm	1913	4, 7
51J$_1$	Mossy	Wilson's farm	1914-1919	4, 7, 19, 22, 24, 26.
51J$_2$	Mossy	Outlet Stuart lake	1915	19.
5MF$_{12}$	McDonald Creek	Beilby's bridge	1914.1919	4, 22, 24, 26.
5MF$_1$	Minnedosa	Minnedosa Power House	1914-1919	19, 22, 24, 26.
5MF$_1$	Minnedosa	Riverdale	1913-1914	4, 7
5MF$_2$	Minnedosa	Middleton Bridge	1915.1919	19, 22, 24, 26.
5MF$_4$	Minnedosa	Elphinstone	1915-1919	19, 22, 24, 26.
5MF$_4$	Minnedosa	Minnedosa traffic bridge	1912-1913	4, 22
5MF$_{10}$	Minndeosa	Above Shell rapids	1914-1916	4, 19, 22.
5UE$_1$	Nelson	Ochre river	1912-1919	4, 19, 22, 24, 26.
51J$_4$	Ochre	Scandinavia	1915-1919	19. 22, 24, 26.
5MF$_{11}$	Otter Creek	Killarney	1915-1916	19, 22.
5OA$_1$	Pembina	La Rivière	1912-1915	4, 19, 22.
5OB$_1$	Pembina	Below Control Dam	1906 1919	3, 4, 19, 22, 24, 26
5PF$_3$	Pinawa Channel	W.E.R. Power House	1906-1919	4, 22, 24, 26.
5PF$_4$	Pinawa Channel	Cromer	1912	4, 22.
5NG$_2$	Pipestone Creek	Above Shining falls	1914-1918	4, 26
5RD$_4$	Pigeon	Above 1st Falls	1914-1917	4,19 22, 24.
5RD$_5$	Pigeon	De Corby's farm	1915	19, 22.
5JM$_1$	Qu'Appelle	Otterburne	1912-1919	4, 19, 22, 24, 26.
5OE$_1$	Rat	Emerson	1912-1919	4, 7, 19, 22, 24, 26.
5OC$_1$	Red	2 miles below Emerson	1912-1913	4, 22.
5OC$_2$	Red	Elm Park	1914-1919	4, 19, 22, 24, 26.
5OC$_3$	Red	Redwood bridge	1912-1919	4, 19, 22, 24, 26.
5OJ$_1$	Red	Baskerville's farm	1913-1919	4,22, 24, 26.
5OD$_1$	Roseau	At Dominion City	1912	4, 7, 19.
5OD$_2$	Roseau	Below Dominion City	1914-1916	4, 19, 22.
5OD$_3$	Roseau	Stuartburn	1915-1919	19, 22, 24, 26.
5OD$_4$	Roseau	Near Erickson	1915	19.
5MF$_7$	Rolling	C.N.R. Crossing	1915-1919	19, 22, 24, 26
5MF$_8$	Rolling	The Pas	1912-1919	4, 7, 19, 22, 24, 26.
5KJ$_1$	Saskatchewan	Grand Rapids	1912-1917	4, 7, 19, 22, 24.
5KL$_1$	Saskatchewan	Ste. Anne des Chênes	1912-1919	4, 19, 22, 24, 26.
5OH$_1$	Seine	Assiniboine	1913-1919	4, 7, 19, 22, 24, 26.
5MD$_1$	Shell	Steel bridge S. of Roblin	1919	26.
5MD$_2$	Shell	Burrows bridge, E. of Roblin	1919	26.
5MD$_3$	Shell			

STATIONS IN MANITOBA—*Continued.*

REGULAR METERING STATIONS—*Concluded.*

Station No.	River.	Location.	Period.	Water Resources Paper No.
5NF1	Souris	Melita	1915–1919	19, 22, 24, 26.
5NG1	Souris	Wawanesa	1912–1919	4, 7, 19, 22, 24, 26.
5LL1	Squirrel Creek	Austin	1913–1914	4, 22.
5LE1	Swan	Swan river	1912–1919	4, 7, 19, 22, 24, 25.
5OB2	Tobacco creek	North of Roland	1918–1919	26.
5LJ4	Valley	Valley river	1912–1919	4, 7, 19, 22, 24, 26.
5PH1	Whitemouth	Whitemouth	1912–1919	4, 7,19, 22, 24, 26.
5LL2	Whitemud	Westbourne	1912–1914	4, 22.
5OA2	Whitemud	Holmfield	1915	19, 22, 24, 26.
5PF1	Winnipeg	Above Slavo falls	1911–1919	3, 4, 7, 19, 22, 24, 26.
5PF2	Winnipeg	Otter falls	1903–1910	3, 4, 7.
5PF3	Winnipeg	Head of Grand du Bonnet	1911–1919	3, 4, 22, 24, 26.
5PF5	Winnipeg	Between 4th and 5th Falls, Seven Sisters	1917–1919	24, 26.
5MF2	Whirlpool	Danvers	1915–1919	19, 22, 24, 26.
5LE2	Woody	Bowsman	1915–1919	19, 22, 24, 26.

MISCELLANEOUS METERING STATIONS.

5UE1	Armstrong	Near Manitou, Nelson river	1914	4.
5RD2	Berens	8½ miles from Mouth	1914–1917	4, 19, 22, 24.
5RD3	Berens	East Channel	1914	*
5RD4	Berens	West Channel	1914	*
5RD5	Berens	Above 10th Falls	1914	*
5RD6	Berens	Between 22nd and 23rd Falls	1914	*
5RD7	Berens	Above 27th falls	1914	4*.
5PJ1	Bird	Five miles from Mouth	1913	4.
5RB1	Bloodvein	Above Eagle falls	1914	4.
5RB2	Bloodvein	9 miles from mouth 1st rapid	1914–1916	4, 22, 24.
5RB3	Bloodvein	North branch above 15th falls	1914	4.
5RB4	Bloodvein	Above 20th falls	1914	4.
5RB5	Bloodvein	8 miles from Mouth	1914–1915	4, 19.
5TG1	Burntwood	Below Manasa falls	1915	19
5TG5	Burntwood	Above 1st rapid	1915	19
5TE1	Burntwood	One mile below Gate rapids	1915	19.
5TF1	Burntwood	3 miles below 3 Point lake	1915	19.
5MF3	Clear creek	At outlet	1915–1915	19, 22
5RD1	Entomami	Near Berens river	1913	4
5SH3	Eating Point creek	Lake Winnipeg	1913	4
5TA1	Grass	1st rapids above Reed lake	1915	19.
5TA2	Grass	Above 9th rapid	1915	19.
5TB1	Grass	ALove 5th rapid	1915	19.
5TC1	Grass	Below Lynx falls	1915	19.
5TC3	Grass	Above 2nd rapid	1915	19.
5TD1	Grass	Below Paint lake	1915	19.
5TD4	Grass	Standing Rock falls	1915	19.
5MF3	Heron creek	Near Mouth	1915	19.
5UA1	Jack	Near Norway House	1913	4.
5OG1	La Salle	La Salle	1912	4.
5RA1	Manigotagan	1½ miles below Cascade Portage	1913	7 *
5RA2	Manigotagan	2 miles below Turtle lake	1913	7.*
5RA3	Manigotagan	Outlet Muskrat lake	1913	7 *
5RA4	Manigotagan	Above Muskrat lake	1913	7.*
5RA5	Manigotagan	Between Moose lake and Muskrat lake	1913	7.*
5RA8	Manigotagan	Above Caribou rapids	1913	7.*
5LS3	Mossy	Cameron's bridge	1913	4, 22.
5TG3	Manasa creek	Below Manasa falls	1915	19.
5MF1	Minnedosa	5 miles above Minnedosa	1914	4.
5UD1	Nelson	Eve's Falls channel	1919	26
5UD2	Nelson	Whitemud channel	1919	26.
5UD3	Nelson	Ebb and Flow channel	1919	25.
5NG1	Oak creek	Trees bank	1915	19.
5TG4	Odei	Near Split lake	1915	19.
5OB1	Pembina	Manitou	1915	22.
5RD9	Pigeon	Below Sturgeon Falls	1914–1915	4, 19
5RD10	Pigeon	Above 8th rapid	1914	4
5RD8	Painted Moose	3 miles above Berens river	1914	*
5OD1	Roseau	Mayne's Farm	1913	4.
5LE1	Shoal	Pelican rapids, near Swan lake	1914	4.
5SH1	Sturgeon Gill creek	2 miles from Mouth	1913	4.
5PF1	Tye creek	Above Sturgeon Falls	1912	4.
5LJ1	Valley	Near mouth of Drifting river	1913	*
5LJ3	Valley	Gilbert Plains	1913	*
5LL1	Whitemud	Gladstone	1914	4.
5PG1	Whiteshell	Near Lake Jessie	1912	4.
51 H1	Waterhen	Near Lake Manitoba	1913	4.
5RA2	Wanipigow	Silver Falls	1919	26.
5RA3	Wanipigow	1st rapids below Wallace lake	1919	26.
5RA4	Wanipigow	Muskeg creek	1919	26.

STATIONS IN MANITOBA—*Continued.*

GAUGING STATIONS.

Station No.	Lake, River.	Location.	Period.	Water Resources Paper No.
5UH$_1$	Airhole	Near Manitou, Nelson river	1915	*
5MH$_1$	Assiniboine	Currie's Landing	1913	22.
5MF$_1$	Audy Lake	Outlet	1915	22.
5RD$_1$	Berens river	Lake Winnipeg	1914–1919	22, 24, 26.
5MF$_3$	Boggy lake	At outlet	1915–1916	22.
5MF$_2$	Clear lake	At outlet	1914–1918	22.
5RD$_2$	Family lake	Little Grand Rapids	1916–1	22, 24.
5LK$_1$	Lake Manitoba	Meadow portage	1913	*
5LN$_1$	Lake Manitoba	Oak point	1913–1915	2.
5LL$_1$	Lake Manitoba	Delta	1914–1919	19, 22, 24, 26.
5LJ$_1$	Mossy river	Clendenning's bridge	1913–1915	22
5MF$_4$	Minnedosa	Kirkham bridge	1913–1914	22
5MF$_6$	Minnedosa	McKellar's bridge	1913	22
5SH$_1$	Nelson river	Wurren's landing	1913–1915	19, 22.
5UB$_1$	Nelson river	Norway House	1913–1919	19, 22, 24, 26
5UD$_1$	Nelson river	Cross lake	1918–1919	26.
5UE$_1$	Nelson river	McMillan's landing	1914–1916	22
5UE$_2$	Nelson river	Manitou crossing	1915–1918	22, 24, 26.
5UF$_1$	Nelson river	Above Kettle rapids	1916	*
5UF$_2$	Nelson river	Kettle crossing	1916–1918	22, 24, 26
5UH$_2$	Nelson river	30 miles above Port Nelson		*
5UB$_2$	Nelson river	East Branch Sea falls	1913	4.
5UB$_3$	Nelson river	West Branch, Whisky Jack Portage	1913	4
5MF$_5$	Otter lake	Erickson	1915	22
5PF$_{33}$	Pinawa channel	Below Main Diversion dam, M.H.S	1911	22.
5PF$_{34}$	Pinawa channel	Below Main Diversion dam, W.E. Ry	1911–1916	22.
5PF$_{35}$	Pinawa channel	Above Main Diversion dam, M.H.S	1913–1917	22, 24.
5PF$_{36}$	Pinawa channel	Above Main Diversion dam, W.E. Ry	1909–1916	22.
5PF$_{37}$	Pinawa channel	Above Sharkey's dam	1913–1917	22, 24.
5PF$_{38}$	Pinawa channel	Intake gauge	1905–1919	22, 24, 26
5PF$_{39}$	Pinawa channel	Above control dam	1906–1919	3, 22, 24, 26
5PF$_{40}$	Pinawa channel	Gauge "D"	1914–1917	22, 24.
5PF$_{41}$	Pinawa channel	Gauge "C"	1914	22 *
5PF$_{42}$	Pinawa channel	Gauge "B"	1914	22. *
5PF$_{43}$	Pinawa channel	Gauge "A"	1914–1917	22, 24.
5PF$_{44}$	Pinawa channel	Automatic gauge above Control dam	1913–1919	22, 24, 26.
5OC$_1$	Red river	St. Agathe	1912	19, 22
5OC$_2$	Red river	Morris	1914–1919	19,22 24, 26
5OC$_3$	Red river	Agricultural College	1914	22
5LC$_1$	Red Deer lake	Barrows	1913–1914	*
5MF$_3$	Round lake	Near Erickson	1915	22
5KL$_1$	Saskatchewan	Outlet of overflow channel	1912–1913	22
5KL$_2$	Saskatchewan	Morrison's dock	1912–1913	22
5KL$_3$	Saskatchewan	Mouth of river	1912–1914	22.
5MF$_6$	Sandy lake	Sandy lake	1915	*
5MF$_7$	Stuart lake	Stuart lake	1915	*
5MF$_8$	Sturgeon-weir	Pelican Narrows	1919	*
5KG$_1$	Whitemouth	Head of 1st falls	1913	22.
5PH$_1$	Winnipegosis lake	Winnipegosis	1913–1919	19, 22, 24, 26
5LH$_1$	Winnipeg lake	Winnipeg beach	1913–1919	19, 22, 24, 26.
5SB$_1$	Winnipeg river	Above Intake Point du Bois	1916–1917	7, 22.
5PF$_1$	Winnipeg river	Forebay Point du Bois	1911–1919	7, 22, 24, 26
5PF$_2$	Winnipeg river	Tailrace Point du Bois	1907–1919	22, 24, 26.
5PF$_3$	Winnipeg river	Above Eight Foot falls	1916–1919	22, 24, 26.
5PF$_4$	Winnipeg river	Below Eight Foot falls	1916–1919	22, 24, 26.
5PF$_5$	Winnipeg r	Hunt Club landing	1912–1915	22
5PF$_6$	Winnipeg r	Automatic gauge Slave falls	1915–1919	19, 22, 24, 26.
5PF$_7$	Winnipeg	Below Slave falls	1914–1917	19, 22, 24.
5PF$_8$	Winnipeg	Rapids below Twin falls	1913	22
5PF$_9$	Winnipeg river	Below Twin falls, Loon river	1916	22
5PF$_{10}$	Winnipeg river	Head of Seven Sisters	1913–1919	22, 24, 26.
5PF$_{11}$	Winnipeg river	Seven Sisters between 1st and 2nd falls	1913–1916	22.
5PF$_{12}$	Winnipeg river	Seven Sisters between 2nd and 3rd falls	1913–1916	22
5PF$_{13}$	Winnipeg river	Seven Sisters foot of 3rd falls	1911–1916	22
5PF$_{14}$	Winnipeg river	Seven Sisters, foot of 4th falls	1913–1917	22, 24.
5PF$_{15}$	Winnipeg river	Above Whitemouth river	1913	22.
5PF$_{16}$	Winnipeg river	At mouth of Whitemouth river	1913	22.
5PF$_{17}$	Winnipeg river	Foot of Seven Sisters falls	1913–1917	22, 24.
5PF$_{18}$	Winnipeg river	Above rapids at B.M. 161	1914	22.
5PF$_{19}$	Winnipeg river	Below rapids at B.M. 161	1914	22.
5PF$_{20}$	Winnipeg river	Gustafson's farm, Lac du Bonnet	1914	22. *
5PF$_{21}$	Winnipeg river	Winnipeg city tramway bridge	1912–1918	22, 24, 26.
5PF$_{22}$	Winnipeg river	Foot of 1st McArthur falls	1911–1919	22, 24, 26
5PF$_{24}$	Winnipeg river			

STATIONS IN MANITOBA—*Concluded.*

GAUGING STATIONS—*Continued.*

Station No.	Lake, River.	Location	Period.	Water Resources Paper No.
5PE$_{24}$	Winnipeg river	Foot of 2nd McArthur falls	1915–1919	22, 24, 26
5PE$_{25}$	Winnipeg river	Head of Little du Bonnet	1913–1919	22, 24, 26
5PE$_{26}$	Winnipeg river	Foot of Little du Bonnet	1914–1919	22, 24, 26
5PE$_{27}$	Winnipeg river	Head of Whitemud falls	1911–1919	22, 24, 26
5PE$_{28}$	Winnipeg river	Head of Silver falls	1911–1919	22, 24, 26
5PE$_{29}$	Winnipeg river	Foot of Silver falls	1911–1919	22, 24, 26
5PE$_{30}$	Winnipeg river	Head of Pine falls	1911–1919	22, 24, 26
5PE$_{31}$	Winnipeg river	Foot of Pine falls	1911–1919	22, 24, 26
5PE$_{32}$	Winnipeg river	Fort Alexander	1913–1919	22, 24, 26
5MF$_8$	Wolf lake	Near Elphinstone	1915–1916	22

STATIONS IN ONTARIO.

REGULAR METERING STATIONS.

Station No.	Lake, River.	Location.	Period.	Water Resources Paper No.
5QD$_3$	Eagle	Eagle river	1914	3 *
5QE$_1$	English	Ear falls	1914	3 *
5QE$_2$	English	Manitou falls	1914	3 *
5QE$_3$	English	Oak falls	1914	3 *
5QE$_4$	English	Sturgeon falls	1914	3 *
5QE$_5$	English	Caribou falls	1914	3, 4 *
5PB$_6$	Foot Print river	Rainy Lake falls	1914	3 *
5PA$_1$	Kettle	Canadian channel	1912–1913	3, 4
5PA$_2$	Kettle	American channel	1912–1913	4
5PE$_1$	Lake of Woods	East Branch Kenora P.H	1905–1919	3, 4, 19, 22, 24, 26.
5PE$_2$	Lake of Woods	West Branch Norman traffic bridge	1905–1919	3, 4, 19, 22, 24, 26.
5PE$_3$	Lake of Woods	Mill "A" headrace	1906–1919	3, 4, 19, 22, 24, 26
5PE$_4$	Lake of Woods	Mill "C" headrace	1905–1919	3, 4, 19, 22, 24, 26
5PE$_5$	Lake of Woods	K.L.M. Co's headrace	1905–1919	3, 4, 19, 22, 24 *
5PE$_6$	Lake of Woods	C.P.R. Culvert, Mink bay	1912–1918	4, 19, 22 *
5PE$_7$	Lake of Woods	War Eagle outlet	1912–1915	4, 19
5PE$_8$	Lake of Woods	North Tunnel island	1907–1919	3, 4, 19, 22, 24, 26
5PC$_4$	Little Fork river	Little Fork, Minnesota	1909–1919	3, 26 *
5PB$_5$	Manitou	Devils cascade (Rainy lake)	1912–1914	3, 4
5PC$_1$	Rainy	Fort Frances	1905–1919	3, 4 *
5PC$_2$	Rainy	Emo	1912–1913	3, 4 *
5PC$_3$	Rainy	Baudette	1912–1913	3, 4 *
5PB$_1$	Seine	Skunk rapids	1912–1914	3, 4
5PB$_2$	Turtle	Mountain rapids	1914	3
5QD$_1$	Wabigoon	Wabigoon falls	1914	3
5QD$_2$	Wabigoon	Near Quibell	1914	3
5PE$_9$	Winnipeg	Minaki	1913–1919	3, 4, 22, 24, 26
5PE$_{10}$	Winnipeg	Whitedog falls	1914–1919	3, 4, 19, 22, 24, 26.

MISCELLANEOUS METERING STATIONS.

5PE$_1$	Lake of Woods	Middle Lake, at Garret's narrows	1912	4
5PE$_2$	Lake of Woods	Control No. 1	1915–1916	19, 22.
5PE$_3$	Lake of Woods	Control No. 3	1915–1916	19, 22.
5PE$_4$	Lake of Woods	Control No. 4	1915–1916	19, 22.
5PE$_5$	Lake of Woods	Control No. 5	1915–1916	19, 22.
5PB$_1$	Rainy Lake Feeders	Small creek, Hale bay	1912	3, 4
5PB$_2$	Rainy Lake feeder	Pipestone river	1912	3, 4
5PB$_3$	Rainy Lake feeder	Seine river	1912	3, 4
5PB$_4$	Rainy Lake feeder	Small creek, Northwest bay	1912	3, 4
5PB$_6$	Rainy Lake feeder	Bears Pass creek	1912	*
5PB$_7$	Rainy Lake feeder	Big Canoe river	1912	3, 4
5PB$_8$	Rainy Lake feeder	Little Canoe river	1912	3, 4
5PB$_9$	Rainy Lake feeder	Ash river	1912	3, 4
5PB$_{9}$	Rainy Lake feeder	North-West Bay river	1912	3, 4
5PB$_{10}$	Rainy Lake feeder	Whitefish creek	1912	3
5PB$_{11}$	Rainy Lake feeder	Outlet Wegg lake	1912	3, 4
5PB$_{12}$	Rainy Lake feeder	Lost creek, North-West bay	1912	3, 4
5PB$_{13}$	Rainy Lake feeder	Brownlee's creek, North-West bay	1912	3, 4
5PB$_{14}$	Rainy Lake feeder	Grassy Narrows creek	1912	3, 4
5PB$_{15}$	Rainy Lake feeder	Wasaw creek	1912	3, 4
5PB$_{16}$	Rainy Lake feeder	Frog	1912	3, 4

STATIONS IN ONTARIO—*Concluded.*

Miscellaneous Metering Stations—*Concluded.*

Station No.	Lake, River.	Location.	Period.	Water Resources Paper No.
5PB17	Rainy Lake feeder	Cranberry river	1912	4
5PB18	Rainy Lake feeder	Small creek, Lost bay	1912	3, 4.
5PB19	Rainy Lake feeder	Big Island river	1912	4.
5PB20	Rainy Lake feeder	Small creek, Ash bay	1912	3, 4.
5PB21	Rainy Lake feeder	Small creek, Seine bay	1912	3, 4.
5PE6	Winnipeg river	The Dalles rapids	1913–1915	4, 19.*
5PE7	Winnipeg river	Throat rapids	1914–1915	4, 19, 22.

Gauging Stations.

5QB1	Lac Seul	Hudson Bay Post	1914–1916	22 *
5QB2	Lac Seul	At Hudson	1915	*
5QB3	Lac Seul	Automatic gauge, Hudson Bay Post	1917–1919	26
5PD1	Lake of Woods	Warroad, Minnesota	1915–1919	*
5PE1	Lake of Woods	Headrace, Norman dam	1903–1919	3, 4, 19, 22, 24, 26
5PE2	Lake of Woods	Tailrace, Norman dam	1913–1919	19, 22, 24, 26.
5PE3	Lake of Woods	Western outlet slope gauges	1913–1919	19, 22, 24, 26.
5PE4	Lake of Woods	D.P.W. lake gauge	1899–1919	3, , 19, 22, 24, 26.
5PE5	Lake of Woods	D.P.W. river gauge	1913–1919	19, 22, 24, 26.
5PE6	Lake of Woods	Automatic gauge, Kenora	1915–1919	22, 24, 26.
5PE7	Lake of Woods	Dorway's gauges	1915	*
5PE8	Lake of Woods	Near Dorway's gauge	1915	*
5IA1	Namakan lake	Kettle falls	1912–1919	*
5PB1	Rainy lake	Ranier	1911–1919	3 *
5PE9	Winnipeg river	Villeneuve rapids	1915	*
5PE10	Winnipeg river	Whitedog automatic gauge	1915–1919	19, 22, 24, 26

STATIONS IN SASKATCHEWAN.

Regular Metering Stations.

Station No.	River.	Location.	Period.	Water Resources Paper No.
5JM1	Qu'Appelle	Near Welby	1915	19, 22.
5LC1	Red Deer	Erwood	1914	4.
5LC2	Red Deer	Hudson Bay Junction	1913–1919	4, 7, 19, 22, 24, 26

Miscellaneous Metering Stations.

6EA1	Churchill	Above Attik rapids	1919.	26
6CB1	Rapid	Outlet Rabbit lake	1919	26.
6CB2	Rapid	Lac la Ronge	1919	26.
6DD1	Reindeer	Above Deer rapids	1919	26.
5KG1	Sturgeon-weir	Outlet of Wood lake	1919	26.
5KG2	Sturgeon-weir	Outlet of Lake Deschambault	1917–1919	26.*
5KG3	Sturgeon-weir	Scoop rapids	1916–1919	26.*
5KG4	Sturgeon-weir	Outlet of Beaver lake	1919	26.

Gauging Stations.

6CD1	Churchill	Stanley Mission	1919	*

*Subsequent records for these stations have not been included in annual publications. Copies of such records may be secured on application to the Director of Dominion Water Power.

Definition of Terms.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) Those which represent a rate of flow, as "second-feet," "miner's inches" and "discharge in second-feet per square mile"; and (2) those which represent the actual quantity of water, as "run-off depth in inches", "acre-feet", "mile feet", and "millions of cubic feet".

The units used in this series of reports are "second-feet", "second-feet per square mile", "run-off depth in inches", "acre-feet", "mile-feet" and "millions of cubic feet". These may be defined as follows:—

"Second-feet is an abbreviation for cubic feet per second (c.f.s.). A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section, 1 foot wide and 1 foot deep, at an average velocity of 1 foot a second. It is generally used as a fundamental unit from which others are computed by the use of factors given in the following table of equivalents.

"Second-feet per square mile" is the average number of cubic feet flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off depth in inches" is the depth to which a drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

"Acre-foot" is equivalent to 43,560 cubic feet and is the quantity of water required to cover 1 acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation or power.

"Mile-foot" is equivalent to 27,878,400 cubic feet, and in the quantity of water required to cover one square mile to a depth of 1 foot, and is equal to 640 acre-feet.

"Millions of cubic feet" is a term frequently used to express quantity of storage. When the quantities are of sufficient magnitude the unit is increased to that of "billions of cubic feet."

Certain terms not in common use may be defined as follows:—

"Control", "controlling section", and "point of control" are used to designate the cross section of the stream below the gauge which controls or regulates the height of the water surface at the gauge. The control may not be the same cross section at all stages.

"Discharge relation" is the relation of gauge height to discharge.

Convenient Equivalents.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting velocity in feet per second into velocity in miles per hour.

[1 feet per second = 0·681818 mile per hour, or very nearly ⅔ mile per hour. 1 mile per hour = 1·467 feet per second or very nearly 1½ feet per second. In computing the table the values 0·68182 and 1·4667 were used.]

Units.	Tenths.									
	0	1	2	3	4	5	6	7	8	9
0	0·000	0·068	0·136	0·205	0·273	0·341	0,409	0·477	0·545	0·614
1	0·682	0·750	0·818	0·886	0·955	1·020	1·090	1·160	1·230	1·300
2	1·360	1·430	1·500	1·570	1·640	1·700	1·770	1·840	1·910	1·980
3	2·050	2·110	2·180	2·250	2·320	2·390	2·450	2·520	2·590	2·660
4	2·730	2·800	2·860	2·930	3·000	3·070	3·140	3·200	3·270	3·340
5	3·410	3·480	3·550	3·610	3·680	3·750	3·820	3·890	3·950	4·020
6	4·090	4·160	4·230	4·300	4·360	4·430	4·500	4·570	4·640	4·700
7	4·770	4·840	4·910	4·980	5·050	5·110	5·180	5·250	5·320	5·390
8	5·450	5·520	5·590	5·660	5·730	5·800	5·860	5·930	6·000	6·070
9	6·140	6·200	6·270	6·340	6·410	6·480	6·550	6·610	6·680	6·750

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile	Run-off in inches				
	1 day	28 days	29 days.	30 days	31 days
1	0·03719	1·041	1·079	1·116	1·153
2	0·07438	2·083	2·157	2·231	2·306
3	0·11157	3·124	3·236	3·347	3·459
4	0·14876	4·165	4·314	4·463	4·612
5	0·18595	5·207	5·393	5·578	5·764
6	0·22314	6·248	6·471	6·694	6·917
7	0·26033	7·289	7·550	7·810	8·070
8	0·29752	8·331	8·628	8·926	9·223
9	0·33471	9·372	9·707	10·041	10·376

NOTE.—For part of a month multiply the values for one day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet				
	1 day.	28 days.	29 days.	30 days.	31 days.
1	1·983	55·54	57·52	59·50	61·49
2	1·967	111·10	115·00	119·00	123·00
3	5·950	166·60	172·60	178·50	184·50
4	7·934	222·10	230·10	238·00	246·00
5	9·917	277·70	287·60	297·50	307·40
6	11·900	333·20	345·10	357·00	368·90
7	13·880	388·80	402·60	416·50	430·40
8	15·870	444·30	460·20	476·00	491·90
9	17·850	499·80	517·70	535·50	553·40

NOTE.—For part of a month multiply values for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of gallons.

Discharge in second-feet	Run-off in millions of gallons.				
	1 day	28 days.	29 days.	30 days.	31 days.
1	0·6463	18·10	18·74	19·39	20·04
2	1·2930	36·20	37·48	38·78	40·08
3	1·9390	54·30	56·22	58·17	60·12
4	2·5850	72·40	74·96	77·56	80·16
5	3·2320	90·50	93·70	96·95	100·20
6	3·8780	108·60	112·40	116·30	120·20
7	4·5240	126·70	131·20	135·70	140·30
8	5·1710	144·80	149·90	155·10	160·30
9	5·8170	162·90	168·70	174·50	180·40

NOTE.—For part of a month multiply the value for one day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge in second-feet	Run-off in millions of cubic feet.				
	1 day	28 days.	29 days	30 days.	31 days.
1	0·0864	2·419	2·506	2·592	27·68
2	0·1728	4·838	5·012	5·184	55·56
3	0·2592	7·257	7·518	7·776	83·04
4	0·3456	9·676	10·024	10·368	10·712
5	0·4320	12·095	12·530	12·960	13·390
6	0·5184	14·514	15·036	15·552	16·068
7	0·6048	16·933	17·542	18·144	18·746
8	0·6912	19·352	20·048	20·736	21·424
9	0·7776	21·771	22·554	23·328	24·102

NOTE.—For part of a month multiply values for one day by the number of days.

1 second-foot equals 35·7 British Columbia miner's inches, or one British Columbia miner's inch equals 1·68 cubic feet per minute.
1 second-foot equals 6·23 British imperial gallons per second; equals 538,453 gallons for one day.
1 second-foot equals 7·48 United States gallons per second; equals 646,317 gallons for one day.
1 second-foot for one year covers 1 square mile 1·131 feet or 13·572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet; equals 724 acre-feet.
1 second-foot for one hour equals about 1 acre-inch.
100 British imperial gallons per minute equals 0·268 second-foot.
100 United States gallons per minute equals 0·223 second-foot.
1,000,000 British imperial gallons per day equals 1·86 second-feet.
1,000,000 United States gallons per day equals 1·55 second-feet.
1,000,000 British imperial gallons equals 3·68 acre-feet.
1,000,000 United States gallons equals 3·07 acre-feet.
1,000,000 cubic feet equals 22·95 acre-feet.
1,000,000,000 (1 billion) cubic feet equals 11·570 second-feet for one day.
1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.
1 acre-foot equals 43,560 cubic feet.
1 acre-foot equals 271,472 British imperial gallons.
1 acre-foot equals 325,850 United States gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0·0737 second-foot per year.
1 foot deep on 100 square miles equals 2·79 billions of cubic feet, equals 3,227 second-feet for 10 days, 1,076 second-feet for 30 days or 88 second-feet for one year.
1 foot equals 0·3048 metre.
1 mile equals 1·60935 kilometres.
1 mile equals 5·280 feet.
1 acre equals 0·4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2·59 square kilometres.
1 cubic foot equals 0·0283 cubic metre.
1 cubic foot of water weighs 62·43 pounds.
1 cubic metre per minute equals 0·5886 second-foot.
1 horse-power equals 550 foot-pounds per second.
1 horse-power equals 76·0 kilogram-metres per second.
1 horse-power equals 746 watts or 0·746 kilowatts.
1 horse-power equals 1 second-foot of water falling 8·80 feet.
1½ horse power equals about 1 kilowatt.

To calculate water-power quickly:—
second-feet × fall in feet ÷ 11 = net horse-power on water wheel, realizing 80 per cent of theoretical power.

Explanation of Data.

For each regular gauging station the following data, so far as available, are given:—

1. Description of the Station.
2. Table of Discharge Measurements.
3. Table of Daily Discharges.
4. Table of Monthly Discharges and Run-off.

Under the description of the station, the following information is given: Location of station, records available, extent of drainage area, description of gauge, and method of determining discharge.

The table of discharge measurements gives the following particulars of each individual measurement: the date of the measurement, the gauge height, the discharge in second feet, and where necessary relevant notes as to control.

The table of daily discharges gives the daily discharge corresponding to the observed daily elevation of water surface at the station. Where observations are made more frequently than once a day, the mean of the day's readings have been used in computing the discharge.

Attention is called to the fact that the zero of the gauge bears no relation to zero flow or the bottom of the river.

The discharge measurements and gauge heights are the basic data from which discharge rating tables, daily discharges and monthly discharges are computed.

The discharge rating table, which is not published in this report, gives the discharge in second-feet corresponding to every stage of the river recorded during the period for which the table is applicable. At such times as the gauge height is temporarily affected by ice cover, backwater, etc., the discharge relation is not applicable unless proper corrections to the gauge heights are known and applied.

In the table of monthly discharge, the column head "Maximum" gives the mean flow for the day of highest discharge. As this discharge is based on the mean daily gauge reading, it is evident that there may have been short periods when the discharge was higher than that given in the column. Likewise in the column of "Minimum" the quantity given is the mean flow for the day of the lowest discharge. The column headed "Mean" is the average flow for the month in cubic feet per second based upon the mean daily discharge. On this mean are based the computations of run-off which have previously been defined.

The drainage areas as given for each station have been obtained by planimeter determination from the latest available departmental maps.

The basic data presented in this report, unless otherwise stated in the description of station, has been collected by methods commonly in practice and described in previous annual reports.

Acknowledgments.

The Dominion Water Power Branch is indebted to the officials of a number of corporations for co-operation in obtaining records and for placing the results of various observations made by members of their own staff, at the disposal of the Survey. The officials to whom acknowledgment is due are those of the Winnipeg Electric Railway Company the Winnipeg Municipal Power Plant, Point du Bois, the Lake of the Woods Milling Company, the Kenora Municipal Plant, and the Minnedosa Power Company.

PART II.

HYDROMETRIC DATA.

KENORA POWER HOUSE—STATION NO. 5PE1

(EASTERN OUTLET LAKE OF THE WOODS.)

Location.—150 feet above Kenora power-house.

Records Available.—August 21, 1907, to September 30, 1919.

Drainage Area.—26,400 square miles. As there are several other outlets from the Lake of the Woods, this drainage area should not be used in computation of the run-off.

Gauge.—Vertical staff gauge in forebay and tailrace. The former on the timber platform and the latter 55 feet north of the east end of the power-house.

Discharge Measurements.—Boat station.

Remarks.—Since this station was established discharge measurements have been made covering practically the entire range in head and load to be met with in the operation of the plant, and from this information rating curves of load discharge for various heads have been constructed.

Discharge Measurements of East Branch, Winnipeg River at Kenora Power House for 1918-19.

Date.	Gauge Height.	Discharge	Date.	Gauge Height	Discharge
1918.	Feet.	Sec.-ft.	1919.	Feet.	Sec. ft
Oct. 3	1,058·52	1,301	July 23	1,059·77	1,647
Oct. 3	1,058·52	1,305	July 23	1,059·77	1,620
			Aug. 26	1,059·10	689
			Aug. 26	1,059·10	715

Daily Gauge Height and Discharge of East Branch, Winnipeg River, at Kenora Power House, for Year ending September 30, 1919.

Day	October		November		December		January		February		March	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet	Sec-ft	Feet	Sec-ft	Feet	Sec-ft	Feet	Sec-ft	Feet	Sec-ft	Feet	Sec-ft
1	58·58	1,267	58·30	1,101	58·47	1,449	58·50	1,418	58·67	716	58·80	731
2	58·10	1,290	58·30	1,093	58·11	1,491	58·51	1,393	58·69	673	58·83	684
3	58·50	1,302	58·37	704	58·45	1,477	58·51	1,305	58·68	704	58·78	970
4	58·23	1,213	58·10	1,171	58·42	1,472	58·39	1,511	58·67	710	58·80	1,000
5	58·23	1,297	58·43	1,423	58·17	1,479	58·57	821	58·69	710	58·77	991
6	58·37	689	58·40	1,110	58·17	1,542	58·18	1,274	58·67	713	58·79	987
7	58·55	1,052	58·40	1,088	58·47	1,451	58·52	1,530	58·71	705	58·75	972
8	58·45	1,294	58·27	1,091	58·55	760	58·53	1,191	58·69	713	58·77	1,054
9	58·45	1,293	58·15	1,441	58·41	1,225	58·53	1,443	58·71	672	58·70	676
10	58·25	1,320	58·61	725	58·41	1,113	58·53	1,451	58·71	701	58·74	931
11	58·40	1,320	58·70	830	58·29	1,411	58·47	1,167	58·67	701	58·67	1,001
12	58·40	1,311	58·47	976	58·18	1,463	58·53	861	58·69	685	58·57	1,066
13	58·20	704	58·37	995	58·53	1,465	58·55	726	58·67	656	58·57	1,011
14	58·11	1,107	58·55	1,185	58·52	1,488	58·58	713	58·67	670	58·57	1,072
15	58·25	1,174	58·41	1,397	58·60	778	58·62	717	58·65	697	58·64	1,008
16	58·41	1,167	58·43	1,388	58·48	1,413	58·58	722	58·74	652	58·71	720
17	58·10	1,420	58·50	760	58·51	1,527	58·61	718	58·71	657	58·61	1,005
18	58·30	1,375	58·25	1,184	58·50	1,471	58·58	724	58·71	678	58·61	970
19	58·55	1,397	58·47	1,432	58·53	1,461	58·64	673	58·72	678	58·55	974
20	58·37	698	58·30	1,425	58·50	1,462	58·57	681	58·72	671	58·57	1,024
21	58·30	1,139	58·20	1,121	58·59	1,479	58·59	715	58·73	677	58·55	1,029
22	58·19	1,178	58·37	1,448	58·53	1,123	58·51	1,218	58·80	670	58·51	972
23	58·15	1,448	58·55	1,426	58·59	1,418	58·57	1,442	58·81	655	58·59	726
24	57·85	1,425	58·64	1,351	58·52	1,503	58·53	1,102	58·78	682	58·59	735
25	58·10	1,417	58·35	1,197	58·60	861	58·63	1,474	58·71	691	58·58	705
26	58·21	1,387	58·75	1,134	58·53	1,269	58·65	737	58·81	699	58·56	742
27	58·37	691	58·65	1,410	58·59	1,724	58·67	703	58·77	716	58·53	762
28	58·07	1,228	58·40	1,424	58·51	1,464	58·63	706	58·70	712	58·51	780
29	58·15	1,411	58·25	1,405	58·51	1,442	58·65	707			58·45	778
30	58·25	1,417	58·30	1,472	58·45	1,535	58·71	703			58·45	758
31	58·15	1,450			58·18	1,514	58·62	715			58·45	774

Day	April		May		June		July		August		September	
1	58·43	778	58·48	860	58·65	713	59·30	775	59·70	868	59·28	733
2	58·40	761	58·50	1,073	58·57	1,017	59·48	1,002	59·77	854	58·84	785
3	58·38	748	58·41	1,434	58·58	1,239	59·76	1,280	59·74	803	58·86	797
4	58·32	754	58·43	761	58·49	1,304	59·93	768	59·66	872	58·90	817
5	58·30	759	58·42	1,145	58·52	703	60·05	789	59·62	1,228	58·86	935
6	58·31	728	58·51	1,418	58·65	620	60·19	734	59·51	1,524	58·75	972
7	58·35	744	58·40	1,394	58·75	605	60·42	842	59·35	935	58·73	718
8	58·31	750	58·53	1,387	58·77	571	60·50	1,153	59·46	865	58·65	772
9	58·38	745	58·57	1,472	58·75	604	60·35	1,578	59·45	839	58·70	1,215
10	58·17	797	58·62	1,412	58·83	630	60·17	1,612	59·51	786	58·85	1,451
11	58·40	788	58·71	747	58·93	631	60·28	1,606	59·58	826	58·76	1,419
12	58·39	803	58·70	1,087	58·94	838	60·25	1,573	59·57	848	58·92	1,373
13	58·42	745	58·74	1,432	58·89	1,182	60·45	968	59·37	835	58·93	1,379
14	58·37	935	57·75	1,449	58·80	932	60·25	907	59·27	1,242	58·85	815
15	58·34	1,099	58·58	1,353	58·91	577	60·21	1,308	59·41	1,222	58·85	722
16	58·33	1,302	58·56	1,364	58·85	931	60·24	1,568	59·56	855	58·73	1,108
17	58·36	1,541	58·65	1,368	58·95	807	60·31	1,563	59·49	790	58·75	1,043
18	58·38	1,541	58·68	739	59·00	590	60·32	1,657	59·38	819	58·90	815
19	58·36	1,429	58·58	1,085	58·86	590	60·22	1,018	59·48	831	58·93	1,110
20	58·43	818	58·60	1,382	58·95	600	60·24	847	59·48	831	58·96	1,072
21	58·48	1,110	58·59	1,267	58·95	632	60·07	1,295	59·36	828	58·95	674
22	58·41	1,430	58·57	1,301	59·22	572	60·06	1,687	59·38	821	58·75	720
23	58·40	1,417	58·54	1,332	59·12	590	59·93	1,650	59·26	841	59·05	693
24	58·42	1,441	58·66	718	59·19	939	59·90	1,545	59·21	754	58·95	695
25	58·45	1,429	58·70	574	59·25	1,099	61·03	1,112	59·20	787	58·72	723
26	58·47	1,397	58·56	1,023	59·16	810	59·94	889	59·11	796	59·05	1,044
27	58·53	733	58·66	1,241	59·32	924	59·93	836	59·04	805	58·59	1,072
28	58·50	878	58·74	1,120	59·47	1,117	59·87	1,139	59·10	825	58·66	678
29	58·55	933	58·70	614	59·57	671	59·88	968	59·13	837	58·63	712
30	58·53	901	58·82	858	59·43	958	59·76	1,188	58·95	828	58·78	725
31			58·69	1,020			59·66	876	59·07	724		

NOTE.—Gauge heights refer to Foreshay gauge. 1,000·00 should be added to gauge heights to reduce them to W.P.S. datum.

Monthly Discharge of East Branch, Winnipeg River at Kenora Power House, for Year ending September 30, 1919.

(Drainage area, 26,400 square miles.)

Month	Discharge in Second Feet				Run Off	
	Maximum	Minimum	Mean	Per square mile	Depth in inches on Drainage area	Total in acre-feet
October	1,450	989	1,236			73,960
November	1,472	704	1,251			73,749
December	1,523	769	1,196			85,847
January	1,505	673	1,046			64,316
February	716	652	689			38,265
March	1,372	676	891			54,808
April	1,541	728	1,004			59,742
May	1,418	971	1,114			68,527
June	1,301	571	802			47,732
July	1,087	714	1,185			72,861
August	1,521	724	887			54,539
September	1,451	674	920			55,279
The year	1,523	571	1,011			734,951

NOTE.—Discharge per square mile and run off depth in inches are cited as the outlet records of several from the Lake of the Woods.

NORMAN TRAFFIC BRIDGE.—STATION NO. 5PE2

(WESTERN OUTLET LAKE OF THE WOODS.)

Location.—Norman Traffic bridge.

Records Available.—May 1, 1913, to September 30, 1919.

Drainage Area.—26,400 square miles. As there are several other outlets from the Lake of the Woods, this drainage area should not be used in computation of run off.

Gauge.—Vertical staff gauge on northeast corner of the west pier of the bridge.

Discharge Measurements.—From bridge.

Remarks.—The Norman dam, which is located about 4,000 feet below the section, forms the control, and the discharge is therefore dependent upon the manipulation of the dam. Considerable range in discharge may occur for the same gauge height recorded at the station.

Discharge Measurements of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1918 and 1919.

Date.	Gauge Height	Discharge	Remarks.	Date.	Gauge Height	Discharge.	Remarks
1918	Feet	Sec.-ft	Logs in Dam.	1918	Feet	Sec.-ft	Logs in Dam.
Oct. 2	1,058·13	4,819	283	Dec. 16	1,058·51	4,553	283
Oct. 2	1,058·16	4,972	283	Dec. 18	1,058·52	4,605	283
Oct. 8	1,058·35	4,765	283	Dec. 18	1,058·52	4,753	283
Oct. 8	1,058·36	4,866	283				
Oct. 10	1,058·26	4,894	283	1919			
Oct. 10	1,058·26	4,943	283				
Oct. 15	1,058·20	4,931	283	Jan. 13	1,058·49	4,550	283
Oct. 15	1,058·19	4,782	283	Jan. 13	1,058·50	4,548	283
Oct. 21	1,058·33	4,958	283	Jan. 15	1,058·54	4,856	283
Oct. 21	1,058·33	4,810	283	Jan. 15	1,058·55	4,809	283
Oct. 23	1,058·19	4,880	283	Jan. 20	1,058·52	4,852	283
Oct. 23	1,058·19	4,929	283	Jan. 20	1,058·51	4,652	283
Nov. 27	1,058·67	4,829	283	Jan. 27	1,058·60	4,868	283
Nov. 28	1,058·41	4,777	283	Jan. 27	1,058·61	4,870	283
Nov. 28	1,058·40	4,677	283	Jan. 29	1,058·59	4,916	283
Dec. 2	1,058·45	4,538	283	Jan. 29	1,058·58	4,817	283
Dec. 2	1,058·45	4,538	283	Feb. 3	1,058·62	4,773	283
Dec. 4	1,058·43	4,684	283	Feb. 5	1,058·63	4,725	283
Dec. 4	1,058·42	4,683	283	Feb. 5	1,058·63	4,775	283
Dec. 9	1,058·44	4,590	283	Feb. 10	1,058·60	4,836	283
Dec. 11	1,058·53	4,706	283	Feb. 12	1,058·61	4,970	283
Dec. 11	1,058·54	4,460	283	Feb. 12	1,058·61	4,970	283

Discharge Measurements of Western Outlet, Lake of the Woods, at Norman Traffic Bridge for 1918-1919—Concluded.

Date.	Gauge Height.	Discharge.	Remarks	Date.	Gauge Height.	Discharge.	Remarks
1919.	Feet.	Sec.-ft.	Logs in Dam.	1919	Feet	Sec.-ft.	Logs in Dam
Feb. 20	1,058·63	4,725	283	June 27	1,059·18	9,514	241
Feb. 20	1,058·64	4,876	283	June 28	1,059·25	12,245	234
Feb. 24	1,058·67	4,832	283	June 28	1,059·21	12,225	229
Feb. 24	1,058·67	4,982	283	June 29	1,059·06	15,133	202
Feb. 28	1,058·72	4,693	283	June 30	1,058·99	16,655	195
Mar. 4	1,058·76	4,950	283	June 30	1,058·88	16,631	193
Mar. 4	1,058·76	4,650	283	July 3	1,059·01	19,843	172
Mar. 5	1,058·75	4,998	281	July 4	1,059·15	22,586	156
Mar. 6	1,058·72	5,941	274	July 4	1,059·14	22,595	149
Mar. 6	1,058·68	6,678	268	July 5	1,059·12	23,949	138
Mar. 7	1,058·68	8,074	264	July 5	1,059·12	24,051	132
Mar. 7	1,058·67	8,668	259	July 7	1,059·32	28,296	86
Mar. 8	1,058·56	10,812	241	July 8	1,059·30	28,375	75
Mar. 8	1,058·54	11,100	234	July 8	1,059·35	27,971	70
Mar. 10	1,058·48	12,061	220	July 8	1,059·34	28,575	68
Mar. 10	1,058·46	12,644	212	July 9	1,059·10	27,989	46
Mar. 11	1,058·38	13,488	205	July 9	1,059·07	27,554	44
Mar. 11	1,058·38	13,340	205	July 9	1,058·91	26,619	37
Mar. 13	1,058·30	13,445	205	July 10	1,058·96	27,077	37
Mar. 13	1,058·28	12,305	205	July 10	1,058·96	27,128	37
Mar. 17	1,058·31	13,057	205	July 11	1,059·05	27,937	35
Mar. 17	1,058·31	12,615	205	July 11	1,059·05	27,836	35
Mar. 19	1,058·26	12,442	205	July 12	1,059·04	27,318	35
Mar. 19	1,058·26	12,687	205	July 12	1,059·06	28,101	35
Mar. 25	1,058·11	14,603	195	July 14	1,058·99	27,160	35
Mar. 25	1,058·11	14,360	195	July 14	1,058·97	27,795	35
Mar. 26	1,058·00	15,408	183	July 15	1,058·99	27,616	35
Mar. 26	1,058·00	15,941	183	July 15	1,059·02	27,954	35
Mar. 27	1,057·89	16,833	178	July 21	1,058·85	27,559	35
Mar. 27	1,057·85	17,093	174	July 21	1,058·85	27,408	35
Mar. 28	1,057·82	17,023	174	July 22	1,058·81	27,414	36
Mar. 28	1,085·85	16,975	174	July 22	1,058·83	27,184	35
Mar. 31	1,057·77	16,619	174	July 28	1,058·70	26,389	35
Mar. 31	1,057·77	16,411	174	July 30	1,058·52	26,193	35
April 2	1,057·76	16,260	174	July 30	1,058·52	26,044	35
April 2	1,057·75	16,110	174	Aug. 5	1,058·48	26,347	35
April 14	1,057·76	16,069	174	Aug. 5	1,058·48	25,902	35
April 14	1,057·74	17,061	174	Aug. 6	1,058·31	25,581	35
Mar. 16	1,057·75	16,302	174	Aug. 12	1,058·34	25,307	35
April 16	1,057·75	16,541	174	Aug. 12	1,058·34	24,569	35
April 21	1,057·82	15,725	174	Aug. 13	1,058·15	24,429	35
April 21	1,057·84	16,171	174	Aug. 13	1,058·15	24,234	35
April 22	1,058·13	11,985	199	Aug. 18	1,058·16	24,780	35
April 22	1,058·14	11,795	203	Aug. 18	1,058·16	25,317	35
April 24	1,058·16	12,000	205	Aug. 19	1,058·26	25,823	48
April 24	1,058·16	11,951	205	Aug. 19	1,058·26	24,835	50
April 28	1,058·21	12,172	205	Aug. 20	1,058·27	24,796	68
April 28	1,058·21	12,220	205	Aug. 20	1,058·26	24,002	70
April 30	1,058·25	12,094	205	Aug. 21	1,058·21	23,317	85
April 30	1,058·25	12,143	205	Aug. 21	1,058·21	23,708	85
May 5	1,058·17	11,593	205	Aug. 22	1,058·26	23,855	93
May 5	1,058·19	12,064	205	Aug. 22	1,058·26	23,757	95
May 6	1,058·30	11,236	217	Aug. 25	1,058·07	23,598	100
May 7	1,058·29	10,397	226	Aug. 25	1,058·07	23,132	100
May 8	1,058·46	8,248	245	Aug. 27	1,057·92	22,503	100
May 8	1,058·50	7,322	258	Aug. 27	1,057·92	22,601	100
May 9	1,058·49	7,665	258	Sept. 2	1,057·69	21,473	100
May 9	1,058·49	7,368	258	Sept. 2	1,057·69	21,616	100
May 13	1,058·70	7,831	258	Sept. 3	1,057·76	21,824	100
May 13	1,058·73	7,791	258	Sept. 3	1,057·76	22,064	100
May 14	1,058·71	8,034	258	Sept. 5	1,057·73	22,227	100
May 14	1,058·71	7,834	258	Sept. 5	1,057·71	21,874	100
May 19	1,058·45	7,702	258	Sept. 8	1,057·80	20,228	125
May 19	1,058·45	7,554	258	Sept. 8	1,057·72	19,489	138
May 21	1,058·54	7,978	258	Sept. 8	1,057·74	19,218	142
May 20	1,058·54	7,681	258	Sept. 9	1,058·11	17,281	162
May 27	1,058·59	7,796	258	Sept. 9	1,058·35	14,553	185
May 27	1,058·59	7,796	258	Sept. 10	1,058·47	13,983	191
June 9	1,058·58	8,239	258	Sept. 10	1,058·47	14,329	191
June 9	1,058·57	8,186	258	Sept. 15	1,058·41	13,949	191
June 11	1,058·71	8,234	258	Sept. 15	1,058·11	13,949	191
June 11	1,058·71	8,084	258	Sept. 19	1,058·54	15,015	191
June 18	1,058·81	8,468	258	Sept. 19	1,058·54	14,767	191
June 18	1,058·81	8,518	258	Sept. 22	1,058·29	14,419	191
June 19	1,058·72	8,187	258	Sept. 22	1,058·29	13,978	191
June 19	1,058·72	8,287	258	Sept. 25	1,058·28	14,315	191
June 24	1,059·07	8,911	258	Sept. 25	1,058·28	14,115	191
June 24	1,059·09	8,614	258	Sept. 29	1,058·30	14,082	191
June 25	1,059·19	9,056	258	Sept. 29	1,058·30	15,259	191
June 25	1,059·18	9,056	258	Sept. 29	1,058·45	14,515	191
June 27	1,059·23	8,870	258	Sept. 30	1,058·45	11,613	191

Daily Gauge Height and Discharge of Western Outlet, Lake of the Woods at Norman Traffic Bridge, for year ending September 30, 1919.

Day.	October.		November.		December.		January.		February.		March.	
	Gauge Height	Discharge.	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	58·14	4,843		4,776	58·26	4,596	58·42	4,561	58·48	4,694	58·61	4,704
2	57·97	4,843		4,776	58·33	4,543	58·43	4,544	58·50	4,693	58·63	4,700
3		4,832		4,769	58·31	4,539	58,42	4,555	58·50	4,698	58·60	4,668
4		4,846		4,767	58·34	4,545	58·37	4,552	58·52	4,695	58·66	4,771
5	58·04	4,837		4,761	58·31	4,544	58·40	4,604	58·51	4,695	58,65	4,843
6	58·21	4,835		4,769	58·30	4,550	58·38	4,585	58·52	4,692	58·58	6,092
7		4,791		4,755	58·35	4,545	58·43	4,602	58·51	4,697	58·40	8,308
8	58·23	4,792		4,755	58·36	4,542	58·43	4,601	58·51	4,707	58·05	11,801
9	58·24	4,794		4,751	58·30	4,495	58·43	4,603	58·52	4,710	57·88	12,052
10	58·14	4,791		4,748	58·37	4,495	58·33	4,601	58·53	4,710	57·88	12,178
11	58·33	4,792		4,756	58·40	4,500	58·35	4,638	58·51	4,703	57·53	13,279
12	58·18	4,799		4,752	58·41	4,500	58·36	4,646	58·51	4,707	57·43	13,154
13	58·08	4,795		4,750	58·41	4,500	58·39	4,656	58·48	4,711	57·43	13,064
14	58·13	4,794		4,752	58·40	4,492	58·42	4,660	58·48	4,707	57,43	12,953
15	58·10	4,793		4,744	58·43	4,514	58·44	4,662	58·52	4,705	57·48	12,870
16	58·10	4,798		4,746	58·43	4,540	58·40	4,638	58·54	4,706	57·45	12,751
17	58·00	4,793		4,743	58·41	4,551	58·40	4,627	58·52	4,707	57·44	12,540
18	58·24	4,790		4,741	58·41	4,542	58·41	4,617	58·51	4,707	57·45	12,522
19	58·30	4,793		4,713	58·41	4,545	58·47	4,613	58·52	4,703	57·42	12,423
20	57·93	4,787	58·10	4,720	58·40	4,542	58·42	4,620	58·55	4,709	57·41	12,341
21	58·17	4,782	58·04	4,712	58·39	4,542	58·44	4,622	58·56	4,711	57·38	12,312
22		4,783	58·38	4,712	58·39	4,556	58·42	4,642	58·59	4,708	57·36	12,291
23	58·04	4,786	58·48	4,709	58·40	4,573	58·44	4,628	58·59	4,710	57·38	12,355
24		4,779		4,713	58·42	4,573	58·47	4,627	58·58	4,705	57·40	12,547
25	58·10	4,779	58·27	4,708		4,571	58·47	4,666	58·61	4,705	57,20	14,335
26	58·14	4,780	58·39	4,707	58·42	4,569	58·48	4,687	58·62	4,704	56·80	15,532
27	58·11	4,782	58·54	4,703	58·43	4,575	58·49	4,693	58·62	4,703	56·46	16,850
28		4,779	58·31	4,698	58·43	4,569	58·48	4,697	58·61	4,710	56·03	16,831
29		4,781	58·20	4,696	58·36	4,572	58·49	4,699			56·03	16,747
30		4,780	58·21	4,699	58·37	4,581	58·50	4,696			56·01	16,665
31		4,779			58·40	4,590	58·48	4,700			56·00	16,447

	April.		May.		June.		July.		August.		September.	
1	55·98	16,511	57·36	12,313	58·10	7,918		18,090	50·20	26,723		22,419
2	55·98	16,509	57·35	12,284	58·10	8,014	57·17	19,190	50·20	26,727	52·60	22,345
3	55·98	16,542	57·35	12,259	58·10	8,092	57·15	20,340	50·25	26,613	52·60	22,495
4	55·97	16,547	57·32	12,230	58·05	8,046	56·20	22,990	50·20	26,578	52·60	22,520
5	55·95	16,553	57·32	12,055	58·10	8,071	55·85	24,540	50·20	26,633	52·55	22,595
6		16,616	57·52	10,699	58·15	8,092	54·60	26,990	50·15	26,373	54·60	20,895
7		16,636	57·48	9,150	58·25	8,112	53·20	28,990	50·10	25,883	54·60	20,295
8		16,653	57·86	7,741	58·22	8,195	52·50	28,990	50·05	25,941	54·45	19,895
9		16,611	58·15	7,595	58·24	8,253	50·60	28,390	50·05	25,958	58·35	16,395
10		16,679	58·17	7,697	58·32	8,296	50·40	27,890	50·00	25,620	57·20	14,545
11		16,696	58·24	7,904	58·24	8,295	50·70	27,990	50·00	25,298	57·20	14,520
12		16,708	58·25	7,959	58·38	8,295	50·60	28,190	50·05	25,333	57·20	14,495
13		16,692	58·33	8,005	58·38	8,313	50·75	28,180	49·95	24,893	57·17	14,470
14	55·95	16,767	58·30	8,024	58·32	8,311	50·60	28,180	49·95	24,968	57·17	14,578
15	55·95	16,758	58·18	8,024	58·34	8,322	50·70	28,180	49·95	25,048	57·22	14,570
16	55·95	16,693	58·12	8,017	58·36	8,328	50·55	28,170	49·95	25,128	57·17	14,670
17	55·95	16,642	58·20	8,015	58·38	8,338	50·55	28,170	49·95	25,160	57·15	14,845
18	56·00	16,605	58·12	7,996	58·44	8,348	50·55	28,160	49·95	25,343	57·25	14,970
19	55·95	16,559	58·11	7,978	58·32	8,349	50·60	28,150	50·15	25,793	57·27	15,070
20	55·95	16,517	58·18	7,980	58·40	8,173	50·50	28,025	51·05	25,093	57·27	14,995
21	55·98	16,273	58·17	7,972	58·42	8,619	50·40	27,940	51·60	24,164	57·25	14,762
22	56·95	12,077	58·13	7,975	58·52	8,756	50·40	27,865	52·75	23,973	57·12	14,595
23	57·30	12,112	58·10	7,964	58·60	8,895	50·40	27,790	52·85	23,795	57·08	14,620
24	57·32	12,156	58·18	7,955	58·65	9,000	50·35	27,715	52,75	23,615	57·00	14,645
25	57·32	12,166	58·17	7,945	58·75	9,166	50·35	27,640	52·75	23,295	57·12	14,670
26	57·35	12,182	58·22	7,898	58·62	9,211	50·25	27,570	52·55	23,120	57·34	14,695
27	57·30	12,233	58·21	7,890	58·78	9,276	50·35	27,223	52·65	23,165	57·07	14,720
28	57·35	12,312	58·20	7,894	58·76	12,456	50·35	26,840	52·70	23,080	57·07	14,770
29	57·40	12,327	58·17	7,899	57 87	15,457	50·60	26,765	52·65	22,990	57·10	14,945
30	57·37	12,340	58·30	7,890	57·80	16,974	50·20	26,690	52·55	22,925	57·15	14,995
31			58·20	7,897			50·25	26,740	52·70	22,723		

NOTES.—Gauge Heights are those read on the D.P.W. gauge at the Forebay, Norman dam.
1000·00 should be added to gauge heights to reduce to W.P.S. datum.

Monthly Discharge of Western Outlet, Lake of the Woods, at Norman Traffic Bridge, for Year ending September 30, 1919.

[Drainage area, 26,400 square miles.]

Month	Discharge in Second-Feet.				Run-Off	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	4,846	4,770	4,798			295,018
November	4,776	4,696	4,737			281,871
December	4,596	4,492	4,547			279,584
January	4,700	4,544	4,631			284,749
February	4,711	4,602	4,704			261,247
March	16,850	4,668	11,772			723,832
April	16,767	12,077	15,289			909,750
May	12,313	7,595	8,745			537,709
June	16,974	7,918	9,075			540,000
July	28,990	18,090	26,728			1,643,441
August	26,727	22,723	24,902			1,531,164
September	22,595	14,470	16,633			989,732
The year	28,990	4,492	11,434			8,278,098

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the outlet is one of several from the Lake of the Woods.

MILL "A" —HEADRACE, KEEWATIN—STATION NO. 5PE3.

(OUTLET LAKE OF THE WOODS.)

Location.—Just above intake racks of power-house of Mill "A."

Records Available.—February 14, 1913, to September 30, 1919.

Drainage Area.—26,400 square miles. As there are several other outlets from the Lake of the Woods, this drainage area should not be used in computation of run-off.

Gauge.—Vertical staff gauge just above racks in headrace.

Discharge Measurements.—From foot-bridge across headrace.

Remarks.—Rating of the plant has been obtained and records of daily discharge are based on load-head, etc.

Discharge Measurements of Flume No. 1, Mill at "A", Headrace, Lake of the Woods Milling Co., for 1918-19.

Date.	Gauge Height	Discharge	Date.	Gauge Height	Discharge.
1918.	Feet	Sec.-ft	1919	Feet	Sec.-ft
Oct 9	99·03	228	Feb. 18	99·39	216
Oct 9	99·02	217	Feb. 18	99·39	206
Dec 23	99·14	248	April 29	99·09	264
Dec 23	99·14	248	April 29	99·08	255
			May 26	99·36	231
1919			May 26	99·36	232
			Sept. 26	99·83	288
Jan 9	99·18	247	Sept 26	99·85	287
Jan 9	99·16	254			

Discharge Measurements of Flume No. 2, Mill "A" at Headrace, Lake of the Woods Milling Co., for 1918-1919—Concluded.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
1918.	Feet	Sec.-ft	1919.	Feet	Sec.-ft
Oct. 19	99·13	815	July 16	100·87	1,013
Oct. 19	99·09	801	July 16	100·87	989
1919.			July 29	100·43	1,083
			July 29	100·43	1,059
			July 31	100·00	1,131
Jan. 6	99·04	870	July 31	100·00	1,113
Jan. 8	99·10	841	Aug 1	100·02	1 127
Feb. 11	99·38	755	Aug 1	100·02	1,158
Feb. 11	99·37	777	Aug 8	99·75	1,108
April 15	98·78	898	Aug 8	99·75	1,127
April 15	98·78	910	Sept 12	99·42	938
May 30	99·53	728	Sept 12	99·42	926
May 30	99·53	757			

Mean daily discharge in second-feet of Mill "A" at Keewatin, Ont., for Year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	April	May	June	July	Aug	Sept
1	871	1,052	97	146	224	935	1,222	1,146	98	106	1,385	1,327
2	926	1,042	1,104	272	115	109	1,225	1,161	998	985	1,393	1,301
3	859	114	1,078	261	910	223	1,238	1,169	899	1,025	95	1,249
4	863	1,016	1,113	995	903	232	1,237	97	1,046	1,021	85	1,448
5	912	1,012	1,093	133	923	248	1,2	1,062	1,000	979	1,399	1,156
6	98	1,004	1,087	1,122	896	230	1c	1,089	1,000	92	1,384	1,423
7	903	1,018	1,102	1,055	921	243	1,22.	1,067	1,000	1,102	1,398	128
8	907	1,018	105	117	882	241	1,208	1,116	78	1,142	1,571	1,279
9	954	1,022	1,041	1,053	779	103	1,187	1,083	909	1,089	1,394	1,200
10	998	115	1,112	1,027	915	1,027	1,235	1,044	866	1,223	94	1,137
11	908	1,072	1,119	1,058	912	1,041	1,217	107	974	1,155	1,209	1,204
12	930	1,078	1,097	95	868	1,056	1,235		909	306	1,253	1,153
13	114	1,030	1,069	1,065	874	1,102	89	1,0	911	65	1,227	1,155
14	914	1,028	1,096	261	865	1,093	1,145	1,08	952	1,191	1,390	98
15	906	1,026	123	644	940	1,086	1,165	1,100	74	1,162	1,377	1,076
16	871	1,054	1,106	1,035	109	115	1,220	1,042	885	1,258	1,400	1,118
17	954	114	1,087	1,035	848	1,007	1,190	1,046	885	1,227	86	1,038
18	958	969	1,086	917	918	1,096	1,108	90	846	1,220	1,383	1,108
19	936	1,011	1,063	123	862	1,074	1,193	1,053	883	319	1,433	1,100
20	114	1,032	1,086	200	866	1,085	78	982	840	89	1,410	1,093
21	1,037	1,036	1,096	190	924	1,074	1,210	1,040	884	1,271	247	80
22	986	1,031	123	190	931	1,087	1 199	1,037	103	1,312	235	1,154
23	1,032	973	1,075	192	109	110	1 192	1,038	872	1,322	244	1,947
24	1,068	114	1,024	216	924	1,061	1,143	98	876	1,350	99	1,073
25	1,057	1,010	124	200	904	1,122	1,183	98	891	1,354	1,388	1,084
26	1,048	1,017	1,047	109	935	1,148	1,158	985	921	1,307	1,249	1,013
27	121	1,030	1,003	243	926	1,159	98	1,003	879	87	1,239	1,019
28	1,028	1,041	1,029	241	885	1,203	1,108	980	857	1,349	1,429	112
29	1,056	962	141	239		1,265	1,172	954	82	1,289	1,443	1,065
30	1,068	1,009	1,056	912		105	1,140	953	885	1,363	1,399	1,180
31	1,028		1,086	938		1,206		976		1,365	77	

Mill "C"—Headrace, Keewatin—Station No. 5pe4.

(OUTLET LAKE OF THE WOODS.)

Location.—Just above intake racks of power-house of Mill "C."

Records available.—July 17, 1912, to September 30, 1919.

Drainage area.—26,400 square miles. As there are several other outlets from the Lake of the Woods, this drainage area should not be used in computation of run-off.

Gauge.—Vertical staff gauge on east side of channel, ten feet above the racks.

Discharge Measurements.—From bridge across headrace.

Remarks.—Rating of the plant has been obtained and daily discharge through same is based on load head, etc.

Discharge Measurements of Headrace, Mill "C", at Lake of the Woods Milling Co., for 1918-1919.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
1918.	Feet	Sec.-ft.	1919.	Feet	Sec.-ft.
Oct. 7	98·98	844	May 17	98·98	789
Oct. 7	98·98	859	May 17	98·98	794
Nov. 26	98·88	837	June 14	99·12	667
Nov. 26	98·85	870	June 14	99·12	692
Dec. 26	98·83	991	Sept 11	99·06	814
			Sept 11	99·06	824
1919.			Sept 18	99·22	809
			Sept 18	99·21	799
Jan. 4	98·80	955	Sept 27	98·86	781
April 1	98·66	963	Sept. 27	98·86	791
April 1	98·66	963			

Mean daily discharge in second-feet of Mill "C" at Keewatin, Ont., for Year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept
1	722	848	233	229	198	267	893	866	139	163	1,083	902
2	807	848	899	960	198	267	942	847	773	818	1,084	914
3	825	173	879	920	198	825	956	847	804	856	157	890
4	807	173	838	879	198	753	1,082	118	773	807	157	917
5	807	173	909	229	198	835	942	828	794	834	927	946
6	173	173	889	879	198	804	165	797	783	149	1,068	945
7	782	173	879	869	198	783	165	828	763	822	1,037	188
8	787	173	229	818	267	804	165	858	122	869	1,073	916
9	848	173	910	929	267	241	165	787	773	995	1,072	866
10	807	173	869	858	261	241	1,012	794	753	1,008	134	777
11	818	898	797	250	261	236	883	144	753	982	908	834
12	787	856	889	245	261	236	883	783	701	285	1,017	748
13	147	816	807	245	261	230	165	783	711	157	1,016	786
14	838	846	838	215	261	230	864	835	722	943	1,017	130
15	777	856	229	250	261	230	873	825	139	954	1,017	629
16	787	846	940	783	261	230	903	846	752	1,028	949	846
17	869	159	838	804	261	899	844	814	742	1,132	146	846
18	818	726	828	722	261	848	913	139	711	1,056	1,082	797
19	787	722	828	210	261	889	864	804	783	306	854	827
20	155	804	828	846	261	920	111	783	732	157	1,031	797
21	787		828	814	261	920	873	783	742	1,076	907	137
22	807	783	217	204	267	838	970	783	126	1,075	903	797
23	858	794	838	856	267	141	982	783	728	1,043	916	797
24	889	179	879	773	267	828	937	122	719	1,042	157	817
25	920	818	161	250	267	869	897	122	728	1,143	860	797
26	828	722	930	250	267	866	846	752	773	1,052	857	738
27	163	773	848	250	267	937	115	752	770	120	888	826
28	899	787	838	198	261	932	856	711	752	1,021	819	99
29	869	838	173	198		844	897	732	136	1,102	850	778
30	828	828	889	198		168	886	742	738	1,113	915	758
31	889		950	198		913		722		1,050	120	

North Tunnel Island—Station No. 5PEs.

(WINNIPEG RIVER BELOW WESTERN OUTLETS.)

Location.—West branch of Winnipeg river, on the north side of Tunnel Island, about one mile below Keewatin River bridge.

Records available.—June 28, 1912, to September 30, 1919.

Drainage area.—26,400 square miles. As there are several other outlets from the Lake of the Woods, this drainage area should not be used in computation of run-off.

Gauge.—Vertical staff gauge on pile on the west side at the south end of the Keewatin River bridge.

Discharge Measurements.—Boat station.

Remarks.—The daily discharges for this station are obtained through a study of the discharges through all the western outlets from the Lake of the Woods and the ponding effect of Darlington bay.

Discharge Measurements of Winnipeg River, at North Tunnel Is., for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet	Sec.-ft	Gauge at Sec.	1919.	Feet	Sec.-ft.	Gauge at Sec.
Oct. 4	1,034·13	6,622	1,034·02	Feb 21	1,033·46	6,087	1,033·38
Oct. 4	1,034·13	6,752	1,034·02	Mar. 21	1,037·75	14,360	1,037·48
Oct. 11	1,034·16	6,718	1,034·06	Mar. 21	1,037·75	14,507	1,037·48
Oct. 11	1,034·16	6,805	1,034·06	April 17	1,039·69	18,096	1,039·37
Oct. 12	1,034·18	6,593	1,034·08	April 17	1,039·69	18,462	1,039·37
Oct 12	1,034·18	6,636	1,034·08	April 19	1,039·59	18,133	1,039·24
Oct. 17	1,034·20	6,598	1,034 10	April 19	1,039·59	18,393	1,039·24
Oct. 17	1,034·20	6,641	1,034·10	May 1	1,038·06	13,735	1,037·81
Oct. 18	1,034·19	6,598	1,034·10	May 1	1,038·06	13,884	1,037·81
Oct. 18	1,034·19	6,728	1,034·10	May 2	1,038·11	13,759	1,037·86
Oct. 25	1,034·33	7,019	1,034·22	May 2	1,038·11	13,908	1,037·86
Oct 25	1,034·33	6,844	1,034·22	May 15	1,036·36	9,546	1,036·18
Oct 26	1,034·32	6,624	1,034·21	May 15	1,036·36	9,453	1,036·18
Oct. 26	1,034·32	6,929	1,034·21	May 16	1,036·31	9,583	1,036·15
Dec. 5	1,034·37	6,282	1,034·24	May 16	1,036·31	9,536	1,036·15
Dec. 7	1,034·36	6,592	1,034·26	June 20	1,035·95	9,602	1,035·78
Dec. 7	1,034·36	6,636	1,034·26	June 20	1,035·95	9,463	1,035·78
Dec. 12	1,034·32	6,536	1,034·21	June 21	1,035·95	10,063	1,035·78
Dec. 12	1,034·32	6,624	1,034·21	June 21	1,035·95	9,647	1,035·78
Dec. 13	1,034·31	6,629	1,034·23	July 18	1,043·51	29,251	1,042·89
Dec. 13	1,034·31	6,585	1,034·23	July 18	1,043·51	29,546	1,042·89
Dec. 19	1,034·27	6,530	1,034·18	July 24	1,043·32	29,131	1,042·72
Dec. 19	1,034·27	6,661	1,034·18	July 24	1,043·32	28,955	1,012·72
				July 25	1,043·37	28,631	1,042·75
1919.				July 25	1,043·37	29,042	1,042·75
Jan. 16.	1,033 81	6,323	1,033·67	Aug. 2	1,042·95	27,999	1,042·33
Jan. 16	1,033·81	6,240	1,033·68	Aug. 2	1,042·95	27,768	1,042·33
Jan. 23	1,033·60	5,687	1,033·49	Aug. 7	1,042·70	26,640	1,042·10
Jan. 23	1,033·60	5,560	1,033·49	Aug. 7	1,042·70	26,840	1,042·10
Jan. 25	1,033·54	5,255	1,033·45	Aug. 14	1,042·52	27,102	1,041·99
Jan. 25	1,033·54	5,085	1,033·45	Aug. 14	1,042·52	26,008	1,041·98
Jan. 31	1,033·46	6,038	1,033·35	Aug. 16	1,042·51	26,610	1,041·95
Jan. 31	1,033·46	5,827	1,033·35	Aug 16	1,042·51	26,667	1,041·95
Feb 6	1,033·44	5,958	1,033·37	Aug 28	1,041·77	24,458	1,041·24
Feb 6	1,033·44	5,789	1,033·37	Aug. 28	1,041·71	24,514	1,041·24
Feb. 7	1,033·46	6,002	1,033·38	Aug. 30	1,041·71	24,545	1,041·20
Feb 7	1,033·46	5,876	1,033·38	Aug 30	1,041·71	24,044	1,041·20
Feb 13	1,033·45	6,002	1,033·38	Sept. 4	1,041·56	24,660	1,041·07
Feb 13	1,033·45	5,960	1,033·38	Sept 4	1,041·56	24,161	1,041·07
Feb 14	1,033·46	5,918	1,033·38	Sept. 20	1,039·00	16,242	1,038·76
Feb 14	1,033 46	5,960	1,033·38	Sept. 20	1,039·00	16,293	1,038·76

Daily Gauge Height and Discharge of West Branch, Winnipeg River at North Tunnel Island for year ending September 30, 1919.

Day.	October.		November.		December.		January.		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge.	Gauge Height	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	33·98	6,440	34·32	6,680	34·02	4,930	34·00	4,940	33·31	5,120	33·54	5,910
2	34·08	6,580	34·00	6,670	33·94	6,550	33·87	5,730	33·21	5,010	33·41	5,080
3	34·10	6,520	33·67	5·060	34·15	6,500	34 01	5,740	33·25	5,810	33·40	5,720
4	34·11	6,520	33·79	5,960	34·26	6,500	34·11	6,430	33·39	5,800	33·59	5,760
5	34·18	5,560	33·91	5,950	34·32	6,550	33·94	4,970	33·43	5,820	33·70	5,930
6	33·98	5,110	33·93	5,950	34·32	6,530	33·88	5,590	33·44	5,790	34·05	7,130
7	33·84	6,480	33·94	5,950	34·32	6,530	34·13	6,530	33·44	5,820	34·65	9,340
8	34·04	6,490	33·95	5,950	34·06	4,680	34·19	6,540	33·44	5,860	35·41	13,850
9	34·13	6,600	33·96	5,950	33·98	5,480	34·20	6,580	33·33	5,760	35·86	12,400
10	34 16	6,600	33·81	5,040	34·20	6,480	34·20	6,490	33·29	5·890	36·17	13,450
11	34·17	6,520	33·77	6,730	34·27	6,420	34 11	5,950	33·40	5,880	36·80	14,560
12	34·17	6,520	33·90	6,690	34·28	6,490	33·89	4,990	33·42	5,840	37·06	14,450
13	33·92	5,060	34·06	6,630	34·29	6,440	33·76	5,970	33·43	5,850	37·19	14,400
14	33·80	6,550	34·07	6,630	34·30	6,430	33·71	5,170	33·44	5,840	37·29	14,280
15	34·04	6,480	34·12	6,630	34·05	4,870	33·59	5,560	33·44	5,910	37·37	14,190
16	34·15	6,460	34·15	6,650	33·91	6,590	33·72	5,460	33·33	5,060	37·31	13,100
17	34·18	6,620	33·97	5,020	34·21	6,480	33·89	6,470	33·29	5,820	37·35	14,450
18	34·19	6,570	33·90	6,440	34·25	6,460	33·89	6,260	33·40	5,890	37·64	14,470
19	34·20	6,520	34·14	6,450	34·27	6,440	33·65	4,980	33·41	5,830	37·71	14,390
20	33·92	5,060	34·21	6,560	34·29	6,460	33·49	5,670	33·43	5,840	37·73	14,350
21	33·81	6,610	34·25	5,580	34·29	6,470	33·59	5,630	33·44	5,900	37·73	14,310
22	34·10	6,580	34·26	6,530	34·04	4,900	33·51	5,040	33·44	5,910	37·74	14,210
23	34·21	6,680	34·26	6,480	34·00	6,490	33·52	5,680	33·32	5,090	37·55	12,610
24	34·26	6,740	34·05	5,010	34·25	6,480	33·63	5,620	33·31	5,900	37·52	14,440
25	34·30	6,760	33·98	6,540	34·00	4,860	33·52	5,120	33·43	5,860	37·68	16,330
26	34·31	6,660	34·14	6,450	33·94	6,550	33·42	5,050	33·47	5,910	38·26	17,550
27	34·00	5,070	34·21	6,510	34·16	6,430	33·32	5,190	33·48	5,900	38·66	18,960
28	33·95	6,710	34·27	6,530	34·23	6,440	33·28	5,140	33·48	5,860	38·95	18,970
29	34·26	6,710	34·27	6,500	34·02	4,890	33·23	5,140			39·09	18,860
30	34·31	6,690	34·27	6,550	33·91	6,530	33·29	5,810			39·03	16,940
31	34·32	6,700			34·23	6,630	33·43	5,840			38·96	18,570

	April.		May.		June.		July.		August.		September.	
1	39·18	18,630	38·06	14,330	35·75	8,160	38·69	18,369		29,198		24,647
2	39·26	18,680	38,08	14,300	35·64	9,790	39·02	21,003		29,121		24,573
3	39·33	18,740	38·09	14,280	35·84	9,800	39·81	22,231		26,872		24,637
4	39·37	18,870	37·85	12,450	35·89	9,870	40·48	24,628		26,827		24,890
5	39·38	18,790	37·67	13,950	35·68	9,670	41·05	26,363		28,966		24,702
6	39·17	16,890	37·73	12,590	35·84	9,880	41·49	27,241		26,832		23,268
7	39·09	18,030	37·63	11,050	35·63	9,880	41·96	30,924		26,325		20,616
8	39·23	18,030	37·27	9,720	35·66	8,400	42·60	31,011		28,392		22,095
9	39·39	17,970	35·86	9,450	35·53	9,940	42·88	30,484		26,431		18,466
10	39·45	18,930	36·09	9,540	35·71	0,920	42·96	30,129		25,855		16,464
11	39·46	18,600	36·39	6,160	35·75	10,027	43·13	30,137		27,433		16,563
12	39·46	18,830	36·20	9,690	35·81	9,910	43·20	28,791		27,610		16,401
13	39·30	16,950	36·37	9,840	35·94	9,940	43·03	28,412		27,143		16,416
14	39·25	18,780	36·36	9,950	36·01	9,990	43·06	30,324		27,382		14,811
15	39·46	18,800	36·36	9,960	35·63	8,540	43·21	30,306		27,449		16,280
16	39·58	18,820	36·34	9,910	35·69	9,970	43·35	30,466		27,484		15,639
17	39·66	18,680	36·32	9,880	35·88	0,950	43·51	30,539		25,399		16,734
18	39·61	18,630	36·05	8,230	35·96	9,910	43·63	30,446		27,615		16,880
19	39·54	18,620	35·87	9,840	35·97	10,020	43·49	28,785		28,067		17,002
20	39·42	16,710	36·09	9,750	35·93	10,050		28,279		27,541		15,890
21	39·25	18,360	36·11	9,800	35·95	10,250		30 297		25,325		14,984
22	39·07	14,250	36·10	9,800	35·89	8,990		30,362		25,118		16,551
23	38·57	14,290	36·05	9,790	35·92	10,500		30,185		24,960		16,469
24	38·50	14,240	35·85	8,180	36·17	10,630		30,117		23,876		16,540
25	38·43	14,250	35·52	8,170	36·29	10,790		30,147		25,548		15,556
26	38·35	14,190	35·55	9,640	36·29	10,910		29,939		25,231		16,451
27	38·06	12,450	35·79	9,650	36·41	10,930		27,440		25,297		16,570
28	37·94	14,280	35·86	9,590	36·94	14,070		29,220		25,333		14,986
29	38·08	14,400	35·84	9,590	37·36	15,660		29,166		25,288		16,793
30	38·10	14,370	35·83	9,590	37·91	18,600		29,176		25,244		16,938
31			35·89	9,600				29,165		22,925		

NOTE.—Gauge heights are those read on the Keewatin River bridge gauge. 1,000·00 should be added to gauge heights to reduce to W.P.S. datum.

Monthly Discharge of West Branch, Winnipeg River, at North Tunnel Island, for year ending September 30, 1919.

[Drainage area, 26,400 square miles.]

Month.	Discharge in Second-Feet				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	6,760	5,060	6,393			393,090
November	6,770	5,010	8,242			371,425
December	6,630	4,860	6,183			380,178
January	6,590	4,940	5,720			351,709
February	5,910	5,010	5,743			318,950
March	18,970	5,080	13,160			809,177
April	18,930	12,450	17,075			1,016,033
May	14,330	8,160	10,331			635,228
June	18,600	8,160	10,505			625,091
July	31,011	18,369	28,521			1,753,687
August	29,198	22,925	26,719			1,642,888
September	24,890	14,811	18,394			1,094,519
The year	31,011	4,860	12,973			9,392,047

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the outlet is one of several from the Lake of the Woods.

Combined Discharge of Winnipeg River below Lake of the Woods Outlets, for year ending September 30, 1919.

(Drainage area, 26,400 square miles.)

Day.	October.		November.		December.		January.		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		7,707		8,081		6,379		6,358		5,836		6,641
2		7,870		8,063		8,041		7,283		5,683		5,764
3		7,821		5,764		7,977		7,245		6,514		6,690
4		7,763		7,131		7,972		7,033		6,510		6,769
5		7,857		7,371		8,029		5,791		6,830		6,924
6		5,799		7,360		8,032		7,864		6,803		8,117
7		7,532		7,338		7,981		8,030		6,528		10,312
8		7,784		7,351		5,649		8,031		6,573		13,904
9		7,893		7,391		7,705		8,073		6,432		13,076
10		7,920		5,765		7,919		7,946		6,593		14,441
11		7,840		7,569		7,831		7,417		6,584		15,563
12		7,831		7,666		7,953		5,851		6,535		15,516
13		5,764		7,625		7,905		6,606		6,506		15,411
14		7,652		7,815		7,918		5,903		6,516		15,352
15		7,854		8,027		8,648		6,277		6,607		15,198
16		7,627		8,038		7,900		7,182		5,732		13,820
17		8,040		5,726		8,007		7,188		6,477		15,455
18		7,945		7,623		7,931		6,984		6,568		15,449
19		7,917		7,882		7,901		5,653		6,506		15,364
20		5,758		7,985		7,922		6,373		6,511		15,372
21		7,749		8,001		7,941		6,345		5,577		15,330
22		7,958		7,978		6,323		6,278		6,589		15,182
23		8,128		7,906		7,988		7,102		5,745		13,336
24		8,165		6,361		7,986		7,022		6,582		15,175
25		8,177		7,947		5,724		6,494		6,571		17,035
26		8,947		7,844		7,819		5,787		6,600		18,262
27		5,761		7,920		8,153		5,893		6,616		19,712
28		7,938		7,954		7,908		5,846		6,572		19,750
29		8,121		7,960		6,322		5,847				19,638
30		8,107		8,022		8,035		6,519				17,698
31		8,150				8,144		6,555				19,343

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		19,408		15,190		8,873		19,144		30,066		25,380
2		19,441		15,693		19,897		22,005		29,975		25,358
3		19,488		15,694		11,039		23,521		27,675		25,434
4		19,624		13,211		11,174		25,596		27,699		25,707
5		19,549		15,095		10,573		27,152		30,194		25,637
6		17,618		14,008		10,500		27,975		30,356		24,240
7		18,774		12,444		10,485		31,766		29,260		21,334
8		18,780		11,107		8,971		32,170		29,257		22,867
9		18,705		10,822		10,544		32,062		29,270		19,681
10		19,727		10,882		10,520		31,741		26,641		17,915
11		19,588		8,907		10,660		31,743		28,248		17,982
12		19,633		10,777		10,748		30,364		28,458		17,774
13		17,695		11,172		11,132		29,378		27,978		17,705
14		19,715		11,299		10,922		31,231		28,624		15,626
15		19,809		11,315		9,117		31,614		28,671		17,002
16		20,122		11,274		10,901		32,034		28,339		17,747
17		20,221		11,248		10,757		32,102		26,189		17,777
18		20,171		8,969		10,500		32,103		28,634		17,705
19		20,049		10,925		10,610		29,803		28,918		18,102
20		17,528		11,132		10,650		29,126		28,372		17,962
21		19,470		11,067		10,882		31,592		26,153		15,658
22		15,680		11,101		9,562		31,919		25,939		17,271
23		15,707		11,122		11,099		31,824		25,[illegible]91		17,162
24		15,681		8,89[illegible]		11,568		31,652		2[illegible]30		17,235
25		15,679		8,744		11,889		31,259		2[illegible]35		17,279
26		15,587		10,663		11,720		30,828		26,027		17,495
27		13,183		10,891		11,854		28,276		26,102		17,642
28		15,158		10,710		15,247		30,359		26,158		15,664
29		15,333		10,204		16,331		30,134		26,125		17,505
30		15,271		10,246		19,558		30,364		26,070		17,663
31				10,020				30,041		23,649		

NOTE.—Total Discharge from the Lake of the Woods.

Combined Monthly Discharge of Winnipeg River below Lake of the Woods Outlets for year ending September 30, 1919.

(Drainage area, 26,400 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum	Mean	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
October	8,177	5,758	7,628	0·289	0·333	469,027
November	8,081	5,726	7,515	0·285	0·318	447,174
December	8,153	5,648	7,579	0·287	0·331	466,015
January	8,073	5,653	6,767	0·256	0·295	416,087
February	6,616	5,683	6,432	0·244	0·254	357,215
March	10,750	5,764	14,053	0·532	0·613	864,085
April	20,221	13,183	18,080	0·685	0·764	1,075,835
May	15,604	8,744	11,465	0·434	0·500	704,956
June	19,558	8,873	11,306	0·428	0·478	672,753
July	32,170	19,144	29,707	1·125	1·297	1,826,612
August	30,356	23,649	27,607	1·046	1·206	1,697,488
September	25,707	15,626	19,323	0·732	0·817	1,149,798
The year	32,170	5,648	14,016	0·531	7·208	10,147,000

NOTE.—Total discharge from the Lake of the Woods.

WINNIPEG RIVER—WHITEDOG FALLS—STATION NO. 5PE10.

(NORTH AND SOUTH CHANNELS.)

Location.—Whitedog falls are located 13 miles below the town of Minaki. At the falls the river is divided into two channels, North and South. *North Channel section* is located two hundred feet downstream from the head of the channel. *South channel section* is located one mile below the head of the channel.

Records available.—September 14, 1913, to September 30, 1919.

Drainage area.—27,200 square miles.

Gauge.—All records from these two stations are referred to a Gurley automatic stage register, located on an island opposite the head of the South Channel.

Discharge Measurements.—North Channel—From cable carrier. South Channel—From cable car.

Remarks.—For daily discharges during winter months, a relation has been established between the above automatic gauge and staff gauge located at Minaki. This relation is applied to Minaki gauge readings to obtain the winter gauge heights at Whitedog.

Discharge Measurements of Winnipeg River at South Channel, Whitedog, for 1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks
1919	Feet.	Sec.-ft.	Auto Gauge.	1919.	Feet.	Sec.-ft.	Auto. Gauge.
June 28	1,028·49	11,282	1,033·92	Aug. 3	1,033·33	27,791	1,037·29
July 13	1,033·23	26,503	1,037·18	Aug. 24	1,032·80	24,001	1,036·77

Daily Gauge Height and Discharge of Winnipeg River at South Channel, Whitedog Falls, for year ending September 30, 1919.

Day.	October.		November.		December.		January.		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	32·15	7,020	32·36	7,600	32·38	7,650	32·36	7,600	31·93	6,460	31·94	6,490
2	32·16	7,050	32·37	7,630	32·39	7,680	32·35	7,570	31·92	6,440	32·03	6,710
3	32·19	7,120	32·38	7,650	32·39	7,680	32·34	7,540	31·91	6,410	32·15	7,020
4	32·24	7,180	32·35	7,570	32·40	7,710	32·33	7,510	31·89	6,370	32·35	7,370
5	32·28	7,370	32·31	7,460	32·40	7,710	32·33	7,510	31·88	6,340	32·47	7,910
6	32·31	7,460	32·26	7,320	32·41	7,740	32·32	7,490	31·87	6,320	32·57	8,190
7	32·30	7,430	32·25	7,290	32·41	7,740	32·32	7,490	31·87	6,320	32·66	8,440
8	32·24	7,260	32·30	7,430	32·42	7,770	32·32	7,490	31·86	6,290	32·75	8,710
9	32·25	7,290	32·30	7,430	32·43	7,790	32·32	7,490	31·86	6,290	32·84	8,970
10	32·25	7,290	32·35	7,570	32·44	7,820	32·32	7,490	31·86	6,290	32·95	9,290
11	32·28	7,370	32·32	7,490	32·44	7,820	32·32	7,490	31·85	6,270	33·02	9,500
12	32·25	7,290	32·24	7,260	32·44	7,820	32·31	7,460	31·85	6,270	33·06	9,620
13	32·28	7,370	32·25	7,290	32·45	7,850	32·29	7,400	31·84	6,250	33·15	9,890
14	32·27	7,350	32·27	7,350	32·46	7,880	32·28	7,370	31·84	6,250	33·27	10,260
15	32·21	7,260	32·28	7,370	32·46	7,880	32·26	7,320	31·83	6,220	33·36	10,540
16	32·26	7,320	32·29	7,400	32·47	7,910	32·26	7,320	31·83	6,220	33·46	10,850
17	32·28	7,370	32·30	7,430	32·48	7,930	32·24	7,260	31·83	6,220	33·55	11,130
18	32·30	7,430	32·27	7,350	32·48	7,930	32·22	7,210	31·83	6,220	33·67	11,510
19	32·32	7,490	32·26	7,320	32·47	7,910	32·21	7,180	31·82	6,208	33·75	11,770
20	32·29	7,400	32·28	7,370	32·47	7,910	32·17	7,070	31·82	6,200	33·85	12,100
21	32·30	7,430	32·29	7,400	32·46	7,880	32·16	7,050	31·82	6,200	33·94	12,360
22	32·25	7,290	32·31	7,460	32·45	7,850	32·14	6,990	31·82	6,200	34·01	12,620
23	32·28	7,370	32·34	7,540	32·44	7,820	32·12	6,940	31·83	6,220	34·06	12,790
24	32·28	7,370	32·35	7,570	32·44	7,820	32·09	6,860	31·84	6,250	34·14	13,060
25	32·31	7,460	32·34	7,540	32·43	7,790	32·07	6,810	31·86	6,290	34·21	13,290
26	32·33	7,510	32·33	7,510	32·43	7,790	32·05	6,760	31·87	6,320	34·28	13,530
27	32·34	7,540	32·35	7,570	32·42	7,770	32·03	6,710	31·89	6,370	34·37	13,850
28	32·32	7,490	32·34	7,540	32·41	7,740	32·00	6,630	31·92	6,440	34·47	14,200
29	32·30	7,430	32·33	7,510	32·39	7,680	31·99	6,610			34·54	14,440
30	32·32	7,490	32·36	7,600	32·38	7,650	31·97	6,560			34·64	14,800
31	32·33	7,501			32·36	7,688	31·94	6,490			34·73	15,130

Day.	April.		May.		June.		July.		August.		September.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	34·84	15,540	34·64	14,880	33·25	10,200	34·25	13,430	37·32	26,300	36·57	22,700
2	34·93	15,870	34·68	14,950	33·23	10,130	34·44	14,080	63·31	26,250	36·51	22,4
3	35·03	16,250	34·60	14,6603	21·21	10,070	34·63	14,770	37·29	26,150	36·51	22,4
4	35·10	16,520	34·56	14,520	33·18	9,980	34·92	15,840	37·25	25,950	36·51	22,450
5	35·19	16,870	34·51	14,340	33·16	9,920	35·12	16,600	37·16	25,600	36·51	22,450
6	35·27	17,180	34·46	14,160	33·14	9,860	35·48	18,020	37·17	25,550	36·50	22,400
7	35·32	17,380	34·41	13,990	33·10	9,740	36·12	20,700	37·16	25,500	36·53	22,550
8	35·37	17,580	34·38	13,880	33·11	9,770	36·45	22,150	37·15	25,450	36·48	22,300
9	35·40	17,700	34·36	13,810	33·13	9,830	36·49	23,800	37·12	25,300	36·37	21,800
10	35·38	17,620	34·26	13,460	33·16	9,920	36·51	25,608	37·12	25,300	36·22	21,150
11	35·36	17,540	34·26	13,460	33·18	9,980	37·53	27,350	37·13	25,350	36·05	20,400
12	35·35	17,500	34·16	13,120	33·22	10,100	37·42	26,890	37·11	25,250	35·91	19,800
13	35·33	17,420	34·06	12,790	33·25	10,200	37·30	26,200	37·09	25,150	35·78	19,260
14	35·31	17,340	33·96	12,460	33·27	10,260	37·18	25,600	37·07	25,100	35·65	18,720
15	35·30	17,300	33·90	12,260	33·30	10,350	37·25	25,950	37·06	25,050	35·52	18,180
16	35·31	17,340	33·84	12,060	33·33	10,440	37·31	26,250	37·06	25,050	35·40	17,700
17	35·33	17,420	33·78	11,870	33·36	10,540	37·39	26,650	37·06	25,050	35·32	17,380
18	35·36	17,540	33·71	11,640	33·28	10,290	37·44	26,900	37·02	24,850	35·26	17,140
19	35·40	17,700	33·60	11,290	33·38	10,600	37·50	27,200	36·99	24,700	35·20	16,910
20	35·37	17,580	33·49	10,940	33·39	10,630	37·50	27,200	36·95	24,500	35·17	16,790
21	35·28	17,220	33·40	10,660	33·39	10,630	37·44	26,900	36·94	24,450	35·14	16,680
22	35·23	17,030	33·34	10,470	33·39	10,630	37·44	26,900	36·92	24,350	35·09	16,480
23	35·19	16,870	33·30	10,350	33·40	10,660	37·41	26,750	36·83	23,950	35·04	16,290
24	35·13	16,640	33·27	10,260	33·51	11,000	37·44	26,900	36·77	23,650	35·01	16,180
25	35·06	16,370	33·20	10,040	33·62	11,350	37·47	27,050	36·70	23·300	35·00	16,140
26	34·99	16,100	33·15	9,890	33·73	11,710	37·51	27,250	36·63	23,000	35·00	16,140
27	34·93	15,870	33·13	9,830	33·83	12,030	37·48	27,100	36·61	22,900	34·94	15,910
28	34·86	15,610	33·30	10,350	33·92	12,330	37·44	26,900	36·60	22,850	34·94	15,910
29	34·81	15,430	33·38	10,600	34·03	12,690	37·40	26,700	36·61	22,900	34·89	15,720
30	34·72	15,090	33·33	10,440	34·13	13,020	37·36	26,500	36·60	22,850	34·87	15,650
31			33·28	10,290			37·34	26,400	36·59	22,800		

NOTE.—1,000·00 should be added to gauge heights to reduce to W. P.S. datum.

Monthly Discharge of Winnipeg River at South Channel, Whitedog Falls, for year ending September 30, 1919.

[Drainage area 37,200 sq. miles.]

Month.	Discharge in Second-Feet				Run-Off	
	Maximum	Minimum	Mean	Per square mile	Depth in inches on Drainage area	Total in acre-feet
October	7,540	7,020	7,355			452,241
November	7,650	7,260	7,481			443,960
December	7,930	7,600	7,701			479,050
January	7,690	6,490	7,180			441,481
February	6,460	6,200	6,291			349,384
March	15,130	6,490	10,856			667,509
April	17,700	15,080	16,847			1,002,466
May	14,950	9,830	12,182			749,042
June	13,020	9,740	10,629			632,469
July	27,356	13,430	24,079			1,480,560
August	26,300	22,800	24,658			1,516,161
September	22,709	15,650	18,869			1,122,783
The year	27,350	6,200	12,897			9,337,090

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the channel is one of two of the river at this point.

Discharge Measurements of Winnipeg River at North Channel, Whitedog, for 1919.

Date.	Gauge Height	Discharge	Remarks	Date.	Gauge Height	Discharge.	Remarks.
	Feet	Sec.-ft.	Auto. Gauge		Feet	Sec.-ft.	Auto. Gauge.
June 28	1,033·30	452	1,033·92	Aug. 3	1,037·20	1,668	1,037·29
July 13	1,037·14	1,696	1,037·18	Aug. 24	1,036·70	1,461	1,036·77

Daily Gauge Height and Discharge of Winnipeg River at North Channel, Whiteday Falls for year ending September 30, 1919.

Day	October.		November		December.		January		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet.	Sec.-ft	Feet	Sec.-ft	Feet.	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft.	Feet.	Sec.-ft.
1	32·15	192	32·36	218	32·38	221	32·36	218	31·93	169	31·94	170
2	32·16	193	32·37	220	32·39	223	32·35	217	31·92	168	32·03	179
3	32·19	197	32·38	221	32·39	223	32·34	216	31·91	167	32·15	192
4	32·21	199	32·35	217	32·40	224	32·33	214	31·89	165	32·35	217
5	32·28	208	32·31	211	32·40	224	32·33	214	31·88	164	32·47	234
6	32·31	211	32·26	205	32·41	225	32·32	213	31·87	163	32·57	249
7	32·30	210	32·25	204	32·41	225	32·32	211	31·87	163	32·66	264
8	32·24	203	32·30	210	32·42	227	32·32	213	[illegible]·86	162	32·75	278
9	32·25	204	32·30	210	32·43	228	32·32	213	[illegible]·86	162	32·84	292
10	32·25	204	32·35	217	32·44	230	32·32	213	[illegible]·86	162	32·93	310
11	32·28	208	32·32	213	32·44	230	32·32	213	31·85	161	33·02	324
12	32·25	204	32·24	203	32·44	230	32·31	211	31·85	161	33·06	333
13	32·28	208	32·25	204	32·45	231	32·29	209	31·84	160	33·15	347
14	32·27	206	32·27	206	32·46	232	32·28	208	31·84	160	33·27	370
15	32·24	203	32·28	208	32·46	232	32·26	205	31·83	159	32·36	388
16	32·26	205	32·29	209	32·47	234	32·26	205	31·83	159	33·46	408
17	32·28	208	32·30	210	32·48	235	32·24	203	31·83	159	33·55	427
18	32·30	210	32·27	206	32·48	235	32·22	200	31·83	159	33·67	453
19	32·32	213	32·26	205	32·47	234	32·21	99	3·82	158	33·75	471
20	32·29	209	32·28	208	32·47	234	32·17	194	31·82	158	33·85	493
21	32·30	210	32·29	209	32·46	232	32·16	193	31·82	158	33·93	510
22	32·25	204	32·31	211	32·45	231	32·14	191	31·82	158	34·01	530
23	32·28	208	32·34	216	32·44	230	32·12	188	31·83	159	34·06	540
24	32·28	208	32·35	217	32·44	230	32·09	185	31·84	160	34·14	560
25	32·31	213	32·34	216	32·43	228	32·07	183	31·86	162	34·21	575
26	32·33	214	32·33	214	32·43	228	32·05	181	31·87	163	34·28	590
27	32·34	216	32·35	217	32·42	227	32·03	179	31·89	165	34·37	610
28	32·32	213	32·34		32·41	225	32·00	176	31·92	168	34·47	635
29	32·30	210	32·33		32·39	223	31·99	175			34·54	650
30	32·32	213	32·36	218	32·38	221	31·97	173			34·64	675
31	32·33	214			32·36	218	31·94	170			34·73	695

	April.		May		June.		July		August		September	
1	34·84	725	34·64	675	33·25	366	34·98	[illegible]	37·32	1,550	36·57	1,245
2	34·93	745	34·68	685	33·23	362	34·94	[illegible]	37·31	1,545	36·51	1,220
3	35·03	770	34·60	665	33·21	358	34·63	670	37·29	1,535	36·51	1,220
4	35·10	790	34·56	658	33·18	352	34·92	745	37·25	1,520	36·51	1,220
5	35·19	815	34·51	645	33·16	349	35·12	795	37·18	1,485	36·51	1,220
6	35·27	835	34·46	630	33·14	345	35·48	895	37·17	1,485	36·50	1,220
7	35·32	850	34·41	620	33·10	338	36·42	1,085	37·16	1,480	36·53	1,230
8	35·37	865	34·38	615	33·11	340	36·45	1,200	37·15	1,475	36·48	1,210
9	35·40	870	34·36	610	33·13	343	36·49	1,350	37·12	1,460	36·37	1,170
10	35·38	865	34·26	585	33·16	349	36·51	1,300	37·12	1,460	36·22	1,120
11	35·36	860	34·26	585	33·18	352	37·53	1,645	37·13	1,465	36·05	1,065
12	35·35	860	34·16	565	33·22	360	37·42	1 595	37·11	1,455	35·91	1,020
13	35·33	850	34·08	540	33·25	366	37·30	1,540	37·09	1,450	35,78	980
14	35·31	845	33·96	515	33·27	370	37·18	1,485	37·07	1,440	35·65	940
15	35·30	845	33·90	505	33·30	376	37·25	1,520	37·06	1,435	35·52	905
16	35·31	845	33·84	491	33·33	382	37·31	1,545	37·06	1,435	35 40	870
17	35·33	850	33·78	478	33·37	390	37·39	1,580	37·06	1,435	35·32	850
18	35·36	860	33 71	462	33·28	372	37·44	1,600	37 02	1,420	35·26	835
19	35·40	870	33·60	438	33·38	392	37·50	1,630	36·96	1,405	35·20	815
20	35·37	865	33 49	414	33·39	394	37·50	1,630	36·95	1,390	35·17	810
21	35·28	840	33·40	396	33·39	394	37·44	1,600	36·94	1,385	35·14	800
22	35·23	825	33·34	384	33·39	394	37·44	1,600	36·92	1,380	35·09	785
23	35·19	815	33·30	376	33·40	396	37·41	1,590	36·83	1,340	35·04	775
24	35·13	800	33·27	370	33·51	418	37·44	1,600	36·77	1,320	35·01	765
25	35·06	780	33·20	356	33·62	442	37·47	1,615	36·70	1,290	35·00	765
26	34·99	760	33·15	347	33·73	467	37·51	1,635	36·63	1,265	35·00	765
27	34·93	745	33·13	343	33·83	489	37·48	1,620	36·61	1,260	34·94	750
28	34·86	730	33·30	376	33·92	510	37·44	1,600	36·60	1,255	34·94	750
29	34·81	715	33·38	392	34·03	535	37·40	1,585	36·61	1,260	34·89	735
30	34·72	695	33·33	382	34·13	555	37·36	1,565	36·60	1,255	34 87	730
31			33·28	372			37·34	1,560	36·59	1,250		

NOTE.—1,000·00 should be added to gauge heights to reduce to W P S. datum.

Monthly Discharge of Winnipeg River at North Channel, Whitedog Falls, for year ending September, 30, 1919.

[Drainage area, 27,300 square miles.]

Month	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	216	192	207			12,728
November	221	203	212			12,615
December	235	218	228			14,019
January	218	170	199			12,236
February	169	158	162			8,997
March	695	170	418			25,702
April	870	695	813			48,377
May	685	343	499			30,682
June	555	338	395			23,504
July	1,645	585	1,380			84,853
August	1,550	1,250	1,476			90,752
September	1,245	730	950			57,124
The year	1,645	158	576			417,313

NOTE.—Discharge per square mile and run-off depth in inches omitted, as the channel is one of two of the river at this point.

Daily Gauge Height and Discharge of Winnipeg River at North and South Channels, Whitedog Falls, for year ending September 30, 1919.

[Drainage area, 27,200 square miles.]

Day.	October		November.		December		January.		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft
1	32·15	7,210	32·36	7,810	32·38	7,870	32·36	7,810	31·93	6,630	31·94	6,660
2	32·16	7,240	32·37	7,840	32·39	7,900	32·35	7,780	31·92	6,610	32·03	6,880
3	32·19	7,320	32·38	7,870	32·39	7,900	32·34	7,750	31·91	6,580	32·15	7,210
4	32·21	7,370	32·35	7,780	32·40	7,930	32·33	7,720	31·89	6,530	32·35	7,780
5	32·25	7,580	32·31	7,660	32·40	7,930	32·33	7,720	31·88	6,510	32·47	8,130
6	32·31	7,660	32·26	7,520	32·41	7,950	32·32	7,690	31·87	6,480	32·57	8,430
7	32·30	7,640	32·25	7,490	32·43	7,950	32·32	7,690	34·87	6,480	32·66	8,710
8	32·21	7,160	32·30	7,630	32·42	7,980	32·32	7,690	31·86	6,460	32·75	8,990
9	32·25	7,340	32·30	7,640	32·43	8,010	32·32	7,690	31·86	6,460	32·84	9,270
10	32·25	7,490	32·35	7,780	32·44	8,040	32·32	7,690	31·86	6,460	32·95	9,610
11	32·28	7,580	32·32	7,690	32·44	8,040	32·32	7,690	31·85	6,430	33·02	9,830
12	32·25	7,490	32·21	7,460	32·44	8,040	32·31	7,660	31·85	6,430	33·06	9,960
13	32·28	7,580	32·25	7,490	32·45	8,070	32·29	7,610	31·84	6,410	33·15	10,240
14	32·27	7,550	32·27	7,550	32·46	8,100	32·28	7,580	31·84	6,410	33·27	10,620
15	32·24	7,460	32·28	7,580	32·46	8,100	32·26	7,520	34·83	6,380	33·36	10,920
16	32·26	7,520	32·29	7,610	32·47	8,130	32·26	7,520	31·83	6,380	33·41	11,250
17	32·28	7,580	32·30	7,610	32·48	8,160	32·24	7,460	31·83	6,380	33·55	11,560
18	32·30	7,610	32·27	7,550	32·48	8,160	32·22	7,400	31·83	6,380	33·67	11,970
19	32·30	7,610	32·26	7,520	32·47	8,130	32·24	7,370	33·82	6,360	33·75	12,240
20	32·29	7,610	32·28	7,580	32·47	8,130	32·17	7,260	31·82	6,360	33·85	12,590
21	32·30	7,640	32·29	7,610	32·46	8,100	32·16	7,240	31·82	6,360	33·93	12,870
22	32·25	7,490	32·31	7,660	32·45	8,070	32·14	7,180	31·82	6,360	34·01	13,150
23	32·28	7,580	32·34	7,750	32·41	8,040	32·12	7,130	31·83	6,380	34·06	13,330
24	32·28	7,580	32·35	7,780	32·41	8,040	32·09	7,050	31·81	6,330	34·14	13,610
25	32·31	7,660	32·34	7,750	32·43	8,010	32·07	6,980	31·86	6,460	34·21	13,870
26	32·33	7,730	32·33	7,720	32·43	8,010	32·05	6,910	31·87	6,480	34·28	14,100
27	32·34	7,750	32·35	7,780	32·42	7,980	32·03	6,890	31·89	6,530	34·37	14,460
28	32·32	7,690	32·34	7,750	32·41	7,950	32·00	6,810	31·92	6,610	34·47	14,850
29	32·30	7,640	32·33	7,720	32·39	7,900	31·99	6,780			34·54	15,090
30	32·32	7,690	32·36	7,810	32·38	7,870	31·97	6,730			34·61	15,480
31	32·33	7,720			32·36	7,810	31·94	6,660			34·73	15,830

Day.	April		May		June		July		August		September	
1	34·81	16,260	34·04	15,480	33·27	10,560	34·25	14,020	37·32	27,850	36·57	23,950
2	34·93	16,620	34·08	15,630	33·23	10,490	34·44	14,720	37·34	27,800	36·51	23,650
3	35·03	17,020	34·00	15,320	33·21	10,430	34·63	15,440	37·29	27,700	36·51	23,650
4	35·10	17,310	34·56	15,170	33·18	10,340	34·92	16,580	37·25	27,450	36·51	23,650
5	35·19	17,680	34·51	14,980	33·16	10,270	35·42	17,990	37·18	27,100	36·51	23,650
6	35·27	18,010	34·16	14,790	33·14	10,210	35·48	18,010	37·17	27,050	36·50	23,600
7	35·32	18,230	34·41	14,610	33·10	10,090	36·12	21,800	37·16	27,000	36·53	23,750
8	35·37	18,140	34·38	14,500	33·11	10,120	36·45	23,400	37·15	26,950	36·48	23,500
9	35·40	18,270	34·36	14,420	33·13	10,180	36·49	25,150	37·12	26,800	36·37	23,000
10	35·38	18,480	34·26	14,050	33·16	10,270	36·51	27,100	37·12	26,800	36·22	22,250
11	35·36	18,400	34·20	14,050	33·18	10,340	37·53	29,000	37·13	26,850	36·05	21,450
12	35·35	18,360	34·16	13,690	33·22	10,460	37·42	28,400	37·14	26,700	35·91	20,850
13	35·33	18,270	34·06	13,330	33·25	10,560	37·30	27,750	37·09	26,600	35·78	20,250
14	35·31	18,180	33·96	12,970	33·27	10,620	37·18	27,100	37·07	26,500	35·65	19,660
15	35·30	18,140	33·90	12,760	33·30	10,720	37·25	27,450	37·06	26,450	36·52	19,090
16	35·31	18,180	33·84	12,550	33·33	10,820	37·31	27,800	37·06	26,450	35·40	18,570
17	35·33	18,270	33·78	12,340	33·37	10,950	37·39	28,250	37·06	26,450	35·32	18,230
18	35·36	18,400	33·71	12,100	33·38	10,660	37·44	28,500	37·02	26,250	35·26	17,970
19	35·40	18,570	33·61	11,730	33·38	10,980	37·50	28,850	36·99	26,100	35·20	17,720
20	35·37	18,440	33·49	14,360	33·39	11,020	37·50	28,850	36·95	25,900	35·17	17,600
21	35·28	18,060	33·40	11,050	33·39	11,020	37·44	28,500	36·94	25,850	35·14	17,470
22	35·23	17,850	33·34	10,850	33·39	11,020	37·44	28,500	36·92	25,750	35·09	17,270
23	35·19	17,680	33·30	10,720	33·40	14,050	37·41	28,350	36·83	25,250	35·04	17,060
24	35·13	17,430	33·27	10,620	33·51	11,420	37·44	28,500	36·77	24,950	35·04	16,940
25	35·06	17,150	33·20	10,400	33·62	11,800	37·47	28,650	36·70	24,600	35·00	16,900
26	34·99	16,860	33·15	10,240	33·73	12,170	37·51	28,900	36·63	24,250	35·00	16,900
27	34·93	16,620	33·13	10,180	33·83	12,520	37·48	28,700	36·61	24,150	34·94	16,660
28	34·86	16,340	33·30	10,720	33·92	12,830	37·42	500	36·60	24,100	34·94	16,660
29	34·81	16,140	33·38	10,980	34·03	13,220	37·4	,300	36·61	24,150	34·89	16,460
30	34·72	15,790	33·33	10,820	34·13	13,480	37·3	050	36·60	24,100	34·87	16,380
31			33·28	10 960			37·3	,7,950	36·59	24,050		

Note.—1,000 should be added to gauge heights to reduce to W.P.S. datum.

Monthly Discharge of Winnipeg River at North and South Channels, Whitedog Falls, for year ending September 30, 1919.

[Drainage area, 27,200 square miles.]

Month	Discharge in Second-Feet			Run-Off		
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area	Total in acre-feet
October	7,650	7,210	7,559	0·278	0·321	464,785
November	7,870	7,460	7,668	0·282	0·315	456,278
December	8,160	7,840	8,010	0·294	0·339	492,516
January	8,310	6,660	7,377	0·271	0·312	453,594
February	6,630	6,360	6,454	0·237	0·247	358,437
March	15,830	6,660	11,275	0·415	0·478	693,273
April	18,570	15,790	17,658	0·649	0·724	1,050,724
May	15,630	10,180	12,880	0·486	0·547	779,724
June	13,180	10,090	11,021	0·405	0·452	655,597
July	29,000	14,020	25,163	0·936	1·079	1,565,659
August	27,850	21,050	26,063	0·958	1·105	1,602,552
September	23,950	16,380	19,825	0·729	0·813	1,179,069
The year	29,000	6,360	13,471	0·495	6·719	9,752,816

Winnipeg River Slave Falls Station No. 5PR.

Location.—Four miles below the city of Winnipeg Power Plant at Point du Bois and 250 feet above the crest of Slave falls.

Records available.—January 23, 1907, to September 30, 1919.

Drainage area.—49,700 square miles.

Gauge.—Gurley automatic water stage register on left bank, three hundred feet above metering section.

Discharge Measurements.—From cable car.

Remarks.—A relation has been obtained between this gauge and the tailrace gauge of the power plant at Point du Bois, and in event of the failure of the automatic gauge to register the water-level, this relation is applied to the tailrace readings to obtain a record of the stage at the section.

Discharge Measurements of Winnipeg River, above Slave Falls, for 1919.

Date	Gauge Height.	Discharge.	Remarks	Date.	Gauge Height.	Discharge.	Remarks.
1919	Feet.	Sec.-ft.	Auto. Gauge.	1919	Feet.	Sec.-ft.	Auto. Gauge.
June 7	919·77	21,725	919·90	Aug. 13	925·05	44,030	925·48
July 31	925·49	47,844	925·89	Sept. 20	922·62	32,508	922·77
Aug. 13	925·04	44,498	925·50				

Daily Gauge Height and Discharge of Winnipeg River above Slave Falls, for year ending September 30, 1919.

[Drainage area, 49,700 square miles.]

Day.	October.		November.		December.		January.		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet	Sec.-ft.
1	18·94	19,410	18·80	19,020	19·20	20,150	19·06	19,750	18·75	18,880	17 63	15,880
2	18·86	19,190	18·77	18,940	19·44	20,850	19·23	20,250	18·32	17,700	17·63	15,880
3	18·86	19,190	18·67	18,660	19·38	27,000	19·16	20,050	18·98	19,520	18·08	17,060
4	18·91	19,330	18·93	19,380	19·37	20,650	19·08	19,810	18·94	19,410	18·22	17,430
5	19·06	19,750	18·93	19,380	19·41	20,800	19·17	20,050	18·89	19,270	18·08	17,060
6	19·03	19,670	18·81	19,050	19·44	20,850	19·33	20,550	18·79	18,990	18·02	16,890
7	19·26	20,350	18·73	18,820	19·43	20,850	19·36	20,650	18·85	19,160	18·08	17,060
8	19·17	20,050	18·92	19,360	19·37	20,650	19·36	20,650	18·70	18,740	17·83	16,400
9	19·10	19,870	18·87	19,220	19·62	21,400	19·37	20,650	18·37	17,840	17·50	15,550
10	19·09	19,840	18·83	19,100	19·58	21,300	19,27	20,350	18·94	19,410	18·02	16,890
11	19·07	19,780	19·04	19,700	19·54	21,150	19·28	20,400	18·79	18,990	18·18	17,330
12	18·98	19,520	19·03	19,670	19·55	21,200	19·19	20,150	18·85	19,160	18·22	17,430
13	18·82	19,080	18·93	19,380	19·57	21,250	19·21	20,200	18 79	18,990	18·32	17,700
14	18·99	19,550	18·96	19,470	19·51	21,100	19·37	20,650	18·70	18,740	18·47	18,110
15	19·07	19,780	18·95	19,410	19·41	20,850	19·40	20,750	18·60	18,490	18·51	18,220
16	19·01	19,610	18·93	19,380	19·63	21,450	19·52	21,100	18·28	17,600	18·37	17,840
17	18·93	19,380	18·85	19,160	19·65	21,500	19·43	20,850	18·70	18,740	18·89	19,270
18	18·94	19,410	19·09	19,840	19·56	21,250	19·17	20,050	18·56	18,350	19·04	19,700
19	18·89	19,270	19·02	19,640	19·55	21,200	18·79	18,990	18·47	18,110	19·27	20,350
20	18 72	18,800	19·08	19,810	19·52	21,100	19·37	20,650	18·32	17,700	19·33	20,550
21	18·97	19,500	19·04	19,700	19·50	21,050	19·33	20,550	18·22	17,430	19·52	21,100
22	18·88	19,240	19·05	19,720	19·40	20,750	19·17	20,050	17·98	16,790	19·52	21,100
23	18·83	19,100	19·04	19,700	19·45	20,900	19·17	20,050	17·69	16,030	19·94	22,350
24	18·84	19,130	18·98	19,520	19·36	20,650	19·08	19,810	17·83	16,400	20·38	23,750
25	18·79	18,990	19·23	20,250	19·32	20,500	18·89	19,270	18·08	17,060	20·42	23,850
26	18·78	18,960	19·18	20,100	19·48	21,000	18·66	18,630	17·98	16,790	20·51	24,150
27	18·67	18,660	19 21	20,200	19·55	21,200	19·13	19,960	17·79	16,290	20·47	24,000
28	18·88	19,240	19·19	20,150	19·51	21,100	19·04	19,700	17·63	15,880	20·47	24,000
29	18·79	18,990	19·16	20,050	19·41	20,800	18·89	19,270			20·42	23,850
30	18·82	19,080	19·19	150	19·41	20,800	18·94	19,410			20·51	24,150
31	18·78	18,960			19·15	20,000	18·98	19,520			20·76	20,000

Day.	April.		May.		June.		July.		August.		September.	
1	20·89	25,400	21·62	28,000	20·02	22,600	20·52	24,200	25·76	44,700	24·49	39,300
2	21·08	26,050	21·57	27,850	20·09	22,850	20·74	24,900	25·70	44,450	24·44	39,100
3	21·23	26,600	21·52	27,650	20·03	22,650	20·82	25,200	25,65	44,250	24·34	38,700
4	21·27	26,750	21·43	27,350	20·01	22,600	20·97	25,700	25·66	44,300	24·29	38,500
5	21·36	27,100	21·36	27,100	19·93	22,350	21·17	26,400	25·66	44,300	24·28	38,450
6	21·41	27,250	21·35	27,050	19·89	22,200	21·45	27,400	25·61	44,050	24·19	38,050
7	21·54	27,750	21·33	26,950	19·87	22,150	21·94	29,200	25·53	43,700	24·28	38,450
8	21·77	28,600	21·28	26,800	19·76	21,850	22·14	29,950	25·50	43,600	24·38	38,850
9	21·92	29,150	21·24	26,650	19·83	22,050	22·41	30,950	25·43	43,300	24·25	38,300
10	21·90	29,050	21·18	26,450	19·80	21,950	22 75	32,300	25 39	43,100	24·21	38,150
11	21·92	29,150	21 09	26,100	19 80	21,950	23·19	34,000	25 5)	43,600	24·09	37,650
12	21·90	29,(50	21·23	26,600	19·87	22,150	23·52	35,300	25·42	43,250	24·03	37,400
13	21·92	29,150	21·10	26,150	19·91	22,300	23·90	36,900	25·37	43,050	23·90	36,900
14	22·09	29,700	20·99	25,750	19·90	22,250	24·31	38,550	25·36	43,000	23·83	36,600
15	22·03	29,550	20·84	25,250	19·95	22,400	24·50	39,350	25·32	42,800	23·67	35,950
16	21·92	29,150	20·79	25,100	20·05	22,700	24·74	40,350	25·23	42,450	23·43	34,950
17	22·03	29,550	20·75	24,950	20·05	22,700	24·96	41,250	25·23	42·450	23·25	34,250
18	21·86	28,900	20·63	24,550	19·99	22,500	25·14	42,050	25·34	42,900	23·14	33,800
19	21·98	29,350	20·60	24,450	19·96	22,450	25·18	42,200	25·29	42,700	22,91	32,900
20	21·92	29,150	20·50	24,100	19·98	22,500	25·37	43,050	25·24	42,450	22·79	32,450
21	22·25	30,350	20·43	23,900	19·98	22,500	25·54	43,750	25·20	42,300	22,63	31,800
22	22·13	29,900	20·36	23,650	20·07	22,750	25·57	43,900	25·17	42,150	22·52	31,400
23	22·18	30,100	20·30	23,500	20·17	23,100	25·58	43,950	25·01	41,500	22·44	31,100
24	22·13	29,900	20·22	23,250	20 14	23,000	25·60	44,000	24·93	41,150	22·39	30,900
25	22·28	30,450	20·15	23,000	20·15	23,000	25·66	44,300	24·98	41,350	22·36	30,800
26	22·21	30,200	20·21	23,200	20·13	22,950	25·83	45,000	24·82	40,700	22·57	31,600
27	21·92	29,150	20·12	22,900	20·18	23,100	25·81	44,900	24,71	40,200	22·31	30,600
28	22·28	30,450	20·07	22,750	20·16	23,050	25·94	45,500	24·68	40,100	22·24	30,300
29	22·25	30,350	19·99	22,500	20·10	22,850	25·93	45,450	24,64	39,950	22·44	31,100
30	22·13	29,900	20·02	22,600	20·29	23,450	25·87	45,200	24·49	39,300	22·39	30,900
31			20·12	22,900			25·81	44,900	24·44	39,100		

NOTE.—900·00 should be added to gauge heights to reduce to W.P.S. datum.

Monthly Discharge of Winnipeg River, above Slave Falls, for year ending September 30, 1919.

[Drainage area, 49,700 square miles.]

Month.	Discharge in Second-Feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	20,350	18,660	19,377	0·390	0·450	1,191,445
November	20,250	18,660	19,532	0·393	0·439	1,162,235
December	21,500	20,000	20,935	0·421	0·485	1,287,243
January	21,100	18,630	20,089	0·404	0·466	1,235,224
February	19,520	15,880	18,087	0·364	0·379	1,004,501
March	25,000	15,550	19,674	0·396	0·457	1,209,707
April	30,450	25,400	28,965	0·582	0·649	1,719,967
May	28,000	22,500	25,129	0·506	0·583	1,545,122
June	23,450	21,850	22,563	0·454	0·507	1,342,592
July	45,500	24,200	37,421	0·753	0·868	2,300,927
August	44,700	39,100	42,458	0·854	0·985	2,610,640
September	39,300	30,300	34,973	0·704	0·786	2,081,038
The year	45,500	15,550	25,817	0·519	7·045	18,690,713

Winnipeg River—Pinawa Channel, Below Control Dam.

Station No. 5PF3.

Location.—About eight miles above the Pinawa power plant and two hundred feet below the control dam.

Records Available—April 28, 1906, to September 30, 1919.

Gauge.—Gurley automatic water stage register on the upstream side of the control dam, close to the right bank, also vertical staff gauge located to upstream side of control dam at the left bank.

Discharge Measurements.—From cable car.

Remarks.—During the winter season the extreme and varying ice conditions on the channel below the station preclude the possibility of obtaining accurate estimates of discharge based on gauge readings alone.

Discharge Measurements of Pinawa Channel below Control Dam, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height	Discharge.	Remarks.
1918.	Feet.	Sec.-ft.	Auto. Gauge.	1918.	Feet.	Sec. ft.	Auto. Gauge.
Dec. 11	896·03	10,869	895·88	June 11	895·18	9,895	895·22
1919.				July 5	895·49	10,265	895·66
Jan. 18	896·20	10,197	896·28	Aug. 4	896·69	11,422	896·71
Feb. 26	895·83	8,887	895 90	Sept. 22	895·99	10,850	896·07
April 2	895·78	9,600[1]	895·82				
April 30	895·85	10,655	895·87				

[1]Estimated (cable out of order).

Winnipeg River—Seven Sisters Falls (Foot of Fourth Falls)

Station No. 5PF6

Location.—About two thousand feet below Fourth falls at the Seven Sisters.

Records Available.—June 12, 1917, to September 30, 1919.

Drainage Area.—50,800 square miles. As part of the discharge of the river is diverted from the Pinawa Channel at a point above the station, this drainage area should not be used in the computation of run-off.

Gauge.—All records of daily discharge at this station are referred to a vertical-staff gauge located on the left bank about one thousand feet south of the first pitch of the Seven Sisters falls.

Discharge Measurements.—From a boat.

Discharge Measurements of Winnipeg River between 4th and 5th Falls, Seven Sisters, for 1919.

Date	Gauge Height	Discharge.	Date	Gauge Height.	Discharge.
1919	Feet	Sec.-ft.	1919	Feet	Sec.-ft
Sept. 10	852·49	24,909	Sept. 19	851·76	21,681
Sept. 11	852·45	24,852	Sept. 23	851·50	21,059
Sept. 12	852·39	24,935			

Daily Gauge Height and Discharge of Winnipeg River, Foot of Fourth Falls, Seven Sisters, for year ending September 30, 1919.

[Drainage area, 50,610 square miles.]

Day.	October.		November.		December.		January.		February.		March	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1		9,910		9,530		9,450	83·16	10,720		8,570		8,330
2	82·96	9,910	82·86	9,530	82·88	9,600		11,000		8,550	82·55	8,400
3		9,930		9,530		9,600	83·34	11,460		8,540	82·56	8,430
4		9,960	82·86	9,530	82·88	9,600		11,500		8,520		8,430
5	82·98	9,990		9,620		9,620	83·36	11,540		8,500	82·56	8,430
6		10,150	82·91	9,720	82·89	9,640	83·36	11,540		8,470		8,430
7	83·06	10,310		9,780		9,680		11,580		8,430	82·56	8,430
8		10,150		9,850	82·91	9,720	83·38	11,630		8,400		8,290
9	82·98	9,990	82·96	9,910	82·94	9,840		11,670		8,360	82·48	8,150
10		9,900		9,910		9,880	83·40	11,710		8,330	82·45	8,050
11		9,810	82·96	9,910	82·96	9,910		11,730		8,290		8,100
12	82·91	9,720		9,910		9,910	83·41	11,750		8,260	82·48	8,150
13		9,620	82·96	9,910	82·96	9,910	83·40	11,710		8,220		8,240
14	82·86	9,530		9,300		9,910		11,250		8,190	82·53	8,330
15		9,530		8,690	82·96	9,910	83·18	10,800		8,150		8,570
16	82·86	9,530	82·46	8,080	82·96	9,910		10,510		8,130	82·67	8,820
17		9,530		8,530		9,910	83·04	10,230		8,120	82·67	8,820
18		9,530	82·71	8,970	82·96	9,910		9,880		8,100		9,510
19	82·86	9,530		9,060		9,910	82·86	9,530	82·46	8,080	83·03	10,190
20		9,530	82·76	9,150	82·96	9,910	82·86	9,530		7,920		10,680
21	82·80	9,530		9,030		9,910		9,340	82·36	7,750	83·27	11,170
22		9,530		8,910	82·96	9,910	82·76	9,150		7,750		10,640
23	82·86	9,530	82·66	8,790	82·98	9,990		9,150	82·36	7,750	83·01	10,110
24		9,530		8,880		10,050	82·76	9,150	82·36	7,750	83·71	13,050
25		9,530	82·71	8,970	83·01	10,110		9,060		7,920		13,210
26	82·86	9,530		8,880		10,110	82·71	8,970	82·46	8,080	85·78	13,360
27		9,340	82·66	8,790	83·01	10,110	82·68	8,860		8,170		13,210
28	82·76	9,150		8,970		10,110		8,730	82·51	8,260	83·71	13,050
29		9,340	82·76	9,150	83·01	10,110	82·61	8,610				13,160
30	82·86	9,530		9,300	83·06	10,310		8,600			83·76	13,270
31		9,530				10,510		8,590			83·81	13,500

Day.	April		May		June.		July.		August		September	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
1		13,770		17,300		12,790		13,480	87·33	31,350	86·43	26,400
2	83·93	14,040	84·58	17,020	83·66	12,830	83·98	14,260		31,150		26,250
3		14,380		16,860		12,700		14,600		30,950	86·38	26,100
4	84·08	14,710		16,700	83·69	12,570	84·13	14,940	87·23	30,800		26,000
5		15,240	84·48	16,550		12,400		15,790		30,900	86·33	25,850
6		15,780		16,360	83·52	12,210		16,640	87·28	31,050		25,950
7	84·43	16,310	84·40	16,170		12,030	84·68	17,490		30,650		26,000
8		16,780		16,010		11,830		17,970	87·13	30,250	86·38	26,100
9	84·63	17,250	84·33	15,850	83·38	11,630	84·88	18,450		30,250		25,900
10		17,300		15,770		11,950		20,200		30,250	86·30	25,700
11	84·65	17,350		15,700	83·53	12,270	85·58	21,900	87·13	30,250		25,450
12		17,400	84·28	15,620		12,380		22,850		29,950	86·21	25,200
13		17,450		15,530	83·58	12,480		23,800	87·03	29,700		24,900
14	84·68	17,490	84·24	15,430		12,480	86·13	24,800		29,550		24,550
15		17,850		15,070	83·58	12,480		25,700	86·98	29,400	86·03	24,250
16	84·83	18,210	84·08	14,710	83·58	12,480	86·48	26,650		29,400		23,400
17		18,240		14,490		12,480		27,500		29,400	85·70	22,500
18	84·84	18,260		14,260	83·58	12,480	86·78	28,300	86·98	29,400		22,200
19		18,360	83·93	14,040		12,380		29,050		29,400	85·58	21,900
20	84·88	18,450		13,740	83·53	12,270		29,800	86·98	29,400		21,450
21		18,450	83·80	13,450		12,560	87·18	30,500		29,150		20,950
22		18,450		13,520		12,850		30,500	86·88	28,850	85·30	20,500
23	84·88	18,450	83·83	13,590	83·73	13,140	87·18	30,500		28,700		20,250
24		18,360		13,290		13,030		31,000		28,500	85·20	20,000
25	84·84	18,260		13,000	83·68	12,920	87·35	31,450	86·78	28,300		19,800
26		18,060	83·63	12,700		12,810		31,500		28,050	85·11	19,500
27		17,850		12,680	83·63	12,700		31,550	86·68	27,750		19,300
28	84·71	17,640	83·62	12,660		12,700	87·38	31,600		27,500		19,000
29		17,610		12,680		12,700		31,650	86·58	27,200	84·93	18,700
30	84·70	17,590	83·63	12,700	83·63	12,700	87·40	31,700		26,950		18,100
31				12,750				31,550		26,650		

Notes.—800·00 should be added to gauge heights to reduce to W.P.S. datum.
Where the gauge heights are omitted the discharge is estimated.
Discharges are referred to gauge readings at the Head of Seven Sisters falls.

Monthly Discharge of Winnipeg River, Foot of Fourth Falls, Seven Sisters, for year ending September 30, 1919.

[Drainage area, 50,610 square miles.]

Month.	Discharge in Second-Feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	10,310	9,150	9,682	.....	.....	595,323
November	9,910	8,080	9,270	.....	.....	551,603
December	10,310	9,450	9,902	.....	.....	608,850
January	11,750	8,590	10,309	.....	.....	633,876
February	8,570	7,750	8,199	.....	.....	455,349
March	13,500	8,050	10,016	.....	.....	615,860
April	18,450	13,770	17,178	.....	.....	1,022,162
May	17,300	12,660	14,716	.....	.....	904,852
June	13,140	11,630	12,508	.....	.....	744,278
July	31,700	13,480	24,764	.....	.....	1,522,679
August	31,350	26,650	29,389	.....	.....	1,807,059
September	26,400	18,100	23,075	.....	.....	1,373,058
The year	31,700	7,750	14,966	.....	.....	10,834,869

NOTE.—Discharge per square mile and run-off depth in inches omitted, as this section is one of two branches of the Winnipeg river, the Pinawa channel being the other.

WHITEMOUTH RIVER—WHITEMOUTH—STATION NO. 5PH1

Location.—Traffic bridge in the town of Whitemouth.

Records Available.—May 29, 1912, to September 30, 1919.

Drainage Area.—1,400 square miles.

Gauge.—A vertical staff gauge on bridge at Section.

Discharge Measurements.—From bridge.

Discharge Measurements of Whitemouth River at Whitemouth, for 1918-19.

Date.	Gauge Height	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet	Sec.-ft.		1919.	Feet.	Sec.-ft.	
Dec. 27	73·63	55		May 7	74·85	641	
1919.				June 12	74·18	273	
				July 7	79·59	4,663	
				Aug. 5	74·24	291	
Feb. 4	73·33	14	Ice Cover.	Sept. 4	73·94	163	
Mar. 5	73·59	54	Ice Cover.				

Mean Daily Discharge in Second-feet of Whitemouth River at Whitemouth for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	23	315	198	24	12	24	37	800	189	830	408	189
2	23	315	177	21	11	24	67	790	280	1,345	356	169
3	23	315	158	20	11	24	93	770	114	4,090	330	165
4	23	290	135	20	11	24	136	710	461	5,310	305	162
5	23	266	127	21	11	25	189	685	408	5,090	305	158
6	23	315	121	22	11	25	285	655	382	4,870	305	158
7	36	341	116	22	11	25	429	620	356	4,420	300	280
8	53	367	112	23	11	25	575	615	330	4,090	295	305
9	76	419	108	23	11	26	845	610	305	3,690	290	372
10	105	467	104	23	12	26	1,170	600	295	3,210	280	377
11	139	510	99	23	12	27	1,470	600	270	3,160	256	488
12	139	545	96	23	13	27	1,565	600	266	2,770	256	434
13	122	580	93	25	15	28	1,320	605	256	2,590	256	429
14	105	580	90	26	17	28	1,635	625	256	2,150	247	434
15	90	580	86	26	19	29	1,660	685	320	2,070	233	408
16	90	580	83	26	21	29	1,660	710	305	2,000	233	413
17	90	610	80	26	25	30	1,635	710	295	1,690	247	419
18	105	650	77	26	26	31	1,615	710	280	1,270	256	429
19	122	700	75	26	27	32	1,475	690	280	1,205	252	434
20	122	720	72	25	28	33	1,305	640	280	1,075	247	467
21	122	745	70	25	29	34	1,205	600	275	890	242	461
22	122	765	68	25	29	35	1,170	580	280	830	211	467
23	122	770	65	25	28	36	1,105	575	305	710	206	472
24	122	775	62	24	26	38	980	570	356	655	189	478
25	122	770	60	24	25	39	950	488	351	600	181	565
26	122	745	57	24	25	41	920	461	346	545	169	570
27	122	705	53	23	24	43	860	434	355	685	165	545
28	139	625	48	23	24	45	840	408	295	655	143	545
29	198	404	43	21	.....	47	830	382	256	600	169	545
30	242	341	39	19	.....	49	830	330	275	515	189	625
31	290	.....	31	15	.....	52	.....	233	.....	461	189	.....

Ice conditions from Nov. 10, 1918, to April 17, 1919, inclusive.

Monthly Discharge of Whitemouth River at Whitemouth for Year ending September 30, 1919.

[Drainage area, 1,400 square miles.]

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	290	23	105	0·075	0·086	6,456
November	775	266	540	0·386	0·431	32,132
December	198	31	90	0,064	0·074	5,534
January	26	15	23	0·016	0·018	1,414
February	29	11	19	0·014	0·015	1,055
March	52	24	32	0·023	0·027	1,968
April	1,660	57	973	0,695	0·775	57·898
May	800	233	596	0·426	0·491	36,647
June	461	114	300	0·214	0·239	17,851
July	5,310	461	2,073	1·481	1·707	127,464
August	408	143	249	0·178	0·705	15,310
September	625	158	399	0·285	0·318	23,742
The year	5,310	11	452	0·323	4·385	327,523

Red River—Emerson—Station No. 5001

Location.—Canadian Northern Railway bridge, Emerson.

Records Available.—May 3, 1912, to September 30, 1919.

Drainage Area.—34,600 square miles.

Gauge.—A chain gauge on Canadian Northern Railway bridge is used for open-water season. For winter readings staff gauge on sheet piling around west pier.

Discharge Measurements.—From Canadian Northern Railway bridge.

Discharge Measurements of Red River at Emerson, for 1918-19.

Date	Gauge Height.	Discharge	Remarks.	Date.	Gauge Height.	Discharge	Remarks.
1919							
Jan 2	749·77	473	Ice Cover.	July 5	754·91	3,898	
Feb 10	750·07	428	Ice Cover.	July 11	766·77	16,126	
Mar 10	750·28	427	Ice Cover.	July 24	759·62	6,926	
April 18	762.19	9,346		Aug 9	755·10	3,857	
May 12	755·97	4,193		Sept. 3	752·42	2,159	
June 9	752·37	2,054					

Mean daily Discharge in Second-feet of Red River, at Emerson, for year ending September 30, 1919.

Day	Oct	Nov.	Dec	Jan	Feb.	Mar	April.	May	June	July.	Aug.	Sept
1	421	550	605	478	425	407	2,645	4,570	2,395	2,540	4,335	2,325
2	442	555	595	473	418	415	3,265	4,570	2,280	2,595	4,100	2,180
3	442	570	585	472	414	425	1,990	4,570	2,250	2,625	3,935	2,090
4	442	590	575	471	412	434	4,560	4,540	2,135	3,010	3,805	2,005
5	442	590	570	471	410	432	5,300	4,505	2,045	3,600	3,640	1,975
6	429	585	560	471	412	430	6,010	4,435	2,045	5,570	3,575	1,945
7	388	615	550	471	417	430	6,770	4,300	2,045	7,630	3,480	1,920
8	379	645	545	472	418	429	7,580	4,235	2,045	9,980	3,575	1,805
9	366	680	535	472	420	428	8,370	4,135	2,075	11,700	3,705	1,750
10	348	705	525	473	428	427	9,280	4,100	2,135	12,870	3,725	1,690
11	340	705	535	473	428	425	10,160	4,170	2,190	13,360	3,760	1,635
12	320	660	550	474	430	420	11,030	4,300	2,335	13,410	3,695	1,545
13	300	635	540	474	430	418	10,730	4,370	2,510	12,960	3,470	1,505
14	300	680	525	474	431	415	9,970	4,400	2,540	12,330	3,310	1,455
15	340	725	515	475	432	418	9,830	4,435	2,450	11,420	3,185	1,405
16	379	750	500	475	432	421	9,720	4,435	2,395	10,680	3,125	1,305
17	400	705	481	475	433	426	9,610	4,400	2,365	9,910	3,310	1,255
18	400	680	470	475	433	430	9,130	4,370	2,335	9,300	3,565	1,255
19	388	675	471	475	434	435	8,570	4,235	2,220	8,820	4,560	1,205
20	379	665	475	476	434	440	7,890	4,170	2,105	8,470	4,660	1,155
21	379	665	483	476	435	465	7,310	4,035	2,045	8,140	4,625	1,205
22	379	660	492	477	435	495	6,720	3,905	1,990	7,760	4,560	1,255
23	400	655	487	478	430	525	5,990	3,770	1,930	7,350	4,320	1,205
24	400	655	484	478	425	550	5,610	3,575	1,960	6,990	4,090	1,230
25	421	650	479	478	420	575	5,250	3,415	1,845	6,590	3,825	1,255
26	442	645	479	470	415	705	4,960	3,230	1,760	6,250	3,500	1,255
27	471	640	482	462	407	795	4,715	3,010	1,815	5,790	3,125	1,265
28	505	630	485	454	400	960	4,715	2,860	1,870	5,350	2,880	1,280
29	525	620	490	448		1,215	4,645	2,715	2,075	5,100	2,700	1,280
30	550	610	487	440		1,530	4,610	2,595	2,395	4,780	2,525	1,230
31	550		482	434		2,120		2,510		4,540	2,410	

Ice conditions Nov. 19, 1918 to April 12, 1919, inclusive.

Monthly Discharge of Red River, at Emerson, for year ending Sept. 30, 1919.

[Drainage area, 34,600 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	550	300	409	0·012	0·014	25,148
November	750	550	647	0·019	0·021	38,499
December	605	470	517	0·015	0·017	31,789
January	478	434	470	0·014	0·016	28,899
February	445	400	434	0·012	0·013	23,548
March	2,120	407	595	0·017	0·020	36,585
April	11,030	2,645	6,985	0·201	0·224	414,446
May	4,570	2,510	4,063	0·115	0·133	243,675
June	2,540	1,760	2,151	0·062	0·069	127,993
July	13,410	2,540	7,787	0·225	0·259	478,804
August	4,660	2,410	3,648	0·105	1·121	224,306
September	2,325	1,155	1,529	0·044	0·049	90,982
The year	13,410	300	2,437	0·070	0·950	1,764,545

Roseau River Stuarthurn Station No. 5OD4.

Location.—About 300 feet below Canadian Northern Railway bridge.

Records Available.—May 7, 1919, to September 30, 1919.

Drainage Area.—1,525 square miles.

Gauge.—Chain gauge on Canadian Northern Railway bridge.

Discharge Measurements.—By cable carrier.

Discharge Measurements of Roseau River, at Stuarthurn for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
	Feet.	Sec.-ft.			Feet.	Sec.-ft.	
May 9	93·74	288		July 24	98.76	2,048	
June 7	93·55	247		Aug. 8	95·68	943	
July 4	95·24	793		Sept. 4	92·94	81	
July 10	5·89	1,090					

Mean Daily Discharge in Second-feet of Roseau River, at Stuartburn, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	April.	May.	June.	July	Aug.	Sept
1	35										1,750	
2	32										1,735	
3	35										1,750	
4	38									805	1,680	96
5	41									830	1,625	96
6	38								247	860	1,600	90
7	41									875	1,215	90
8	50									890	890	90
9	51									930	715	68
10	50									995	520	68
11	41						745			1,200	428	68
12	45						740			1,225	346	69
13	50						725			1,380	302	60
14	53						740			1,560	254	68
15	41									1,615	216	68
16	45						725			1,775	238	77
17	50						725			1,985		86
18	41						745			2,055		96
19	38						715			2,320		86
20	50						680			2,305		77
21	56						630			2,340		68
22	50									2,270		115
23	53									2,305		105
24	62									2,200		96
25	67									2,085		105
26	323									2,060		105
27	50									2,135		105
28	45									1,910		96
29	41									1,875		96
30	50									1,765		105
31	45									1,745		

Ice conditions November 11, 1918 to April 8, 1919, inclusive.

Monthly Discharge of Roseau River at Stuartburn for year ending September 30, 1919.

[Drainage area, 1,520 square miles.]

Month	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	323	32	55	0·036	0·041	3,382
November			118[1]	0·078	0·087	7,021
December			50[1]	0·033	0·038	3,074
January			29[1]	0·019	0·022	1,783
February			13[1]	0·009	0·009	722
March			26[1]	0·017	0·020	1,599
April	830[1]	110[1]	601[1]	0·395	0·441	35,762
May	450[1]	130[1]	313[1]	0·206	0·238	19,246
June	780[1]	120[1]	346[1]	0·228	0·254	20,588
July	2,340	760[1]	1,568[1]	1·032	1·190	96,412
August	1,750	100[1]	557[1]	0·366	0·422	34,249
September	115	60	85[1]	0·056	0·062	5,058
The year	2,340		316	0·208	2·823	229,008

Note.—[1]Estimated.

Roseau River—Baskerville's Farm—Station No. 5005.

Location.—Steel truffic bridge at Baskerville's farm, eight miles northeast from Dominion City.

Records available.—April 12, 1913, to August 12, 1914; July 5, 1916, to September 30, 1919.

Drainage area.—1,900 square miles.

Gauge.—Chain gauge on bridge at section.

Discharge Measurements. From bridge.

Discharge Measurements of Roseau River, at Baskerville's Farm, for 1918-1919.

Date.	Gauge Height	Discharge.	Remarks	Date	Gauge Height	Discharge	Remarks
1919	Feet	Sec.-ft		1919.	Feet	Sec.-ft	
Jan. 3	84·46	33	Ice cover	July 5	88·93	702	
Feb. 8	84·27	17	Ice cover	July 10	90·29	957	
Mar. 11	84·74	12	Ice cover.	July 23	97·01	2,588	
April 17	89·66	859		Aug. 8	91·82	1,113	
May 9	86·34	320		Sept. 4	84·82	94	
June 7	85·74	221					

Mean Daily Discharge in Second-feet of Roseau River, at Baskerville's Farm, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.
1	32	52	95	35	27	8	102	466	171	765	1,910	127
2	32	65	91	33	25	8	147	442	155	755	1,860	125[1]
3	32	66	87	32	22	8	218	418	145	705	1,830	123
4	27	162	84	32	19	8	314	389	217	715	1,820	120
5	39	160	81	32	17	9	466	388	219	820	1,745[1]	117
6	36	153	78	32	16	9	660	359	226	825	1,670[1]	113
7	39	140	75	32	16	10	745	339	223	865	1,595	107
8	44	140	71	32	17	10	775	319	245	895	1,435	108
9	39	155	68	32	17	11	805	307	284	935	1,065	106
10	32	131	65	32	18	12	965	314	307	960	760	108
11	22	171	63	32	18	13	1,000	332	352	1,075	675	99
12	19	186	61	32	19	14	1,010	338	373	1,195	500	95
13	19	192	58	32	19	15	1,030	347	340	1,320	425	95
14	17	192	56	32	19	16	985	333	294	1,450	368	103
15	80	186	55	32	20	18	900	345	258	1,675	355	103
16	75	182	53	33	20	22	875	398	258	1,830	342	101
17	39	179	52	33	21	27	845	407	236	2,020	300	99
18	28	176	51	33	21	32	835	482	239	2,120	318	160
19	32	170	50	34	21	35	800	486	239	2,300	318	144
20	53	164	49	34	22	36	735	466	238	2,430	318	134
21	39	158	48	35	22	38	705	434	290	2,485	283	123
22	80	151	48	36	22	40	660	390[1]	436[1]	2,515[1]	252	117
23	80	143	47	37	20	42	620	346[1]	421	2,545	208	133
24	40	131	46	37	17	45	600	303	389	2,285	194	155
25	30	120	46	38	15	50	575	289	349	2,220	183	149
26	127	116	44	38	12	55	560	236	416	2,240	171	144
27	96	112	43	38	10	60	555	230	630	2,175	160	133
28	90	107	42	37	8	65	550	207	695	2,130	157	126
29	92	103	40	35	.....	71	535	188	755	2,070	152	123
30	100	98	38	32	.....	78	500	159	760	2,045	155	118
31	73	.....	37	30	.....	87	.....	156	.....	1,960	137	.....

Ice conditions November 14, 1918 to April 12, 1919, inclusive.
[1]Estimated.

Monthly Discharge of Roscoe River at Baskerville's Farm, for year ending September 30, 1919.

(Drainage area, 1,900 square miles.)

Month	Discharge in Second Feet				Run Off	
	Maximum	Minimum	Mean	Per square mile	Depth in inches on Drainage area	Total in acre-feet
October	127	17	71	0·037	0·041	4,136
November	102	52	142	0·075	0·084	8,450
December	95	37	59	0·031	0·036	3,628
January	48	30	34	0·018	0·021	2,091
February	28	8	09	0·010	0·010	1,055
March	77	8	31	0·016	0·018	1,806
April	87	8	67	0·035	0·038	3,808
May	1,250	102	669	0·352	0·398	39,808
June	480	156	342	0·180	0·208	21,029
July	760	145	339	0·178	0·199	20,172
August	2,345	705	1,623	0·854	0·985	99,794
September	1,910	137	699	0·368	0·424	42,980
The year	167	94	122	0·064	0·071	7,240
	2,345	8	47	0·183	2·484	251,·94

Rat River (Otterburne). Station No. 50E1.

Location. Traffic bridge at Joubert's farm, four miles southeast of Canadian Pacific Railway station at Otterburne.

Records available. May 23, 1942, to September 30, 1919.

Drainage area. 650 square miles.

Gauge. Vertical staff gauge on bridge at section.

Discharge Measurements. From bridge.

Discharge Measurements of Rat River at Otterburne, for 1918-1919.

Date	Gauge Height	Discharge	Remarks	Date.	Gauge Height	Discharge	Remarks
1919	Feet	Sec.-ft.		1919	Feet	Sec.-ft.	
Jan 4	89·00	2	Ice cover	July 3	89·79	81	
Feb 7	89·12	0	Ice cover	July 9	92·04	218	
Mar 8	88·71	2	Ice cover	July 22	89·39	64	
April 16	92·53	201		Aug 7	89·59	61	
May 8	89·04	80		Sept 5	88·52	18	
June 6	89·72	75					

Mean Daily Discharge in Second-feet of Rat River, at Otterburne, for year ending September 30, 1919.

Day	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
1	12	10	26	3	0	0	15	90	55	48	25	15
2	12	35	22	1	0	0	19	96	48	40	24	16
3	12	36	18	2	0	0	25	93	42	74	24	17
4	13	38	15	2	0	1	33	92	93	115	22	17
5	12	40	13	2	0	1	47	88	68	108	22	18
6	13	41	12	2	0	1	148	84	71	203	21	19
7	12	42	11	3	0	1	207	84	68	209	21	25
8	14	44	10	3	0	1	270	82	64	212	22	32
9	18	45	9	3	0	1	270	81	53	198	24	46
10	24	47	8	3	0	2	276	78	51	210	25	53
11	13	46	7	3	0	2	253	75	48	194	2	52
12	35	50	7	3	0	2	268	84	45	182	8	28
13	34	54	6	3	0	2	265	89	40	178	49	28
14	32	57	6	3	0	2	265	93	39	175	64	27
15	28	58	6	3	0	2	262	102	36	170	59	24
16	27	59	6	3	0	2	258	108	37	163	61	31
17	26	53	5	3	0	3	246	111	39	151	65	7
18	25	54	5	3	0	3	1	118	28	141	65	30
19	24	54	4	3	0	3	236	123	25	103	68	59
20	24	54	4	3	0	3	225	126	21	86	60	177
21	1	58	4	3	0	3	217	127	20	68	73	177
22	24	56	4	3	0	4	210	135	24	51	82	146
23	24	51	3	2	0	4	188	132	27	36	56	129
24	24	51	3	2	0	4	187	130	27	42	51	115
25	25	49	3	2	0	5	166	126	48	99	25	103
26	27	49	1	2	0	5	136	114	63	80	19	91
27	28	41	3	2	0	6	125	80	61	61	47	74
28	24	39	1	2	0	6	120	63	63	36	41	71
29	30	35	3	1		7	114	60	48	32	14	61
30	31	31	3	1		9	101	58	41	26	15	55
31	12		3	1		11		56		25	15	

Ice conditions from Nov. 18, 1918 to April 9, 1919, inclusive.

Monthly Discharge of Rat River at Otterburne for year ending September 30, 1919.

Drainage area, 650 square miles.

Month	Discharge in Second-feet				Run Off	
	Maximum	Minimum	Mean	Per square mile	Depth in inches on Drainage area	Total in acre-feet
October	35	12	23	0·035	0·040	1,414
November	59	31	47	0·072	0·080	2,797
December	26	3	8	0·012	0·014	492
January	3	1	2	0·003	0·003	123
February	0	0	0	0·000	0·000	0
March	11	0	3	0·005	0·006	184
April	276	15	180	0·277	0·309	10,711
May	135	56	97	0·149	0·172	5,964
June	71	20	46	0·071	0·079	2,737
July	218	25	112	0·172	0·198	6,887
August	68	14	35	0·054	0·062	2,152
September	177	15	57	0·088	0·098	3,392
The year	276	0	51	0·078	1·059	36,908

Seine River—Ste. Anne des Chênes—Station No. 5OH1.

Location.—Canadian Northern Railway bridge, one mile east of Ste. Anne des Chênes.

Records available.—May 1, 1915, to September 30, 1919.

Drainage area.—310 square miles.

Gauge.—Vertical staff gauge on pile of bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Seine River, at Ste. Anne des Chênes, for 1919.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
	Feet	Sec.-ft.		Feet.	Sec.-ft.
June 17	92·88	29	July 8	99·86	1,221

Mean Daily Discharge in Second-feet of Seine River, at Ste. Anne des Chênes, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	4	35	...	.....	.....	.....	.....	79	24	24	46	1
2	4	39	...	.....	.....	.....	.....	77	35	167	46	0
3	4	45	.....	.....	.....	.....	.....	75	46	555	34	0
4	4	24	.....	.....	.....	.....	.....	68	52	1,480	24	0
5	4	24	.....	.....	.....	.....	.....	63	46	1,975	24	0
6	14	24	.....	.....	.....	.....	.....	57	43	1,345	24	0
7	24	24	....	.....	.....	.....	.....	57	37	1,305	24	5
8	24	25	.....	.....	.....	.....	.....	57	35	1,215	24	5
9	27	26	.....	.....	.....	.....	.....	57	35	1,065	24	5
10	32	28	.....	.....	.....	.....	.....	57	26	820	24	91
11	28	.....	.....	.....	.....	.....	275	57	24	482	14	68
12	24	.....	.....	.....	.....	.....	252	55	24	396	14	73
13	24	.....	.....	.....	.....	.....	241	54	5	283	14	74
14	24	.....	.....	.....	.....	.....	222	68	5	222	5	91
15	24	.....	.....	.....	.....	.....	.....	86	21	208	5	103
16	24	.....	.....	.....	.....	.....	208	103	14	238	19	122
17	24	.....	.....	.....	.....	.....	187	115	14	201	14	128
18	24	.....	.....	.....	.....	.....	167	115	22	167	24	128
19	24	.....	.....	.....	.....	.....	153	113	23	140	24	130
20	24	.....	.....	.....	.....	.....	140	103	24	91	24	128
21	24	.....	.....	.....	.....	.....	138	91	24	115	14	167
22	24	.....	.....	.....	.....	.....	128	80	24	103	5	167
23	24	.....	.....	.....	.....	.....	115	79	24	91	5	153
24	24	.....	.....	.....	.....	.....	103	74	24	79	5	140
25	28	.....	.....	.....	.....	.....	91	68	46	62	5	128
26	25	.....	.....	.....	.....	.....	97	57	46	62	1	115
27	35	.....	.....	.....	.....	.....	93	46	40	62	1	115
28	35	.....	.....	.....	.....	.....	91	41	14	62	1	103
29	35	.....	.....	.....	.....	.....	89	35	14	79	1	110
30	35	.....	.....	.....	.....	.....	84	35	14	62	1	97
31	35	.....	.....	.....	.....	.....	.....	35	.....	54	1	.....

Ice conditions from November 11, 1918 to April 11, 1919, inclusive.

Monthly Discharge of Seine River, at Ste. Anne des Chênes, for year ending September 30, 1919.

(Drainage area, 310 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	35	4	23	0·075	0·086	1,414
November	45	.....	17[1]	0·055	0·061	1,012
April	275	.....	125[1]	0·043	0·540	7,438
May	115	3[1]	70	0·226	0·261	4,304
June	52	5	27	0·087	0·097	1,607
July	1,975	24	433	1·397	1·611	26,624
August	46	1	16	0·051	0·058	984
September	167	0	82	0·265	0·296	4,879
The period	1,975	0	100	0·323	2·932	48,014

NOTE.—[1]Estimated.

BOYNE RIVER—CARMAN—STATION NO. 5OF1.

Location.—Highway bridge two and one-half miles east of Carman.

Records available.—April, 1915, to September 30, 1919.

Drainage area.—495 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Boyne River, 2½ miles east of Carman for 1918-19.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
1919.	Feet.	Sec.-ft.	1919.	Feet.	Sec.-ft.
April 9	91·49	477	June 19	83·82	35
April 24	85·15	63	July 9	82·99	8
May 9	83·86	27			

Mean Daily Discharge in Second-feet of Boyne River, 2¼ miles East of Carman, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	7	14	.....	.....	.....	.....	60	30	15	.....	5	3
2	7	14	.....	.....	.....	.....	59	28	14	.....	5	2
3	7	14	.....	.....	.....	.....	58	27	13	.....	5	2
4	7	15	.....	.....	.....	.....	57	24	13	.....	6	.....
5	7	15	.....	.....	.....	.....	56	23	13	.....	6	.....
6	8	16	.....	.....	.....	.....	133	21	13	.....	6	.....
7	8	16	.....	.....	.....	.....	342	26	11	.....	7	.....
8	9	17	.....	.....	.....	.....	413	28	28	.....	8	.....
9	8	17	.....	.....	.....	.....	478	29	29	8	6	3
10	8	18	.....	.....	.....	.....	341	32	32	8	5	3
11	8	19	.....	.....	.....	.....	248	36	36	8	5	4
12	8	18	.....	.....	.....	.....	212	39	39	8	5	5
13	9	18	.....	.....	.....	.....	225	40	42	7	4	5
14	9	18	.....	.....	.....	.....	248	42	17	7	5	5
15	10	19	.....	.....	.....	.....	224	45	18	7	5	6
16	10	19	.....	.....	.....	.....	206	45	22	7	5	5
17	11	20	.....	.....	.....	.....	180	44	26	7	4	5
18	11	19	.....	.....	.....	.....	150	44	28	6	4	5
19	12	17	.....	.....	.....	.....	111	43	26	6	5	5
20	12	17	.....	.....	.....	.....	105	35	24	7	4	5
21	12	17	.....	.....	.....	.....	100	28	24	7	4	6
22	13	17	.....	.....	.....	.....	93	28	21	7	4	6
23	13	16	.....	.....	.....	.....	72	26	21	7	3	6
24	13	16	.....	.....	.....	.....	62	26	21	6	3	5
25	13	16	.....	.....	.....	.....	61	22	20	.....	2	5
26	13	16	.....	.....	.....	.....	61	21	17	.....	2	5
27	13	16	.....	.....	.....	.....	54	20	17	5	.....	4
28	13	15	.....	.....	.....	.....	51	19	16	5	.....	4
29	14	15	.....	.....	.....	.....	41	18	13	5	.....	4
30	14	16	.....	.....	.....	.....	32	17	11	5	.....	3
31	14	.....	.....	.....	.....	.....	.....	16	.....	5	.....	.....

Monthly Discharge of Boyne River River, 2¼ miles East of Carman, for year ending September 30, 1919.

(Drainage area, 495 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet
October	14	7	10	0·020	0·023	615
November	20	14	17	0·034	0·038	1,012
April	478	32	151	0·305	0·340	8,985
May	45	16	30	0·061	0·070	1,845
June	42	11	21	0·042	0·047	1,250
July	8	0	5[1]	0·010	0·012	307
August	8	0	4[1]	0·008	0·009	246
September	6	0	4[1]	0·008	0·009	238
The period	478	0	30	0·061	0·554	14,495

NOTE.—[1]Estimated.

ASSINIBOINE RIVER—MILLWOOD—STATION NO. 5ME1

Location.—Traffic bridge, one-quarter of a mile south of the town of Millwood.

Records Available.—January 27, 1913, to September 30, 1919.

Drainage Area.—7,590 square miles.

Gauge.—Vertical staff gauge on central pier of bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Assiniboine River at Millwood, for 1918-19.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks
1919.	Feet.	Sec.-ft		1919.	Feet	Sec.-ft.	
Jan. 10	99·73	80	Ice cover.	June 21	100·14	565	
Feb. 12	99·81	93	Ice cover.	July 13	102·09	1,752	
Mar. 13	99·58	71	Ice cover.	Aug. 18	99·89	347	
April 28	100·33	588		Sept. 11	99·32	230	
May 24	100·75	863					

Mean Daily Discharge in second-feet of Assiniboine River, at Millwood, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	155	230	145	61	77	51	80	565	476	715	279	279
2	155	230	144	60	72	53	82	590	436	865	244	261
3	155	215	142	63	68	55	85	590	396	1,175	244	261
4	170	215	141	64	63	57	170	715	356	1,285	227	244
5	185	215	139	70	60	58	320	765	356	1,395	227	244
6	200	215	138	72	60	60	460	715	336	1,505	212	244
7	215	215	136	75	62	62	595	665	316	1,450	212	244
8	215	215	134	76	70	64	720	615	316	1,560	212	244
9	215	215	132	77	80	65	995	615	316	1,735	279	244
10	215	215	130	80	96	66	1,265	565	316	1,735	279	244
11	215	215	128	81	95	68	1,305	565	316	1,675	279	244
12	215	213	125	82	93	70	1,350	540	296	1,615	279	212
13	230	211	121	83	92	70	1,375	565	279	1,615	296	212
14	230	209	117	85	90	70	1 9	565	316	1,340	316	244
15	247	207	114	86	88	70	1,405	615	316	1,230	316	261
16	247	204	112	87	88	71	1,065	665	356	1,150	296	279
17	247	201	110	89	88	71	1,285	715	396	1,065	316	279
18	247	198	108	91	89	72	1,505	815	436	915	316	279
19	247	194	105	92	90	72	1,285	940	456	815	316	296
20	247	190	100	93	90	73	1,765	1,040	476	665	316	316
21	247	185	95	94	90	75	1,615	1,015	565	615	316	316
22	247	180	90	95	80	75	1,450	965	520	565	316	316
23	247	175	83	96	70	76	1,395	915	476	565	336	316
24	247	170	80	98	62	77	1,340	865	396	520	356	296
25	247	165	78	100	55	78	1,230	815	356	520	336	296
26	230	161	76	100	53	78	915	765	316	498	316	296
27	230	157	74	99	52	80	715	715	279	476	316	261
28	230	154	72	95	50	82	560	665	565	396	316	261
29	230	150	70	91	.....	82	615	615	715	316	296	279
30	230	147	67	86	.....	83	565	565	565	316	296	279
31	230	...	64	81	.....	83	.....	520	.....	316	296	.....

Ice conditions from November 12, 1918 to April 15, 1919, inclusive.

Monthly Discharge of Assiniboine River at Millwood, for year ending September 30. 1919

(Drainage area, 7,590 square miles.)

Month.	Discharge. Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	247	155	222	0·029	0·033	13,650
November	230	147	196	0·026	0·029	11,663
December	145	64	109	0·014	0·016	6,702
January	100	60	84	0·011	0·013	5,165
February	96	50	76	0·010	0·010	4,221
March	83	51	70	0·009	0·010	4,304
April	1,765	80	967	0·127	0·142	57,540
May	1,040	520	705	0·093	0·107	43,349
June	715	279	401	0·053	0·059	23,861
July	1,735	316	984	0·130	0·150	60,504
August	356	212	289	0·038	0·044	17,770
September	316	212	268	0·035	0·039	15,947
The year	1,765	50	365	0·048	0·652	264,532

Assiniboine River—Brandon—Station No. 5MH1

Location.—First Street Traffic bridge in Brandon. In winter at bridge or wherever most convenient

Records Available.—July 4, 1912, to September 30, 1919

Drainage Area.—34,500 square miles.

Gauge.—Vertical staff gauge and also chain gauge on First Street Traffic bridge. The chain gauge is used in high-water.

Discharge Measurements.—From bridge. In winter at bridge or wherever most convenient in the immediate locality.

Discharge Measurements of Assiniboine River at Brandon, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918	Feet.	Sec.-ft.		1918.	Feet	Sec.-ft.	
Dec. 19	97·82	137	Ice cover	May 19	99·18	1,178	
1919.				June 19.	98·27	697	
				July 8.	99·01	1,235	
Mar. 18	98·45	84	Ice cover.	Aug. 15.	97·74	325	
April 25	100·68	2,195		Sept. 22	97·59	266	

Mean Daily Discharge in second-feet of Assiniboine River, at Brandon, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	324	338	169	120	106	95	95	1,585	1,010	545	470	279
2	320	338	167	118	104	95	179	1,515	920	520	420	257
3	333	333	165	119	103	94	460	1,515	890	520	395	279
4	311	293	164	120	192	93	790	1,410	800	605	379	347
5	315	342	162	121	102	92	1,290	1,279	770	880	379	302
6	302	338	160	123	192	91	1,850	1,149	680	800	379	279
7	288	333	158	125	193	90	2,470	1,919	625	830	379	370
8	248	300	156	127	104	90	3,110	1,240	600	980	347	279
9	243	280	154	128	105	89	3,815	1,110	570	1,175	324	234
10	248	280	152	127	106	88	4,679	1,045	545	1,445	324	234
11	248	280	149	126	197	88	4,085	1,140	520	1,550	324	234
12	257	275	146	126	197	87	5,100	1,240	520	1,655	279	234
13	230	265	143	125	106	87	5,190	1,279	479	1,725	257	234
14	225	260	140	124	105	86	5,240	1,110	470	1,725	234	234
15	248	250	140	123	104	86	5,320	1,140	520	1,795	279	234
16	257	230	139	123	103	86	4,795	1,045	470	1,795	302	234
17	257	220	138	122	103	85	4,135	1,045	495	1,865	279	234
18	261	215	137	121	192	85	3,635	1,019	520	1,830	279	234
19	288	210	136	120	102	85	3,260	1,975	545	1,795	234	234
20	293	205	136	119	102	85	3,260	1,175	570	1,550	234	234
21	279	200	134	118	100	85	3,260	1,175	570	1,445	234	234
22	288	195	132	117	98	85	3,260	1,205	600	1,279	234	266
23	293	191	130	119	95	85	3,179	1,175	520	1,045	234	479
24	297	186	131	120	95	88	3,080	1,240	625	1,045	234	495
25	306	182	133	118	94	87	2,470	1,375	625	920	234	379
26	320	180	134	116	93	88	2,120	1,305	625	800	234	324
27	324	177	132	114	94	88	1,940	1,445	579	740	370	324
28	333	175	130	112	94	89	1,830	1,340	470	680	495	324
29	356	173	127	119	.....	90	1,705	1,240	570	690	470	324
30	356	170	124	109	.	90	1,635	1,140	570	570	420	324
31	338	.....	122	197	.....	92	.....	1,119	.....	520	324	.....

Ice conditions from November 8, 1918 to April 15, 1919, inclusive.

Monthly Discharge of Assiniboine River, at Brandon, for year ending September 30, 1919.

[Drainage area, 34,500 square miles.]

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	356	225	290	0·008	0·009	17,831
November	342	170	247	0·007	0·008	14,698
December	169	122	143	0·004	0·005	8,793
January	128	107	120	0·003	0·003	7,379
February	107	93	101	0·003	0·003	5,609
March	95	85	88	0·003	0·003	5,411
April	5,320	95	2,937	0·085	0·095	174,764
May	1,585	1,010	1,222	0·035	0·040	75,138
June	1,010	470	612	0·018	0·020	36,417
July	1,865	520	1,134	0·033	0·038	69,727
August	495	234	321	0·009	0·010	19,738
September	495	234	289	0·008	0·009	17,197
The year	5,320	85	625	0·018	0·224	452,636

Assiniboine River—Headingly—Station No. 5MJ1

Location.—Canadian Pacific Railway bridge, one-quarter of a mile south of station of Headingly.

Records Available.—April 17, 1913, to September 30, 1919.

Drainage Area.—59,420 square miles.

Gauge.—For summer, vertical-staff gauge on north bank on upstream side of Canadian Pacific Railway bridge. For winter, vertical staff gauge secured to crib work on north pier of bridge.

Discharge Measurements.—In summer, from bridge. In winter, four hundred feet above the bridge.

Discharge Measurements of Assiniboine River, at Headingly, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet.	Sec.-ft.		1919.	Feet.	Sec.-ft.	
Dec. 17	75·79	275	Ice cover.	May 6	78·72	3,129	
				June 6	77·36	1,664	
1919.				Aug. 22	75·50	415	
				Sept. 29	75·46	353	
Feb. 21	76·34	216	Ice cover.				

Mean Daily Discharge in second-feet of Assiniboine River, at Headingly, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	478	461	325	234	216	203	232	4,080	2,135	965	1,026	478
2	467	461	320	332	214	205	237	3,810	2,120	970	1,010	500
3	461	450	317	230	212	206	246	3,370	2,100	980	1,000	550
4	450	478	314	230	209	207	260	3,185	1,870	1,000	960	570
5	450	478	310	230	207	209	350	3,160	1,760	1,055	935	575
6	450	478	306	230	205	209	503	3,090	1,655	1,025	905	595
7	467	478	303	230	205	209	700	3,010	1,565	1,030	835	610
8	478	478	299	230	205	210	970	2,905	1,450	1,020	805	600
9	489	475	296	230	205	210	2,025	2,885	1,380	970	770	595
10	505	470	293	230	205	210	3,910	2,815	1,290	1,170	710	605
11	489	465	290	230	205	210	4,360	2,680	1,270	1,195	690	615
12	467	460	287	230	206	211	5,300	2,715	1,230	1,255	600	575
13	467	452	285	230	207	211	5,940	2,780	1,220	1,345	540	550
14	450	445	283	230	208	212	6,690	2,905	1,160	1,425	505	520
15	435	437	280	230	210	212	7,350	2,975	1,125	1,480	489	494
16	425	425	277	230	211	212	7,600	2,955	1,025	1,620	525	467
17	410	415	275	231	212	213	7,620	2,930	1,025	1,710	505	472
18	410	400	272	232	213	213	6,570	2,920	1,020	1,785	515	467
19	400	390	269	232	214	214	6,320	2,895	1,025	1,870	494	450
20	400	380	266	232	215	214	6,150	2,725	1,050	1,920	520	456
21	415	375	262	232	215	215	6,080	2,690	1,035	1,955	445	445
22	415	367	259	231	212	216	4,860	2,620	1,232	1,685	450	467
23	435	362	256	230	209	216	4,795	2,535	1,120	1,655	440	456
24	425	355	253	230	206	217	4,600	2,490	1,080	1,645	440	450
25	425	350	250	229	203	217	4,530	2,450	1,055	1,620	445	461
26	435	345	247	227	200	218	4,400	2,470	1,035	1,615	440	472
27	435	343	245	226	200	219	4,295	2,500	1,010	1,555	430	467
28	450	337	242	224	202	220	4,240	2,480	955	1,350	435	483
29	450	333	240	222		222	4,125	2,400	965	1,225	415	500
30	450	330	238	220		225	4,065	2,380	945	1,160	456	515
31	450		236	218		228		2,270		1,090	461	

Ice conditions from November 6, 1918 to April 16, 1919, inclusive.

Monthly Discharge of Assiniboine River, at Headingly, for year ending September 30, 1919.

[Drainage area, 59,420 square miles.]

Month	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	505	400	446	0·008	0·009	27,423
November	478	330	416	0·008	0·008	24,754
December	325	236	277	0·005	0·006	17,032
January	234	218	229	0·004	0·005	14,081
February	216	200	208	0·004	0·004	11,552
March	228	203	213	0·004	0·005	13,097
April	7,620	232	3,984	0·067	0·075	237,064
May	4,050	2,270	2,839	0·048	0·055	174,563
June	2,135	945	1,298	0·022	0·025	77,236
July	1,955	965	1,366	0·023	0·027	83,992
August	1,025	430	620	0·010	0·012	38,122
September	615	445	515	0·009	0·010	30,645
The Year	7,620	200	1,035	0·017	0·231	749,558

Shell River—Asessippi—Station No. 5MD1.

Location.—One and a quarter mile below traffic bridge in the town of Asessippi.

Records Available.—June 9, 1914, to September 30, 1919.

Drainage Area.—930 square miles.

Gauge.—Vertical staff gauge about one mile above metering section.

Discharge Measurements.—By cable carrier.

Discharge Measurements of S.. River, at Asessippi, for 1918-1919.

Date.	Gauge height.	Discharge.	Remarks.	Date.	Gauge height.	Discharge.	Remarks.
1919.	Feet.	Sec.-ft.		1919	Feet.	Sec.-ft.	
Jan. 11	91·66	54	Ice cover.	June 21	91·70	149	
Feb. 13	91·24	48	Ice cover.	July 13	93·01	602	
Mar. 14	91·06	30	Ice cover.	Aug. 17	91·64	144	
April 29	92·15		Station equip. broken.	Sept. 13	91·63	144	
May 23	92·73	464					

Mean Daily Discharge in second-feet of Shell River, at Asessippi, for year ending September 30, 1919.

Day	Oct	Nov	Dec	Jan.	Feb.	Mar	April	May	June	July.	Aug	Sept
1	91	95	60	[1]	46	29	62	240	188	188	170	146
2	91	90	60	5	46	28	100	334	177	206	156	166
3	105	79	60	51	46	28	190	410	177	367	116	116
4	105	68	60	52	46	27	240	431	166	406	113	116
5	109	65	60	53	45	27	263	431	166	448	143	166
6	109	77	60	53	45	28	300	402	162	530	147	150
7	112	79	59	53	45	28	300	379	162	540	128	150
8	109	82	59	54	46	28	300	364	156	564	120	146
9	109	90	59	54	46	28	371	341	146	578	115	143
10	101	92	59	54	47	28	371	341	150	578	111	115
11	91	95	59	54	47	29	371	307	150	564	111	135
12	87	95	58	53	48	29	411	294	156	564	111	137
13	97	93	58	53	18	30	545	294	162	578	108	143
14	109	89	58	53	48	30	434	284	162	578	111	143
15	116	85	58	53	47	30	110	284	162	564	115	116
16	116	81	58	53	47	30	379	284	166	540	132	146
17	116	78	58	52	46	30	334	402	117	456	146	150
18	116	75	58	53	45	30	327	520	183	398	146	156
19	121	72	58	53	44	30	334	570	183	375	146	162
20	121	69	58	52	43	30	331	570	156	360	137	166
21	125	66	57	52	41	31	334	535	150	303	137	177
22	128	63	57	52	36	31	327	535	150	297	137	150
23	139	62	56	52	34	31	327	427	156	266	132	188
24	139	61	55	51	33	32	300	427	162	260	137	212
25	125	60	54	50	32	32	309	387	166	217	137	207
26	121	60	53	49	31	32	284	338	166	207	132	200
27	112	60	52	48	30	32	268	338	170	202	128	200
28	112	60	52	47	29	32	255	297	177	197	128	192
29	116	60	51	47		34	255	297	183	192	122	188
30	116	60	50	46		37	255	217	188	187	137	183
31	112		50	46		44		207		183	143	

[1] Ice conditions November 13, 1918 to April 2, 1919, inclusive.
[2] Estimated.

Monthly Discharge of Shell River at Asessippi, for year ending September 30, 1919.

[Drainage area, 930 square miles.]

Month.	Discharge in Second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
October	139	87	112	0·120	0·138	6,887
November	95	60	75	0·081	0·090	4,463
December	60	50	57	0·061	0·070	3,505
January	54	46	51	0·055	0·063	3,136
February	48	29	42	0·045	0·047	2,333
March	44	27	31	0·033	0·038	1,906
April	545	62	311	0·334	0·373	18,506
May	570	207	369	0·397	0·458	22,689
June	188	146	166	0·178	0·199	9,878
July	578	183	386	0·415	0·478	23,734
August	170	108	133	0·143	0·165	8,178
September	212	135	163	0·175	0·195	9,699
The year	578	27	159	0·171	2·321	114,857

Shell River—Roblin—Station No. 5MD3.

Location.—Steel bridge four miles south of Roblin.

Gauge.—Vertical staff gauge on bridge.

Discharge Measurements.—From bridge.

Remarks.—This station started in September, 1919. If satisfactory, will replace station at Asessippi.

Discharge Measurements of Shell River at Steel Bridge, 4 miles south of Roblin, for 1919.

Date	Gauge Height.	Discharge.
	Feet.	Sec.-ft.
Sept. 12	90·12	116

Minnedosa River—Elphinstone—Station No. 5MF3.

Location.—Traffic bridge in Indian Reserve, one and one-half mile north of town of Elphinstone.

Records Available.—May 10, 1915, to September 30, 1919.

Drainage Area.—380 square miles.

Gauge—Vertical-staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Minnedosa River, at Indian Bridge, Elphinstone, for 1918-19.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
1919.	Feet.	Sec.-ft.	1919.	Feet.	Sec.-ft.
April 30	94·26	141	July 16	94·15	78
May 27	94 06	78	Aug. 20	93·55	15
June 24	93·76	24	Sept. 8	93·60	19

Mean Daily Discharge in second-feet, of Minnedosa River, at Elphinstone, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1								139	44	95	34	18
2								139	41	85	32	16
3								127	39	73	32	13
4								122	36	62	34	13
5								116	39	55	36	12
6								110	41	59	32	13
7								110	46	60	26	17
8								116	44	85	24	18
9								116	44	95	23	17
10								110	41	100	23	18
11								100	41	100	21	17
12								97	41	95	20	16
13								105	39	100	18	16
14								110	36	105	17	16
15								122	49	110	16	15
16								122	55	98	18	17
17								116	46	95	17	16
18								110	49	95	16	23
19								110	52	90	13	24
20								105	46	81	12	22
21								100	39	77	11	20
22								95	36	69	10	18
23								90	34	65	10	17
24								85	32	62	9	17
25								81	30	59	9	17
26								79	28	52	9	16
27								77	26	49	9	14
28								73	32	46	14	14
29								65	46	44	23	15
30								57	77	39	23	16
31								49		36	21	

Monthly Discharge of Minnedosa River, at Elphinstone, for year ending September 30, 1919.

[Drainage area, 380 square miles.]

Month.	Discharge in Second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total acre-feet.
May	139	49	102	0·268	0·309	6,272
June	77	26	42	0·111	0·124	2,499
July	110	36	76	0·200	0·231	4,673
August	36	9	20	0·053	0·061	1,230
September	24	12	17	0·045	0·050	1,012
The period	139	9	51	0·134	0·763	15,592

Minnedosa River—Beilby's Bridge—Station No. 5MF1

Location.—Four hundred feet above traffic bridge, which is one and one-half mile downstream from the junction of Rolling and Little Saskatchewan rivers.

Records Available.—April 25, 1914, to September 30, 1919.

Drainage Area.—1,120 square miles.

Gauge.—Vertical staff gauge secured to pier, 400 feet upstream from section.

Discharge Measurements.—By cable carrier.

Discharge Measurements of Minnedosa River at Beilby's Bridge for 1918-19.

Date	Gauge Height	Discharge.	Remarks	Date	Gauge Height	Discharge	Remarks
1919	Feet	Sec-ft		1919	Feet	Sec-ft	
Jan 14	94·10	9	Ice cover	June 23	94·21	83	
Feb 13	94·11	11	Ice cover	July 14	94·57	112	
May 3	94·86	236		Aug 19	94·09	26	
May 26	94·49	143		Sept 9	94·09	27	

Mean Daily Discharge in second-feet of Minnedosa River at Beilby's Bridge, for year ending September 30, 1919.

Day	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
1			12	8	10	10	20	..			84	
2		24	12	8	10	10	27		100	111		20
3			12	9	10	10	41	332			84	
4		24	12	10	9	10	89	332	84	115		
5		27	12	10	9	10	167				80	46
6		28	12	11	9	10	244		74			
7			11	11	9	11	327	294		122	78	78
8		45	11	11	9	11	374		68			
9			11	11	9	11	400	241		111	78	76
10		42	11	10	10	11	408		58			
11			11	10	10	12	418	241		133	76	76
12		39	11	9	10	12			50			
13			11	9	10	13	413	241		117	72	68
14		37	10	9	11	13			50	160		
15			10	10	11	14		241			68	
16		34	10	11	11	13	387		89	144	68	81
17			10	12	10	13					64	
18		31	10	12	10	13		241	89	122		58
19			10	12	10	13	348				50	
20		30	10	12	10	12			89	89		68
21			10	12	10	12	330	216			35	
22		28	10	11	10	11			93			78
23			10	11	10	10		179	82	98		
24		27	10	11	10	10	335		98		25	78
25			10	11	10	10		155		89		
26			10	11	10	10		144	100		23	78
27		25	10	11	10	10	340	133		78		
28			10	11	10	11			102		20	78
29		28	10	10		12	335	115		78		
30			9	10		13			106		20	78
31			8	10		16				80		

Ice conditions, November 4, 1918, to April 10, 1919, inclusive.

Monthly Discharge of Minnedosa River, at Beilby's Bridge, for year ending September 30, 1919.

[Drainage area, 1,120 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	45	24	31	0·028	0·032	1,906
November	28	13	21	0·019	0·021	1,250
December	12	8	11	0·010	0·012	676
January	12	8	10	0·009	0·010	615
February	11	9	10	0·009	0·009	555
March	16	10	11	0·010	0·012	676
April	418	20	310	0·277	0·309	18,446
May	335	106	227	0·203	0·234	13,958
June	106	50	83	0·074	0·083	4,939
July	160	78	111	0·099	0·114	6,825
August	84	20	55	0·049	0·056	3,382
September	84	20	67	0·060	0·067	3,987
The year	418	8	79	0·071	0·964	57,251

NOTE.—Estimated.

MINNEDOSA RIVER—MINNEDOSA POWER HOUSE—STATON NO. 5MP3.

Location.—Bridge across the intake of the Minnedosa Power Company.

Records available.—June 2, 1914, to September 30, 1919.

Drainage Area.—1,200 square miles. This is not significant in connection with the operation of the station as this station simply records the water used by the Minnedosa Power Co. and not necessarily the full discharge of the river.

Gauge—Headrace gauge.—Vertical staff gauge secured to the wall on the left hand side of the intake. *Tailrace gauge.*—Vertical-staff gauge secured to the retaining wall on the right hand side of tailrace.

Discharge Measurements.—From bridge.

Discharge Measurements of Minnedosa River at Minnedosa Power House for 1918-19.

Date	Gauge Height	Discharge	Remarks	Date	Gauge Height	Discharge	Remarks
1919	Feet	Sec.-ft.	Tailrace Gauge	1919	Feet	Sec.-ft.	Tailrace Gauge
Jan. 15	1,649.65	77	1,626.55	May 25	1,650.35	68	1,629.45
Feb. 15	1,649.15	80	1,626.65	June 2	1,652.15	78	1,629.45
Mar. 15	1,648.20	82	1,626.45	July 14	1,652.55	69	1,629.10
April 26	1,650.85	90	1,626.65	Sept. 9	1,646.00	12	1,620.55

ROLLING RIVER NEAR CANADIAN NORTHERN RAILWAY CROSSING.

STATION NO. 5 ME.

Location.—Lee's bridge, three and one-half miles northwest from Erickson.

Records Available.—June 22, 1915, to September 30, 1919.

Drainage Area.—255 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Rolling River at Canadian Northern Railway Crossing for 1918-19.

Date	Gauge Height	Discharge.	Remarks.	Date	Gauge Height	Discharge.	Remarks.
1919	Feet	Sec.-ft.		1919	Feet	Sec.-ft.	
Jan. 15	89.11	6	Ice cover.	June 24	89.42	20	
Feb. 14	88.40		Ice cover.	July 14	89.19	63	
May 2	90.52	108		Aug. 20	89.07	11	
May 27	89.77	59		Sept. 6	89.38	24	

Mean Daily Discharge in second-feet of Rolling River, at Canadian Northern Railway Crossing for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	18	12	8	8	3	1	11	96	29	45	18	12
2	14	12	8	8	3	1	12	94	27	79	17	13
3	14	12	8	6	2	1	14	88	27	104	16	13
4	13	12	9	6	1	1	16	72	28	103	19	18
5	14	12	9	5	1	1	34	66	23	84	23	29
6	15	12	9	5	1	1	60	60	22	72	27	28
7	17	12	9	5	1	1	90	57	21	63	36	27
8	19	12	8	5	1	1	140	57	20	61	40	28
9	20	12	8	6	1	1	210	59	19	74	44	28
10	21	12	8	5	1	1	236	56	18	81	42	24
11	22	12	8	5	1	1	318	54	18	81	32	24
12	20	12	8	5	2	1	258	53	17	75	28	25
13	19	11	7	5	2	1	224	51	16	71	25	24
14	18	11	7	5	3	1	198	56	15	66	23	23
15	16	10	7	5	2	1	182	78	21	66	21	22
16	15	10	7	5	1	2	173	87	33	63	20	21
17	18	9	7	3	0	2	151	92	45	59	19	21
18	16	9	7	5	0	2	150	102	47	55	19	22
19	16	8	7	5	0	2	155	96	50	49	20	38
20	16	8	7	5	0	2	157	86	48	44	20	38
21	16	6	7	4	0	2	162	83	46	40	19	32
22	17	8	7	4	0	3	166	78	37	36	18	29
23	16	8	6	4	0	3	171	72	32	30	16	25
24	16	8	6	4	0	4	177	65	31	28	15	25
25	15	8	6	4	0	4	178	60	27	26	14	23
26	14	8	6	4	1	8	166	56	25	24	13	21
27	14	8	6	4	1	8	144	53	24	23	11	20
28	13	8	5	4	1	6	135	48	23	21	11	20
29	12	8	8	4	....	7	125	41	28	20	11	18
30	12	8	8	4	....	7	99	36	22	19	11	19
31	13	.....	8	4	.....	9	....	32	.....	18	13	.....

Ice conditions November 1, 1918 to April 10, 1919, inclusive.

Monthly Discharge of Rolling River near Canadian Northern Railway Crossing, for year ending September 30, 1919.

[Drainage area, 235 square miles.]

Month.	Discharge in Second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	22	12	16	0·068	0·078	984
November	12	8	10	0·043	0·048	595
December	9	5	7	0·030	0·035	430
January	5	4	5	0·021	0·024	307
February	3	0	1	0·004	0·004	56
March	9	1	3	0·013	0·015	184
April	218	11	144	0·613	0·684	8,569
May	102	32	67	0·285	0·329	4,120
June	50	15	28	0·119	0·133	1,666
July	104	18	54	0·230	0·265	2,320
August	44	11	21	0·089	0·103	1,291
September	38	12	24	0·102	0·114	1,428
The year	318	0	22	0·136	1·846	22,921

Whirlpool River—Danvers—Station No. 5MF9.

Location.—Erickson's bridge, one-half mile from Danvers.

Records Available.—May, 1915, to September 30, 1919.

Drainage Area.—79 square miles.

Gauge.—Vertical staff gauge on bridge.

Discharge Measurements.—From bridge.

Discharge Measurements of Whirlpool River at Danvers, for 1919.

Date.	Gauge Height	Discharge.	Remarks	Date.	Gauge Height	Discharge.	Remarks.
1919	Feet	Sec.-ft.		1919	Feet	Sec.-ft.	
Jan. 13	88·81	3	Ice cover	June 24	87·57	8	
Feb. 14		4	Ice cover	July 15	88·31	21	
May 2	88·38	28		Aug. 20	87·20	3	
May 27	88·65	20		Sept. 9	88·20	22	

Mean Daily Discharge in second-feet of Whirlpool River, at Danvers, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.
1	6	6						27	12	14	6	6
2	6	6						23	12	17	6	6
3	6	6			..			20	11	19	6	12
4	6	6						18	11	19	6	31
5	6							18	11	17	6	31
6	7							16	10	17[1]	6	26
7	7							18	8	16[1]	7	19
8	6							15	8	16	8	17
9	6							13	7	16	8	18
10	6							13	6	26	8	17
11	6						170	46	6	36	8	16
12	6						166	36	6	36	8	16
13	6						158	65	7	31	8	16
14	6						154	65	7	26	8	16
15	6						154	95	10	22	10	16
16	6						146	65	11	22	10	16
17	6						142	67	11[1]	10	10	16
18	6						138	67	10[1]	8	4	16
19	6						130	65	10[1]	8	4	16
20	6						122	62	10[1]	8	4	14
21	6						106	59	9[1]	7	4	14
22	6						100	56	9[1]	7	4	14
23	6						91	54	9[1]	7	4	26
24	6						83	45	9	7	4	26
25	6						83	24	7	7	4	26
26	6						71	21	6	7	4	26
27	6						55	16	6	6	4	24
28	6						43	19	8	5	4	21
29	6						29	16	11	5	6	19
30	6						27	17	12	5	6	17[1]
31	6							14		5	6	

Ice conditions from November 5, 1918 to April 10, 1919, inclusive.
[1]Estimated.

Monthly Discharge of Whirlpool River at Danvers for year ending September 30, 1919.

[Drainage area, 79 square miles.]

Month.	Discharge in Second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	7	6	6	0·076	0·088	369
November	6	...	5[1]	0·063	0·070	298
December	...	...	3[1]	0·038	0·044	184
January	...	...	2[1]	0·025	0·029	123
February	...	...	1[1]	0·013	0·014	56
March	...	...	2[1]	0·025	0·029	123
April	170	...	90[1]	1·139	1·271	5,355
May	67	13	37	0·468	0·540	2,275
June	12	6	9	0·114	0·127	536
July	36	5	15	0·190	0·219	922
August	10	4	8	0·076	0·088	369
September	31	6	08	0·228	0·254	1,071
The year	170	...	16	0·205	2·756	11,677

NOTE.—[1]Estimated.

SOURIS RIVER—MELITA—STATION NO. 5NF1

Location.—Traffic bridge, River park, Melita.

Records Available.—April 23, 1915, to September 30, 1919.

Drainage Area.—18,024 square miles.

Gauge.—Vertical staff on bridge at section.

Discharge Measurements.—From bridge at ordinary stages and Canadian Pacific Railway bridge, Melita, at flood stage.

Discharge Measurements of Souris River at Melita, for 1918-19.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
1919.	Feet.	Sec.-ft.	1919.	Feet.	Sec.-ft.
April 24	95·22	1,319	July 10	87·73	42
May 20	93·58	921	Aug. 15	87·01	2
June 08	88·17	83	Sept 24	86·91	0

Mean Daily Discharge in second-feet of Souris River, at Melita, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	10	14	.....	.....	.....	.....	.....	1,210	226	54	14	0
2	9	15	..	.....	.....	.....	.....	1,205	217	43	15	0
3	10	16	....	.....	.....	.....	.....	1,190	211	41	15	0
4	11	19	.....	.....	.....	.....	.....	1,165	209	40	14	0
5	12	20	.....	.....	.....	.....	.....	1,145	193	37	13	0
6	15	22	.....	.....	.....	.....	.....	1,130	174	35	12	0
7	14	21	.....	.....	.....	.....	.....	1,180	163	33	11	0
8	13	20	.....	.....	.....	.....	.....	1,225	152	31	11	11
9	12	.....	.....	.....	.....	.....	.....	1,305	142	28	11	11
10	12	..	.....	.....	.....	.....	.....	1,360	128	26	10	10
11	10	.....	.....	.....	.....	.....	.....	1,410	124	25	10	10
12	9	.....	.....	.....	.....	.....	.....	1,370	114	23	10	10
13	8	.....	.....	.....	.....	.....	.....	1,325	106	23	10	10
14	9	.....	.....	.....	.....	.....	.....	1,270	96	22	9	9
15	10	.....	.....	.....	.....	.....	.....	1,220	98	21	6	9
16	12	.....	.....	.....	.....	.....	.....	1,140	99	21	5	9
17	12	.....	.....	.....	.....	.....	1,355	1,110	100	20	4	8
18	13	.....	.....	.....	.....	.....	1,350	1,060	103	19	3	8
19	14	.....	.....	.....	.....	.....	1,340	995	69	19	2	7
20	14	.....	.....	.....	.....	.....	1,370	950	68	18	1	7
21	13	.....	.....	.....	.....	.....	1,410	865	68	18	1	7
22	13	.....	.....	.....	.....	.....	1,400	785	66	17	1	6
23	14	.....	.....	.....	.....	.....	1,265	745	63	16	0	4
24	15	.....	.....	.....	.....	.....	1,225	670	62	16	0	1
25	15	.....	.....	.....	.....	.....	1,245	640	69	15	0	1
26	16	.....	.....	.....	.....	.....	1,280	465	61	15	0	2
27	15	..	.....	.....	.....	.....	1,258	484	64	15	0	2
28	.	.....	.....	.....	.....	.....	1,240	416	67	13	0	4
29	.	.....	.....	.....	.....	.....	1,270	360	69	15	0	10
30	15	.....	.....	.....	.....	.....	1,230	285	63	14	0	14
31	15	.....	.....	.....	.....	.....	.....	232	.....	14	0	.....

Ice conditions from November 8, 1918 to April 16, 1919.

Monthly Discharge of Souris River, at Melita, for year ending September 30, 1919.

[Drainage area, 18,024 square miles.]

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	16	8	13	0·001	0·001	799
November	22		10[1]	0·001	0·001	595
April			1,100[1]	0·061	0·068	65,455
May	1,410	232	965	0·054	0·062	59,336
June	226	61	115	0·006	0·007	6,843
July	54	13	24	0·001	0·001	1,476
August	15	0	6	0·000		369
September	14	0	6	0·000		357
The period	1,410	0	279	0·015	0·136	135,173

[1]Estimated.

Souris River—Wawanesa—Station No. 5NG1.

Location.—Traffic bridge, about one-quarter of a mile north of the town of Wawanesa.

Records Available.—October 7, 1912, to September 30, 1919.

Drainage Area.—20, 056 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Souris River, at Wawanesa for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet	Sec.-ft.		1919.	Feet.	Sec.-ft.	
Oct. 20	101·14	17	Ice cover.	May 20	104·19	1,220	
1919.				June 18	101·54	186	
				July 9	101·15	70	
				Aug. 14	100·69	18	
Feb. 19	100·66	0	Ice cover.	Sept 23	101·84	10	Beaver Dam below section.
Mar. 19	101·05	2	Ice cover.				
April 23	104·68	1,447					

Mean Daily Discharge in second-feet of Souris River, at Wawanesa, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	19	36	29	2	0	0	95	1,345	425	94	29	17
2	23	36	29	3	0	0	115	1,340	403	119	28	17
3	28	35	29	3	0	0	135	1,330	353	143	28[1]	17
4	31	35	28	4	0	0	1,120	1,285	303	141	28	16
5	34	35	28	5	0	0	1,715	1,305	272	125	27	16
6	36	35	28	5	0	0	1,875	1,310	251	84	39	16
7	37	34	27	6	0	0	2,040	1,280	242	77	37	16[1]
8	38	34	27	7	0	0	1,370	1,295	228[1]	72	32	15
9	39	34	27	7	0	0	1,105	1,305	214	72	33	15
10	40	34	27	8	0	0	1,200	1,315	198	74	31	15
11	40	34	26	8	0	1	1,130	1,415	187	72	29	15
12	40	33	26	9	0	1	1,035	1,420	187	70	27	15
13	40	33	26	10	0	1	1,180	1,430	211	72	25	14
14	40	33	25	10	0	1	1,255	1,440	187	68	25	14
15	40	33	24	10	0	1	1,760	1,445	184	63[1]	26	14
16	40	33	23	10	0	1	1,620	1,435	184	57	27	14
17	40	32	22	9	0	2	1,595	1,405	149	49	25	14
18	40	32	20	8	0	2	1,610	1,305	145	47	25	13
19	40	32	18	8	0	3	1,605	1,260	141	43	24	13
20	40	31	16	8	0	4	1,580	1,225	138	42	22	13
21	40	31	14	8	0	5	1,580	1,195	128	42	21	13
22	40	31	11	8	0	6	1,550	1,140	123	39	21	13
23	39	31	8	7	0	7	1,530	1,090	115	38	21	12
24	39	31	6	7	0	8	1,505	1,000	105	37	21	12
25	38	31	4	6	0	12	1,470	925	102	36	20	12
26	38	30	3	5	0	17	1,430	860	96	36	20	22
27	37	30	3	4	0	23	1,375	770	105	35	19	12
28	37	30	3	3	0	31	1,365	695	96	34	19	12
29	36	30	2	3		40	1,365	620	93	33	17	12
30	36	29	2	2		56	1,345	550	98	31	17	12
31	36		2	1		73		495		30	17	

Ice conditions November 8, 1918 to April 7, 1919, inclusive.
[1]Estimated.

Monthly Discharge of Souris River, at Wawanesa, for year ending September 30, 1919.

[Drainage area, 20,056 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	40	19	37	0·002	0·002	2,275
November	36	29	33	0·002	0·002	1,964
December	29	2	18	0·001	0·001	1,107
January	10	1	6	0·000	0·000	369
February	0	0	0	0·000	0·000	
March	75	0	10	0·000	0·000	615
April	2,040	95	1,322	0·066	0·074	78,664
May	1,445	495	1,169	0·058	0·067	71,879
June	425	93	189	0·009	0·010	11,246
July	143	39	64	0·003	0·003	3,935
August	39	17	25	0·001	0·001	1,537
September	17	12	14	0·001	0·001	833
The year	2,040	0	241	0·012	0·163	174,341

Red Deer River—Hudson Bay Junction—Station No. 5LC2.

Location.—At the Ferry crossing, 500 feet below the junction of the Etomami and Red Deer rivers, three and one-half miles south of the town of Hudson Bay Junction.

Records Available.—July 9, 1913, to September 30, 1919.

Drainage Area.—4,900 square miles.

Gauge.—Vertical staff gauge on right bank forty feet below section.

Discharge Measurements.—By boat or ferry.

Discharge Measurements of Red Deer River, at Hudson Bay Junction for 1918-1919.

Date.	Gauge Height	Discharge.	Date.	Gauge Height.	Discharge.
1918.	Feet	Sec.-ft	1919.	Feet.	Sec.-ft.
Oct. 12	100·71	308	May 23	102·84	2,022
			June 19	102·95	2,214
1919.			July 16	102·15	1,402
			Aug. 13	101·06	614
April 24	101·20	845	Sept. 19	101·40	715

Mean Daily Discharge in second-feet of Red Deer River, at Hudson Bay Junction, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	122	210						498	440	1,045	358	259
2	129	232						469	429	1,585	347	236
3	132	214						469	406	1,075	384	214
4	136	197						440	530	1,030	440	201
5	143	189						423	560	965	560	193
6	154	177						440	855	950	620	185
7	214	169						451	620	895	755	281
8	264	165						412	498	855	785	177
9	337	157						384	440	820	755	181
10	342						980	374	358	765	720	173
11	347						980	395	374	710	655	185
12	342						980	412	440	655	560	185
13	332						980	486	560	685	545	193
14	307						980	785	640	1,615	498	434
15	302						980	1,765	785	1,335	785	486
16	292						980	2,415	2,415	1,380	880	685
17	283						970	3,405	1,335	1,400	820	685
18	273						960	3,055	2,185	1,190	775	705
19	264						950	3,345	2,015	930	740	765
20	259						940	3,405	1,815	820	655	815
21	250						930	2,995	1,490	765	510	805
22	241						915	2,195	1,290	685	412	780
23	197						895	1,865	1,125	655	358	755
24	205						855	1,715	905	595	332	720
25	241						755	1,310	785	560	327	665
26	219						620	1,165	705	530	317	610
27	210						530	930	469	481	312	720
28	205						498	895	342	440	302	725
29	197						560	1,085	530	440	292	775
30	189						530	1,205	855	412	283	820
31	197							905		384	273	

Ice conditions November 10, 1918 to April 22, 1919, inclusive.

Monthly Discharge of Red Deer River at Hudson Bay Junction, for year ending September 30, 1919.

[Drainage area, 4,900 square miles.]

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	347	122	236	0·048	0·055	14,511
November	232					
April	980		620[1]	0·127	0·142	36,893
May	3,405	374	1,293	0·264	0·304	79,503
June	2,415	342	872	0·178	0·199	51,888
July	1,615	384	860	0·176	0·203	52,879
August	880	273	528	0·108	0·125	32,465
September	820	173	484	0·099	0·110	28,800
The period	3,405		699	0·143	1·138	296,886

NOTE.—[1]Estimated

WOODY RIVER—BOWSMAN—STATION NO. 5LE2.

Location.—Traffic bridge, one mile south of the town of Bowsman.

Records Available.—May 31, 1915, to September 30, 1919.

Drainage Area.—731 square miles.

Gauge.—Chain gauge on bridge section.

Discharge Measurements.—From bridge.

Discharge Measurements of Woody River at Bowsman for 1918-1919.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height.	Discharge.
1918.	Feet.	Sec.-ft.	1919.	Feet.	Sec.-ft.
Oct. 8	88·69	13	May 28	89·37	149
			June 24	88·80	29
1919.			July 14	89·36	107
			Aug. 16	88·79	42
April 30	89·22	78	Sept. 18	89·49	154

Mean Daily Discharge in Second-feet of Woody River at Bowsman for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	9	29	....	....	....	....	....	86	71	108	17	17
2	10	32	....	....	....	....	....	90	63	133	17	16
3	9	40	....	....	....	....	....	92	53	123	16	16
4	8	27	....	....	....	....	....	101	53	92	20	16
5	14	29	....	....	....	....	223	73	44	75	22	17
6	14	29	....	....	....	....	287	66	36	66	24	18
7	15	23	....	....	....	....	348	60	35	75	20	16
8	17	24	....	....	....	....	409	63	33	110	22	14
9	21	35	....	....	....	....	401	52	28	161	25	15
10	20	44	....	....	....	....	396	32	27	155	27	16
11	19	50	....	....	....	....	394	35	24	136	26	17
12	25	53	....	....	....	....	392	32	34	123	30	17
13	24	53	....	....	....	....	366	41	29	118	25	27
14	21	52	....	....	....	....	339	70	33	110	24	95
15	21	50	....	....	....	....	304	115	40	108	27	238
16	24	49	....	....	....	....	274	213	50	86	35	242
17	23	45	....	....	....	....	242	238	56	79	28	164
18	24	41	....	....	....	....	213	170	56	66	38	152
19	26	42	....	....	....	....	189	189	45	60	42	152
20	26	28	....	....	....	....	167	234	44	50	34	144
21	26	....	....	....	....	....	148	253	37	45	32	136
22	27	....	....	....	....	....	164	287	34	41	30	120
23	29	....	....	....	....	....	130	265	26	38	27	103
24	26	....	....	....	....	....	99	234	24	35	24	97
25	23	....	....	....	....	....	105	196	22	34	20	97
26	25	....	....	....	....	....	108	167	19	29	25	95
27	24	....	....	....	....	....	97	147	16	26	19	97
28	25	....	....	....	....	....	103	128	20	24	19	92
29	24	....	....	....	....	....	77	108	28	22	20	90
30	25	....	....	....	....	....	82	92	63	20	20	84
31	26	....	....	....	....	....	....	82	....	18	17	....

Ice conditions, November 12, 1918 to April 22, 1919, inclusive.

Monthly Discharge of Woody River, at Bowsman, for year ending September, 30, 1919.

[Drainage area 731 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	29	8	21	0·029	0·033	1,291
November	53		33¹	0·045	0·050	1,964
March						
April	409		217¹	0·297	0·331	12,912
May	287	32	129	0·176	0·203	7,932
June	71	16	38	0·052	0·058	2,261
July	161	18	76	0·104	0·120	4,673
August	42	16	25	0·034	0·039	1,537
September	242	14	81	0·111	0·124	4,820
The period	409		77	0·105	0·953	37,412

NOTE.—¹Estimated.

SWAN RIVER—SWAN RIVER—STATION NO. 5LE1.

Location.—Traffic bridge at northerly end of the town of Swan River.
Records Available.—October 24, 1912, to September 30, 1919.
Drainage Area.—1,215 square miles.
Gauge.—Chain gauge on bridge at section.
Discharge Measurements.—From bridge.

Discharge Measurements of Swan River, at Swan River, for 1918-1919.

Date.	Gauge Height	Discharge.	Remarks.	Date.	Gauge Height	Discharge.	Remarks.
1918.	Feet.	Sec.-ft.		1919	Feet.	Sec.-ft.	
Oct. 8	100·10	89		Mar. 27	102·47	9	Ice cover
1919.				April 29	100·50	228	
				May 27	100·83	430	
				June 24	99·99	111	
Jan. 28	100·74	12	Ice cover.	July 14	100·22	162	
Feb. 27	99·78	7	Ice cover.	Aug. 16	100·37	191	
				Sept. 18	100·79	363	

Mean Daily Discharge in second-feet, of Swan River, at Swan River, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May	June.	July.	Aug.	Sept.
1	94	103	40	12	8	7	34	308	272	297	34	67
2	94	101	39	12	8	7	108	316	258	308	33	65
3	92	99	38	11	7	7	195	320	240	293	30	58
4	90	97	37	11	7	7	430	304	209	279	30	53
5	90	97	36	11	7	8	840	279	186	272	58	50
6	97	94	34	11	7	8	920	248	165	286	135	48
7	103	94	32	11	8	8	1,005	227	150	316	162	45
8	135	92	31	11	9	9	1,090	216	141	300	141	44
9	138	92	30	12	9	10	1,180	202	135	272	111	42
10	141	87	29	12	10	10	1,225	192	127	254	92	44
11	144	83	28	12	11	10	1,270	186	121	244	79	44
12	141	80	27	12	12	10	1,300	174	124	247	79	44
13	138	76	26	12	13	9	1,335	165	124	198	77	48
14	141	73	24	13	14	8	1,975	227	138	180	75	141
15	138	70	23	14	14	8	1,855	380	144	159	202	336
16	132	67	22	14	14	8	1,080	670	162	144	212	415
17	127	64	20	15	14	8	600	840	168	130	237	410
18	124	61	19	15	14	8	535	865	174	111	209	372
19	121	58	19	16	13	8	490	905	171	101	189	360
20	119	56	18	16	13	8	460	850	156	96	156	344
21	119	54	17	16	12	8	430	765	141	92	127	320
22	119	52	16	15	12	8	405	690	121	83	99	304
23	119	50	16	15	11	8	380	620	103	73	87	290
24	119	49	15	14	10	8	360	560	96	65	75	282
25	116	48	15	14	9	8	324	496	90	58	69	258
26	119	47	14	13	8	8	290	430	75	51	65	233
27	119	46	14	13	7	9	272	376	69	47	60	212
28	113	44	13	12	7	9	260	344	83	45	56	205
29	111	43	13	11	...	10	282	328	92	41	63	209
30	108	42	12	10	.....	12	286	308	189	38	73	202
31	106	...	12	9	.....	22	.....	293	.....	34	69	.....

Ice conditions from November 10, 1918 to April 12, 1919, inclusive.

Monthly Discharge of Swan River at Swan River, for year ending September 30, 1919.

[Drainage area, 1,215 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean	Per. square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	144	90	118	0·097	0·112	7,256
November	103	42	71	0·058	0·065	4,225
December	40	12	24	0·020	0·023	1,476
January	16	9	13	0·011	0·013	799
February	14	7	10	0·008	0·008	555
March	22	7	9	0·007	0·008	553
April	1,975	34	707	0·582	0·649	42,069
May	905	165	422	0·347	0·400	25,948
June	272	69	147	0·121	0·135	8,747
July	316	34	165	0·136	0·157	10,145
August	237	30	103	0·085	0·098	6,333
September	415	42	183	0·152	0·170	11,008
The year	1,975	7	165	0·136	1·846	119,107

MOSSY RIVER—WILSON'S FARM, BELOW FORK RIVER.—STATION NO. 5LJ2.

Location.—One-quarter of a mile upstream from the house on the farm of D. F. Wilson, two and one-half miles northeast of the town of Fork River.

Records Available.—July 3, 1914, to September 30, 1919.

Drainage Area.—3,950 square miles.

Gauge.—Vertical staff gauge secured to a post driven into the bed of the stream near the left bank about one quarter of a mile downstream from the metering section.

Discharge Measurements.—By cable carrier.

Discharge Measurements of Mossy River, below Fork River, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet.	Sec.-ft.		1919.	Feet.	Sec.-ft.	
Oct. 5.....	90·65	135		May 1.....	91·27	269	
1919.				May 29.....	91·04	283	
				June 26.....	90·72	250	
Jan. 30.....	91.07	49	Ice cover.	July 10.....	91·03	271	
Mar. 1.....	91·35	65	Ice cover.	Aug. 12.....	90·53	173	
Mar. 29.....	92·14	171	Ice Cover.	Sept. 23.....	90·36	112	

Mean Daily Discharge in second-feet of Mossy River, below Fork River, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	79	242	104	62	45	64	298	268	186	195	172	248
2	144	193	102	61	44	65	352	256	176	178	166	83
3	180	204	101	60	44	66	412	261	233	128	158	110
4	165	206	99	60	44	66	485	193	261	161	158	125
5	159	193	98	61	43	67	520	256	178	186	146	128
6	193	73	96	61	43	68	505	284	214	200	143	113
7	300	189	94	62	43	69	476	302	302	329	143	114
8	159	206	92	62	43	70	409	298	178	170	144	101
9	159	73	90	63	43	72	404	279	189	174	149	121
10	165	200	88	64	44	72	415	284	214	216	186	114
11	225	189	86	65	45	73	324	302	256	256	158	108
12	186	182	85	66	46	75	302	237	208	223	128	156
13	182	174	83	67	48	77	279	246	193	329	143	114
14	258	166	82	67	51	80	275	214	189	216	128	88
15	172	156	81	68	53	82	256	127	208	256	135	108
16	174	152	80	68	55	84	212	279	191	242	103	112
17	235	147	80	69	56	89	229	284	208	218	150	114
18	174	143	79	69	58	93	214	286	180	197	121	117
19	191	138	79	68	59	100	214	284	191	223	144	108
20	152	137	78	67	60	105	218	279	191	161	97	103
21	191	135	78	66	62	112	214	296	189	193	187	79
22	92	130	78	65	62	116	252	309	212	206	214	88
23	178	124	77	64	63	121	214	275	189	128	103	117
24	174	118	77	63	63	127	216	291	184	166	97	103
25	163	113	76	62	64	133	218	279	127	218	107	89
26	268	112	75	61	64	143	250	326	153	159	114	189
27	197	111	72	59	64	153	256	218	281	114	102	44
28	191	110	70	57	64	160	261	216	329	166	128	95
29	161	106	67	54		171	270	218	195	180	135	143
30	141	105	64	49		210	214	365	212	121	109	116
31	117		63	47		256		195		147	248	

Ice conditions from November 10, 1918 to April 6, 1919, inclusive.

Monthly Discharge of Mossy River, below Fork River, for year ending September, 30, 1919.

[Drainage area, 3,960 square miles.]

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	300	79	178	0·045	0·052	10,945
November	242	73	148	0·037	0·041	8,807
December	104	63	83	0·021	0·024	5,103
January	69	47	63	0·016	0·018	3,874
February	64	43	53	0·013	0·014	2,943
March	256	64	104	0·026	0·030	6,395
April	520	212	305	0·077	0·086	18,149
May	365	127	264	0·067	0·077	16,233
June	329	127	207	0·052	0·058	12,317
July	329	114	195	0·049	0·056	11,990
August	248	97	142	0·036	0·042	8,731
September	248	44	115	0·029	0·032	6,843
The year	520	43	155	0·039	0·529	112,411

Valley River—Valley River.—Station No. 5LJ4.

Location.—Canadian Northern Railway bridge, fifteen hundred feet north of the railroad station of Valley River.

Records Available.—October 29, 1912, to September 30, 1919.

Drainage Area.—1,028 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Valley River, at Valley River, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks.	Date.	Gauge Height.	Discharge.	Remarks.
1918.	Feet	Sec.-ft.		1919.	Feet	Sec.-ft.	
Oct 2	99·92	15		May 1	100·77	119	
1919.				May 29	101·20	309	
				June 25	100·14	36	
				July 11	102·25	684	
Jan. 29	100·08	3	Ice cover.	Aug 12	100·29	50	
Feb. 28	100·79	2	Ice cover.	Sept. 23	100·47	78	
Mar. 28	100·42	1·4	Ice cover.				

Mean Daily Discharge in second-feet of Valley River, at Valley River, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	13	57	12	3	2	2	4	149	174	22	52	20
2	17	54	12	4	2	2	5	163	299	24	47	19
3	17	57	11	4	2	2	8	269	189	147	44	19
4	20	58	11	4	2	2	21	149	147	299	40	19
5	23	57	10	5	2	2	70	303	99	299	35	99
6	23	43	10	5	2	2	160	286	189	268	58	47
7	23	32	9	5	2	2	286	269	79	299	70	26
8	20	32	9	4	2	2	450	238	99	406	75	19
9	21	30	8	4	2	2	615	253	88	484	54	13
10	17	27	8	4	2	2	705	303	147	655	47	19
11	17	26	8	4	2	2	488	373	174	535	62	19
12	20	24	8	4	2	2	410	337	99	484	58	22
13	20	22	8	4	2	2	570	355	79	452	54	21
14	22	21	7	3	2	2	373	410	54	444	62	24
15	23	20	7	3	2	2	301	448	40	444	54	26
16	23	20	7	3	2	2	238	373	47	425	47	27
17	23	19	6	3	2	2	310	373	62	370	44	27
18	25	18	6	3	2	2	488	660	65	373	40	30
19	27	18	5	3	2	2	570	448	58	283	40	33
20	27	17	5	3	2	2	303	448	40	134	35	37
21	37	17	5	3	2	2	286	410	35	99	30	38
22	37	16	4	3	2	2	276	238	44	75	29	40
23	37	16	4	3	2	2	238	373	60	70	26	39
24	43	15	4	3	2	2	207	410	40	73	27	40
25	45	15	4	3	2	2	207	530	28	75	26	42
26	43	14	4	3	2	2	410	337	26	70	30	62
27	47	14	4	3	2	2	177	410	30	65	26	65
28	57	13	4	3	2	2	171	373	24	62	27	68
29	41	13	4	3		3	149	276	19	58	26	79
30	40	12	3	3		3	149	238	20	62	22	86
31	43		3	3		3		238		47	22	

Ice conditions November 11, 1918 to April 8, 1919, inclusive.

Monthly Discharge of Valley River, at Valley River, for year ending September 30, 1919.

[Drainage area, 1,028 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	57	13	29	0·028	0·032	1,783
November	57	12	27	0·026	0·029	1,647
December	12	3	7	0·007	0·008	400
January	5	3	3	0·003	0·003	132
February	2	2	2	0·002	0·002	181
March	3	2	2	0·002	0·002	113
April	705	4	287	0·279	0·311	17,078
May	660	149	337	0·328	0·378	20,721
June	299	19	85	0·083	0·093	5,058
July	655	22	245	0·238	0·274	15,064
August	79	22	43	0·042	0·048	2,644
September	99	13	37	0·036	0·040	2,202
The year	705	2	93	0·090	1,222	67,012

Ochre River—Ochre River.—Station No. 5IJ5.

Location.—Four hundred feet above the traffic bridge, which is about one-quarter of a mile north of the railroad station, Ochre River.

Records Available.—October 18, 1912, to September 30, 1919.

Drainage Area.—250 square miles.

Gauge.—Vertical staff gauge on traffic bridge above metering station.

Discharge Measurements.—By cable carrier.

Discharge Measurements of Ochre River, at Ochre River, for 1918-1919.

Date	Gauge Height	Discharge.	Date.	Gauge Height	Discharge.
1918.	Feet	Sec.-ft	1919.	Feet	Sec.-ft
Oct. 2	99·49	5	May 30	99·84	35
			June 18	99·70	17
1919.			July 12	100·01	39
			Aug. 18	99·48	7
May 3	100·36	59	Sept. 24	99·58	16

Mean Daily Discharge in second-feet of Ochre River, at Ochre River, for year ending September 30, 1919.

Day	Oct.	Nov.	Dec.	Jan	Feb	Mar	April.	May.	June	July.	Aug.	Sept.
1	7	14							22	71	1	10
2	6	14							16	46	1	5
3	5	14						63	16	34	2	2
4	7	19						63	16	23	2	2
5	14	22						48	10	22	5	5
6	14	48						48	10	28	5	5
7	16	38						41	8	22	5	5
8	17	41						41	5	71	5	10
9	16	40						48	5	79	2	10
10	14	40						48	5	48	5	5
11	14	39						48	5	28	2	5
12	13	38						48	5	22	2	3
13	12	38						55	5	34	2	5
14	13	30						88	10	28	1	10
15	13	29						214	16	22	2	10
16	13	26						214	28	22	5	10
17	13	26						161	23	16	2	5
18	14	26						118	18	10	2	10
19	16	20						97	11	10	5	22
20	17	19						86	10	8	5	16
21	16	18						71	8	5	2	10
22	16	16						63	5	5	1	10
23	16	14						55	5	5	1	10
24	16	14						48	5	5	1	10
25	16							41	5	5	1	10
26	14							41	5	2	1	10
27	16							34	5	2	1	5
28	15							28	5	2	1	5
29	14							28	28	2	5	5
30	14							22	48	4	10	5
31	14							16		2	10	

Monthly Discharge of Ochre River, at Ochre River, for year ending September 30, 1919.

[Drainage area, 250 square miles.]

Month.	Discharge in Second-Feet				Run-off.	
	Maximum.	Minimum.	Mean	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
October	17	5	14	0·056	0·065	861
November	48	5	24[1]	0·096	0·107	1,428
May	214	16	69[1]	0·272	0·314	4,181
June	48	5	12	0·048	0·054	714
July	79	2	22	0·088	0·101	1,353
August	10	1	3	0·012	0·014	184
September	22	2	8	0·032	0·036	476
The period	214	1	22	0·086	0·684	9,128

NOTE.—[1]Estimated.

Saskatchewan River—The Pas.—Station No. 5kj1.

Location.—Hudson Bay Railway bridge at The Pas.

Records Available.—February 9, 1913, to September 30, 1919.

Drainage Area.—149,500 square miles above the section.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge in open-water season and from ice about 200 feet below the bridge in winter.

Discharge Measurements of Saskatchewan River at The Pas for 1918-19.

Date.	Gauge Height	Discharge	Remarks	Date.	Gauge Height	Discharge	Remarks
1918	Feet	Sec.-ft.		1919.	Feet.	Sec.-ft.	
Oct. 10	819·4.	22,857		April 26	821·65	30,580	
1919				May 24	819·48	21,638	
				June 22	822·45	37,056	
				July 19	821·15	28,115	
Jan. 24	815·12	4,848	Ice cover	Aug. 14	820·30	24,589	
Feb. 24	815·65	5,271	Ice cover	Sept. 30	819·30	22,690	
Mar. 25	815·12	4,292	Ice cover				

Daily Gauge Height and Discharge of Saskatchewan River, at The Pas, for year ending September 30, 1919.

[Drainage area, 140,800 square miles.]

Day.	October		November.		December		January		February.		March.	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet	Sec.-ft.	Feet.	Sec.-ft	Feet	Sec.-ft	Feet.	Sec.-ft	Feet.	Sec.-ft	Feet	Sec.-ft
1	19·50	22,400	18·30	17,350	15·55	6,580	15·70	4,755	15·29	4,980	15·47	4,885
2	19·55	22,250	18·25	17,270	15·30	6,390	15·66	4,710	15·32	4,950	15·40	4,775
3	19·53	22,150	18·20	17,190	15·25	6,240	15·61	4,730	15·34	4,975	15·38	4,710
4	19·50	22,050	18·11	16,870	15·25	6,070	15·57	4,755	15·36	5,020	15·28	4,645
5	19·47	21,950	17·90	16,120	15·24	5,970	15·51	4,755	15·58	5,040	15·22	4,605
6	19·42	21,750	17·70	15,420	15·24	5,780	15·46	4,755	15·30	5,080	15·15	4,605
7	19·39	21,600	17·45	14,570	15·23	5,670	15·40	4,775	15·41	5,110	15·10	4,605
8	19·35	21,450	17·25	13,910	15·25	5,580	15·40	4,800	15·41	5,150	15·05	4,605
9	19·21	21,300	17·10	13,410	15·27	5,510	15·39	4,800	15·45	5,190	15·05	4,605
10	19·41	21,700	17·05	13,250	15·45	5,420	15·39	4,800	15·47	5,220	15·05	4,605
11	19·47	21,950	17·05	13,250	15·55	5,350	15·30	4,800	15·49	5,240	15·05	4,605
12	19·55	22,250	17·05	13,250		5,280	15·30	4,775	15·51	5,260	15·06	4,585
13	19·53	22,150	17·10	13,150		5,220	15·20	4,775	15·52	5,280	15·08	4,565
14	19·50	22,050	17·10	13,090		5,190	15·16	4,755	15·54	5,300	15·06	4,540
15	19·45	21,850	17·12	13,030	15·80	5,170	15·14	4,730	15·56	5,330	15·07	4,480
16	19·37	21,550	17·14	12,960	15·84	5,130	15·13	4,720	15·58	5,350	15·07	4,135
17	19·30	21,300	17·15	12,900	15·91	5,080	15·12	4,710	15·60	5,370	15·08	4,415
18	19·23	21,000	17·17	12,770	16·00	5,040	15·11	4,710	15·62	5,370	15·08	4,375
19	19·15	20,700	17·20	12,610	16·00	4,995	15·09	4,710	15·64	5,370	15·09	4,355
20	19·10	20,500	17·20	12,390	16·00	4,950	15·09	4,720	15·64	5,450	15·10	4,330
21	19·05	20,350	17·20	12,130	15·98	4,910	15·08	4,730	15·64	5,330	15·11	4,310
22	19·00	20,150	17·17	11,510	15·97	4,895	15·06	4,755	15·65	5,300	15·12	4,270
23	18·95	19,500	17·10	10,740	15·95	4,885	15·07	4,775	15·66	5,280	15·12	4,250
24	18·89	19,720	16·95	9 940	15·91	4,885	15.12	4,800	15·66	5,260	15·12	4,205
25	18·80	19,390	16·75	9,290	15·90	4,885	15·13	4,800	15·64	5,190	15·13	4,185
26	18·84	19,340	16·53	8,610	15·88	4,885	15·14	4,820	15·61	5,110	15·14	4,185
27	18·70	19,020	16·30	7,950	15·85	4,885	15·16	4,820	15·54	5,040	15·14	4,205
28	18·60	18,650	16·05	7,480	15·83	4,885	15·18	4,840	15·51	4,975	15·15	4,250
29	18·51	18,320	15·79	7,100	15·81	4,895	15·20	4,865			15·15	4,290
30	18·41	17,950	15 49	6,750	15·79	4,820	15·22	4,885			15·17	4,330
31	18·35	17,730			15·76	4,800	15·25	4,910			15·21	4,375

Day.	April		May.		June.		July.		August.		September	
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft	Feet	Sec.-ft
1	15·25	4,415	20·88	27,550	19·45	21,85	21·59	30,600	20·73	26,950	21·05	28,250
2	15·30	4,520	20·76	27,050	19·50	22,05	21·61	30,700	20·61	26,450	20·80	27,250
3	15·37	4,670	20·65	26,600	19·55	22,250	21·64	30,850	20·49	25,950	20·65	26,600
4	15·45	4,775	20·53	26,100	19·60	22,450	21·67	30,950	20·39	25,550	20·55	26,200
5	15·55	4,930	20·39	25,550	19·65	22,850	21·70	31,100	20·50	25,200	20·45	25,800
6	15·85	5,190	20·21	24,900	19·70	22,850	21.74	31,300	20·23	24,900	20·37	25,500
7	16·15	5,420	19·97	23,900	19·85	23,400	21·79	31,500	20·17	24,700	20·30	25,200
8	16·65	5,690	19·79	23,200	20·00	24,000	21·85	31,800	20·11	24,500	20·20	24,800
9	16·95	6,410	19·64	22,600	20·25	25,000	22·00	32,450	20·09	24,350	20·13	24,500
10	17·05	7,150	19·49	22,000	20·85	27,450	22·20	33,400	20·05	24,200	20·05	24,200
11	17·25	7,920	19·35	21,450	21·35	29,550	22·45	34,550	20·05	24,200	19·95	23,800
12	17·50	8,720	19·33	21,400	21·60	30,650	22·50	34,800	20·15	24,600	19·89	23,550
13	17·65	9,540	19·34	21,400	21·95	32,250	22·55	35,050	20·25	25,000	19·83	23,350
14	17·95	10,300	19·35	21,450	22·30	33,850	22·55	35,050	20·30	25,200	19·79	23,200
15	18·35	11,310	19·37	21,550	22·35	34,100	22·40	34,350	20·37	25,500	19·75	23,050
16	19·19	12,550	19·40	21,650	22·40	34,350	22·20	33,400	20·45	25,800	19·67	22,700
17	19·85	13,610	19·40	21,650	22·41	34,500	21·85	31,800	20·53	26,100	19·50	22,050
18	20·45	14,740	19·40	21,650	22·47	34,650	21·45	30,000	20·61	26,450	19·40	21,650
19	23·55	18,280	19·40	21,650	22·50	34,800	21·15	28,700	20·68	26,750	19·25	21,100
20	25·05	22,250	19·43	21,800	22·50	34,800	21·20	28,900	20·75	27,050	19·20	20,900
21	25·05	26,300	19·45	21,850	22·51	34,850	21·25	29,100	21·03	28,200	19·17	20,800
22	23·85	30,650	19·45	21,850	22·45	34,550	21·30	29,350	21·15	28,700	19·17	20,800
23	22·60	35·300	19·45	21,850	22·38	34,250	21·30	29,350	21·25	29,150	19·25	21,100
24	22·15	33,150	19·48	21,950	22·25	33,650	21·25	29,100	21·40	29,750	19·35	21,450
25	21·85	31,800	19·48	21,950	22·05	32,700	21·17	28,800	21·45	30,000	19·45	21,850
26	21·55	30,450	19·53	22,150	21·85	31,800	21·12	28,550	21·45	30,000	19·55	22,250
27	21·47	30,050	19·57	22,300	21·65	30,900	21·05	28,250	21·45	29,900	19·60	22,450
28	21·30	29,350	19·60	22,450	21·53	30,350	21·00	28,050	21·40	29,750	19·65	22,650
29	21·14	28,650	19·55	22,250	21·55	30,450	20·94	27,800	21·30	29,350	19·70	22,850
30	21·00	28,050	19·50	22,050	21·57	30,500	20·90	27,650	21·24	29,100	19·73	22,950
31			19·45	21,850			20·83	27,350	21·15	28,700		

NOTE.—800·00 should be added to gauge heights to reduce to station datum.

Monthly Discharge of Saskatchewan River at The Pas for year ending September 30, 1919.

[Drainage area, 149,500 square miles.]

Month.	Discharge in Second-feet				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on Drainage area.	Total in acre-feet.
October	22,400	17,730	20,796	0·139	0·160	1,278,696
November	17,550	6,750	12,552	0·084	0·094	746,896
December	6,580	4,800	5,297	0·035	0·040	325,700
January	4,910	4,770	4,775	0·032	0·037	293,603
February	5,370	[illegible]	5,192	0·035	0·036	288,348
March	4,885	[illegible]	4,458	0·030	0·035	274,111
April	35,300	[illegible]	16,219	0·108	0·120	965,097
May	27,550	[illegible]	22,926	0·153	0·176	1,403,516
June	34,85	50	20	0·199	0·222	1,768,165
July	35,0	[illegible]	[illegible]	0·206	0·237	1,993,449
August	30,0	[illegible]	[illegible]	180	0·208	1,650,266
September	28	[illegible]	[illegible]	157	0·175	1,394,003
The year	[illegible]	[illegible]	[illegible]	·3	1·334	12,281,712

Fairford River at Fairford (Sta. No. 5LM1).

Location.—Canadian Northern Railway bridge at Fairford.

Records Available.—June 28, 1912 to September 30, 1919.

Drainage Area.—31,900 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Fairford River, at Fairford, for 1918-19.

Date.	Gauge Height.	Discharge.	Date.	Gauge Height	Discharge.
1918.	Feet	Sec.-ft.	1919.	Feet	Sec.-ft.
Nov. 15	901·59	2,361	April 7.	901·23	2,009

Mean Daily Discharge in second-feet of Fairford River, at Fairford, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	2,260	2,555	2,260	2,070	2,240		2,070	2,273	2,725	2,[illegible]	1,915	2,110
2	2,110	2,520	2,320	2,030	2,215		2,080	2,160	2,100	2,975	2,355	1,850
3	2,330	2,620	2,285	2,090	2,160		2,130	2,285	2,495	2,775	2,070	1,650
4	2,215	2,695	2,260	2,120	2,110		2,100	2,365	2,330	2,470	2,100	1,565
5	2,010	2,725	2,240	2,100	2,120		2,150	2,330	2,340	2,330	2,215	1,730
6	2,495	2,570	2,215	2,150	2,130		2,090	2,250	2,305	2,660	2,090	1,725
7	2,885	2,960	2,385	2,160	2,175		2,000	2,275	2,945	3,660	1,895	1,425
8	2,975	2,215	2,425	2,215	2,215		1,980	2,285	2,505	3,620	1,830	1,360
9	2,735	1,360	2,320	2,150	2,215		1,950	2,365	2,410	3,330	1,915	1,805
10	2,695	2,975	2,385	2,185	2,295		2,010	2,295	2,400	2,630	2,130	1,730
11	2,425	3,005	2,410	2,140	2,355	2,020	2,090	2,240	2,895	2,330	2,530	1,570
12	2,370	2,595	2,330	2,175	2,295	1,990	2,110	2,275	2,895	2,530	2,295	1,655
13	2,595	2,445	2,410	2,240	2,205	1,925	2,060	2,285	2,400	2,630	2,090	1,725
14	2,620	2,435	2,340	2,160	2,130	2,000	2,070	2,330	2,330	2,215	2,000	1,410
15	2,400	2,275	2,205	2,250	2,070	2,050	2,010	2,340	2,895	2,385	1,820	1,940
16	2,495	2,485	2,230	2,205	2,175	2,000	2,050	2,460	2,725	2,425	1,730	1,630
17	2,215	2,460	2,220	2,275		1,915	2,130	2,445	2,900	2,700	1,775	1,715
18	2,775	2,435	2,400	2,230		1,980	2,195	2,630	2,860	2,845	1,810	1,585
19	3,125	2,460	2,460	2,295		1,980	2,175	2,495	2,660	2,945	1,915	1,795
20	2,735	2,410	2,400	2,295		1,895	2,120	2,570	2,660	2,660	1,885	1,775
21	2,710	2,375	2,410	2,295		1,940	2,230	2,670	2,545	2,410	1,820	1,570
22	2,005	2,355	2,295	2,230		1,950	2,150	2,670	2,330	2,215	1,750	1,425
23	2,215	3,400	2,175	2,320		1,980	2,070	2,620	2,385	2,010	2,150	1,630
24	2,285	2,435	2,150	2,385		2,900	2,080	2,695	2,660	2,090	1,665	1,260
25	2,830	2,425	2,230	2,305		2,020	2,110	2,570	2,630	2,900	1,585	1,545
26	3,110	2,425	2,320	2,240		1,915	2,185	2,080	2,010	2,215	1,585	1,610
27	2,125	2,485	2,260	2,305		1,950	2,140	2,080	2,410	2,010	1,495	1,225
28	2,725	2,435	2,320	2,250		2,050	2,305	2,735	2,185	2,090	1,570	1,360
29	2,570	2,295	2,205	2,305		2,050	2,305	2,530	2,505	2,160	1,555	1,530
30	2,275	2,275	2,150	2,340		1,990	2,215	3,300	3,125	1,820	1,650	1,925
31	2,110		2,100	2,160		2,050		2,580		1,895	1,810	

Ice conditions from Nov. 14, 1918 to May 15, 1919, inclusive.

Monthly Discharge of Fairford River, at Fairford, for year ending September 30, 1919.

[Drainage area, 21,900 square miles.]

Month	Discharge in Second-Feet				Run-Off	
	Maximum.	Minimum.	Mean	Per square mile	Depth in inches on Drainage area.	Total in acre-feet.
October	3,125	2,010	2,372	0·081	0·093	158,146
November	3,005	1,360	2,470	0·077	0·085	145,975
December	2,460	2,100	2,297	0·072	0·083	141,257
January	2,385	2,050	2,212	0·069	0·080	136,072
February	2,355	1,760	2,104	0·066	0·069	118,856
March	2,090	1,830	1,967	0·062	0·071	120,946
April	2,305	1,950	2,173	0·068	0·076	129,302
May	3,300	2,160	2,500	0·078	0·090	153,719
June	3,125	2,010	2,532	0·079	0·088	150,664
July	3,620	1,820	2,481	0·078	0·090	152,551
August	2,530	1,495	1,903	0·060	0·069	117,011
September	2,110	1,260	1,641	0·051	0·057	97,646
The year	3,620	1,260	2,234	0·070	0·950	1,617,201

Note.—Estimated.

Brokenhead River Sinnot. Station No. 5sa1.

Location.—Traffic bridge, nine hundred feet northeast of the Canadian Pacific Railway station at Sinnot.

Records Available.—June 8, 1912, to September 30, 1919.

Drainage Area.—530 square miles.

Gauge.—Vertical staff gauge on bridge at section.

Discharge Measurements.—From bridge.

Discharge Measurements of Brokenhead River, at Sinnot, for 1918-1919.

Date.	Gauge Height.	Discharge.	Remarks	Date.	Gauge Height.	Discharge.	Remarks.
1918	Feet	Sec.-ft		1919.	Feet	Sec.-ft	
Dec. 27	91·15	16·0		May 7	92·15	184	
1919				June 6	91·52	80	
				July 7	95·87	1,252	
				Aug. 5	92·11	157	
Feb. 5	90·85	2·0	Ice cover	Sept. 4	91·12	37	
Mar. 6	91·05	0·5	Ice cover				

Mean Daily Discharge in second-feet of Brokenhead River, at Sinnot, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	18	66	50	13	2	1	46	274	88	49	265	43
2	18	71	46	12	2	1	62	243	93	81	236	42
3	18	72	42	11	2	1	76	215	95	297	209	41
4	20	74	38	10	2	1	101	189	93	362	180	40
5	27	76	36	10	2	1	156	179	83	543	162	38
6	39	78	34	9	2	1	287	170	78	985	157	34
7	48	92	32	9	2	1	429	167	77	1,248	154	32
8	54	104	31	8	2	1	555	165	71	1,405	153	59
9	58	119	30	8	2	1	625	162	68	1,584	151	57
10	59	122	27	8	3	1	595	165	66	1,566	137	87
11	57	130	24	8	3	1	695	179	64	1,482	132	104
12	55	132	22	8	3	1	680	179	81	1,444	123	108
13	51	139	21	8	3	1	660	177	100	1,374	122	121
14	47	145	20	8	3	1	625	182	107	1,367	121	126
15	46	164	20	8	3	2	610	191	142	1,248	119	132
16	45	172	19	7	3	2	560	222	191	1,199	118	146
17	48	180	19	7	3	3	505	308	146	1,125	119	184
18	50	204	18	7	3	4	500	184	135	992	121	162
19	52	251	18	7	3	5	481	180	111	859	121	180
20	52	245	18	7	2	6	415	173	104	657	122	188
21	53	228	18	7	2	8	393	162	91	618	106	196
22	50	224	17	7	2	9	355	149	114	520	96	191
23	47	249	17	7	1	10	332	135	143	447	84	182
24	46	313	17	7	1	11	222	126	148	370	72	179
25	45	228	17	6	1	14	209	121	142	344	62	172
26	44	112	17	6	1	17	262	108	122	384	58	167
27	44	82	16	5	1	21	247	104	116	367	52	159
28	45	71	16	5	1	24	313	95	84	357	44	148
29	50	60	16	4		28	315	87	63	339	45	133
30	55	54	15	3		35	317	86	50	315	44	121
31	63		14	2		40		84		299	43	

Ice conditions from Nov. 27, 1918 to April 14, 1919, inclusive.

Monthly Discharge of Brokenhead River, at Sinnat, for year ending September 30, 1919

[Drainage area, 530 square miles.]

Month.	Discharge in Second-Feet				Run-Off.	
	Maximum.	Minimum	Mean	Per square mile	Depth in inches on Drainage area	Total in acre-feet
October	63	18	45	0·085	0·098	2,767
November	313	54	142	0·268	0·299	8,450
December	50	14	24	0·045	0·052	1,476
January	13	2	7	0·013	0·015	430
February	3	1	2	0·004	0·004	111
March	40	1	8	0·015	0·017	492
April	695	46	395	0·745	0·831	23,504
May	308	84	166	0·313	0·361	10,207
June	191	50	102	0·192	0·214	6,069
July	1,584	49	782	1·475	1·700	48,083
August	265	44	120	0·226	0·261	7,379
September	196	32	119	0·225	0·251	7,081
The Year	1,584	1	160	0·302	1·099	115,124

MISCELLANEOUS METERINGS.

Measurements were obtained on the following streams in the municipalities of Dufferin, Roland and Grey:—

Boyne channel—1½ miles north of Homewood.
Elm creek—2 miles west of Elm creek.
Tobacco creek—2 miles north of Roland.

Discharge Measurements of Boyne Channel, 1¼ mile north of Homewood, for 1918-1919.

Date.	Gauge Height	Discharge.	Date.	Gauge Height	Discharge.
1919.	Feet	Sec.-ft	1919.	Feet	Sec.-ft
April 9	97·94	228	May 9	93·15	3
April 24	93·32	4	July 9		0

Discharge Measurements of Elm Creek, at Kenyon's Farm, for 1918-1919.

Date.	Gauge Height	Discharge.	Date.	Gauge Height.	Discharge.
1919	Feet	Sec.-ft	1919	Feet	Sec.-ft
April 10	98·42	0·3	July 9	95·50	0·0

Discharge Measurements of Tobacco Creek, 2 miles North of Roland, for 1919.

Date	Gauge Height	Discharge.	Date.	Gauge Height	Discharge.
	Feet	Sec.-ft		Feet	Sec.-ft
April 9	91·21	64·00	June 19	88·67	4·00
April 24	88·09	0·14	July 8	87·84	0·00
May 9	87·64	0·00			

Measurements were obtained on the following streams in the course of power investigations:

Churchill river.
Nelson river.
Rapid river.
Reindeer river.
Sturgeon-weir river.
Wanipigow river.

Discharge Measurements of Churchill River, above Attik Rapids, for 1919.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge.
Right Channel	Feet	Sec.-ft	*Left Channel*	Feet	Sec.-ft
			Aug 9	91·07	18,933
			Aug 20	90·92	18,476
Aug 9			Sept 25	91·01	18,885
Aug 20					
Sept 25					
	91·07	10·146	*Total Discharge*		
	90·80	9,733			
	91·00	10·599	Aug 9		29,079
			Aug 20		28,209
			Sept 25		29,484

Discharge Measurements of Nelson River, Vicinity of Whitemud Falls, for 1919.

Date.	Gauge Height.	Discharge.
	Feet	Sec.-ft
Eve's Falls Channel.	Approx. W. I.	
Sept 30	629·07	15,306

Date	Gauge Height	Discharge
	Feet	Sec.-ft
Whitemud Channel Below Whitemud Falls.	Approx. W. I.	
Sept 30	629·28	91,845
Ebb and Flow Channel, 1¼ miles above Whitemud Falls	Approx. W. I.	
Oct 1	669·04	9,688

Discharge Measurements of Rapid River, near outlet Rabbit Lake for 1919.

Date	Gauge Height	Discharge
	Feet	Sec.-ft
	W. I.	
Aug 17	105·84	271

Discharge Measurements of Rapid River, at Outlet Lac la Ronge, for 1919.

	Gauge Height	Discharge
	Feet	Sec.-ft
	W. I.	
Aug 16	95·38	938

Discharge Measurements of Reindeer River, above Deer Rapids, for 1919.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
1919	Feet	Sec.-ft	1919	Feet	Sec.-ft
	W. I.				
Aug 10	93·90	19,572	Aug 20	93·84	19,110

Discharge Measurements of Sturgeon-weir River, at Outlet of Beaver Lake, for 1919

Date	Gauge Height	Discharge
	Feet	Sec.-ft
Oct 1		93

Discharge Measurements of Sturgeon-weir River, at Stony [illegible]

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
	Feet	Sec.-ft		Feet	Sec.-ft
	W. I.			W. I.	
Aug	98·1	100	Sept Oct	98· 98·	

Discharge Measurements of Sturgeon-weir River, near Outlet of Deschambault Lake, for 1919.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
	Feet W.L.	Sec.-ft.		Feet W.L.	Sec.-ft.
Aug. 29	1,021·78	684	Sept. 12	1,021·61	352
			Oct. 9	1,021·77	660

Discharge Measurements of Sturgeon-weir River, near Outlet of Wood Lake, for 1919.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
	Feet W.L.	Sec.-ft.		Feet W.L.	Sec.-ft.
Aug. 23	1,031·53	63	Oct. 7	1,031·15	32
Sept. 18	1,031·17	36			

Discharge Measurements of Wanipigow River, at Silver Falls, for 1919.

Date	Gauge Height	Discharge	Date	Gauge Height	Discharge
	Feet	Sec.-ft.		Feet	Sec.-ft.
May 7	804·34	58	June 3	804·67	85

Discharge Measurements of Wanipigow River, at First Rapids below Wallace Lake, for 1919.

Date	Gauge Height	Discharge
	Feet	Sec.-ft.
June 4		74

Discharge Measurements of Wanipigow River Feeder (Maskeg Creek), at Wallace Lake, for 1919.

Date	Gauge Height	Discharge
	Feet	Sec.-ft.
May 4		15

PART III.

GAUGE RECORDS.

Lake of the Woods—Lake Gauge, Keewatin.—Station No 5ep4.

Location. Keewatin Lake bridge.

Records Available.—From May 1, 1913, to September 30, 1919.

Gauge. Vertical staff gauge on pile, south end of bridge.

Mean Daily Gauge Height in feet on Ont. D.P.W. Lake Gauge, at Keewatin, for year ending September 30, 1919.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.
1	1,059·89	1,059·79	1,059·80	1,059·92	1,060·00	1,060·12	1,059·75	1,059·81	1,060·95	1,060·63	1,060·99	1,060·61
2	1,059·53	1,059·22	1,059·83	1,059·90	1,060·02	1,060·16	1,059·72	1,059·87	1,059·94	1,060·87	1,061·07	1,060·19
3	1,059·75	1,059·62	1,059·83	1,059·94	1,060·03	1,060·13	1,059·72	1,059·79	1,059·92	1,061·08	1,060·98	1,060·18
4	1,059·56	1,059·82	1,059·83	1,059·89	1,060·02	1,060·16	1,059·70	1,059·73	1,059·85	1,061·30	1,061·00	1,060·22
5	1,059·56	1,059·86	1,059·80	1,059·94	1,060·03	1,060·15	1,059·67	1,059·84	1,059·84	1,061·39	1,061·01	1,060·15
6	1,059·75	1,059·60	1,059·86	1,059·90	1,060·03	1,060·15	1,059·73	1,059·87	1,060·01	1,061·54	1,060·84	1,060·12
7	1,060·00	1,059·72	1,059·86	1,059·91	1,060·03	1,060·16	1,059·69	1,059·84	1,060·08	1,061·75	1,060·63	1,060·09
8	1,059·74	1,059·57	1,059·88	1,059·92	1,060·03	1,060·13	1,059·70	1,059·93	1,060·10	1,061·83	1,060·76	1,060·00
9	1,059·74	1,059·62	1,059·82	1,059·92	1,060·03	1,060·10	1,059·71	1,059·96	1,060·09	1,061·56	1,060·74	1,060·15
10	1,059·65	1,060·00	1,059·86	1,059·90	1,060·03	1,060·12	1,059·69	1,059·97	1,060·18	1,061·55	1,060·86	1,060·17
11	1,059·76	1,060·02	1,059·89	1,059·88	1,060·03	1,060·08	1,059·72	1,060·03	1,060·17	1,061·57	1,060·81	1,060·07
12	1,059·65	1,059·90	1,059·89	1,059·90	1,060·03	1,060·09	1,059·73	1,060·00	1,060·27	1,061·62	1,061·91	1,059·27
13	1,059·60	1,059·82	1,059·90	1,059·91	1,060·02	1,060·00	1,059·77	1,060·19	1,060·25	1,061·77	1,060·67	1,060·27
14	1,059·69	1,059·89	1,059·89	1,059·94	1,060·02	1,059·99	1,059·75	1,060·11	1,060·16	1,061·46	1,060·63	1,060·17
15	1,059·62	1,059·82	1,059·92	1,059·96	1,060·02	1,060·02	1,059·73	1,059·98	1,060·23	1,061·57	1,060·72	1,060·20
16	1,059·63	1,059·89	1,059·89	1,059·90	1,060·04	1,060·05	1,059·72	1,059·95	1,060·23	1,061·56	1,060·50	1,060·10
17	1,059·50	1,059·85	1,059·88	1,059·91	1,060·05	1,060·01	1,059·76	1,060·02	1,060·28	1,061·66	1,060·62	1,060·16
18	1,059·77	1,059·58	1,059·91	1,059·92	1,060·01	1,059·98	1,059·76	1,060·04	1,060·27	1,061·57	1,060·68	1,060·26
19	1,059·72	1,060·70	1,059·90	1,059·96	1,060·05	1,059·92	1,059·76	1,059·92	1,060·20	1,061·52	1,060·82	1,060·28
20	1,059·59	1,059·67	1,059·91	1,059·94	1,060·05	1,059·92	1,059·80	1,059·98	1,060·26	1,061·54	1,060·60	1,060·17
21	1,059·75	1,059·59	1,059·88	1,059·96	1,060·07	1,059·91	1,059·82	1,060·00	1,060·30	1,061·36	1,060·62	1,060·24
22	1,059·63	1,059·80	1,059·92	1,059·95	1,060·10	1,059·89	1,059·80	1,059·96	1,060·35	1,061·39	1,060·76	1,060·10
23	1,059·57	1,059·97	1,059·92	1,059·94	1,060·15	1,059·93	1,059·77	1,059·92	1,060·46	1,061·20	1,060·55	1,060·28
24	1,059·35	1,059·85	1,059·92	1,059·97	1,060·09	1,059·93	1,059·82	1,060·02	1,060·39	1,061·33	1,060·49	1,060·18
25	1,059·50	1,060·78	1,059·93	1,060·01	1,060·13	1,059·88	1,059·83	1,060·02	1,060·63	1,061·38	1,060·46	1,060·07
26	1,059·56	1,060·00	1,059·90	1,060·01	1,060·13	1,059·86	1,059·86	1,060·06	1,060·48	1,061·27	1,060·39	1,060·48
27	1,059·70	1,060·02	1,059·90	1,060·02	1,060·12	1,059·83	1,059·83	1,060·07	1,060·68	1,061·21	1,060·33	1,059·96
28	1,059·53	1,059·77	1,059·91	1,060·03	1,060·11	1,059·80	1,059·87	1,060·07	1,060·79	1,061·22	1,060·40	1,060·04
29	1,059·58	1,059·74	1,059·88	1,060·01		1,059·76	1,059·92	1,060·02	1,060·81	1,061·21	1,060·35	1,060·03
30	1,059·58	1,059·72	1,059·94	1,060·01		1,059·81	1,059·87	1,060·18	1,060·76	1,061·01	1,060·23	1,060·18
31	1,059·55		1,059·87	1,060·00		1,059·77		1,060·11		1,060·97	1,060·39	

U.S.C. and G.S. datum.

Lake of the Woods—Automatic Gauge, Kenora.—Station No. 5PE4

Location.—Department of Public Works dock, Kenora.

Records Available.—From February, 1916, to September 30, 1919.

Gauge.—Gurley automatic water stage register on outer end of dock, Kenora.

Mean Daily Gauge Height in feet, of Lake of the Woods, Automatic Gauge, Kenora, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	1,059·79	1,059·66	1,059·75	1,059·84	1,059·94	1,060·06	1,059·71	1,059·79	1,059·93	1,060·87	1,061·01	1,060·53
2	1,059·52	1,059·66	1,059·76	clear	1,059·96	1,060·09	1,059·70	1,059·83	1,059·92	1,060·85	1,061·07	1,060·19
3	1,059·78	1,059·68	1,059·78	stopped	1,059·96	1,060·07	1,059·69	1,059·75	1,059·89	1,061·06	1,061·01	1,060·17
4	1,059·58	1,059·78	1,059·78	"	1,059·97	1,060·09	1,059·67	1,059·66	1,059·85	1,061·26	1,060·96	1,060·21
5	1,059·54	1,059·83	1,059·77	"	1,059·97	1,060·11	1,059·62	1,059·77	1,039·83	1,061·35	1,060·97	1,060·15
6	1,059·35	1,059·68	1,059·81	"	1,059·97	1,060·08	1,059·65	1,059·80	1,059·95	1,061·47	1,060·83	1,060·09
7	1,059·87	7,059·64	1,059·83	"	1,059·97	1,000·09	1,059·63	1,059·79	1,060·08	1,061·73	1,060·67	1,000·01
8	1,059·71	1,059·78	1,059·84	"	1,059·98	1,060·07	1,059·63	1,059·90	1,060·04	1,061·82	1,060·75	1,059·99
9	1,059·71	1,059·61	1,059·78	"	1,059·98	1,060·05	1,059·68	1,059·92	1,060·03	1,061·56	1,060·75	1,060·14
10	1,059·63	1,060·90	1,500·80	"	1,059·99	1,060·06	1,059·67	1,059·94	1,060·14	1,061·52	1,060·85	1,060·17
11	1,059·70	1,059·85	1,059·87	"	1,059·99	1,060·02	1,059·69	1,060·00	1,060·15	1,061·56	1,060·84	1,060·10
12	1,059·58	1,059·76	1,059·86	"	1,059·98	1,059·95	1,059·69	1,060·05	1,060·21	1,061·59	1,000·82	1,060·22
	1,059·48	1,059·77	1,059·86	"	1,059·94	1,059·93	1,059·70	1,060·11	1,060·19	1,061·75	1,060·66	1,060·21
	1,059·65	1,059·85	1,059·86	"	1,059·94	1,059·93	1,059·70	1,060·09	1,060·14	1,061·51	1,060·64	1,060·17
	1,059·58	1,059·78	1,059·87	"	1,059·98	1,059·95	1,059·69	1,059·97	1,060·17	1,061·56	1,060·71	1,060·17
	1,059·57	1,059·76	1,059·85	"	1,059·99	1,059·98	1,059·69	1,059·92	1,060·19	1,061·57	1,060·59	1,060·09
	1,059·46	1,059·74	1,059·86	"	1,059·98	1,059·94	1,059·71	1,059·98	1,060·26	1,061·62	1,060·55	1,060·13
	1,059·72	1,059·56	1,059·86	"	1,059·97	1,059·93	1,059·74	1,059·95	1,060·24	1,061·55	1,060·66	1,060·22
9	1,059·79	1,059·64	1,059·87	"	1,059·99	clock	1,059·74	1,059·89	1,060·16	1,061·51	1,060·78	1,060·26
20	1,059·54	1,059·64	1,059·87	1,059·89	1,060·00	stopped	1,059·73	1,059·94	1,060·27	1,061·53	1,060·71	1,060·25
21	1,059·71	1,059·54	1,059·84	1,059·90	1,060·02		1,058·78	1,059·94	1,060·27	1,061·40	1,060·60	1,060·17
22	1,059·67	1,059·77	1,059·84	1,059·88	1,060·05	"	1,059·76	1,059·91	1,060·40	1,061·38	1,060·68	1,060·11
23	1,059·51	1,059·95	1,059·87	1,059·89	1,060·06	"	1,059·75	1,059·89	1,060·43	1,061·23	1,060·53	1,060·21
24	1,059·59	1,059·87	1,059·88	1,059·91	1,060·04	1,059·88	1,059·78	1,059·93	1,060·54	1,061·33	1,060·47	1,060·07
25	1,059·45	1,059·74	1,059·88	1,059·95	1,060·07	1,059·85	1,059·80	1,059·96	1,060·55	1,061·36	1,060·43	1,060·06
26	1,059·50	1,059·95	1,059·85	1,059·93	1,060·07	1,059·82	1,059·81	1,059·99	1,060·45	1,061·25	1,060·36	1,060·25
27	1,059·61	1,059·91	1,059·86	1,059·95	1,060·07	1,059·81	1,059·80	1,060·02	1,060·62	1,061·21	1,060·32	1,059·97
28	1,059·48	1,059·76	1,059·86	1,059·95	1,060·06	1,059·77	1,059·82	1,060·04	1,060·75	1,061·20	1,060·40	1,059·96
29	1,059·54	1,059·64	1,059·84	1,059·94		1,059·72	1,059·87	1,059·98	1,060·76	1,061·18	1,060·33	1,060·01
30	1,059·56	1,059·73	1,059·81	1,059·96		1,059·74	1,059·85	1,060·10	1,060·72	1,061·00	1,060·23	1,060·14
31	1,059·52		1,059·83	1,059·93		1,059·72	..	1,060·06		1,060·97	1,060·36	

U.S.C. & G.S. datum.

Winnipeg River—West Branch—Station 5PE$_2$.

TAILRACE, NORMAN DAM.

Location.—Lower end of fishway, Norman dam.

Records Available.—From 1913 to September 30, 1919.

Gauge.—Vertical-staff gauge secured to north side of timber crib at fishway, Norman dam.

Mean Daily Gauge Height in feet, of West Branch of Winnipeg River, at Tailrace, at Norman Dam, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept
1	1,035·55		1,035·55	1,035·23	1,034·89	1,034·96	1,040·68	1,039·51	1,037·08		1,044·35	
2	1,035·58		1,035·59	1,035·32	1,034·46	1,034·71	1,040·73	1,039·53	1,037·21	1,040·43	1,044·35	1,042·90
3			1,035·75	1,035·36	1,034·71	1,034·81	1,040·73	1,039·52	1,037·31	1,041·23	1,044·10	1,042·95
4			1,035·80	1,035·35	1,034·83	1,035·01	1,040·78	1,039·27	1,037·35	1,041·88	1,043·85	1,042·90
5	1,035·72		1,035·85	1,035·18	1,034·86	1,035·03	1,040·83	1,039·13	1,037·30	1,042·33	1,044·05	1,042·95
6	1,035·27		1,035·85	1,035·38	1,034·87	1,035·26		1,039·18	1,037·26	1,043·13	1,044·15	1,042·70
7			1,035·85	1,035·52	1,034·89	1,035·91		1,039·18	1,037·26		1,044·15	1,042·25
8	1,035·55		1,035·36	1,035·57	1,034·89	1,036·83		1,038·98	1,037·01	1,043·97	1,044·05	1,042·08
9	1,035·62		1,035·49	1,035·60	1,034·71	1,037·38		1,038·33	1,036·93	1,041·35	1,044·05	1,042·03
10	1,035·65		1,035·76	1,0[illegible]·60	1,034·63	1,037·63		1,038·13	1,037·15	1,044·45	1,043·85	1,041·43
11	1,035·65		1,035·80	1,035·44	1,034·83	1,038·33		1,037·73	1,037·20	1,044·65	1,043·95	1,041·13
12	1,035·68		1,035·81	1,035·23	1,034·85	1,038·63		1,037·78	1,037·36	1,044·65	1,043·95	1,040·98
13	1,035·25		1,035·81	1,035·10	1,034·87	1,038·78		1,037·81	1,037·38	1,044·50	1,043·95	1,040·88
14	1,035·46		1,035·84	1,035·10	1,034·88	1,038,83	1,040·63	1,037·81	1,037·50	1,044·55	1,044·92	1,040·58
15	1,035·55		1,035·39	1,034·97	1,034·87	1,038·88	1,040·98	1,037·78	1,037·13	1,044·70	1,043·95	1,040·53
16	1,035·63		1,035·50	1,035·06	1,034·68	1,038·83	1,041,03	1,037·76	1,037·10	1,044·80	1,043·92	1,040·58
17	1,035·71		1,035·59	1,035·27	1,034·79	1,038·93	1,040·98	1,037·75	1,037·39	1,044·85	1,043·70	1,040·53
18	1,035·72		1,035·62	1,035·29	1,034·83	1,039·08	1,040·98	1,037·28	1,037·48	1,044·90	1,043·65	1,040·53
19	1,035·71		1,035·63	1,034·98	1,034·84	1,039·18	1,040·98	1,037·20	1,037·40	1,044·90	1,043·80	1,040·58
20	1,035·32	1,035·77	1,035·64	1,034·86	1,034·86	1,039·23	1,040·7[illegible]	1,037·55	1,037·40	1,044·50	1,043·80	1,040·53
21	1,035·35	1,035·80	1,035·64	1,035·01	1,034·88	1,039·25	1,040·73	1,037·55	1,037·43	1,044·55	1,043·60	1,040·38
22		1,035·80	1,035·43	1,034·91	1,034·89	1,034·28	1,036·58	1,040·54	1,037·28	1,044·70	1,043·45	1,040·26
23	1,035·74	1,035·79	1,035·51	1,034·96	1,034·69	1,039·03	1,040·08	1,037·53	1,037·58	1,044·80	1,043·25	1,040·25
24			1,035·63	1,035·05	1,034·71	1,039·03	1,040·03	1,037·08	1,037·66	1,044·75	1,043·00	1,040·23
25	1,035·82	1,045·57		1,034·94	1,034·86	1,039·23	1,039·93	1,036·93	1,037·76	1,044·75	1,042·95	1,040·14
26	1,035·82	1,035·70	1,035·42	1,034·76	1,034·91	1,039·73	1,039·83	1,037·13	1,037·76	1,044·65	1,043·10	1,040·21
27	1,035·34	1,034·72	1,035·57	1,034·71	1,034·94	1,040·08	1,039·48	1,037·23	1,037·78	1,044·45	1,043·15	1,040·18
28		1,035·76	1,035·60	1,034·68	1,034·93	1,040·48	1,039·33	1,037·26	1,038·13	1,044·40	1,043·10	1,039·80
29		1,035·80	1,035·20	1,034·64		1,040·53	1,039·53	1,037·26	1,039·03	1,044·60	1,043·10	1,039·86
30		1,035·80	1,035·52	1,034·71		1,040·38	1,039·58	1,037·30	1,039·78	1,044·50	1,043·10	1,040·08
31			1,035·50	1,034·83		1,040·43		1,037·30		1,044·40	1,042·85	

U.S.C. & G.S. datum.

Lake of the Woods—Kenora Power House.

Station No. 5PE1.

Tailrace gauge.

Location.—Fifty-five feet north of eastend of power-house.

Records Available.—From August, 1907, to September 30, 1919.

Gauge.—Vertical staff gauge.

Mean Daily Gauge Height, in feet, of East Branch of Winnipeg River, at Tail-Kenora Power House, for year ending September 30, 1919.

Day.	Oct.	Nov.	Dec	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	1,037·61	1,037·66	1,037·71	1,037·71	1,036·94	1,037·02	1,039·73	1,038·91	1,037·19	1,039·21	1,043·31	1,041·87
2	1,037·61	1,037·66	1,037·81	1,037·78	1,036·68	1,036·65	1,039·26	1,039·11	1,037·69	1,039·26	1,043·29	1,043·01
3	1,037·64	1,036·71	1,037·76	1,037·81	1,036·83	1,037·45	1,039·91	1,036·14	1,037·67	1,040·29	1,043·26	1,042·01
4	1,037·86	1,037·81	1,037·74	1,037·78	1,036·79	1,037·61	1,039·66	1,038·84	1,037·70	1,040·74	1,042·82	1,042·00
5	1,037·66	1,037·66	1,037·79	1,037·04	1,036·79	1,037·60	1,039·64	1,038·77	1,036·83	1,041·26	1,042·97	1,043·06
6	1,036·68	1,037·71	1,037·82	1,037·74	1,036·82	1,037·58	1,036·93	1,038·82	1,036·78	1,041·73	1,043·21	1,482·10
7	1,037 61	1,037 66	1,037 76	1,037 61	1,036 78	1,037 84	1,039 76	1,038 84	1,036 78	1,042 07	1,043 11	1,041·77
8	1,037 61	1,037 66	1,036 74	1,037·78	1,036·82	1,037·64	1,039·82	1,038·63	1,036·70	1,042·68	1,043·06	1,041·44
9	1,037·86	1,037·66	1,037·74	1,037·78	1,036·64	1,036·82	1,036·96	1,038·26	1,036·69	1,043·22	1,043·00	1,041·38
10	1,037·61	1,036·76	1,037·76	1,037·72	1,036·84	1,037·84	1,040·06	1,038·13	1,036·66	1,043·37	1,042·91	1,040·93
11	1,037·64	1,036·96	1,037·72	1,037·84	1,036·79	1,037·84	1,040·06	1,037·68	1,036·70	1,043·53	1,042·76	1,040·65
12	1,037·66	1,037·71	1,037·76	1,037·01	1,036·78	1,038·05	1,040·13	1,037·76	1,036·94	1,043·65	1,042·89	1,040·47
13	1,036·46	1,037·61	1,037·69	1,036·89	1,036·59	1,037·95	1,040·09	1,037·89	1,037·46	1,043·44	1,042·90	1,040·32
14	1,037·61	1,037·71	1,037·71	1,037·19	1,036·74	1,038·28	1,040·09	1,037·89	1,037·63	1,043·40	1,042·98	1,040·04
15	1,037·66	1,037·71	1,038 91	1,037·13	1,036·79	1,038·32	1,040·34	1,037·94	1,036·82	1,043·60	1,043·05	1,039·78
16	1,036·96	1,037·64	1,037·81	1,037·13	1,036·68	1,038·06	1,040·44	1,037·89	1,037·46	1,043·73	1,042·90	1,039·94
17	1,037·71	1,036·71	1,037·74	1,037·13	1,036·74	1,038·40	1,040·50	1,037·88	1,037·56	1,043·83	1,042·83	1,039·84
18	1,037·68	1,037·71	1,037·74	1,037·16	1,036·74	1,038·52	1,040·54	1,037·36	1,036·66	1,043·93	1,042·55	1,039·79
19	1,037·68	1,037·66	1,037·76	1,036·83	1,036·74	1,038·70	1,040·34	1,037·67	1,036·83	1,043·85	1,042·70	1,039·96
20	1,036·61	1,037·66	1,037·74	1,037·11	1,036·69	1,038·75	1,040·31	1,037·80	1,036·83	1,043·83	1,042·77	1,039·92
21	1,037·66	1,037·71	1,037·74	1,037·14	1,036·74	1,038·80	1,040·00	1,037·78	1,036·90	1,043·50	1,042·79	1,039·50
22	1,037·66	1,037·71	1,037·69	1,037·68	1,036·74	1,038·75	1,040·16	1,037·76	1,036·83	1,043·70	1,042·48	1,039·34
23	1,037·74	1,037·66	1,037·79	1,037·70	1,036·56	1,038·44	1,039·78	1,037·71	1,036·98	1,043·80	1,042·37	1,039·44
24	1,037·76	1,037·62	1,037·78	1,037·72	1,036·58	1,038·34	1,039·61	1,037·18	1,037·62	1,043·74	1,042·24	1,039·44
25	1,037·71	1,037·71	1,037·06	1,037·68	1,036·78	1,038·51	1,036·51	1,036·74	1,037·71	1,043·78	1,042·05	1,039·42
26	1,037·71	1,037·74	1,037·79	1,036·84	1,036·74	1,038·90	1,039·41	1,037·86	1,037·76	1,043·68	1,042·15	1,039·68
27	1,036·74	1,037·71	1,037·74	1,036·78	1,036·83	1,039·24	1,039·04	1,037·61	1,037·76	1,043·48	1,042·15	1,039·91
28	1,037·71	1,037·71	1,037·74	1,036·93	1,036·78	1,039·61	1,038,96	1,037·64	1,037·66	1,043·40	1,042·16	1,039·35
29	1,037·66	1,037·76	1,037·84	1,036·81		1,039·65	1,039·06	1,037·96	1,036·94	1,043·45	1,042·21	1,039·25
30	1,037·66	1,037·84	1,037·84	1,036·94		1,039·78	1,039·14	1,037·62	1,038·48	1,043·42	1,042·14	1,039·32
31	1,037·76		1,037·76	1,036·94		1,039·36		1,037·04		1,043·36	1,042·10	...

U.S.C. & G.S. datum.

Winnipeg River—Gauge at Mill "A", Keewatin.

Location.—On arm of Winnipeg river known as Darlington bay, at Mill "A", Lake of the Woods Milling Company, Keewatin.

Records Available.—From June, 1913, to September 30, 1919.

Gauge.—Vertical-staff gauge.

Mean Daily Gauge Height, in feet, of Ont. D.P.W. River Gauge, at Mill "A" Keewatin, for the year ending September 30, 1919.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.
1	1,035·35	....	1,035·40	1,035·22	1,034·61	1,034·33	1,040·49	1,039·33	1,037·23	1,039·95	1,044·34	1,043·71
2	1,035·41		1,035·43	1,035·35	1,034·61	1,034·69	1,040·57	1,039·37	1,035·99	1,040·23	1,044·22	1,042·66
3	1,035·43	1,035·20	1,035·37	1,035·32	1,034·64	1,034·76	1,040·61	1,039·96	1,037·13	1,041·06	1,043·98	1,042·85
4	1,035·43	1,035·05	1,035·00	1,035·40	1,034·76	1,034·89	1,040·67	1,039·11	1,037·19	1,041·76	1,043·71	1,042·88
5	1,035·51	1,035·15	1,035·06	1,035·22	1,034·75	1,034·96	1,040·68	1,038·96	1,037·16	1,042·33	1,043·55	1,042·55
6	1,035·24	1,035·20	1,035·07	1,035·27	1,034·76	1,035·35	1,040·46	1,038·96	1,037·11	1,042·06	1,044·06	1,042·81
7	1,035·16	1,035·20	1,035·07	1,035·45	1,034·78	1,035·96	1,040·36	1,038·90	1,037·08	1,043·13	1,043·96	1,042·39
8	1,035·41	1,035·30	1,035·24	1,035·52	1,034·79	1,036·75	1,040·50	1,038·64	1,036·92	1,043·78	1,043·94	1,041 86
9	1,035·43	1,035·25	1,035·33	1,035·57	1,034·61	1,037·14	1,040·65	1,038·13	1,036·61	1,044·16	1,043·88	1,041·0m
10	1,035·48	1,035·15	1,035·56	1,035·58	1,034·61	1,037·38	1,040·74	1,037·96	1,036·99	1,044·38	1,043·65	1,041,22
11	1,035·48	1,035·10	1,035·60	1,035·46	1,034·72	1,035·12	1,040·75	1,037·67	1,037·02	1,044·46	1,043·72	1,040·98
12	1,035·49	1,035·20	1,035·62	1,035·16	1,034·76	1,038·39	1,040·77	1,037·48	1,037·06	1,044·49	1,043·89	1,040·85
13	1,035·20	1,035·36	1,035·62	1,035·05	1,034·78	1,038·52	1,040·58	1,037·64	1,037·23	1,044·32	1,043·78	1,040·77
14	1,035·14	1,035·35	1,035·64	1,034·99	1,034·76	1,038·60	1,040·58	1,037·65	1,037·29	1,044·38	1,043·78	1,040·47
15	1,035·40	1,035·42	1,035·24	1,034·87	1,034·79	1,038·67	1,040·80	1,037·64	1,037·08	1,044·62	1,043·86	1,040·29
16	1,035·45	1,035·45	1,035·24	1,035·07	1,034·62	1,038·59	1,040·87	1,037·59	1,036·96	1,044·62	1,043·78	1,040·34
17	1,035·50	1,035·25	1,035·55	1,035·22	1,034·63	1,038·72	1,040·97	1,037·57	1,037·34	1,044·74	1,043·61	1,040·36
18	1,035·52	1,035·29	1,035·58	1,035·22	1,034·73	1,038·92	1,040·98	1,037·35	1,037·22	1,044·80	1,043·48	1,040·23
19	1,035·51	1,035·47	1,035·58	1,034·96	1,034·74	1,038·97	1,040·85	1,037·14	1,037·21	1,044·78	1,043·63	1,040 32
20	1,035·24	1,035·55	1,035·60	1,034·83	1,034·76	1,039·03	1,040·70	1,037·36	1,037·20	1,044·38	1,043·64	1,040·21
21	1,035·21	1,035·60	1,035·63	1,034·91	1,034·76	1,039·05	1,040·59	1,037·39	1,037·20	1,044·39	1,043·48	1,040·12
22	1,035·48	1,035·60	1,035·33	1,034·82	1,034·79	1,039·07	1,040·34	1,037·37	1,037·08	1,044·58	1,043·34	1,039·91
23	1,035·53	1,035·55	1,035·44	1,034·80	1,034·63	1,038·85	1,039·98	1,037·34	1,037·22	1,044·62	1,043·19	1,040·12
24	1,035·61	1,035·25	1,035·60	1,034·98	1,034·65	1,035·64	1,039·82	1,037·16	1,037·43	1,044·60	1,042·93	1,040·09
25	1,035·63	1,035·39	1,035·29	1,034·84	1,034·79	1,039·16	1,039·72	1,036·18	1,037·56	1,044·62	1,042·89	1,040·00
26	1,035·61	1,035·48	1,035·22	1,034·76	1,034·82	1,039·86	1,039·63	1,038·78	1,037·58	1,044·60	1,043·01	1,040·13
27	1,035·30	1,035·51	1,035·51	1,034·68	1,034·82	1,040·00	1,039·33	1,037·09	1,037·64	1,044·35	1,043·00	1,040·16
28	1,035·23	1,035·56	1,035·56	1,034·60	1,034·63	1,040·20	1,039·21	1,037·18	1,038·20	1,044·26	1,043·01	1,039·83
29	1,035·55	1,035·60	1,035·32	1,034·61		1,040·46	1,039·35	1,037·11	1,035·72	1,044·27	1,043·06	1,039·72
30	1,035·63	1,035·63	1,035·42	1,034·65	..	1,040·28	1,039·37	1,037·09	1,039·22	1,044·33	1,043·99	1,039·93
31	1,035·55		1,035·53	1,034·77	.....	1,040·31	..	1,037·12		1,044·29	1,043·82	...

U.S.C. & G.S. datum

WINNIPEG RIVER—HEAD OF PINE FALLS. STATION NO. 4 (Con.)

Location.—Left bank of river close to the head of Pine falls.

Records Available. Intermittent records of daily gauge height are available from 1911 to September 30, 1919.

Gauge. Vertical-staff gauge.

Mean Daily Gauge Height in feet of Winnipeg River, at Head of Pine Falls, for year ending September 30, 1919.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1.	720·57	720·59	721·57								725·13	724·17
2	720·57	720·57	721·57								725·09	724·17
3	720·57	720·57	721·27								725·05	724·15
4	720·57	720·57	721·22								725·02	724·13
5	720·57	720·62	721·17								725·00	724·12
6	720·57	720·67	721·12								724·97	724·11
7	720·57	720·72	721·07								724·94	724·12
8	720·62	720·77	721·07								723·89	724·14
9	720·67	720·82	721·13								724·86	724·12
10	720·72	720·87	721·12								724·84	724·11
11	720·77	720·92	721·14								724·82	724·10
12	720·82	720·92	721·32								724·80	724·07
13	720·87	720·92	721·17								724·79	724·04
14	720·82	720·90	721·12								724·77	724·02
15	720·77	720·89	721·12								724·76	723·97
16	720·77	720·87	721·07								724·75	723·92
17	720·79	720·87	721·07								724·72	723·87
18	720·80	720·87	721·07								724·70	723·77
19	720·82	720·92								724·72	724·67	723·72
20	720·77	721·03								724·72	724·65	723·67
21	720·75	721·07								724·82	724·52	721·62
22	720·72	721·05								724·86	724·60	723·52
23	720·69	721·04								724·86	724·59	723·42
24	720·67	721·02								724·88	724·57	723·32
25	720·65	721·00								724·92	724·52	723·22
26	720·64	720·99								724·96	724·48	723·12
27	720·62	720·97								725·02	724·47	722·97
28	720·62	721·02								725·05	724·42	722·92
29	720·62	721·02								725·07	724·37	722·97
30	720·62	721·07								725·12	724·32	722·92
31	720·60									725·17	724·27	

W.P.S. datum.

LAC SEUL.—HUDSON BAY POST.—AUTOMATIC GAUGE.—STATION NO. 5 QB6.

Location.—One hundred feet northwest of inshore end of Hudson's Bay Company's dock.

Records Available.—From September 11, 1914, to September 30, 1919.

Gauge.—Gurley automatic water-stage register.

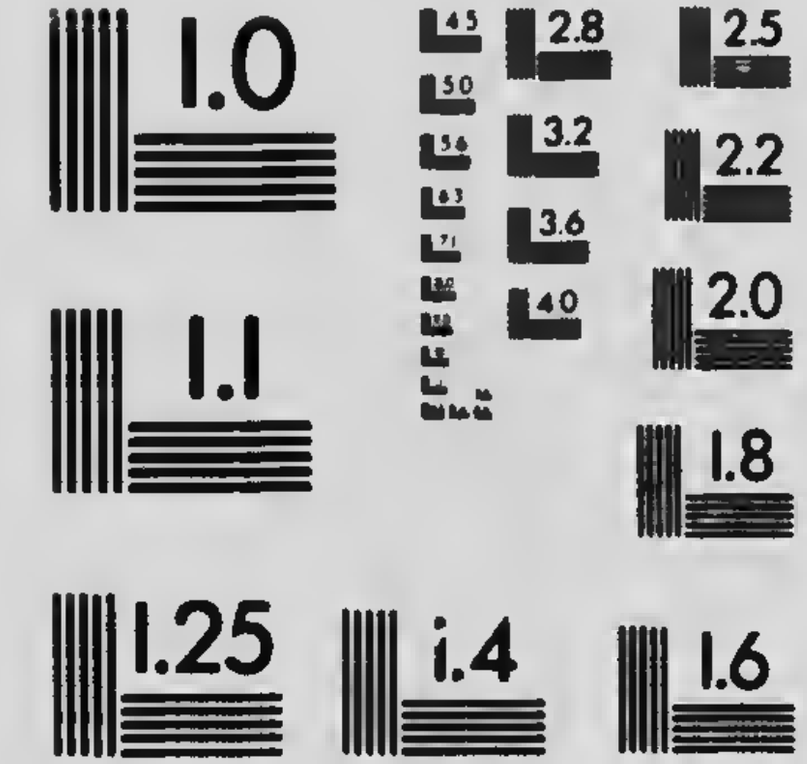
Mean Daily Gauge Height (in feet) of Lac Seul, at Hudson Bay Post, Lac Seul, Automatic Gauge, for year ending September 30, 1919.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1	1,159·30	1,158·92	1,159·50	1,159·68	1,159·33	1,158·99	clock	1,158·56	1,158·87	1,159·50	1,159·35	1,159·49
2	1,159·27	1,158·91	1,159·51	1,159·65	1,159·33	1,158·93	stopped	1,158·57	1,158·90	1,159·56	1,159·54	1,159·47
3	1,159·26	1,158·90	1,159·51	1,159·68	1,159·31	1,158·94	"	1,158·57	1,158·91	1,159·63	1,159·52	1,159·45
4	1,159·25	1,158·89	1,159·51	1,159·65	1,159·31	1,158·91	"	1,158·57	1,158·95	1,159·65	1,159·49	1,159·44
5	1,159·25	1,158·94	1,159·53	1,159·64	1,159·28	1,158·90	"	1,158·57	1,159·03	1,159·67	1,159·47	1,159·42
6	1,159·23	1,159·00	1,159·54	1,159·64	1,159·28	1,158·88	"	1,158·59	1,159·09	1,159·69	1,159·46	1,159·40
7	1,159·22	1,159·06	1,159·47	1,159·64	1,159·27	1,158·87	1,158·75	1,158·61	1,159·10	1,159·70	1,159·45	1,159·44
8	1,159·21	1,159·18	1,159·55	1,159·61	1,159·25	1,158·85	1,158·71	1,158·62	1,159·11	1,159·71	1,159·43	1,159·50
9	1,159·19	1,159·21	1,159·55	1,159·62	1,159·24	1,158·84	1,158·67	1,158·63	1,159·14	1,159·75	1,159·41	1,159·62
10	1,159·16	1,159·25	1,159·58	1,159·59	1,159·24	1,158·83	1,158·65	1,158·63	1,159·16	1,159·73	1,159·38	1,159·61
11	1,159·15	1,159·26	1,159·60	1,159·56	1,159·22	1,158·81	1,158·62	1,158·65	1,159·18	1,159·71	1,159·38	1,159·63
12	1,159·13	1,159·27	1,159·60	1,159·58	1,159·19	1,158·78	1,158·59	1,158·66	1,159·21	1,159·69	1,159·40	1,159·61
13	1,159·12	1,159·27	1,159·62	1,159·58	1,159·18	1,158·76	1,158·68	1,158·71	1,159·22	1,159·70	1,159·37	1,159·61
14	1,159·11	1,159·24	1,159·61	1,159·55	1,159·17	1,158·76	1,158·71	1,158·72	1,159·26	1,159·70	1,159·60	1,159·64
15	1,159·08	1,159·29	1,159·63	1,159·56	1,159·11	1,158·77	1,158·70	1,158·72	1,159·28	1,159·69	1,159·62	1,159·65
16	1,159·05	1,159·18	1,159·18	1,159·55	1,159·11	1,158·74	1,158·68	1,158·73	1,159·29	1,159·70	1,159·63	1,159·64
17	1,159·04	1,159·29	1,159·64	1,159·54	1,159·10	1,158·70	1,158·65	1,158·74	1,159·32	1,159·69	1,159·66	1,159·64
18	1,159·04	1,159·24	1,159·65	1,159·51	1,159·08	1,158·70	1,158·63	1,158·76	1,159·19	1,159·68	1,159·68	1,159·65
19	1,159·06	1,159·29	1,159·67	1,159·50	1,159·08	1,158·69	1,158·60	1,158·77	1,159·05	1,159·68	1,159·68	1,159·67
20	1,159·04	1,159·29	1,159·67	1,159·49	1,159·08	1,158·64	1,158·58	1,158·77	1,159·07	1,159·68	1,159·68	1,159·67
21	1,159·02	1,159·32	1,159·67	1,159·47	1,159·07	1,158·63	1,158·57	1,158·78	1,159·08	1,159·69	1,159·69	1,159·64
22	1,159·01	1,159·35	1,159·67	1,159·41	1,159·09	1,158·62	1,158·56	1,158·79	1,159·09	1,159·68	1,159·66	1,159·65
23	1,158·98	1,159·42	1,159·66	1,159·45	1,159·04	1,158·62	1,158·56	1,158·81	1,159·08	1,159·67	1,159·67	1,159·68
24	1,159·01	1,159·46	1,159·68	1,159·45	1,159·02	1,158·61	1,158·56	1,158·79	1,159·07	1,159·64	1,159·66	1,159·69
25	1,158·97	1,159·44	1,159·69	1,159·40	1,159·02	1,158·60	1,158·56	1,158·79	1,159·07	1,159·63	1,159·64	1,159·69
26	1,158·96	1,159·47	1,159·68	1,159·41	1,159·00	1,158·60	1,158·57	1,159·80	1,159·08	1,159·63	1,159·62	1,159·71
27	1,158·95	1,159·48	1,159·67	1,159·40	1,158·99	1,158·64	1,158·57	1,159·81	1,159·08	1,159·67	1,159·57	1,159·69
28	1,158·99	1,159·48	1,159·69	1,159·38	1,158·98	1,158·62	1,158·53	1,158·82	1,159·07	1,159·67	1,159·53	1,159·67
29	1,158·95	1,159·48	1,159·66	1,159·38		1,158·60	1,158·56	1,158·82	1,159·04	1,159·62	1,159·54	1,159·67
30	1,158·93	1,159·49	1,159·65	1,159·36		1,158·58	1,158·57	1,158·81	1,159·04	1,159·60	1,159·52	1,159·67
31	1,158·93		1,159·67	1,159·33		*		1,158·85		1,159·58	1,159·49	

* Clock stopped. W.P.S. Datum.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

PART IV.

METEOROLOGICAL DATA.

Meteorological Station, Keewatin, Ont.

Location.—In bay at Keewatin.

Records Available.—From 1913 to September 30, 1919.

Monthly Record of Meteorological Station at Keewatin, Ont., for year ending September 30, 1919.

Mean Monthly Temperature of Lake.

Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	Jun.	July.	Aug.	Sept.
50·6	35·7	32	32	32	32	37·8	49·3	68·0	69·8	70·2	62·8

Mean Monthly Temperature of Tank.

50·5	..	..	..	..	..	..	54·5	70·0	71·9	71·7	63·3

Mean Monthly Temperature of Day.

44·0	23·7	13·8	..	9·4	18·5	39·8	57·3	67·8	68·7	66·3	56·2

Mean Monthly Wind Velocity in Miles.

7·7	8·3	4·2	6·0	5·1	6·0	6·7	5·6	6·0	6·4	5·9	6·0

Mean Monthly Barometric Pressure..

28·34	28·31	28·38	28·35	28·33	28·44	28·34	28·31	28·39	28·27	78·25	28·27

Mean Monthly Humidity%.

0·75	90	..	..	..	..	..	67	55	66	63	65	77

Total Monthly Evaporation in Inches.

2·18	..	..	..	..	..	..	1·78	3·21	2·73	3·26	3·14

Total Monthly Precipitation in Inches.

5·00	2·03	1·72	0·42	0·95	1·76	1·32	1·33	4·06	5·72	4·36	4·84

Daily records will be furnished on application to the Director of Water Power.

Meteorological Station, Pinawa, Man.

Location.—In Forebay about one hundred yards above the racks of the Winnipeg Electric Railway Company's plant at Pinawa.

Records Available.—From May 30, 1915, to September 30, 1919.

Monthly Record of Meteorological Station at Pinawa, Man., for year ending September 30, 1919.

Mean Monthly Temperature of Day.

Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
40·5	28·9	12·0	10·1	3·0	14·0	38·6	56·6	66·4	67·8	64·3	53·4

Total Monthly Evaporation in inches.

...							1·50	3·29	3·47	3·28	3·17

Total Monthly Precipitation in Inches.

2·48	1·80	0·66	0·53	0·34	0·69	1·44	0·95	3·56	5·15	2·98	3·31

Daily records will be furnished on application to the Director of Water Power.

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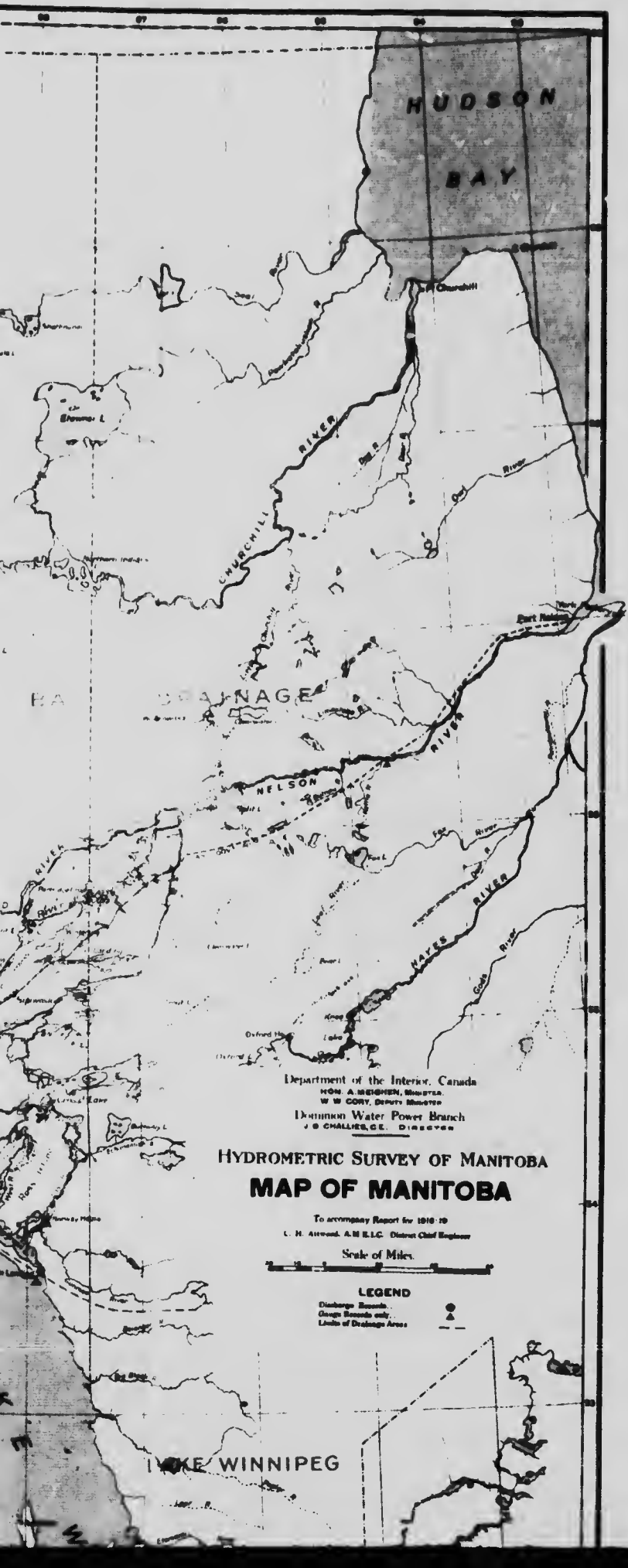
REINDEER
LAKE
SASKATCHEWAN RIVER
DRAINAGE
PORCUPINE MT


HUDSON
BAY
CHURCHILL
RIVER
NELSON
RIVER
HAYES
RIVER
Department of the Interior, Canada
HON. A. MEIGHEN, Minister
W. W. CORY, Deputy Minister
Dominion Water Power Branch
J. B. CHALLIES, C.E., Director
HYDROMETRIC SURVEY OF MANITOBA
MAP OF MANITOBA
To accompany Report for 1918-19
L. H. Atwood, A.M.E.I.C., District Chief Engineer
Scale of Miles.
LEGEND
Discharge Records
Gauge Records only
Limits of Drainage Areas
WINNIPEG


DRAINAGE
LAKE
PORCUPINE MT
SECOND MERIDIAN
SASKATCHEWAN
MANITOBA
RIDING MOUNTAIN
ASSINIBOINE
DRAINAGE
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MANITOBA
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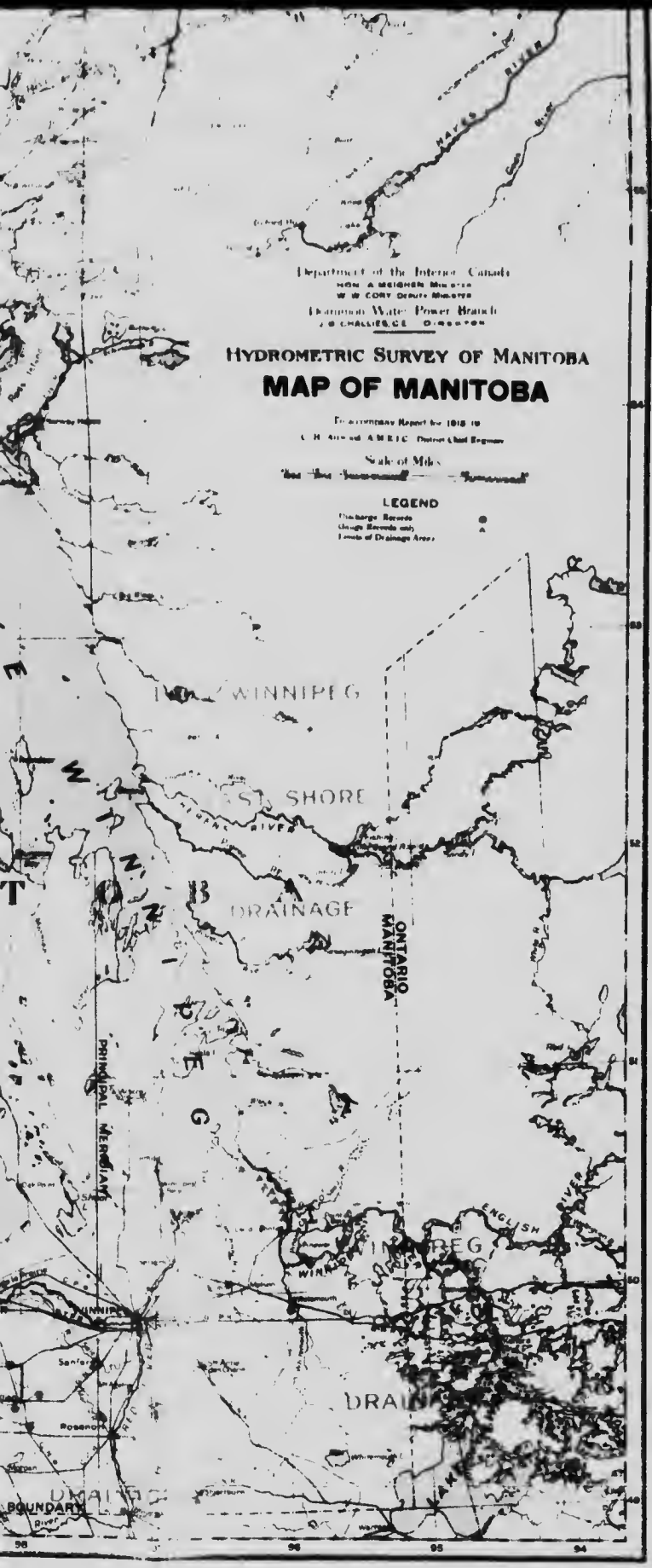
Department of the Interior, Canada
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HYDROMETRIC SURVEY OF MANITOBA
MAP OF MANITOBA
Scale of Miles
LEGEND
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DRAINAGE
ONTARIO
MANITOBA
PRINCIPAL MERIDIAN
ENGLISH
BOUNDARY

CLASSIFIED LIST OF REPORTS

The Reports published by the Dominion Water Power Branch, with the exception of the Annual Reports, have been called Water Resources Papers, and have been numbered, 1, 2, etc.

Annual Reports previous to 1913 are included with the Annual Reports of the Department of the Interior, and can be secured from the Secretary of the Department.

Annual Report for 1912-13, published 1914. Out of print.

Annual Report for 1913-14, published 1915.

Annual Report for 1914-15, published 1916.

Annual Report for 1915-16, published 1917.

Annual Report for 1916-17, published 1918.

Annual Report for 1917-18 and

Annual Report for 1918-19, published 1920.

Annual Report for 1919-20, in course of preparation.

WATER RESOURCES PAPER No. 1.—Report of the Railway Belt Hydrometric Survey for 1911-12, by P. A. Carson, Chief Engineer. Part I outlines the history of the Railway Belt with special reference to its administrative, legal and physical problems in regard to water. Describes the organization, scope and methods of the Hydrometric Survey. Parts II, III and IV give all hydrometric data acquired from the commencement of the survey in May, 1911, to the end of 1912. Published 1914.

WATER RESOURCES PAPER No. 2.—Report on Bow River Power and Storage Investigations (Bow River west of Calgary) by M. C. Hendry, Chief Engineer in charge of surveys. This is a complete study of the Bow river west of Calgary. It deals with meteorological conditions and their effect on run-off and ice formation. Existing and possible power and storage developments, together with maps and plans are appended complete. Published 1914.

WATER RESOURCES PAPER No. 3.—Report on Power and Storage Investigations, Winnipeg River, by J. T. Johnston, Chief Hydraulic Engineer, Dominion Water Power Branch. A complete study based on field surveys and office computations of the Winnipeg River basin; deals fully with history, international considerations, topography, climate, storage possibilities; describes existing and gives preliminary designs and estimates for possible power developments; discusses other sources of power and the power market. Maps, plans and all relevant data are appended. Published 1915.

WATER RESOURCES PAPER No. 4.—Report of the Manitoba Hydrometric Survey to end of 1914, by M. C. Hendry, Chief Engineer. Part I outlines organization and scope, districts and methods of survey. Part II contains complete hydrometric data secured during 1912-13-14. Part III is a gazetteer of lakes and rivers in Manitoba. Published 1917.

WATER RESOURCES PAPER No. 5.—Preliminary Report on the Pasqua Reclamation Project, by T. H. Dunn, Chief Engineer in charge of Reclamation Survey. This is a progress report of investigations carried out to determine the possibility of lowering the level of Cedar lake and its effect in a general scheme for reclaiming the low-lying lands contiguous to the Saskatchewan river in the Pasqua region. Published 1914. Out of print.

WATER RESOURCES PAPER No. 6.—Report on cost of various sources of power for pumping in connection with the South Saskatchewan Water Supply Diversion Project, by H. E. M Kensit. It deals with the problem of power for pumping water from the South Saskatchewan river for the supply of cities and towns in the central portion of South Saskatchewan. Published 1914. Out of print.

WATER RESOURCES PAPER No. 7.—Report on the Manitoba Water Powers, by D.L. McLean, S. S. Scovil and J. T. Johnston, compiled for the Manitoba Public Utilities Commission. A general survey of the water-power situation in Manitoba, with all available general information and hydrometric data published to date in condensed form concerning the rivers in Manitoba. Published 1914.

WATER RESOURCES PAPER No. 8.—Report of the British Columbia Hydrometric Survey for 1913, by R. G. Swan, Chief Engineer, in co-operation with the Provincial Water Rights Branch, Victoria, B.C. Continues the hydrometric work of the Railway Belt Hydrometric Survey with scope enlarged so as to cover territory beyond the Railway Belt. Published 1915.

WATER RESOURCES PAPER No. 9.—Report of Red River Navigation Surveys, by S. S. Scovil, Assistant Chief Engineer of Manitoba Hydrometric Surveys. In course of preparation.

WATER RESOURCES PAPER No. 10.—General Guide for Compilation of Water Power Reports of the Dominion Water Power Branch, prepared for the guidance of field engineers of the Dominion Water Power Branch by J. T. Johnston, Chief Hydraulic Engineer. Published 1915. Limited edition.

WATER RESOURCES PAPER No. 11.—Second Report on the Pasqua Reclamation Project by T. H. Dunn, Chief Engineer in charge of Reclamation Survey. This is a continuation report based on further investigations as outlined under Water Resources Paper No. 5. Published 1915.

WATER RESOURCES PAPER No. 12.—Report on Small Water Powers in Western Canada and discussion of sources of power for the Farm, by A. M. Beale. Part I is a brief description of certain small western water-power developments. Part II gives an analysis of requirements and cost data for the farm power supply. Published 1915.

CLASSIFIED LIST OF REPORTS—Concluded.

WATER RESOURCES PAPER No. 13.—Report of the Coquitlam-Buntzen Hydro-Electric Development. A complete description of the project and of the details of construction, with plans, diagrams and illustrations, by G. R. G. Conway, Chief Engineer of the British Columbia Electric Railway Company, Limited. Published 1915.

WATER RESOURCES PAPER No. 14.—Report of the British Columbia Hydrometric Survey for 1914 by R. G. Swan, Chief Engineer. Continues the hydrometric work and data acquired as outlined in Water Resources Paper No. 8 to the close of the calendar year 1914. Published 1915.

WATER RESOURCES PAPER No. 15.—Report on the Water Powers of Alberta and Saskatchewan by C. H. Attwood, Chief Engineer Alberta and Saskatchewan Power Surveys. In course of preparation.

WATER RESOURCES PAPER No. 16.—Water Powers of Canada. A series of five pamphlets in one volume covering the water-power situation in Canada, prepared for distribution at the Panama Pacific Exposition, San Francisco, 1915, by G. R. G. Conway, Consulting Engineer, Toronto; Percival H. Mitchell, Consulting Engineer, Toronto; H. G. Acres, Hydraulic Engineer, Hydro-Electric Power Commission, Ontario; F. T. Kaelin, Asst. Chief Engineer, Shawinigan Water and Power Co., Montreal; K. H. Smith, Engineer, Nova Scotia Water Power Commission, Halifax, N.S. Published 1916.

WATER RESOURCES PAPER No. 17.—Canadian Hydraulic Power Development and Electric Power in Canadian Industry, by Percival H. Mitchell, Consulting Engineer to Dominion Water Power Branch. Part I deals with progress of utilization, features in design, construction and operation specially applicable to Canada. Description of certain typical Canadian water-power developments. Part II analyses the uses, growth and future of electrical power in Canadian Industry. Published 1916.

WATER RESOURCES PAPER No. 18.—Report of the British Columbia Hydrometric Survey for 1915, by R. G. Swan, Chief Engineer. Continues the hydrometric work of the survey to the close of the calendar year 1915. Published 1917.

WATER RESOURCES PAPER No. 19.—Report of the Manitoba Hydrometric Survey for 1915, by M. C. Hendry, Chief Engineer. Continues the hydrometric work of the survey to the close of the calendar year 1915. Published 1917.

WATER RESOURCES PAPER No. 20.—Report on the Interests Dependent on Winnipeg River Power, with Special Reference to the Capital Invested and the Labour Employed, by H. E. M. Kensit. A detailed study of the industrial growth and future power requirements of the district tributary to the Winnipeg River power sites. Published 1917.

WATER RESOURCES PAPER No. 21.—Report of the British Columbia Hydrometric Survey for 1916, by R. G. Swan, Chief Engineer. Continues the hydrometric work of the survey to the close of the calendar year 1916. Published 1918.

WATER RESOURCES PAPER No. 22.—Report of the Manitoba Hydrometric Survey for 1916, by M. C. Hendry, Chief Engineer. Continues the hydrometric work of the survey to the close of the calendar year 1916. Published 1918.

WATER RESOURCES PAPER No. 23.—Report of the Hydrometric Survey of British Columbia for 1916-17 and 17-1918, by R. G. Swan, Chief Engineer. Continues the hydrometric work of the survey to September 30, 1918. Inaugurates the use of the climatic year in place of the calendar year. Published 1919.

WATER RESOURCES PAPER No. 24.—Report of the Hydrometric Survey of Manitoba for 1916-17 and 1917-18, by M. C. Hendry, Chief Engineer. Continues the hydrometric work of the survey to September 30, 1918. Inaugurates the use of the climatic year in place of the calendar year. Published 1919.

WATER RESOURCES PAPER No. 25. Report of the Hydrometric Survey of British Columbia for the Climatic Year 1918-19, by R. G. Swan, Chief Engineer. Continues the hydrometric work of the Survey to September 30, 1919. Published 1921.

WATER RESOURCES PAPER No. 26. Report of the Hydrometric Survey of Manitoba for the Climatic Year 1918-19, by C. H. Attwood, Chief Engineer. Continues the hydrometric work of the Survey to September 30, 1919. Published 1921.

WATER RESOURCES PAPER No. 27.—Directory of Central Electric Stations in Canada to January 1, 1919, compiled by J. T. Johnston, Asst. Director, Dominion Water Power Branch. Comprises an analysis of the central electric census statistics, and a directory of the stations. Published 1919.