

WILLAMETTE RIVER AT ALBANY, OREG.

Date	Discharge second-feet	Run-off acre-feet
<u>1918</u>		
Oct.	3,370	207,000
Nov.	6,600	393,000
Dec.	9,560	588,000
<u>1919</u>		
Jan.	30,200	1,860,000
Feb.	30,500	1,690,000
Mar.	33,500	2,060,000
Apr.	25,200	1,500,000
May	14,300	879,000
June	8,880	528,000
July	4,550	280,000
Aug.	2,970	183,000
Sept.	3,460	206,000
<i>Year</i>	<i>14,300</i>	<i>10,400,000</i>
Oct.	3,480	214,000
Nov.	16,000	952,000
Dec.	27,300	1,680,000
<u>1920</u>		
Jan.	16,600	1,020,000
Feb.	9,720	559,000
Mar.	12,400	762,000
Apr.	22,700	1,350,000
May	11,000	676,000
June	7,420	442,000
July	3,910	240,000
Aug.	2,630	162,000
Sept.	6,600	393,000
<i>Year</i>	<i>11,600</i>	<i>8,450,000</i>
Oct.	13,600	836,000
Nov.	21,900	1,300,000
Dec.	34,900	2,130,000
<u>1921</u>		
Jan.	43,100	2,650,000
Feb.	35,700	1,980,000
Mar.	22,500	1,380,000
Apr.	15,800	940,000
May	15,600	959,000
June	10,100	601,000
July	5,390	331,000
Aug.	3,410	210,000
Sept.	3,520	209,000
<i>Year</i>	<i>18,700</i>	<i>13,500,000</i>

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

606 Post Office,
Portland, Oreg.,
Jan. 2, 1923.

WATER RESOURCES BRANCH

Mr. J. E. Church, Jr.,
Mount Rose Observatory,
Reno, Nevada.

Dear Mr. Church:

I am enclosing a tabulation giving the monthly mean discharge in second-feet and run-off in acre feet for Willamette River at Albany for the three years ending September 30, 1921. The 1922 records have not yet been worked up.

I am requesting our Tacoma office to send you similar data from April, 1917 to date for Snake River.

Yours very truly,

Fred E. Henshaw
Fred E. Henshaw,
District Engineer.

Enclosures.

Divisor	Dividend	Quotient
23	6,155,000	267,609
	19,854,000	863,217
	32,211,000	1,400,478
	39,366,000	1,711,565
Means	33,088,000	1,438,609
	30,904,000	1,343,652
	24,030,000	1,044,783
	18,979,000	825,174
	13,523,000	587,957
	8,610,000	374,348
	5,209,000	226,478
	4,872,000	211,826
	237,850,000	10,341,304
	65,142,000	2,832,261

Divisor	Dividend	Quotient
10,341,304	10,500,000	101.5
	10,200,000	98.6
	8,420,000	81.4
	6,330,000	61.2
Annual	13,700,000	132.5
	10,200,000	98.6
	10,400,000	100.6
	2,832,261	4,860,000
	3,458,000	122.1
	1,975,000	69.7
	4,197,000	148.2
	2,256,000	79.7
	2,577,000	91.0
	3,612,000	127.5
	2,260,000	79.8
	3,513,000	124.0
	1,951,000	68.9
	2,515,000	88.8
	2,883,000	101.8
	2,502,000	88.3
	1,945,000	68.7
	1,757,000	62.0
	2,237,000	79.0
	2,854,000	100.8
	3,774,000	133.3
	2,102,000	74.2
	1,994,000	70.4
	3,308,000	116.8
	4,673,000	165.0
	1,939,000	68.5

Divisor	Dividend	Quotient
237,850,000	6,155,000	2.5990
	19,854,000	8.35
	32,211,000	13.54
	39,366,000	16.55
Percent of year	33,088,000	13.91
	30,904,000	12.99
	24,030,000	10.10
	18,979,000	7.98
	13,523,000	5.69
	8,610,000	3.62
	5,209,000	2.19
	4,872,000	2.05
		99.56

Divisor	Dividend	Quotient
Period	3,513,000	124.0
	1,951,000	68.9
	2,515,000	88.8
	2,883,000	101.8
	2,502,000	88.3
	1,945,000	68.7
	1,757,000	62.0
	2,237,000	79.0
	2,854,000	100.8
	3,774,000	133.3
	2,102,000	74.2
	1,994,000	70.4
	3,308,000	116.8
	4,673,000	165.0
	1,939,000	68.5

Divisor	Dividend	Quotient
Annual	10,341,304	120.9
		127.6
		84.2
		128.6
		105.4
		110.2
		101.5
		110.2
		132.5
		64.0
		76.9
		108.3
		89.5
		90.9
		96.7
	77.9	

approx. 7% due to Total

Willamette River
at
Albany, Ore.

WILLAMETTE River at ALBANY, OREGON
(Drainage Area 4860 sq. mi.)

Not months

	1895-96	1896-97	1897-98	1898-99	1899-1900	1900-01	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	Totals	
October	167,000	196,000	236,000	215,000	566,000	342,000	237,000	197,000	272,000	232,000	325,000	245,000	177,000	328,000	228,000	219,000	267,000	334,000	371,000	429,000	166,000	218,000	193,000	4,155,000	
November	192,000	250,000	1,040,000	1,010,000	833,000	833,000	457,000	1,040,000	1,420,000	295,000	297,000	108,000	469,000	518,000	205,000	791,000	934,000	1,114,000	631,000	447,000	1,130,000	533,000	214,000	19,859,000	
December	1,230,000	1,880,000	2,260,000	1,260,000	2,090,000	1,390,000	1,600,000	2,520,000	812,000	1,010,000	732,000	1,110,000	2,480,000	604,000	1,540,000	1,440,000	732,000	765,000	664,000	592,000	1,880,000	1,080,000	2,340,000	32,211,000	
January	2,830,000	1,070,000	996,000	2,040,000	2,210,000	2,450,000	848,000	2,590,000	1,570,000	1,240,000	1,480,000	1,210,000	1,350,000	2,890,000	1,090,000	1,410,000	2,430,000	1,800,000	1,920,000	1,040,000	1,090,000	972,000	2,340,000	39,568,000	
February	1,050,000	2,020,000	1,140,000	1,520,000	1,290,000	1,850,000	1,680,000	1,300,000	2,530,000	622,000	1,220,000	2,630,000	776,000	1,590,000	1,320,000	878,000	1,700,000	7,550,000	1,070,000	822,000	2,500,000	955,000	1,820,000	33,088,000	
March	1,680,000	1,600,000	701,000	2,300,000	1,320,000	1,490,000	1,600,000	990,000	3,140,000	935,000	984,000	1,140,000	1,090,000	1,140,000	1,210,000	682,000	965,000	935,000	1,230,000	664,000	2,030,000	1,390,000	1,230,000	39,040,000	
April	1,720,000	1,720,000	738,000	1,260,000	946,000	1,080,000	1,270,000	714,000	1,590,000	744,000	714,000	1,610,000	791,000	588,000	660,000	660,000	643,000	1,580,000	916,000	558,000	982,000	1,760,000	788,000	49,340,000	
May	1,780,000	861,000	514,000	1,190,000	611,000	769,000	1,110,000	701,000	1,020,000	553,000	695,000	569,000	781,000	540,000	556,000	793,000	972,000	873,000	528,000	726,000	990,000	1,290,000	557,000	18,978,000	
June	893,000	500,000	471,000	1,120,000	406,000	443,000	619,000	527,000	559,000	417,000	774,000	427,000	578,000	508,000	317,000	498,000	803,000	750,000	419,000	447,000	672,000	1,020,000	369,000	13,523,000	
July	467,000	377,000	252,000	627,000	293,000	285,000	613,000	322,000	344,000	237,000	332,000	277,000	352,000	303,000	224,000	285,000	340,000	571,000	239,000	263,000	664,000	603,000	237,000	8,610,000	
August	240,000	223,000	183,000	355,000	205,000	189,000	237,000	234,000	239,000	167,000	203,000	207,000	229,000	208,000	176,000	180,000	276,000	281,000	189,000	188,000	325,000	274,000	204,000	5,209,000	
September	212,000	224,000	181,000	313,000	179,000	230,000	182,000	269,000	198,000	150,000	191,000	174,000	189,000	177,000	166,000	227,000	331,000	236,000	253,000	152,000	258,000	210,000	170,000	4,872,000	
Annual	12,500,000	13,200,000	8,710,000	13,300,000	19,900,000	11,400,000	10,500,000	11,400,000	13,700,000	6,620,000	7,950,000	11,200,000	9,260,000	9,400,000	10,000,000	8,060,000	10,500,000	10,200,000	8,420,000	6,330,000	13,700,000	10,200,000	10,400,000	237,850,000	
April																									
May																									
June																									
July																									
Period	4,860,000	3,480,000	1,975,000	4,197,000	2,256,000	2,577,000	3,612,000	2,260,000	3,813,000	1,961,000	2,615,000	2,883,000	2,602,000	1,943,000	1,757,000	2,237,000	2,854,000	3,774,000	2,102,000	1,994,000	3,308,000	4,673,000	1,937,000	65,142,000	



COLUMBIA RIVER AT TRAIL, B.C.

(Discharge in thousands of second-feet).

Climatic year.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Mean for year
1913	—	—	—	—	—	—	—	86.4	262	181	125	83.5	—
1914	46.9	32.2	22.6	20.7	16.8	17.8	43.7	125	190	200	112	65.7	74.9
1915	49.3	45.9	30.5	19.9	16.4	17.3	45.5	110	123	140	132	76.6	67.6
1916	38.2	35.0	25.4	16.3	13.7	23.0	45.0	99.9	192	262	136	85.7	81.3
1917	42.3	29.1	19.6	14.1	12.4	10.6	17.3	79.2	198	205	115	68.6	67.9
1918	53.5	28.6	27.1	27.9	20.8	18.4	41.5	113	200	186	113	75.9	75.9
1919	53.6	34.5	25.8	19.9	21.1	16.2	34.4	107	195	179	119	72.5	73.2
1920	34.7	21.8	15.7	15.2	13.3	11.7	15.4	74.1	146	240	144	71.3	66.9
1921	70.9	40.7	28.7	22.4	21.4	22.7	36.6	117	245	190	127	61.2	82.3

WORTHMORE
 BOND

UNPUBLISHED REPORT
 SUBJECT TO REVISION

Yearly Discharge of Columbia River at Trail, B.C.

(61)

15
0

[DRAINAGE AREA. 34,000 SQUARE MILES.]

YEAR ENDING SEPTEMBER 30.	DISCHARGE IN SECOND-FEET					RUN-OFF.		
	MAXIMUM DAY.	DAY	MINIMUM		ANNUAL MEAN.	ANNUAL MEAN PER SQUARE MILE.	INCHES.	ACRE-FEET.
			CALENDAR MONTH					
			MEAN	MONTH				
1914	222,000	15,500	16,800	Feb.	74,900	2.20	29.82	54,200,000
1915	149,000	15,500	16,400	Feb.	57,600	1.99	26.93	48,900,000
1916	306,000	12,000	13,700	Feb.	81,300	2.39	32.54	59,000,000
1917	224,000	9,600	10,600	Mar.	67,900	2.00	27.10	49,300,000
1918	274,000	16,200	18,400	Mar.	75,900	2.23	30.29	54,900,000
1919	229,000	13,000	16,200	Mar.	72,200	2.15	29.37	53,200,000
1920	263,000	11,000	11,700	Mar.	66,900	1.97	26.91	48,900,000
1921	270,000	19,700	21,400	Feb.	82,300	2.42	32.89	59,600,000

UNPUBLISHED RECORDS
SUBJECT TO REVISION

Divisor	Dividend	Quotient
3	8,260,000	2,753,333
	6,730,000	2,243,333
	4,830,000	1,610,000
	3,490,000	1,163,333

Columbia at Trail, B.C.

Means.	Dividend	Quotient
	2,632,000	877,333
	3,560,000	1,186,667
	8,000,000	2,666,667
	20,560,000	6,853,333
	30,020,000	10,006,667
	37,010,000	12,336,667
	23,370,000	7,790,000
	13,630,000	4,543,333
	162,100,000	54,033,333
	95,590,000	31,863,333

Divisor	Dividend	Quotient
54,033,333	54,200,000	100.3%
Annual based on uncorrected Normal	48,900,000	90.5
	59,000,000	109.2
31,863,333	33,900,000	106.4
Period based on uncorrected Normal	25,400,000	79.7
	36,290,000	113.9

1.0343 54,033,333 52,241,452
Corrected Normal

52,241,452 54,200,000 103.7
Annual 48,900,000 93.6
 59,000,000 112.9

.992 31,863,333 32,120,296
Corrected Normal

32,120,296 33,900,000 105.5
Period 25,400,000 79.1
 36,290,000 113.0

162,100,000 8,260,000 5.10%

Per Cent
of
Year

 6,730,000 4.15

 4,830,000 2.98

 3,490,000 2.15

 2,632,000 1.62

 3,560,000 2.20

 8,000,000 4.94

 20,560,000 12.68

 30,020,000 18.52

 37,010,000 22.83

 23,370,000 14.42

 13,630,000 8.41

Period 95,590,000 58.97

 100.00

Columbia Riv.
at Trall, B.C.

3 years

1913-14 thro 1915-16

Errors
Upper Columbia
Trail, B.C.
 //

Annual

Apr. - July

+43.0 - 10.9
 - 21.8

+47.1 - 14.1
 - 35.4

+ 43.0 - 32.7
 - 32.7

+47.1 - 49.5
 + 47.1

3) + 10.3

 + 3.43

3) - 2.4

 - 0.80

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
COOPERATING WITH
THE STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT

WATER RESOURCES BRANCH

404-406 FEDERAL BUILDING, TACOMA, WASHINGTON.

January 19, 1923.

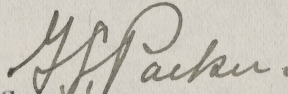
Mr. J. E. Church, Jr.,
Mount Rose Observatory,
Reno, Nevada.

Dear Mr. Church:

In accordance with your request of January 15, there is being enclosed herewith blue prints of monthly and yearly summaries for Columbia River at Trail, B. C. from May, 1913 to September 30, 1921. Results for the year ending September 30, 1922 have not yet been received from the Dominion Water Power Branch. Kindly note that the monthly summary of discharge is given in units of 1,000 second-feet.

If I can be of any further assistance to you, kindly advise.

Very truly yours,


G. L. Parker,
District Engineer.

Enclosures.

Divisor	Dividend	Quotient
1.1338	7,540,000	6,659,203
6,659,203	8,530,000	128.3
	5,350,000	80.4
Annual	7,502,000	112.8
	8,765,000	131.8
1.0269	4,850,000	4,722,953
4,722,953	2,870,000	60.8
	5,700,000	120.7
	3,500,000	74.1
	4,518,000	95.7
	5,967,000	126.3
	3,285,000	69.6
	6,604,000	139.8
	3,863,000	81.8
	5,301,000	112.2
	6,860,000	145.2

Grand River

at

Moab, & Cisco, Utah.

Corrected Normals

6,650,203 Annual
4,722,953 Period

Comparison { Colo at Yuma
+ San Juan at mouth
Bluff

			1914/15-	15/16	16/17
Colo	% of Normal	4 mo	51.17	60.60	84.14
		an.	54.89	74.28	76.77
Colo.	% of 1617	4 mo	61	72	100
		an	71+	96-	100
San Juan	"	4 mo	90	87	100
		an.	81	97	100

Yuma

48,940.00
57,960.00
80,480.00
187,380.00 *
81,860.00
110,780.00
114,490.00
307,130.00 *

Grand

53,500.00
75,020.00
87,650.00
216,170.00 *
38,630.00
53,010.00
68,600.00
160,240.00 *

Willamette
orclay, Oregon



GRAND RIVER

Measurements 1908-1913 inclusive made at Fruita, Colo; Measurements Seasonal Year 1913-14 made at Moab, Utah; Measurements 1914-1917 made at Cisco, Utah.

	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	Total	Normal	Average Annual					
October							249000	374000	172000	424000	1219000	305000	2.05					
November							215000	209000	165000	206000	795000	199000	2.64					
December							142000	144000	156000	167000	609000	152000	2.02					
January							180000	130000	181000	123000	614000	154000	2.04					
February							152000	141000	186000	139000	618000	156000	2.06					
March							224000	176000	422000	193000	1015000	254000	3.37					
April							584000	578000	756000	530000	2448000	612000	3.12					
May							2080000	1120000	1680000	1520000	6400000	1600000	2.122					
June							2810000	1550000	2010000	3300000	9670000	2418000	32.07					
July							1130000	615000	855000	1310000	4110000	1028000	13.63	75.04%				
August							477000	184000	633000	422000	1738000	435000	5.77					
September							265000	129000	286000	231000	911000	228000	3.02					
Annual							8530000	5350000	7502000	8766000	30147000	7540000	100.00					
April	484000	389000	643000	547000	337000	619000	584000	578000	756000	530000								
May	670000	1430000	1320000	1380000	1750000	1180000	2080000	1120000	1680000	1520000				Error +13.38%				
June	1200000	2710000	1150000	1780000	2550000	1060000	2810000	1550000	2010000	3300000								
July	513000	1170000	391000	861000	1330000	426000	1130000	615000	855000	1510000								
Period	2870000	5700000	3500000	4518000	5967000	3285000	6604000	3863000	5301000	6860000	47468000	4850000	64.35					
														Error +2.69%				

MONTHLY DISCHARGE OF COLORADO RIVER at Topock and Yuma

MONTH	DISCHARGE IN SEC.-FT.				Colorado R. above
	TOPOCK	YUMA	LAGUNA DIVERSION	GILA (Mouth)	LAGUNA DAM
1919-20					
OCT.	9440	5290	676	350	5626
NOV.	9400	10200	342	3160	7380
DEC.	10500	15400	301	4990	10700
JAN.	7990	11400	274	651	11000
FEB.	18300	38000	338	7370	31000
MAR.	14900	18000	790	3090	15800
APR.	22800	20400	766	1820	19300
MAY	16300	46200	755	238	46700
JUNE	94200	129000	896	0	130000
JULY	40100	43100	1030	0	44100
AUG.	23300	17600	1030	0	8630
SEPT.	9470	8430	607	0	9040
THE YEAR	28100	30100		1806	
1920-21					
OCT.	8910	6500	686	0	7180
NOV.	8390	10400	452	169	10700
DEC.	7460	7350	390	211	7530
JAN.	6990	6950	405	373	6980
FEB.	8980	7360	585	151	7790
MAR.	14600	13400	792	16	14200
APR.	17100	13700	863	0	14600
MAY	63100	43400	757	0	44200
JUNE	122000	111000	781	0	112000
JULY	44700	45800	861	0	46700
AUG.	35600	35200	734	5548	30400
SEPT.	18700	18000	769	690	18100
THE YEAR	29800	26600		597	
1921-22					
OCT.	9210	8970	382	247	9110
NOV.	9410	7530	683	96	8120
DEC.	10700	10300	378	698	9980
JAN.	10800	13000	190	5540	7650
FEB.	11100	10800	666	1480	9990
MAR.	19000	16200	856	2670	14400
APR.	22500	19100	782	575	19300
MAY	71700	55900	869	45	56700
JUNE	94600	97700	902	0	98600
JULY	30900	31600	929	0	32500
AUG.	15100	12100	942	0	13000
SEPT.	9360	8810	544	117	9240
THE YEAR	26200	24400		956	

Error - 0.6%. Corrected normal 742,331 A.F.
 = 737,877 Acc.-feet.

1021 ^{sec. ft.} _{dr.} daily 1916 - 1921 - 22

Data collected in cooperation with the
State of Arizona. Provisional; subject to
revision for publication.

U. S. Geological Survey
Tucson, Arizona

University Station, Box 164

Corrected normal

742,331 A.R.

MONTHLY DISCHARGE OF *Colorado River*
at Topock and Yuma

DRAINAGE AREA, SQUARE MILES.

MONTH.	DISCHARGE IN SECOND-FEET.				<i>Colorado River above.</i>
	<i>Topock</i>	<i>Yuma</i>	<i>Laguna Diversion</i>	<i>Gila (Mouth)</i>	<i>Laguna Dam.</i>
<i>1916-17</i>					
OCTOBER		26600	334	3610	
NOVEMBER		11900	323	503	
DECEMBER		7390	56	447	
JANUARY		9140	130	2670	
FEBRUARY	7330	7930	389	1500	6820
MARCH	10800	9800	505	2160	8140
APRIL	30700	26300	544	7530	33300
MAY	64800	49300	591	3970	43900
JUNE	98700	69300	668	0	90600
JULY	67300	93200	641	0	94500
AUGUST	19400	23500	668	1340	22800
SEPTEMBER	12000	9010	630	0	9640
THE YEAR		30500	458	2010	
<i>1917-18</i>					
OCTOBER	a	9570	375	0	7940
NOVEMBER	a	9100	314	0	7410
DECEMBER	a	8830	141	0	6970
JANUARY	a	8590	142	32	6700
FEBRUARY		8300	205	224	5790
MARCH		16100	319	3950	13000
APRIL		17000	570	289	13200
MAY		58200	527	2	29600
JUNE		68300	603	0	62400
JULY		45100	744	0	44000
AUGUST		15600	694	855	11400
SEPTEMBER		8770	605	0	7440
THE YEAR		24000	455	452	
<i>1918-19</i>					
OCTOBER		9780	356	0	8000
NOVEMBER		9400	136	0	8190
DECEMBER		8440	102	46	7400
JANUARY		5060	361	195	3930
FEBRUARY		7250	506	439	7240
MARCH		11700	639	509	9170
APRIL		23200	909	1010	20500
MAY		44400	780	51	36800
JUNE		45000	965	0	35200
JULY		24400	912	693	20400
AUGUST		16900	763	882	10800
SEPTEMBER		6680	769	146	5780
THE YEAR		17800	596	302	

(a) Estimated by R.C.R. as 2,000 more than Yuma

Compute

Means for

1. Annual
2. April-July
3. August-December

Correcting for departure
for these periods at
Yuma - NB. There is
a separate set of seasonal
percentage for each of these
periods viz Annual, Apr-July,
Aug-Dec.

Data collected in cooperation with the
State of Arizona. Provisional; subject to
revision for publication.

U. S. Geological Survey
Tucson, Arizona
University Station

891 162

Divisor	Dividend	Quotient
5	2,883,000	576,600
	2,718,000	543,600
	2,825,000	565,000
	2,461,000	492,200

Colorado River
at
Topok, Ariz.

Normals

6	3,436,000	572,667
	5,357,000	892,833
	7,940,000	1,323,333
	22,040,000	3,673,333
	31,000,000	5,166,667
	15,530,000	2,588,333
	7,735,000	1,289,167
	3,864,000	644,000
6 Period	76,510,000	12,751,667
5 Annual	88,952,000	17,790,400 -
17,890,400	576,600	3.2290
	543,600	3.04
	565,000	3.16
	492,200	2.75
	572,667	3.20
	892,833	4.99
	1,323,333	7.40
	3,673,333	20.53
	5,166,667	28.88
	2,588,333	14.47
	1,289,167	7.21
	644,000	3.60
		102.45
	12,751,667	71.28

Divisor	Dividend	Quotient
.9404	17,790,400	18,917,907 Cor. Annual Normal
	18,917,907	15,210,000 80.4 %
	Annual	12,876,000 68.1
		20,366,000 107.7
		21,500,000 113.6
		19,000,000 100.4
1.0452	12,751,667	12,200,217 Cor. Period Normal
	12,200,217	15,820,000 129.7 %
	Period	14,080,000 82.6
		8,290,000 67.9
		14,130,000 115.8
		13,280,000 108.9

Divisor	Dividend	Quotient
88,952,000	2,883,000	3.2490
	2,718,000	3.0690
	2,825,000	3.18
	2,461,000	2.77
Percent of year	3,029,000	3.41
	4,693,000	5.28
	6,110,000	6.87
	18,060,000	20.30
	25,130,000	28.25
	11,390,000	12.80
	6,545,000	7.36
	3,150,000	3.54
		100.0690
Period	60,690,000	68.2390

Grand River

Colorado River
at
Topok, Ariz .00*

	588.00
	541.00
Total	543.00
	528.00
1917-18	461.00
	990.00
	1,010.00
	2,350.00
	3,950.00
	2,770.00
	957.00
	522.00
	15,210.00*

Periods	1,830.00
	3,980.00
1916-17	5,870.00
	4,140.00
	15,820.00*

1917-18	1,010.00
	2,350.00
	3,950.00
	2,770.00
	10,080.00*

18-19	1,380.00
	2,730.00
	2,680.00
	1,500.00
	8,290.00*

19-21	1,360.00
	4,690.00
	5,610.00
	2,470.00
	14,130.00*

20-21	1,020.00
	3,880.00
	7,260.00
	2,750.00
	14,910.00*

21-22	1,340.00
	4,410.00
	5,630.00
	1,190.00
	12,570.00*

1,900,000
1,190,000

710,000

Totals	13,280,000
	588.00
	601.00
Oct.	580.00
	548.00
	566.00
	2,883.00*

Nov.	541.00
	559.00
	559.00
	499.00
	560.00
	2,718.00*

Dec.	543.00
	519.00
	646.00
	459.00
	658.00
	2,825.00*

Jan.	528.00
	348.00
	491.00
	430.00
	664.00
	2,461.00*

Feb.	407.00
	461.00
	403.00
	1,050.00
	499.00
	616.00
	3,436.00*

March	664.00
	990.00
	719.00
	916.00
	898.00
	1,170.00
	5,357.00*

April	1,830.00
	1,010.00
	1,380.00
	1,360.00
	1,020.00
	1,340.00
	7,940.00*

May	3,980.00
	2,350.00
	2,730.00
	4,690.00
	3,880.00
	4,410.00
	22,040.00*

June	5,870.00
	3,950.00
	2,680.00
	5,610.00
	7,260.00
	5,630.00
	31,000.00*

July	4,140.00
	2,770.00
	1,500.00
	2,470.00
	2,750.00
	1,900.00
	15,530.00*

Aug.	1,190.00
	957.00
	1,040.00
	1,430.00
	2,190.00
	928.00
	7,735.00*

Sept.	714.00
	522.00
	397.00
	564.00
	1,110.00
	557.00
	3,864.00*

Annual	15,210.00
	12,876.00
	20,366.00
	21,500.00
	19,000.00
	88,952.00*

Period	15,820.00
	10,080.00
	8,290.00
	14,130.00
	14,910.00
	12,570.00
	75,800.00*

13,280,000
12,570,000

710,000

710,000

76,510,000

—
10.6
35.4
40.8
18.4

+
32.2

105.2
32.2
5) 73.0
14.6

5) 15,715,000
3,143,000

85.4

Colorado
at
Topok

COLORADO RIVER at TOPOCK, ARIZ.

	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22
October		58,000	60,000	58,000	54,800	56,000
November		54,000	55,000	55,000	49,000	56,000
December		54,000	51,000	64,000	45,000	65,000
January		52,000	34,800	49,000	43,000	66,000
February	40,700	46,000	40,300	1,050,000	49,000	61,000
March	664,000	990,000	719,000	916,000	898,000	1,170,000
April	1,830,000	1,010,000	1,380,000	1,360,000	1,020,000	1,340,000
May	3,980,000	2,750,000	2,730,000	4,690,000	3,880,000	4,410,000
June	5,870,000	3,950,000	2,680,000	5,610,000	7,260,000	5,630,000
July	4,140,000	2,770,000	1,500,000	2,470,000	2,750,000	1,900,000
August	1,190,000	957,000	1,040,000	1,430,000	2,190,000	928,000
September	714,000	52,000	397,000	564,000	1,110,000	557,000
Annual		15,210,000	12,876,000	20,366,000	21,500,000	19,000,000

April
May
June
July

Period

3,033,000 2,639,000 2,576,000 3,041,000 4,426,000

15,715,000
3,142,000

82.4 71.7 70.0 82.6 120.3

Sum = 14.6
Rounded Annual
3,680,328





Colorado River
at
Topok, Ariz.

The
channel is
wide and the bed is
sand is constantly shifting.
The
channel is the river after
a steep walled rock canyon
with the channel rapidly
narrows from about
100 feet to 40 feet. The
bed in the canyon shifts
during floods. After the
floods again the
normal condition, which
is maintained until the
next rise when it
again becomes
indistinct. River
floods.

Southern Colorado

— Annual —

Season of Summer Stream

	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22
Three Tribes	20,539,300					16,100,000
Seas Ferry						
Topoaca		15,200,000	12,876,000	20,366,000	21,500,000	19,000,000
[Gila R.]		152,040	735,750			
Yuma	22,064,000	13,037,000	10,254,000	21,852,000	19,300,000	17,600,000
Variation	(126.4%)	(74.7%)	(58.8%)	(125.2%)	(110.6%)	(100.9%)

	April - July						
Three Tribes	15,924,000			19.6%	107.3%	89.8%	92.6%
Seas Ferry							12,010,000
Topoaca	15,499,480	10,094,860	8,644,860	14,130,000	14,910,000	13,280,000	
[Gila R.]	(15,820,000)	(10,080,000)	(8,290,000)				
Yuma	15,693,000	8,382,000	6,719,000	14,380,000	12,905,000	12,330,000	
Variation	(139.8%)	(74.7%)	(59.8%)	(128.1%)	(114.9%)	(109.8%)	
	99.2%	(83.2)	81.0%	101.8%	86.6%	92.8%	

Normal annual loss Topoaca to Yuma 2,500,000 AF
 1,100,000 AF

	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22
Three Tribes	2,581,800 det.					
Seas Ferry						
Topoaca	3,033,000	2,639,000	2,576,000	3,041,000	4,426,000	1,485,000 P
[Gila R.]	53,690	49,650	188,900 P			
Yuma	2,862,000	2,067,000	1,894,000	2,611,000	4,236,000	1,268,000 P
Variation	-224,690	-621,650	-870,900 P	-430,000 P	-190,000 P	-217,000 P
	94.4	78.3%	73.5	85.9	95.7	85.4%

August - November
 Fall, above Apr - July.