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Roy O. West, Secretary

U. S. GEOLOGICAL SURVEY
George Otis Smith, Director

Water-Supply Paper 594

SURFACE WATER SUPPLY OF THE UNITED STATES

1924

PART XII. NORTH PACIFIC SLOPE DRAINAGE BASINS

C. LOWER COLUMBIA RIVER BASIN AND PACIFIC SLOPE DRAINAGE BASINS IN OREGON

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Prepared in cooperation with the States of
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SURFACE WATER SUPPLY OF LOWER COLUMBIA RIVER AND PACIFIC SLOPE DRAINAGE BASINS IN OREGON, 1924

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting records of measurements of flow made on streams in the United States during the year ending September 30, 1924.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation in the arid West. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1925

1895	$12,500.00	1903–1906	$200,000.00	1919	$148,244.10
1896	[1] 24,500.00	1907	150,000.00	1920	175,000.00
1897–1899	50,000.00	1908–1910	100,000.00	1921–1923	180,000.00
1900	[2] 70,000.00	1911–1917	150,000.00	1924–1925	170,000.00
1901–1902	100,000.00	1918	175,000.00		

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 5,600 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1924, 1,670 gaging stations were being maintained by the Geological Survey and the cooperating organiza-

[1] Includes $4,500 appropriated in act of Apr. 25, 1896.

[2] Includes $20,000 appropriated in deficiency act of Mar. 30, 1900.

tions. Many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

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 that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, and acre-feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." 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 per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water 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 in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

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

The following terms not in common use are here defined:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

"Control," a term used to designate the section or sections of the stream channel below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.

EXPLANATION OF DATA

The data presented in this report cover the year ending September 30,1924. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water, in the form of snow or ice, or in ponds, lakes, and swamps, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

The base data collected at gaging stations consists of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in deter-

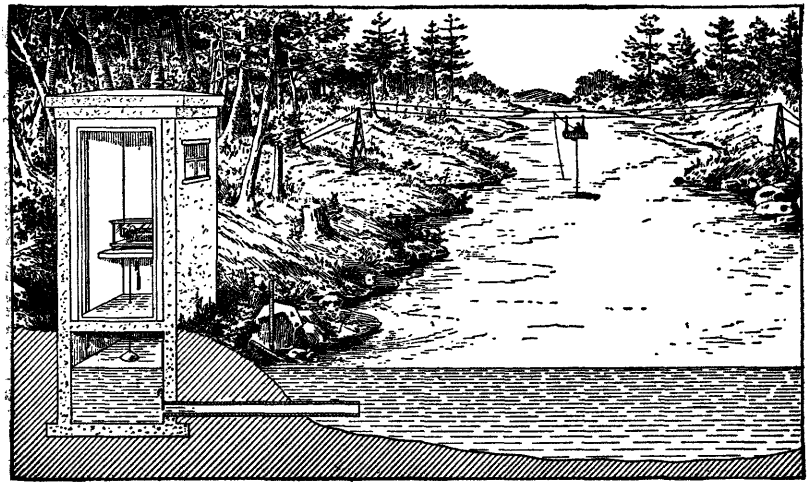

FIGURE 1.—Typical gaging station

mining the daily flow. The records of stage are obtained either from direct readings on a staff or chain gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter. The general methods are outlined in standard textbooks on the measurement of river discharge. A gaging station, equipped with water-stage recorder and measuring cable and car is shown in Figure 1.

From the discharge measurements rating tables are prepared that give the discharge for any stage. The application of the daily gage heights to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is computed.

The data presented for each gaging station in the area covered by this report comprise a description of the station, a table giving records of discharge measurements, a table showing the daily dis-

charge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage height and records of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any condition that may affect the permanence of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and effect of backwater; it gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuations the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by using the discharge integrator, an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow computations recorded in the remaining columns, which are defined on page 2, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

A paragraph in the description of the station gives information regarding the (1) permanence of the stage-discharge relation, (2) precision with which the discharge rating curve is defined, (3) refinement of gage readings, (4) frequency of gage readings, and (5)

methods of applying daily gage height to the rating table to obtain the daily discharge.

For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "second-feet per square mile" and "run-off in inches" published in the earlier reports by the Survey should be used with caution because of possible inherent sources of error not known to the Survey.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied. To give an idea of the amount of prior appropriations, a paragraph on diversions is presented in each station description. The figures given can not be considered exact but represent the best information available.

The tables of monthly discharge give only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigations of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have

appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features, as indicated below:

Part I. North Atlantic slope basins (St. Johns River to York River).
II. South Atlantic slope and eastern Gulf of Mexico basins (James River to the Mississippi).
III. Ohio River Basin.
IV. St. Lawrence River Basin.
V. Upper Mississippi River Basin and Hudson Bay Basins.
VI. Missouri River Basin.
VII. Lower Mississippi River Basin.
VIII. Western Gulf of Mexico Basins.
IX. Colorado River Basin.
X. Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins, in three parts:
A, Pacific slope basins in Washington and upper Columbia River Basin.
B, Snake River Basin.
C, Lower Columbia River Basin and Pacific slope basins in Oregon.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities of the United States.

3. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Boston, Mass., 2500 Customhouse.
Albany, N. Y., 704 Journal Building.
Trenton, N. J., State House.
Charlottesville, Va., care of University of Virginia.
Asheville, N. C., 316 Jackson Building.
Chattanooga, Tenn., 830 Power Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Chicago, Ill., 1510 Consumers Building.
Madison, Wis., care of Railroad Commission of Wisconsin.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Helena, Mont., 45–46 Federal Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 313 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, Federal Building.
Tacoma, Wash., 404 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.

Los Angeles, Calif., 600 Federal Building.
Tucson, Ariz., 106 College of Law Building, University of Arizona.
Austin, Tex., Capitol Building.
Honolulu, Hawaii, Territorial Office Building.

A list of the Geological Survey's publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 5,600 points in the United States, and the data obtained have been published in the reports tabulated below:

Stream-flow data in reports of the United States Geological Survey

[A=Annual Report; B=Bulletin; W=Water-Supply Paper]

Report	Character of data	Year
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September, 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 4	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905.
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910.
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1924. The data for any particluar station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Maine, 1903 to 1921, are published in Water-Supply Papers, 97, 124, 165, 201, 241, 261, 281, 301, 321, 351, 381, 401, 431, 451, 471, 501, and 521, which contain records for the New England streams from 1903 to 1921. Results of miscellaneous measurements are published by drainage basins.

Numbers of water-supply papers containing results of stream measurements, 1899–1924

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
												A	B	C
1899 [a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 39	38, [e] 39	38, [f] 39	38	38	38
1900 [g]	47, [h] 48	48	48, [i] 49	49	49	49, [j] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 78	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166 [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 178	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202 [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332A	332B	332C
1913	351	352	353	354	355	356	357	358	359	360	361	362A	362B	362C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern Rivers and south Pacific slope basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Monthly discharge for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas Rivers.
[r] Great Basin in California except Truckee and Carson River Basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work in Oregon and Washington was carried on under cooperative agreements between the United States Geological Survey and the respective States.

Acknowledgments for the work in Oregon are due to Rhea Luper, State engineer of Oregon; and for the work in Washington, to Dan A. Scott, director of the Department of Conservation and Devlopment, and to Marvin Chase, supervisor of hydraulics,

Acknowledgments are also due to the United States Bureau of Reclamation and the United States Office of Indian Affairs for assistance, suggestions, and the use of data gathered exclusively for them and paid for by them, and to the United States Weather Bureau for hydrographic and climatic data.

Special acknowledgments are due for financial assistance rendered by municipalities, corporations, and individuals, as follows: Watermasters for Umatilla, Crook, Deschutes, and Jackson Counties; Water Bureau of city of Portland; Attalia Irrigation District, Central Oregon Irrigation District, Deschutes County Municipal Improvement District; Eagle Point, East Fork, Horse Heaven, Medford, Talent, and Teel Irrigation Districts; Arnold Irrigation Co.; California-Oregon Power Co.; North Canal Co.; Northwestern Electric Co.; Pacific Power & Light Co.; Portland Electric Power Co.; Puget Sound Power & Light Co.; Rogue River Valley Canal Co.; and W. F. Crowe.

DIVISION OF WORK

Data for stations in Oregon and Washington, except those in the Cowlitz River Basin in Washington, were collected and preparad for publication under direction of F. F. Henshaw, district engineer, assisted by G. H. Canfield, Kenneth N. Phillips, Wendell Dawson, E. O. Hokanson, and R. J. McKinney.

Data for the stations in the Walla Walla and Cowlitz River Basins in Washington were collected and prepared for publication under the direction of G. L. Parker, district engineer, assisted by D. J. F. Calkins, R. B. Kilgore, J. S. Gatewood, K. N. Vaksvik, and J. M. Rogers.

The manuscript was reviewed by D. S. Wallace.

GAGING-STATION RECORDS

COLUMBIA RIVER AT THE DALLES, OREG.

LOCATION.—In NW. ¼ sec. 3, T. 1 N., R. 13 E., at foot of Court Street at The Dalles, Wasco County, 18 miles below Deschutes River and above Hood and Klickitat Rivers.

DRAINAGE AREA.—237,000 square miles.

RECORDS AVAILABLE.—June 1, 1878, to September 30, 1924. Maximum stages 1858 to 1877.

GAGE.—Vertical staff in several sections attached to row of dolphins, with upper section on a warehouse; belongs to United States Weather Bureau. Gage of United States Army Engineers at Cascade Locks, about 40 miles below The Dalles, attached to side of wooden fender of upper locks chamber between upper guard and lock gates. Elevation of datum of The Dalles gage, 46.36 feet (adjustment of primary level net, 1912).

DISCHARGE MEASUREMENTS.—In 1903 measurements were made by United States Army engineers with rod floats and meter from a steamer; in 1907, 1923, and 1924 by United States Geological Survey engineers with meter from a launch; in 1908 flood measurements by United States Geological Survey engineers 2,000 feet below gage at The Dalles; in 1910 and 1913 measurements by United States Geological Survey engineers on Columbia River above Snake River and on Snake River referred to The Dalles gage, allowance being made for intervening tributaries.

CHANNEL AND CONTROL.—Rocky and permanent at the rapids at Cascade Locks, the control for both gages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.6 feet May 25–27 (discharge, 433,000 second-feet); minimum stage recorded −1.2 feet January 22 (discharge, 60,800 second-feet).

1857–1924: Maximum stage recorded, 59.6 feet at 2 p. m. June 6, 1894 (discharge, 1,170,000 second-feet); minimum stage recorded, −4.0 feet on gage at Cascade Locks December 17, 1919 (discharge, 47,000 feet).

ICE.—Stage-discharge relation at The Dalles affected by ice January 3–11, gage not read.

DIVERSIONS.—Quantity of water diverted for irrigation is large in the aggregate but constitutes only a small proportion of the total flow; the low-water flow, which comes in the winter, is little affected.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined; below 100,000 second-feet it is based on low-water measurements for 1923–24. Gage read to tenths once daily. Readings at Cascade Locks used December 9–22, January 1–11, and March 30 to April 8. Daily discharge ascertained by applying daily gage readings to rating table. Records excellent.

COOPERATION.—Gage readings furnished by United States Weather Bureau.

The following discharge measurements were made:

November 18, 1923: Gage height, 0.47 foot; discharge, 70,800 second-feet.
January 23, 1924: Gage height, −0.80 foot; discharge, 63,200 second-feet.
February 20, 1924: Gage height, 6.18 feet; discharge, 123,000 second-feet.

Daily discharge, in second-feet, of Columbia River at The Dalles, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94,000	79,600	75,400	72,400	82,600	107,000	80,500	131,000	381,000	219,000	143,000	117,000
2	93,100	79,600	75,400	71,600	90,400	108,000	79,500	143,000	365,000	218,000	142,000	118,000
3	92,200	78,200	75,400	70,800	99,000	112,000	77,700	151,000	354,000	216,000	142,000	118,000
4	91,300	76,800	74,000	69,200	120,000	111,000	76,800	170,000	349,000	215,000	142,000	117,000
5	90,400	76,100	72,800	67,600	127,000	111,000	75,900	185,000	344,000	213,000	142,000	116,000
6	89,500	75,400	72,800	65,300	122,000	111,000	75,000	202,000	339,000	211,000	141,000	115,000
7	88,600	74,700	83,400	63,200	123,000	107,000	75,900	206,000	335,000	209,000	139,000	114,000
8	86,800	74,000	78,900	62,000	123,000	103,000	75,900	197,000	328,000	212,000	142,000	113,000
9	85,000	73,400	86,500	61,400	123,000	101,000	81,800	190,000	320,000	216,000	145,000	111,000
10	84,200	72,800	84,500	61,400	130,000	100,000	85,000	187,000	313,000	223,000	143,000	108,000
11	84,200	72,200	82,500	63,200	135,000	98,000	93,100	192,000	308,000	229,000	139,000	106,000
12	84,200	72,200	81,500	77,500	130,000	97,000	104,000	205,000	303,000	230,000	138,000	105,000
13	85,000	71,600	80,500	76,100	124,000	95,000	111,000	237,600	299,000	226,000	137,000	105,000
14	85,000	71,600	79,500	74,000	122,000	94,000	117,000	264,000	292,000	222,000	136,000	105,000
15	85,900	71,600	77,700	71,000	131,000	92,200	121,000	300,000	287,000	215,000	131,000	107,000
16	85,900	70,400	75,900	72,200	136,000	91,300	122,000	327,000	284,000	208,000	129,000	106,000
17	86,800	70,400	75,000	69,200	135,000	90,400	123,000	340,000	276,000	199,000	125,000	104,000
18	84,200	71,000	73,200	71,000	131,000	89,500	123,000	352,000	273,000	194,000	124,000	102,000
19	83,400	71,000	73,200	66,800	125,000	88,600	118,000	379,000	269,000	188,000	125,000	100,000
20	83,400	70,400	72,400	65,000	122,000	90,400	115,000	386,000	267,000	187,000	126,000	98,000
21	84,200	70,400	72,400	63,200	122,000	88,600	112,000	397,000	267,000	185,000	126,000	96,000
22	85,900	69,800	72,400	60,800	121,000	86,800	109,000	411,000	264,000	181,000	127,000	94,000
23	84,200	69,800	68,600	62,000	118,000	85,900	109,000	428,000	261,000	177,000	129,000	92,200
24	83,400	73,400	68,600	65,000	116,000	84,200	109,000	430,000	257,000	170,000	129,000	92,200
25	81,800	73,400	68,600	65,000	114,000	83,400	109,000	433,000	252,000	169,000	127,000	92,200
26	83,400	73,400	68,600	64,400	113,000	81,800	114,000	433,000	246,000	168,000	126,000	89,500
27	82,600	73,400	68,600	65,000	110,000	81,800	120,000	433,000	240,000	162,000	126,000	85,900
28	81,800	73,400	68,600	65,000	110,000	81,800	123,000	430,000	233,000	154,000	126,000	85,000
29	80,300	74,700	75,400	66,800	108,000	81,000	123,000	414,000	227,000	150,000	120,000	84,200
30	79,600	76,800	74,700	67,400	-------	80,500	121,000	399,000	220,000	148,000	120,000	83,400
31	79,600	-------	74,000	74,700	-------	80,500	-------	390,000	-------	145,000	117,000	-------

Monthly discharge of Columbia River at The Dalles, Oreg., for the year ending September 30, 1924

[Drainage area, 237,000 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	94,000	79,600	85,500	0.361	0.42	5,260,000
November	79,600	69,800	73,400	.310	.35	4,370,000
December	86,500	68,600	75,200	.317	.37	4,620,000
January	77,500	60,800	67,400	.284	.33	4,140,000
February	136,000	82,600	119,000	.502	.54	6,840,000
March	112,000	80,500	94,000	.397	.46	5,780,000
April	123,000	75,000	103,000	.435	.49	6,130,000
May	433,000	131,000	301,000	1.27	1.46	18,500,000
June	381,000	220,000	292,000	1.23	1.37	17,400,000
July	230,000	145,000	195,000	.823	.95	12,000,000
August	145,000	117,000	132,000	.557	.64	8,120,000
September	118,000	83,400	103,000	.435	.49	6,130,000
The year	433,000	60,800	137,000	.578	7.87	99,300,000

TRIBUTARIES OF COLUMBIA RIVER BELOW MOUTH OF SNAKE RIVER

WALLA WALLA RIVER BASIN

WALLA WALLA RIVER NEAR MILTON, OREG.

LOCATION.—In sec. 21, T. 5 N., R. 36 E., half a mile below junction of North and South Forks of Walla Walla River and 4 miles above Milton, Umatilla County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 13, 1903, to May 29, 1906; March 17, 1918, to September 30, 1919; March 19, 1920, to September 30, 1921, and irrigation seasons 1922 to 1924.

GAGE.—Friez water-stage recorder on left bank; staff gage in sec. 14., T. 5 N., R. 35 E., used August 12, 1905, to May 29, 1906.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Channel straight at cable; curved above and below; two channels at extreme high water, with some discharge passing around cable to south where bank is low and brush covered; right bank high and rocky. Control is about 100 feet below gage and is composed of gravel and small boulders; shifts at high stages.

EXTREMES OF DISCHARGE.—Maximum stage during period of records from water-stage recorder, 1.44 feet at 8 p. m. May 2 (discharge, 504 second-feet); minimum stage from recorder, 0.31 foot July 5, August 8, and 9 (discharge, 90 second-feet).

1903–1906; 1918–1924: Highest flood ever known occurred May 30, 1906, discharge estimated from observation of cross sections and slope, after flood had subsided, at 8,130 second-feet. Minimum daily discharge recorded, 86 second-feet September 4, 1923 (gage height, 0.76 foot).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—A few small canals take water out above station, total area irrigated, only few hundred acres; some small diversions between sites of present and former stations.

REGULATION.—The Pacific Power & Light Co.'s power plant about 5 miles above this station will affect the flow somewhat, especially at low water. Water is ponded in fore bay to some extent.

ACCURACY.—Stage-discharge relation permanent during season. Rating curve well defined. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

COOPERATION.—Most of data obtained under direction of A. E. Perry, water master for Umatilla County.

The following discharge measurements were made:

May 17, 1924: Gage height, 1.00 foot; discharge, 286 second-feet.

June 4, 1924: Gage height, 0.48 foot; discharge, 125 second-feet.

July 14, 1924: Gage height, 0.38 foot; discharge, 99 second-feet.

Daily discharge, in second-feet, of Walla Walla River near Milton, Oreg., for the year ending September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	217	420	131	103	93	98	16	316	308	120	105	98	105
2	261	440	124	100	93	98	17	285	285	122	105	103	105
3	285	440	122	96	95	98	18	265	265	122	105	105	105
4	277	410	122	91	95	96	19	253	238	122	105	116	111
5	265	312	118	90	95	95	20	257	228	122	118	113	109
6	277	321	122	91	93	95	21	285	210	116	116	109	109
7	326	321	150	93	91	95	22	316	195	116	113	107	109
8	380	321	153	96	91	105	23	312	186	113	105	105	109
9	355	335	145	95	91	105	24	312	177	113	103	103	109
10	350	365	138	93	91	105	25	308	174	107	102	105	111
11	400	385	131	93	91	105	26	308	159	105	93	103	111
12	385	390	128	93	95	105	27	326	162	103	93	102	113
13	415	395	124	98	93	103	28	350	156	103	95	100	113
14	370	375	120	103	95	105	29	370	148	105	95	96	107
15	340	340	118	105	96	105	30	410	138	105	95	98	109
							31		131		93	98	

Monthly discharge of Walla Walla River near Milton, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April	415	217	319	19,000
May	440	131	282	17,300
June	153	103	121	7,200
July	118	90	99.4	6,110
August	116	91	98.7	6,070
September	113	95	105	6,250
The period				61,900

WALLA WALLA RIVER NEAR WALLULA, WASH.

LOCATION.—In NW. ¼ sec. 30, T. 7 N., R. 32 E., at Attalia Irrigation District Canal crossing, just above Inland Empire Highway Bridge, 3 miles east of Wallula, Walla Walla County.

DRAINAGE AREA.—1,480 square miles (measured on United States Geological Survey and Forest Service maps).

RECORDS AVAILABLE.—May 17 to September 30, 1924.

GAGE.—Vertical staff in two sections on left bank, attached to Attalia Irrigation District Canal trestle; read by G. M. Comstock and E. R. Birdsill.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge.

CHANNEL AND CONTROL.—River bed is of gravel and small boulders. Right bank high; left bank is overflowed at extremely high stage. Control is boulder and gravel riffle; will shift at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 2.10 feet on May 17 (discharge, 136 second-feet). River dry August 1–15, when Attalia Irrigation District Canal was taking entire flow.

ICE.—No ice during period of record.

DIVERSIONS.—Entire low water flow above station appropriated for irrigation. Diversion through Attalia Irrigation District Canal added to flow at river gage to determine mean monthly flow available for use at the canal intake.

REGULATIONS.—See diversions.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined above 5 second-feet. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage height to rating table. Records good May 17 to June 20; otherwise fair.

Discharge measurements of Walla Walla River near Wallula, Wash., during the period May 17 to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 17	2.10	136	July 25	1.06	4.4
May 27	1.78	71.5	Sept. 4	.80	.4
July 18	.80	.4			

Daily discharge, in second-feet, of Walla Walla River near Wallula, Wash., for the period May 17 to September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		26	0.8	0	0.3	16		38.0	0.2	0.2	3.5
2		22	.6	0	.3	17	136	35.0	.2	.3	1.6
3		22	.6	0	.3	18	115	32.0	.4	.3	1.1
4		15.0	.4	0	.4	19	115	30.0	1.1	.4	.6
5		16.5	.4	0	.3	20	115	19.5	15.0	.4	.6
6		16.5	.3	0	.3	21	94	2.7	15.0	.8	.6
7		11.6	.2	0	.6	22	75	2.7	15.0	.8	.6
8		37	.3	0	.4	23	58	2.0	15.0	1.6	.6
9		50	.3	0	2.3	24	44	1.6	15.0	2.7	.6
10		50	.4	0	16.5	25	58	1.3	2.3	.8	.6
11		37	.4	0	21	26	72	1.2	.8	.6	1.1
12		39	.4	0	21	27	72	.8	.8	.6	7.1
13		21	.3	0	22	28	75	.8	.3	.4	7.8
14		19.5	.3	0	22	29	58	.8	.2	.3	8.6
15		18.0	.3	0	16.5	30	32	.8	.2	.3	8.6
						31	27		.2	.3	

NOTE.—Observer's record of gage heights May 26, June 16, 17, and July 20 inconsistent with results obtained at gaging station on Attalia Irrigation District Canal; discharge estimated.

Monthly discharge of Walla Walla River and Attalia Irrigation District Canal near Wallula, Wash., for the period May 17 to September 30, 1924

Month	Discharge in second-feet					Combined run-off in acre-feet
	Combined			River mean	Canal mean	
	Maximum	Minimum	Mean			
May 17-31	166	55	96.9	76.4	20.5	2,880
June	76	16.0	37.6	19.0	18.6	2,240
July	20	9.4	13.2	2.8	10.4	812
August	18.9	6.6	10.7	.4	10.3	658
September	32	11.1	18.2	5.6	12.6	1,080
The period						7,670

TOUCHET RIVER AT BOLLES, WASH.

LOCATION.—In sec. 8, T. 9 N., R. 37 E., half a mile above highway bridge, three-fourths mile southeast of Bolles, and 3 miles west of Waitsburg, Walla Walla County.

DRAINAGE AREA.—284 square miles (measured on topographic and Forest Service maps).

RECORDS AVAILABLE.—February 1 to September 30, 1924.

GAGE.—Gurley eight-day water-stage recorder on left bank, half a mile above highway bridge; inspected by W. F. Crowe and Wesley Lloyd.

DISCHARGE MEASUREMENTS.—Made by wading near gage or from highway bridge below.

CHANNEL AND CONTROL.—Bed composed of gravel, banks fairly high; right bank may be overflowed at extremely high stage. Control is formed by riffle, over gravel and small boulders, and moves downstream as stage rises.

EXTREMES OF DISCHARGE.—Maximum stage, from recorded range of stage, 3.34 feet sometime during January 28 to February 2 (discharge, 938 second-feet); minimum stage recorded, 0.73 foot at 2 p. m. August 10 (discharge, 6 second-feet).

ICE.—Stage-discharge relation seriously affected by ice during severe winters; discharge determined from observer's notes, discharge measurements, and weather records.

DIVERSIONS.—Numerous small ditches divert water above gage for irrigation.

REGULATION.—Considerable fluctuation in stage at extremely low water caused by operation of flour mill at Waitsburg.

ACCURACY.—Stage-discharge relation changed as result of construction of temporary wing dam near control sometime during July 6–18. Rating curve used to July 5 well defined between 60 and 500 second feet; that used July 19 to September 30, fairly well defined. Operation of water-stage recorder fairly satisfactory except as noted in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage heights obtained from recorder graph by inspection. Records good except for extreme low water and for periods represented by flat estimates of discharge.

Discharge measurements of Touchet River at Bolles, Wash., during the years ending September 30, 1920–1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1920	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Aug. 11	1.19	29.5	Apr. 12	1.86	272	May 20	1.27	109
Sept. 7	1.24	41.7	Apr. 13	1.91	299	May 25	1.10	70.5
			Apr. 19	1.58	190	July 19	1.01	23.1
1923			Apr. 26	1.53	177	July 26	.98	18.9
Oct. 23	1.29	89.1				Sept. 7	.96	16.1

Daily discharge, in second-feet, of Touchet River at Bolles, Wash., for the period February 1 to September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	850	251		236	54	21	14	
2	700	246		243	54	17	12	
3	640	240	130	255	48	18	12	
4	611	235			42	20	12	20
5	760	229			42	21	12	
6	785	224	201		46		12	
7	760	218	215	200	77		11	17
8	736	213	240		77		11	18
9	663	207	246		75		11	18
10	570	198	243		68		11	19
11	503	192	275	204	66		12	19
12	452	187	278	204	64	20	13	21
13	447	179	285	195	58		12	21
14	464	173	288	182	50		14	22
15	460	171	272	160			15	24
16	431	168	246	142			16	22
17	407	159	236	134	45		18	21
18	376	151	215	130			20	28
19	330	142	198	118		21	21	31
20	285	142	190	105		40	24	33
21	288	142	184	95	35	36	27	31
22	281	142	187	93	34	34	29	31
23	272	140	190	75	31	33	31	31
24	262	134	190	72	31	30	29	31
25	255	130	179	70	27	23	25	34
26	272	124	179	70	24	19	21	40
27	268	122	184	68	24	18	21	40
28	262		190	68	25	17	22	40
29	257	130	201	64	21	17	21	34
30	-------		218	60	23	16	21	33
31	-------		-------	58	-------	14	21	-------

NOTE.—Water-stage recorder not operating satisfactorily Feb. 1, 2, 19, 28, 29, Mar. 1–8, 17, 18, 28–31, Apr. 1–5, May 4–10, 19, June 15–20, July 6–18, Aug. 3–9, 14–16, and Sept. 1–6. Discharge Feb. 1 and 2 determined from recorded range of stage; flat estimates of discharge as indicated by braced figures made by comparison with records of Tucannon River near Pomeroy. Discharge for other periods of no gage-height record estimated by interpolation.

Monthly discharge of Touchet River at Bolles, Wash., for the period February 1 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
February		255	471	27,100
March	251		174	10,700
April	288		206	12,300
May		58	145	8,920
June	77	21	45.5	2,710
July	40	14	21.8	1,340
August	31	11	17.8	1,090
September	40		26.0	1,550
The period				65,700

ATTALIA IRRIGATION DISTRICT CANAL NEAR WALLULA, WASH.

LOCATION.—In NE. ¼ sec. 30, T. 7 N., R. 32 E., at upper end of flume on trestle across Walla Walla River, 1,000 feet north of Inland Empire Highway and 3 miles east of Wallula, Walla Walla County.

RECORDS AVAILABLE.—May 17 to September 30, 1924.

GAGE.—Vertical staff gage bolted to concrete wall on left side at upper end of galvanized iron section of flume; read by employees of Attalia Irrigation District.

DISCHARGE MEASUREMENTS.—Made from cross ties at head of flume near gage.

CHANNEL AND CONTROL.—Long section of semicircular galvanized iron flume.

EXTREMES OF DISCHARGE.—Maximum stage recorded, from May 17 to September 30, 1924, 2.24 feet 6.30 p. m. May 17, 3.30 p. m. May 18, 5.10 p. m. May 19, and on May 20 (discharge, 30 second-feet). No flow May 26–28, June 16–19, July 20–23, and September 10–14, when water was turned out for repairs to canal.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined between 10 and 40 second-feet. Gage read to hundredths twice daily prior to July 15, once daily thereafter. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

COOPERATION.—Gage-height record furnished by Attalia Irrigation District.

Canal diverts water from left bank of Walla Walla River about on line between secs. 22 and 23, T. 7 N., R. 32 E., 7 miles below mouth of Touchet River. Water is used for irrigation.

Discharge measurements of Attalia Irrigation District Canal near Wallula, Wash., during the period May 17 to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 17	2.24	29.7	July 25	1.68	17.7
July 18	1.34	11.3	Sept. 4	1.35	11.7

Daily discharge, in second-feet, of Attalia Irrigation District Canal near Wallula, Wash., for the period May 17 to September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	28	14.3	9.2	10.8	16	------	------	11.1	7.2	17.2
2	------	27	14.3	7.8	10.8	17	30	------	11.4	9.2	17.2
3	------	27	14.3	7.8	12.5	18	30	------	11.6	10.0	16.2
4	------	26	13.4	7.8	12.5	19	29	------	10.8	11.6	15.2
5	------	24	12.5	7.8	11.6	20	30	7	------	17.2	16.2
6	------	23	12.5	7.4	10.8	21	29	19.2	------	17.2	16.2
7	------	26	12.5	7.3	10.8	22	27	19.2	------	16.2	16.2
8	------	26	11.6	7.2	10.8	23	26	18.2	------	16.2	16.2
9	------	26	10.8	7.2	9.0	24	24	17.2	5.0	16.2	17.2
10	------	26	10.8	7.2	------	25	23	16.2	18.2	15.2	18.2
11	------	27	10.8	6.8	------	26	------	17.2	17.2	13.4	20
12	------	26	10.8	7.1	------	27	------	16.2	15.2	12.5	21
13	------	23	10.8	7.2	------	28	------	16.2	11.6	12.5	22
14	------	23	10.8	6.6	------	29	6	15.2	11.6	11.6	23
15	------	20	10.8	6.6	4.0	30	26	15.2	9.2	11.6	22
						31	28	------	9.2	11.6	------

NOTE.—No flow through canal May 26-28, June 16-19, July 20-23, and Sept. 10-14.

Monthly discharge of Attalia Irrigation District Canal near Wallula, Wash., for the period May 17 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 17-31	30	0	20.5	610
June	28	0	18.6	1,110
July	18.2	0	10.4	640
August	17.2	6.6	10.3	633
September	23	0	12.6	750
The period	------	------	------	3,740

UMATILLA RIVER BASIN

UMATILLA RIVER ABOVE McKAY CREEK, NEAR PENDLETON, OREG.

LOCATION—In NW. ¼ sec. 8, T. 2 N., R. 32 E., near track of main line of Oregon-Washington Railroad & Navigation Co., a quarter of a mile above mouth of McKay Creek, and 2 miles west of Pendleton, Umatilla County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1921, to September 30, 1922, January 25, 1923, to September 30, 1924. Records at Pendleton, February, 1891, to July, 1892, and May 22, 1903, to March 21, 1906, are directly comparable with those at this station.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by A. E. Perry.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Channel straight 100 yards above and below gage; banks are not overflowed. The control is a gravel riffle opposite old gage on left bank, where at low stages the stream is confined to narrow channel along left bank.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.18 feet at 7 a. m. February 8 (discharge, 4,010 second-feet); minimum stage recorded, 1.87 feet at 12.30 p. m. August 14 (discharge, 7 second-feet).

1921–1924: Maximum stage from water-stage recorder, 6.6 feet April 22, 1922 (discharge, 5,400 second-feet); minimum discharge recorded, that of 1924.

ICE.—Stage-discharge relation affected by ice during short period when well was frozen over.

DIVERSIONS.—Water diverted for power at Pendleton is returned to river above this station; some small diversions are made for irrigation above the station.

REGULATION.—At low stages there is considerable diurnalfluctuation due to impounding and release of water in the power canals of the two flour mills at Pendleton.

ACCURACY.—Stage-discharge relation changed January 31. Rating curves well defined. Operation of water-stage recorder satisfactory except as indicated in footnote of table of daily discharge. Daily discharge ascertained by applying to rating table the mean daily gage height determined from recorder graph by inspection; or for days of considerable variation in stage, by averaging results obtained by applying mean gage heights for shorter intervals. Records good except for periods when recorder was not operating satisfactorily, for which they are fair.

Discharge measurements of Umatilla River above McKay Creek, near Pendleton, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 18	2.84	95	May 9	3.56	427	July 5	2.14	31.1
Jan. 15	3.58	327	May 26	2.69	137	July 25	2.15	28.8
Apr. 5	4.80	1,230						

Daily discharge, in second-feet, of Umatilla River above McKay Creek, near Pendleton, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	134	875		3,640	795	436	717	91	42	22	23
2	45	137	670		3,280	776	578	717	83	39	23	25
3	50	134	532		2,200	795	717	730	75	36	23	26
4	55	134	454		1,700	782	736	665	71	31	26	26
5	63	126	421	620	2,090	736	704	578	67	28	26	26
6	74	120			2,420	717	691	495	71	28	26	26
7	106	112			2,610	678	860	450	133	28	23	26
8	247	112			3,720	617	1,150	422	148	25	23	39
9	198	109			2,420	583	1,190	422	131	23	21	44
10	158	106		355	1,800	544	1,150	432	126	22	19	44
11	146	106		410	1,390	506	1,440	436	117	23	21	42
12	128	106		382	1,150	470	1,480	436	108	23	21	39
13	120	101		366	1,110	450	1,440	422	99	26	22	42
14	112			355	1,190	455	1,310	892	91	33	23	39
15	112			355	1,230	460	1,070	349	81	28	26	
16	114	90	520	372	1,110	455	895	320	73	28	31	
17	126			355	1,040	450	795	295	75	26	31	
18	123	91		342	930	436	717	267	81	26	26	
19	120	94		302	860	436	653	246	81	33	36	
20	114	98		268	789	436	611	214	69	41	39	
21	112	98		261	828	436	635	194	67	36	36	
22	205	103		258	776	409	730	178	64	33	36	48
23	233	103		264	776	392	717	170	60	33	36	
24	205	137		261	698	276	710	158	62	33	26	
25	184	226		261	659	364	653	150	56	28	23	
26	178	233	366	261	665	360	635	133	54	28	21	
27	171	230	337	261	653	360	635	128	54	28	21	
28	167	208	399	276	762	372	665	126	51	23	20	
29	158	1,120	2,080	394	828	388	678	117	48	26	21	
30	149	1,230	1,460	721	-------	384	717	106	46	26	21	
31	134	-------	900	3,040	-------	392	-------	99	-------	23	23	-------

NOTE.—Recorder not operating satisfactorily; discharge estimated as that at station above Furnish Reservoir minus that for McKay and Birch Creeks for following periods: Oct. 1–2, Nov. 14–17, Dec. 6-25, and Dec. 31 to Jan. 9. Mean discharge for Sept. 15–30 estimated from record above Furnish Reservoir.

Monthly discharge of Umatilla River above McKay Creek, near Pendleton, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	247	----------	134	8,240
November	1,230	----------	196	11,700
December	2,080	337	609	37,400
January	3,040	258	506	31,100
February	3,720	653	1,490	85,700
March	795	360	510	31,400
April	1,480	436	847	50,400
May	730	99	341	21,000
June	148	46	81.1	4,830
July	42	23	29.2	1,800
August	39	19	25.5	1,570
September	----------	23	41.2	2,450
The year	3,720	19	396	288,000

UMATILLA RIVER ABOVE FURNISH RESERVOIR, NEAR YOAKUM, OREG.

LOCATION.—In NW. ¼ sec. 17, T. 2 N., R. 31 E., at Oregon-Washington Railroad & Navigation Co.'s bridge a quarter of a mile above Campbell flag station, 5 miles by river above Yoakum and the old gaging station, and 10 miles west of Pendleton, Umatilla County; just above backwater from Furnish Reservoir.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 18 to August 28, 1915; July 5, 1916, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right of main channel at downstream end of bridge pier; inspected by A. E. Perry, water master.

DISCHARGE MEASUREMENTS.—Made from cable 20 feet above gage or by wading.

CHANNEL AND CONTROL.—Channel straight at bridge; current even; overflow channel extends under west span of bridge; left bank high and rocky; right bank low with some cottonwood and brush. Control is at almost right-angle turn to right, about 250 feet below gage and below deep pool, and is composed of gravel and free of vegetation; subject to slight shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.45 feet at 11 a. m. February 8 (discharge, 5,420 second-feet); minimum stage, 0.44 foot at 6 a. m. July 29 (discharge, 22 second-feet).

1916–1924: Maximum stage from water-stage recorder, 9.9 feet, January 3, 1921 (discharge, 10,000 second-feet); minimum discharge, 16 second-feet August 19, 1920.

ICE.—Stage-discharge relation affected by ice January 9–10 and probably while well was frozen December 31 to January 8.

DIVERSIONS.—On Umatilla River above gaging station and below mouth of McKay Creek 150 acres are irrigated, and above mouth of McKay Creek 600 acres. On the principal tributaries, 1,750 acres are irrigated on Birch Creek and 1,300 on McKay Creek.

REGULATION.—At low stages water is ponded in the power canals of two flouring mills at Pendleton and released at intervals to obtain sufficient power for operating the mills, thus causing considerable fluctuation at the station. There is practically no effect at medium and high stages. The backwater from Furnish Reservoir extends to within a few hundred yards below the control.

ACCURACY.—Stage-discharge relation changed three times during year. Rating curves and periods of application well defined. Operation of water-stage recorder satisfactory except as indicated in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection or for days of considerable variation in stage, by averaging results obtained by applying mean gage height for shorter intervals. Records good, except for periods when recorder was not operating, for which they are poor.

Discharge measurements of Umatilla River above Furnish Reservoir, near Yoakum, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 18	1.22	142	Mar. 25	2.63	521	May 23	1.67	199
Nov. 28	1.71	242	Apr. 4	3.48	985	May 27	1.49	134
Dec. 18	2.41	491	May 8	2.57	512	June 22	1.13	70
Jan. 15	2.32	476	May 16	2.20	361	July 5	.62	26.7
Feb. 2	6.95	4,520	May 18	2.03	295	July 25	.56	28.4

Daily discharge, in second-feet, of Umatilla River above Furnish Reservoir, near Yoakum, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	169	1,150		4,650	1,250	545	810	98	41	23	30
2	52	151	855		4,820	1,180	700	780	95	38	22	30
3	57	147	680		3,180	1,220	900	780	93	38	22	32
4	63	147	590		2,580	1,280	990	750	86	32	23	32
5	70	147	530		2,940	1,220	960	650	84	28	24	32
6	76	145	665	700	3,320	1,140	930	540	84	28	24	32
7	92	137	1,920		3,320	1,080	1,080	525	126	27	24	32
8	216	133	1,460		4,990	1,020	1,530	496	166	28	24	33
9	300	131	1,060		3,740	960	1,600	480	158	28	24	36
10	243	131	830			900	1,600	468	152	28	23	38
11	192	131	705	610		840	1,840	460	150	28	23	45
12	169	129	630	570		810	2,080	460	142	28	23	38
13	153	129	550	550	1,820	700	2,080	446	132	29	23	50
14	145	125	510	490		675	1,840	436	112	30	25	41
15	143	127	452	490		650	1,920	400	105	31	25	34
16	147	133	435	510		675	1,280	366	96	31	25	31
17	151	131	435	490		675	1,140	343	95	30	27	37
18	155	129	470	470	1,390	625	725	313	98	30	30	31
19	153	129	435	435	1,250	550	930	283	98	30	33	37
20	149	137	452	382	1,110	570	870	259	91	35	46	59
21	141	143	435	330	1,140	580	870	244	78	37	50	62
22	368	143	382	321	1,140	575	930	215	73	34	56	52
23	470	147	330	330	1,140	550	960	207	73	30	52	44
24	418	159	365	348	1,080	540	930	194	71	28	41	46
25	315	294	400	330	1,080	515	840	162	70	26	39	51
26	288	297	418	324	1,050	492	780	148	66	28	37	63
27	267	264	418	324	1,020	460	780	134	60	25	35	70
28	246	243	418	330	1,140	468	780	134	54	23	33	70
29	231	1,150	2,320	484	1,280	488	780	132	48	26	30	63
30	213	1,600	2,000	1,000	-------	530	780	130	42	25	30	58
31	195	-------	1,100	3,470	-------	535	-------	111	-------	24	30	-------

NOTE.—No gage-height record Oct. 1–2 (discharge estimated), Dec. 31 and Jan. 1–10 (discharge estimated by comparison with record at station at Umatilla), Feb. 10–17 (discharge estimated as sum of discharge of Umatilla River above McKay Creek, McKay Creek at mouth, and Birch Creek near Pilot Rock).

Monthly discharge of Umatilla River above Furnish Reservoir, near Yoakum, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	470	----------	191	11,700
November	1,600	125	239	14,200
December	2,320	330	755	46,400
January	3,470	321	632	38,900
February	4,990	1,020	2,140	123,000
March	1,280	460	766	47,100
April	2,080	545	1,130	67,200
May	810	111	382	23,500
June	166	42	96.5	5,740
July	41	23	29.8	1,830
August	56	22	30.5	1,880
September	70	30	43.6	2,590
The year	4,990	22	529	384,000

UMATILLA RIVER NEAR UMATILLA, OREG.

LOCATION.—In NW. ¼ sec. 21, T. 5 N., R. 28 E., near main line of Oregon-Washington Railroad & Navigation Co., 1½ miles below diversion point of West Division Main Canal, and 1½ miles above Umatilla, Umatilla County and mouth of river.

DRAINAGE AREA.—2,130 square miles.

RECORDS AVAILABLE.—October 21, 1903, to September 30, 1924.

GAGE.—Inclined staff in two sections. Read by employees of United States Bureau of Reclamation.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Solid rock overlain with coarse gravel or sand. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.65 feet February 1 (discharge, 4,050 second-feet). Stream bed practically dry June 2–6.

1903–1924: Maximum stage recorded, 11.0 feet May 31, 1906 (discharge, 19,600 second-feet); no flow July 25 and August 1–9, 1906, September 1–15, 1922, and June 2–6, 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Large part of total flow of river diverted for irrigation above station. The Umatilla project feed canal also diverts water during the winter for storage in the Cold Springs Reservoir. West Division Main Canal of Umatilla project of the United States Bureau of Reclamation diverts 1½ miles above the station. The low-water flow is return water from the Hermiston project and other irrigated tracts.

REGULATION.—Discharge is occasionally affected by pondage at the diversion dam.

ACCURACY.—Stage-discharge relation changed owing to gravel filling in between ridges in bedrock at control beginning April 13 for stages below 2.8 feet. Rating curve before and after change fairly well defined. Staff gage read to hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records good except for discharge below 100 second-feet, for which they are fair.

Discharge measurements of Umatilla River near Umatilla, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 30	1.95	8.4	July 24	2.15	15.6
Apr. 3	3.02	302	July 31	2.10	14.8

Daily discharge, in second-feet, of Umatilla River near Umatilla, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	------	1,230	1,090	4,050	885	80	75	10	10	13	14
2	29	------	715	885	3,680	950	80	81	------	10	13	14
3	22	------	625	885	3,310	885	307	81	------	10	12	14
4	2	14	580	765	2,620	950	415	188	------	10	12	14
5	8	14	375	625	2,290	885	455	95	------	11	13	14
6	31	14	375	715	2,960	820	439	86	------	11	13	14
7	58	15	495	820	2,620	765	415	7	9	11	13	14
8	58	15	1,660	670	3,490	765	715	6	10	11	13	14
9	22	15	1,090	670	4,050	715	1,160	6	10	11	13	14
10	179	15	1,020	670	2,790	670	1,020	6	10	11	13	14
11	165	15	625	670	2,130	580	1,090	6	10	12	13	14
12	134	15	625	625	1,810	580	1,370	6	10	12	13	14
13	124	15	415	625	1,440	580	1,370	6	10	13	13	14
14	107	15	375	625	1,370	535	1,300	6	10	13	13	14
15	107	14	415	535	1,370	580	1,020	6	10	13	13	14
16	94	14	375	535	1,370	580	1,020	8	10	13	13	14
17	94	14	375	495	1,370	495	580	7	10	13	13	14
18	107	14	375	495	1,090	495	431	8	10	13	23	14
19	107	14	375	471	950	439	355	8	10	13	23	14
20	102	14	375	391	820	375	307	8	10	13	37	14
21	102	14	375	391	765	399	216	9	12	13	37	14
22	99	14	375	361	820	355	228	9	12	13	37	14
23	205	14	307	361	715	276	174	9	12	13	37	14
24	276	14	307	361	765	276	216	10	11	13	37	14
25	264	14	307	321	715	188	234	10	10	13	37	14
26	234	80	307	114	670	150	399	10	10	13	37	14
27	179	80	282	188	670	188	118	10	10	13	37	14
28	124	80	282	188	670	124	83	10	10	13	18	14
29	124	80	282	205	885	124	75	10	10	13	18	14
30	23	43	2,130	216	------	80	75	12	10	13	15	14
31	23	------	1,510	245	------	80	------	12	------	13	15	------

NOTE.—Stream bed practically dry Nov. 1-3 and June 2-6.

Monthly discharge of Umatilla River near Umatilla, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	276	2	105	6,460
November	80	0	22.6	1,340
December	2,130	282	612	37,600
January	1,090	114	523	32,200
February	4,050	670	1,800	104,000
March	950	80	509	31,300
April	1,370	75	525	31,200
May	188	6	26.2	1,610
June	12	0	8.53	508
July	13	10	12.2	750
August	37	13	20.2	1,240
September	14	14	14.0	833
The year	4,050	0	343	249,000

McKAY CREEK AT MOUTH, NEAR PENDLETON, OREG.

LOCATION.—In SE. ¼ sec. 8, T. 2 N., R. 32 E., at road bridge ¼ mile above Umatilla River, 2½ miles west of Pendleton, Umatilla County, and 4½ miles downstream from former gaging station at dam site.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 23, 1903, to July 6, 1904, and April 19, 1922, to June 30, 1924, when station was discontinued. Nearly comparable record at former gaging station at dam site available November 12, 1919, to September 30, 1923.

GAGE.—Vertical staff fastened to right pier of bridge; read by Ned Cheney.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge at gage or from another bridge 2 miles upstream, correcting for diversions.

CHANNEL AND CONTROL.—Banks not subject to overflow; river is pooled at bridge at low stages, an eddy near left bank at higher stages; below bridge, stream divides into two channels separated by a gravel bar, main channel being against right bank; control is a gravel riffle 50 feet below bridge and is subject to change.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.12 feet on January 31 (discharge, 900 second-feet); minimum discharge estimated at 2 second-feet during July and August.

1903–1904; 1919–1924: Maximum discharge recorded at dam site, 3,250 second-feet (gage height, 4.4 feet) February 10, 1921. Minimum discharge at station at dam site, zero at times; minimum discharge at station at mouth estimated at 2 second-feet during September, 1923, and July and August, 1924.

ICE.—Stage-discharge relation affected by ice on January 3.

DIVERSIONS.—Numerous ditches above station divert practically entire summer flow, but at this point there is a constant flow of 2 or 3 second-feet from springs or return water.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed owing to scouring by ice January 10 and to log jamming on high-water portion of control January 31. Rating curves fairly well defined by discharge measurements and points determined from comparisons with records for other stations. Staff gage read to hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records fair.

Discharge measurements of McKay Creek at mouth, near Pendleton, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 18	1.16	22.5	Feb. 24	2.20	199	May 9	0.98	22.3
Jan. 15	1.67	100	Apr. 8	2.22	240	May 26	.66	4.1
Feb. 4	3.40	617						

Daily discharge, in second-feet, of McKay Creek at mouth, near Pendleton, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		36	175	120	645	270	122	57	3
2		34	146	81	900	250	146	50	3
3		33	120	77	680	250	168	48	2
4		31	98	73	565	330	179	48	2
5		30	91	47	615	330	179	42	2
6		28	91	49	565	290	179	35	2
7		27	218	51	540	250	190	31	2
8		26	203	65	760	235	220	26	6
9		26	146	73	615	220	235	22	8
10		24	120	73	510	190	220	19	16
11	10	23	116	91	450	179	270	18	17
12		22	98	95	395	168	352	17	15
13		22	84	88	375	146	330	17	16
14		22	78	75	330	146	290	16	8
15		21	70	96	330	146	235	15	6
16		22	70	106	290	136	205	13	4
17		26	70	101	250	136	190	10	5
18		26	70	96	235	126	168	8	4
19		26	70	83	220	124	157	6	4
20		26	67	77	205	122	146	4	3
21	28	27	62	74	190	122	136	4	2
22	116	27	60	69	220	114	118	5	2
23	88	27	55	69	220	110	114	8	2
24	73	26	55	77	220	106	103	6	2
25	62	26	57	84	220	103	92	6	2
26	57	27	60	88	250	99	83	5	2
27	53	28	62	92	220	96	80	5	2
28	49	28	67	92	290	99	74	5	2
29	45	385	203	103	290	106	66	5	2
30	41	274	189	290	-------	106	61	4	2
31	40	-------	169	900	-------	110	-------	4	-------

NOTE.—Gage not read Oct. 1–20; discharge estimated from records on Birch Creek and on Umatilla River above and below mouth of McKay Creek.

Monthly discharge of McKay Creek at mouth, near Pendleton, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	116	----------	27.5	1,690
November	385	21	46.9	2,790
December	218	55	105	6,460
January	900	47	115	7,070
February	900	190	400	23,000
March	330	96	168	10,300
April	352	61	170	10,100
May	57	4	18.0	1,110
June	17	2	4.9	292
July	----------	----------	*2	123
August	----------	----------	*2	123
September	----------	----------	*3	179
The year	900	2	87.1	63,260

* Estimated.

BIRCH CREEK NEAR PILOT ROCK, OREG.

LOCATION.—In SE. ¼ sec. 15, T. 1 N., R. 32 E., at Guderian ranch, 6 miles downstream from Pilot Rock and 8 miles south of Pendleton, Umatilla County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1919, to September 30, 1924.

GAGE.—Vertical staff gage on right bank about 50 feet above bridge, 400 feet west of Guderian ranch house. Vertical staff above diversion dam in SE. ¼ sec. 22, 1 mile above Guderian ranch, used up to February 12, 1922; read by Howard Guderian.

DISCHARGE MEASUREMENTS.—At high stages made from bridge; at medium and low stages made by wading.

CHANNEL AND CONTROL.—Stream bed of gravel and small boulders; banks not subject to overflow; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.20 feet at 5 p. m. (discharge, 460 second-feet). No flow in August and September. 1920–1924: Maximum stage recorded, 3.80 feet at old gage April 13, 1920 (discharge, 1,270 second-feet). Stream bed dry at times.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Several small ditches divert water above the station, using practically all the summer flow.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined. Staff gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

The following discharge measurements were made:

February 24, 1924: Gage height, 0.95 foot; discharge, 101 second-feet.

April 5, 1924: Gage height, 0.72 foot; discharge, 58 second-feet.

May 9, 1924: Gage height, 0.32 foot; discharge, 9.6 second-feet.

Daily discharge, in second-feet, of Birch Creek near Pilot Rock, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1	2	28	26	24	285	124	41	86	5	
2	1	27	28	18	425	124	33	33	5	
3	1	24	27	10	285	146	33	25	6	2
4	4	22	27	9	223	183	41	21	7	
5	4	21	26	9	302	126	57	18	7	
6	5	20	28	10	355	118	65	15	7	2
7	8	18	46	10	355	113	87	12	7	2
8	24	17	41	10	425	107	223	10	8	2
9	30	17	40	12	408	107	223	10	9	2
10	24	16	38	32	320	103	223	9	9	2
11	21	16	38	32	210	91	285	7	10	2
12	23	16	38	32	158	84	302	6	10	2
13	24	15	33	32	170	80	320	5	8	2
14	23	15	33	31	158	77	253	5	6	2
15	26	15	32	30	158	73	183	5	6	2
16	26	15	31	30	137	70	135	5	6	2
17	26	15	30	28	126	68	114	5	6	2
18	24	15	31	28	118	62	105	5	5	2
19	24	14	32	27	113	57	87	5	4	2
20	22	14	31	27	105	59	87	5	2	
21	20	14	30	26	101	57	87	5	2	
22	80	14	30	25	94	54	87	5	2	
23	72	15	30	26	158	54	78	5	2	
24	62	15	28	26	158	44	62	5	2	
25	59	16	28	26	105	46	54	5	2	1
26	57	16	28	26	103	36	57	5	2	
27	57	16	27	26	101	32	54	5	2	
28	51	16	27	28	135	36	51	5	2	
29	41	20	27	31	124	48	44	5	2	
30	31	26	26	60		54	38	5	2	
31	28		26	158		54		5		

NOTE.—Braced figures show mean discharge for periods included. No flow in August and September.

Monthly discharge of Birch Creek near Pilot Rock, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	80	1	29.0	1,780
November	28	14	17.6	1,050
December	46	26	31.1	1,910
January	158	9	29.0	1,780
February	425	94	204	11,700
March	183	32	80.2	4,930
April	320	33	117	6,960
May	36	5	9.6	590
June	10	2	5.1	303
July	2		1.61	99
August	0	0	0	0
September	0	0	0	0
The year	425	0	42.9	31,100

UMATILLA PROJECT FEED CANAL NEAR ECHO, OREG.

LOCATION.—In SW. ¼ sec. 22, T. 3 N., R. 29 E., a quarter of a mile below head gate at United States Bureau of Reclamation diversion dam on Umatilla River, 2 miles above Echo, Umatilla County.

RECORDS AVAILABLE.—October 1, 1920, to September 30, 1924.

GAGE.—Vertical staff on right bank 60 feet above concrete dam just below the first waste gage in canal. Gage read by M. C. Wolverton, employee of United States Bureau of Reclamation.

DISCHARGE MEASUREMENTS.—Made at footbridge across concrete-lined section of canal half a mile below gage.

CHANNEL AND CONTROL.—Gage is at earth section of canal just above concrete dam having five piers. At middle of dam is a gate, 2 feet wide, of removable 2-inch planks, the top of which is 0.33 foot below crest of dam. Just above at left bank is a gate used to flush sand out of canal, but its operation does not affect stage-discharge relation because gate is below crest of dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.87 feet on several days in February and March (discharge, 280 second-feet); canal dry at times.

1920–1924: Maximum stage recorded, 2.0 feet on several days in March and April, 1922, and January, March, and April, 1923 (discharge, 315 second-feet).

ACCURACY.—Stage-discharge relation changed before water was turned into canal on October 19. Rating curve fairly well defined. Gage read to hundredths once a day and also after making changes at head gate. Daily discharge ascertained by applying daily or weighted mean daily gage height to rating table, or for days when large changes were made, by taking weighted mean of results obtained by applying to rating table the gage heights for various periods. Records good.

Umatilla project feed canal diverts from right bank of Umatilla River at diversion dam. The water is carried to Cold Springs Reservoir, from which it is released during the irrigation season.

Discharge measurements of Umatilla project feed canal near Echo, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 27	0.40	30.0	Apr. 23	1.72	240	Apr. 23	1.72	248
Apr. 2	1.04	108	Do	1.72	244	June 11	.30	17.7
Apr. 21	1.66	225						

Daily discharge, in second-feet, of Umatilla project feed canal near Echo, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		122	200		250	280	102	238	
2		116	202		250	280	102	236	
3		108	214		255	280	102	236	
4		108	214		257	280	102	238	
5		106	214		257	280	113	207	
6		102	214		260	280	117	183	
7		102	214		262	280	117	149	
8		99	214		262	280	117	155	7
9		99	226		262	280	129	151	24
10		99	226		262	264	157	126	24
11		94	226		264	170	209	112	24
12		99	226		262	110	245	114	24
13		98	214		252	50	248	114	24
14		92	214		274	50	243	114	7
15		94	231	15	274	50	243	114	
16		91	231	71	274	50	248	112	
17		91	231	102	274	50	252	89	
18		91	236	102	277	50	257	37	
19	28	91	238	114	280	50	257	26	
20	42	92	238	155	274	50	238	7	
21	28	99	238	142	280	50	238		
22	28	99	238	131	280	50	236	7	
23	28	98	231	114	280	50	245	24	
24	28	99	233	114	280	50	248	24	
25	28	131	238	180	280	50	245	24	
26	28	146	238	214	280	31	219	24	
27	28	162	238	219	280	28	207	15	
28	28	157	238	224	280	50	214		
29	91	168	238	233	280	106	224		
30	129	185	238	236		102	231		
31	129		169	248		102			

NOTE.—Canal dry on days for which no record is given.

Monthly discharge of Umatilla project feed canal near Echo, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	129	0	20.7	1,270
November	185	91	111	6,600
December	238	169	225	13,800
January	248	0	84.3	5,180
February	280	250	269	15,500
March	280	28	133	8,180
April	257	102	197	11,700
May	238	0	92.8	5,710
June	24	0	4.47	266
The year	280	0	94.0	68,200

NOTE.—Canal dry during July, August, and September.

ECHO MILL TAILRACE AT ECHO, OREG.

LOCATION.—In NW. ¼ sec. 16, T. 3 N., R. 29 E., 100 yards west of Echo mill and 200 yards west of head gate on Umatilla project feed canal at Echo, Umatilla County.

RECORDS AVAILABLE.—October 1, 1920, to September 30, 1924.

GAGE.—Inclined staff about 150 feet below outlet of tunnel under main-line track of Oregon-Washington Railroad & Navigation Co.

DISCHARGE MEASUREMENTS.—Made by wading or from strut across channel 15 feet below tunnel outlet.

CHANNEL AND CONTROL.—The channel is in earth; banks high. Stage-discharge relation likely to be affected by aqueous growth during summer and occasionally by flashboards at outlet into Umatilla River.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.75 feet March. 20–22 (discharge, 20 second-feet); maximum mean daily discharge wasted from Umatilla project feed canal to river through spillway at that point, 42 second-feet on October 20. Channel dry at times.

1921–1924: Maximum discharge, that of October 20, 1923.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Staff gage read to hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records good.

Water diverted from the Umatilla project feed canal is used for power in the Echo flour mill or wasted into tailrace or occasionally into spillway at that point and returned to Umatilla River a quarter of a mile below gage. The flow at gage is not subject to diurnal fluctuation.

Discharge measurements of Echo mill tailrace at Echo, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 27	1.70	18.3	Apr. 2	1.64	18.3
Mar. 11	1.72	19.3	Apr. 21	1.04	6.9

Daily discharge, in second-feet, of Echo mill tailrace at Echo, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1		16	13		3.4	8.1	17	5.0
2		3.4	1.5		3.4	8.1	11	5.0
3		3.4	1.5		1.5	8.1	12	5.0
4		1.5	1.5		3.5	8.1	6.3	5.0
5		1.5	1.5		2.6	19	5.4	5.0
6		1.5	1.5		5.4	7.8	5.6	5.3
7		12	1.5		3.2	19	5.3	5.0
8		1.5	1.5		3.0	19	5.0	5.0
9		1.5	1.5		3.0	19	5.3	5.0
10		1.5	1.5		3.4	19	5.6	5.0
11		1.5	1.5		9.4	19	5.5	5.3
12		10	1.5		10	13	5.6	5.3
13		13	1.5		11	7.0	5.6	5.0
14		13	1.5		11	7.8	5.6	4.5
15		8.6	1.5	1.5	8.6	7.0	5.4	4.4
16		14	1.5	1.5	7.8	7.8	5.3	4.4
17		14	1.5	1.5	7.8	7.2	19	5.0
18		13	1.5	1.5	7.8	7.2	5.5	5.0
19	28	3.4	3.4	1.5	7.8	7.2	5.5	
20	42	8.6	15	1.5	7.8	20	5.8	
21	28	17	3.4	1.5	7.8	20	6.9	
22	28	13	3.4	1.5	7.8	20	6.3	
23	28	14	3.4	1.5	7.8	7.6	6.3	
24	28	14	3.4	1.5	8.0	7.0	6.3	
25	28	1.5	1.5	1.5	7.8	7.0	5.6	
26	28	11	1.5	1.5	7.8	7.0	5.0	
27	28	11	1.5	1.5	19	7.0	5.0	
28	28	11	3.0	1.5	8.1	7.0	5.0	
29	1.5	1.5	1.5	1.5	8.1	7.0	5.0	
30	1.5	1.5	1.5	1.5		7.2	5.3	
31	1.5		1.5	1.5		7.0		

NOTE.—Flow in Umatilla project feed canal wasted at spillway Oct. 19–28. No flow on days for which no record is given.

Monthly discharge of Echo mill tailrace at Echo, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			9.63	592
November	17	1.5	7.95	473
December	15	1.5	2.66	164
January	1.5	0	.82	50
February	19	1.5	7.02	404
March	20	7.0	11.0	676
April	19	5.0	6.80	405
May	5.3	0	2.88	177
The period		0	4.05	2,940

NOTE.—No flow June to September.

WESTERN LAND & IRRIGATION CO.'S CANAL NEAR ECHO, OREG.

LOCATION.—In SE. ¼ sec. 17, T. 3 N., R. 29 E., at rectangular timber weir, half a mile below turnout to Allen Canal, 1 mile below head gate on Umatilla River and 1 mile southwest of Echo, Umatilla County.

RECORDS AVAILABLE.—May 10 to July 31, 1921; April 1 to June 30, 1922, March 1 to September 30, 1923, and March 1 to June 30, 1924.

GAGE.—Vertical staff gage on right wing wall of weir; gage lowered during 1922 to read heights above crest of weir. Read by Ed Nunn.

DISCHARGE MEASUREMENTS.—Made from footbridge half a mile upstream just below turnout to Allen Canal.

CHANNEL AND CONTROL.—Canal is in earth section. Control for gage is 16-foot rectangular weir having 2-inch crest.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 2.68 feet May 4 and 5 (discharge, 267 second-feet). Canal dry at times.

1921–1924: Maximum stage recorded, 2.78 feet May 18 and 19, 1922 (discharge, 284 second-feet).

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records good.

Head gate is situated in NE. ¼ sec. 21, T. 3 N., R. 29 E., on left bank of Umatilla River. A portion of flow may be turned into Allen Canal half a mile below head gate and into Pioneer & Courtney Canal a quarter of a mile below gage. During the irrigation season of 1924 the amount of water, in acre-feet, turned into Allen Canal was approximately as follows: March, 523; April, 1,260; May, 1,590; June, 1,270; July, 1,080; August, 701; September, 1,360.

The following discharge measurement was made:

April 1, 1924: Gage height, 1.81 feet; discharge, 137 second-feet.

Daily discharge, in second-feet, of Western Land & Irrigation Co.'s canal near Echo, Oreg., for the year ending September 30, 1924

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1	34	134	259	33	16	--------	219	161	90
2	71	154	259	68	17	100	235	160	60
3	71	154	259	71	18	105	235	149	58
4	71	161	119	60	19	110	235	90	60
5	71	166	267	55	20	95	227	60	60
6	71	157	259	37	21	100	235	121	60
7	67	154	211	45	22	100	196	128	48
8	--------	146	211	119	23	100	227	108	45
9	--------	124	188	100	24	98	227	102	45
10	--------	196	133	100	25	100	189	96	28
11	--------	219	174	98	26	119	235	90	22
12	90	235	171	80	27	119	235	90	27
13	121	211	174	108	28	119	243	86	22
14	127	203	174	90	29	119	259	55	10
15	--------	235	168	66	30	121	243	60	5
					31	121	--------	58	--------

NOTE.—Canal dry on days for which no discharge is given.

Monthly discharge of Western Land & Irrigation Co.'s canal near Echo, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	127	0	78.1	4,800
April	259	124	203	12,100
May	267	55	150	9,220
June	119	5	59	3,510
The period	----------	----------	----------	29,600

MAXWELL CANAL NEAR HERMISTON, OREG.

LOCATION.—In SW. ¼ sec. 20, T. 4 N., R. 28 E., below second wasteway, 2⅓ miles below head gate on Umatilla River, and 3 miles southwest of Hermiston, Umatilla County.

RECORDS AVAILABLE.—March 18, 1921, to August 25, 1924.

GAGE.—Vertical staff and float gage in stilling well 200 feet below second wasteway into Umatilla River. Read by W. H. Starr for United States Bureau of Reclamation.

DISCHARGE MEASUREMENTS.—Made from foot plank 100 feet below gage.

CHANNEL AND CONTROL.—Canal is concrete lined and is straight between gage and measuring section; control is permanent except when affected by aqueous growth.

EXTREMES OF DISCHARGE.—Maximum stage, 3.14 feet May 14 (discharge, 82 second-feet). Canal dry during winter.

1921–1924: Maximum stage recorded, 3.25 feet May 24 and 25, 1921 (discharge, 96 cond-feet).

ACCURACY.—Stage-discharge relation affected during the summer by aqueous growth. Rating curve well defined; method of shifting control used during the summer. Gage read to hundredths once a day and also after making change at head gate. Daily discharge ascertained by applying daily gage heights to rating table directly April 1 to May 16 and indirectly May 17 to September 30. Records good.

Maxwell Canal diverts from right bank of Umatilla River at diversion dam in SW. ¼ sec. 28, T. 4 N., R. 28 E. The water is used for irrigation on the Umatilla project of United States Bureau of Reclamation.

During the winter of 1922–23 the United States Bureau of Reclamation constructed a wasteway from the A line canal into the Maxwell Canal just above second wasteway of Maxwell Canal into Umatilla River. Waste from the A line may go down Maxwell Canal or into Umatilla River, or both. In 1924 amount of water, in acre-feet, wasted at this point from the A line was as follows: April, 732; May, 378; June, 88; July, 519; August, 640; September, 27.

Discharge measurements of Maxwell Canal near Hermiston, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 3	1.83	25.7	May 29	2.74	56	July 18	2.20	29.1
May 22	2.80	62	June 9	2.84	51	Sept. 24	1.30	8.1

Daily discharge, in second-feet, of Maxwell Canal near Hermiston, Oreg., for the year ending September 30, 1924

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20		28	80	41	27	38	6.5
2	20		28	80	42	27	27	4.9
3	20		32	78	39	31	43	5.8
4	20		40	80	36	24	41	6.8
5	20		50	64	42	33	43	11
6	26		54	64	38	29	35	6.2
7	19		64	74	37	31	34	6.5
8	21		68	73	36	24	29	6.8
9	14		74	70	46	22	24	7.4
10	12		76	70	47	27	29	7.0
11	11		78	68	45	21	36	7.1
12	10		78	79	43	15	30	7.1
13	10		79	79	46	13	36	6.8
14	22		78	82	38	13	31	6.6
15	16		77	82	41	16	39	6.6
16			78	80	42	36	34	
17			75	67	27	37	17	
18			72	72	41	37	34	
19			76	72	40	28	29	
20			78	66	6.7	39	22	7.5
21			79	64	10	42	20	
22			77	62	25	39	24	
23			77	63	24	42	31	
24			76	56	30	40	27	
25			72	54	35	33	33	8.0
26		15	80	56	44	15	6.2	
27			80	55	34	42	5.8	
28			80	59	30	24	5.7	8.0
29			80	59	29	15	5.6	
30			80	51	27	27	5.8	
31				48		35	5.8	

NOTE.—Braced figures are estimated means for periods indicated.

Monthly discharge of Maxwell Canal near Hermiston, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	26	0	8.42	518
March			4.84	298
April	80	28	68.8	4,090
May	82	48	68.0	4,180
June	46	6.7	35.4	2,110
July	42	13	28.5	1,750
August	43	5.6	26.5	1,630
September	11	4.9	7.30	434
The year	82	0	22.5	15,000

NOTE.—Water turned out of canal Oct. 15 and into canal about Mar. 22, estimated flow Mar. 22–31 being 15 second-feet.

WEST DIVISION MAIN CANAL NEAR UMATILLA, OREG.

LOCATION.—In SW. ¼ sec. 28, T. 5 N., R. 28 E., just below head gate at United States Bureau of Reclamation diversion dam on Umatilla River, 3 miles above Umatilla.

RECORDS AVAILABLE.—March 17, 1921, to September 30, 1924.

GAGE.—Vertical staff gage in stilling well just below head gate used November 1 to April 24; inclined staff gage below Umatilla spillway used October 1–30 and April 25 to September 30. Read by ditch rider of United States Bureau of Reclamation.

DISCHARGE MEASUREMENTS.—Made from footbridge about 2 miles below intake and just below Umatilla spillway.

CHANNEL AND CONTROL.—Canal is concrete lined; stage-discharge relation of both gages seriously affected by aqueous growth during summer. Stage-discharge relation of gage at head gate seriously affected by sand drifting into canal and flushed out through the Umatilla spillway.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 159 second-feet on June 2 (gage height, at gage below Umatilla spillway, 4.86 feet); canal dry at times.

1921–1924: Maximum discharge recorded, 164 second-feet, May 16–19, 1921 (gage height, 5.00 feet), and June 10 and 11, 1922 (gage height, 5.40 feet).

ACCURACY.—Stage-discharge relation unstable for both gages during the year owing to sand blown into or cleaned out of canal and to the growth of aquatic plants. Standard rating curves for both gages are fairly well defined; shifting-control method used except April 25 to May 10 for gage below Umatilla wasteway. Staff gage read to hundredths once a day except May 13 to July 25 when it was generally read twice a day because of diurnal fluctuation due to work on canal. Daily discharge ascertained by applying to rating table daily gage height directly or indirectly by shifting-control method. Records fair except for November, February, and March, when backwater effect was poorly defined, and May 1 to July 14, when no water was going over dam and there was considerable diurnal fluctuation, for which periods the records are poor.

Main canal diverts water from left bank of Umatilla River at United States Bureau of Reclamation diversion dam for irrigation on the western division of the Umatilla project of the United States Bureau of Reclamation. Part of the area was formerly irrigated by the Oregon Land & Water Co.'s ditch which diverted water from the left bank of Umatilla River 1 mile below the present diversion dam of United States Bureau of Reclamation.

Discharge measurements of West Division Main Canal near Umatilla, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 3	4.98	130	Apr. 11	4.20	135	June 30	4.22	102
Apr. 11	5.13	154	Apr. 24	4.19	142	July 22	5.02	133
July 24	5.30	148	May 22	4.31	134	Aug. 20	4.91	120
Apr. 3	3.60	96	June 9	4.36	122			

NOTE.—First three measurements made at gage at head gate; remainder at gage below Umatilla spillway.

Daily discharge, in second-feet, of West Division Main Canal near Umatilla, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	138	78	------	9	123	140	143	110	137	118
2	101	129	75	------	12	123	152	159	110	140	116
3	98	123	78	------	18	129	152	156	110	138	116
4	96	118	75	------	19	132	149	152	118	133	116
5	107	118	75	------	19	135	149	143	118	140	113
6	101	116	75	------	19	138	152	137	118	133	113
7	101	113	75	------	19	141	143	127	113	130	113
8	101	113	73	------	18	141	124	133	121	130	113
9	98	113	75	------	17	144	113	130	124	130	113
10	88	110	75	------	21	152	110	127	124	133	113
11	88	103	78	------	34	155	107	127	124	133	113
12	88	100	78	------	34	155	107	124	127	133	113
13	88	103	78	------	34	155	107	127	127	121	110
14	86	103	78	------	36	152	110	84	133	118	110
15	86	100	------	------	44	149	113	124	146	121	110
16	96	100		------	44	149	116	68	140	121	113
17	90	103		------	44	135	124	124	137	137	110
18	84	100		------	44	135	127	116	137	137	107
19	88	103	20	------	44	135	133	118	137	130	110
20	88	98		10	44	132	127	124	143	118	107
21	88	98		10	63	132	149	137	137	124	113
22	91	96		17	82	129	140	130	133	124	113
23	91	98	------	19	84	129	143	124	143	124	104
24	94	98	------	19	84	141	149	127	140	124	98
25	77	89	------	19	84	137	152	124	143	124	101
26	80	84	------	19	84	133	143	113	143	124	98
27	98	89	------	19	84	137	137	118	140	124	101
28	94	86	------	14	118	133	137	113	140	124	96
29	96	86	------	12	118	137	143	110	140	127	96
30	94	86	------	------	118	137	143	113	137	118	88
31	100	------	------	------	118	------	143	------	137	118	------

NOTE.—Discharge estimated Dec. 15–22. No flow Dec. 23 to Feb. 19.

Monthly discharge of West Division Main Canal, near Umatilla, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	107	77	92.8	5,710
November	138	84	104	6,190
December	78	0	39.5	2,430
January	0	0	0	0
February	19	0	5.4	311
March	118	9	51.9	3,190
April	155	123	138	8,210
May	152	107	133	8,180
June	159	68	125	7,440
July	146	110	131	8,060
August	140	118	128	7,870
September	118	88	108	6,430
The year	159	0	88.2	64,000

JOHN DAY RIVER BASIN

JOHN DAY RIVER AT McDONALD, OREG.

LOCATION.—In NW. ¼ sec. 11, T. 1 N., R. 19 E., at ferry at McDonald post office, Sherman County, half a mile below mouth of Rock Creek, 16 miles above junction with Columbia River, and 18 miles southwest of Arlington.

DRAINAGE AREA.—7,800 square miles.

RECORDS AVAILABLE.—December 16, 1904, to September 30, 1924.

GAGE.—Inclined staff in two sections on left bank, 183 feet above ferry cable. Gage reader, J. L. Garrett.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Bed composed of clean gravel and sand; shifts slightly. Banks high. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.25 feet on February 9 (discharge, 9,180 second-feet); minimum stage recorded, 0.90 foot August 18–23 and September 6 (discharge, 66 second-feet).

1905–1924: Maximum stage recorded, 10.38 feet February 6, 1907 (discharge, 22,800 second-feet). A flood, probably in 1884, is said to have reached a stage of 12.8 feet (discharge estimated from extension of rating curve, 33,000 second-feet). Minimum stage recorded, 1.02 feet September 8–11, 1915 (discharge, 63 second-feet).

ICE.—Stage-discharge relation affected by ice during several periods in January.

DIVERSIONS.—Large part of natural low-water flow of stream diverted in the upper John Day Valley for irrigation.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water in February, affecting only low stages. Two well defined rating curves used, identical above 1,200 second-feet. Gage read once a day to quarter-tenths. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurement was made:

June 10, 1924: Gage height, 2.02 feet; discharge, 594 second-feet.

Daily discharge, in second-feet, of John Day River at McDonald, Oreg., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	700	690	2,460	2,800	1,380	3,160	850	288	92	87
2	690	650	5,500	2,460	1,380	3,360	755	240	92	87
3	780	605	5,500	2,300	1,490	3,560	660	262	87	87
4	648	605	3,560	2,300	1,610	3,780	580	217	87	87
5	605	250	3,360	2,300	1,670	3,780	580	217	87	87
6	605	225	5,780	2,150	1,860	3,560	505	177	87	66
7	648	225	5,500	2,000	1,860	2,980	505	197	87	87
8	690		6,060	2,000	2,000	2,800	472	177	87	87
9	780		9,180	1,860	2,980	2,460	505	177	87	87
10	870	550	6,060	1,730	3,560	2,300	580	142	87	87
11	825		4,220	1,730	3,780	2,460	660	160	87	87
12	780		3,560	1,730	3,780	2,630	802	160	87	87
13	735		3,160	1,610	4,700	2,800	755	142	87	87
14	565	870	3,160	1,490	4,460	2,800	755	142	87	87
15	410	780	3,160	1,440	4,700	2,800	802	142	87	87
16	605	648	3,160	1,490	4,220	2,630	708	142	87	87
17	605	648	2,980	1,490	3,560	2,460	620	128	87	87
18	690	825	2,800	1,490	3,160	2,460	580	128	66	87
19	780	970	2,630	1,380	2,980	2,000	505	128	66	87
20	780	890	2,460	1,380	2,800	2,860	505	119	66	87
21	735	810	2,300	1,380	2,630	1,730	505	113	66	87
22	735	730	2,300	1,440	2,630	1,550	620	108	66	87
23	690	648	2,800	1,380	2,630	1,490	542	99	66	87
24	565	605	2,460	1,380	2,980	1,320	505	99	87	87
25	485	870	2,460	1,320	3,160	1,270	440	99	87	87
26	525	690	2,150	1,380	2,800	1,160	408	99	87	92
27	780	690	2,150	1,320	2,630	1,050	375	113	87	92
28	780	648	2,150	1,380	2,630	1,000	345	113	92	113
29	690	690	2,150	1,320	2,800	950	315	113	92	118
30	690	870	-------	1,490	2,800	850	288	113	87	118
31	735	1,270	-------	1,490	-------	850	-------	99	87	-------

NOTE.—Gage heights affected by ice Jan. 2, 8–13, and 20–22; discharge interpolated. No record Oct. 1 to Nov. 30.

Monthly discharge of John Day River at McDonald, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			[a] 300	18,400
November			[a] 400	23,800
December	870	410	684	42,100
January	1,270	225	668	41,100
February	9,180	2,150	3,630	209,000
March	2,800	1,320	1,690	104,000
April	4,700	1,380	2,850	170,000
May	3,780	850	2,290	141,000
June	850	288	568	33,800
July	288	99	150	9,220
August	92	66	83.6	5,140
September	118	66	89.6	5,330
The year	9,180	66	1,100	803,000

[a] Estimated.

CAMAS CREEK ABOVE CABLE CREEK, NEAR UKIAH, OREG.

LOCATION.—In SE. ¼ sec. 4, T. 5 S., R. 32 E., at highway bridge 200 feet above mouth of Cable Creek and 6 miles east of Ukiah, Umatilla County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1914, to September 30, 1917; November 1, 1919, to June 30, 1924; station discontinued.

GAGE.—Vertical staff on abutment of highway bridge; read by C. W. Meteer.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; slightly shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.85 feet on February 9 (discharge, 388 second-feet); minimum stage recorded, 1.10 feet October 2 and 3 (discharge, 3 second-feet).

1914–1917; 1920–1924: Maximum stage recorded, 4.5 feet May 13 and 14, 1917 (discharge, 1,790 second-feet); minimum discharge recorded, 2 second-feet in August and September, 1921, and August, 1922.

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Practically none.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during year except as affected by ice from December 31 to January 31. Rating curve fairly well defined. Gage read to half-tenths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records fair.

The following discharge measurement was made:

April 7, 1924; Gage height, 2.58 feet; discharge, 247 second-feet.

Daily discharge, in second-feet, of Camas Creek above Cable Creek, near Ukiah, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4	11	8		185	185	90	215	30
2	3	11	11		215	185	82	235	25
3	3	11	11		255	200	82	235	25
4	4	11	14		280	200	82	215	25
5	4	11	14		305	215	73	200	25
6	4	11	14		332	200	73	185	40
7	6	11	17		332	185	247	170	52
8	8	14	21		360	170	52	155	45
9	8	14	21		388	155	66	155	45
10	11	14	21		360	155	82	142	45
11	14	14	21		305	142	99	142	40
12	14	11	21		280	130	130	142	40
13	14	11	21		255	119	155	130	35
14	14	11	25		255	119	215	130	32
15	14	11	30		255	119	305	108	30
16	14	8	35	60	255	119	280	82	25
17	14	8	40		255	108	255	58	2[illegible]
18	11	8	45		255	108	235	58	2[illegible]
19	11	6	52		255	108	235	58	21
20	11	6	58		255	108	235	52	17
21	14	6	58		235	108	235	52	17
22	14	6	66		235	108	215	52	17
23	14	6	66		235	108	215	52	17
24	14	6	66		215	119	215	52	21
25	14	6	66		200	119	200	45	21
26	14	8	66		200	119	185	40	21
27	14	8	66		185	108	185	35	17
28	14	8	66		185	108	185	35	17
29	14	8	66		185	108	200	35	17
30	14	8	66		-------	99	200	35	17
31	11	-------	60		-------	90	-------	35	-------

NOTE.—Stage-discharge relation affected by ice Dec. 31 to Jan. 31; discharge estimated by study of weather records and observer's notes.

Monthly discharge of Camas Creek above Cable Creek, near Ukiah, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	14	3	10.9	670
November	14	6	9.4	559
December	66	8	39.1	2,400
January	-------	-------	60	3,690
February	388	185	259	14,900
March	215	90	136	8,360
April	305	66	170	10,100
May	235	35	108	6,640
June	52	17	27.6	1,640
The period	-------	-------	-------	49,000

CABLE CREEK NEAR UKIAH, OREG.

LOCATION.—In NE. ¼ sec. 9, T. 5 S., R. 32 E., at highway bridge, 1,000 feet above mouth of creek and 6 miles east of Ukiah, Umatilla County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1914, to September 30, 1917; November 1, 1919, to June 30, 1924; station discontinued.

GAGE.—Vertical staff on abutment of bridge; read by C. W. Meteer.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and rock; uneven, slightly shifting.

EXTREMES OF STAGE.—Maximum stage recorded during year, 1.55 feet on February 2 (discharge, 285 second-feet); minimum stage recorded, 0.15 foot October 2 and 3 (discharge, 0.5 second-foot).

1914–1917; 1920–1924: Maximum stage recorded, 2.7 feet May 15, 1917 (discharge, 590 second-feet); minimum, creek probably dry at times during freezing weather in winter of 1917.

ICE.—Stage-discharge relation affected by ice.

DIVERSIONS.—Probably none.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except when affected by ice December 30 to January 31. Rating curve fairly well defined. Gage read to half-tenths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records fair.

The following discharge measurement was made:

April 7, 1924: Gage height, 0.74 foot; discharge, 43.5 second-feet.

Daily discharge, in second-feet, of Cable Creek near Ukiah, Oreg., for the period October 1 to June 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1	2	2		245	17	17	124	8
2	.5	2	2		285	17	17	140	6
3	.5	2	2		265	25	17	140	6
4	1	2	3		245	25	12	124	6
5	1	2	3		225	33	12	110	6
6	1	2	4		225	25	17	96	25
7	2	2	4		208	17	40	84	42
8	2	2	6		208	17	51	72	33
9	2	2	4		190	17	62	62	33
10	3	2	4		155	12	84	51	33
11	4	2	6		124	8	96	51	25
12	4	2	6		110	8	96	42	25
13	4	2	6		96	6	124	42	17
14	4	2	8		84	6	140	33	17
15	4	2	17		72	6	140	33	8
16	4	1	25	30	62	8	124	33	6
17	4	1	33		62	12	110	33	6
18	3	1	51		62	17	96	25	6
19	3	1	72		62	17	84	25	6
20	3	1	72		51	17	84	17	8
21	2	1	84		51	17	84	17	8
22	2	1	84		51	17	96	17	8
23	2	1	84		51	25	96	17	8
24	2	1	84		42	25	84	17	12
25	2	1	84		33	25	84	17	12
26	2	1	84		25	25	96	12	6
27	2	2	84		17	17	96	12	4
28	2	2	84		17	17	110	12	4
29	2	2	84		17	17	110	12	4
30	2	2	80		-------	17	124	12	4
31	2	-------	70		-------	17	-------	12	-------

NOTE.—Stage-discharge relation affected by ice Dec. 30 to Jan. 31; discharge estimated from study of observer's notes and temperature records.

Monthly discharge of Cable Creek near Ukiah, Oreg., for the period October 1 to June 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4	0.5	2.35	144
November	2	1	1.63	95
December	84	2	39.9	2,450
January			30	1,840
February	285	17	115	6,620
March	33	6	17.1	1,050
April	140	12	80.1	4,770
May	140	12	48.2	2,960
June	42	4	13.1	780
The period				20,700

DESCHUTES RIVER BASIN

DESCHUTES RIVER ABOVE SNOW CREEK, NEAR LAPINE, OREG.

LOCATION.—In NE. ¼ sec. 21, T. 20 S., R. 8 E., 1 mile above mouth of Snow Creek, and backwater of proposed Crane Prairie Reservoir, 30 miles northwest of Lapine, Deschutes County.

DRAINAGE AREA.—Indeterminate, as most of water comes from springs.

RECORDS AVAILABLE.—May 25, 1922, to September 30, 1924.

GAGE.—Vertical staff on left bank; read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made from footbridge 150 feet above gage.

CHANNEL AND CONTROL.—Bed composed of gravel with steep soil banks, somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum discharge during year, 172 second-feet, October 1–5 (interpolated); maximum stage recorded, 1.78 feet October 6. Minimum stage recorded, 0.82 foot May 20 (discharge, 52 second-feet).

1922–1924: Maximum stage recorded, 2.22 feet August 21 and 22, 1922 (discharge, 213 second-feet); minimum stage that of 1924.

ICE.—Ice never forms, stream spring fed.

DIVERSIONS.—None.

REGULATION.—Natural regulation from springs.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Gage read to hundredths at irregular intervals, averaging once or twice a week. Daily discharge obtained by applying gage readings to rating table. Records good.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Deschutes River above Snow Creek, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 1	1.28	96	Mar. 11	0.85	54	July 8	0.97	67
Jan. 21	.99	65	Apr. 25	.86	56	Aug. 19	1.08	77

Daily discharge, in second-feet, of Deschutes River above Snow Creek, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			96							62		
2											72	
3			94				54		54			66
4												
5										62	74	
6	166							55				
7									55			
8		117				56				64	73	
9				64	64							65
10	160							55	55			
11						54				65		
12							55				75	
13								55				
14				69	62		54		56			
15	154							54				61
16										67	75	
17								54	56			
18		104										
19										69	74	
20						53	52	52				
21			80	65			56		58			
22										70		60
23												
24	142							53	60			
25							55				71	
26		96								71		
27								54	61			
28	133			62	56							
29							55			72		58
30								54				
31												

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Deschutes River above Snow Creek, near Lapine, Oreg., for the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
October	152	9,350	March	54.2	3,330	August	72.6	4,460
November	109	6,490	April	54.5	3,240	September	62.1	3,700
December	82.7	5,080	May	54.1	3,330			
January	66.9	4,110	June	56.9	3,390	The year	74.5	54,100
February	60.7	3,490	July	67.0	4,120			

CRANE PRAIRIE RESERVOIR NEAR LAPINE, OREG.

LOCATION.—At reservoir dam, in NW. ¼ sec. 16, T. 21 S., R. 8 E., 28 miles by road west of Lapine, Deschutes County.

RECORDS AVAILABLE.—November 15, 1922, to September 30, 1924.

GAGE.—Vertical staff in sections on left bank; read by E. L. Dalrymple and C. J. Keefer; datum 4,400 feet above sea level based on levels by United States Bureau of Reclamation in 1914.

EXTREMES OF CONTENTS.—Maximum stage recorded, 44.10 feet January 10–13 (contents, 50,830 acre-feet); minimum stage recorded, 28.82 feet September 23, 24, and 30 (contents, 119 acre-feet).

1923–1924: Maximum and minimum stages, those of 1924.

Crane Prairie Reservoir temporary dam was completed in 1922, gates closed November 4, 1922; spillway crest at elevation 4,445 feet, capacity 55,200 acre-feet. Stored water to be used for irrigation, but none used in 1923 or 1924.

As shown by the tables which follow, a comparison between the monthly gain or loss in storage, as determined from the run-off into and the outflow from the reservoir, and the gain or loss in storage, as determined from the contents in the reservoir at the end of each month, indicates that there is a reservoir loss during October to February when the storage exceeds 30,000 acre-feet, only a part of which is chargeably to evaporation. From March to September the storage is under 30,000 acre-feet and the records of outflow corrected for storage check reasonably well with the inflow.

Monthly run-off, in acre-feet, of Deschutes River and tributaries above Crane Prairie, Oreg., compared with outflow, for year ending September 30, 1924

	Deschutes River above Snow Creek	Snow Creek	Cultus River	Cultus Creek	Deer Creek	Quinn River	Charlton Creek	Rock Creek	Cold Creek and springs	Total inflow	Outflow of Deschutes River at Crane Prairie	Gain or loss in storage
1923–24												
October	9,350	1,780	3,830	552	307	1,940	0	1,230	111	19,100	1,880	+17,200
November	6,490	1,730	3,510	952	357	1,550	0	1,130	89	15,800	2,040	+13,800
December	5,090	1,720	3,370	676	246	1,230	0	1,110	68	13,500	2,180	+11,300
January	4,110	1,720	3,010	676	369	861	0	1,050	67	11,900	3,220	+8,680
February	3,490	1,610	2,570	633	173	805	0	978	63	10,300	21,900	−11,600
March	3,330	1,720	2,710	670	184	861	0	1,050	64	10,600	16,600	−6,000
April	3,240	1,670	2,610	750	381	797	40	952	65	10,500	22,000	−11,500
May	3,330	1,720	2,740	2,120	633	806	91	984	91	12,500	15,100	−2,600
June	3,390	1,670	2,730	1,270	61	863	0	952	178	11,100	20,400	−9,300
July	4,120	1,660	2,830	467	0	836	0	953	179	11,000	13,200	−2,200
August	4,460	1,660	2,830	80	0	750	0	953	179	10,900	11,600	−700
September	3,700	1,610	2,740	0	0	547	0	893	160	9,650	10,400	−750
The year	54,100	20,300	35,500	8,850	2,710	11,800	131	12,200	1,310	147,000	141,000	+6,330

NOTE.—Monthly run-off of Rock Creek and Cold Creek and springs estimated; very uncertain as the sources of these streams were submerged during most of the year. Monthly run-off estimated for Cultus Creek October to February, for Deer Creek October to January, and for Quinn River November to February.

Monthly stage and contents of Crane Prairie Reservoir at Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Date	Gage-height	Storage	Loss or gain during month	Date	Gage-height	Storage	Loss or gain during month
	Feet	*Acre-feet*			*Feet*	*Acre-feet*	
September 30	40.30	33,790		May 31	34.31	11,780	−4,200
October 31	42.16	41,840	+8,050	June 30	30.30	1,770	−10,010
November 30	43.16	46,400	+4,560	July 31	28.98	206	−1,560
December 31	43.95	50,110	+3,710	Aug. 31	29.00	217	+10
January 31	43.89	49,830	−280	September 30	28.82	119	−100
February 29	40.26	33,620	−16,210				
March 31	38.64	27,080	−6,540	The year			−33,670
April 30	35.60	15,980	−11,100				

DESCHUTES RIVER AT CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—In NW. ¼ sec. 16, T. 21 S., R. 8 E., 200 yards below Crane Prairie dam site, 28 miles by road west of Lapine, Deschutes County.

DRAINAGE AREA.—Indeterminate.

RECORDS AVAILABLE.—January 1, 1914, to June 30, 1917, and February 23, 1922, to September 30, 1924; fragmentary gage readings 1907 to 1913.

GAGE.—Stevens eight-day recorder on left bank, just above new Forest Service bridge. Staff gage in section 17, about half a mile above present gage, used up to June 8, 1922.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Bed composed of rock and boulders, probably permanent; slight aquatic growth at times.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.40 feet at 9 a. m. April 18 due to release of stored water (discharge, 604 second-feet); minimum stage recorded, 0.43 foot at 6 p. m. April 25 (discharge, 23 second-feet).

1907–1917; 1922–1924: Maximum stage recorded, that of 1924; maximum natural stage from fragmentary records, 2.75 feet on old gage July 31, 1913 (determined from high-water marks on September 15; discharge, 531 second-feet). Minimum stage recorded, 0.05 foot April 24, 1923 (discharge, 2.5 second-feet due to closing of dam). Minimum natural discharge recorded, 130 second-feet March 31, 1917 (gage height, 1.12 feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Gates at dam at outlet of Crane Prairie just above station were closed October 1 to February 11, March 15 to April 2, and April 23–28.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of water-stage recorder satisfactory with the exception of January 8 and 9, April 16, July 6–7 and 12–13. Discharge ascertained by applying to rating table mean daily gage height determined by inspecting recorder graph. Records excellent.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Deschutes River at Crane Prairie, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 27	0.53	34.2	Mar. 15	1.87	363	Apr. 17	2.35	564
Jan. 17	.71	56.5	Do	2.15	482	Apr. 18	2.40	612
Mar. 13	2.31	568	Do	1.40	226	Aug. 20	1.29	183
Mar. 15	1.66	299	Do	1.10	140			

Daily discharge, in second-feet, of Deschutes River at Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	36	35	37	62	575	30	313	203	291	192	184
2	24	35	35	37	62	580	42	313	203	281	192	181
3	24	35	35	37	62	570	173	313	106	272	192	181
4	24	35	35	37	62	565	173	313	25	262	189	181
5	24	35	35	37	62	570	170	310	25	244	189	181
6	24	35	35	37	61	575	333	306	25	244	189	181
7	24	34	35	37	61	570	570	209	25	244	189	181
8	24	34	35	37	61	565	589	209	60	229	189	179
9	26	34	35	37	61	565	589	209	508	220	189	179
10	27	34	35	57	61	570	589	209	560	217	189	179
11	27	34	35	57	167	565	585	209	550	214	189	176
12	28	34	35	57	497	560	585	209	536	214	189	176
13	28	34	35	57	570	513	585	209	522	212	189	173
14	29	34	35	57	565	422	589	209	513	209	189	173
15	30	34	35	57	570	135	589	203	499	203	189	173
16	30	34	35	57	580	31	589	200	486	203	189	173
17	30	34	35	57	580	31	580	197	472	203	189	173
18	31	34	35	57	580	31	594	203	459	203	189	173
19	31	34	35	59	580	31	594	203	451	203	189	173
20	31	34	35	59	575	31	594	203	434	198	189	170
21	37	34	35	59	517	30	589	203	422	198	189	170
22	37	34	35	59	575	30	477	203	410	192	189	170
23	37	34	36	59	585	30	25	203	399	192	189	170
24	37	34	36	59	580	30	24	200	387	192	189	170
25	37	34	36	59	580	30	24	200	372	192	189	170
26	37	34	36	59	580	30	25	200	354	192	189	170
27	37	34	37	59	580	30	25	238	340	192	189	173
28	37	34	37	59	575	30	163	434	323	189	189	173
29	37	35	37	61	575	30	303	442	307	192	187	173
30	36	35	37	62	-------	30	316	320	297	189	184	173
31	36	-------	37	62	-------	30	-------	203	-------	192	184	-------

Monthly discharge of Deschutes River at Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Month	Observed discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	37	24	30.5	1,880
November	36	34	34.3	2,040
December	37	35	35.5	2,180
January	62	37	52.3	3,220
February	585	61	380	21,900
March	580	30	270	16,600
April	594	24	370	22,000
May	442	197	245	15,100
June	560	25	342	20,400
July	291	189	215	13,200
August	192	184	189	11,600
September	184	170	175	10,400
The year	594	24	194	141,000

DESCHUTES RIVER AT PRINGLE FALLS, NEAR LAPINE, OREG.

LOCATION.—In NE. ¼ sec. 23, T. 21 S., R. 9 E., at head of Pringle Falls, 9 miles by road northwest of Lapine, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 26, 1915, to June 17, 1916; October 1, 1916, to June 30, 1917; and June 6, 1922, to September 30, ~~1~~1924.

GAGE.—Stevens continuous water-stage recorder, on left bank about 250 yards above road bridge. Staff gage almost directly opposite used 1915 to 1917.

DISCHARGE MEASUREMENTS.—Made from cable half a mile below gage and below falls; during 1916 and 1917 made from boat near gage.

CHANNEL AND CONTROL.—Control is at head of falls, mostly rock and practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year from water-stage recorder, 2.74 feet at noon February 16 (discharge, 1,140 second-feet); minimum stage recorded, 1.51 feet at 4 p. m. June 8 (discharge, 551 second-feet).

1915–1917; 1922–1924: Maximum discharge recorded, 1,170 second-feet June 23, 1917 (gage height on old gage, 1.49 feet); minimum discharge, 540 second-feet December 27, 1915 (gage height, 0.40 foot).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Water stored in Crane Prairie Reservoir.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of recorder satisfactory with the exception of March 7–12; May 5–7, 21–23, and September 1–8. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspecting recorder graph. Records excellent.

COOPERATION.—Records furnished by State engineer of Oregon.

Discharge measurements of Deschutes River at Pringle Falls, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 21	1.70	630	Apr. 14	2.66	1,080	July 7	1.98	751
Feb. 14	2.73	1,140	Apr. 28	1.54	567	Sept. 17	1.79	682
Apr. 4	1.88	733	May 16	1.89	712			

Daily discharge, in second-feet, of Deschutes River at Pringle Falls, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	622	638	630	626	634	1,120	580	807	724	798	694	676
2	622	638	655	626	634	1,130	584	807	724	793	694	676
3	630	634	689	626	638	1,130	693	807	720	784	689	676
4	630	634	698	626	638	1,130	706	807	572	779	689	676
5	634	634	711	626	638	1,110	706	766	559	769	689	676
6	634	634	655	626	638	1,130	719	766	559	756	689	676
7	634	634	638	626	634	1,120	1,030	766	559	751	689	676
8	638	634	630	626	634	1,120	1,070	724	555	746	689	676
9	638	634	630	638	634	1,120	1,090	724	817	742	685	676
10	638	634	630	643	634	1,110	1,090	724	1,020	737	685	672
11	643	634	630	647	634	1,110	1,080	724	1,020	733	689	672
12	643	634	630	651	850	1,110	1,080	724	1,020	728	685	668
13	643	634	630	651	1,130	1,100	1,080	724	1,010	724	685	668
14	643	634	630	651	1,130	1,040	1,080	720	998	724	685	664
15	647	630	630	647	1,130	890	1,080	715	987	724	689	659
16	647	630	630	651	1,130	630	1,070	711	977	715	698	655
17	647	630	630	655	1,130	601	1,070	711	972	715	689	659
18	647	630	630	655	1,130	588	1,070	711	961	715	694	664
19	647	630	630	651	1,130	588	1,080	715	946	715	694	668
20	643	630	630	647	1,130	588	1,080	715	936	711	694	664
21	643	630	630	643	1,120	588	1,080	715	920	706	694	659
22	643	630	630	643	1,100	588	1,070	715	910	706	689	659
23	643	630	630	643	1,120	588	800	715	895	702	689	651
24	638	630	630	643	1,120	588	563	715	885	702	685	664
25	638	630	630	643	1,120	588	563	715	875	702	685	651
26	638	630	630	643	1,120	584	563	711	860	702	685	664
27	638	630	630	647	1,120	584	563	706	845	702	681	664
28	638	630	630	643	1,120	584	596	850	836	698	681	664
29	638	630	630	643	1,120	588	779	915	821	698	681	664
30	638	630	630	638	-------	580	807	910	812	694	681	659
31	638	-------	630	638	-------	580	-------	729	-------	694	676	-------

NOTE.—Recorder not in operation Mar. 7–12, May 5–7, 21–23, and Sept. 1–8; discharge estimated.

Monthly discharge of Deschutes River at Pringle Falls, near Lapine, Oreg., for the year ending September 30, 1924

Month	Observed discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	647	622	639	39,300
November	638	630	632	37,600
December	711	630	639	39,300
January	655	626	641	39,400
February	1,130	634	929	53,400
March	1,130	580	836	51,400
April	1,090	563	881	52,400
May	915	706	750	46,100
June	1,020	555	843	50,200
July	798	694	728	44,800
August	698	676	688	42,300
September	676	651	667	39,700
The year	1,130	555	738	536,000

DESCHUTES RIVER AT BENHAM FALLS, NEAR BEND, OREG.

LOCATION.—In SE. ¼ sec. 9, T. 19 S., R. 11 E., 50 yards above head of Benham Falls, 1½ miles below proposed dam site for Benham Falls Reservoir, and 14 miles by road south of Bend, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 30, 1909, to September 30, 1913; August 27 to December 22, 1920; July 1 to September 15, 1921; and February 12 to September 30, 1924.

GAGE.—Stevens continuous recorder, installed February 12, 1924, on left bank 50 yards above head of falls. Staff gage near same location used for earlier records.

DISCHARGE MEASUREMENTS.—Made from cable about 100 yards above gage.

CHANNEL AND CONTROL.—Control is rock reef at head of Benham Falls. Gage and cable located in comparatively deep and sluggish water above head of falls.

EXTREMES OF DISCHARGE.—Maximum stage during period February 12 to September 30 from water-stage recorder, 2.06 feet at noon February 17 (discharge, 1,710 second-feet); minimum stage recorded, 0.80 foot at 6 p. m. June 8 (discharge, 1,010 second-feet).

1909–1913; 1920–1921; and 1924: Maximum stage of flood of November 27, 1909, not recorded, see Bend record (p. 47); minimum discharge recorded, 1,000 second-feet January 4, 1912 (height on old gage, 3.2 feet).

ICE.—None.

DIVERSIONS.—Some irrigation in headwaters of river. Station is above all large diversions near Bend.

REGULATION.—Discharge during 1924 affected by storage regulation in Crane Prairie and Crescent Lake Reservoirs.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of water-stage recorder satisfactory except February 28 to March 13. Daily discharge ascertained by applying to rating table mean daily gage heights by inspection of recorder graph. Records excellent.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Deschutes River at Benham Falls, near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 15	2.05	1,690	Apr. 11	1.92	1,610	June 6	0.82	1,020
Feb. 21	2.04	1,690	Apr. 28	.93	1,090	July 12	1.22	1,240
Apr. 3	.98	1,090	May 16	1.27	1,260	Aug. 13	1.10	1,160

Daily discharge, in second-feet, of Deschutes River at Benham Falls, near Bend, Oreg., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1,630	1,090	1,350	1,280	1,400	1,200	1,120
2		1,630	1,080	1,360	1,230	1,380	1,200	1,120
3		1,630	1,110	1,360	1,210	1,350	1,200	1,110
4		1,630	1,230	1,350	1,190	1,330	1,190	1,110
5		1,630	1,240	1,350	1,060	1,360	1,190	1,100
6		1,630	1,240	1,340	1,030	1,320	1,190	1,100
7		1,630	1,290	1,340	1,020	1,240	1,190	1,100
8		1,630	1,500	1,350	1,020	1,230	1,190	1,120
9		1,630	1,580	1,280	1,040	1,270	1,180	1,110
10		1,630	1,610	1,260	1,270	1,260	1,170	1,100
11		1,630	1,620	1,250	1,470	1,250	1,170	1,100
12	1,240	1,630	1,620	1,240	1,530	1,230	1,170	1,100
13	1,430	1,630	1,630	1,250	1,540	1,220	1,170	1,100
14	1,630	1,630	1,630	1,250	1,540	1,220	1,160	1,090
15	1,700	1,570	1,630	1,250	1,530	1,210	1,150	1,090
16	1,710	1,420	1,630	1,260	1,530	1,210	1,160	1,090
17	1,710	1,180	1,620	1,250	1,530	1,190	1,170	1,090
18	1,710	1,120	1,620	2,250	1,530	1,190	1,160	1,090
19	1,690	1,110	1,630	1,250	1,540	1,190	1,170	1,090
20	1,690	1,100	1,640	1,240	1,530	1,190	1,170	1,100
21	1,690	1,110	1,640	1,210	1,500	1,200	1,170	1,090
22	1,650	1,100	1,620	1,200	1,480	1,210	1,150	1,080
23	1,650	1,100	1,600	1,200	1,460	1,200	1,170	1,080
24	1,660	1,100	1,310	1,200	1,440	1,190	1,160	1,090
25	1,660	1,090	1,110	1,190	1,430	1,180	1,150	1,090
26	1,630	1,090	1,090	1,190	1,430	1,180	1,140	1,090
27	1,630	1,080	1,080	1,180	1,420	1,180	1,140	1,080
28	1,630	1,090	1,080	1,190	1,420	1,200	1,130	1,080
29	1,630	1,100	1,140	1,310	1,400	1,210	1,130	1,080
30		1,100	1,310	1,400	1,400	1,210	1,120	1,080
31		1,090		1,390		1,210	1,120	

NOTE.—Recorder not in operation Feb. 28 to Mar. 13; discharge estimated.

Monthly discharge of Deschutes River at Benham Falls, near Bend, Oreg., for the year ending September 30, 1924

Month	Observed discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
February 12–29	1,710	1,240	1,630	58,200
March	1,630	1,080	1,370	84,200
April	1,640	1,080	1,410	83,900
May	1,400	1,180	1,270	78,100
June	1,540	1,020	1,370	81,500
July	1,400	1,180	1,240	76,200
August	1,200	1,120	1,170	71,900
September	1,120	1,080	1,100	65,500
The period				600,000

DESCHUTES RIVER BELOW BEND, OREG.

LOCATION.—In SE. ¼ sec. 20, T. 17 S., R. 12 E., half a mile below North Canal Dam and 2 miles north of Bend, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 27, 1914, to September 30, 1924.

GAGE.—Stevens water-stage recorder on right bank; inspected by G. A. Hathaway and W. L. Beebe.

DISCHARGE MEASUREMENTS.—Made from cable about 50 feet upstream from gage.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and boulders, logs, drift, and aquatic plants on the wide, shallow control may affect stage-discharge relation at times.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 2.50 feet at 2 p. m. February 15 and 16 (discharge, 1,740 second-feet); minimum stage from recorder, −0.26 foot at 5 p. m. June 6 (discharge, 6 second-feet).

1915–1924: Maximum stage from water-stage recorder, 2.90 feet December 7, 1921 (discharge, 2,500 second-feet); minimum discharge recorded, that of 1924.

1905–1924: Maximum discharge of river in this vicinity, 4,820 second-feet at 7.45 a. m. November 27, 1909 (gage height 3.45 feet at pumping plant at Bend; no diversions).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Station is below intakes of six large canals which divert water from Deschutes River near Bend; only small diversions below station.

REGULATION.—Flow regulated by two hydroelectric plants; one at North Canal dam and one at Bend.

ACCURACY.—Stage-discharge relation changed slightly on February 16; two well defined rating curves used. Operation of water-stage recorder satisfactory except for a few days when clock was stopped. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph, or for days of considerable variation in stage by averaging results obtained by applying mean gage heights for shorter periods. Records good, except for estimated period in October and November for which they are fair.

Discharge measurements of Deschutes River below Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 12	1.80	1,020	Mar. 29	1.86	1,040	July 18	0.42	119
Feb. 13	2.18	1,380	June 6	−.22	8.7	Aug. 5	.57	156
Feb. 19	2.36	1,570						

Daily discharge, in second-feet, of Deschutes River below Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	285		672	800	755	1,480	944	385	88	80	168	168
2	379		755	820	755	1,340	739	304	39	158	176	168
3	454		890	845	890	1,370	747	469	30	275	172	168
4	373		1,070	1,030	1,070	1,370	861	385	24	285	168	106
5	338	600	1,070	1,220	1,070	1,400	852	342	20	215	165	28
6	361		1,070	1,170	1,070	1,550	799	290	17	233	168	21
7	403		1,070	1,170	1,170	1,550	739	275	15	154	168	19
8	373	750	1,020	1,120	1,170	1,580	962	265	15	154	101	20
9	373	820	1,020	1,070	1,170	1,560	1,080	215	14	117	31	20
10	355	820	1,020	1,070	1,120	1,550	1,050	181	21	60	28	18
11	355	820	1,020	1,070	1,170	1,540	981	176	156	45	30	73
12	385	740	980	980	1,220	1,540	953	143	198	39	30	154
13	422		1,020	935	1,320	1,540	897	143	189	28	37	154
14	467		980	980	1,550	1,530	879	130	193	24	111	158
15	550	700	1,020	935	1,610	1,500	870	140	198	24	121	154
16	670		1,120	1,020	1,650	1,380	906	150	180	27	150	154
17	678		1,120	1,020	1,640	1,190	934	161	423	50	150	154
18	642	710	1,020	1,020	1,640	1,090	925	451	295	108	143	147
19	630	710	935	1,070	1,580	991	906	470	185	95	140	136
20	636	755	980	1,020	1,520	934	906	103	176	105	143	133
21	636	755	980	1,020	1,530	925	897	67	150	111	79	133
22		845	1,020	1,020	1,500	888	897	50	140	127	21	127
23		845	1,020	935	1,480	915	879	50	117	105	17	130
24		755	935	980	1,440	1,010	692	267	80	78	15	130
25		800	890	980	1,390	1,000	365	327	83	36	15	143
26	620	845	935	1,020	1,370	981	241	62	85	30	15	168
27		800	935	1,020	1,370	1,030	189	42	83	28	15	154
28		710	890	1,020	1,390	1,020	194	40	88	27	56	143
29		638	1,070	935	1,450	1,020	185	58	85	25	154	158
30		630	1,020	800	-------	1,060	300	143	98	25	165	147
31		-------	920	755	-------	1,100	-------	161	-------	38	168	-------

NOTE.—No record Oct. 22 to Nov. 17, recorder pencil broken. Total discharges estimated from records on Deschutes River at Pringle Falls plus those for East Fork; discharges at station computed by deducting diversions in canals taking out above.

Monthly discharge of Deschutes River below Bend, Oreg., for the year ending September, 30 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	678	285	515	31,700
November	845	----------	715	42,500
December	1,120	672	983	60,400
January	1,220	755	995	61,200
February	1,650	755	1,310	75,400
March	1,580	888	1,260	77,500
April	1,080	185	759	45,200
May	470	40	208	12,800
June	423	14	116	6,900
July	285	24	93.7	5,760
August	176	15	101	6,210
September	168	18	120	7,140
The year	1,650	14	596	433,000

Daily discharge, in second-feet, of Deschutes River, including canals, near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,040		1,070	869	1,130	1,580	1,220	1,290	1,240	1,330	1,140	1,090
2	1,060		1,080	889	1,060	1,540	1,060	1,190	1,180	1,280	1,150	1,090
3	1,080		1,040	914	983	1,580	1,050	1,340	1,170	1,210	1,150	1,080
4	1,140		1,100	1,100	1,100	1,580	1,140	1,320	1,140	1,310	1,140	1,110
5	1,100		1,090	1,290	1,100	1,550	1,160	1,310	1,040	1,250	1,140	1,080
6	1,140		1,140	1,210	1,100	1,570	1,190	1,270	965	1,260	1,150	1,080
7	1,120		1,160	1,170	1,200	1,570	1,160	1,270	1,000	1,150	1,150	1,070
8	1,150		1,100	1,120	1,200	1,610	1,380	1,270	965	1,110	1,160	1,080
9	1,130		1,120	1,070	1,200	1,600	1,510	1,220	1,010	1,210	1,140	1,080
10	1,070	1,120	1,120	1,070	1,150	1,580	1,540	1,150	1,140	1,190	1,130	1,080
11	1,050		1,120	1,110	1,200	1,560	1,530	1,190	1,360	1,190	1,130	1,030
12	1,070		1,090	1,080	1,230	1,560	1,540	1,180	1,440	1,170	1,120	1,070
13	1,070		1,170	1,040	1,330	1,570	1,530	1,180	1,450	1,160	1,080	1,060
14	1,100		1,170	1,080	1,550	1,580	1,520	1,180	1,460	1,160	1,110	1,060
15	1,120		1,130	1,080	1,610	1,540	1,510	1,170	1,460	1,080	1,110	1,050
16	1,200		1,130	1,080	1,650	1,410	1,520	1,190	1,440	1,140	1,120	1,060
17	1,200		1,130	1,030	1,640	1,220	1,500	1,200	1,440	1,110	1,120	1,060
18	1,150	1,110	1,070	1,020	1,640	1,120	1,500	1,190	1,440	1,140	1,120	1,060
19	1,140	1,110	1,110	1,070	1,590	1,110	1,510	1,180	1,460	1,140	1,120	1,050
20	1,140	1,110	1,180	1,040	1,550	1,090	1,530	1,170	1,450	1,130	1,120	1,050
21	1,140	1,040	1,120	1,050	1,570	1,070	1,530	1,140	1,430	1,150	1,140	1,050
22		1,130	1,100	1,060	1,540	1,030	1,560	1,150	1,420	1,140	1,130	1,040
23		1,220	1,140	1,030	1,530	1,010	1,570	1,160	1,390	1,140	1,120	1,040
24		1,160	1,040	1,060	1,570	1,010	1,400	1,160	1,350	1,140	1,110	1,030
25		1,110	1,060	1,050	1,580	1,010	1,140	1,170	1,350	1,140	1,110	1,040
26	1,130	1,130	1,080	1,080	1,570	1,000	1,070	1,170	1,350	1,120	1,100	1,040
27		1,060	1,070	1,060	1,570	1,050	1,030	1,140	1,350	1,130	1,100	1,050
28		1,010	1,040	1,070	1,580	1,040	1,040	1,150	1,350	1,140	1,040	1,030
29		1,070	1,160	1,120	1,600	1,040	1,060	1,160	1,340	1,150	1,080	1,030
30		1,060	1,100	1,110	-------	1,070	1,200	1,280	1,300	1,150	1,090	1,030
31		-------	1,000	1,120	-------	1,100	-------	1,330	-------	1,100	1,100	-------

Monthly discharge of Deschutes River, including canals, near Bend, Oreg., for the year ending September 30, 1924

Month	Observed discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,200	1,040	1,120	68,900
November	1,220	1,010	1,110	66,000
December	1,180	1,000	1,100	67,600
January	1,290	869	1,070	65,800
February	1,650	983	1,390	80,000
March	1,610	1,000	1,320	81,200
April	1,570	1,030	1,340	79,700
May	1,340	1,140	1,210	74,400
June	1,460	965	1,300	77,400
July	1,330	1,080	1,170	71,900
August	1,160	1,040	1,120	68,900
September	1,110	1,030	1,060	63,100
The year	1,650	869	1,190	865,000

DESCHUTES RIVER NEAR MADRAS, OREG.

LOCATION.—In NW. ¼ sec. 19, T. 10 S., R. 13 E., at proposed Pelton dam site 5 miles above mouth of Shitike Creek, 8 miles below mouth of Metolius River, and 9 miles northwest of Madras, Jefferson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 28, 1923, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on right bank, just below dam site; inspected by R. D. Cooper and J. L. Campbell. Staff gage at same location used prior to May 5.

DISCHARGE MEASUREMENTS.—Made from cable at gage; measurements made in January and February, 1924, from boat held in place by light cable

CHANNEL AND CONTROL.—Bed composed of boulders and heavy gravel; apparently permanent. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.95 feet at 8.30 a. m. February 9 (discharge, 7,440 second-feet); minimum stage from water-stage recorder, 0.35 foot 1 to 4 p. m. August 29 (discharge, 3,230 second-feet).

ICE.—None.

DIVERSIONS.—Flow affected by diversions from upper Deschutes River, Crooked River, and Tumalo and Squaw Creeks. Most of low-water flow comes from springs entering below irrigation diversions.

REGULATION.—Some fluctuation due to power plants and canal intakes near Bend.

ACCURACY.—Stage-discharge relation apparently permanent. Rating curve fairly well defined at medium and high stages by measurements in 1925. Gage read to hundredths once or twice a day to May 5; operation of recorder satisfactory thereafter except in July when it was not attended regularly. Daily discharge ascertained by applying to rating table the mean daily gage height obtained by inspecting the recorder graph or the mean daily gage reading. Records good.

Discharge measurements of Deschutes River near Madras, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 10	1.75	[a] 5,080	May 23	0.64	3,420	June 9	0.48	3,370
Feb. 1	3.35	[a] 7,340	May 24	.60	3,570	June 20	.67	3,520
Feb. 4	2.40	[a] 5,900	June 1	.67	3,580	Sept. 6	.44	3,230
May 21	.68	3,650	June 3	.62	3,520			

[a] Measurement made from boat, accuracy questionable.

Daily discharge, in second-feet, of Deschutes River near Madras, Oreg., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1		4,190	6,690		3,660	3,500		3,280	3,350
2		4,160	6,060		3,660	3,500		3,360	3,360
3		4,470	5,690		3,760	3,460		3,420	3,360
4		4,520	5,440		3,760	3,400		3,420	3,370
5		4,580	5,440		3,760	3,360		3,400	3,350
6		4,700	5,820		3,660	3,350		3,390	3,300
7		4,700	5,820		3,660	3,320		3,400	3,290
8		4,820	6,690		3,710	3,320		3,400	3,310
9		4,700	7,320		3,710	3,340		3,390	3,270
10		4,700	5,820		3,660	3,350		3,320	3,240
11		4,700	5,440		3,660	3,350		3,320	3,250
12		4,470	5,320		3,710	3,360		3,320	3,250
13		4,470	5,320		3,710	3,500		3,310	3,340
14		4,470	5,560		3,710	3,480		3,300	3,350
15		4,470	5,820		3,660	3,480		3,320	3,360
16		4,470	5,690		3,710	3,470		3,360	3,360
17		4,580	5,620		3,710	3,460		3,360	3,360
18		4,470	5,560		3,660	3,710		3,390	3,360
19		4,470	5,440	4,470	3,860	3,610		3,390	3,360
20		4,470	5,440	4,420	3,760	3,510		3,360	3,320
21		4,470	5,440	4,360	3,540	3,500		3,360	3,350
22		4,470	5,440	4,470	3,490	3,470		3,360	3,350
23		4,470	5,560	4,360	3,490	3,470		3,290	3,350
24		4,360	5,440	4,360	3,480	3,460		3,300	3,360
25		4,360	5,190	4,110	3,450	3,420	3,400	3,290	3,360
26		4,470	5,190	3,860	3,610	3,400	3,360	3,300	3,360
27		4,470	5,060	3,780	3,410	3,400	3,320	3,290	3,370
28	4,360	4,470	5,060	3,710	3,390	3,390	3,310	3,290	3,390
29	4,580	4,470	5,190	3,710	3,360	3,390	3,310	3,240	3,360
30	4,820	4,360		3,660	3,360	3,390	3,300	3,330	3,400
31	4,470	6,060			3,430		3,290	3,360	

Monthly discharge of Deschutes River near Madras, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			3,920	241,000
November			4,150	247,000
December			4,480	275,000
January	6,060	4,160	4,550	280,000
February	7,320	5,060	5,640	324,000
March			4,960	305,000
April			4,460	265,000
May	3,860	3,360	3,620	223,000
June	3,710	3,320	3,440	205,000
July			3,370	207,000
August	3,420	3,240	3,340	205,000
September	3,400	3,240	3,340	199,000
The year			4,110	2,980,000

NOTE.—Monthly means for October, November, December, March, April, and July obtained by deducting flow of Shitike Creek from that for Deschutes River at Mecca.

DESCHUTES RIVER AT MECCA, OREG.

LOCATION.—In SW. ¼ sec. 20, T. 9 S., R. 13 E., at bridge at Mecca station on Oregon Trunk Railway, Jefferson County, 1½ miles below mouth of Shitike Creek and 12 miles above mouth of Warm Spring River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 7, 1911, to September 30, 1924.

GAGE.—Gurley eight-day recorder installed August 11, referred to vertical staff on right bank 75 feet above bridge. Gage read by H. E. Massey.

DISCHARGE MEASUREMENTS.—Made from highway bridge.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; subject to occasional slight shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.1 feet at 5 p. m. February 8 and noon February 9 (discharge, 7,570 second-feet); minimum stage recorded, 1.90 feet August 29 and September 7 (discharge, 3,250 second-feet).

1911–1924: Maximum stage recorded, 6.9 feet during night of January 6, 1923 (discharge, 15,200 second-feet); minimum stage recorded, 1.95 feet August 27–30, 1920 (discharge, 3,170 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Flow affected by diversions from upper Deschutes River, only small diversions below Bend gaging station. Summer flow of Crooked River above head of lower canyon near Terrebonne and of Tumalo and Squaw Creeks practically all diverted.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during winter. Well-defined rating curves used October 1 to April 14 and April 15 to September 30. Gage read to hundredths once a day; operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage heights obtained by inspecting recorder graph, or daily gage reading. Records good.

Discharge measurements of Deschutes River at Mecca, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 10	2.80	4,870	June 3	2.10	3,630	June 19	2.15	3,650
Apr. 14	2.97	5,060	June 9	2.01	3,380	Sept. 6	1.95	3,250

Daily discharge, in second-feet, of Deschutes River at Mecca, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,850	4,040	4,330	4,330	7,110	5,570	4,530	3,810	3,560	3,480	3,480	3,400
2	3,850	4,040	4,330	4,330	6,430	5,570	4,530	3,810	3,560	3,400	3,400	3,400
3	3,850	4,040	4,330	4,330	5,990	5,360	4,530	3,900	3,560	3,400	3,400	3,400
4	3,850	4,040	4,730	4,330	5,570	5,570	4,330	3,900	3,560	3,480	3,400	3,400
5	3,760	4,140	4,530	4,530	5,990	5,570	4,330	3,900	3,480	3,560	3,400	3,400
6	3,850	4,140	5,150	4,530	5,990	5,570	4,330	3,810	3,480	3,560	3,400	3,310
7	3,850	4,140	5,360	4,730	5,990	5,570	4,330	3,810	3,480	3,640	3,400	3,370
8	3,760	4,330	4,940	4,940	7,340	5,570	4,530	3,810	3,400	3,480	3,320	3,380
9	3,760	4,330	4,730	4,730	7,570	5,570	4,940	3,720	3,400	3,480	3,320	3,360
10	3,760	4,140	4,530	4,730	5,990	5,360	4,940	3,720	3,400	3,480	3,320	3,340
11	3,760	4,140	4,530	4,730	5,570	5,150	4,940	3,900	3,480	3,400	3,320	3,360
12	3,850	4,140	4,530	4,530	5,570	5,360	5,150	3,900	3,480	3,400	3,360	3,370
13	3,850	4,140	4,530	4,530	5,780	5,150	5,150	3,810	3,560	3,400	3,370	3,400
14	3,850	4,140	4,530	4,530	5,990	5,150	5,150	3,810	3,560	3,400	3,360	3,480
15	3,950	4,140	4,730	4,530	6,210	5,150	5,000	3,720	3,640	3,400	3,400	3,480
16	4,140	4,140	4,730	4,530	5,990	5,150	5,000	3,560	3,640	3,400	3,400	3,480
17	4,330	4,140	4,530	4,530	5,990	5,150	4,900	3,720	3,990	3,370	3,400	3,400
18	4,140	4,140	4,530	4,530	5,780	4,940	4,900	3,810	3,720	3,370	3,400	3,400
19	4,140	4,140	4,530	4,530	5,780	4,730	4,800	4,170	3,560	3,370	3,400	3,400
20	4,140	4,140	4,530	4,530	5,570	4,730	4,710	3,990	3,560	3,400	3,480	3,400
21	4,140	4,140	4,330	4,530	5,570	4,730	4,620	3,720	3,480	3,400	3,480	3,400
22	4,140	4,330	4,330	4,530	5,570	4,530	4,620	3,720	3,480	3,400	3,380	3,400
23	4,140	4,730	4,330	4,530	5,570	4,330	4,530	3,640	3,480	3,400	3,370	3,400
24	4,140	4,730	4,330	4,330	5,570	4,730	4,440	3,640	3,400	3,400	3,340	3,400
25	4,140	4,530	4,330	4,330	5,570	4,530	4,080	3,560	3,480	3,400	3,340	3,400
26	4,140	4,330	4,330	4,330	5,360	4,530	3,900	3,560	3,480	3,400	3,340	3,400
27	4,140	4,330	4,530	4,330	5,360	4,530	3,810	3,480	3,480	3,400	3,340	3,400
28	4,140	4,330	4,730	4,330	5,150	4,530	3,810	3,480	3,400	3,400	3,340	3,400
29	4,140	4,330	4,730	4,330	5,150	4,530	3,720	3,400	3,400	3,320	3,310	3,400
30	4,140	4,330	4,940	4,530	-------	4,530	3,720	3,400	3,400	3,320	3,360	3,400
31	4,140	-------	4,730	6,430	-------	4,530	-------	3,480	-------	3,320	3,400	-------

Monthly discharge of Deschutes River at Mecca, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,330	3,760	3,990	245,000
November	4,730	4,040	4,230	252,000
December	5,360	4,330	4,590	282,000
January	6,430	4,330	4,570	281,000
February	7,570	5,150	5,900	339,000
March	5,570	4,330	5,030	309,000
April	5,150	3,720	4,540	270,000
May	4,170	3,400	3,730	229,000
June	3,990	3,400	3,520	209,000
July	3,640	3,320	3,420	210,000
August	3,480	3,310	3,380	208,000
September	3,480	3,310	3,400	202,000
The year	7,570	3,310	4,190	3,040,000

DESCHUTES RIVER AT SHERARS BRIDGE, OREG.

LOCATION.—In NE. ¼ sec. 3, T. 4 S., R. 14 E., half a mile above Sherars Bridge, Wasco County, immediately below mouth of Tygh Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 13 to September 23, 1923, and July 25 to November 6, 1924, when station was discontinued. Gage-height record only February 13, 1912, to September 30, 1914.

GAGE.—Vertical staff on left bank; read by employees of Deschutes Falls Power Co.

DISCHARGE MEASUREMENTS.—Made from cable 1 mile below gage just below Buck Creek.

CHANNEL AND CONTROL.—Rocky section of river extending from gage to Sherar Falls with very little overlying gravel.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period June 13 to September 23, 1923, 717.09 feet June 13 (discharge, 5,400 second-feet); minimum stage, 715.62 feet September 17 (discharge, 4,100 second-feet).

Maximum stage recorded during period July 25 to November 6, 1924, 716.80 feet November 3 (discharge, 5,130 second-feet); minimum stage, 715.25 feet August 13–15, 26, 27, 30, Sept. 10, 11 (discharge, 3,790 second-feet).

ICE.—None.

DIVERSIONS.—Same as for station at Mecca.

REGULATION.—Practically none.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Gage read daily to hundredths in 1923, to half-tenths in 1924. Daily discharge ascertained by applying daily gage height to rating table. Records good.

The following discharge measurements were made:

October 13, 1924: Gage height, 715.50 feet; discharge, 4,000 second-feet.
October 27, 1924: Gage height, 715.45 feet; discharge, 4,000 second-feet.
November 6, 1924: Gage height, 716.55 feet; discharge, 4,910 second-feet.

Daily discharge, in second-feet, of Deschutes River at Sherars Bridge, Oreg., for the years 1923 and 1924

Day	1923				1924				
	June	July	Aug.	Sept.	July	Aug.	Sept.	Oct.	Nov.
1		5,220	4,410	4,270		3,840	3,840	3,920	4,640
2		5,130	4,430	4,250		3,840	3,880	3,960	4,900
3		5,130	4,380	4,270		3,960	3,920	4,080	5,130
4		5,040	4,320	4,680		3,960	3,840	4,040	4,950
5		5,000	4,310	4,590		3,920	3,840	3,880	4,950
6		5,000	4,250	4,250		3,920	3,840	3,880	4,900
7		5,080	4,410	4,250		3,920	3,840	3,880	
8		5,130	4,430	4,340		3,920	3,840	3,880	
9		5,130	4,430	4,290		3,920	3,840	3,880	
10		5,040	4,430	4,250		3,920	3,790	3,960	
11		5,130	4,470	4,250		3,920	3,790	3,960	
12		5,130	4,470	4,170		3,840	3,840	3,960	
13	5,400	5,080	4,470	4,170		3,790	3,840	4,000	
14	5,360	5,040	4,430	4,210		3,790	3,840	4,000	
15	5,220	5,130	4,430	4,140		3,790	3,920	3,960	
16	5,220	4,900	4,430	4,140		3,920	3,840	3,960	
17	5,130	4,950	4,430	4,100		3,880	3,840	3,920	
18	5,220	5,220	4,410	4,170		3,880	3,840	3,920	
19	5,260	5,040	4,380	4,210		3,920	3,880	3,920	
20	5,260	5,040	4,380	4,220		3,920	3,880	3,920	
21	5,220	5,000	4,340	4,250		3,920	3,840	3,920	
22	5,220	4,950	4,430	4,250		3,880	3,840	3,920	
23	5,220	4,950	4,430	4,290		3,840	3,840	3,920	
24	5,130	4,950	4,430			3,840	3,840	3,920	
25	5,130	4,680	4,410		3,920	3,840	3,960	3,920	
26	5,220	4,680	4,390		3,920	3,790	3,880	3,960	
27	5,130	4,640	4,400		3,920	3,790	3,880	3,960	
28	5,220	4,590	4,370		3,840	3,840	3,880	4,130	
29	5,220	4,680	4,390		3,840	3,840	3,880	4,130	
30	5,310	4,510	4,340		3,840	3,790	3,880	4,210	
31		4,470	4,350		3,840	3,840		4,340	

Monthly discharge of Deschutes River at Sherars Bridge, Oreg., for 1923 and 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1923				
June 13–30	5,400	5,130	5,230	187,000
July	5,220	4,470	4,960	305,000
August	4,470	4,250	4,400	271,000
September 1–23	4,680	4,100	4,260	194,000
The period				957,000
1924				
July 25–31	3,920	3,840	3,870	53,700
August	3,960	3,790	3,870	238,000
September	3,960	3,790	3,860	230,000
October	4,340	3,880	3,970	244,000
November 1–6	5,130	4,640	4,910	58,400
The period				824,000

DESCHUTES RIVER AT MOODY, NEAR BIGGS, OREG.

LOCATION.—In SE. ¼ sec. 26, T. 2 N., R. 15 E., opposite Moody railroad station 1¼ miles above bridge of Oregon-Washington Railroad & Navigation Co., 1½ miles above mouth of river, and about 5 miles southwest of Biggs, Sherman County.

DRAINAGE AREA.—About 9,180 square miles.

RECORDS AVAILABLE.—July 7, 1906, to September 30, 1924; October 19, 1897, to December 31, 1899, for a station near Moro, 10 miles above mouth of river in NE. ¼ sec. 5, T. 1 S., R. 16 E. Records for 1908 and 1910 somewhat fragmentary.

GAGE.—Staff in two sections; the lower inclined, the upper vertical. Gage read by Lynn B. Mulkins.

DISCHARGE MEASUREMENTS.—Made from a cable about 450 feet above gage.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; shifting only in floods.

EXTREMES OF DISCHARGE.—Maximum stage during year, 3.7 feet on February 1, 9, and 10 (discharge, 8,660 second-feet); minimum stage recorded, 2.12 feet September 10 and 11 (discharge, 3,670 second-feet).

1906–1924: Maximum stage recorded, 10.2 feet on January 7, 1923 (discharge, 43,600 second-feet); minimum stage recorded, 1.9 feet August 23–28, 1920 (discharge, 3,510 second-feet).

ICE.—Stage-discharge relation never affected by ice.

DIVERSIONS.—Summer discharge at this station has been progressively reduced since about 1904 or 1905 by diversions from the upper river. Some of the water returns but the net reduction during midsummer now probably exceeds 20 per cent.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed slightly during high water of February. Two well-defined rating curves used, identical above 7,000 second-feet. Gage read once a day to hundredths or half-tenths at low water; twice a day to tenths at high stages. Records good.

The following discharge measurements were made:

February 21, 1924: Gage height, 3.23 feet; discharge, 6,830 second-feet.

June 11, 1924: Gage height, 2.27 feet; discharge, 3,880 second-feet.

Daily discharge, in second-feet, of Deschutes River at Moody, near Biggs, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,360	4,750	4,880	5,440	8,240	6,320	5,000	4,730	4,030	3,920	3,820	3,780
2	4,360	4,620	5,160	5,440	8,240	6,320	5,000	4,730	4,030	3,920	3,820	3,780
3	4,490	4,620	5,440	5,440	7,840	6,320	5,000	4,730	4,030	3,920	3,820	3,780
4	4,620	4,620	5,440	5,440	7,460	6,320	5,000	4,730	4,030	4,030	3,820	3,780
5	4,620	4,620	5,440	5,440	7,840	6,320	5,000	4,480	4,030	3,920	3,820	3,780
6	4,490	4,620	5,740	5,440	7,840	5,960	5,000	4,480	4,030	3,920	3,820	3,780
7	4,490	4,750	7,460	5,440	8,240	5,960	5,000	4,480	4,030	3,920	3,820	3,780
8	4,490	4,750	6,380	5,740	8,240	6,320	5,000	4,480	4,030	3,920	3,820	3,780
9	4,490	4,750	6,060	5,740	8,240	6,320	5,300	4,480	4,030	3,920	3,780	3,780
10	4,490	4,620	5,440	5,740	8,240	6,320	5,960	4,480	4,030	4,030	3,780	3,670
11	4,490	4,620	5,440	6,720	7,460	5,960	5,960	4,480	3,920	3,920	3,780	3,670
12	4,490	4,620	5,440	6,060	7,080	5,960	5,960	4,730	4,030	3,920	3,780	3,720
13	4,490	4,620	5,440	5,740	7,080	5,960	5,960	4,730	4,030	3,920	3,780	3,720
14	4,490	4,750	5,440	5,740	7,080	5,960	5,960	4,730	4,030	3,920	3,780	3,720
15	4,490	4,750	5,440	5,440	7,080	5,960	5,960	4,730	4,030	3,820	3,780	3,720
16	4,490	4,750	5,440	5,440	7,080	5,960	5,620	4,730	4,030	3,820	3,820	3,820
17	4,620	4,750	5,440	5,440	7,080	5,620	5,620	4,730	4,030	3,820	3,820	3,820
18	4,620	4,880	5,440	5,440	7,080	5,620	5,620	4,480	4,030	3,820	3,820	3,820
19	4,750	4,880	5,440	5,440	7,080	5,300	5,620	4,480	4,250	3,820	3,820	3,820
20	4,750	4,880	5,440	5,440	7,080	5,300	5,620	4,730	4,030	3,820	3,820	3,820
21	4,750	4,880	5,160	5,440	6,700	5,300	5,620	4,480	4,030	3,820	3,820	3,780
22	4,750	5,020	5,160	5,440	6,700	5,300	5,620	4,250	4,030	3,820	3,820	3,780
23	4,620	5,020	5,160	5,440	7,080	5,000	5,620	4,250	4,030	3,820	3,820	3,780
24	4,620	4,880	5,160	5,440	6,700	5,000	5,300	4,250	3,920	3,820	3,820	3,820
25	4,620	4,880	5,160	5,440	6,700	5,000	5,000	4,250	3,920	3,820	3,780	3,820
26	4,750	5,020	5,160	5,440	6,320	5,000	4,730	4,250	3,920	3,820	3,780	3,820
27	4,750	5,160	5,160	5,440	6,320	5,300	4,480	4,250	3,920	3,820	3,780	3,820
28	4,750	5,160	5,440	5,440	6,320	5,620	4,480	4,250	3,920	3,820	3,780	3,820
29	4,750	5,160	7,840	6,060	6,320	5,300	4,480	4,030	3,920	3,820	3,780	3,820
30	4,750	5,020	7,080	6,060	-------	5,300	4,480	4,030	3,920	3,820	3,780	3,820
31	4,750	-------	6,380	6,720	-------	5,000	-------	4,030	-------	3,820	3,780	-------

Monthly discharge of Deschutes River at Moody, near Biggs, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,750	4,360	4,590	282,000
November	5,160	4,620	4,810	286,000
December	7,840	4,880	5,640	347,000
January	6,720	5,440	5,630	346,000
February	8,240	6,320	7,270	418,000
March	6,320	5,000	5,720	352,000
April	5,960	4,480	5,300	315,000
May	4,730	4,030	4,470	275,000
June	4,250	3,920	4,010	239,000
July	4,030	3,820	3,870	238,000
August	3,820	3,780	3,800	234,000
September	3,820	3,670	3,780	225,000
The year	8,240	3,670	4,900	3,560,000

SNOW CREEK ABOVE CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—In SE. ¼ sec. 21, T. 20 S., R. 8 E., half a mile above mouth and backwater of proposed Crane Prairie Reservoir, 30 miles northwest of Lapine, Deschutes County.

DRAINAGE AREA.—Indeterminate, stream spring fed.

RECORDS AVAILABLE.—May 25, 1922, to September 30, 1924.

GAGE.—Vertical staff, read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel, fairly permanent.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 29 second-feet during October and November; minimum discharge, 27 second-feet during July, August, and September.

1922–1924: Maximum discharge recorded, 29 second-feet during nearly every month of record from May, 1922, to November, 1923; minimum stage recorded, 0.75 foot March 28, 1923 (discharge, 22 second-feet).

ICE.—Ice never forms.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation somewhat unstable. Shifting-control method used. Gage read to hundredths on days for which discharge is presented. Daily discharge so uniform that it has been based largely on results of discharge measurements. Records good.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Snow Creek above Crane Prairie, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 3	0.80	27.9	July 8	0.82	26.6	Aug. 19	0.84	27.2
May 15	.82	27.9	Do	.83	26.8			

Daily discharge, in second-feet, of Snow Creek above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			28							27		
2											27	
3			28				28		28			27
4												
5										27	27	
6	29				28			28				
7						28			28			
8				28						27	27	
9												27
10	29	29						28	28			
11						28						
12							28				27	
13								28				
14				28	28		28		28			
15	29							28				27
16										27	27	
17		29					28	28	28			
18		29										
19										27	27	
20						28	28	28				
21			28						28			
22				28						27		27
23												
24	29							28	28			
25							28				27	
26		29								27		
27								28	28			
28				28	28							
29	29						28			27		27
30								28				
31												

NOTE.—Daily discharge given for days when gage was read. Discharge for periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Snow Creek above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
October	29	1,780	March	28	1,720	August	27	1,660
November	29	1,730	April	28	1,670	September	27	1,610
December	28	1,720	May	28	1,720			
January	28	1,720	June	28	1,670	The year	27.9	20,300
February	28	1,610	July	27	1,660			

CULTUS RIVER ABOVE CULTUS CREEK, NEAR LAPINE, OREG.

LOCATION.—In SW. ¼ sec. 20, T. 20 S., R. 8 E., 2 miles above Cultus Creek and 5 miles north of Crane Prairie Dam, Deschutes County.

DRAINAGE AREA.—Indeterminate, mostly spring fed.

RECORDS AVAILABLE.—June 10, 1923, to September 30, 1924; June 13 to October 26, 1922, at station below mouth of Cultus Creek.

GAGE.—Vertical staff on left bank half a mile above footbridge and ford; a gage about 1 mile farther upstream was used in June, 1923. Gages read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Channel is wide and narrow and stream bed consists of gravel and small stones; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 0.67 foot October 3 and 10 (discharge, 63 second-feet); minimum stage recorded, 0.43 foot April 20 and 28 (discharge, 43 second-feet).

1923–1924: Maximum stage recorded, 0.73 foot August 7, 14, and 17, 1923 (discharge, 70 second-feet); minimum, that of April 20 and 28, 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Stream is fed by springs and yearly variation is small.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Staff gage read to hundredths once or twice a week. Daily discharge ascertained by applying daily gage height to rating table. Records good.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Cultus River above Cultus Creek, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 28	0.63	58	Mar. 11	0.46	44.2	Aug. 19	0.50	47.4
Jan. 22	.49	45	Apr. 25	.46	44.5			

Daily discharge, in second-feet, of Cultus River above Cultus Creek, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			58							46		
2											46	
3	63		57						46			
4							44					
5										46	46	
6								45				
7					45	45			46			
8		59								46		
9				52								46
10	63							46	46		46	
11						44				46		
12							44				46	
13			55					46				
14				49	45		44		46			
15	62							45				46
16										46	46	
17								44	46			
18		59										
19										46	46	
20						44	43	44				
21			54						46			
22				46						46		46
23												
24	62							44	46			
25							44				46	
26		58								46		
27								44	46			
28		58		45	44		43					
29										46		46
30	62							44				
31												

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Cultus River above Cultus Creek, near Lapine, Oreg., for the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
October	62.3	3,830	March	44.1	2,710	August	46.0	2,830
November	59.0	3,510	April	43.8	2,610	September	46.0	2,740
December	54.8	3,370	May	44.6	2,740			
January	48.9	3,010	June	45.9	2,730	The year	48.8	35,500
February	44.7	2,570	July	46.0	2,830			

CULTUS CREEK ABOVE CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—In SE. ¼ sec. 24, T. 20 S., R. 7 E., 100 yards above point where stream divides into Cultus and Little Cultus Creeks, a quarter of a mile upstream from bridge on Forest road around the west side of Crane Prairie, 1 mile below outlet of Cultus Lake, and 32 miles northwest of Lapine, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 1 to September 30, 1924.

GAGE.—Vertical staff on left bank; read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Stream bed of gravel and boulders; fairly permanent. Current swift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period March 1 to September 30, 0.99 foot May 20 and 24 (discharge, 43 second-feet); stream bed dry beginning about August 25.

ICE.—None during period of record.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve fairly well defined. Gage read occasionally up to April 22 and about twice a week thereafter. Daily discharge ascertained by applying gage readings to rating table. Records fair.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Cultus Creek above Crane Prairie, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 22		10.8	Apr. 25	0.51	15.2	July 8	0.40	9.5
Mar. 11	0.48	11.0	May 15	.88	34.1	Aug. 19	—.10	.74

Daily discharge, in second-feet, of Cultus Creek above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1			17		14		16					7	1
2						3	17			38	19		
3				30			18						
4							19					6	1
5					12	2	20	10		43			
6			23				21				18		
7				23			22		13			5	
8					10		23						
9							24			43	17		
10			36	22		2	25		13				
11	12				9		26					4	
12						1	27			38	15		
13			30				28						
14				22			29					3	
15			34				30			42			
							31						

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Cultus Creek above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
October	[a] 9	552	March	10.9	670	August	1.3	80
November	[a] 16	952	April	12.6	750	September	0	0
December	[a] 11	676	May	34.4	2,120			
January	[a] 11	676	June	21.3	1,270	The year	12.2	8,850
February	[a] 11	633	July	7.6	467			

[a] Estimated.

DEER CREEK ABOVE CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—In NW. ¼ sec. 36, T. 20 S., R. 7 E., 1 mile below outlet of Little Cultus Lake, 8 miles by road from Crane Prairie Dam, and 30 miles northwest of Lapine, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 14 to September 30, 1924.

GAGE.—Vertical staff on right bank of stream about 75 feet below bridge; read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders; fairly permanent. Current rather swift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period February 14 to September 30, 1.01 feet May 13 (discharge, 16 second-feet); creek bed dry beginning about July 1.

ICE.—Stage-discharge relation affected by ice February 14–19.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during season. Rating curve well defined. Gage read to hundredths occasionally prior to April 25 and about twice a week thereafter. Daily discharge ascertained by applying gage heights to rating table. Records fair.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Deer Creek above Crane Prairie, near Lapine, during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 12	0.46	3.0	May 15	0.99	15.5
Apr. 25	.80	9.6	July 8	.02	[a].05

[a] Estimated.

Daily discharge, in second-feet, of Deer Creek above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	Day	Feb.	Mar.	Apr.	May	June
1						16					
2						17				14	1
3					2	18					
4			3			19	3				
5						20		3		11	
6				11		21					1
7		3			1	22					
8						23	3				
9						24				7	1
10				14	1	25				10	
11						26					
12		3				27				4	1
13				16		28	3				
14	3				1	29				10	
15				16		30				3	
						31					

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods, when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Deer Creek above Crane Prairie, near Lapine, Oreg., for the the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
October	[a] 5	307	March	3.0	184	August	0	0
November	[a] 6	357	April	6.4	381	September	0	0
December	[a] 4	246	May	10.3	633			
January	[a] 6	369	June	1.02	61	The year	3.72	2,710
February	3.0	173	July	0	0			

[a] Estimated.

QUINN RIVER ABOVE CRANE PRAIRIE, NEAR LAPINE, OREG.

LOCATION.—In NW. ¼ sec. 1, T. 21 S., R. 7 E., 400 feet below head of river and 3 miles northwest of Crane Prairie Dam, Deschutes County.

DRAINAGE AREA.—Indeterminate because stream is spring fed.

RECORDS AVAILABLE.—June 1, 1922, to September 30, 1924.

GAGE.—Vertical staff on tree root, 400 feet below springs which form source of river; read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading 200 feet above gage.

CHANNEL AND CONTROL.—Bed composed of fine loose gravel; slight growth, where velocities are slow, of aquatic plants in summer; distinct riffle just below gage forms a well-defined and practically permanent control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 0.76 foot October 10, 15, and 21 (discharge, 33 second-feet); minimum stage recorded, 0.33 foot September 22 and 29 (discharge, 8 second-feet).

1922–1924: Maximum stage recorded, 0.83 foot July 15, 1923 (discharge, 36 second-feet); minimum that of 1924.

ICE.—None.

REGULATION.—Stream is spring fed.

ACCURACY.—Stage-discharge relation somewhat unstable. Shifting-control method used. Staff gage read to hundredths once or twice a week except November 1 to March 12 when stage-discharge relation was affected by backwater from Crane Prairie Reservoir. Records good; estimated monthly discharge November to February, fair.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Quinn River above Crane Prairie, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 13	0.42	14.1	May 15	0.40	11.0	Sept. 16	0.36	9.4
Apr. 25	.39	11.1	Aug. 19	.40	11.5			

Daily discharge, in second-feet, of Quinn River above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				13		14		
2								
3	25				14			11
4								
5			14			14	13	
6				13				
7					14			
8						14		
9								10
10	33			13	14		12	
11						14		
12			14				12	
13		14		13				
14					14			
15	33			13		14		9
16							12	9
17			14	13	15			
18								
19		14				14	12	
20				13				
21			14		15			
22						13		8
23								
24	33			13	15			
25			11				12	
26		14				13		
27				13	15			
28								
29			13			13		8
30				14				
31								

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Quinn River above Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	33	25	31.5	1,940
November	----------	----------	[a] 26	1,550
December	----------	----------	[a] 20	1,230
January	----------	----------	[a] 14	861
February	----------	----------	[a] 14	805
March	14	14	14	861
April	14	11	13.4	797
May	14	13	13.1	806
June	15	14	14.5	863
July	14	13	13.6	836
August	13	12	12.2	750
September	11	8	9.2	547
The year	33	8	16.3	11,800

[a] Estimated.

BROWN CREEK NEAR LAPINE, OREG.

LOCATION.—In sec. 29, T. 21 S., R. 8 E., at road crossing a quarter of a mile above mouth, 3½ miles south of Crane Prairie dam site, and 20 miles west of Lapine, Deschutes County.

DRAINAGE AREA.—Indeterminate, spring fed.

RECORDS AVAILABLE.—May 24, 1922, to September 30, 1924.

GAGE.—Vertical staff on left bank, read by E. L. Dalrymple and C. J. Keefer.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel bar, with aquatic plants along sides, somewhat unstable.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 0.5 foot November 10 (discharge, 37 second-feet); minimum stage recorded, 0.24 foot May 20 and 24 (discharge, 25 second-feet).

1922–1924: Maximum stage recorded, 0.56 foot January 1, 1924 (discharge, 47 second-feet); minimum stage recorded, that of 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation somewhat unstable. Fairly well defined rating curve used. Gage read to hundredths once on days for which discharge is given. Daily discharge ascertained by applying daily gage reading to rating table. Records fair.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Brown Creek near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 6	0.49	35.9	Jan. 6	0.41	31.9	July 7	0.30	28.7
Dec. 20	.46	34.8	Apr. 24	.31	26.9			

Daily discharge, in second-feet, of Brown Creek at Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1								28		29
2										
3							27			
4									28	
5				32						
6						28				
7								28		
8										
9										29
10	37						27			
11										
12									29	
13						28				
14								28		28
15										
16		36	33							
17					29					
18		36					27			
19										
20		34				25				
21										
22							28	28	29	28
23										
24					28	25				
25									29	
26										
27						27				
28					28			28		
29										28
30										
31										

NOTE.—Daily discharge given for days when gage was read. Discharge for other periods when gage was not read, interpolated for purpose of computing monthly discharge.

Monthly discharge of Brown Creek at Crane Prairie, near Lapine, Oreg., for the year ending September 30, 1924

Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet	Month	Mean discharge in second-feet	Run-off in acre-feet
October	[a] 41.0	2,520	March	[a] 30.0	1,840	August	28.6	1,760
November	37.0	2,200	April	28.6	1,700	September	28.3	1,680
December	35.2	2,160	May	26.8	1,650			
January	33.0	2,030	June	27.4	1,630	The year	31.3	22,700
February	32.0	1,840	July	28.0	1,720			

[a] Estimated.

ODELL CREEK NEAR CRESCENT, OREG.

LOCATION.—In SW. ¼ sec. 25, T. 23 S., R. 6 E., at outlet of Odell Lake, 18 miles northwest of Crescent, Klamath County.

DRAINAGE AREA.—48 square miles.

RECORDS AVAILABLE.—August 5 to September 18, 1911; January 5 to September 28, 1912; January 4 to February 15, May 27 to November 29, 1913; April 12 to August 12, 1914; and December 1, 1923, to June 7, 1924, when station was discontinued.

GAGE.—Vertical staff about 800 feet below Odell Lake; read by W. H. Brock.

DISCHARGE MEASUREMENTS.—Made by wading near the gage.

CHANNEL AND CONTROL.—Bed composed of gravel; fairly permanent; stage-discharge relation occasionally affected by drift and logs.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during the period December 1 to June 7, 92 second-feet, June 4, 5, and 7 (gage height, 0.99 foot); minimum stage recorded, 0.65 foot March 22 (discharge, 41 second-feet). Measurement of September 8 probably made close to the minimum stage for the year.

1911–1914; 1924: Maximum stage recorded, 1.90 feet June 14, 1912 (discharge, 390 second-feet); minimum discharge recorded that of September 8, 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Some diurnal fluctuations due to effect of wind on the broad surface of Odell Lake.

ACCURACY.—Stage-discharge relation affected by fallen trees lodged on control. Rating curve fairly well defined. Correction of 0.54 foot made to gage readings December 1 to February 29 before applying discharge to allow for the effect of obstruction. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage readings to rating table. Records good except for December for which they are somewhat uncertain.

Discharge measurements of Odell Creek near Crescent, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 18	1.00	51	Mar. 1	[a] 0.80	62	May 6	0.86	70
Jan. 31	1.33	57	Mar. 25	.77	56	Sept. 8	.38	17.0

[a] Gage read, 1.34 feet before removal of fallen trees.

Daily discharge, in second-feet, of Odell Creek near Crescent, Oreg., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	60		51	61	54	48	82
2	60		53	61	54		86
3	60	60	57	58	55	47	91
4	61		58	55	55		92
5	61		58	55	57	45	92
6	61	60	60	54	60	57	91
7	67	60	60	54	63	46	92
8	72	60	61	55	63	46	-------
9	71	61	60	54	64	47	-------
10	71	63	58	54	64	48	-------
11	67	63	61	54	61	50	-------
12	67	61	63	53	60	50	-------
13	77	60	64	53	58	51	-------
14	77	58	63	51	58	51	-------
15	79	57	63	50	57	53	-------
16	80	57	63	50	55	54	-------
17	80	58	63	50	55	55	-------
18	79	57	64	50	54	57	-------
19	77	57	63	47	54	57	-------
20	75	57	61	45	54	58	-------
21	75	57	64	43	53	60	-------
22	74	55	66	41	54	60	-------
23	72	58	63	45	53	61	-------
24	63	57	67	46	53	63	-------
25	64	55	64	51	54	64	-------
26	63	48	64	47	53	67	-------
27	61	46	64	50	51	71	-------
28	61	46	63	50	50	75	-------
29	60	48	60	51	48	77	-------
30	60	50	-------	51	48	80	-------
31	60	55	-------	53	-------	84	-------

Monthly discharge of Odell Creek near Crescent, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December	80	60	68.2	4,190
January	63	46	56.9	3,500
February	67	51	61.3	3,530
March	61	41	51.4	3,160
April	64		55.7	3,310
May	84	45	57.3	3,520
June 1-7	92	82	89.4	1,240
The period				22,400

LITTLE DESCHUTES RIVER ABOVE WALKER BASIN INTAKE, NEAR LAPINE, OREG.

LOCATION.—In sec. 33, T. 23 S., R. 9 E., above intake of canal of Walker Basin project and below Crescent Creek, half a mile from river road to Crescent, and 12 miles southwest of Lapine, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 26, 1904, to September 14, 1917, except during winter; May 7 to August 31, 1919; April 5 to September 13, 1920; June 9 to September 30, 1921; and May 1, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank above intake. Inspected by G. A. Hathaway.

DISCHARGE MEASUREMENTS.—Made by wading or from road bridge.

CHANNEL AND CONTROL.—Bed composed of gravel and sand, with steep banks of silt, overgrown with brush; may shift in floods.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.86 feet at 5 a. m. June 26 (discharge, 252 second-feet); minimum stage recorded, 2.42 feet at 6 p. m. September 24 (discharge, 48 second-feet).

1914–1917; 1919–1924: Maximum stage, 6.73 feet June 12, 1917 (discharge, 835 second-feet); flood of November 24, 1909, may have reached 1,800 second-feet (estimated from records at Allen's ranch). Minimum discharge recorded, 3.4 second-feet November 15, 1922 (gage height, 2.42 feet). Minimum discharge unaffected by storage, 40 second-feet September 3–11, 1915 (gage height, 0.40 foot at original gage.)

ICE.—Stream frozen from about December 6 to February 21. Discharge estimated from study of meter measurements, temperature records, and discharge of Deschutes River at Bend.

DIVERSIONS.—A few small ditches divert water above station; Walker Basin Canal diverts a short distance below.

REGULATION.—Affected by storage at Crescent Lake Reservoir.

ACCURACY.—Stage-discharge relation practically permanent, affected by ice during December, January, and February. Rating curve well defined. Operation of water-stage recorder satisfactory throughout year, except October 1–5, December 9 to February 28, March 15–19, and May 16–23. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good except for December to February for which they are poor.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Little Deschutes River above Walker Basin intake, near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 14	3.1	72	May 5	3.31	157	Sept. 9	2.66	67
Feb. 22	2.95	111	June 3	3.28	148	Oct. 7	2.39	41.9
Mar. 24	2.78	85	July 29	3.5	188			

Daily discharge, in second-feet, of Little Deschutes River above Walker Basin intake near Lapine, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		64	79		112	88	111	151	203	181	90
2		64	98		110	97	115	148	203	186	87
3	116	64	96		108	99	121	149	125	184	86
4		63	88		108	96	127	156	91	180	87
5		62	85		108	90	154	154	86	175	86
6	114	62			114	94	164	156	159	167	86
7	114	61			114	102	162	178	176	167	86
8	112	62			114	108	160	191	173	164	86
9	110	62	85		116	110	160	191	167	159	75
10	107	63			121	110	162	189	164	162	71
11	107	64		97	124	114	162	188	170	156	67
12	106	67			127	116	164	188	180	149	65
13	106	67			128	120	172	186	167	156	64
14	106	68			131	127	178	184	135	151	64
15	107	70	84			131	183	228	139	144	64
16	111	70				130		243	135	141	64
17	125	70			120	130		233	158	142	63
18	125	67				130		183	160	141	62
19	120	65				127		180	164	138	62
20	116	65			108	123	145	176	162	137	62
21	114	66	82		106	118		172	149	134	62
22	111	68		105	98	115		172	137	125	54
23	110	71			91	114		203	134	118	51
24	107	75			88	115	108	203	132	110	51
25	103	96			84	112	102	235	160	110	54
26	98	93		109	82	111	99	249	191	102	55
27	93	86			86	108	96	247	198	101	55
28	91	82	80		87	107	125	235	178	98	54
29	79	88		114	87	108	164	224	181	97	55
30	68	101			84	110	162	212	186	93	55
31	65				83		154		186	91	

Monthly discharge of Little Deschutes River above Walker Basin intake, near Lapine, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	125	65	107	6,580
November	101	61	70.9	4,220
December	98	79	83.7	5,150
January			[a] 76.0	4,670
February	114		100	5,750
March	131	82	107	6,580
April	131	88	112	6,660
May	183	96	144	8,850
June	249	148	194	11,500
July	203	86	160	9,840
August	186	91	141	8,670
September	90	51	67.4	4,010
The year	249	51	113	82,500

[a] Estimated.

LITTLE DESCHUTES RIVER NEAR LAPINE, OREG.

LOCATION.—In sec. 2, T. 22 S., R. 10 E., at wagon bridge at former town of Rosland, 1½ miles north of Lapine, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 22, 1910, to October 31, 1913, fragmentary; June 23 to November 2, 1918, August 26 to October 28, 1920, and May 15 to September 30, 1924.

GAGE.—Vertical staff on downstream side of east bent of bridge; read by Mrs. M. C. Bogue.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge.

CHANNEL AND CONTROL.—Earth banks that are overflowed at high stages, sandy bottom. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the period May 15 to September 30, 2.38 feet July 1 (discharge, 233 second-feet); minimum stage recorded, 0.66 foot September 30 (discharge, 41 second-feet).

1910–1913; 1918; 1920; 1924: Maximum stage recorded, 4.6 feet, about June 12, 1912, observed from high-water marks July, 1912, discharge, 760 second-feet. Minimum stage recorded, 0.20 foot September 8–11, 1920, (discharge, 38 second-feet).

DIVERSIONS.—Some water diverted above stations for irrigating small tracts of land.

REGULATION.—Affected by storage at Crescent Lake Reservoir.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve well defined. Staff gage read to hundredths once a day. Daily discharge ascertained by applying daily gage height to rating table. Records good.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Little Deschutes River near Lapine, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 14	1.50	136	July 30	1.83	150	Sept. 9	1.01	66
June 13	1.86	164	Aug. 20	1.41	101	Oct. 7	.54	34

Daily discharge, in second-feet, of Little Deschutes River near Lapine, Oreg., for the year ending September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	64	233	152	74	16	116	192	129	107	57
2	-------	61	209	142	72	17	114	212	121	104	57
3	-------	61	198	149	70	18	112	230	126	109	56
4	-------	107	112	157	70	19	94	178	152	114	54
5	-------	114	93	139	74	20	85	168	155	104	54
6	-------	109	83	139	66	21	81	168	155	107	54
7	-------	116	147	124	66	22	77	157	136	107	54
8	-------	139	160	121	64	23	76	147	124	104	50
9	-------	155	152	129	63	24	74	178	124	100	49
10	-------	155	142	116	64	25	72	170	121	98	43
11	-------	157	129	119	63	26	67	192	147	100	47
12	-------	160	131	124	61	27	60	195	178	83	44
13	-------	165	136	104	60	28	64	208	178	83	44
14	-------	160	129	112	61	29	93	227	155	83	42
15	131	170	119	109	61	30	114	230	157	81	41
						31	114	-------	155	77	-------

Monthly discharge of Little Deschutes River near Lapine, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 15-31	131	60	90.8	3,060
June	230	61	158	9,400
July	233	83	145	8,920
August	157	77	113	6,950
September	74	41	57.8	3,440
The period				31,800

CRESCENT LAKE RESERVOIR NEAR CRESCENT, OREG.

LOCATION.—At reservoir dam in sec. 11, T. 24 S., R. 6 E., 16 miles west of Crescent, Klamath County.

RECORDS AVAILABLE.—August 25, 1922, to September 30, 1924.

GAGE.—Vertical staff on outlet gate tower; zero at level of gate sill, elevation 4,826 feet. Readings reported to sea-level datum.

EXTREMES OF CONTENTS.—Maximum stage recorded during year, 4,843.02 feet on May 25 (storage, 58,620 acre-feet); minimum stage recorded, 4,835.86 feet September 21 and 22 (storage, 33,200 acre-feet).

1922–1924: Maximum stage recorded, 4,845.55 July 15, 1923 (storage, 67,760 acre-feet); minimum that of 1924.

Crescent Lake Reservoir was completed in 1922, the water was stored back of a coffer dam beginning some time in August. As most of the storage is obtained by lowering the outlet, storage began with about 41,380 acre-feet, as computed above the sill of the outlet gate. Water used by Deschutes County Municipal Improvement District through their canal that diverts from Deschutes River at Bend.

Monthly stage and contents of Crescent Lake Reservoir near Crescent, Oreg., for the year ending September 30, 1924

Date	Gage height	Storage	Loss or gain during month	Date	Gage height	Storage	Loss or gain during month
	Feet	*Acre-feet*	*Acre-feet*		*Feet*	*Acre-feet*	*Acre-feet*
Sept. 30	4,839.90	47,730		May 31	4,842.82	57,900	+2,300
Oct. 31		[a] 47,810	+80	June 30		[a] 49,230	−8,670
Nov. 30		[a] 50,300	+2,490	July 31	4,838.18	41,340	−7,890
Dec. 31		[a] 51,900	+1,600	Aug. 31	4,836.30	34,730	−6,610
Jan. 31		[a] 53,500	+1,600	Sept. 30	4,835.94	33,480	−1,250
Feb. 29		[a] 54,600	+1,100				
Mar. 31		[a] 55,170	+570	The year			−14,250
Apr. 30	4,842.18	55,600	+430				

[a] Estimated.

CRESCENT CREEK BELOW COLD CREEK, NEAR CRESCENT, OREG.

LOCATION.—In SW. ¼ sec. 7, T. 24 S., R. 7 E., 1 mile below Cold Creek, 2 miles by road below outlet of Crescent Lake, and 15 miles west of Crescent, Klamath County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 30, 1912, to December 11, 1913; June 17 to December 12, 1922, and May 30, 1923, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on left bank; staff gage at road bridge, half a mile above road during 1912–13.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders, wide and flat, fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 1.47 feet at 4 p. m. June 29 (discharge, 213 second-feet); minimum stage recorded, —0.39 foot at 5 p. m. October 27 (discharge, 5 second-feet). 1912–13; 1922–1924: Maximum stage recorded, 1.50 feet June 17, 1922 (discharge, 228 second-feet); minimum stage that of October 27, 1923.

ICE.—No note of ice obstruction, probably none during period recorder was operating.

DIVERSIONS.—None.

REGULATION.—Gates in Crescent Lake Reservoir Dam remained closed October 20 to May 26 and September 22–30; water released May 27 to September 20 (see p. 69).

COOPERATION.—Record furnished by State engineer of Oregon.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Operation of recorder satisfactory except November 1 to December 1, December 28 to January 30, and February 9–28. Discharge estimated for periods of missing record. Discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good except for November, January, and February, for which they are poor.

Discharge measurements of Crescent Creek below Cold Creek, near Crescent, Oreg., during the year ending September 30, 1926

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 2	−0.08	15.9	June 2	0.70	81	Aug. 26	0.71	87
Feb. 1	.04	24.1	July 2	1.30	183	Sept. 8	.38	54
Mar. 25	−.10	14.5	July 29	1.18	162			

Daily discharge, in second-feet, of Crescent Creek below Cold Creek, near Crescent, Oreg., for the year ending September 30, 1924

Day	Oct.	Dec.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	20	23	17	16	18	86	189	159	62
2	53	18	20	19	24	19	88	141	159	59
3	55	23	18	19	24	19	94	54	155	56
4	55	21	21	19	19	20	100	39	144	54
5	55	22	20	19	18	20	101	55	138	53
6	55	39	24	19	17	20	120	136	135	51
7	54	27	22	19	19	20	140	146	132	50
8	55	30	27	19	21	20	146	135	128	48
9	54	36		18	21	20	146	122	127	46
10	52	30		18	21	20	144	120	127	45
11	52	21		19	22	20	144	120	119	43
12	51	21		18	21	20	144	116	117	40
13	53	21		18	21	20	141	109	125	39
14	57	20		18	21	20	146	111	125	38
15	54	20		18	21	20	186	112	119	37
16	45	22		18	21	20	184	112	119	36
17	39	21		18	21	20	159	112	122	34
18	34	21		21	20	20	125	132	114	33
19	31	23	20	17	20	20	120	130	106	32
20	29	23		17	19	20	116	127	117	30
21	22	20		16	19	20	114	120	117	20
22	20	20		16	19	20	136	127	111	14
23	18	19		17	19	20	148	116	111	13
24	24	23		17	18	20	160	106	98	13
25	10	28		16	18	20	189	182	94	13
26	8	28		19	18	20	200	177	86	13
27	7	42		17	18	31	204	164	83	13
28	11	23		17	19	84	207	168	77	12
29	16	23	18	20	19	86	209	168	73	12
30	16	23		17	18	83	200	164	68	12
31	16	23		16		86		157	65	

Monthly discharge of Crescent Creek below Cold Creek, near Crescent, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet		
	Maximum	Minimum	Mean	Observed	Gain or loss in storage	Corrected for storage
October	57	7	37.2	2,290	+80	2,370
November			a 30.0	1,790	+2,490	4,280
December	42	18	24.2	1,490	+1,600	3,090
January			a 23.0	1,410	+1,600	3,010
February	27	18	20.4	1,170	+1,100	2,270
March	21	16	18.0	1,110	+570	1,680
April	24	16	19.7	1,170	+430	1,600
May	86	18	28.6	1,760	+2,300	4,060
June	209	86	147	8,750	−8,670	80
July	189	39	128	7,870	−7,890	−20
August	159	65	115	7,070	−6,610	460
September	62	12	34.0	2,020	−1,250	770
The year	209	7	52.2	37,900	−14,250	26,100

a Estimated.

ARNOLD CANAL NEAR BEND, OREG.

LOCATION.—In SW. ¼ sec. 23, T. 18 S., R. 11 E., a mile below intake of canal and 9 miles south of Bend, Deschutes County.

RECORDS AVAILABLE.—April 10, 1914, to September 30, 1924; information sufficient for an approximate estimate, October, 1912, to March, 1914.

GAGE.—Stevens eight-day recorder in rock section, installed August 2, 1924; prior to August 2 gage was a vertical staff on right side of flume 400 feet below a spillway located half a mile above present gage. Gage read by G. W. Shafer.

DISCHARGE MEASUREMENTS.—Made from collar of flume near old gage.

CHANNEL AND CONTROL.—Rock section at recorder, permanent flume 12 to 14 feet wide at old gage, fairly steep gradient at both gages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.32 feet at 8 a. m. on staff gage May 30 and 31 (discharge, 140 second-feet); canal dry at many times during year.

1914–1924: Maximum discharge recorded, 151 second-feet August 4, 1923 gage height, 2.50 feet). Canal dry many times.

ICE.—Canal dry during coldest weather of winter.

ACCURACY.—Stage-discharge relation changed during winter and on August 2 owing to relocation of station. Rating curves used as follows: October 1 to November 24, fairly well defined; January 20 to August 1, well defined; August 2 to September 30, well defined. Gage read to hundredths twice a day. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table the mean daily gage reading or the mean daily gage height obtained by inspecting recorder graph. Records good.

Arnold Canal diverts water from the right bank of Deschutes River at the head of Lava Island, in SW. ¼ sec. 27, T. 18 E., R. 11 E., and irrigates land south and east of Bend lying above the Central Oregon Irrigation Co.'s Carey Act segregation.

Discharge measurements of Arnold Canal near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr 19	1.52	76	June 5	2.30	138	Aug 2	[a] 1.94	108
May 13	2.13	124	July 16	2.04	112	Aug 8	[b] 2.18	126

[a] Gage height on new gage, 2.40 feet. [b] Gage height on new gage, 2.62 feet.

Daily discharge, in second-feet, of Arnold Canal near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	97	83	-------	32	24	-------	108	134	135	105	99
2	97	83	-------	32	12	-------	80	136	136	106	98
3	97	83	-------	-------	-------	-------	45	136	-------	104	93
4	112	90	-------	-------	-------	-------	99	137	93	106	105
5	112	90	-------	-------	-------	-------	104	138	90	107	110
6	112	90	-------	-------	-------	-------	105	63	86	108	116
7	97	90	-------	-------	-------	-------	117	56	79	109	115
8	97	83	-------	-------	5	-------	117	119	73	121	113
9	90	83	-------	-------	16	-------	117	119	93	126	118
10	83	83	-------	-------	5	-------	117	115	93	123	118
11	97	83	-------	-------	-------	-------	115	115	112	121	105
12	90	83	-------	-------	-------	18	115	123	119	122	100
13	83	90	-------	-------	8	29	117	123	119	126	102
14	97	90	-------	-------	}	29	117	126	119	113	102
15	112	90	-------	-------	}	41	124	124	50	101	100
16	112	90	-------	-------	} 29	41	128	124	101	100	106
17	106	97	-------	-------	}	41	128	125	114	100	104
18	97	90	-------	-------	}	41	131	125	110	101	107
19	97	90	-------	9	}	57	134	127	108	103	108
20	90	83	24	}	14	61	134	127	99	102	98
21	90	83	}	}	-------	59	132	132	114	116	94
22	90	83	}	}	-------	62	136	132	114	122	96
23	83	97	}	}	-------	73	134	132	117	122	98
24	83	97	}	} 24	-------	73	135	131	118	121	98
25	83	-------	} 24	}	-------	72	134	132	127	121	94
26	90	-------	}	}	-------	71	133	132	130	118	94
27	90	-------	}	}	-------	78	135	131	130	123	93
28	90	-------	}	}	-------	78	136	132	125	109	89
29	83	-------	}	}	-------	85	138	128	128	100	89
30	97	-------	28	-------	-------	99	139	133	127	101	90
31	97	-------	32	-------	-------	-------	139	-------	116	100	-------

NOTE.—Canal dry during periods when no discharge is given. Braced figures show estimated mean discharge for periods indicated when gage was not read. Discharge estimated Feb. 1, 2, 19, Mar. 1, 2, 8–10, 13, and 20.

Monthly discharge of Arnold Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	112	83	95.2	5,850
November	97	0	70.1	4,170
December	0	0	0	0
January	32	0	9.7	596
February	32	0	10.8	621
March	29	0	8.3	510
April	99	18	36.9	2,200
May	139	45	121	7,440
June	138	56	124	7,380
July	136	0	106	6,520
August	126	100	112	6,890
September	118	89	102	6,070
The year	139	0	66.3	48,200

CENTRAL OREGON CANAL NEAR BEND, OREG.

LOCATION.—In NE. ¼ sec. 7, T. 18 S., R. 12 E., at a flume section about half a mile below point where waters in main diversion canal are divided between this canal and the Pilot Butte Canal, 2 miles south of Bend, Deschutes County.

RECORDS AVAILABLE.—May 11, 1905, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on left wingwall at entrance to flume section, installed June 9, 1924; vertical staff on right side of flume 200 yards downstream used up to March 31; staff gage at present location read April 1 to June 8; read by Gustave Berry.

DISCHARGE MEASUREMENTS.—Made from yoke of flume at section of old gage.

CHANNEL AND CONTROL.—Earth section at present gage; control at head of flume; at old station a plank flume of rectangular cross section with battened seams. Flume rather unstable but the rating appears to have changed little.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.62 feet at 2 p. m. August 23 (discharge, 410 second-feet). Canal dry at various times during year.

1905–1924: Maximum discharge recorded, 459 second-feet at time of measurement August 20, 1919 (gage height on gage in flume 4.1 feet).

ICE.—Canal operated in winter only for a few days during periods of moderately cold weather, for furnishing water for domstic use. The gradient of the flume below the gage is sufficient to maintain open channel at all times.

ACCURACY.—Stage-discharge relation practically permanent during year at each station. Rating curves well defined. Daily discharge ascertained by applying to rating table the mean daily gage reading or the mean daily gage height obtained by inspecting the recorder graph. Records good.

COOPERATION.—Gage-height records furnished by Central Oregon Irrigation Co.

Central Oregon Canal diverts water from the right bank of Deschutes River at the NE. ¼ sec. 13, T. 18 S., R. 11 E., and irrigates land lying to the east of Bend and near Powell Buttes.

Discharge measurements of Central Oregon Canal near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height in feet		Discharge	Date	Gage height in feet		Discharge
	New gage	Old gage			New gage	Old gage	
			Sec.-ft.				*Sec.-ft.*
Apr. 9	3.05	2.85	234	July 31	4.55	----------	402
May 13	4.32	3.87	385	Aug. 6	3.79	----------	308
June 5	4.24	3.74	373	Aug. 7	3.78	----------	313
July 16	4.50	----------	398				

Daily discharge, in second-feet, of Central Oregon Canal near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	213	138	162	-------	168	52	176	360	396	391	311	341
2	213	138	162	-------	168	160	176	360	396	391	309	341
3	213	135	68	-------	63	175	176	360	396	392	307	340
4	213	127	-------	-------	-------	175	176	372	396	392	309	379
5	213	127	-------	-------	-------	117	176	372	372	395	311	402
6	213	159	-------	-------	-------	-------	231	372	372	394	311	402
7	213	175	-------	-------	-------	-------	231	372	384	394	309	395
8	213	58	-------	-------	-------	-------	231	372	366	394	362	396
9	213	-------	-------	-------	-------	-------	231	372	359	392	402	398
10	210	-------	-------	-------	-------	-------	259	378	388	395	403	400
11	194	-------	-------	-------	-------	-------	259	378	394	391	403	389
12	194	-------	-------	-------	-------	-------	259	378	398	394	400	379
13	194	-------	-------	-------	-------	-------	259	378	398	397	401	370
14	194	-------	-------	-------	-------	-------	259	390	400	397	403	368
15	139	-------	-------	-------	-------	-------	259	390	400	395	403	367
16	122	-------	-------	-------	-------	-------	259	391	398	396	404	365
17	127	-------	-------	-------	-------	-------	259	390	163	396	403	366
18	127	-------	-------	-------	-------	-------	259	390	295	397	402	367
19	127	-------	-------	-------	-------	-------	259	390	400	398	403	364
20	127	-------	-------	-------	-------	-------	259	394	396	397	402	368
21	127	-------	-------	4	-------	-------	259	396	394	398	402	364
22	127	-------	-------	10	-------	-------	259	396	392	397	403	354
23	127	-------	-------	8	-------	-------	259	396	391	398	406	352
24	127	-------	24	6	-------	-------	259	396	391	396	402	352
25	127	-------	81	7	-------	-------	298	396	392	402	401	353
26	127	-------	114	7	11	-------	342	396	391	404	402	353
27	127	-------	127	7	13	-------	342	396	391	407	403	354
28	127	40	111	8	-------	-------	342	396	392	406	356	355
29	127	162	-------	62	-------	-------	360	396	392	406	333	352
30	127	162	-------	128	-------	-------	360	396	391	404	336	350
31	132	-------	-------	158	-------	-------	-------	396	-------	361	341	-------

NOTE.—Canal dry during periods for which no discharge is given.

Monthly discharge of Central Oregon Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	213	127	164	10,100
November	175	0	47.4	2,820
December	162	0	27.4	1,680
January	158	0	13.1	806
February	168	0	14.6	840
March	175	0	21.9	1,350
April	360	176	258	15,400
May	396	360	384	23,600
June	400	163	379	22,600
July	407	361	396	24,300
August	406	307	372	22,900
September	402	340	368	21,900
The year	407	0	204	148,000

PILOT BUTTE CANAL NEAR BEND, OREG.

LOCATION.—In NE. ¼ sec. 7, T. 18 S., R. 12 E., directly opposite old gage on Central Oregon Canal, half a mile below the point where the waters are divided between this canal and the Central Oregon Canal, and 2 miles south of Bend, Deschutes County.

RECORDS AVAILABLE.—March 6, 1905, to September 30, 1924.

GAGE.—Vertical staff on right bank. Gage read by Gustave Berry.

DISCHARGE MEASUREMENTS.—Made by wading at gage.

CHANNEL AND CONTROL.—Channel of gravel and sand; control partly solid rock; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.8 feet June 9 (discharge, 25 second-feet); canal dry at various times.

1905–1924: Maximum stage recorded, 3.10 feet June 8, 11–16, July 19–21, 1913 (discharge, 244 second-feet); canal dry at various times.

ICE.—Canal dry during freezing weather.

ACCURACY.—Stage-discharge relation apparently permanent during year. Rating curve fairly well defined. Gage read to half-tenths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Pilot Butte Canal diverts water from the right bank of Deschutes River, in NE. ¼ sec. 13, T. 18 S., R. 11 E., in a flume common to it and the Central Oregon Canal, for irrigating lands lying mostly north of Bend and extending nearly to Crooked River. North Canal also diverts water into the Pilot Butte.

Discharge measurements of Pilot Butte Canal near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 13	1.70	19.5	July 31	1.58	16.0
June 5	1.69	19.3	Aug. 6	1.43	11.2

Daily discharge, in second-feet, of Pilot Butte Canal near Bend, Oreg., for the year ending September 30, 1923

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	-------	9	-------	10	3	8	20	20	18	12	8
2	15	-------	9	-------	10	9	17	20	20	18	12	8
3	14	3	3	-------	4	10	18	20	20	18	12	8
4	13	8	-------	-------	-------	10	20	20	20	18	12	11
5	13	8	-------	-------	-------	7	20	20	20	18	12	13
6	13	8	-------	-------	-------	-------	20	20	20	18	12	13
7	15	8	-------	-------	-------	-------	20	20	20	18	11	13
8	15	3	-------	-------	-------	-------	20	20	24	18	12	13
9	15	-------	-------	-------	-------	-------	20	20	25	17	13	13
10	15	-------	-------	-------	-------	-------	20	20	20	18	13	13
11	15	-------	-------	-------	-------	-------	20	20	20	18	13	13
12	15	-------	-------	-------	-------	-------	20	20	20	18	13	18
13	15	-------	-------	-------	-------	-------	20	20	20	18	13	20
14	13	-------	-------	-------	-------	-------	20	20	20	18	13	20
15	9	-------	-------	-------	-------	-------	20	20	18	17	13	20
16	8	-------	-------	-------	-------	-------	20	20	18	17	13	20
17	8	-------	-------	-------	-------	-------	20	20	9	17	13	20
18	8	-------	-------	-------	-------	-------	20	20	16	17	13	20
19	8	-------	-------	-------	-------	-------	20	20	18	17	13	20
20	8	-------	-------	-------	-------	-------	17	20	18	17	13	20
21	8	-------	-------	-------	-------	-------	13	20	18	17	13	20
22	8	-------	-------	-------	-------	-------	13	20	18	17	13	20
23	8	-------	-------	-------	-------	-------	13	20	18	17	13	20
24	8	-------	2	-------	-------	-------	13	20	18	17	13	20
25	8	-------	8	-------	-------	-------	13	20	18	16	13	20
26	8	-------	9	-------	-------	-------	13	20	18	16	13	14
27	8	-------	9	-------	-------	-------	13	20	18	16	13	11
28	8	-------	7	-------	-------	-------	13	20	18	16	9	11
29	8	4	-------	6	-------	-------	16	20	18	16	6	11
30	8	9	-------	10	-------	-------	20	20	18	16	8	11
31	6	-------	-------	10	-------	-------	-------	20	-------	15	8	-------

NOTE.—Canal dry during periods for which no discharge is given.

Monthly discharge of Pilot Butte Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	15	6	10.9	670
November	9	0	1.70	101
December	9	0	1.81	111
January	10	0	.84	52
February	10	0	.83	48
March	10	0	1.26	77
April	20	8	17.3	1,030
May	20	20	20.0	1,230
June	25	9	18.9	1,120
July	18	15	17.2	1,060
August	13	6	12.0	738
September	20	8	15.4	916
The year	25	0	9.85	7,150

DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT CANAL AT BEND, OREG.

LOCATION.—In SE. ¼ sec. 29, T. 17 S., R. 12 E., at Bend, Deschutes County.

RECORDS AVAILABLE.—July 22, 1923, to September 30, 1924, with an estimate of diversions beginning May 10, 1923.

GAGE.—Stevens eight-day recorder on stream wall of canal, about 100 yards below intake; vertical staff on masonry wall near same location used until about May 30; read by W. Andrew and G. A. Hathaway.

DISCHARGE MEASUREMENTS.—Made from footbridge near gage.

CHANNEL AND CONTROL.—Concrete and masonry lined at gage, trapezoidal section, permanent; control is entrance of semicircular metal flume, about 100 yards below gage.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.84 feet at 3.30 p. m. September 29 (discharge, 223 second-feet). Canal dry at times.

1923–24: Maximum discharge that of 1924.

ICE.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Gage read to tenths twice a day. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table the mean of the daily readings or the mean daily gage height obtained by inspecting recorder graph. Records good.

The Deschutes County Municipal Improvement District Canal diverts from Deschutes River in NE. ¼ sec. 32, at Bend, using surplus natural flow and water released from the Crescent Lake storage reservoir. The canal delivers the water to the Tumalo project feed canal, to supplement the flow of Tumalo Creek in irrigating the Tumalo project.

Discharge measurements of Deschutes County Municipal Improvement District Canal at Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 14	3.35	174	Aug. 5	2.70	123	Sept. 29	3.84	223
May 13	1.00	30.8	Sept. 11	.48	8.3	Do	2.38	110
June 5	1.91	76	Do	1.54	54	Do	3.14	158

Daily discharge, in second-feet, of Deschutes County Municipal Improvement District Canal at Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Apr.	May	June	July	Aug.	Sept.
1	112	80	75				82	178	130	77
2	68	80					76	59	126	77
3	18	80		69			72		124	
4	148	80					72		123	
5	148	80			24	30	76		125	76
6	148	27	45	39	61	30	84		124	77
7	148		68		80	30	84		124	77
8	148		68		27	30	85		120	77
9	148		105			30	90	75	116	77
10	112		105			30	113	113	105	77
11	112		105		39	30	156	104	105	67
12	112	75	112		63	30	179	92	105	61
13	84	112	148		68	30	194	85	103	61
14	53	112	182		74	30	196	82	98	61
15	53	112	99		74	0	196	82	95	61
16	53	112			50		198	78	86	61
17	53	112					196	73	88	61
18	53	112					193	77	93	61
19	53	112	27				205	93	95	61
20	53	75	61				207	90	95	61
21	53		0				207	109	95	61
22	53		43		22	22	207	112	92	61
23	53	80	119		34	35	206	108	91	61
24	53	112	80		34	35	204	102	91	61
25	53	112	80			35	203	102	91	61
26	53	112	27			36	201	102	91	67
27	53	112	0			36	190	102	87	97
28	53	112	27			36	185	122	80	142
29	53	112	80			36	186	150	79	151
30	53	112	80			65	171	142	77	161
31	80		80			88		133	77	

NOTE.—Canal dry during periods for which no discharge is given. Discharge estimated Jan. 1–5.

Monthly discharge of Deschutes County Municipal Improvement District Canal at Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	148	18	80.2	4,930
November	112	0	74.2	4,420
December	182	0	58.6	3,600
January	69	0	12.4	762
February	0	0	0	0
March	0	0	0	0
April	80	0	21.7	1,290
May	88	0	23.4	1,440
June	207	72	157	9,340
July	178	0	82.7	5,080
August	130	77	101	6,210
September	161	61	76.9	4,580
The year	207	0	57.4	41,700

NORTH CANAL NEAR BEND, OREG.

LOCATION.—In NE. ¼ sec. 29, T. 17 S., R. 13 E., 500 feet below bridge on road to Tumalo, a quarter of a mile below intake, and a mile north of Bend, Deschutes County.

RECORDS AVAILABLE.—June 14, 1913, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder just above railroad bridge, installed June 9, 1924; inclined staff painted on left side of concrete lining of flume, about 100 yards above bridge, used up to June 8. Gage read by W. L. Beebe.

DISCHARGE MEASUREMENTS.—Made from plank across canal.

CHANNEL AND CONTROL.—Concrete-lined section extends about 1,000 feet below gage; below this point the canal is unlined and sides and bottom are very rough. Changes in unlined section affect stage-discharge relation.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.28 feet at 12.30 a. m. June 11 (discharge, 458 second-feet). Canal dry at various times.

1913–1924: Maximum discharge recorded, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Staff gage read generally twice a day to tenths. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table daily gage reading or gage height obtained by inspecting recorder graph. Records excellent.

North Canal diverts water from the right bank of Deschutes River at a concrete dam about 60 feet high, in NE. ¼ sec. 29, T. 17 S., R. 13 E., and extends eastward for about a mile to a point where it discharges the water into Pilot Butte Canal.

Discharge measurements of North Canal near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 8	3.15	132	July 17	6.08	345	Aug. 7	6.11	340
May 13	6.95	417	July 22	5.48	294	Aug. 13	6.68	407
June 5	6.40	388	Aug. 5	6.10	340			

Daily discharge, in second-feet, of North Canal near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	277	189	123	------	141	------	88	367	430	426	339	329
2	281	189	123	------	70	------	131	376	421	427	345	329
3	281	189	46	------	------	------	112	385	421	427	351	326
4	277	189	------	------	------	------	83	385	408	426	350	347
5	273	189	------	------	------	------	83	385	354	429	350	366
6	277	189	------	------	------	------	83	385	354	426	349	366
7	273	189	------	------	------	------	93	392	372	427	349	365
8	273	189	------	------	------	------	135	398	310	428	360	378
9	273	189	------	------	------	------	172	398	349	432	365	376
10	273	189	------	------	------	------	206	398	402	425	368	371
11	249	189	------	41	------	------	225	416	429	417	359	311
12	233	189	------	99	------	------	225	423	428	414	360	283
13	233	189	------	99	------	------	238	430	430	424	380	279
14	233	189	------	99	------	------	249	430	429	423	342	279
15	223	189	------	99	------	------	249	430	430	416	302	279
16	202	189	------	49	------	------	249	430	429	421	289	280
17	189	175	------	------	------	------	249	430	428	368	287	281
18	189	168	47	------	------	------	249	125	428	343	290	297
19	189	168	141	------	------	88	249	90	431	342	288	299
20	189	168	141	------	------	141	265	430	431	337	289	305
21	189	168	141	------	------	141	281	430	430	318	350	307
22	189	168	41	------	------	141	281	430	431	303	390	311
23	189	168	------	49	6	94	281	430	431	307	383	309
24	189	168	------	25	82	------	303	215	428	344	383	303
25	189	168	------	25	141	------	358	163	427	372	376	299
26	189	142	------	19	141	------	367	430	427	357	372	282
27	189	123	------	------	141	------	367	430	432	352	371	273
28	189	123	------	------	141	------	367	430	432	351	346	271
29	189	123	------	70	100	------	367	430	430	339	327	269
30	189	123	------	123	------	------	367	430	405	353	330	270
31	189	------	------	141	------	------	------	430	------	347	332	------

NOTE.—Canal dry during periods for which no discharge is given.

Monthly discharge of North Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	281	189	225	13,800
November	189	123	173	10,300
December	141	0	25.9	1,590
January	141	0	30.3	1,860
February	141	0	33.2	1,910
March	141	0	20.2	1,240
April	367	83	232	13,800
May	430	90	379	23,300
June	432	310	413	24,600
July	432	303	385	23,700
August	390	287	344	21,200
September	378	269	311	18,500
The year	432	0	214	156,000

SWALLEY CANAL NEAR BEND, OREG.

LOCATION.—In NE. ¼ sec. 29, T. 17 S., R. 12 E., 100 yards above road crossing, a quarter of a mile below intake of canal at North Canal Dam, and 1½ miles north of Bend, Deschutes County.

RECORDS AVAILABLE.—June 1, 1913, to September 30, 1924.

GAGE.—Stevens eight-day recorder on right bank at lower end of intake flume, installed June 30, 1924, vertical staff at same location used up to June 30. Gage read by W. L. Beebe.

DISCHARGE MEASUREMENTS.—Made from plank across flume.

CHANNEL AND CONTROL.—Earth canal of regular cross section and practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.38 feet 6 to 8 a. m. July 5 (discharge, 114 second-feet). Canal dry at various times.

1913–1924: Maximum discharge recorded, that of 1924. Canal dry at various times.

ICE.—Stage-discharge relation not affected by ice.

ACCURACY.—Stage-discharge relation changed slightly about January 1. Two rating curves used, both well defined above 20 second-feet. Gage read to half-tenths twice a day. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table the mean daily reading or mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of Swalley Canal near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 28	0.98	21.1	June 5	1.61	59	July 10	2.21	98
May 13	1.83	66	June 6	2.05	85	Aug. 5	1.91	72

Daily discharge, in second-feet, of Swalley Canal near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	38	29	------	26	22	------	52	92	98	77	72
2	12	38	29	------	26	22	------	52	92	94	77	72
3	4	38	29	------	26	22	------	55	96	99	76	72
4	4	38	25	------	26	22	------	58	83	93	74	81
5	4	38	21	------	26	22	------	61	55	102	73	85
6	4	38	21	------	28	22	------	64	55	106	75	85
7	4	38	21	------	28	22	2	64	71	82	76	85
8	21	33	9	------	26	22	4	64	46	47	89	85
9	21	33	------	------	30	22	4	68	55	84	89	81
10	21	33	------	------	30	22	4	30	75	88	92	81
11	29	33	------	------	30	22	4	52	92	100	95	73
12	38	33	------	------	9	24	4	71	92	95	92	71
13	43	33	------	4	10	26	22	66	96	89	21	71
14	38	33	4	4	------	26	6	68	96	93	28	71
15	38	33	7	9	------	13	------	64	96	92	77	72
16	38	33	7	11	------	------	------	71	92	96	74	72
17	38	33	7	9	------	------	------	71	96	96	75	69
18	38	33	7	4	------	------	2	71	87	92	74	65
19	38	33	7	0	3	------	16	75	96	89	75	66
20	38	33	2	0	9	------	18	87	99	87	74	69
21	38	33	------	4	14	------	24	96	96	83	81	70
22	38	33	------	4	20	------	30	96	96	65	92	70
23	38	31	------	13	22	------	30	96	98	89	93	70
24	38	29	------	22	22	------	30	96	96	89	89	70
25	38	29	------	16	22	6	30	96	99	85	95	70
26	38	29	------	11	22	22	35	96	96	85	93	66
27	38	29	------	11	22	22	40	83	101	96	90	65
28	38	29	4	14	22	22	46	92	101	92	81	22
29	38	29	7	18	22	22	52	79	96	90	73	------
30	38	29	2	24	------	14	52	87	94	87	72	------
31	38	------	------	26	------	------	------	96	------	88	72	------

NOTE.—Canal dry during periods for which no discharge is given.

Monthly discharge of Swalley Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	43	4	29.9	1,840
November	38	29	33.2	1,980
December	29	0	7.7	473
January	26	0	6.6	406
February	30	0	18.0	1,040
March	26	0	14.2	873
April	52	0	15.2	904
May	96	30	73.5	4,520
June	101	46	87.8	5,220
July	106	47	89.4	5,500
August	95	21	77.9	4,790
September	85	0	66.7	3,970
The year	106	0	43.4	31,500

TUMALO CREEK NEAR BEND, OREG.

LOCATION.—In SE. ¼ sec. 23, T. 17 S., R. 11 E., one-fourth mile above the diversion dam of the feed canal of the Tumalo project, half a mile below highway bridge on old Bend-Sisters road, 4 miles above mouth, and 4 miles northwest of Bend, Deschutes County.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—November 1, 1913, to September 30, 1924, also during winters from October 6, 1906, to April 30, 1913, except 1909–10.

GAGE.—Stevens continuous water-stage recorder referred to outside staff gage, inspected by W. Andrew. Records previous to November, 1910, obtained at different site.

DISCHARGE MEASUREMENTS.—At ordinary stages, made by wading near the gage or from footbridge across canal when all water is diverted; at flood stages, from a large tree fallen across stream about 200 yards below gage, or by wading below diversion dam and adding measured canal flow.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; one channel at all stages; fairly straight above and below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.43 feet May 15 (discharge, 300 second-feet); minimum stage from recorder, 0.65 foot at 1 a. m. November 23 (discharge, 6 second-feet).

1906–1924: Maximum stage from recorder, 4.55 feet during winter of 1923, probably on January 6, clock stopped (discharge, 1,420 second-feet); minimum stage from recorder, 0.55 foot October 28, 1922 (discharge, 4.0 second-feet).

ICE.—Stage-discharge relation affected by ice December 7 to January 12; discharge estimated from study of climatic data taking into account also diversion in Columbia Southern Canal.

DIVERSIONS.—Columbia Southern Canal diverted water above the station during most of the year. Water was diverted into the head of Tumalo Creek from Crater Creek, tributary of Deschutes River, no record of this diversion in 1924.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of water-stage recorder satisfactory during period not affected by ice, except October 1–29 and April 16–19. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Tumalo Creek near Bend, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 12	1.50	70	May 1	1.54	79	Sept. 5	0.86	10.1
Mar. 27	1.14	35.7	July 5	1.60	89			

Daily discharge, in second-feet, of Tumalo Creek near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		12	83	25	90	67	31	82	140	23	58	53
2		13	73	25	76	67	31	103	126	38	58	53
3		12	72	25	70	66	31	113	113	82	57	51
4		12	69		90	65	30	105	94	82	58	52
5		12	61		92	63	31	86	76	79	55	51
6	38	11	61		86	63	34	79	67	75	50	52
7		11	57	77	86	65	38	83	54	70	50	51
8		11			79	65	41	103	55	62	49	52
9		11			79	65	41	126	57	56	56	46
10		12			79	66	43	151	54	58	65	47
11		11			74	65	47	177	42	57	64	46
12		11		77	74	65	49	203	27	54	64	47
13		11	30	79	76	65	56	228	26	54	64	47
14		11		70	74	65	58	231	26	57	64	48
15		11		66	73	63	47	240	28	57	64	49
16		11		66	70	63		237	27	53	67	53
17		10		63	70	63	44	217	25	53	64	58
18		10			70	73		197	25	50	67	57
19		10			70	63		187	22	52	67	57
20		10			70	51	41	166	19	53	61	56
21	36	9	15	63	69	34	44	151	18	53	61	53
22		8			67	34	50	147	21	55	61	53
23		16			67	34	50	156	19	54	62	54
24		35		63	66	34	49	140	16	54	62	56
25		27	15	62	66	33	48	135	19	55	60	57
26		21		62	66	33	50	97	23	57	52	57
27		17		62	66	32	56	88	21	55	57	36
28		16	28	62	66	32	63	90	19	53	57	14
29		28		65	66	30	71	88	19	52	52	15
30	13	30		73	-------	32	76	94	19	52	52	15
31	12	-------	41	80	-------	32	-------	117	-------	55	49	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Variation of diversions in Columbia Southern Canal considered in deriving estimates.

Monthly discharge of Tumalo Creek near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	----------	12	35.2	2,160
November	35	8	14.3	851
December	83	----------	35.2	2,160
January	80	----------	65.1	4,000
February	92	66	74.0	4,260
March	73	30	53.2	3,270
April	76	30	46.1	2,740
May	240	79	142	8,730
June	140	18	43.2	2,570
July	82	23	56.8	3,490
August	67	49	59.0	3,630
September	58	14	47.9	2,850
The year	240	8	56.1	40,700

Combined monthly discharge of Tumalo Creek and Columbia Southern Canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			[a] 69.0	4,240
November			[a] 72.0	4,280
December	103		74.3	4,570
January			67.8	4,170
February	92	66	74.0	4,260
March	73		64.4	3,960
April	119	58	81.1	4,830
May	298	105	190	11,700
June	200	85	109	6,490
July	114	60	71.2	4,380
August	67	56	63.9	3,930
September	61	49	55.9	3,330
The year			82.9	60,100

[a] Partly estimated.

COLUMBIA SOUTHERN CANAL NEAR TUMALO, OREG.

LOCATION.—In sec. 1, T. 18 S., R. 10 E., 200 feet below highway bridge across canal on Tumalo Creek road, 1 mile below head gates, 9 miles west of Bend, and 12 miles southwest of Tumalo, Deschutes County.

RECORDS AVAILABLE.—May 15, 1906, to May 23, 1914; May 5 to July 28, 1916; October 17, 1917, to November 2, 1921, and April 18, 1923, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on left bank referred to vertical staff; inspected by G. A. Hathaway.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading at gage.

CHANNEL AND CONTROL.—Canal is earth cut about 30 feet wide and 4 feet deep. Control not well defined but fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 1.81 feet at 5 a. m. June 29 (discharge, 84 second-feet); canal dry at times.

1906–1914; 1916–1921; 1923–1924: Maximum discharge recorded, 165 second-feet, July 2, 1921 (gage height, 2.42 feet).

ICE.—None during period of record.

DIVERSIONS.—None above gage.

REGULATIONS.—Flow controlled by head gates.

ACCURACY.—Stage-discharge relation fairly permanent. Rating curve well defined. Operation of water-stage recorder satisfactory except from December 19 to January 3 when float was frozen in well. Discharge ascertained by applying to rating table mean daily gage height determined by inspecting recorder graph and for periods of missing record by comparison with flow of Tumalo Creek below the canal intake. Records good.

COOPERATION.—Record furnished by the State engineer of Oregon.

Columbia Southern Canal diverts water from Tumalo Creek in SE. ¼ sec. 2, T. 18 S., R. 10 E. It has been operated since 1916 primarily to furnish water to a sawmill and to supplement the Tumalo feed canal. Most of the water eventually finds its way to the Tumalo project canals.

Discharge measurements of Columbia Southern Canal near Tumalo, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 28	1.20	28.6	June 10	1.50	53
May 1	1.40	43.1	July 26	.92	15.0

Daily discharge, in second-feet, of Columbia Southern Canal near Tumalo, Oreg. for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21			56		29	45	60	79	8	3
2	21			28		29	37	62	76	9	5
3	22					29	29	57		9	7
4	22					28	29	62		9	6
5	22		15			29	28	57		12	6
6	22		42			30	26	52		16	6
7	22		39			32	27	46		16	6
8	22		40			33	28	43	10	16	9
9	22		37			33	30	40	14	1	9
10	22		35			35	32	48	13		8
11	21		36			35	35	58	12		8
12		60	37			35	34	58	11		8
13			38			38	39	62	11		8
14			38			36	54	65	11		7
15			39			35	58	67	10		7
16			40			35	56	69	10		8
17			42			35	55	71	10		
18			44			35	53	74	10		
19						34	53	74	10		
20					29	34	55	74	11		
21	41		50		29	36	71	75	11		
22					29	38	70	74	12		
23					29	38	68	74	12		
24					29	38	68	74	13		
25					29	37	71	79	14	3	
26					29	38	63	80	15	12	
27		50	55		29	39	57	81	15	7	20
28					29	41	57	79	15	9	35
29					29	42	57	81	15	10	35
30					29	43	57	79	15	9	38
31	61				29		38		11	7	

NOTE.—Daily discharge estimated from record on Tumalo Creek near Bend, Oct. 31, Jan 1, 2, Mar 20–26 29–30, and Sept. 15. Braced figures show estimated mean discharge for periods indicated. Canal dry on days for which no discharge is given.

Monthly discharge of Columbia Southern Canal near Tumalo, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	61	21	34.8	2,140
November			[a] 57.7	3,430
December	55	0	39.1	2,400
January	56	0	2.71	167
February	0	0	0	0
March	29	0	11.2	689
April	43	28	35.0	2,080
May	71	26	47.7	2,930
June	81	40	65.8	3,920
July	79	0	14.4	885
August	16	0	4.94	304
September	38	0	7.97	474
The year	81	0	26.8	19,400

[a] Estimated.

TUMALO FEED CANAL NEAR BEND, OREG.

LOCATION.—In SE. ¼ sec. 23, T. 17 S., R. 11 E., in concrete-lined section, 300 feet below diversion dam, half a mile below bridge across Tumalo Creek on old road from Bend to Sisters, and 4 miles from Bend, Deschutes County.

RECORDS AVAILABLE.—May 21, 1914, when water was first diverted, to September 30, 1919, October 1–31, 1920, April 1 to September 30, 1921, May 19 to October 16, 1922, and April 1, 1923, to September 30, 1924.

GAGE.—Painted on sloping concrete lining. Gage read by W. Andrew.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Trapezoidal concrete section; the control is the sand trap just above the intake to a steel flume.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.4 feet May 16 and 17 (discharge, 163 second-feet); canal dry at various times.

1914–1924: Maximum stage recorded, 3.80 feet May 4, 5, and 6, 1916 (discharge, 219 second-feet).

ICE.—Water has to be turned out in extremely cold weather.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Daily discharge ascertained by applying to rating table the daily gage height. After May 20, except May 31 to June 2, canal diverted entire flow of Tumalo Creek, and the record obtained by the recorder just above on the creek is used. Records good.

COOPERATION.—Record furnished by the State engineer of Oregon.

Tumalo feed canal diverts water from Tumalo Creek in SE. ¼ sec. 23, T. 17 S., R. 11 E., for irrigation on the Tumalo project.

The following discharge measurements were made:

April 9, 1924: Gage height, 1.94 feet; discharge, 33.3 second-feet.

May 1, 1924: Gage height, 2.45 feet; discharge, 72 second-feet.

August 6, 1924: Gage height, 2.2 feet; discharge, 43.1 second-feet.

Daily discharge, in second-feet, of Tumalo feed canal near Bend, Oreg., for the year ending September 30, 1924

Day	Oct.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	----	8	74	30	42	105	23	58	53
2	40	----	----	74	30	62	105	38	58	53
3	40	----	2	74	28	82	113	82	57	51
4	40	----	3	74	28	82	94	82	58	52
5	38	----	3	66	28	82	76	79	55	51
6	45	----	3	66	32	86	67	75	50	52
7	40	----	3	59	34	95	54	70	50	51
8	36	----	1	59	34	116	55	62	49	52
9	36	2	2	59	38	122	57	56	56	46
10	36	3	3	59	38	122	54	58	65	47
11	36	3	3	59	11	134	42	57	64	46
12	36	3	18	59	----	148	27	54	64	47
13	18	3	18	59	----	148	26	54	64	47
14	----	3	18	59	----	148	26	57	64	48
15	----	3	18	59	----	155	28	57	64	49
16	----	3	18	59	4	163	27	53	67	53
17	----	3	18	59	34	163	25	53	64	58
18	----	3	18	32	34	155	25	50	67	57
19	----	3	18	----	34	155	22	52	67	57
20	----	3	38	----	38	155	19	53	61	56
21	----	3	42	----	38	151	18	53	61	53
22	----	3	42	----	42	147	21	55	61	53
23	----	3	42	----	42	156	19	54	62	54
24	----	3	42	21	38	140	16	54	62	56
25	----	3	42	30	34	135	19	55	60	57
26	----	3	42	30	32	97	23	57	52	57
27	----	18	66	32	35	88	21	55	57	36
28	----	18	66	32	36	90	19	53	57	14
29	----	18	74	32	36	88	19	52	52	15
30	----	18	----	32	38	94	19	52	52	15
31	----	18	----	32	----	110	----	55	49	----

NOTE.—Canal dry on days for which no discharge is given.

Monthly discharge of Tumalo feed canal near Bend, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	45	0	15.4	946
January	18	0	4.61	284
February	74	0	23.1	1,330
March	74	0	43.6	2,680
April	42	0	28.2	1,680
May	163	42	120	7,380
June	113	16	41.4	2,460
July	82	23	56.8	3,490
August	67	49	59.0	3,630
September	58	14	47.9	2,850
The year	163	0	36.8	26,700

NOTE.—No flow during months for which no record is given.

SQUAW CREEK NEAR SISTERS, OREG.

LOCATION.—In NW. ¼ sec. 32, T. 15 S., R. 10 E., immediately above intake of McCallister ditch and 5 miles by road above Sisters, Deschutes County.

DRAINAGE AREA.—63 square miles.

RECORDS AVAILABLE.—Irrigation seasons, 1913, 1914, and 1916 to 1924. From July 1, 1906, to May 23, 1913, in sec. 29, at station below intake of McCallister ditch and about 700 feet farther downstream.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by water master.

DISCHARGE MEASUREMENTS.—Made from a cable about 100 yards above gage or by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during period April 23 to September 30 from water-stage recorder, 2.83 feet at 10 p. m. May 15 (discharge, 228 second-feet); minimum stage recorded, 1.99 feet 2 to 11 a. m. September 25, 1922 (discharge, 46 second-feet).

1906–1924: Maximum stage recorded, 7.5 feet at old station, November 22, 1909 (discharge, estimated from extension of rating curve, 1,940 second-feet); minimum discharge recorded, 19 second-feet December 6, 1922.

DIVERSIONS.—Pole Creek, a tributary of Squaw Creek from the west, has been diverted for irrigation. The diversion canal has been eroded until it carries the entire flow of this creek. Low-water flow entirely diverted below the station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during season. Rating curve fairly well defined. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage heights obtained by inspecting recorder graph. Records good.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of Squaw Creek near Sisters, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 23	2.08	55	Aug. 18	2.27	104	Sept. 11	2.07	57
May 12	2.52	144	Sept. 5	2.07	56	Sept. 16	2.51	145
June 11	2.36	113						

Daily discharge, in second-feet, of Squaw Creek near Sisters, Oreg., for the period April 23 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1		90	165	163	121	92	16		204	126	98	96	88
2		98	173	165	108	94	17		181	119	100	96	72
3		98	175	168	108	96	18		170	113	104	134	57
4		90	155	170	104	100	19		163	96	115	108	52
5		80	139	160	102	104	20		160	94	104	84	51
6		76	121	130	102	96	21		163	106	108	90	52
7		84	102	121	104	102	22		165	115	117	92	54
8		96	100	123	108	111	23	57	160	117	106	96	52
9		108	106	126	111	80	24	58	170	123	117	92	49
10		123	113	134	113	72	25	58	160	132	128	90	48
11		146	117	128	111	70	26	58	133	128	132	106	49
12		168	119	121	123	76	27	63	123	121	128	123	48
13		178	115	123	115	80	28	72	126	119	119	113	49
14		183	126	119	104	80	29	80	123	123	119	92	51
15		191	128	100	94	86	30	84	126	134	117	84	53
							31		143		115	78	

Monthly discharge of Squaw Creek near Sisters, Oreg., for the period April 23 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 23–30	84	57	66.2	1,050
May	204	76	138	8,480
June	175	94	124	7,380
July	170	98	125	7,690
August	134	78	103	6,330
September	111	48	72.1	4,290
The period				35,200

CROOKED RIVER NEAR CULVER, OREG.

LOCATION.—In NW. ¼ sec. 11, T. 12 S., R. 12 E., one-eighth mile below the Cove power plant and 6 miles west of Culver, Jefferson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1917, to September 30, 1924.

GAGE.—Inclined staff on right bank 100 feet below power house; gage read by A. K. McAlpine.

DISCHARGE MEASUREMENTS.—Made from cable half a mile below gage.

CHANNEL AND CONTROL.—Rocky banks, bed and control of boulders; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.30 feet at 5.30 p. m. February 8 (discharge, 4,720 second-feet); minimum stage recorded 0.36 foot May 16–22, 25, 26, and May 30 to June 1 (discharge, 1,110 second-feet).

1917–1924: Maximum stage recorded, 6.3 feet April 5, 1919 (discharge, 5,200 second-feet); minimum discharge recorded, 970 second-feet July 12 to September 5, 1921.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Practically all the summer flow of Crooked River above Prineville is diverted for irrigation. Low-water flow at this station is from springs within a few miles above.

REGULATION.—Slight regulation by power plant above gage and storage reservoir on Ochoco project.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Gage read once a day to hundredths below a stage of 1 foot and to tenths above that stage. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurement was made:
June 7, 1924: Gage height, 0.37 foot; discharge, 1,140 second-feet.

Daily discharge, in second-feet, of Crooked River near Culver, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,180	1,200	1,200	1,160	3,560	1,570	1,220	1,200	1,110	1,110	1,110	1,110
2	1,180	1,180	1,200	1,160	3,280	1,510	1,220	1,200	1,110	1,110	1,110	1,110
3	1,180	1,180	1,200	1,160	2,540	1,510	1,260	1,200	1,110	1,110	1,110	1,110
4	1,180	1,180	1,200	1,160	1,830	1,510	1,260	1,180	1,110	1,110	1,110	1,110
5	1,180	1,180	1,200	1,160	1,760	1,510	1,260	1,180	1,110	1,110	1,110	1,110
6	1,180	1,180	1,200	1,160	2,130	1,450	1,300	1,180	1,110	1,110	1,110	1,110
7	1,200	1,200	1,200	1,160	2,050	1,450	1,300	1,160	1,110	1,110	1,110	1,110
8	1,200	1,180	1,200	1,160	3,420	1,450	1,350	1,160	1,110	1,110	1,110	1,110
9	1,180	1,180	1,180	1,180	3,880	1,400	1,450	1,160	1,110	1,110	1,110	1,110
10	1,180	1,180	1,180	1,180	2,130	1,400	1,570	1,150	1,110	1,110	1,110	1,110
11	1,180	1,180	1,180	1,180	1,690	1,400	1,570	1,150	1,110	1,110	1,110	1,110
12	1,200	1,180	1,180	1,160	1,570	1,350	1,570	1,140	1,110	1,110	1,110	1,110
13	1,180	1,180	1,180	1,180	1,510	1,350	1,630	1,110	1,110	1,110	1,110	1,110
14	1,200	1,180	1,160	1,180	1,510	1,300	1,630	1,110	1,110	1,110	1,110	1,110
15	1,180	1,180	1,160	1,160	1,630	1,300	1,630	1,110	1,110	1,110	1,110	1,110
16	1,200	1,200	1,180	1,160	1,570	1,300	1,510	1,110	1,110	1,110	1,110	1,110
17	1,200	1,200	1,160	1,180	1,570	1,300	1,450	1,110	1,110	1,110	1,110	1,110
18	1,200	1,200	1,160	1,180	1,450	1,260	1,400	1,110	1,110	1,110	1,110	1,110
19	1,180	1,200	1,180	1,180	1,450	1,260	1,350	1,110	1,110	1,110	1,110	1,110
20	1,180	1,200	1,180	1,180	1,450	1,260	1,300	1,110	1,110	1,110	1,110	1,110
21	1,180	1,200	1,180	1,180	1,400	1,260	1,300	1,110	1,110	1,110	1,110	1,110
22	1,180	1,200	1,180	1,180	1,450	1,260	1,300	1,110	1,110	1,110	1,110	1,110
23	1,180	1,200	1,180	1,180	1,630	1,260	1,260	1,110	1,110	1,110	1,110	1,110
24	1,180	1,200	1,180	1,180	1,450	1,260	1,260	1,110	1,110	1,110	1,110	1,110
25	1,180	1,200	1,180	1,180	1,450	1,260	1,260	1,110	1,110	1,110	1,110	1,110
26	1,180	1,200	1,180	1,180	1,450	1,220	1,240	1,110	1,110	1,110	1,110	1,110
27	1,180	1,200	1,180	1,180	1,450	1,220	1,240	1,110	1,110	1,110	1,110	1,110
28	1,180	1,200	1,180	1,220	1,400	1,220	1,240	1,110	1,110	1,110	1,110	1,110
29	1,180	1,200	1,180	1,220	1,400	1,220	1,240	1,110	1,110	1,110	1,110	1,110
30	1,180	1,200	1,180	1,220	-------	1,220	1,220	1,110	1,110	1,110	1,110	1,110
31	1,180	-------	1,180	3,280	-------	1,220	-------	1,110	-------	1,110	1,110	-------

Monthly discharge of Crooked River near Culver, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,200	1,180	1,180	72,600
November	1,200	1,180	1,190	70,800
December	1,200	1,160	1,180	72,600
January	3,280	1,160	1,240	76,200
February	3,880	1,400	1,900	109,000
March	1,570	1,220	1,340	82,400
April	1,630	1,220	1,360	80,900
May	1,200	1,110	1,130	69,500
June	1,110	1,110	1,110	66,000
July	1,110	1,110	1,110	68,200
August	1,110	1,110	1,110	68,200
September	1,110	1,110	1,110	66,000
The year	3,880	1,110	1,240	902,000

OCHOCO CREEK ABOVE MILL CREEK, NEAR PRINEVILLE, OREG.

LOCATION.—In SW. ¼ sec. 36, T. 14 S., R. 17 E., on Dobb ranch, 1½ miles above mouth of Mill Creek and 12 miles east of Prineville, Crook County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 8, 1917, to September 30, 1922; February 18 to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on right bank; inspected by Herman Dill and S. B. Ellis.

DISCHARGE MEASUREMENTS.—Made from cable 75 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel; may shift slightly. Control is riffle 100 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage during year ending September 30, 1921, from water-stage recorder, 3.61 feet at 10 p. m. May 17 (discharge, 500 second-feet); minimum stage not determined.

Maximum stage during year ending September 30, 1922, from water-stage recorder, 3.53 feet at noon April 23 (discharge, 482 second-feet); minimum stage, 0.32 foot August 2 (discharge, 0.4 second-foot).

Maximum stage during period February 18 to September 30, 1924, from water-stage recorder, 1.61 feet at 5 p. m. February 28 (discharge, 71 second-feet); stream dry after July 7.

1917–1922; 1924. Maximum discharge recorded, 600 second-feet April 4, 1919; stream dry at times.

ICE.—Stage-discharge relation not seriously affected by ice.

DIVERSIONS.—Many small private ditches divert water for a distance of about 30 miles above station.

REGULATIONS.—None above station; reservoir of Ochoco Irrigation District controls entire flow of creek immediately below station.

ACCURACY.—Stage-discharge relation practically permanent. Rating curves fairly well defined except for periods shown by break in records. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table. Records for 1924 good, others fair except estimates for September and October, 1921, and January, 1922, which are poor.

COOPERATION.—Records for 1924 furnished by State engineer of Oregon.

Discharge measurements of Ochoco Creek above Mill Creek, near Prineville, Oreg., during the years ending September 30, 1921, 1922, and 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1920	*Feet*	*Sec.-ft.*	1922	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Nov. 5	0.64	4.2	Feb. 8	1.10	26.0	Feb. 26	1.36	45.6
			Feb. 13	.84	12.6	Mar. 5	1.32	43.5
1921			May 9	2.56	210	Apr. 2	1.10	32.2
Apr. 4	2.56	213	May 11	2.31	148	Apr. 7	1.50	63
July 2	.98	22.5	May 17	2.44	181	May 9	.76	14.5
			Sept. 19	.30	1.4	June 21	.29	2.0

Daily discharge, in second-feet, of Ochoco Creek above Mill Creek, near Prineville, Oreg., for the years ending September 30, 1921, 1922, and 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1920-21												
1		3.2	23	126	52	258	183	174	119	21	3.3	-------
2		3.5	22		54	271	212	174	126	20	2.5	-------
3		3.8	19		46	355	234	183	157	22	2.9	-------
4		4.0	19		52	385	212	174	157	20	5.2	-------
5		4.3	17	100	45	355	192	183	108	19	4.3	-------
6		4.6	21		38	340	174	174	70	17	3.3	-------
7		4.6	22		35	284	174	174	57	14	2.9	-------
8	1.0	4.3	22		33	246	202	174	51	14	2.4	-------
9		4.3	21	68	76	223	355	166	53	11	2.4	-------
10		4.3	21	62	200	223	258	166	52		2.4	-------
11		4.1	21			212	326	157	52	11	2.1	-------
12		4.3	16			202	298	223	50		1.8	-------
13		5.2	14	58	258	192	298	312	53		2.0	-------
14		5.2	16		465	183	258	340	51	11	2.2	-------
15		5.5	16		326	166	212	326	54	9		-------
16	1.0	6.7	18	55	157	174	174	340	59	7		-------
17	1.0	21	19	57	141	258	157	415	57	5.2		-------
18	1.0	31	19	56	141	370	166	465	52			-------
19	1.0	40	17	48	141	340	166	415	47			-------
20	1.0	38	16	43	141	258	174			5.2		-------
21	1.2	33	17	41	134	246	183					-------
22	1.3	29	14	41	134	212	202		36	5.2	1.0	-------
23	1.4	26	19	41		202	192			4.9		-------
24	1.6	24	14	40		183	183	250		4.3		-------
25	1.2	19	14	39	146	183	166			3.5		-------
26	1.2	20	15	40		166	157		25	3.0		-------
27	1.8	33	17	40	157	166	149			2.7		-------
28	2.7	28	20	39	234	157	166		23	2.5		-------
29	3.5	25	31	39	-------	166	174	119		2.5		-------
30	3.3	24	71	40	-------	166	174	126		3.0		-------
31	3.5	-------	149	33	-------	183	-------	126	-------	3.5		-------
1921-22												
1	-------		174	34			99	271	61	2.9	.6	
2	-------		134	-------	20	14	107	312	48	2.9	.4	
3	-------		126	-------			174	271	46	2.7	1.2	1.0
4	-------		84	-------			149	284	43	2.5	.9	
5	-------		72	-------	15	14	126	312	68	2.2	.8	
6	-------		64	-------	20	13	141	298	61	1.9	.8	1.2
7	-------	4	58	-------	25	12	202	284	55	1.5		
8	-------		52	25	30	11	212	234	65	2.4		1.0
9	-------		48	20	16	10	174	202	126	2.9		
10	-------		47	-------	12	11	166	174	126	2.1	.9	
11	-------		46	-------	11	12	141	157	95	1.4		.7
12	-------		47	-------	10	13	126	149	77	2.1		.7
13	-------		51	-------	13	15	119	166	64	2.4	1.0	.6
14	-------	7.0	54	-------		18	112	174	55	2.1		.7
15	-------		51	22	15		119	174	47	1.8		.7
16	-------		32	-------		25	112	174	43	1.9		.9
17	2.9	10	38	-------	20		88	166	35	1.9	.9	1.5
18	-------		37	-------	20		100	174	34	1.6		1.5
19	-------		39	-------	20	26	134	166		1.4		1.4
20	-------	35		-------	19		192	157		1.6		1.4
21	-------	108			18		312	141	25	1.5	.8	1.3
22	-------	98	40	41	17	60	448			.8		1.3
23	-------	65		-------	16		430			.7		1.3
24	-------	51		-------	15		430			.8		1.4
25	-------	51	40	-------	15		415	100	17	.8		1.3
26	-------	49		-------	15	55	415		17	1.0	1.0	1.3
27	-------	51		-------	15	60	385		15	.9		1.3
28	-------	50	37	-------	15	60	340	70	8.5	.8		1.4
29	-------	47		27	-------	60	298	68	4.1	.8		1.4
30	-------	126		-------	-------	65	258	62	2.9	.8		1.5
31	-------	-------		-------	-------	82	-------	62	-------	.8		-------

Daily discharge, in second-feet, of Ochoco Creek above Mill Creek, near Prineville, Oreg., for the years ending September 30, 1921, 1922, and 1924—Continued

Day	Feb.	Mar.	Apr.	May	June	July	Day	Feb.	Mar.	Apr.	May	June	July
1923–24							1923–24						
1	------	58	27	20	6	2	16	------	31	43	11	4	------
2	------	57	29	19	5	1	17	------	31	38	8	5	------
3	------	55	34	20	4	1	18	54	25	36	7	5	------
4	------	50	33	20	3	1	19	52	30	34	7	4	------
5	------	45	36	20	3	1	20	52	30	32	7	3	------
6	------	45	43	19	3	1	21	64	26	31	7	2	------
7	------	43	55	18	3	1	22	52	23	28	7	2	------
8	------	39	64	16	3	------	23	50	27	28	7	2	------
9	------	40	59	16	3	------	24	45	26	26	7	2	------
10	------	39	60	16	4	------	25	49	25	25	7	2	------
11	------	35	55	16	4	------	26	48	26	24	6	2	------
12	------	42	50	14	4	------	27	48	24	22	6	2	------
13	------	37	50	11	4	------	28	67	24	22	5	2	------
14	------	35	50	11	4	------	29	60	24	22	6	2	------
15	------	33	46	11	4	------	30	------	24	21	6	2	------
							31	------	26	------	6	------	------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Ochoco Creek above Mill Creek, near Prineville, Oreg., for the years ending September 30, 1921, 1922, and 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1920–21				
October	3.5	----------	1.38	85
November	40	3.2	15.4	916
December	149	14	24.5	1,510
January	126	33	62.5	3,840
February	465	33	144	8,000
March	385	157	236	14,500
April	355	149	206	12,300
May	465	119	237	14,600
June	157	----------	58.6	3,490
July	22	2.5	9.36	576
August	5.2	----------	1.83	113
September	----------	----------	[a]1.5	89
The year	465	----------	82.9	60,000
1921–22				
October	----------	----------	[a]2.0	123
November	126	----------	28.0	1,670
December	174	----------	55.4	3,410
January	----------	----------	28.2	1,730
February	30	10	17.2	955
March	82	10	34.0	2,090
April	448	88	217	12,900
May	312	62	171	10,500
June	126	2.9	45.4	2,700
July	2.9	.7	1.67	103
August	1.2	.4	.91	56
September	1.5	.6	1.13	67
The year	448	.4	50.2	36,300
1923–24				
February 18–29	67	48	53.4	1,270
March	58	23	34.7	2,130
April	64	21	37.4	2,230
May	20	5	11.5	707
June	6	2	3.3	196
July	2	0	.3	18
The period	----------	----------	----------	6,550

[a] Estimated.

NOTE.—Creek dry July 8 to Sept. 30, 1924.

MILL CREEK NEAR PRINEVILLE, OREG.

LOCATION.—In SE. ¼ sec. 22, T. 14 W., R. 17 E., on Dill ranch, 1 mile above mouth and 10 miles east of Prineville, Crook County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE—March 14 to September 5, 1916; December 8, 1917, to July 4, 1918; December 21, 1919, to September 30, 1922; and April 1 to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on left bank; inspected by Herman Dill and S. B. Ellis.

DISCHARGE MEASUREMENTS.—Made by wading or from footlog at gage.

CHANNEL AND CONTROL.—Bed and control composed of gravel; subject to shift at high stages.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder during year ending September 30, 1922, 2.03 feet at 10 a. m. April 23 and 11 p. m. April 24 (discharge, 140 second-feet); stream dry during several periods.

Maximum stage recorded during the period April 1 to September 30, 1924, 0.96 foot at 5 a. m. April 15 (discharge, 24 second-feet); stream dry June to September.

1916; 1918; 1920–1922; 1924: Maximum stage recorded, 2.86 feet February 14, 1921 (discharge, 225 second-feet). Stream dry during part of most years.

DIVERSIONS.—Many small ditches above station. Two divert around gage, probably not over a few hundred acre-feet a year.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Staff gage read to hundredths once a day February 7 to March 23, 1922. Operation of water-stage recorder fairly satisfactory at other times except during winter and for several short periods. Records good for March and May, 1922; fair for other periods.

COOPERATION.—Records furnished by State engineer of Oregon.

Discharge measurements of Mill Creek near Prineville, Oreg., during the year ending September 30, 1922

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 7	0.24	4.4	May 9	1.47	87	May 17	1.66	100
Feb. 13	.24	4.3	May 11	1.21	58	Sept. 20	.06	[a].2

[a] Estimated.

Daily discharge, in second-feet, of Mill Creek near Prineville, Oreg., for the years ending September 30, 1922 and 1924

Day	1921-22									1924	
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Apr.	May
1		51	9		4	36	79			8	
2		47		4	4	38	82	36	1	6	
3		38			9	50	85			5	
4		30			6	64	91	28			
5		30		4	5	58	95	30		7	9
6		29		4	4	54	100	29			
7		26		5	6	62	105	27		8	
8		23	6	4	6	72	92	27		12	
9		21		5	7	62	83	52	1	15	9
10		19		5	5	54	72	48			9
11		17		4	6	44	62	42		19	9
12		17		5	6	42	62				5
13		16		4	9	37	65				5
14		16		3	6	34	74			23	3
15	1	16	7	4	10	31	85	28		21	1
16		13		6	9	28	93			18	1
17		11		6	6	25	100			18	1
18		10		5	10	26	105	14			1
19		10		6	8	28	100			18	1
20	9			5	19	38	94				1
21		10		4	16	54	78	12		18	1
22			6	5	44	135				18	1
23				3	72	135				17	1
24	20			5	35	125				16	0
25		10		4	31	120	69	10		14	0
26				6	30	120				13	0
27	18			6	29	110					0
28	18			3	31	100	60	6		12	0
29	18	9	4		32	91					0
30	22				33	81	52				0
31					34						0

NOTE.—Stream dry Oct. 1 to Nov. 10, 1921, probably for greater part of July, August, and September, 1922 and June to September, 1924.

Monthly discharge of Mill Creek near Prineville, Oreg., for the years ending September 30, 1922 and 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1921-22				
October			[a] 0	0
November	22	0	7.1	422
December	51		17.9	1,100
January			6.4	394
February	6	3	4.5	250
March	72	4	17.2	1,060
April	135	25	65.1	3,870
May	105		78.5	4,830
June	52		22.8	1,360
July			[a] 1.0	61
August			[a] 0	0
September			[a] .2	12
The year	135	0	18.5	13,400
1924				
April	23	5	14.3	851
May	9	0	3.90	240

[a] Estimated.

NOTE.—Stream dry June to September, 1924.

METOLIUS RIVER NEAR GRANDVIEW, OREG.

LOCATION.—In NE. ¼ sec. 19, T. 11 S., R. 11 E., at Montgomery ranch, 11 miles above mouth and 10 miles northwest of Grandview post office, Jefferson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1921, to September 30, 1914.

GAGE.—Vertical staff on right bank; gage read by E. A. Montgomery.

DISCHARGE MEASUREMENTS.—Made from cable one-fourth mile above gage.

CHANNEL AND CONTROL.—Bed composed of smooth boulders, current swift, channel straight, river confined to its banks at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 0.86 foot on November 24 (discharge, 1,950 second-feet); minimum stage recorded, 0.32 foot September 21–30 (discharge, 1,300 second-feet).

ICE.—Never any ice on this river.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurement was made:

June 8, 1924: Gage height, 0.43 foot; discharge, 1,430 second-feet.

Daily discharge, in second-feet, of Metolius River near Grandview, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,450	1,450	1,450	1,500	1,610	1,500	1,400	1,400	1,450	1,450	1,400	1,350
2	1,450	1,450	1,400	1,500	1,610	1,500	1,400	1,400	1,450	1,450	1,350	1,350
3	1,450	1,450	1,400	1,500	1,610	1,500	1,400	1,400	1,450	1,450	1,350	1,350
4	1,450	1,450	1,400	1,500	1,610	1,500	1,400	1,400	1,450	1,450	1,350	1,350
5	1,450	1,450	1,400	1,500	1,610	1,500	1,400	1,400	1,450	1,450	1,350	1,350
6	1,450	1,450	1,660	1,500	1,610	1,500	1,400	1,400	1,450	1,400	1,350	1,350
7	1,450	1,450	1,560	1,500	1,610	1,500	1,400	1,400	1,500	1,400	1,350	1,350
8	1,450	1,450	1,450	1,500	1,610	1,500	1,400	1,400	1,500	1,400	1,400	1,400
9	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,400	1,450	1,400	1,400	1,350
10	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,450	1,450	1,400	1,400	1,350
11	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,500	1,450	1,400	1,400	1,350
12	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,500	1,450	1,400	1,400	1,350
13	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,500	1,450	1,400	1,400	1,350
14	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,560	1,450	1,400	1,400	1,350
15	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,560	1,400	1,400	1,400	1,350
16	1,450	1,450	1,450	1,500	1,610	1,450	1,400	1,610	1,400	1,400	1,400	1,350
17	1,450	1,400	1,450	1,500	1,610	1,450	1,400	1,610	1,400	1,400	1,350	1,350
18	1,450	1,400	1,450	1,500	1,610	1,450	1,400	1,610	1,400	1,400	1,350	1,350
19	1,450	1,400	1,450	1,450	1,610	1,450	1,400	1,560	1,400	1,400	1,400	1,350
20	1,450	1,400	1,450	1,450	1,610	1,450	1,400	1,560	1,400	1,400	1,400	1,350
21	1,450	1,400	1,400	1,450	1,560	1,400	1,400	1,500	1,400	1,400	1,400	1,300
22	1,450	1,400	1,400	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
23	1,450	1,500	1,400	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
24	1,450	1,950	1,400	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
25	1,450	1,720	1,560	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
26	1,450	1,500	1,450	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
27	1,450	1,450	1,450	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
28	1,450	1,400	1,450	1,450	1,500	1,400	1,400	1,500	1,400	1,400	1,350	1,300
29	1,450	1,610	1,610	1,450	1,500	1,400	1,400	1,450	1,400	1,400	1,350	1,300
30	1,450	1,450	1,610	1,500	-------	1,400	1,400	1,450	1,400	1,400	1,350	1,300
31	1,450	-------	1,500	1,660	-------	1,400	-------	1,450	-------	1,400	1,350	-------

Monthly discharge of Metolius River near Grandview, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,450	1,450	1,450	89,200
November	1,950	1,400	1,470	87,500
December	1,660	1,400	1,460	89,800
January	1,660	1,450	1,490	91,600
February	1,610	1,500	1,580	90,900
March	1,500	1,400	1,450	89,200
April	1,400	1,400	1,400	83,300
May	1,610	1,400	1,480	91,000
June	1,500	1,400	1,430	85,100
July	1,450	1,400	1,410	86,700
August	1,400	1,350	1,370	84,200
September	1,400	1,300	1,340	79,700
The year	1,950	1,300	1,440	1,050,000

LAKE CREEK NEAR SISTERS, OREG.

LOCATION.—In SE. ¼ sec. 24, T. 13 S., R. 8 E., Jefferson County, one-fourth mile below outlet of Suttle Lake, 6 miles from mouth of creek, and 15 miles northwest of Sisters, Deschutes County.

DRAINAGE AREA.—20.5 square miles.

RECORDS AVAILABLE.—April 7, 1915, to September 30, 1924, with a few gaps; occasional readings May to November, 1911; March to September, 1912; May to October, 1913.

GAGE.—Stevens continuous water-stage recorder on left bank; inspected by G. A. Hathaway.

CHANNEL AND CONTROL.—Bed composed of heavy gravel and boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 1.13 feet at noon February 8 (discharge, 82 second-feet); minimum stage from recorder, 0.43 foot September 21–23 (discharge, 25 second-feet).

1911–1913; 1915–1924: Maximum stage from recorder, 2.58 feet January 10, 1923 (discharge, 302 second-feet); minimum stage recorded, 0.31 foot October 18, 1916 (discharge, 20 second-feet).

ICE.—Stage-discharge relation apparently not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation apparently permanent during year. Rating curve well defined. Operation of recorder fairly satisfactory beginning November 18, with a few gaps as indicated by braces. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection. Records good except for periods when recorder was not operating, for which they are fair.

COOPERATION.—Record furnished by the State engineer of Oregon.

Discharge measurements of Lake Creek near Sisters, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 7	0.84	56.5	Feb. 23	1.00	66.6	June 12	0.64	35.3
Jan. 8	.85	52.2	Mar. 20	.72	44.3	July 11	.55	29.7
Jan. 30	.76	48.9	May 20	.78	45.2			

Daily discharge, in second-feet, of Lake Creek near Sisters, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36		35	56	48	61	49	50	44	34	29	28
2			34	56	53	61	48	50	44	34	29	28
3			34	56	56	61	48	51	44	34	28	28
4		34	34	56	62	60	48	52		34	28	28
5			34	58	68	59	47	54		33	27	28
6			47	56	72	58	47	53		33	28	27
7			52	56	79	57	47	53	40	33	28	27
8			51	54	82	56	46	53		32	28	28
9			50	54		55	46	52		32	28	28
10			48	54		54	45	52		32	28	28
11			48	53		54	45	51		32	28	27
12			47	52		53	46	52	38	32	28	27
13		33	46	50		52	47	50	38	32	29	27
14			46	50		51	48	49	38	31	29	27
15	35		44	49	75	50	48	48	38	30	29	27
16			44	48		49	48	49	37	30	29	26
17			43	48		48	51	49	37	33	29	26
18		33	42	48		48	53	48	37	34	29	25
19		32	42	48		48	54	48	39	32	29	25
20		30	42	48		46	54	48	38	32	29	25
21		30	41	47		44	54	49	38	31	29	25
22		30	41	46		44	54	48	37	31	30	25
23		39	40	45	69	45	54	48	37	31	29	25
24		44	39	45	67	46	54	48	36	31	30	
25		42	44	45	65	47	53	48	36	31	30	
26		39	44	44	65	48	53	47	35	31	30	27
27		37	44	44	64	46	52	45	35	30	29	
28	34	36	48	45	63	48	53	44	35	29	30	
29	34	36	51	45	62	48	52	44	34	29	29	
30	34	36	52	47	-------	50	50	44	34	29	29	
31	34	-------	54	47	-------	49	-------	44	-------	29	29	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Lake Creek near Sisters, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	36	34	34.9	2,140
November	44	30	34.4	2,050
December	54	34	43.9	2,700
January	58	44	50.0	3,070
February	82	48	69.8	4,010
March	61	44	51.5	3,170
April	54	45	49.8	2,960
May	54	44	49.1	3,020
June	44	34	38.3	2,280
July	34	29	31.6	1,940
August	30	27	28.8	1,770
September	28	25	26.8	1,590
The year	82	25	42.3	30,700

FIRST CREEK NEAR SISTERS, OREG.

LOCATION.—In SW. ¼ sec. 12, T. 13 S., R. 8 E., Jefferson County, just above a trail crossing, 1½ miles from road leading to Suttle Lake, and 15 miles northwest of Sisters, Deschutes County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 7, 1915, to March 31, 1917; March 1 to July 31, 1924

GAGE.—Stevens continuous water-stage recorder on left bank at same location as old vertical staff used prior to 1924.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed of heavy gravel and angular boulders; fairly permanent. Control is a round-crested weir about 15 feet long with considerable velocity of approach.

EXTREMES OF DISCHARGE.—Maximum stage during period March 1 to July 31, from water-stage recorder, 1.23 feet at 1 a. m. May 16 (discharge, 37 second-feet); no record of minimum.

1915–1917; 1924: Maximum discharge recorded, 71 second-feet June 18 and 20, 1916 (gage height, 6.3 feet); minimum discharge estimated at 0.1 second-foot March 2–23, 1917 (stage-discharge relation affected by ice).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspecting recorder graph. Records good.

COOPERATION.—Record furnished by State engineer of Oregon.

Discharge measurements of First Creek near Sisters, Oreg., during the period March 1 to July 31, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 20	0.81	6.8	May 20	1.07	19.6	July 11	0.56	2.6
Apr. 22	.91	10.4	June 12	.68	4.0			

Daily discharge, in second-feet, of First Creek near Sisters, Oreg., for the period March 1 to July 31, 1924

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1		6	13	7	3	16		13	32	4	2
2		6	14	7	3	17		13	26	4	2
3		7	15	6	3	18	5	13	23	4	2
4		6	16	6	3	19		13	22	4	2
5		6	15	6	3	20	7	13	21	4	2
6		7	15	5	3	21	7	13	19	4	2
7		7	15	5	3	22	6	11	17	3	2
8	5	8	15	5	3	23	6	11	16	3	2
9		8	16	5	3	24	6	10	15	3	2
10		9	19	4	3	25	6	10	14	3	2
11		11	21	4	3	26	6	10	12	3	2
12		12	26	4	3	27	6	10	11	3	2
13		13	30	4	3	28	6	11	10	3	2
14		13	29	4	2	29	5	12	9	3	2
15		13	30	4	2	30	5	13	8	3	2
						31	6	-------	8	-------	2

NOTE.—Discharge estimated Mar. 1–19.

Monthly discharge of First Creek near Sisters, Oreg., for the period March 1 to July 31, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	7	----------	5.4	332
April	13	6	10.3	613
May	32	8	17.8	1,090
June	7	3	4.2	250
July	3	2	2.4	148

SHITIKE CREEK AT WARMSPRING, OREG.

LOCATION.—In NE. ¼ sec. 26, T. 9 S., R. 12 E., at Warmspring, Jefferson County, 2 miles above mouth of creek and below all tributaries.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 11, 1911, to October 31, 1916; April 1, 1923, to September 30, 1924.

GAGE.—Vertical staff on left bank opposite store; read by L. E. See.

DISCHARGE MEASUREMENTS.—Made by wading near gage or from wagon bridges over three channels about one-fourth mile upstream.

CHANNEL AND CONTROL.—Stream bed composed of gravel and small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.70 feet at noon November 24 (discharge, 370 second-feet); minimum stage recorded, 0.20 foot August 27 to September 7 and September 13 to 18 (discharge, 32 second-feet).

1911–1916; 1923–1924: Maximum discharge recorded, 720 second-feet, February 9, 1916 (gage height on old gage, 2.90 feet); minimum discharge, that of 1924.

ICE.—None.

DIVERSIONS.—Probably none above station.

REGULATION.—Practically none. There is a small power plant just above the station.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Gage read to hundredths once daily. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurements were made:

April 14, 1924: Gage height, 0.64 foot; discharge, 95 second-feet.

June 3, 1924: Gage height, 0.59 foot; discharge, 86 second-feet.

Daily discharge, in second-feet, of Shitike Creek at Warmspring, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Feb.	Apr.	May	June	July	Aug.	Sept.
1	61	58	85	137	232	88	69	91	85	58	39	32
2	61	58	85	124	193	88	69	91	85	55	39	32
3	61	58	85	124	156	88	69	98	85	55	39	32
4	61	58	88	109	168	85	69	102	78	52	37	32
5	61	58	102	98	206	85	69	102	75	52	37	32
6	64	58	180	98	180	85	69	95	69	52	37	32
7	64	58	245	98	168	85	69	95	69	50	37	32
8	64	58	168	105	156	85	82	95	64	50	37	39
9	64	55	128	116	141	82	88	91	61	50	37	37
10	64	55	116	98	137	78	91	105	64	50	37	37
11	64	55	105	88	132	72	91	124	72	47	37	34
12	64	55	98	82	132	72	91	145	72	47	37	34
13	64	55	91	82	156	72	95	145	72	47	37	32
14	64	55	88	78	145	69	95	141	72	47		32
15	72	55	85	75	132	69	88	137	72	47		32
16	95	55	85	72	124	69	88	137	72	47		32
17	91	55	78	72	116	69	88	128	72	47		32
18	91	55	78	72	113	69	78	128	78	47	37	32
19	88	55	75	72	105	69	78	128	72	44		37
20	88	58	75	78	105	69	72	124	66	44		37
21	88	58	72	78	102	69	72	113	66	44		37
22	88	58	72	72	102	66	72	113	64	44		39
23	85	58	72	72	98	66	72	113	64	44	37	42
24	78	370	72	72	95	66	75	109	61	44	37	42
25	69	168	72	66	91	66	75	109	61	42	34	42
26	64	145	85	66	91	66	78	109	61	42	34	44
27	61	98	82	66	88	66	78	98	61	42	32	42
28	58	82	218	66	88	66	82	95	58	42	32	39
29	58	82	180	69	88	66	82	95	58	39	32	37
30	58	85	168	137	-------	66	88	95	58	39	32	47
31	58	-------	168	218	-------	69	-------	88	-------	39	32	-------

NOTE.—Discharge estimated Aug. 14–22.

Monthly discharge of Shitike Creek at Warmspring, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	95	58	70.0	4,300
November	370	55	77.7	4,620
December	245	72	110	6,760
January	218	66	92.3	5,680
February	232	88	132	7,590
March	88	66	73.5	4,520
April	95	69	79.4	4,720
May	145	88	111	6,820
June	85	58	68.9	4,100
July	58	39	46.7	2,870
August	39	32	36.2	2,230
September	47	32	36.1	2,150
The year	370	32	77.9	56,360

WHITE RIVER BELOW TYGH VALLEY, OREG.

LOCATION.—In NW. ¼ sec. 8, T. 4 S., R. 14 E., just below Pacific Power & Light Co.'s plant at White River Falls and 4½ miles below Tygh Valley, Wasco County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 20, 1917, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on left bank. Gage read by M. F. Coberth.

DISCHARGE MEASUREMENTS.—Made from cable a quarter of a mile below gage.

CHANNEL AND CONTROL.—Control of rock overlain with sand deposits; stage-discharge relation changes somewhat.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.70 feet at 10 a. m. February 5 (discharge, 1,220 second-feet); minimum stage, 0.26 foot at 1 p. m. August 7 (discharge, about 35 second-feet), due to temporary shut down of power plant.

1917–1924: Maximum stage recorded, 12.9 feet at 11 a. m. January 6, 1923 (discharge, 13,300 second-feet); minimum discharge occurred December 11–14, 1919, owing to extreme cold, estimated from records at power plant as 10 second-feet.

ICE.—Possibly some ice effect during December when recorder was not operating properly.

DIVERSIONS.—Numerous small irrigation canals take out above this station.

REGULATION.—Operation of power plant above regulates flow to some extent.

ACCURACY.—Stage-discharge relation changed during high water of February 5, unstable during low water. Rating curves used as follows: October 1 to February 5, fairly well defined; February 6 to August 14, well defined above 100 second-feet; August 15 to September 30, shifting-control method used. Operation of water-stage recorder satisfactory except for periods in October and December 4 to January 10. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good except for December, for which they are poor.

Discharge measurements of White River below Tygh Valley, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 3	2.04	366	Apr. 22	2.21	446	Aug. 8	0.88	109
Apr. 14	2.46	578	June 17	1.24	190			

Daily discharge, in second-feet, of White River below Tygh Valley, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	147	161	238	400	970	550	285	490	230	153	111	75
2	147	165	225	400	850	530	300	510	222	153	113	96
3	143	171	216	398	750	530	330	510	210	149	111	92
4	149	159	208		1,030	510	300	490	208	153	107	88
5	145	163	210		1,150	490	300	470	198	147	105	84
6	163	157	350	280	1,060	490	330	435	212	153	107	81
7	165	161	480		1,060	470	400	418	238	143	96	84
8	167	155			1,000	452	452	435	230	143	102	115
9	157	151	365		830	435	470	452	212	141	94	110
10	147	147		398	755	418	530	490	200	136	91	100
11		147	288	468	730	400	570	550	198	136	100	99
12		151		380	805	400	570	590	208	140	94	96
13	150	151		345	940	418	610	590	202	140	96	94
14		143		330	940	418	570	570	193	136	113	94
15		143	240	336	880	400	510	530	193	132	113	96
16	206	145			805	400	490	510	183	132	113	92
17	216	147			780	382	490	470	188	128	110	91
18	184	145	232	320	705	365	470	435	202	132	105	96
19	174	149			655	365	470	418	202	140	118	90
20	174	171			630	365	452	400	193	132	111	110
21	174	159	220	273	630	348	452	400	188	128	108	120
22	180	167		270	590	348	470	400	188	127	105	107
23	169	191		282	590	348	452	400	183	128	99	102
24		415		282	550	348	435	315	178	130	99	108
25		324	288	270	530	330	418	300	173	125	99	138
26	160	264		270	530	315	418	285	176	132	99	138
27		235		264	550	300	435	270	169	132	103	123
28		238	350	270	610	300	452	270	164	132	102	125
29		324		288	570	300	470	258	162	125	97	116
30	163	294		450	-------	285	490	245	162	122	99	81
31	163	-------		750	-------	285	-------	235	-------	113	96	-------

NOTE.—Mean discharge for periods of missing records as indicated by braces have been estimated from a hydrographic comparison with record for Sandy River near Marmot.

Monthly discharge of White River below Tygh Valley, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	216	143	163	10,000
November	415	143	190	11,300
December	480	----------	280	17,200
January	750	----------	336	20,700
February	1,150	530	775	44,600
March	550	285	397	24,400
April	610	285	446	26,500
May	590	235	424	26,100
June	238	162	196	11,700
July	153	113	136	8,360
August	118	91	104	6,400
September	138	75	101	6,010
The year	1,150	75	294	213,000

KLICKITAT RIVER BASIN

KLICKITAT RIVER NEAR GLENWOOD, WASH.

LOCATION.—In NE. ¼ sec. 14, T. 7 N., R. 12 E., just below Dairy Creek, 2½ miles below southern boundary of Yakima Indian Reservation, 3 miles below Big Buddy Creek, and 6 miles north of Glenwood, Klickitat County.

DRAINAGE AREA.—356 square miles.

RECORDS AVAILABLE.—December 16, 1910, to September 10, 1924, with gaps in winters of 1921–1924. October 29, 1909, to December 15, 1910, at a point a mile above, in sec. 11.

GAGE.—Stevens water-stage recorder referred to vertical staff on left bank, datum lowered 1.0 foot October 1, 1918. Gage read by A. G. Hanson.

DISCHARGE MEASUREMENTS.—Made from cable just below gage.

CHANNEL AND CONTROL.—Bed composed of heavy gravel, shifts in high water.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.28 feet 8 to 10 p. m. May 13 (discharge, 2,230 second-feet); minimum stage from recorder, 1.42 feet at 5 p. m. November 22 (discharge, 462 second-feet). No higher or lower stages were indicated by recorder pencil when clock was stopped.

1909–1924: Maximum stage recorded, 5.20 feet on original gage, November 24, 1909 (discharge, estimated by extension of rating curve, 6,250 second-feet); minimum discharge recorded, 285 second-feet at 1 p. m. November 13, 1915.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed for stages of over 1.6 feet, probably during winter. Two fairly well defined rating curves used, identical below discharge of 555 second-feet. Operation of water-stage recorder fairly satisfactory, some gaps in record due to infrequent visits of observer. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records fair.

The following discharge measurements were made:

April 20, 1924: Gage height, 2.03 feet; discharge, 869 second-feet.

June 1, 1924: Gage height, 2.30 feet; discharge, 1,060 second-feet.

Daily discharge, in second-feet, of Klickitat River near Glenwood, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	516	490	-------	1,200	1,100	815		522
2	516	490	-------	1,290	1,110	808		533
3	528	495	-------	1,320	1,100	770		550
4	528	490	-------	1,280	1,050	748		555
5	516	490	-------	1,180	990	741		550
6	512	486	-------	1,130	966	720	650	544
7	500	481	-------	1,120	926	700		573
8	506	486	-------	1,160	878	680		567
9	495	486	-------	1,300	878	657		506
10	486	476	-------	1,520	894	603		500
11	486	466	-------	1,770	862	615		-------
12	490	480	-------	2,020	1,010	603	636	-------
13	490	476	-------	2,160	974	603	597	-------
14	490	476	-------	2,160	926	615	591	-------
15	486	476	-------	2,020	886	550	567	-------
16	662	471	-------	1,960	862	561	538	-------
17	669	466	-------	1,830	838	544	544	-------
18	568	466	-------	1,770	815	550	615	-------
19	538	466	-------	1,710	792	555	567	-------
20	536	466	870		792	567	538	-------
21	533	466	886		808	591	544	-------
22	533	471	950		800	573	544	-------
23	522	730	926		785	591	555	-------
24	506	895	910		785		561	-------
5	500	669	894	1,400	785		585	-------
26	500	-------	910		755		591	-------
27	500	-------	958		734	600	573	-------
28	500	-------	1,020		734		555	-------
29	495	-------	1,080		748		516	-------
30	495	-------	1,150		762		533	-------
31	490	-------	-------		-------		511	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Klickitat River near Glenwood, Wash., for the year ending September 30, 1924

[Drainage area, 356 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	669	486	519	1.46	1.68	31,900
November 1–25	895	466	512	1.44	1.34	25,400
April 20–30	1,150	870	959	2.69	1.10	20,900
May	2,160	1,120	1,510	4.24	4.89	92,800
June	1,110	734	878	2.47	2.76	52,200
July	815	544	631	1.77	2.04	38,800
August		511	594	1.67	1.92	36,500
September 1–10	573	500	540	1.52	.57	10,700

HOOD RIVER BASIN

HOOD RIVER AT POWERDALE, NEAR HOOD RIVER, OREG.

LOCATION.—In NE. ¼ sec. 36, T. 3 N., R. 10 E., at Powerdale, about three-fourths mile south of town of Hood River, Hood River County, above discharge of tailrace of Powerdale plant of Pacific Power & Light Co., and 1½ miles above mouth of stream.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 31, 1913, to September 30, 1924.

GAGE.—Gurley eight-day water-stage recorder on right bank near power plant, about half a mile above railroad bridge; inspected by R. E. Fewel.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet above gage.

CHANNEL AND CONTROL.—Bed composed of rock and boulders; shifts slightly.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 8.40 feet at 4 p. m. December 6 (discharge, 22,200 second-feet); minimum stage recorded, −0.48 foot at 5 p. m. November 13 (discharge, 5 second-feet).

Minimum daily discharge, including power conduit, 270 second-feet August 31, momentary minimum not computed.

1913–1924: Maximum stage recorded, 10.1 feet January 6, 1923 (discharge, 34,000 second-feet); minimum discharge, including that of tailrace, 176 second-feet September 4, 1915 (gage at railroad bridge, 1.33 feet).

ICE.—Stage-discharge relation not seriously affected by ice.

DIVERSIONS.—Large diversions for irrigation above station; water for power plant is diverted around upper gage a record of this diversion has been kept (p. 105).

REGULATION.—Water stored at sawmill at Dee causes sudden fluctuations at low water.

ACCURACY.—Stage-discharge relation changed during high water on December 6. Rating curves used before and after change fairly well defined except below 30 second-feet. Water-stage recorder operated fairly satisfactorily November 24 to May 20; from May 21 to September 27 stage was below bottom of well; on September 28 recorder operated again after lowering well. Staff gage read once a day October 1 to January 4 and May 10 to July 14. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection or, for periods when recorder did not operate, by applying daily gage height to rating table. Records for periods when recorder was operating, good; for other periods, fair.

Discharge measurements of Hood River at Powerdale, near Hood River, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 19	0.03	46.3	Jan. 20	1.59	488	Apr. 13	2.08	891
Jan. 4	1.98	710	Feb. 21	2.34	1,150	June 11	.15	37.4

Daily discharge, in second-feet, of Hood River at Powerdale, near Hood River, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	15	1,140	1,210	1,110	844	351	386	299	26		
2	41	11	1,180	1,020	460	871	440	368	76	38		
3	41	12	392	925	335	799	465	347	55	76		
4	50	150	396	799	750	734	450	425	55	364	20	
5	49	63	465	808	1,160	718	450	378	55	382		
6	229	23	10,200	678	766	670	415	287	65	382		
7	332	61	4,280	609	710	602	435	287	76	150	80	
8	34	106	2,160	646	530	609	415	307	118	26		
9	23	10	1,900	654	415	638	405	327	38	15		
10	23	9	1,360	678		609	415	355	38	15		
11	23	169	1,060	710		560	425	382	38	65		
12	34	119	1,110	662	1,200	554	799	440	38	15	20	
13	15	50	880	646		567	782	335	55	161		
14	400	98	790	490		574	623	295	38			
15	34	79	880	512		554	460	295	142			35
16	955	23	826	460	1,460	485	445	351	38			
17	634	61	758	480	1,570	425	465	351	38		100	
18	465	119	774	506	1,410	368	554	490	97			
19	372	60	750	450	1,310	355	536	378	55			
20	415	34	630	530	1,210	368	530	351	55			
21	415	19	602	400	1,260	355	490	258	20		25	
22	372	34	512	391	1,140	368	485	258	55	15		
23	372	5,350	500	500	1,020	391	475	258	26			
24	34	3,200	694	450	970	347	490	224	26		150	
25	34	1,680	1,160	425	1,020	323	495	335	26			
26	34	1,090	1,060	430	1,060	315	475	97	15			
27	15	790	835	430	1,020	295	440	76	8		30	
28	51	955	4,230	600	1,060	355	530	55	15			85
29	15	1,530	4,020	1,100	880	386	415	76	38			41
30	15	1,040	2,300	1,200	-------	405	364	76	26			57
31	15	-------	1,620	1,360	-------	355	-------	155	-------	-------		-------

NOTE.—Daily discharge was estimated from gage height reported by observer and daily load curve or plant Oct. 28, Nov. 4, 5, 13, 19, July 7, 11, and 13. Daily discharge Jan. 27–30 and mean discharge Feb. 10–15, when recorder was not operating, estimated by comparison with records for White and Sandy Rivers. Discharge July 14 to September 27, when observer reported that water level was below gage, based on estimate by engineer of Pacific Power & Light Co. of discharge in river as varying from 15 to 50 second-feet, and on number of hours generator at plant was shut down on Aug. 7, 17, and 24.

Monthly discharge of Hood River at Powerdale, near Hood River, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	955	15	180	11,100
November	5,350	9	565	33,600
December	10,200	392	1,600	98,400
January	1,360	391	670	41,200
February	-------	335	1,030	59,200
March	871	295	510	31,400
April	799	351	484	28,800
May	440	55	290	17,800
June	299	8	57.5	3,420
July	382	-------	64.0	3,940
August	-------	-------	31.9	1,960
September	-------	-------	37.6	2,240
The year	10,200	8	458	333,000

Combined daily discharge, in second-feet, of Hood River and Pacific Power & Light Co.'s conduit at Powerdale, near Hood River, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	402	435	1,440	1,500	1,360	1,110	658	760	639	413	320	275
2	441	391	1,450	1,370	727	1,130	734	742	483	485	327	295
3	468	446	726	1,240	602	1,070	752	687	495	476	327	309
4	477	470	730	1,130	1,020	1,010	737	672	495	458	314	342
5	476	370	785	1,110	1,450	985	744	665	462	479	300	349
6	629	417	10,500	932	1,050	937	562	687	505	516	300	349
7	524	361	4,550	996	984	876	669	667	536	417	307	349
8	448	453	2,430	1,030	790	889	722	667	505	386	307	362
9	423	370	2,130	1,050	695	885	712	701	445	362	327	386
10	443	303	1,670	1,040	647	903	709	709	458	369	300	369
11	443	416	1,370	1,080	694	854	725	582	452	325	354	369
12	441	373	1,380	929	1,294	854	1,050	614	478	349	347	395
13	415	350	1,170	866	2,280	847	922	629	495	408	354	402
14	572	385	1,110	837	2,080	854	863	562	485	342	320	429
15	388	393	1,160	859	1,874	848	794	549	529	355	294	435
16	1,300	337	1,070	787	1,730	715	785	578	438	315	294	435
17	881	361	1,080	827	1,810	685	805	691	472	295	306	415
18	825	393	1,090	786	1,680	662	868	660	564	315	345	382
19	766	391	1,060	737	1,590	655	850	632	509	349	385	389
20	782	341	957	764	1,480	688	767	698	489	322	305	375
21	755	393	929	754	1,530	635	750	605	434	322	312	369
22	759	394	826	751	1,410	655	792	618	442	355	312	369
23	812	5,620	814	847	1,290	658	782	648	413	342	332	389
24	481	3,460	974	810	1,120	641	824	578	420	349	320	425
25	448	1,960	1,430	745	1,280	630	802	622	413	375	344	462
26	421	1,400	1,370	764	1,330	609	782	484	409	389	337	409
27	389	1,110	1,200	617	1,290	602	637	510	395	355	364	395
28	318	1,260	4,500	934	1,370	642	797	429	395	342	337	412
29	342	1,780	4,270	1,400	1,190	673	689	462	412	329	297	388
30	389	1,350	2,520	1,450	-------	622	684	476	413	329	290	437
31	409	-------	1,790	1,610	-------	642	-------	522	-------	322	270	-------

Combined monthly discharge of Hood River and Pacific Power & Light Co.'s conduit at Powerdale, near Hood River, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,300	318	551	33,900
November	5,620	303	883	52,500
December	10,500	726	1,890	116,000
January	1,610	617	986	60,600
February	2,280	602	1,300	74,800
March	1,130	602	789	48,500
April	1,050	562	766	45,600
May	760	429	616	37,900
June	639	395	469	27,900
July	516	315	372	22,900
August	385	270	321	19,700
September	462	275	382	22,700
The year	10,500	270	775	563,000

EAST FORK IRRIGATION DISTRICT CANAL NEAR MOUNT HOOD, OREG.

LOCATION.—In SE. ½ sec. 33, T. 1 N., R. 10 E., 1 mile below point of diversion, 1½ miles south of Mount Hood post office, Hood River County, and 2 miles east of Parkdale station on the Mount Hood Railroad.

RECORDS AVAILABLE.—June 17, 1913, to September 30, 1924, irrigation seasons only.

GAGE.—Stevens water-stage recorder on left side of canal just below road crossing; inspected by C. H. Shaw.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Smooth earth section; head of flume probably acts as control; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.36 feet 11 p.m. July 21 (discharge, 108 second-feet); canal dry at various times.

1913–1924: Maximum discharge recorded, 153 second-feet July 9, 1919 (gage height, 3.42 feet).

ICE.—No water carried in cold weather.

ACCURACY.—Stage-discharge relation changed during winter. Rating curve fairly well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection or, for days of considerable variation in stage, by averaging results obtained by applying mean gage heights for shorter intervals. Records good.

No meter measurements during year ending September 30, 1924. Rating curve based on measurement made in October, 1924.

Daily discharge, in second-feet, of East Fork Irrigation District Canal near Mount Hood, Oreg., for the year ending September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	33	100	100	100	73	16	12	82	96	96	92	29
2	------	42	96	96	92	74	17	12	82	96	96	89	30
3	------	47	100	100	96	74	18	12	60	92	96	96	33
4	------	46	100	103	92	77	19	12	77	92	103	92	34
5	12	51	96	103	92	76	20	12	92	92	100	86	35
6	12	50	100	100	92	70	21	12	100	92	103	78	39
7	13	50	96	103	92	70	22	12	96	92	103	73	35
8	13	54	92	103	92	63	23	12	92	92	100	86	34
9	13	54	92	100	92	54	24	12	92	92	103	86	34
10	13	61	92	103	96	50	25	12	66	92	103	86	35
11	13	62	92	100	96	41	26	12	88	92	103	82	33
12	13	66	92	100	100	36	27	12	89	92	100	82	37
13	13	48	94	100	96	30	28	19	89	92	100	82	37
14	12	5	94	103	96	28	29	26	96	92	96	75	37
15	12	68	96	96	92	29	30	30	100	96	96	72	37
							31	------	100	------	100	73	------

Monthly discharge of East Fork Irrigation District Canal near Mount Hood, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 5-30	30	12	13.8	712
May	100	5	68.7	4,220
June	100	92	94.1	5,600
July	103	96	100	6,150
August	100	72	88.6	5,450
September	77	29	45.5	2,710
The period				24,800

PACIFIC POWER & LIGHT CO.'S CONDUIT NEAR HOOD RIVER, OREG.

LOCATION.—In NE. ¼ sec. 36, T. 3 N., R. 10 E., at new power house on Hood River, half a mile southeast of Hood River, Hood River County.

RECORDS AVAILABLE.—May 12 to September 30, 1924; also on tailrace of old plant October 1, 1913, to September 30, 1914, and January 1, 1916, to July 31, 1922, when operation of plant was discontinued.

GAGE.—Indicating wattmeter read every hour and integrating wattmeter read once a day at midnight by operator on duty at power house. Mean daily load in kilowatts determined by dividing the total output for day in kilowatt-hours by the number of hours in day plant was operating.

DISCHARGE MEASUREMENTS.—Made from collar of flume between diversion dam and intake to pipe line, 2½ miles above power house.

EXTREMES OF DISCHARGE.—Maximum load during year, 6,600 kilowatts on several days in June (discharge, 480 second-feet); plant shut down part of time October 7, 14, February 24, July 6, August 17, 24, and September 9. 1913–14; 1916–1924: Maximum discharge, that of 1924.

ACCURACY.—Relation of discharge to electrical load in kilowatts quite constant, as operating head varies only about 5 feet from an average of about 200 feet. Kilowatt-discharge relation curve fairly well defined. Daily discharge ascertained by applying to kilowatt-discharge rating table mean daily load in kilowatts determined from midnight readings of integrating wattmeter. Records good.

Discharge measurements of Pacific Power & Light Co.'s conduit near Hood River, Oreg., during the year ending September 30, 1924

Date	Power plant load	Discharge	Date	Power plant load	Discharge	Date	Power plant load	Discharge
	Kw.	*Sec.-ft.*		*Kw.*	*Sec.-ft.*		*Kw.*	*Sec.-ft.*
Jan. 21	5,800	429	May 4	3,000	242	May 4	6,200	452
May 4	1,600	147	Do	4,500	338			

Daily discharge, in second-feet, of Pacific Power & Light Co.'s conduit near Hood River, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	360	420	300	287	254	267	307	374	340	387	300	240
2	400	380	267	354	267	260	294	374	407	447	307	260
3	427	434	334	314	267	274	287	340	440	400	307	274
4	427	320	334	327	274	274	287	247	440	94	294	307
5	427	307	320	300	287	267	294	287	407	97	280	314
6	400	394	280	254	280	267	147	400	440	134	280	314
7	192	300	274	387	274	274	234	380	460	267	227	314
8	414	347	274	380	260	280	307	360	387	360	287	327
9	400	360	227	394	280	247	307	374	407	347	307	351
10	420	294	314	367	247	294	294	354	420	354	280	334
11	420	247	314	374	280	294	300	200	414	260	334	334
12	407	254	267	267	294	300	247	174	440	334	327	360
13	400	300	287	220	280	280	140	294	440	247	334	367
14	172	287	320	347	280	280	240	267	447	327	300	394
15	354	314	280	347	274	294	334	254	387	340	274	400
16	340	314	247	327	267	230	340	227	400	300	274	400
17	247	300	327	347	240	260	340	340	434	280	206	380
18	360	274	320	280	274	294	314	170	467	300	320	347
19	394	327	307	287	280	300	314	254	454	334	360	354
20	367	307	327	234	274	320	237	347	434	307	280	340
21	340	374	327	354	274	280	260	347	414	307	287	334
22	387	360	314	360	267	287	307	360	387	340	287	334
23	440	267	314	347	267	267	307	390	387	327	307	354
24	447	260	280	360	148	294	334	354	394	334	170	390
25	414	280	274	320	260	307	307	287	387	360	314	427
26	387	314	314	334	267	294	307	387	394	374	307	374
27	374	320	360	187	274	307	197	434	387	340	334	360
28	267	300	267	334	307	287	267	374	380	327	307	327
29	327	247	254	300	307	287	274	387	374	314	267	347
30	374	314	217	254	-------	217	320	400	387	314	260	380
31	394	-------	174	254	-------	287	-------	367	-------	307	240	-------

Monthly discharge of Pacific Power & Light Co.'s conduit near Hood River, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	447	172	370	22,800
November	420	247	317	18,900
December	360	174	291	17,900
January	394	187	316	19,400
February	307	148	269	15,500
March	320	217	280	17,200
April	340	147	281	16,700
May	400	170	326	20,000
June	467	340	412	24,500
July	447	94	308	18,900
August	360	170	289	17,800
September	427	240	345	20,500
The year	467	94	317	230,000

WHITE SALMON RIVER BASIN

WHITE SALMON RIVER NEAR UNDERWOOD, WASH.

LOCATION.—In NW. ¼ sec. 14, T. 3 N., R. 10 E., 200 yards below Northwestern Electric Co.'s Condit plant, 2 miles north of Underwood, Skamania County.

DRAINAGE AREA.—384 square miles, measured on map of Columbia National Forest.

RECORDS AVAILABLE.—March 1, 1915, to December 14, 1917, and June 1, 1918, to September 30, 1924; also October 18, 1912, to February 26, 1913, at dam about a mile above.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by D. J. Shore, foreman of power plant.

DISCHARGE MEASUREMENTS.—Made from cable at gage; measuring conditions good.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 5.10 feet at midnight February 1 (discharge, 3,060 second-feet); minimum discharge, practically zero, when plant was occasionally shut down; float will not operate recorder below a stage of about 0.2 foot.

1915–1924: Maximum stage from high-water marks, 9.5 feet, old gage datum December 29, 1917 (discharge, about 9,700 second-feet); minimum stage occurs when power plant is occasionally shut down suddenly, recorder does not operate to such low stages, discharge negligible.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—About 3,500 acres irrigated above this station.

REGULATION.—At low and medium stages practically all the water is used through the wheels of the power plant. The pond above the dam covers about 80 acres; daily discharges have been corrected for storage.

ACCURACY.—Stage-discharge relation apparently permanent during year. Daily discharge obtained by use of discharge integrator October 1 to November 26, and January 21 to June 22, when operation of water-stage recorder was fairly satisfactory, except for days when discharge exceeded 1,900 second-feet when mean daily gage height, obtained by inspecting recorder graph was applied to rating table. For September 28-30 discharge obtained from recorder graph by averaging results for fractional parts of a day. For all other periods, discharge obtained from the electrical output at power plant using a curve that shows the relation between the kilowatt output and the discharge and is well defined above 500 second-feet; overflow at dam on nine days in December estimated from gage heights above dam and an approximate rating. Records good.

Discharge measurements of White Salmon River near Underwood, Wash., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 20	0.48	162	June 11	2.09	660
Do	.78	206	Sept. 27	1.59	476

Daily discharge, in second-feet, of White Salmon River near Underwood, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	532	476	611	724	2,850	1,280	908	848	669	543	444	391
2	554	473	564	744	2,490	1,240	902	864	676	563	438	411
3	574	474	560	730	2,010	1,260	902	858	660	586	438	404
4	536	472	547	710	2,110	1,240	896	869	640	511	457	406
5	560	463	565	666	2,510	1,200	869	832	620	550	448	406
6	562	472	1,370	656	2,510	1,170	886	814	615	507	428	410
7	530	471	1,340	655	2,190	1,170	915	796	648	470	406	492
8	534	472	1,220	670	1,890	1,140	966	798	638	504	445	432
9	531	462	931	668	1,680	1,100	962	807	630	501	481	420
10	502	566	776	716	1,510	1,130	993	839	615	504	462	408
11	552	447	749	744	1,530	1,100	986	911	612	515	446	435
12	500	494	706	692	1,940	1,080	1,040	980	698	500	452	431
13	550	492	687	643	2,500	1,100	1,030	1,030	737	506	449	442
14	488	512	679	646	2,200	1,080	1,020	1,020	714	493	450	421
15	504	485	674	622	1,890	1,100	965	993	694	474	486	420
16	614	482	667	643	1,700	1,010	940	1,050	661	472	454	411
17	732	494	787	660	1,580	1,060	915	946	674	460	454	396
18	656	469	658	662	1,470	1,040	930	914	671	485	487	463
19	570	479	673	638	1,370	1,020	952	898	675	470	504	403
20	546	456	628	602	1,280	996	916	870	650	470	495	389
21	526	530	613	642	1,270	994	911	830	648	478	454	454
22	516	478	605	641	1,320	976	906	800	579	472	490	396
23	513	607	579	616	1,260	957	910	794	577	465	406	387
24	513	1,020	625	617	1,230	968	882	758	575	455	452	432
25	478	1,010	672	600	1,260	942	857	758	569	470	443	438
26	483	848	776	596	1,230	942	854	744	567	470	445	437
27	496	700	653	594	1,230	939	832	702	536	481	424	440
28	478	660	965	613	1,340	938	839	694	534	451	415	459
29	504	674	1,220	742	1,330	914	832	679	532	445	418	433
30	471	670	1,050	1,160	-------	914	839	668	524	436	400	475
31	466	-------	958	2,420	-------	917	-------	666	-------	463	403	-------

NOTE.—Daily discharge has been corrected for storage at power plant.

Monthly discharge of White Salmon River near Underwood, Wash., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	732	466	535	32,900
November	1,020	447	560	33,300
December	1,370	547	778	47,800
January	2,420	594	733	45,100
February	2,850	1,230	1,750	101,000
March	1,280	914	1,060	65,200
April	1,040	832	918	54,600
May	1,050	666	840	51,600
June	737	524	628	37,400
July	586	436	489	30,100
August	504	400	448	27,500
September	492	387	425	25,300
The year	2,850	387	760	552,000

SANDY RIVER BASIN

SANDY RIVER NEAR MARMOT, OREG.

LOCATION.—In SE. ¼ sec. 24, T. 2 S., R. 5 E., on Vanderhoof ranch 2 miles by river above Sandy River dam of Portland Railway, Light & Power Co., 5 miles below mouth of Salmon River, and 1½ miles above Marmot post office, Clackamas County.

DRAINAGE AREA.—262 square miles (revised).

RECORDS AVAILABLE.—August 15, 1911, to December 21, 1915, and July, 1919, to September 30, 1924. Combined discharge of Sandy River and canal gives same results for the gap in record.

GAGE.—Stevens eight-day water-stage recorder on right bank, gage read by employees of Portland Electric Power Co.

DISCHARGE MEASUREMENTS.—Made from a cable about a mile below gage.

CHANNEL AND CONTROL.—Bed composed of rocks and gravel; may shift slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 736.8 feet on gage at dam at 4 p. m. December 6 (discharge, 12,400 second-feet), canal dry; minimum discharge recorded, 260 second-feet, for a stage of 3.05 feet on Sandy River Canal, including 4 second-feet estimated leakage through dam and 15 second-feet estimated waste through fish ladder (recorder on river not operating).

1911–1924: Maximum stage recorded, 17.5 feet about noon of January 6, 1923 (discharge from extension of rating curve, 29,200 second-feet); minimum discharge recorded, that of 1924.

ICE.—Stage-discharge relation apparently unaffected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water of November and December, the change affecting only discharges below about 1,400 second-feet. High-water curve modified on basis of high-water measurements for 1924 and 1925. Well-defined rating curves used up to September 4; daily discharge for September 5–30 computed by adding 4 second-feet, estimated leakage through dam, to recorded discharge of Sandy River Canal at intake. Records good.

Discharge measurements of Sandy River near Marmot, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 15	2.49	493	Feb. 5	7.28	4,950	July 29	2.30	360
Jan. 29	4.29	1,710	Apr 12	4.33	1,800	Aug. 31	2.08	285

Daily discharge, in second-feet, of Sandy River near Marmot, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	326	368	1,650	1,830	4,890	1,560	1,080	1,280	552	520	368	300
2	336	508	1,360	1,700	3,350	1,480	1,560	1,320	576	530	368	308
3	347	446	1,200	1,480	2,800	1,440	1,960	1,200	546	505	376	318
4	361	406	1,160	1,240	3,980	1,360	1,520	1,200	540	490	360	336
5	340	395	1,240	1,160	5,280	1,240	1,400	1,160	505	480	336	336
6	414	387	7,410	1,080	3,720	1,240	1,650	1,040	666	420	336	328
7	494	379	5,080	986	3,240	1,160	1,920	1,000	867	412	350	328
8	499	372	3,020	986	2,580	1,120	1,880	1,040	708	412	350	412
9	406	361	2,190	951	2,190	1,080	1,740	1,160	648	420	368	352
10	376	350	1,830	1,920	2,910	1,040	1,740	1,200	582	412	388	297
11	344	344	1,780	2,240	1,830	1,040	1,960	1,280	546	400	380	297
12	328	354	1,600	1,700	2,190	979	1,830	1,320	618	396	368	297
13	320	354	1,520	1,440	2,800	1,040	1,780	1,240	570	396	350	297
14	316	361	1,650	1,280	2,430	1,120	1,560	1,080	540	408	353	297
15	391	347	1,600	1,480	2,190	1,080	1,400	1,040	515	392	353	297
16	874	340	1,520	1,440	1,920	1,040	1,480	993	505	372	336	297
17	1,060	336	1,520	1,400	1,780	944	1,600	902	540	372	308	282
18	670	323	1,600	1,240	1,650	916	2,060	846	979	380	372	274
19	530	376	1,520	1,080	1,520	909	2,060	825	762	396	424	312
20	481	459	1,320	1,000	1,480	923	1,740	811	642	392	368	297
21	477	391	1,200	958	1,520	867	1,600	790	576	372	339	277
22	676	395	1,120	923	1,440	846	1,560	769	535	392	336	267
23	664	2,060	1,120	1,200	1,480	839	1,400	727	510	380	336	302
24	540	3,720	1,240	1,200	1,400	811	1,280	696	500	392	336	336
25	490	2,240	1,920	1,120	1,400	797	1,200	648	500	412	339	600
26	455	1,600	1,600	1,120	1,480	783	1,200	600	495	436	350	395
27	426	1,200	1,400	1,160	1,520	860	1,200	588	475	416	350	336
28	406	1,650	6,040	1,240	1,960	1,160	1,240	564	470	372	339	320
29	395	1,200	5,960	1,920	1,700	1,160	1,280	540	475	372	311	290
30	387	2,240	3,240	3,850	-------	1,000	1,320	540	500	364	304	361
31	379	-------	2,240	5,150	-------	944	-------	540	-------	356	300	-------

Monthly discharge of Sandy River near Marmot, Oreg., for the year ending September 30, 1924

[Drainage area, 262 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,060	316	468	1.79	2.06	28,800
November	3,720	323	809	3.09	3.45	48,100
December	7,410	1,120	2,220	8.47	9.76	136,000
January	5,150	923	1,530	5.84	6.73	94,100
February	5,280	1,400	2,370	9.05	9.76	136,000
March	1,560	783	1,060	4.05	4.67	65,200
April	2,060	1,080	1,570	5.99	6.68	93,400
May	1,320	540	933	3.56	4.10	57,400
June	979	470	581	2.22	2.48	34,600
July	530	356	412	1.57	1.81	25,300
August	424	300	350	1.34	1.54	21,500
September	600	267	325	1.24	1.38	19,300
The year	7,410	267	1,050	4.01	54.42	760,000

BULL RUN RIVER NEAR BULL RUN, OREG.

LOCATION.—In SE. ¼ sec. 25, T. 1 S., R. 5 E., 1½ miles above intake of Portland water-supply pipe line and 5 miles east of Bull Run, Clackamas County.

DRAINAGE AREA.—102 square miles.

RECORDS AVAILABLE.—August 20, 1907, to September 30, 1924; also readings on a gage of city water department, January 5, 1895, to November 13, 1906.

GAGE.—Vertical staff gage in remains of old well at recorder site used October 1 to February 2, except on days or periods of considerable fluctuation when gage at dam was used. Stevens water-stage recorder used February 2 to September 30; gage datum lowered 0.50 foot July 22. Observed by employees of Portland Water Bureau.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading near gage.

CHANNEL AND CONTROL.—Bed composed of rocks and gravel; shifting in extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from record of three readings a day on gage at dam, 8.8 feet at 6 p. m. December 28 (discharge, 15,300 second-feet); minimum stage from water-stage recorder, 0.12 foot August 12 (discharge, 70 second-feet).

1895–1924: Maximum discharge recorded, 20,300 second-feet November 20, 1921, at spillway of diversion dam; minimum discharge recorded, 68 second-feet October 1, 1918.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None above station. The two water-supply pipes divert practically all the low-water flow 1½ miles below the station.

REGULATIONS.—The flow is regulated to a small extent during the summer by storage in Bull Run Lake.

ACCURACY.—Stage-discharge relation for recording gage changed during high water on December 28; rating curves used well defined below and fairly well defined above 4,000 second-feet. Stage-discharge relation for gage at dam permanent to March 31 after which it was not used in computing record; rating curve well defined. Staff gage in well read to hundredths three or four times a week, October 1 to February 2; staff gage at dam read three times a day. Water-stage recorder operated satisfactorily except for short periods February 2 to September 30. Daily discharge ascertained by applying to rating table the daily gage reading of gage in well, the mean of three daily readings of gage at dam, or the mean daily gage height obtained from recorder graph by inspection. Records good.

Discharge measurements of Bull Run River near Bull Run, Oreg., during the year ending September 30, 1924

Date	Gage height in feet		Discharge in second-feet
	At dam	At water-stage recorder	
Feb. 2	2.68	3.12	2,090
Apr. 25	1.16	.93	468
July 22	----------	.25	91

Daily discharge, in second-feet, of Bull Run River near Bull Run, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	165	1,020	885	3,500	885	540	424	140	138	77	102
2	114	440	795	710	1,980	772	733	419	138	140	77	94
3	123	220	670	630	1,780	739	955	390	132	140	77	93
4	118	200	590	450	3,700	649	746	442	130	140	77	91
5	114	174	670	420	3,010	566	660	478	125	145	76	89
6	150	162	6,000	420	2,120	550	708	442	218	132	76	93
7	175	150	2,830	390	1,940	500	885	406	410	120	76	100
8	192	148	1,640	420	1,420	464	850	398	274	113	76	138
9	160	145	1,020	390	1,100	455	772	402	224	106	75	132
10	128	145	885	1,530	840	442	740	378	206	102	74	105
11	118	145	885	1,420	885	424	885	378	203	99	71	93
12	109	145	750	975	1,750	398	785	370	251	99	71	79
13	117	154	710	795	1,860	410	714	342	206	99	71	75
14	125	162	1,220	670	1,320	446	621	306	191	93	71	72
15	384	148	1,120	930	1,220	473	535	281	176	90	71	71
16	520	134	930	885	990	450	690	260	168	93	72	74
17	860	130	885	795	1,060	419	920	254	176	96	75	76
18	420	126	1,020	885	885	394	1,250	239	785	93	138	89
19	340	123	975	590	752	386	1,260	224	460	91	192	94
20	310	200	750	520	696	382	920	212	358	87	113	84
21	290	162	630	450	818	354	785	194	302	87	98	77
22	272	180	555	450	785	338	708	188	267	89	87	84
23	256	1,640	520	840	885	334	621	176	245	87	82	185
24	240	2,960	630	750	759	323	540	165	224	84	79	371
25	216	1,640	1,530	670	785	320	482	165	212	84	77	239
26	192	1,120	975	630	975	316	455	162	194	82	76	148
27	180	795	795	630	1,020	420	446	158	182	80	76	116
28	168	1,220	8,200	710	1,270	696	442	158	168	80	84	105
29	156	2,460	3,600	1,270	1,020	649	446	150	158	80	100	102
30	150	1,530	1,750	2,830	-------	550	464	148	150	79	111	200
31	145	-------	1,170	4,300	-------	515	-------	145	-------	77	109	-------

NOTE.—Daily discharge interpolated Oct. 2, 4, 6–7, 9, 11, 13, 20–21, 23, 25, 27–28, 30, Nov. 1, 6, 8, 10–11, 13, 15, 17–18, 20, July 2–4, 13, 29. Daily discharge July 9–21, when no water was going over crest of dam, is amount measured by Portland Water Bureau as passing through the two water-supply pipes.

Monthly discharge of Bull Run River near Bull Run, Oreg., for the year ending September 30, 1924

[Drainage area, 102 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	860	109	224	2.20	2.54	13,800
November	2,960	123	571	5.60	6.25	34,000
December	8,200	520	1,470	14.4	16.60	90,400
January	4,300	390	911	8.93	10.30	56,000
February	3,700	696	1,420	13.9	14.99	81,700
March	885	316	484	4.75	5.48	29,800
April	1,260	442	719	7.05	7.87	42,800
May	478	145	286	2.80	3.23	17,600
June	785	125	236	2.31	2.58	14,000
July	145	77	101	.990	1.14	6,210
August	192	71	86.6	.849	.98	5,320
September	371	71	116	1.14	1.27	6,900
The year	8,200	71	549	5.38	73.22	399,000

LITTLE SANDY RIVER NEAR BULL RUN, OREG.

LOCATION.—In NE. ¼ sec. 10, T. 2 S., R. 5 E., three-eighths mile above Portland Railway Light & Power Co.'s dam and tunnel from Sandy River and between 3 and 4 miles south of Bull Run station, Clackamas County.

DRAINAGE AREA.—23 square miles.

RECORDS AVAILABLE.—May 21, 1911, to April 29, 1913, fragmentary; July 1, 1919, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on left bank with inside and outside staff gages.

DISCHARGE MEASUREMENTS.—Made from suspension bridge or by wading at gage.

CHANNEL AND CONTROL.—Stream bed composed of boulders and gravel; fairly permanent. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 5.80 feet at noon December 28 (discharge, 1,410 second-feet); minimum stage from water-stage recorder, 1.77 feet September 17 (discharge, 10 second-feet).

1911–1913; 1919–1924: Maximum stage from recorder, 8.90 feet November 20, 1921 (discharge, 3,950 second-feet); minimum discharge recorded that of September 11, 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection, or for days of considerable variation in stage, by averaging results obtained by applying mean gage heights for subdivided day. Records excellent.

Discharge measurements of Little Sandy River near Bull Run, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 15	2.79	88	Apr. 12	3.30	186
Feb. 2	3.94	399	Aug. 7	1.83	12.3

Daily discharge, in second-feet, of Little Sandy River near Marmot, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	21	170	152	590	163	110	108	22	21	12	11
2	13	64	122	132	360	136	152	105	21	20	12	10
3	14	41	100	112	318	146	190	93	20	20	12	11
4	20	35	93	90	615	119	146	107	20	19	12	11
5	19	27	112	82	750	105	138	98	19	18	12	10
6	35	24	729	82	409	107	152	88	51	18	12	10
7	56	22	483	79	370	93	185	82	159	18	12	10
8	38	21	252	79	252	86	172	83	99	17	12	22
9	28	20	190	79	203	86	159	86	82	17	12	19
10	25	20	146	260	167	82	163	85	58	16	12	13
11	18	20	154	241	170	79	233	84	46	16	12	12
12	16	22	142	174	311	76	192	79	64	16	11	12
13	15	21	152	144	297	86	178	70	47	16	11	11
14	15	28	213	115	230	105	138	59	40	16	12	11
15	60	23	174	249	208	94	113	53	33	16	12	10
16	90	21	148	218	170	90	150	49	30	15	12	10
17	126	20	138	181	159	84	190	44	31	15	12	10
18	61	19	152	142	138	78	281	42	159	15	22	13
19	43	28	132	119	140	78	233	40	80	15	35	20
20	35	44	108	105	119	79	190	37	55	16	23	15
21	32	33	92	94	146	73	167	36	46	15	16	12
22	51	36	84	90	134	72	157	34	44	14	14	12
23	44	362	93	163	152	73	132	32	39	14	13	26
24	34	440	112	138	130	66	114	30	35	13	12	36
25	29	247	223	122	146	65	99	30	33	13	12	88
26	26	172	159	120	187	65	99	28	30	13	12	38
27	24	115	130	126	197	96	108	27	28	13	11	26
28	25	310	690	136	233	138	110	27	26	13	11	20
29	23	540	378	244	185	134	119	26	24	13	11	18
30	22	269	290	201	-------	115	122	24	22	12	11	37
31	22	-------	197	720	-------	105	-------	23	-------	12	11	-------

Monthly discharge of Little Sandy River near Bull Run, Oreg., for the year ending September 30, 1924

[Drainage area, 23.0 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	126	13	34.5	1.50	1.73	2,120
November	540	19	102	4.43	4.94	6,070
December	729	84	205	8.91	10.27	12,600
January	720	79	161	7.00	8.07	9,900
February	750	119	258	11.2	12.08	14,800
March	163	65	95.9	4.17	4.81	5,900
April	281	99	156	6.78	7.56	9,280
May	108	23	58.4	2.54	2.93	3,590
June	159	19	48.8	2.12	2.36	2,900
July	21	12	15.6	.678	.78	959
August	35	11	13.4	.583	.67	824
September	88	10	18.8	.817	.91	1,120
The year	750	10	96.6	4.20	57.11	70,100

WILLAMETTE RIVER BASIN

MIDDLE FORK OF WILLAMETTE RIVER AT EULA, OREG.

LOCATION.—In sec. 18, T. 20 S., R. 2 E., a quarter of a mile southwest of railroad station and post office of Eula, Lane County, and 8 miles below mouth of North Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 1, 1923, to September 30, 1924.

GAGE.—Inclined staff in sections on right bank; gage read by Eula Blakely.

DISCHARGE MEASUREMENTS.—Made from cable about 1 mile above gage or by wading near gage or cable.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders; shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.6 feet at 7.30 a. m. December 7 (discharge, 11,400 second-feet); minimum stage recorded, 2.15 feet September 11 and 18 to 20 (discharge, 495 second-feet). 1923–1924: Extremes of discharge, those of 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Some diurnal fluctuation during low water of 1924 due to work on a logging dam about 10 miles upstream.

ACCURACY.—Stage-discharge relation apparently permanent during year. Rating curve fairly well defined below 5,000 second-feet; although measurement of September 27 is not consistent with other measurements. Gage read once a day to tenths prior to June 14, 1924, to quarter-tenths thereafter. Daily discharge ascertained by applying daily gage reading to rating table. Records good except for July, August, and September, 1924, for which they are fair.

The following discharge measurements were made:

July 18, 1924: Gage height, 2.26 feet; discharge, 572 second-feet.

September 27, 1924: Gage height, 2.50 feet; discharge, 1,080 second-feet.

Daily discharge, in second-feet, of Middle Fork of Willamette River at Eula, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Aug.	Sept.
1	770	1,030	3,290	5,030	8,010	2,690	2,540	2,390	1,120	690	570
2	770	1,030	2,690	3,610	9,110	2,690	3,290	2,390	1,120	690	570
3	770	1,120	2,260	3,290	6,990	2,690	3,140	2,540	1,120	690	530
4	940	1,120	2,000	3,140	6,590	2,690	3,610	2,390	1,120	650	610
5	1,030	1,030	2,130	2,990	6,590	2,540	2,840	2,390	1,030	610	610
6	1,420	1,030	2,840	2,990	6,590	2,390	2,990	2,390	1,030	610	570
7	3,140	940	11,400	2,990	7,590	2,390	3,950	2,260	1,030	610	570
8	1,420	940	6,590	2,990	7,390	2,260	4,650	2,260	1,030	570	570
9	1,210	940	4,650	2,990	6,190	2,130	3,950	2,390	1,030	530	530
10	1,120	940	3,780	2,990	5,600	2,130	3,610	2,540	1,030	610	530
11	1,030	940	3,290	3,440	4,460	2,000	3,610	2,390	1,030	610	495
12	940	940	2,840	3,440	3,780	2,000	3,780	2,840	1,030	610	530
13	850	1,030	3,950	3,290	3,610	1,870	3,290	2,990	1,030	650	530
14	850	1,210	3,950	3,290	3,440	1,870	2,990	2,540	1,030	610	530
15	1,310	1,030	3,780	3,140	3,290	1,750	2,840	2,390	1,080	610	530
16	1,310	1,030	3,140	2,990	2,990	1,530	2,690	2,390	1,030	610	570
17	2,690	940	3,290	2,990	2,840	1,530	2,390	2,260	1,310	610	530
18	2,390	940	3,610	2,690	2,690	1,640	2,260	2,260	2,000	610	495
19	1,870	940	3,140	2,690	2,540	1,750	2,540	2,260	1,530	940	495
20	1,640	940	2,690	2,390	2,540	2,000	2,540	2,260	1,310	850	495
21	1,310	940	2,540	2,260	2,540	2,000	2,540	1,870	1,120	1,080	530
22	2,000	940	2,390	2,000	2,390	1,870	2,540	1,750	1,120	650	530
23	1,640	1,030	2,260	2,260	2,390	1,870	2,260	1,530	940	610	810
24	1,530	2,690	2,390	2,390	2,390	1,750	2,000	1,530	810	690	1,210
25	1,420	2,540	2,540	2,390	2,540	1,530	1,870	1,530	895	530	940
26	1,210	2,540	2,990	2,260	2,540	2,260	2,260	1,530	895	570	850
27	1,120	1,870	2,840	2,260	2,540	2,260	2,540	1,310	895	530	770
28	1,120	1,310	3,950	2,690	2,990	3,780	2,260	1,310	895	610	730
29	1,120	3,290	10,200	2,840	2,840	3,290	2,390	1,210	940	610	690
30	1,120	5,410	6,990	3,440	-------	2,260	2,390	1,210	850	610	650
31	1,030	-------	5,410	3,950	-------	2,390	-------	1,210	-------	610	-------

Monthly discharge of Middle Fork of Willamette River at Eula, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,140	770	1,360	83,600
November	5,410	940	1,420	84,500
December	11,400	2,000	3,860	237,000
January	5,030	2,000	2,970	183,000
February	9,110	2,390	4,340	250,000
March	3,780	1,530	2,190	135,000
April	4,650	1,870	2,880	171,000
May	2,990	1,210	2,080	128,000
June	2,000	810	1,080	64,300
July			[a] 650	40,000
August	1,080	530	647	39,800
September	1,210	495	619	36,800
The year	11,400	495	2,000	1,450,000

[a] Estimated.

WILLAMETTE RIVER AT EUGENE, OREG.

LOCATION.—In SW. ¼ sec. 29, T. 17 S., R. 3 W., at highway bridge at Eugene, Lane County.

DRAINAGE AREA.—2,050 square miles (revised; measured on map of Oregon issued by United States Geological Survey; scale, 1:500,000).

RECORDS AVAILABLE.—June 1, 1919, to September 30, 1924. Record at Springfield November 27, 1911, to September 30, 1913.

GAGE.—Vertical staff graduated to tenths, fixed to first pier from left bank of highway bridge.

DISCHARGE MEASUREMENTS.—Made from highway bridge at Springfield 4 miles by river above gage.

CHANNEL AND CONTROL.—Channel straight with even current. Bed composed of gravel and sand; subject to shift at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.0 feet at 8 a. m. December 7 (discharge, 37,400 second-feet); minimum stage recorded, 0.6 foot September 6–8 and 15–18 (discharge, 550 second-feet).

1911–1913; 1919–1924: Maximum stage recorded, 18.0 feet January 7, 1923 (discharge, 72,500 second-feet). The maximum stage in recent years from records of United States Weather Bureau, 21.5 feet November 23, 1909 (discharge, about 96,000 second-feet). Minimum discharge recorded, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water of December. Fairly well defined rating curve used up to December 7, well defined rating curve thereafter. Gage read once a day to tenths. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

The following discharge measurements were made.

December 22, 1923: Gage height, 3.45 feet; discharge, 3,760 second-feet.

July 19, 1924: Gage height, 0.80 foot; discharge, 660 second-feet.

September 23, 1924: Gage height, 0.80 foot; discharge, 699 second-feet.

Daily discharge, in second-feet, of Willamette River at Eugene, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,060	1,420	7,700	7,640	11,000	4,320	4,640	2,870	1,320	840	610	610
2	980	1,420	5,140	6,180	22,400	4,160	5,560	2,740	1,320	840	610	610
3	980	1,690	4,090	5,560	15,000	4,000	5,760	2,740	1,320	840	610	610
4	980	1,690	3,630	5,560	11,400	4,800	5,960	2,870	1,320	840	610	610
5	1,510	1,420	3,630	4,640	11,400	4,480	5,160	3,280	1,320	840	610	610
6	1,420	1,420	4,090	4,640	11,400	4,160	5,160	2,740	1,320	760	610	550
7	3,630	1,330	37,400	5,160	11,400	3,850	5,560	2,740	1,320	760	610	550
8	2,410	1,240	19,900	5,760	15,000	3,700	6,180	2,480	1,420	760	610	550
9	1,890	1,240	11,000	6,400	10,600	3,700	5,560	2,610	1,420	760	610	610
10	1,890	1,240	8,200	6,620	8,800	3,280	5,160	2,610	1,420	760	610	610
11	1,420	1,240	6,620	6,860	7,640	3,280	4,800	3,000	1,220	760	610	610
12	1,330	1,240	6,620	7,380	6,180	3,140	4,640	2,740	1,220	760	610	610
13	1,240	1,240	6,180	6,180	5,360	3,000	4,320	2,870	1,220	760	610	610
14	1,150	1,240	7,380	5,760	4,980	2,740	4,160	2,870	1,220	760	610	610
15	1,240	1,690	6,620	4,980	4,640	2,740	4,000	2,480	1,120	760	610	550
16	1,790	1,690	5,760	4,320	2,320	2,480	3,700	2,480	1,120	760	610	550
17	4,090	1,420	5,160	4,640	4,320	2,870	3,700	2,350	1,120	760	610	550
18	3,930	1,420	5,160	4,320	4,000	2,740	3,850	2,350	1,120	760	610	550
19	2,640	1,420	4,980	4,000	3,850	2,610	3,700	2,230	1,990	680	930	610
20	2,090	1,240	4,640	3,560	3,560	2,870	3,700	2,110	1,530	680	1,120	610
21	1,890	1,240	4,320	3,560	3,560	3,000	3,140	2,110	1,420	680	930	840
22	2,090	1,150	3,850	3,280	3,560	3,000	3,280	1,990	1,320	680	1,020	680
23	3,180	1,420	3,560	3,560	3,560	3,000	3,280	1,990	1,220	680	680	680
24	2,520	2,770	3,420	3,850	3,420	3,140	3,140	1,750	1,120	680	680	680
25	2,190	4,760	3,000	3,850	3,140	3,140	3,000	1,640	1,120	680	680	1,420
26	1,990	3,480	5,160	3,420	3,850	3,000	2,740	1,640	930	680	680	1,870
27	1,890	2,640	4,640	3,560	4,320	2,870	2,740	1,530	930	680	610	1,220
28	1,690	2,190	4,320	3,850	4,640	3,000	2,610	1,420	930	610	610	930
29	1,600	3,330	19,900	3,850	4,640	3,140	2,610	1,420	930	610	610	760
30	1,420	14,900	15,000	4,160	-------	5,160	2,610	1,420	840	610	610	680
31	1,420	-------	10,600	5,560	-------	4,640	-------	1,420	-------	610	610	-------

Monthly discharge of Willamette River at Eugene, Oreg., for the year ending September 30, 1924

[Drainage area, 2,050 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	4,090	980	1,920	0.937	1.08	118,000
November	14,900	1,150	2,190	1.07	1.19	130,000
December	37,400	3,000	7,800	3.80	4.38	480,000
January	7,640	3,280	4,920	2.40	2.77	303,000
February	22,400	3,140	7,310	3.57	3.85	420,000
March	5,160	2,480	3,420	1.67	1.92	210,000
April	6,180	2,610	4,150	2.02	2.25	247,000
May	3,280	1,420	2,310	1.13	1.30	142,000
June	1,990	840	1,240	.605	.68	73,800
July	840	610	730	.356	.41	44,900
August	1,120	610	669	.326	.38	41,100
September	1,870	550	718	.350	.39	42,700
The year	37,400	550	3,100	1.52	20.60	2,250,000

WILLAMETTE RIVER AT ALBANY, OREG.

LOCATION.—In SW. ¼ sec. 6, T. 11 S., R. 3 W., at end of Broadalbin Street, Albany, Linn County, half a mile above Southern Pacific Railroad bridge, just below mouth of Calapooya River, and 9 miles by river above Santiam River.

DRAINAGE AREA.—4,860 square miles.

RECORDS AVAILABLE.—November 24, 1878, to April 30, 1882; January 21, 1892, to September 30, 1924; some fragmentary records 1883 to 1888.

GAGE.—Vertical staff in two sections on right bank.

DISCHARGE MEASUREMENTS.—Made from Southern Pacific bridge.

CHANNEL AND CONTROL.—Bed composed of sand and fine gravel; control practically permanent. Above gage height 17 feet some water flows through a slough several hundred feet to the left of the main channel.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.2 feet at 8 a. m. February 3 (discharge, 52,000 second-feet); minimum stage recorded, 0.4 foot September 13–19 (discharge, 2,460 second-feet).

1878–1882; 1892–1924: Maximum stage recorded, 32.8 feet January 14, 1881 (discharge, 229,000 second-feet); minimum stage recorded, 0.2 foot September 21–27, 1879 (discharge, 1,870 second-feet, somewhat uncertain); lowest stages recorded in recent years are 0.4 foot October 30 to November 10, 1895 (discharge, 2,220 second-feet); and 0.5 foot August 26 to September 25, 1905, and September 5–14, 1915 (discharge, 2,400 second-feet). The maximum stage ever known was 36.0 feet December 8, 1861 (discharge estimated from extension of rating curve at 274,000 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—The Albany power canal has diverted water from South Santiam River near Lebanon and discharged into Willamette River above the gage and measuring section since the early 90's. It ordinarily carries between 200 and 250 second-feet.

REGULATION.—Practically none.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Gage read to tenths once a day, twice during floods. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

COOPERATION.—Gage-height record furnished by the United States Weather Bureau.

The following discharge measurements were made:

December 24, 1923: Gage height, 3.34 feet; discharge, 9,580 second-feet.

July 21, 1924: Gage height, 0.65 foot; discharge, 2,820 second-feet.

Daily discharge, in second-feet, of Willamette River at Albany, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,260	3,260	24,300	31,000	27,900	14,500	12,800	7,360	4,220	3,440	2,760	2,760
2	3,260	3,440	16,700	22,500	40,500	14,200	13,100	7,080	4,020	3,440	2,760	2,760
3	3,260	3,440	12,800	19,500	52,000	13,100	13,500	7,360	4,020	3,440	2,760	2,760
4	3,260	3,630	10,900	16,700	46,000	12,200	14,200	7,640	3,820	3,440	2,760	2,760
5	3,260	3,440	9,100	15,600	40,000	11,800	14,500	7,640	3,820	3,260	2,760	2,760
6	3,820	3,440	10,300	14,200	41,000	11,800	13,100	8,500	3,820	3,260	2,760	2,610
7	4,020	3,260	17,100	13,100	41,500	11,500	12,500	7,920	3,820	3,260	2,760	2,610
8	5,560	3,260	50,000	14,200	41,000	11,200	11,800	7,640	3,820	2,260	2,760	2,610
9	5,080	3,090	51,000	14,800	42,000	10,900	14,500	7,360	3,820	3,090	2,760	2,610
10	4,640	3,090	33,300	16,700	33,800	10,300	13,500	7,080	3,820	3,090	2,760	2,610
11	4,420	3,090	24,300	18,300	27,900	9,700	12,800	7,080	3,820	3,090	2,760	2,610
12	4,220	3,090	19,100	19,500	22,500	9,400	12,200	7,080	3,820	3,090	2,760	2,610
13	4,220	3,440	17,500	18,700	19,900	9,100	10,900	7,640	3,630	3,090	2,760	2,460
14	4,020	3,630	15,600	16,700	18,300	8,800	11,500	7,360	3,630	3,09	2,610	2,460
15	3,820	3,260	17,500	14,500	15,900	8,200	10,900	7,360	3,630	2,920	2,610	2,460
16	3,630	3,090	15,900	12,800	15,900	8,100	10,900	7,360	3,630	2,920	2,610	2,460
17	4,220	3,090	14,800	12,800	15,200	8,200	10,000	6,820	3,630	2,920	2,610	2,460
18	8,500	3,440	13,800	12,800	14,200	7,920	10,300	6,560	3,630	2,920	2,610	2,460
19	7,640	3,440	12,800	12,200	13,100	7,640	10,300	6,560	4,220	2,920	2,760	2,460
20	6,040	3,440	11,800	11,500	12,800	7,360	10,300	6,040	4,640	2,920	3,090	2,610
21	5,080	3,440	11,500	10,900	11,500	8,200	10,000	5,800	4,220	2,920	3,260	2,610
22	4,860	3,440	11,200	10,300	11,800	8,200	9,400	5,560	4,020	2,920	3,260	2,610
23	5,560	3,440	10,900	10,000	11,200	8,500	9,100	5,320	3,820	2,920	3,090	2,760
24	6,300	4,020	9,700	10,000	11,200	8,200	8,800	5,080	3,820	2,920	3,090	2,920
25	5,560	11,200	9,100	10,000	10,600	8,200	8,500	5,080	3,820	2,920	3,090	3,090
26	5,080	12,200	11,200	10,600	11,200	8,200	8,200	4,860	3,630	2,920	3,090	3,820
27	4,640	9,100	14,500	10,300	12,800	8,500	7,920	4,860	3,630	2,920	2,090	4,220
28	4,220	7,640	13,100	10,900	14,500	8,200	7,640	4,640	3,630	2,920	3,090	3,630
29	4,020	6,560	15,200	11,200	14,500	9,400	7,360	4,640	3,630	2,920	2,920	3,260
30	3,820	12,500	41,000	12,200	-------	13,100	7,360	4,420	3,440	2,920	2,920	3,090
31	3,440	-------	41,500	19,900	-------	13,500	-------	4,220	-------	2,920	2,760	-------

Monthly discharge of Willamette River at Albany, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8,500	3,260	4,600	283,000
November	12,500	3,090	4,660	277,000
December	51,000	9,100	19,000	1,170,000
January	31,000	10,000	14,700	904,000
February	52,000	10,600	23,800	1,370,000
March	14,500	7,360	9,940	611,000
April	14,500	7,360	10,900	649,000
May	8,500	4,220	6,450	397,000
June	4,640	3,440	3,830	228,000
July	3,440	2,920	3,060	188,000
August	3,260	2,610	2,850	175,000
September	4,220	2,460	2,800	167,000
The year	52,000	2,460	8,830	6,420,000

COAST FORK OF WILLAMETTE RIVER AT SAGINAW, OREG.

LOCATION.—In NW. ¼ sec. 15, T. 20 S., R. 3 W., at highway bridge at Saginaw, Lane County, 1 mile above mouth of Row River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1923, to April 30, 1924.

GAGE.—Chain gage on highway bridge; read by M. A. Horn for United States Weather Bureau.

DISCHARGE MEASUREMENTS.—Made from suspension footbridge about a quarter of a mile downstream; conditions favorable. Low-water measurements made by wading below bridge.

CHANNEL AND CONTROL.—River generally sluggish and fairly straight. Control is well-defined gravel riffle about 200 yards below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period October 1 to April 30, 8.4 feet at 8 a. m. December 7 (discharge, 11,500 second-feet); minimum stage recorded, 0.48 foot October 3 (discharge, 61 second-feet).

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation apparently permanent. Rating curve well defined below 5,000 second-feet. Gage read once a day, generally to hundredths. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurements were made:

December 21, 1923: Gage height, 1.79 feet; discharge, 692 second-feet.

January 6, 1924: Gage height, 3.21 feet; discharge, 1,780 second-feet.

September 26, 1924: Gage height, 1.12 feet; discharge, 290 second-feet.

Daily discharge, in second-feet, of Coast Fork of Willamette River at Saginaw, Oreg., for the period October 1 to April 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	70	171	1,230	1,670	6,400		1,570
2	65	244	940	1,080	4,560		1,570
3	61	227	1,390	1,230	3,400		1,770
4	105	211	940	1,310	2,700	1,100	1,770
5	187	187	870	1,310	2,580		1,670
6	203	171	1,310	1,670	1,990		1,670
7	1,230	155	11,500	1,990	3,260	870	1,880
8	490	141	4,920	1,990	2,460	730	1,670
9	360	108	2,700	2,100	1,770	670	1,480
10	227	120	1,990	2,580	2,100	670	1,480
11	187	120	1,670	2,100	2,100	670	1,310
12	171	134	1,670	1,770	2,100	610	1,010
13	155	134	1,770	1,670	1,770	550	870
14	120	271	2,460	2,580	940	490	730
15	134	310	1,770	1,150	800	490	700
16	280	227	1,390	1,010	870	490	700
17	1,390	203	1,230	1,010	730	550	670
18	870	171	1,310	870	610	490	730
19	490	171	1,120	870	610	550	640
20	340	148	835	870	610	550	640
21	290	148	670	835	610	610	550
22	134	187	550	700	730	610	550
23	280	148	550	550	490	730	520
24	490	1,670	430	765	490	730	490
25	430	1,010	700	730	490	730	430
26	310	490	1,010	730	800	730	405
27	271	430	940	670	1,150	670	405
28	227	1,230	940	975	1,150	800	360
29	211	1,880	6,400	765	1,200	1,480	350
30	187	4,200	3,560	1,150	-------	1,570	330
31	195	-------	2,460	1,230	-------	1,480	-------

Monthly discharge of Coast Fork of Willamette River at Saginaw, Oreg., for the period October 1 to April 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,390	61	328	20,200
November	4,200	108	501	29,800
December	11,500	430	1,980	122,000
January	2,580	550	1,290	79,300
February	6,400	490	1,710	98,400
March	1,570	490	810	49,800
April	1,880	330	964	57,400
The period	----------	----------	----------	457,000

McKENZIE RIVER AT McKENZIE BRIDGE, OREG.

LOCATION.—In sec. 14, T. 16 S., R. 6 E., at highway bridge at McKenzie Bridge, Lane County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 8, 1910, to September 30, 1924, with some breaks.

GAGE.—Vertical staff attached to right abutment of the highway bridge at McKenzie Bridge. Gage read by S. L. Taylor, M. C. Hall, and Felix Sparks.

DISCHARGE MEASUREMENTS.—Made from cable three-eighths mile above ranger station.

CHANNEL AND CONTROL.—Bed rocky; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.0 feet at 5 p. m. February 4 (discharge, 4,600 second-feet); minimum stage recorded, 0.42 foot September 21–22 and 28–29 (discharge, 908 second-feet).

1910–1924: Maximum stage recorded, 8.3 feet on January 6, 1923, determined by leveling to high-water marks (discharge from extension of rating curve, 18,000 second-feet); minimum discharge, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation apparently permanent during year. Rating well defined below 3,000 second-feet. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurements were made:

July 19, 1924: Gage height, 0.61 foot; discharge, 1,090 second-feet.

September 23, 1924: Gage height, 0.46 foot; discharge, 945 second-feet.

Daily discharge, in second-feet, of McKenzie River at McKenzie Bridge, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200			3,530	3,880	1,990	1,500	1,500		1,150	1,050	980
2	1,200			2,940	3,880	1,990	1,500	1,500	1,250	1,170	1,050	980
3	1,210			2,940	3,530	1,920	1,610	1,500		1,170	1,050	980
4	1,220		2,000	2,700	4,600	1,920	1,610	1,500		1,170	1,050	980
5	1,240	1,140		2,270	4,240	1,860	1,610	1,500	1,240	1,150	1,050	980
6	1,260			2,130	4,240	1,860	1,500	1,500	1,250	1,150	1,030	980
7	1,210			1,990	3,880	1,860	1,500	1,500	1,240	1,150	1,030	980
8	1,210		2,700	1,990	3,360	1,860	1,500	1,540	1,230	1,150	1,030	980
9	1,210		2,130	1,860	3,020	1,860	1,500	1,570	1,220	1,130	1,030	980
10	1,220		1,990	1,860	3,020	1,800	1,610	1,610	1,210	1,130	1,020	980
11	1,230	1,120	1,990	1,860	2,700	1,800	1,610	1,570	1,210	1,110	1,020	980
12	1,240		1,860	1,860	2,700	1,730	1,610	1,540	1,210	1,110	1,000	980
13	1,260	1,120	1,860	1,860	2,550	1,730	1,610	1,500	1,210	1,090	980	980
14	1,260		1,860	1,860	2,410	1,610	1,610	1,500	1,210	1,090	980	980
15	1,260		1,860	1,860	2,410	1,610	1,610	1,500	1,210	1,090	980	980
16		1,120	1,860	1,860	2,410	1,610	1,610	1,470	1,190	1,070	980	980
17	1,400		1,860	1,800	2,410	1,610	1,560	1,440	1,200	1,070	980	953
18		1,170	1,920	1,800	2,410	1,610	1,560	1,420	1,210	1,070	1,000	971
19			1,920	1,800	2,270	1,500	1,560	1,390	1,280	1,090	1,020	935
20	1,220		1,920	1,730	1,990	1,500	1,560	1,390	1,260	1,090	1,000	935
21	1,260	1,220	1,860	1,670	1,990	1,500	1,610	1,390	1,220	1,070	989	908
22	1,280		1,860	1,670	1,990	1,500	1,610	1,380	1,170	1,070	980	908
23			1,860	1,610	1,990	1,390	1,610	1,380		1,070	980	935
24		1,400	1,920	1,610	1,990	1,390	1,610	1,370		1,070	980	962
25			1,990	1,610	1,990	1,500	1,610	1,370		1,070	980	1,020
26	1,220		1,920	1,610	1,990	1,500	1,610	1,350	1,160	1,070	980	998
27		1,320	1,860	1,610	1,990	1,500	1,610	1,320		1,070	980	935
28		1,500	3,880	1,730	1,990	1,500	1,560	1,300		1,050	980	908
29		2,410	3,700	1,730	1,990	1,500	1,560	1,280	1,150	1,050	980	908
30	1,170	2,000	3,700	3,020	-------	1,500	1,500	1,280	1,150	1,050	980	944
31	1,170	-------	3,530	3,880	-------	1,440	-------	1,270	-------	1,050	980	-------

NOTE.—Daily discharge for Nov. 28, 30, and Dec. 1-7, estimated from hydrographic comparison with Weather Bureau gage-height record at Hendricks Bridge; other braced figures give interpolated or estimated discharge for period.

Monthly discharge of McKenzie River at McKenzie Bridge, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October		1,170	1,250	76,900
November	2,410	1,120	1,280	76,200
December	3,880		2,190	135,000
January	3,880	1,610	2,070	127,000
February	4,600	1,990	2,750	158,000
March	1,990	1,390	1,660	102,000
April	1,610	1,500	1,570	93,400
May	1,610	1,270	1,440	88,500
June	1,280	1,150	1,210	72,000
July	1,170	1,050	1,100	67,600
August	1,050	980	1,000	61,500
September	1,020	908	963	57,300
The year	4,600	908	1,540	1,120,000

LONG TOM RIVER NEAR MONROE, OREG.

LOCATION.—In sec. 21, T. 14 S., R. 5 W., at a highway bridge 1½ miles north of Monroe, Benton County.

DRAINAGE AREA.—400 square miles.

RECORDS AVAILABLE.—November 13, 1920, to September 30, 1924.

GAGE.—Vertical staff on right abutment of bridge; read by William Pfouts.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and gravel, banks low and wooded. Control 400 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.2 feet February 4 (discharge, 3,840 second-feet); minimum stage recorded, 0.26 foot September 5–19 and 22; minimum discharge, 8 second-feet September 14–19 and 22.

ICE.—Stage-discharge relation not affected.

DIVERSIONS.—None.

REGULATION.—Probably some fluctuation at low stages due to pondage at mill-dam at Monroe.

ACCURACY.—Stage-discharge relation practically permanent except as affected by growth of aquatic plants. Well-defined rating curve used October 1 to June 24, shifting-control method June 25 to September 30. Daily discharge ascertained by applying daily gage reading to rating table. Records good, except from July to September for which they are fair.

The following discharge measurements were made:

December 22, 1923: Gage height, 1.62 feet; discharge, 314 second-feet.

July 17, 1924: Gage height, 0.32 foot; discharge, 20 second-feet.

September 21, 1924: Gage height, 0.27 foot; discharge, 8.3 second-feet.

Daily discharge, in second-feet, of Long Tom River near Monroe, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	25	92	1,430	2,210	626	570	107	66	37	18	10
2	27	25	113	1,260	2,940	570	486	107	66	47	18	10
3	31	25	113	910	3,540	514	402	105	64	47	20	10
4	31	25	111	822	3,840	514	374	113	56	35	23	10
5	28	41	113	710	3,440	514	374	115	54	35	16	9
6	30	41	374	654	2,210	486	318	134	73	23	13	9
7	31	34	766	542	2,670	430	290	136	64	35	12	9
8	31	34	1,260	570	2,670	346	251	124	59	30	12	9
9	33	38	2,210	710	2,730	346	232	113	58	26	12	9
10	35	38	1,330	1,160	2,110	346	212	100	56	20	12	9
11	38	34	970	1,190	1,550	346	186	98	58	20	12	9
12	40	41	710	1,000	1,360	346	199	94	56	16	12	9
13	34	41	940	970	1,060	312	186	92	53	16	13	9
14	28	41	910	880	940	277	186	90	50	15	23	8
15	27	41	598	794	794	264	186	88	48	14	13	8
16	28	41	570	682	710	238	173	86	48	15	13	8
17	31	41	458	640	710	238	186	82	48	20	12	8
18	30	34	430	598	682	225	186	81	56	20	10	8
19	28	41	430	570	654	225	186	82	56	25	10	8
20	31	41	402	542	570	225	160	77	56	12	12	9
21	35	41	374	486	514	277	160	77	54	16	13	9
22	37	44	326	430	514	318	150	77	53	15	18	8
23	40	41	277	430	430	290	148	75	53	14	18	9
24	44	73	251	486	402	277	136	77	53	13	18	12
25	48	96	290	542	402	290	127	73	53	15	20	15
26	52	160	598	458	486	290	124	70	53	15	23	20
27	50	186	850	430	598	264	118	64	53	15	18	27
28	34	160	940	430	710	251	113	64	50	22	13	41
29	27	134	1,030	486	682	346	113	66	50	30	18	56
30	27	113	1,260	766	-------	541	111	66	48	25	12	30
31	25	-------	1,600	1,550	-------	598	-------	66	-------	27	12	-------

Monthly discharge of Long Tom River near Monroe, Oreg., for the year ending September 30, 1924

[Drainage area, 400 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	48	25	33.5	0.084	0.10	2,060
November	186	25	59.0	.148	.17	3,510
December	2,210	92	668	1.67	1.92	41,100
January	1,550	430	746	1.86	2.14	45,900
February	3,840	402	1,450	3.62	3.90	83,400
March	626	225	359	.898	1.04	22,100
April	570	111	221	.552	.62	13,200
May	136	64	90.3	.226	.26	5,550
June	73	48	55.5	.139	.16	3,300
July	47	12	23.1	.058	.07	1,420
August	23	10	15.0	.038	.04	922
September	56	8	13.5	.034	.04	803
The year	3,840	8	308	.770	10.46	223,000

NORTH SANTIAM RIVER AT MEHAMA, OREG.

LOCATION.—In NW. ¼ sec. 18, T. 9 S., R. 2 E., at Mehama, Marion County, a mile below mouth of Little North Fork and a mile north of Lyons railroad station.

DRAINAGE AREA.—740 square miles.

RECORDS AVAILABLE.—July 11, 1905, to March 31, 1907; October 11, 1910, to September 30, 1914; September 9, 1921, to September 30, 1924.

GAGE.—Staff in two sections on right bank, the lower section inclined, the upper vertical.

DISCHARGE MEASUREMENTS.—Made from highway bridge 200 feet above gage.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and boulders, shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.0 feet at 8 a. m. December 29 (discharge, 19,600 second-feet); minimum stage recorded, 1.45 feet September 18 (discharge, 420 second-feet).

1905–1907; 1910–1914; 1921–1924: Maximum stage, 17.5 feet November 20, 1922, and January 6, 1923 (discharge, 62,000 second-feet); minimum stage, that of September 18, 1924.

ICE.—None.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation changed during winter; affected by temporary dam of fish hatchery June 6 to July 23. Two rating curves used, identical above 2,300 second-feet; well defined before high water, fairly well defined after. Mean discharge for periods shown by braced figures, estimated for June 6 to July 23. Gage read once a day to tenths at medium and high stages, to hundredths at low water. Daily discharge ascertained by applying daily gage reading to rating table. Records good except for June and July for which they are fair.

The following discharge measurements were made:

October 4, 1923: Gage height, 1.86 feet; discharge, 836 second-feet.

July 16, 1924: Gage height, 2.00 feet; discharge, 706 second-feet.

September 20, 1924: Gage height, 1.53 feet; discharge, 472 second-feet.

Daily discharge, in second-feet, of North Santiam River at Mehama, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	755	960	4,560	5,040	18,800	3,900	2,470	2,470	1,450		520	450
2	755	960	3,510	4,120	12,000	3,510	2,960	2,630	1,450		520	450
3	755	1,160	2,960	3,700	9,000	3,510	3,900	2,630	1,450		520	450
4	790	1,060	2,470	3,320	10,500	3,140	3,320	2,630	1,450		520	450
5	790	960	2,630	2,960	15,200	2,960	2,960	2,630	1,450		520	450
										820		
6	960	960	10,500	2,790	10,500	2,790	3,140	2,470			520	450
7	1,490	960	15,600	2,790	11,400	2,630	4,120	2,310			520	450
8	1,260	960	8,160	2,790	8,440	2,470	4,340	2,310			520	480
9	1,060	960	5,780	2,630	7,080	2,310	3,700	2,790			520	520
10	960	960	4,560	2,790	5,780	2,150	3,700	2,960			520	485
11	870	870	3,700	5,780	5,040	2,150	3,700	3,140			520	450
12	790	870	3,700	4,120	4,340	2,000	3,510	3,320	1,200		520	450
13	790	870	3,320	3,510	5,040	2,000	3,320	3,320		730	520	450
14	790	870	4,340	3,140	4,340	1,860	3,320	2,630			485	450
15	870	870	3,900	2,960	4,340	1,860	2,960	2,470			485	450
16	1,370	870	3,510	2,960	3,900	1,860	2,790	2,470		706	485	450
17	5,520	870	3,320	2,790	3,900	1,860	3,140	2,310			485	450
18	2,630	870	3,700	2,790	3,700	1,860	3,320	2,150			485	420
19	1,870	870	3,900	2,630	3,320	1,720	3,900	2,000	2,160		645	450
20	1,490	1,060	3,320	2,150	3,140	1,860	3,510	2,000	1,520	630	600	485
21	1,490	960	2,960	2,000	3,320	1,860	3,320	2,000			520	450
22	1,740	960	2,790	2,470	3,320	1,860	3,140	2,150			520	450
23	2,010	1,060	2,470	2,630	3,700	1,860	2,960	2,150			520	450
24	1,610	14,400	2,470	2,470	3,510	1,860	2,790	2,000		560	485	970
25	1,490	6,300	4,800	2,470	3,510	1,720	2,470	1,860		560	485	2,000
26	1,370	3,900	4,800	2,470	4,120	1,720	2,310	1,720	1,020	560	485	1,200
27	1,260	2,960	3,900	2,790	4,560	1,720	2,310	1,720		560	485	780
28	1,160	2,470	3,900	3,320	5,040	2,310	2,310	1,580		520	450	690
29	1,060	7,880	19,600	3,510	4,560	2,310	2,470	1,580		520	450	600
30	1,060	6,560	9,000	9,900	-------	2,310	2,790	1,450		520	450	600
31	1,060	-------	6,820	12,600	-------	2,310	-------	1,450	-------	520	450	-------

Monthly discharge of North Santiam River at Mehama, Oreg., for the year ending September 30, 1924

[Drainage area, 740 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	5,520	755	1,350	1.82	2.10	83,000
November	14,400	870	2,210	2.99	3.34	132,000
December	19,600	2,470	5,190	7.01	8.08	319,000
January	12,600	2,000	3,630	4.91	5.66	223,000
February	18,800	3,140	6,390	8.64	9.32	368,000
March	3,900	1,720	2,270	3.07	3.54	140,000
April	4,340	2,310	3,160	4.27	4.76	188,000
May	3,320	1,450	2,300	3.11	3.58	141,000
June	2,160	----------	1,220	1.65	1.84	72,600
July	----------	520	687	.928	1.07	42,200
August	645	450	507	.685	.79	31,200
September	2,000	420	578	.781	.87	34,400
The year	19,600	420	2,440	3.30	44.95	1,770,000

LITTLE NORTH SANTIAM RIVER NEAR MILL CITY, OREG.

LOCATION.—In sec. 18, T. 9 S., R. 3 E., at Lomker Bridge, 2½ miles north of Mill City and 7 miles east of Mehama, Marion County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 16 to September 30, 1924, when station was discontinued.

GAGE.—Vertical staff gage fastened to overhanging branch of tree on right bank; read by Frank L. Lomker.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel; one channel; banks high and covered with brush; well-defined riffle 100 feet below gage forms a practically permanent control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 2.00 feet September 25 (discharge not computed as no measurements above a low stage were made by which rating curve could be drawn); minimum stage recorded, 0.48 foot September 16 (discharge, 22 second-feet).

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined by the two discharge measurements only between 30 and 50 second-feet, extended beyond these limits. Staff gage read to hundredths once a day. Daily discharge ascertained by applying daily gage heights to rating table. Records fair.

The following discharge measurements were made:

July 16, 1924: Gage height, 0.70 foot; discharge, 43.6 second-feet.

September 20, 1924: Gage height, 0.60 foot; discharge, 32.5 second-feet.

Daily discharge, in second-feet, of Little North Santiam River near Mill City, Oreg., for the year ending September 30, 1924

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-------	30	24	11	-------	27	25	21	42	46	28
2	-------	29	23	12	-------	27	23	22	37	39	25
3	-------	29	23	13	-------	27	23	23	34	34	108
4	-------	29	23	14	-------	25	23	24	33	32	-------
5	-------	29	23	15	-------	25	23	25	32	30	-------
6	-------	29	23	16	44	25	22	26	32	28	-------
7	-------	29	23	17	43	25	23	27	31	28	108
8	-------	29	62	18	42	59	23	28	31	27	93
9	-------	29	49	19	42	87	39	29	31	25	81
10	-------	29	27	20	42	62	32	30	30	25	-------
								31	30	25	-------

NOTE.—Gage heights, in feet, observed on following days: Sept. 24, 1.60; Sept. 25, 2.00; Sept. 26, 1.38; Sept. 30, 1.42. Discharge not computed as rating curve is not defined above low stages.

Monthly discharge of Little North Santiam River near Mill City, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 16–31	44	30	36.0	1,140
August	87	25	32.9	2,020
September 1–23	108	22	31.2	1,420

SOUTH SANTIAM RIVER AT WATERLOO, OREG.

LOCATION.—In NW. ¼ sec. 28, T. 12 S., R. 1 W., at Waterloo, Linn County, 4 miles above Hamilton Creek.

DRAINAGE AREA.—640 square miles.

RECORDS AVAILABLE.—July 28, 1905, to March 31, 1907; October 31, 1910, to December 31, 1911; July 1, 1923, to September 30, 1924.

GAGE.—Inclined staff on left bank, 200 yards below site of highway bridge, washed out in 1923, on which was located the gage used 1905–1911; gage read by G. P. Stiers and Leo Lueck.

DISCHARGE MEASUREMENTS.—Made by wading near gage at low water; high-water measurements from highway bridge about 4 miles downstream, and below Hamilton Creek, the flow of which is deducted.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders, control may shift during extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.3 feet at 8 p. m. December 7 (discharge, 39,600 second-feet); minimum stage recorded, 1.4 feet July 20, August 8, August 31 to September 11, and September 14–16 (discharge, 135 second-feet).

1905–1907; 1911; 1923–1924: Maximum recorded stage, that is considered reliable, 16.8 feet February 16, 1907 (discharge, 50,000 second-feet); minimum discharge, that of 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation apparently permanent during year. Rating curve fairly well defined. Gage read once a day to half-tenths at low stages, to tenths at medium and high stages. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

The following discharge measurements were made:

July 17, 1924: Gage height, 1.64 feet; discharge, 210 second-feet.

September 21, 1924: Gage height, 1.52 feet; discharge, 188 second-feet.

Daily discharge, in second-feet, of South Santiam River at Waterloo, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	205	430	4,160	5,520	23,700	3,240	2,340	1,420	500	310	165	135
2	205	430	2,670	3,040	16,700	2,670	2,850	1,310	500	282	165	135
3	205	430	2,670	3,460	11,700	2,850	3,920	1,310	500	255		135
4	310	430	1,770	2,850	19,200	2,850	3,920	1,310	430	282		135
5	430	430	1,650	2,670	16,700	2,500	3,040	1,530	430	282	150	135
6	430	430	10,200	2,850	16,200	2,190	2,850	1,310	430	230		135
7	1,530	430	30,700	2,850	15,200	1,770	2,670	1,310	500	205		135
8	820	500	10,700	2,670	9,830	1,770	4,160	1,310	500	205	135	135
9	730	430	5,840	3,040	11,200	1,650	3,460	1,310	500	215	165	135
10	500	365	5,520	3,460	7,880	1,650	3,040	1,260	500	215	165	135
11	430	365	2,670	6,480	7,530	1,530	3,040	1,200	430	230	165	135
12	365	310	2,670	4,420	6,830	1,420	3,040	1,200	430	230	165	150
13	310	365	3,920	3,460	6,480	1,420	2,340	1,150	430	230	165	150
14	255	430	3,040	3,040	5,520	1,420	2,340	1,050	430	255	165	135
15	650	430	3,240	2,850	3,040	1,420	2,340	1,000	398	205	165	135
16	3,680	365	3,460	2,670	3,240	1,420	2,040	1,000	365	205	159	135
17	1,530	365	3,240	2,670	3,460	1,310	2,670	820	365	185	165	150
18	1,100	365	3,240	2,340	2,670	1,310	2,670	820	430	165	205	165
19	1,000	365	3,460	2,340	2,500	1,200	3,040	820	1,150	165	310	185
20	820	430	2,670	1,900	2,340	1,200	2,670	775	1,000	135	398	185
21	730	430	2,500	1,900	2,500	1,100	2,340	730	1,000		310	185
22	1,200	500	2,040	1,770	2,500	1,310	2,340	730	570		205	185
23	1,310	500	1,900	1,900	2,500	1,420	2,040	730	535		205	163
24	1,000	12,700	1,770	2,500	2,340	1,530	1,900	650	500	142	165	340
25	820	5,520	2,340	2,340	2,340	1,650	1,770	650	465		165	1,730
26	730	2,850	3,920	2,190	3,680	1,530	1,770	650	430		165	430
27	650	1,770	3,040	2,670	3,920	1,530	1,530	650	430	150	165	205
28	570	3,040	3,240	2,850	4,420	3,240	1,530	650	430	150	165	205
29	570	9,030	32,700	3,040	3,460	3,040	1,420	570	310	159	150	255
30	570	10,700	13,700	12,700	-------	2,850	1,530	570	282	159	150	
31	500	-------	9,030	12,700	-------	2,340	-------	570	-------	165	135	-------

NOTE—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of South Santiam River at Waterloo, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,680	205	779	47,800
November	12,700	310	1,840	109,000
December	32,700	1,770	5,920	364,000
January	12,700	1,770	3,590	221,000
February	23,700	2,340	7,570	435,000
March	3,240	1,110	1,880	116,000
April	4,160	1,420	2,550	152,000
May	1,530	570	980	60,300
June	1,150	282	506	30,100
July	310	135	197	12,100
August	398	135	180	11,100
September	1,310	135	232	13,800
The year	32,700	135	2,170	1,570,000

CLACKAMAS RIVER AT BIG BOTTOM, OREG.

LOCATION.—In SE. ¼ sec. 26, T. 6 S., R. 7 E., half a mile above proposed dam site, just below Post Creek, 10 miles above mouth of Oak Grove Fork of Clackamas River, and 26 miles southeast of Cazadero, Clackamas County.

DRAINAGE AREA.—132 square miles (revised).

RECORDS AVAILABLE.—April 11, 1920, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank referenced to an outside gage.

DISCHARGE MEASUREMENTS.—Made from cable 1,000 feet below gage or by wading.

CHANNEL AND CONTROL.—Bed composed of boulders; control fairly permanent. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 4.90 feet at 4 p. m. December 6 (discharge, 2,240 second-feet); minimum stage from recorder, 1.40 feet 3 to 11 p. m. September 22 (discharge, 210 second-feet).

1920–1924: Maximum stage from water-stage recorder, 8.15 feet January 7, 1923 (discharge, 6,600 second-feet); minimum stage that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water in winter. Well-defined rating curves used October 1 to December 6 and December 7 to September 30. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

COOPERATION.—Field data furnished by the Portland Electric Power Co.

Discharge measurements of Clackamas River at Big Bottom, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 30	1.56	274	Jan. 30	2.83	706	June 30	1.53	236
Dec. 9	2.47	579	Jan. 31	3.50	1,040	July 18	1.48	224
Dec. 30	3.05	832	Feb. 1	4.12	1,400	Aug. 8	1.44	221
Dec. 31	2.72	684	Mar. 29	1.80	334	Aug. 15	1.44	214
Jan. 25	1.80	307	May 30	1.66	286	Sept. 14	1.41	218

Daily discharge, in second-feet, of Clackamas River at Big Bottom, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	262	270	391	580	1,390	520	326	402	272	235	225	215
2	260	292	370	560	1,090	492	335	413	269	235	225	212
3	265	283	358	520	890	480	347	413	269	235	225	212
4	268	275	352	472	990	464	338	416	266	235	225	212
5	265	272	349	440	1,270	444	332	416	263	232	225	212
6	289	270	1,280	424	1,090	432	338	410	272	232	220	212
7	292	270	940	410	1,090	413	368	396	281	232	220	215
8	286	268	688	402	940	410	378	396	275	232	220	230
9	275	268	560	385	822	402	385	410	269	232	220	220
10	270	268	500	413	732	392	406	428	266	232	220	218
11	268	268	476	440	688	378	432	440	263	232	220	218
12	265	272	448	406	710	368	428	444	263	232	220	215
13	262	270	428	388	755	371	444	440	260	232	220	215
14	265	275	452	374	710	374	432	413	260	232	220	215
15	286	270	424	371	665	368	410	396	258	232	220	215
16	438	268	410	364	642	360	396	378	255	230	220	212
17	398	268	396	360	642	350	396	360	255	230	220	212
18	322	268	416	350	600	344	399	344	305	230	220	220
19	298	270	410	338	560	344	399	338	281	230	225	230
20	289	272	392	332	540	344	392	329	266	230	222	218
21	283	270	374	329	540	338	396	320	258	230	220	212
22	298	270	364	326	520	332	400	314	252	230	220	212
23	289	574	357	332	540	332	392	308	252	225	218	235
24	280	810	371	329	520	329	378	302	250	225	218	258
25	275	512	520	323	500	326	368	299	250	225	215	296
26	275	433	472	320	540	317	364	293	248	225	215	238
27	272	377	436	323	520	317	371	290	245	225	215	225
28	270	377	875	332	580	329	385	287	242	225	215	218
29	268	468	1,120	432	540	329	396	284	242	225	215	218
30	270	436	822	755	-------	317	406	278	240	225	215	235
31	270	-------	688	1,120	-------	317	-------	275	-------	225	215	-------

Monthly discharge of Clackamas River at Big Bottom, Oreg., for the year ending September 30, 1924

[Drainage area, 132 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	438	260	286	2.17	2.50	17,500
November	810	268	332	2.52	2.81	19,800
December	1,280	349	530	4.02	4.64	32,600
January	1,120	320	427	3.23	3.72	26,300
February	1,390	500	745	5.64	6.08	42,900
March	520	317	375	2.84	3.27	23,100
April	444	326	385	2.92	3.26	22,900
May	444	275	362	2.74	3.16	22,300
June	305	240	262	1.98	2.21	15,600
July	235	225	230	1.74	2.01	14,100
August	225	215	220	1.67	1.92	13,500
September	296	212	222	1.68	1.87	13,200
The year	1,390	212	363	2.75	37.45	264,000

CLACKAMAS RIVER ABOVE THREE LYNX CREEK, OREG.

LOCATION.—In NE. ¼ sec. 21, T. 5 S., R. 6 E., a quarter of a mile above Three Lynx Creek, 25 miles above Estacada, Clackamas County.

DRAINAGE AREA.—488 square miles, measured on Forest Service map.

RECORDS AVAILABLE.—October 1, 1911, to December 31, 1913; October 1, 1921, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by employees of Portland Electric Power Co.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Bed composed of heavy gravel and boulders, overlain with some lighter material washed in from construction operations immediately above.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 9.58 feet at 1 p. m. December 6 (discharge, 16,200 second-feet); minimum stage from water-stage recorder, 0.91 foot noon to 2 p. m. August 10, and noon to 2 p. m. and 4 to 6 p. m. August 16 (discharge, 375 second-feet, Oak Grove power plant shut down temporarily); minimum natural stage, 1.29 feet September 15 and 16 (discharge, 584 second-feet).

1911–1913, 1922–1924: Maximum stage recorded, 15.2 feet January 6, 1923 (discharge, 33,700 second-feet); minimum discharge, that of 1924; minimum natural discharge also occurred in 1924.

ICE.—Ice never forms.

DIVERSIONS.—None.

REGULATION.—Some fluctuation during summer of 1924 due to operation of Oak Grove power project. Daily discharges for June 12 and 13 reduced owing to filling pond back of diversion dam; for August 10–11, 16–17, and 31 affected by temporary shutdown; monthly mean unaffected.

ACCURACY.—Stage-discharge relation changed December 6; well-defined rating curves used before and after this date. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

COOPERATION.—Field data furnished by Portland Electric Power Co.

Discharge measurements of Clackamas River above Three Lynx Creek, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 29	1.22	811	Jan. 10	2.92	1,780	June 9	1.77	904
Nov. 16	1.14	776	Feb. 4	5.38	5,250	July 25	1.48	676
Dec. 16	2.94	1,860	Feb. 8	4.98	4,370	Sept. 10	1.33	649

Daily discharge, in second-feet, of Clackamas River above Three Lynx Creek, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	760	820	1,970	2,660	8,370	2,200	1,330	1,620	930	755	688	616
2	755	910	1,770	2,360	5,800	2,090	1,450	1,660	930	720	688	610
3	760	910	1,640	2,140	4,520	2,040	1,620	1,660	930	720	688	603
4	790	850	1,550	1,890	5,220	1,890	1,530	1,660	895	720	720	603
5	760	850	1,550	1,760	6,610	1,800	1,450	1,620	895	720	655	603
6	880	820	8,590	1,710	5,220	1,760	1,530	1,530	895	720	688	603
7	970	820	5,940	1,620	5,220	1,660	1,800	1,490	965	720	720	603
8	880	790	3,390	1,620	4,360	1,620	1,940	1,490	930	720	688	655
9	820	790	2,600	1,530	3,600	1,620	1,890	1,620	895	720	688	629
10	790	790	2,100	1,800	3,180	1,530	1,890	1,660	860	720	568	610
11	760	790	1,990	2,090	2,910	1,490	1,990	1,760	825	720	755	610
12	760	820	1,840	1,890	2,910	1,450	1,940	1,760	772	720	648	603
13	760	790	1,760	1,760	3,040	1,450	1,940	1,710	735	720	642	603
14	760	820	1,990	1,660	2,840	1,450	1,890	1,580	860	688	636	596
15	880	790	1,890	1,660	2,780	1,410	1,760	1,490	825	720	636	596
16	1,700	790	1,800	1,620	2,540	1,410	1,660	1,410	825	720	544	584
17	1,940	790	1,760	1,580	2,600	1,370	1,660	1,370	825	720	642	584
18	1,280	760	1,890	1,530	2,360	1,330	1,760	1,290	1,040	720	636	603
19	1,100	790	1,840	1,450	2,200	1,330	1,760	1,250	930	720	655	642
20	1,000	820	1,710	1,370	2,090	1,330	1,710	1,210	895	720	642	616
21	940	790	1,620	1,370	2,140	1,290	1,710	1,180	860	720	642	603
22	1,040	790	1,530	1,330	2,090	1,210	1,710	1,140	825	720	629	596
23	1,040	1,950	1,450	1,410	2,090	1,250	1,660	1,100	825	720	622	648
24	970	5,350	1,530	1,410	2,090	1,250	1,620	1,100	825	720	622	790
25	910	2,880	2,540	1,370	2,040	1,210	1,530	1,070	825	720	622	1,100
26	880	2,140	2,360	1,370	2,200	1,180	1,490	1,070	790	720	622	790
27	880	1,770	2,420	1,450	2,260	1,210	1,490	1,040	790	720	616	688
28	850	1,720	4,790	1,660	2,540	1,290	1,530	1,000	755	720	616	655
29	850	2,520	7,180	2,360	2,980	1,330	1,580	1,000	755	720	610	642
30	820	2,410	4,200	5,510	-------	1,250	1,660	965	755	688	616	655
31	820	-------	3,180	7,690	-------	1,250	-------	965	-------	688	598	-------

Monthly discharge of Clackamas River above Three Lynx Creek, Oreg., for the year ending September 30, 1924

[Drainage area, 488 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	1,940	755	939	1.92	2.21	57,700
November	5,350	760	1,290	2.64	2.94	76,800
December	8,590	1,450	2,660	5.45	6.28	164,000
January	7,690	1,330	2,020	4.14	4.77	124,000
February	8,370	2,040	3,410	6.99	7.54	196,000
March	2,200	1,180	1,480	3.03	3.49	91,000
April	1,990	1,330	1,680	3.44	3.84	100,000
May	1,760	965	1,370	2.81	3.24	84,220
June	1,040	735	855	1.75	1.95	50,900
July	755	688	718	1.47	1.70	44,100
August	755	544	647	1.33	1.53	39,800
September	1,100	584	645	1.32	1.47	38,400
The year	8,590	544	1,470	3.01	40.96	1,070,000

CLACKAMAS RIVER NEAR CAZADERO, OREG.

LOCATION.—In NE. ¼ sec. 11, T. 4 S., R. 4 E., half a mile above backwater from Cazadero Dam of Portland Electric Power Co. and 3 miles southeast of Cazadero, Clackamas County.

DRAINAGE AREA.—665 square miles (revised).

RECORDS AVAILABLE.—January 1, 1909, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank, referred to a vertical staff in well and to an inclined and vertical staff gage on bank, used since October 10, 1922; inspected by employees of Portland Electric Power Co.

DISCHARGE MEASUREMENTS.—Made from a cable half a mile below gage.

CHANNEL AND CONTROL.—Bed composed of rocks and gravel; control practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 45.65 feet at 4.30 p. m. December 6 (discharge, 23,800 second-feet); minimum stage, 31.58 feet at 8 p. m. August 10 caused by a shutdown at the power house at Three Lynx (discharge, 415 second-feet); minimum natural flow, 690 second-feet on several days in September.

1909–1924: Maximum stage recorded from watermark inside of recorder shelter (float caught on floor at stage of 53.10 feet for 22 hours) 56.2 feet about 6 p. m. January 6, 1923 (discharge, 60,000 second-feet); minimum, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—The flow is regulated to some extent by the power house of the Portland Electric Co., just above Three Lynx Creek. Water is diverted from the Oak Grove Fork at intake and returned to Clackamas River through this power house. Except for a few hours after a shutdown, the daily fluctuation at the gage is small.

ACCURACY.—Stage-discharge relation changed below 1,100 second-feet during high water on December 6. Rating curve before and after change well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection, or for days of considerable variation in stage, by averaging the results obtained by applying mean gage height for shorter intervals. Record excellent except for discharges below 1,000 second-feet for which they are good.

COOPERATION.—Most of field data furnished by Portland Electric Power Co.

Discharge measurements of Clackamas River near Cazadero, Oreg., during the year ending September 30, 1924

Date	Gage height in feet		Discharge	Date	Gage height in feet		Discharge
	Old gage	New gage			Old gage	New gage	
			Sec.-ft.				*Sec.-ft.*
Oct. 17	27.42	34.87	2,420	July 1	----------	32.63	887
Nov. 15	25.10	32.80	912	July 26	24.90	32.44	778
Dec. 6	37.60	45.50	23,400	Aug. 5	----------	32.40	666
Dec. 7	31.98	39.93	9,310	Sept. 4	24.80	32.29	656
Jan. 17	27.23	34.78	2,274	Sept. 16	24.76	32.26	642
Mar. 29	26.84	34.38	2,080				

Daily discharge, in second-feet, of Clackamas River near Cazadero, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	900	995	2,880	4,050	12,200	3,080	1,950	2,080	1,080	865	740	740
2	900	1,230	2,480	3,540	8,600	2,880	2,260	2,120	1,080	865	740	690
3	920	1,170	2,120	3,080	8,600	2,790	2,580	2,080	1,050	840	765	690
4	945	1,070	2,030	2,790	8,120	2,680	2,480	2,080	1,050	840	790	690
5	920	1,040	2,120	2,480	9,620	2,480	2,300	2,030	1,050	840	761	690
6	1,100	1,040	11,300	2,300	7,800	2,390	2,390	1,950	1,110	840	790	690
7	1,320	1,020	9,460	2,210	6,050	2,300	2,880	1,830	1,230	840	790	690
8	1,140	995	5,910	2,160	6,520	2,120	2,980	1,830	1,140	840	790	765
9	1,020	995	4,180	2,030	5,450	2,120	2,880	1,950	1,080	840	740	740
10	970	970	3,420	2,880	4,580	2,030	2,790	2,030	1,050	840	635	715
11	945	970	3,180	3,660	4,180	1,950	3,080	1,950	995	840	840	690
12	920	995	2,980	2,980	4,180	1,910	2,980	1,790	995	815	765	690
13	900	995	2,880	2,680	4,440	1,950	2,880	1,710	840	815	740	690
14	900	995	3,180	2,480	4,180	1,990	2,680	1,630	995	790	740	690
15	1,040	970	2,980	2,580	3,920	1,950	2,300	1,560	995	790	740	690
16	1,750	945	2,880	2,480	3,420	1,910	2,300	1,490	940	790	678	690
17	2,470	945	2,780	2,390	3,540	1,870	2,390	1,420	995	790	704	690
18	1,670	945	2,980	2,260	3,180	1,790	2,880	1,380	1,290	790	840	690
19	1,350	945	2,880	2,030	2,980	1,790	2,790	1,350	1,230	790	790	690
20	1,230	1,040	2,680	1,950	2,880	1,950	2,580	1,320	1,080	790	790	765
21	1,200	995	2,390	1,870	2,880	1,790	2,480	1,320	1,020	790	740	740
22	1,460	995	2,210	1,790	2,790	1,710	2,390	1,320	995	790	740	690
23	1,460	2,680	2,120	2,030	2,880	1,630	2,300	1,320	968	765	740	765
24	1,260	7,840	2,300	2,030	2,790	1,600	2,210	1,290	940	740	740	940
25	1,170	4,400	3,810	1,910	2,880	1,560	2,030	1,260	940	740	715	915
26	1,120	2,880	3,790	1,950	2,980	1,520	1,950	1,230	915	765	715	1,050
27	1,100	2,260	3,180	2,080	3,080	1,710	1,950	1,200	915	765	715	840
28	1,070	2,520	7,840	2,300	3,540	1,830	1,990	1,200	890	765	715	790
29	1,040	4,440	11,900	3,180	3,300	1,950	2,030	1,170	890	740	690	765
30	1,020	3,920	7,320	7,320	-------	1,790	2,120	1,140	865	740	690	740
31	995	-------	5,000	10,600	-------	1,830	-------	1,110	-------	740	649	-------

Monthly discharge of Clackamas River near Cazadero, Oreg., for the year ending September 30, 1924

[Drainage area, 665 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	2,470	900	1,170	1.76	2.03	71,900
November	7,840	945	1,770	2.66	2.97	105,000
December	11,900	2,030	4,110	6.18	7.12	253,000
January	10,600	1,790	2,940	4.42	5.10	181,000
February	12,200	2,790	4,920	7.40	7.98	283,000
March	3,080	1,520	2,030	3.05	3.52	125,000
April	3,080	1,950	2,460	3.70	4.13	146,000
May	2,080	1,110	1,590	2.39	2.76	97,800
June	1,290	865	1,020	1.53	1.71	60,700
July	865	740	800	1.20	1.38	49,200
August	840	635	745	1.12	1.29	45,800
September	1,050	690	744	1.12	1.25	44,300
The year	12,200	635	2,020	3.04	41.24	1,460,000

OAK GROVE FORK AT TIMOTHY MEADOWS, OREG.

LOCATION.—In SW. ¼ sec. 23, T. 5 S., R. 8 E., one-third mile above Timothy Meadows dam site, 11¼ miles above station at intake, 17 miles above mouth of Oak Grove Fork, and 43 miles above Cazadero, Clackamas County.

DRAINAGE AREA.—54 square miles (revised).

RECORDS AVAILABLE.—February 25, 1913, to November 26, 1916; July 14, 1918, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank; inspected by employees of Portland Electric Power Co.

DISCHARGE MEASUREMENTS.—Made from footbridge 20 feet above gage.

CHANNEL AND CONTROL.—Bed composed of gravel; control fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 1.37 feet at 5 p. m. December 6 (discharge, 309 second-feet); minimum stage from water-stage recorder, 0.53 foot at 6 a. m. September 30 (discharge, 102 second-feet).

1913–1916; 1918–1924: Maximum stage from recorder, 3.20 feet January 7, 1923 (discharge, 970 second-feet); minimum stage recorded, 0.43 foot at 6 p. m. November 11, 1915 (discharge, 100 second-feet).

ICE.—Stage-discharge relation not affected by ice as it is largely spring fed.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation evidently changed slightly early in October, permanent thereafter. Well defined rating curve used October 16 to September 30; shifting-control method used October 1–15. Operation of water-stage recorder satisfactory. Records good.

COOPERATION.—Field data furnished by the Portland Electric Power Co.

Discharge measurements of Oak Grove Fork at Timothy Meadows, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 22	0.72	133	Feb. 9	1.03	209	Aug. 27	0.58	109
Dec. 13	.77	142	July 22	.64	118	Sept. 23	.56	107

Daily discharge, in second-feet, of Oak Grove Fork at Timothy Meadows, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	128	122	128	178	207	193	163	178	138	132	118	110
2	128	123	127	178	209	191	168	175	138	132	116	110
3	128	122	125	170	196	188	165	175	138	132	116	110
4	128	122	123	161	223	185	161	178	138	132	116	110
5	128	120	123	158	238	185	158	178	138	132	116	110
6	132	120	235	153	232	185	158	175	147	132	116	108
7	132	120	201	151	229	183	161	173	145	132	116	108
8	130	118	168	149	218	178	161	173	145	130	116	110
9	132	118	158	147	209	175	163	170	143	130	115	110
10	134	118	149	165	204	175	165	168	140	130	115	108
11	134	118	149	165	201	173	173	168	140	128	115	107
12	134	118	145	153	209	170	173	168	140	128	115	105
13	134	118	143	149	229	170	178	168	140	127	115	105
14	134	118	140	147	221	175	180	165	140	127	115	105
15	136	118	138	147	212	170	178	163	140	125	115	105
16	143	116	136	145	204	168	180	161	138	125	113	105
17	136	116	134	147	201	165	178	161	138	123	113	105
18	134	116	134	145	196	163	180	156	138	122	113	105
19	134	118	132	140	193	163	180	151	138	122	113	105
20	130	118	130	138	193	163	178	151	136	120	113	105
21	130	118	128	138	193	163	178	151	136	120	111	103
22	136	118	127	136	191	161	178	151	136	120	111	103
23	127	143	127	136	188	161	178	147	134	118	111	107
24	125	163	127	136	185	158	173	147	134	118	110	108
25	125	138	145	136	185	156	173	145	134	120	110	110
26	125	130	138	136	188	156	173	143	134	120	110	107
27	125	127	132	134	193	158	173	143	134	118	110	103
28	125	128	201	134	207	153	173	143	134	118	110	103
29	122	140	252	140	198	158	175	143	134	118	110	103
30	122	136	209	163	-------	156	178	143	132	118	110	105
31	122	-------	191	185	-------	158	-------	140	-------	118	110	-------

Monthly discharge of Oak Grove Fork at Timothy Meadows, Oreg., for the year ending September 30, 1924

[Drainage area, 54 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	143	122	130	2.41	2.78	7,990
November	163	116	124	2.30	2.57	7,380
December	252	123	151	2.80	3.23	9,280
January	185	134	150	2.78	3.20	9,220
February	238	185	205	3.80	4.10	11,800
March	193	156	170	3.15	3.63	10,500
April	180	158	172	3.19	3.56	10,200
May	178	140	160	2.96	3.41	9,840
June	147	132	138	2.56	2.86	8,210
July	132	118	125	2.31	2.66	7,690
August	118	110	113	2.09	2.41	6,950
September	110	103	107	1.98	2.21	6,370
The year	252	103	145	2.69	36.62	105,000

OAK GROVE FORK AT PORTLAND ELECTRIC POWER CO.'S INTAKE, OREG.

LOCATION.—In SE. ¼ sec. 4, T. 6 S., R. 7 E., three-fourths mile above intake of Oak Grove power development of Portland Electric Power Co. and 35 miles above Cazadero, Clackamas County.

DRAINAGE AREA.—126 square miles (measured by engineers of Portland Electric Power Co.). 131 square miles at former station.

RECORDS AVAILABLE.—December 3, 1923, to September 30, 1924, at present site; at former location below Kink Creek about half a mile downstream in SW. ¼ sec. 4, May 21, 1909, to December 2, 1923.

GAGE.—Stevens continuous water-stage recorder installed on right bank, recorder at old location in SW. ¼ sec. 4 used to September 30, 1923; meter measurements made practically every day, October 8 to December 2.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Bed composed of boulders, irregular but apparently fairly permanent; a small spring-fed tributary enters just below cable, discharge of which is included in measurements.

EXTREMES OF DISCHARGE.—Maximum stage during the year from water-stage recorder, 3.03 feet at 8 p. m. December 28 (discharge, 1,230 second-feet); minimum stage recorded, 1.52 feet September 4, 16, 21, 22, 28, and 29 (discharge, 314 second-feet).

1909–1924: Maximum stage from water-stage recorder, 5.35 feet at old gage January 7, 1923 (discharge, 5,000 second-feet); minimum discharge recorded, 313 second-feet November 12 and 14, 1920 (gage height, 0.81 foot).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation at new location, permanent. Rating curve well defined between 300 and 1,300 second-feet. Operation of water-stage recorder at new location satisfactory from December 13. Daily discharge ascertained, except as indicated in footnote to daily-discharge table, by applying to rating table mean daily gage height determined from recorder graph by inspection. Records good except for period before recorder was started for which they are fair.

COOPERATION.—Field data furnished by Portland Electric Power Co.

Discharge measurements of Oak Grove Fork at Portland Electric Power Co.'s intake, Oreg., during the year ending September 30, 1924

Below Kink Creek

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 8	0.70	344	Oct. 28	0.69	333	Nov. 15	0.62	309
Oct. 12	.66	330	Oct. 29	.68	314	Nov. 16	.63	327
Oct. 13	.63	326	Oct. 30	.69	330	Nov. 17	.63	310
Oct. 14	.66	335	Oct. 31	.72	313	Nov. 18	.63	334
Oct. 15	.70	343	Nov. 1	.63	321	Nov. 19	1.27	342
Oct. 16	.82	383	Nov. 2	.70	343	Nov. 20	1.25	329
Oct. 17	.74	350	Nov. 3	.67	327	Nov. 22	1.60	327
Oct. 19	.69	335	Nov. 4	.63	325	Nov. 23	------	454
Oct. 20	.71	346	Nov. 5	.64	326	Nov. 24	------	480
Oct. 21	.75	339	Nov. 6	.66	328	Nov. 26	[a].60	348
Oct. 22	.80	371	Nov. 7	.62	327	Nov. 27	.60	358
Oct. 23	.72	333	Nov. 8	.63	309	Dec. 3	1.67	348
Oct. 24	.69	342	Nov. 10	.62	309	Dec. 4	1.67	362
Oct. 25	.68	311	Nov. 11	.63	312	Dec. 5	1.66	339
Oct. 26	.69	333	Nov. 12	.62	311	Dec. 11	1.81	428
Oct. 27	.69	314	Nov. 13	.63	311			

Above Kink Creek

Dec. 3	1.67	380	Jan. 3	1.92	492	June 3	1.66	381
Dec. 4	1.67	386	Jan. 12	1.84	453	June 11	1.63	361
Dec. 5	1.66	374	Jan. 22	1.70	399	July 16	1.54	325
Dec. 6	2.78	1,040	Feb. 4	2.39	789	Aug. 11	1.54	326
Dec. 11	1.80	441	Feb. 12	2.23	668	Aug. 11	1.54	323
Dec. 28	2.58	866	May 3	1.95	518	Sept. 11	1.52	314

[a] Outside gage.

Daily discharge, in second-feet, of Oak Grove Fork at Portland Electric Power Co.'s intake, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		350	380	530	840	568	445	535	386	346	332	318
2		370	380	500	762	556	455	535	386	341	332	318
3		360	382	495	730	551	465	530	381	337	332	318
4	360	350	382	460	840	535	450	535	381	337	328	314
5		360	378	460	872	525	445	530	377	332	328	314
6		360	775	455	840	520	455	515	404	328	328	314
7		360	650	445	808	510	475	510	408	328	328	314
8	370	340	505	440	749	500	485	505	400	328	328	314
9	370	340	465	431	698	495	490	515	386	323	328	314
10	360	340	455	495	662	490	505	520	381	323	328	314
11	360	340	445	505	650	480	540	530	377	323	328	314
12	360	340	435	465	698	480	546	525	372	323	328	314
13	360	340	426	445	710	480	546	515	363	323	328	314
14	360	340	422	436	698	490	540	505	363	323	328	314
15	370	340	418	450	680	485	520	500	359	323	328	314
16	410	360	408	436	650	475	530	485	354	323	328	314
17	380	340	408	431	628	465	535	475	359	323	332	323
18	370	360	418	422	611	460	540	460	381	323	337	332
19	360	370	408	408	590	460	535	455	363	323	328	328
20	380	360	400	404	578	460	530	450	359	323	328	318
21	370	360	390	400	578	450	535	436	354	318	328	314
22	400	360	382	400	568	450	535	431	354	318	328	314
23	360	480	382	413	556	445	530	422	354	318	328	318
24	370	510	395	404	551	440	515	418	354	318	328	350
25	340	440	475	395	556	431	510	413	354	318	323	386
26	360	380	431	395	556	426	510	408	354	318	323	328
27	340	390	418	400	568	440	515	408	350	323	323	318
28	360	390	710	408	611	460	520	404	350	323	323	314
29	340	390	905	465	578	445	530	400	346	323	323	314
30	360	390	692	612	-------	431	535	395	346	323	318	332
31	340	-------	595	762	-------	436	-------	390	-------	328	318	-------

NOTE.—Mean discharge Oct. 1–7 estimated by comparison with record for gaging station at Timothy Meadows. Daily discharge Oct. 8 to Dec. 2, computed from discharge-measurements made nearly every day at bridge below Kink Creek, the result being increased by underground flow of about 30 second-feet between Kink Creek and dam as determined by discharge measurements on same day below Kink Creek and at new gaging station upstream; Dec. 3–5 from daily-discharge measurements at new gaging station; Dec. 6–10, computed from a gage-height graph estimated by comparison with graph for gaging station at Timothy Meadows; Dec. 11, discharge measurement; Dec. 12, interpolated.

Monthly discharge of Oak Grove Fork at Portland Electric Power Co.'s intake, Oreg., for the year ending September 30, 1924

[Drainage area, 126 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	410	340	364	2.89	3.33	22,400
November	510	340	370	2.94	3.28	22,000
December	905	380	475	3.77	4.35	29,200
January	762	395	457	3.63	4.18	28,100
February	872	551	670	5.32	5.74	38,500
March	568	426	479	3.80	4.38	29,500
April	546	445	509	4.04	4.51	30,300
May	535	390	473	3.75	4.32	29,100
June	408	346	368	2.92	3.26	21,900
July	346	318	325	2.58	2.97	20,000
August	337	318	327	2.60	3.00	20,100
September	386	314	321	2.55	2.84	19,100
The year	905	314	427	3.39	46.16	310,000

LEWIS RIVER BASIN

LEWIS RIVER NEAR COUGAR, WASH.

LOCATION.—In SE. ¼ sec. 29, T. 7 N., R. 5 E., Skamania County, three-quarters of a mile above Peterson ranch, 1 mile below Swift Creek, and 5 miles above Cougar, Cowlitz County.

DRAINAGE AREA.—483 square miles.

RECORDS AVAILABLE.—July 1, 1910, to March 2, 1912; June 19 to September 30 1924, July 27, 1909, to June 30, 1910, at a point about 1,000 feet above Swift Creek.

GAGE.—Stevens continuous water-stage recorder on right bank; vertical staff prior to August 26, 1924. Gage used 1910 to 1912 bears no determined relation to present gage; inspected by Ole Peterson.

DISCHARGE MEASUREMENTS.—Made from cable 40 feet below gage; current fairly smooth and conditions favorable.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and large boulders at control at head of island, about 1,000 feet below gage, with some sand at gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period June 24 to September 30, 1.04 feet June 19 (discharge, 1,080 second-feet); minimum stage recorded, 0.30 foot September 22 (discharge, 500 second-feet).

1910–1912; 1924: Maximum stage recorded, 13.8 feet November 21, 1910 (discharge, not computed); minimum stage, that of 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Staff gage read to hundredths once every other day June 19 to August 24; the record from water-stage recorder used August 26 to September 30 was somewhat unsatisfactory at times because of a varying difference between elevation of water surface in well and river. Daily discharge ascertained by applying to rating table daily gage height or the mean daily gage height determined from recorder graph by inspection. Records good.

The following discharge measurements were made:

September 9, 1924: Gage height, 0.46 foot; discharge, 596 second-feet.

September 24, 1924: Gage height, 0.85 foot; discharge, 988 second-feet.

Daily discharge, in second-feet, of Lewis River near Cougar, Wash., for the period June 19 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		912	728	605	16		808	626	577
2		920	720	605	17		816	705	570
3		928	720	591	18		800	784	570
4		904	720	591	19	1,080	784	832	563
5		880	688	605	20	1,060	776	784	549
6		848	656	598	21	1,040	768	712	514
7		816	648	598	22	1,030	744	640	500
8		816	640	626	23	1,020	720	656	672
9		816	656	605	24	974	752	672	952
10		808	672	577	25	928	784	648	896
11		800	664	577	26	920	792	626	688
12		797	656	570	27	912	800	626	672
13		784	648	577	28	896	816	633	570
14		792	640	577	29	880	832	656	800
15		800	633	577	30	896	784	640	960
					31		736	619	

Monthly discharge of Lewis River near Cougar, Wash., for the period June 19 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 19–30	1,080	880	970	23,100
July	928	720	811	49,900
August	832	619	676	41,600
September	960	500	631	37,500
The period				152,000

LEWIS RIVER NEAR AMBOY, WASH.

LOCATION.—In sec. 36, T. 6 N., R. 3 E., at Cresap's ferry crossing, 1 mile below new bridge on county road from Amboy to Cougar, 1½ miles below Canyon Creek, 2 miles above Speilei Creek, and 5 miles northwest of Amboy, Clark County.

DRAINAGE AREA.—665 square miles (measured on map in Water-Supply Paper 253, p. 74, and checked on Forest-Service map).

RECORDS AVAILABLE.—January 20, 1911, to September 30, 1924.

GAGE.—Inclined staff with vertical upper section on left bank; read twice daily by J. M. Hanley.

DISCHARGE MEASUREMENTS.—Made from cable about 30 feet below gage.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders; shifts during extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.1 feet at 4 p. m. January 31 (discharge, 24,500 second-feet); minimum stage recorded, —0.20 foot September 5–14 and 19–22 (discharge, 660 second-feet).

1911–1924: Maximum stage determined by leveling to high-water marks, 16.4 feet December 18, 1917 (discharge estimated from extension of rating curve, 60,000 second-feet); minimum discharge recorded, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATIONS.—None.

ACCURACY.—Stage-discharge relation changed slightly during winter, at low stages only. Two well defined rating curves used. Gage read to hundredths twice daily at low stages, to tenths at medium and high stages. Daily discharge ascertained by applying mean daily gage heights to rating table. Records good.

Discharge measurements of Lewis River near Amboy, Wash., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 22	1.40	2,210	Aug. 14	−0.04	745
June 17	.51	1,140	Sept. 26	.15	888

Daily discharge, in second-feet, of Lewis River near Amboy, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,220	954	2,860	4,300	22,300	5,080	2,190	3,120	1,570	1,000	805	685
2	1,170	1,170	2,540	3,880	15,200	4,740	2,470	3,120	1,570	1,010	805	685
3	1,170	1,130	2,330	3,490	12,600	4,520	2,470	3,040	1,570	990	805	685
4	1,170	1,090	2,330	3,210	11,200	4,080	2,620	3,210	1,570	990	770	685
5	1,170	1,090	2,330	3,120	19,900	3,880	2,470	3,040	1,570	990	770	660
6	975	1,090	20,800	2,860	14,800	3,680	2,620	2,780	1,520	974	770	660
7	926	1,050	13,000	2,780	12,300	3,490	2,780	2,620	1,520	974	770	660
8	905	996	8,000	2,780	9,840	3,300	2,950	2,620	1,410	974	770	660
9	877	975	5,960	2,620	9,200	3,040	2,950	3,040	1,360	950	770	660
10	846	975	4,740	5,700	8,900	2,620	2,950	3,210	1,360	950	770	660
11	822	968	4,300	5,200	8,900	2,780	2,950	4,080	1,310	926	770	660
12	810	947	3,880	3,880	22,800	2,620	2,950	4,410	1,310	926	770	660
13	810	940	3,680	3,580	17,200	2,620	2,950	4,520	1,260	910	770	660
14	810	926	4,410	3,210	12,600	2,620	2,780	4,080	1,250	910	746	660
15	905	912	4,520	3,210	9,520	2,540	2,620	3,400	1,230	910	746	685
16	2,260	905	4,300	3,120	8,300	2,470	2,620	3,300	1,210	896	740	685
17	3,400	884	3,880	3,040	7,700	2,330	2,950	3,120	1,160	896	740	685
18	1,920	884	4,630	2,860	7,100	2,330	3,680	3,040	1,620	875	1,410	670
19	1,620	898	4,410	2,780	6,240	2,330	3,490	2,780	1,360	875	1,120	660
20	1,570	940	3,880	2,470	5,700	2,330	3,300	2,700	1,210	875	990	660
21	1,410	954	3,490	2,400	5,440	2,190	3,040	2,620	1,160	875	854	660
22	1,310	982	3,210	2,330	5,080	2,190	3,120	2,620	1,120	875	784	660
23	1,260	2,120	3,120	2,330	4,960	2,120	2,950	2,470	1,110	875	770	826
24	1,170	8,000	3,400	2,470	4,520	2,050	2,780	2,330	1,080	875	770	1,120
25	1,090	4,520	5,080	2,470	4,960	2,050	2,780	2,260	1,070	875	770	1,240
26	1,090	3,120	4,300	2,540	5,320	2,050	2,700	2,190	1,070	875	770	950
27	1,050	3,880	4,080	2,620	5,440	2,050	2,700	1,920	1,040	854	770	856
28	1,010	4,080	9,200	3,300	6,240	2,260	2,700	1,800	1,030	854	770	770
29	1,000	3,880	9,840	4,960	5,570	2,190	2,780	1,680	1,010	847	746	710
30	996	3,490	6,520	9,840	-------	2,120	2,950	1,680	1,000	840	710	1,620
31	982	-------	4,960	23,900	-------	2,120	-------	1,620	-------	840	685	-------

Monthly discharge of Lewis River near Amboy, Wash., for the year ending September 30, 1924

[Drainage area, 665 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	3,400	810	1,220	1.83	2.11	75,000
November	8,000	884	1,820	2.74	3.06	108,000
December	20,800	2,330	5,290	7.95	9.16	325,000
January	23,900	2,330	4,100	6.17	7.11	252,000
February	22,800	4,520	9,990	15.0	16.18	575,000
March	5,080	2,050	2,800	4.21	4.85	172,000
April	3,680	2,190	2,840	4.27	4.76	169,000
May	4,520	1,620	2,850	4.29	4.95	175,000
June	1,620	1,000	1,290	1.94	2.16	76,800
July	1,010	840	912	1.37	1.58	56,100
August	1,410	685	807	1.21	1.40	49,600
September	1,620	660	760	1.14	1.27	45,200
The year	23,900	660	2,870	4.32	58.59	2,080,000

LEWIS RIVER NEAR ARIEL, WASH.

LOCATION.—In SE. ¼ sec. 33, T. 6 N., R. 2 E., 3½ miles southwest of Ariel post office, Cowlitz County, and 12 miles by road above mouth of river.

DRAINAGE AREA.—733 square miles.

RECORDS AVAILABLE.—July 27 to October 28, 1922; July 31, 1923, to September 30, 1924, at present site; July 7 to November 30, 1909, for station at Ariel, 3½ miles upstream.

GAGE.—Inclined staff on right bank; read by Walter Chilton.

DISCHARGE MEASUREMENTS.—Made from cable about 60 feet above gage; from boat near same location prior to September, 1924.

CHANNEL AND CONTROL.—Bed composed of gravel, smooth and fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.7 feet at 5 p. m. December 6 (discharge, 29,100 second-feet); minimum stage recorded, 0.60 foot on September 18–22 (discharge, 760 second-feet).

1909; 1922–1924: Maximum and minimum discharges recorded, those of 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed below 2.7 feet during high water on December 6 and affected by logs on control June 4–24. Rating curves used before and after change, fairly well defined below 30,000 second-feet. Staff gage read to hundredths generally twice a day. Daily discharge ascertained by applying mean daily gage height to rating table except June 4–24 when daily discharge was estimated from a comparison with hydrograph for Lewis River near Amboy. Records good except June 4–24 for which they are fair.

The following discharge measurements were made:

July 11, 1924: Gage height, 0.86 foot; discharge, 904 second-feet.

September 17, 1924: Gage height, 0.62 foot; discharge, 775 second-feet.

Daily discharge, in second-feet, of Lewis River near Ariel, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	890	1,030	3,260	5,000	26,200	5,560	2,140	3,180	1,410	1,010	870	785
2	890	1,070	2,820	4,740	20,400	5,560	2,240	3,180	1,290	1,010	870	785
3	890	1,070	2,600	4,220	15,600	5,280	2,940	3,440	1,290	1,010	870	785
4	920	1,070	2,400	3,700	18,800	5,000	2,820	3,570	1,410	1,010	870	785
5	920	1,070	2,600	3,180	23,300	4,480	2,700	3,180	1,670	1,010	870	785
6	920	990	19,800	2,940	17,800	3,960	2,460	3,060	1,620	940	840	785
7	990	990	16,900	2,700	16,000	3,700	2,700	2,820	1,570	940	840	785
8	920	990	9,300	2,700	12,200	3,440	2,940	3,700	1,460	940	840	810
9	890	990	6,400	6,120	9,600	3,180	2,940	3,700	1,410	940	840	810
10	890	990	7,800	7,240	7,800	3,060	2,940	3,960	1,410	940	840	760
11	920	955	7,800	6,120	9,600	2,940	2,940	4,220	1,360	940	840	765
12	890	990	6,120	5,000	22,300	2,820	2,940	4,740	1,360	870	840	760
13	890	990	3,700	4,220	23,600	2,700	2,820	5,000	1,310	870	840	760
14	920	990	4,480	3,960	16,600	2,700	2,820	3,440	1,300	940	810	770
15	920	990	3,960	3,700	12,900	2,460	2,940	3,440	1,270	940	810	770
16	1,520	955	4,480	3,440	10,200	2,460	3,960	3,440	1,260	905	840	780
17	4,480	955	4,480	3,180	9,000	2,240	4,220	3,440	1,210	870	840	765
18	2,300	955	5,000	2,820	7,800	2,240	3,440	3,060	1,720	870	940	760
19	1,670	955	5,280	2,700	6,680	2,240	3,440	2,700	1,410	905	1,010	760
20	1,520	990	5,000	2,700	6,120	2,240	3,440	2,700	1,260	870	870	760
21	1,320	1,030	4,480	2,460	6,120	2,040	3,440	2,460	1,210	870	810	760
22	1,260	1,070	3,440	2,350	5,840	2,040	3,180	2,460	1,170	870	810	760
23	1,260	2,710	3,310	2,460	5,560	2,040	2,940	2,350	1,160	870	810	785
24	1,160	9,600	3,700	2,700	5,560	1,950	2,820	2,040	1,130	870	810	1,010
25	1,070	6,120	5,840	2,700	5,560	1,860	2,700	1,860	1,090	870	810	1,240
26	1,070	4,480	5,000	2,700	6,120	1,860	2,700	1,700	1,010	870	810	1,050
27	1,070	3,260	4,480	2,940	6,400	1,950	2,700	1,700	1,010	870	810	940
28	1,030	3,500	11,200	3,440	6,680	2,240	2,700	1,550	1,010	870	810	870
29	1,030	3,980	13,800	5,840	6,680	2,240	2,580	1,550	1,010	870	810	810
30	1,030	3,740	8,400	9,600	-------	2,040	2,940	1,550	1,010	870	785	905
31	1,030	-------	6,680	27,500	-------	2,040	-------	1,410	-------	870	785	-------

Monthly discharge of Lewis River near Ariel, Wash., for the year ending September 30, 1924

[Drainage area, 733 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	4,480	890	1,210	1.65	1.90	74,400
November	9,600	955	1,980	2.70	3.01	118,000
December	19,800	2,400	6,270	8.55	9.86	386,000
January	27,500	2,350	4,680	6.38	7.36	288,000
February	26,200	5,560	12,000	16.4	17.69	690,000
March	5,560	1,860	2,920	3.98	4.59	180,000
April	4,220	2,140	2,950	4.02	4.48	176,000
May	5,000	1,410	2,920	3.98	4.59	180,000
June		1,010	1,290	1.76	1.96	76,800
July	1,010	870	913	1.25	1.44	56,100
August	1,010	785	840	1.15	1.33	51,600
September	1,240	760	822	1.12	1.25	48,900
The year	27,500	760	3,210	4.38	59.46	2,330,000

SWIFT CREEK NEAR COUGAR, WASH.

LOCATION.—In NW. ¼ sec. 28, T. 7 N., R. 5 E., Skamania County, one-eighth mile above mouth, 2 miles east of Peterson's ranch, and 6 miles east of Cougar, Cowlitz County.

DRAINAGE AREA.—26 square miles. Measured on Mount St. Helens topographic sheet.

RECORDS AVAILABLE.—August 1 to October 31, 1909; June 18 to September 30, 1924.

GAGE.—Stevens continuous recorder on left bank about 200 feet above Forest Service trail bridge; gage used in 1909 about a quarter of a mile upstream and 30 feet above present cable.

DISCHARGE MEASUREMENTS.—Made from cable a quarter of a mile above gage. Stream bed rough and current swift.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and boulders; one channel except at extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage during period June 18 to September 30 from water-stage recorder, 0.84 foot at 10 a. m. September 30 (discharge, 179 second-feet); minimum stage recorded, 0.40 foot September 17 and 21 (discharge, 80 second-feet).

1909 and 1924: Maximum and minimum discharges during periods of record, those of 1924.

ICE.—None.

DIVERSION.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation assumed to be permanent but may have changed slightly during period that shelter for recorder was being built. Rating curve fairly well defined. Staff gage read to hundredths once every other day except August 17 to September 4 when gage was removed; water-stage recorder started September 9, but operation was unsatisfactory because of poor connection between well and river. Daily discharge ascertained by applying daily gage height to rating table; discharge interpolated for days gage was not read and mean discharge estimated August 17 to September 4. Records fair.

The following discharge measurements were made:

September 8, 1924: Gage height, 0.50 foot; discharge, 96 second-feet.

September 24, 1924: Gage height, 0.70 foot; discharge, 154 second-feet.

Daily discharge, in second-feet, of Swift Creek near Cougar, Wash., for the period June 18 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		98	87	100	16		94	98	89
2		98	87		17		91		80
3		98	87		18	110	91		84
4		96	87		19	106	91		89
5		94	90	108	20	105	91		84
6		94	93	108	21	104	91		80
7		94	90	110	22	103	90		99
8		98	87	98	23	102	89		118
9		102	86	98	24	102	90	100	142
10		98	84	98	25	102	91		98
11		94	84	98	26	100	89		98
12		94	85	94	27	98	87		98
13		94	86	89	28	98	87		98
14		96	87	94	29	98	87		98
15		98	92	98	30	98	87		118
					31		87		

Monthly discharge of Swift Creek near Cougar, Wash., for the period June 18 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 18–30	110	98	102	2,630
July	102	87	92.9	5,710
August		84	93.9	5,770
September	142	80	98.9	5,890
The period				20,000

CANYON CREEK NEAR AMBOY, WASH.

LOCATION.—In SW. ¼ sec. 4, T. 5 N., R. 4 E., at wagon bridge, 2 miles above mouth and 6 miles northeast of Amboy, Clark County.

DRAINAGE AREA.—64 square miles.

RECORDS AVAILABLE.—July 25, 1922, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder just below bridge. Chain gage on bridge used up to September 26.

DISCHARGE MEASUREMENTS.—Made from cable above bridge, or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders, shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.20 feet at 9 a. m. December 6 (discharge, 5,020 second-feet); minimum discharge recorded, 20 second-feet October 2 (gage height, 0.33 foot).

1922–1924: Maximum stage, 11.3 feet December 24, 1922, observed from high-water mark (discharge, 13,000 second-feet); minimum discharge, that of 1924.

ICE.—None during year.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed during high water. Rating curves well defined below 500 second-feet, used October 1 to December 5 and December 6 to September 30. Gage read once a day to hundredths at low water, to tenths at high water. Operation of recorder satisfactory beginning September 26. Daily discharge ascertained by applying to rating table daily gage reading or mean gage height obtained by inspecting recorder graph. Records good except for extreme high stages, for which they are fair.

Discharge measurements of Canyon Creek near Amboy, Wash., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 22	1.30	176	Aug. 23	0.42	37.9
June 17	.57	47.7	Sept. 25	1.02	109

Daily discharge, in second-feet, of Canyon Creek near Amboy, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.
1	20	36	430	590	3,210	530	228	165	58	39	29	27
2	20	76	375	475	2,190	458	318	165	58	38	29	27
3	22	65	288	405	1,400	405	458	154	56	38	28	26
4	22	51	240	318	2,290	352	388	215	53	38	28	26
5	23	42	305	240	3,730	300	335	202	53	37	28	26
6	52	40	5,020	240	2,090	285	285	165	68	36	28	26
7	38	38	3,470	202	1,710	255	335	154	73	36	28	26
8	32	36	1,710	300	1,190	228	335	143	63	36	27	29
9	25	34	1,070	255	860	215	300	143	61	36	27	28
10	22	33	670	1,330	670	215	255	154	56	36	26	26
11	22	32	590	1,070	760	202	270	165	53	35	26	26
12	20	36	492	810	1,070	190	215	165	52	35	26	26
13	20	33	405	550	1,470	190	215	154	51	34	26	26
14	20	39	590	440	1,010	154	228	134	51	34	26	25
15	45	35	860	475	810	154	190	124	49	38	28	25
16	125	33	670	422	630	143	270	115	49	36	28	24
17	375	32	590	405	630	134	270	115	47	35	30	24
18	210	30	630	370	550	134	492	106	115	34	82	27
19	125	32	670	318	475	124	458	95	76	34	76	28
20	98	34	510	270	405	154	405	92	63	34	46	27
21	90	42	405	255	388	240	335	90	56	33	41	27
22	78	42	352	228	388	165	300	84	49	33	38	26
23	73	665	300	335	440	143	270	82	47	32	36	93
24	64	1,470	318	318	388	143	228	79	46	31	34	87
25	56	810	670	285	405	134	202	76	45	29	31	106
26	51	470	590	370	530	124	178	79	44	29	29	68
27	47	358	475	370	550	165	165	76	48	29	29	55
28	45	375	2,400	458	630	255	154	73	41	29	28	47
29	42	810	2,620	810	590	300	154	71	41	29	28	43
30	40	620	1,550	1,470	------	228	165	71	40	29	28	96
31	38	------	810	2,620	------	202	------	66	------	29	28	------

Monthly discharge of Canyon Creek near Amboy, Wash., for the year ending September 30, 1924

[Drainage area, 64 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	375	20	63.2	0.988	1.14	3,890
November	1,470	30	215	3.36	3.75	12,800
December	5,020	240	970	15.2	17.52	59,600
January	2,620	202	549	8.58	9.89	33,800
February	3,730	388	1,080	16.9	18.23	62,100
March	530	124	223	3.48	4.01	13,700
April	492	154	280	4.38	4.89	16,700
May	215	66	122	1.91	2.20	7,500
June	115	40	55.4	.866	.97	3,300
July	39	29	33.9	.530	.61	2,080
August	82	26	33.0	.516	.59	2,030
September	106	24	39.1	.611	.68	2,330
The year	5,020	20	303	4.73	64.48	220,000

KALAMA RIVER BASIN

KALAMA RIVER NEAR KALAMA, WASH.

LOCATION.—In sec. 7, T. 6 N., R. 1 E., 150 feet below power house of Puget Sound Power & Light Co. and 9 miles by road east of Kalama, Cowlitz County.

DRAINAGE AREA.—184 square miles, measured on Mount St. Helens quadrangle and map of Columbia National Forest.

RECORDS AVAILABLE.—July 6, 1911, to January 11, 1912; December 1, 1912, to September 30, 1913; August 19, 1916, to September 30, 1924.

GAGE.—Vertical staff bolted to rock ledge; lower section up to 8 feet on left bank; upper section 8 to 12 feet, in a cove on right bank opposite lower section; read by E. G. Moser.

DISCHARGE MEASUREMENTS.—Made from cable about half a mile below gage or by wading.

CHANNEL AND CONTROL.—Control is rock reef and bar of coarse gravel about 100 feet below gage; gravel may shift in extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage during year, 7.8 feet at 8 a. m. January 31 (discharge, 6,960 second-feet); minimum stage recorded, 0.5 foot September 17 and 22 (discharge, 158 second-feet).

1911–1913; 1916–1924: Maximum stage recorded, 10.6 feet at 9 a. m. January 6, 1923 (discharge, 12,300 second-feet); minimum stage recorded, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Operation of power plant causes some fluctuation, but gage is read only at times when load is steady.

ACCURACY.—Stage-discharge relation practically permanent during year; rating curve well defined. Gage read once a day to hundredths, twice a day to tenths above a stage of 5 feet. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

Discharge measurements of Kalama River near Kalama, Wash., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 10	0.68	210	July 10	0.72	205
Mar. 23	1.72	598	Sept. 13	.51	160

Daily discharge, in second-feet, of Kalama River near Kalama, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	217	498	1,140	4,930	1,550	715	520	295	223	190	171
2	190	277	455	1,070	3,880	1,340	770	520	289	223	190	167
3	205	241	435	885	2,950	1,270	825	498	289	217	195	171
4	205	229	435	825	3,630	1,070	770	590	283	217	190	167
5	205	223	520	798	4,270	1,070	715	542	283	217	185	171
6	265	217	4,140	770	3,390	1,000	690	495	342	211	185	171
7	223	211	2,950	715	3,160	915	770	475	325	211	180	171
8	211	211	1,690	770	2,450	855	770	475	295	205	180	171
9	205	205	1,200	770	1,950	855	715	475	295	205	180	171
10	200	200	1,000	1,620	1,620	825	715	475	295	211	180	167
11	195	205	975	1,950	1,950	770	690	475	289	211	180	167
12	190	205	855	1,480	3,390	715	665	475	283	200	176	162
13	190	205	770	1,200	2,750	715	665	455	277	200	176	162
14	195	211	1,000	1,070	2,050	715	665	435	271	217	180	162
15	229	205	1,140	1,070	1,690	665	640	415	265	223	180	162
16	565	205	1,000	1,000	1,620	690	665	395	265	217	180	162
17	945	200	975	1,000	1,770	690	640	395	265	205	180	158
18	542	200	1,140	915	1,620	665	1,070	378	325	217	435	171
19	415	211	1,070	825	1,410	615	915	378	283	211	283	171
20	360	205	885	770	1,340	615	825	360	265	205	229	162
21	325	217	825	742	1,270	590	770	360	265	200	205	162
22	325	211	798	715	1,200	590	715	360	259	205	195	158
23	289	520	715	770	1,000	565	665	360	253	200	190	342
24	265	1,410	715	770	1,340	565	615	342	253	200	185	378
25	259	885	1,070	742	1,480	542	590	325	247	200	180	378
26	247	690	1,140	825	1,690	520	565	325	241	200	180	289
27	235	565	1,070	885	1,860	615	542	325	235	195	176	235
28	235	565	2,350	1,140	1,860	742	542	325	235	195	176	217
29	235	590	3,390	2,450	1,770	715	542	310	235	190	171	200
30	229	565	2,150	2,850	-------	690	565	295	229	190	171	455
31	229	-------	1,480	6,660	-------	690	-------	295	-------	190	171	-------

Monthly discharge of Kalama River near Kalama, Wash., for the year ending September 30, 1924

[Drainage area, 184 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	945	190	284	1.54	1.78	17,500
November	1,410	200	350	1.90	2.12	20,800
December	4,140	435	1,250	6.79	7.83	76,900
January	6,660	715	1,260	6.85	7.90	77,500
February	4,930	1,000	2,250	12.2	13.16	129,000
March	1,550	520	788	4.28	4.93	48,500
April	1,070	542	700	3.80	4.24	41,700
May	590	295	415	2.26	2.61	25,500
June	342	229	274	1.49	1.66	16,300
July	223	190	207	1.12	1.29	12,700
August	435	171	195	1.06	1.22	12,000
September	455	158	205	1.11	1.24	12,200
The year	6,660	158	677	3.68	49.98	491,000

COWLITZ RIVER BASIN

LAKE CREEK AT OUTLET OF PACKWOOD LAKE, NEAR LEWIS, WASH.

LOCATION.—In sec. 21, T. 13 N., R. 10 E., 400 feet below outlet of Packwood Lake, 5 miles east of Lewis, Lewis County.

DRAINAGE AREA.—About 18 square miles (measured on Pl. I, Water-Supply Paper 313).

RECORDS AVAILABLE.—September 2, 1911, to September 30, 1924, when records were discontinued.

GAGE.—Friez water-stage recorder on left bank, installed August 3, 1918; inspected by J. A. Combs and Sherman Combs. For description of gages used prior to August 3, 1918, see Water-Supply Paper 484.

DISCHARGE MEASUREMENTS.—Made by wading near gage or from footbridge 200 feet upstream.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders. Incomplete control about 20 feet downstream from gage formed by several trees felled across the stream from both banks. Trees partly broken and wedged against a large boulder in midstream.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, from water-stage recorder, 2.42 feet at 11 a. m. May 14 (discharge, 278 second-feet). Stage may have been slightly higher some time during January 31 to February 2, when recorder was not operating. Minimum discharge, 33 second-feet November 18–20, 22, and for fraction of days September 20 and 24.

1911–1924: Maximum stage estimated, 6.0 feet December 18, 1917 (discharge, not determined); minimum stage recorded, 1.16 feet October 28–31, 1919 (discharge, 30 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Flow regulated by natural storage in the lake.

ACCURACY.—Stage-discharge relation changed February 11. Rating curves fairly well defined above 100 second-feet; poorly defined below. Operation of water-stage recorder fairly satisfactory except as noted in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection. Records good for May and June; for rest of year, fair.

COOPERATION.—Greater part of gage-height record furnished by Portland Electric Power Co.

The following discharge measurement was made:

October 4, 1924: Gage height, 1.48 feet; discharge, 75.7 second-feet.

Daily discharge, in second-feet, of Lake Creek at outlet of Packwood Lake, near Lewis, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	38	78	73		89	44	52	150	128	73	43
2	39	41	73	70	200	86	43	56	161	126	68	43
3	40	42	68	65		83	44	70	171	120	63	43
4	41	41	63	61	171	78	44	89	173	118	58	46
5	41	40	61	59	192	76	44	98	169	116	58	46
6	42	39	113	61	190	70	44	95	165	116		46
7	42	39	153	89	175	70	44	92	154	116		46
8	41	38	140	87	155	66	44	92	145	116		45
9	40	37	122	78	136	63	44	95	136	110		44
10	39	37	108	73	125	63	48	118	138	107		44
11	39	36	89	70	129	60	49	152	138	107		44
12	38	36	84	68	200	58	49	208	147	104		43
13	37	35	78	65	268	58	50	258	152	101		42
14	36	35	76	61	250	58	52	278	150	98	60	41
15	36	35	73	59	220	58	52	268	147	98		40
16	43	35	70	54	187	56	54	258	145	83		39
17	127	34	65	52	167	55	55	250	140	83		38
18	129	33	61	50	147	54	56	237	143	83		36
19	97	33	58	46	130	52	58	224	136	86		35
20	84	33	56	44	118	50	56	216	130	92		34
21	81	34	56	44	113	50	55	218	126	86		34
22	84	33	54	45	107	49	54	224	126	83		35
23	89	41	56	45	104	49	55	222	126	83	68	34
24	87	108	59	44	101	48	55	226	118	83	60	34
25	65	102	68		98	46	54	208	107	86	55	34
26	48	87	68		92	46	54	187	113	86	52	34
27	41	81	65		95	46	54	167	116	89	49	34
28	40	87	84	100	95	46	55	152	118	83	48	34
29	40	95	89		95	49	55	143	118	80	48	34
30	39	89	84		-------	48	55	138	120	78	44	38
31	38	-------	78		-------	46	-------	140	-------	76	43	-------

NOTE.—Water-stage recorder not operating Dec. 2, 3, 19, Jan. 25–31, Feb. 1–3, 12, Aug. 6–22, and Sept 7–11. Discharge Dec. 2, 3, 19, and Sept. 7–11 estimated by interpolation. Discharge for other gaps in record as indicated by braced figures, estimated from records of Johnson Creek near Lewis and from general information.

Monthly discharge of Lake Creek at outlet of Packwood Lake, near Lewis, Wash., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	129	36	55.5	3,410
November	108	33	49.8	2,960
December	153	54	79.0	4,860
January	-------	-------	69.8	4,290
February	-------	92	154	8,860
March	89	46	58.9	3,620
April	58	43	50.7	3,020
May	278	52	169	10,400
June	173	107	139	8,270
July	128	76	97.5	6,000
August	-------	-------	58.3	3,580
September	-------	34	39.4	2,340
The year	-------	33	84.8	61,600

JOHNSON CREEK AT MOUTH, NEAR LEWIS, WASH.

LOCATION.—In sec. 33, T. 13 N., R. 9 E., 1 mile above mouth and 3 miles southwest of Lewis, in Lewis County.

DRAINAGE AREA.—About 30 square miles (measured on Pl. I, Water-Supply Paper 313).

RECORDS AVAILABLE.—August 14, 1907, to September 23, 1914, and October 1, 1918, to September 30, 1924, when records were discontinued.

GAGE.—Friez water-stage recorder on left bank, installed October 1, 1918; inspected by J. A. Combs and Sherman Combs. A vertical staff gage about 80 feet below present site was used prior to September 23, 1914.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Channel composed of small boulders. Low-water control is riffle about 40 feet below gage; at high stages a considerable length of channel forms control. Banks steep; not subject to overflow. Channel curved above and fairly straight for 300 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year from water-stage recorder, 2.68 feet at 10 p. m. January 31 (discharge, 969 second-feet). Minimum stage from recorder, 0.39 foot at 4 p. m. September 22 (discharge, 23 second-feet).

1907–1914; 1918–1924; Maximum stage occurred December 12, 1921, while water-stage recorder was not operating (mean discharge for day, estimated 2,800 second-feet); minimum discharge occurred September 22, 1924.

ICE.—Stage-discharge relation not seriously affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed at high water February 1. Rating curve used prior to change fairly well defined below 1,500 second-feet. That used after change well defined above 30 second-feet. Operation of water-stage recorder fairly satisfactory except as noted in footnote to table of daily discharge. Discharge ascertained by applying to rating table mean daily gage height determined from recorder charts by inspection. Records good except for periods when recorder was not operating.

COOPERATION.—Greater part of gage-height record and discharge measurements furnished by Portland Electric Power Co.

Discharge measurements of Johnson Creek at mouth, near Lewis, Wash., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 21	1.16	141	Apr. 23	1.17	147	May 12	2.35	685
Apr. 23	1.18	142	May 12	2.28	609			

Daily discharge, in second-feet, of Johnson Creek at mouth, near Lewis, Wash., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	48	132	162	740	199	88	267	226	121	48	30
2	33	54	123	152	545	190	90	304	229	114	47	30
3	34	49	114	141	431	181	90	280	283	108	47	29
4	34	49	110	130	488	167	90	256	275	100	46	29
5	34	48	112		557	158	90	232	261	94	46	28
6	41	48	560		482	156	90	226	247	86	45	29
7	39	46	390		412	148	102	218	233	82	45	28
8	39	45	355	200	350	143	114	259	220	79	44	30
9	36	44	320		324	138	129	346	206	77	44	29
10	34	44	285		275	134	138	460	192	73	43	28
11	33	42	250		320	129	151	575	178	70	43	28
12	32	42	215	202	593	127	164	719	190	68	43	29
13	31	42	180	187	551	125	164	663	187	67	42	28
14	32	42	145	170	482	122	156	551	178	65	42	28
15	38	41	145	159	422	119	145	515	175	67	41	28
16	142	41	150	148	372	116	138	515	172	62	41	27
17	178	40	159	142	333	113	132	493	167	63	40	26
18	103	39	173	130	312	110	148	476	164	63	40	26
19	87	39	164	121	259	107	138	441	164	67	39	26
20	90	39	153	114	232	104	134	446	161	64	39	26
21	90	38	142	112	222	102	138	455	158	60	38	25
22	87	38	146	110	215	102	148	446	148	59	38	24
23	76	64	149	116	208	100	145	412	141	56	37	38
24	70	230	153	116	199	96	141	390	132	55	36	
25	66	231	170	114	199	92	143	341	125	52	35	
26	61	178	156	119	196	90	145	295	127	50	34	30
27	58	150	150		205	88	164	247	123	48	34	
28	56	181	231		215	88	190	236	119	48	33	
29	54	173	244	300	208	88	218	229	119	50	32	
30	50	153	205		-------	88	251	222	119	50	31	
31	48	-------	173		-------	88	-------	222	-------	48	31	-------

NOTE.—Water-stage recorder not operating or gage-height record faulty Dec. 8–13, 22, 23, Jan. 1–11, 27–30, Mar. 14–19, Apr. 11, May 3, 4, June 5–10, July 25, Aug. 1–21, 30, 31, and Sept. 1–4, 11–17, and 24–30. Discharge Jan. 5–11, 27–30, and Sept. 24–30, indicated by braced figures, estimated by comparison with records of Lake Creek at outlet of Packwood Lake, range of stage, or from general information; discharges Jan. 4 and Sept. 12 determined from staff-gage observations, for other periods of missing or faulty record, by interpolation.

Monthly discharge of Johnson Creek at mouth, near Lewis, Wash., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	178	31	59.4	3,650
November	231	38	77.3	4,600
December	560	110	199	12,200
January	-------	110	179	11,000
February	740	196	357	20,500
March	199	88	123	7,560
April	251	88	139	8,270
May	719	218	379	23,300
June	283	119	181	10,800
July	121	48	69.9	4,300
August	-------	-------	40.1	2,470
September	-------	24	28.6	1,700
The year	740	24	152	110,000

STREAMS BETWEEN COLUMBIA RIVER AND KLAMATH RIVER

ROGUE RIVER BASIN

ROGUE RIVER NEAR PROSPECT, OREG.

LOCATION.—In NE. ¼ sec. 19, T. 32 S., R. 3 E., 1 mile above intake of power flume of the California-Oregon Power Co., 2 miles northwest of Prospect, Jackson County, and 3 miles above mouth of Mill Creek.

DRAINAGE AREA.—315 square miles (revised).

RECORDS AVAILABLE.—July 17 to October 10, 1907; January 1, 1908, to February 17, 1912; October 1, 1923, to September 30, 1924.

GAGE.—Lietz water-stage recorder on left bank, inspected by L. H. Pankey; gage used from 1908 to 1912 was vertical staff a few hundred yards upstream, in sec. 20; staff gage in sec. 29, near flume intake, used in 1907.

DISCHARGE MEASUREMENTS.—Made from cable at gage, conditions fair.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders at and below gage; control is a bar just below gage which becomes an island at low stages, fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.69 feet at 6 p. m. February 7 (discharge, 2,090 second-feet); minimum stage from recorder, 1.29 feet September 11, 12, and 15–18 (discharge, 278 second-feet).

1907–1912; 1924: Maximum stage recorded, 7.0 feet November 22, 1909 (discharge estimated from extension of rating curve, 9,300 second-feet, both stage and discharge very uncertain); minimum that of 1924.

ICE.—None.

DIVERSIONS.—None above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent, rating curve well defined below 600 second-feet, poorly defined above. Operation of water-stage recorder satisfactory except for short periods. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of Rogue River near Prospect, Oreg., during the years ending September 30, 1923 and 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Sept. 8	1.50	394	Mar. 18	1.84	529	July 29	1.37	298
Nov. 14	1.67	441	May 21	1.86	525	Sept. 17	1.31	265
			July 26	1.37	322			

Daily discharge, in second-feet, of Rogue River near Prospect, Oreg., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		700	680	1,050	722	495	716	420	338	299	282
2		600	575	1,210	710	510	740	411	338	299	282
3		550	630	970	716	535	740	411	334		282
4		491	635	970	710	525	710	407	329		282
5		491	595	1,210	686	580	662	407	334		282
6		600	590	1,300	656	662	640	407	329	299	286
7	380	1,660	585	1,600	640	837	635	411	329		282
8		1,300	570	1,600	625	879	645		325		291
9		800	505	1,300	625	865	710		325	299	282
10		650	500	1,130	620	865	728		325	295	282
11		575	535	1,010	600	865	728	400	321	286	278
12		585	530	935	585	900	716		325	282	278
13		575	520	886	580	879	698		325	282	282
14	437	575	510	844	565	806	645	381	321	282	282
15	415	575	500	806	560	752	625	381	321	286	278
16	407	550	482	800	550	710	610	381	325	295	278
17		535	455	794	540	680	600	381	325	291	278
18	396	580	429	776	525	668	575	420	325	308	278
19		585	442	752	530	668	545	411	325	368	282
20		575	477	734	535	680	530	394	321	321	299
21	385	535	491	746	510	692	520	381	321	308	300
22	385	530	491	734	510	716	500	381	316	299	300
23	429	525	488	716	500	722	496	372	312	295	320
24	680	530	488	704	495	698	486	368	312	291	350
25	525	545	488	692	491	674	473	364	308	286	380
26	469	550	488	680	487	674	455	364	312	291	330
27	446	510	491	704	500	680	451	359	308	291	308
28	433	565	550	740	515	680	451	355	312	291	304
29	686	1,170	550	758	495	692	442	351	308	291	299
30	935	872	605		478	710	424	342	304	282	304
31		764	650		482		420		304	286	

NOTE.—Mean discharge for Nov. 1-13, 17-20, June 8-13, and Aug. 3-8, and daily discharge for Sept. 21-26, estimated from records on Rogue River below Prospect.

Monthly discharge of Rogue River near Prospect, Oreg., for the year ending September 30, 1924

[Drainage area, 315 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October			[a] 410	1.30	1.50	25,200
November	935		439	1.39	1.55	26,100
December	1,660	491	666	2.11	2.43	41,000
January	680	429	533	1.69	1.95	32,800
February	1,600	680	936	2.97	3.20	53,800
March	722	478	572	1.82	2.10	35,200
April	900	495	710	2.25	2.51	42,200
May	740	420	591	1.88	2.17	36,300
June	420	342	389	1.23	1.37	23,100
July	338	304	321	1.02	1.18	19,700
August	368	282	297	.943	1.09	18,300
September	380	278	295	.937	1.05	17,600
The year	1,660	278	511	1.62	22.10	371,000

[a] Estimated from records on Rogue River below Prospect.

ROGUE RIVER BELOW PROSPECT, OREG.

LOCATION.—In NW. ¼ sec. 6, T. 33 S., R. 3 E., at Prospect power plant of the California Oregon Power Co., 1 mile below mouth of Mill Creek, 2 miles above South Fork, and 2 miles below Prospect, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 3, 1913, to September 30, 1924.

GAGE.—Vertical staff on right bank about 100 feet above power house, read by employees of the California Oregon Power Co.

DISCHARGE MEASUREMENTS.—Made form cable about 500 feet above gage.

CHANNEL AND CONTROL.—Control composed of large boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.8 feet at 4 p. m. February 7 (discharge, 2,050 second-feet; total including discharge of flume, 2,240 second-feet); minimum stage recorded, 2.14 feet at time of measurement, 3 p. m. September 16 (discharge, 285 second-feet September 16–18 and 20–22); minimum discharge including flume, 457 second-feet September 18.

1913–1924: Maximum discharge recorded, November 30, 1921, 4,800 second-feet, including flume, 4,980 second-feet (gage height, 7.0 feet); minimum stage recorded, that of 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—The California Oregon Power Co.'s flume diverts around this station; a record is kept of this diversion. (See p. 155.)

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Staff gage read to hundredths once daily, October 1 to December 22; twice daily, December 23 to September 30. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of Rogue River below Prospect, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 15	2.46	422	May 21	2.74	587	July 28	2.22	314
Mar. 17	2.77	617	July 27	2.22	313	Sept. 16	2.14	280

Daily discharge, in second-feet, of Rogue River below Prospect, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	420	445	705	675	1,390	795	585	855	445	350	305	305
2	420	445	615	555	1,320	795	615	855	445	350	305	305
3	420	445	585	735	1,110	855	645	855	445	350	305	305
4	445	445	528	675	1,180	795	645	855	420	350	305	305
5	445	445	528	585	1,550	795	645	795	420	350	305	305
6	500	445	528	615	1,390	735	795	735	420	350	305	305
7	528	395	1,710	615	1,870	735	975	735	420	350	305	305
8	472	372	1,390	585	1,710	705	1,110	735	420	350	305	305
9	472	372	855	585	1,390	675	1,040	795	420	350	305	305
10	472	372	735	585	1,250	675	1,040	855	420	350	305	305
11	445	350	675	585	1,110	675	1,040	795	445	350	305	305
12	445	420	555	585	1,040	645	1,040	795	420	350	305	305
13	420	420	555	555	975	645	1,040	795	420	350	305	305
14	420	420	615	555	975	615	975	735	395	350	305	305
15	420	420	585	555	975	615	915	705	395	328	305	305
16	472	420	585	555	915	615	855	705	395	350	305	285
17	500	420	555	555	855	615	855	675	395	328	305	285
18	472	420	585	555	855	585	795	645	445	328	328	285
19	472	420	615	500	855	585	795	615	445	328	395	305
20	472	420	615	500	855	615	795	585	420	328	372	285
21	445	445	615	500	915	555	795	555	395	328	305	285
22	445	420	555	500	855	555	855	555	395	328	305	285
23	445	420	555	500	795	555	855	555	395	328	305	305
24	420	855	555	500	795	555	855	555	395	328	305	328
25	420	675	585	500	735	555	795	528	372	328	305	372
26	420	615	585	528	795	555	795	500	372	328	305	328
27	420	472	555	528	855	555	795	500	372	328	305	305
28	420	445	585	615	855	585	795	500	372	328	305	305
29	395	915	1,470	615	855	585	795	472	372	328	305	305
30	420	975	975	705	-------	555	795	472	350	328	305	305
31	420	-------	855	735	-------	585	-------	445	-------	305	305	-------

Monthly discharge of Rogue River below Prospect, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	528	395	445	27,400
November	975	350	485	28,900
December	1,710	528	710	43,700
January	735	500	579	35,600
February	1,870	735	1,070	61,600
March	855	555	644	39,600
April	1,110	585	844	50,200
May	855	445	670	41,200
June	445	350	408	24,300
July	350	305	338	20,800
August	395	305	311	19,100
September	372	285	305	18,100
The year	1,870	285	565	410,000

Combined monthly discharge of Rogue River and the California Oregon Power Co.'s flume near Prospect, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	690	570	614	37,800
November	1,160	525	654	38,900
December	1,880	695	878	54,000
January	915	667	750	46,100
February	2,060	905	1,240	71,300
March	1,030	721	811	49,900
April	1,280	755	1,020	60,700
May	1,030	622	844	51,900
June	629	530	587	34,900
July	532	481	519	31,900
August	579	476	485	29,800
September	550	457	479	28,500
The year	2,060	457	738	536,000

ROGUE RIVER AT RAYGOLD, NEAR CENTRAL POINT, OREG.[1]

LOCATION.—In sec. 18, T. 36 S., R. 2 W., at Raygold railroad station, just below dam and power house of California Oregon Power Co., half a mile below mouth of Bear Creek, and 6 miles northwest of Central Point, Jackson County.

DRAINAGE AREA.—2,020 square miles.

RECORDS AVAILABLE.—August 30, 1905, to September 30, 1924.

GAGE.—Water-stage recorder referred to vertical staff bolted to concrete pier of bridge near right bank; gage inspected by James Robins.

DISCHARGE MEASUREMENTS.—Made from cable 300 feet below gage.

CHANNEL AND CONTROL.—Bed composed of rock and boulders; practically permanent. One channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.3 feet at 5 p. m. February 7 (discharge, 14,400 second-feet); minimum stage recorded 0.00 foot, during parts of several days in July, August, and September (discharge, 600 second-feet). Discharge may have gone as low as 500 second-feet momentarily owing to sudden decrease in power load.

[1] Formerly referred to as near Tolo, Oreg., a discontinued post office.

1905–1924: Maximum stage recorded, 20.00 feet at 7.30 a. m. November 23, 1909 (discharge estimated by extension of rating curve at 60,000 second-feet); minimum stage indeterminate, as water went below intake pipe of well (gage height, 0.20 foot) probably every night during low water of 1918 (discharge probably 400 second-feet or less).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—A large area of land is irrigated from Rogue River and its tributaries.

REGULATION.—Discharge is influenced by changes of load on power plant just above station.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Operation of water-stage recorder satisfactory except for a few days in April to July. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting graph, or for days of considerable fluctuation, by averaging discharge for fractional parts of a day. Records good.

Discharge measurements of Rogue River at Raygold, near Central Point, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharg
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 30	2.69	3,190	Apr. 12	2.37	2,840	June 27	0.57	968
Feb. 2	3.53	4,460	June 7	.94	1,260	Aug. 4	.17	684
Feb. 8	4.88	7,280						

Daily discharge, in second-feet, of Rogue River at Raygold, near Central Point, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,170	1,170	2,110	2,470	3,530	2,350	2,170	2,000	1,170	1,010	840	840
2	1,170	1,130	1,680	2,060	4,660	2,350	2,350	2,000	1,170	1,010	840	850
3	1,130	1,170	1,580	2,170	3,680	2,900	2,590	2,060	1,170	1,010	871	828
4	1,200	1,210	1,440	2,230	4,150	2,710	2,880	2,000	1,130	970	871	878
5	1,200	1,210	1,390	2,110	4,310	2,470	2,710	2,000	1,130	970	853	842
6	1,530	1,170	1,780	1,940	4,660	2,350	2,530	1,940	1,130	970	870	814
7	1,840	1,130	5,020	2,060	9,200	2,290	2,710	1,890	1,130	970	840	871
8	1,580	1,130	3,240	2,060	8,160	2,230	2,970	1,840	1,130	970	865	892
9	1,210	1,130	2,590	2,170	5,400	2,170	2,840	1,890	1,090	970	870	865
10	1,300	1,090	2,170	2,350	4,310	2,110	2,880	1,940	1,210	970	878	840
11	1,210	1,130	2,060	2,350	3,830	2,110	2,880	1,940	1,170	970	862	867
12	1,260	1,130	2,000	2,350	3,380	2,060	2,880	2,000	1,130	970	862	890
13	1,210	1,170	2,060	2,170	3,100	2,060	2,530	1,940	1,130	970	857	865
14	1,210	1,340	2,470	2,060	2,970	1,940	2,590	1,890	1,170	970	823	849
15	1,260	1,390	2,170	1,940	2,900	1,940	2,470	1,780	1,090	935	857	874
16	1,390	1,260	1,940	1,890	2,650	1,890	2,420	1,780	1,090	935	845	842
17	1,630	1,210	1,940	1,840	2,710	1,890	2,290	1,730	1,170	935	846	817
18	1,480	1,170	1,940	1,780	2,590	1,840	2,230	1,680	1,210	935	867	813
19	1,340	1,170	2,000	1,730	2,470	1,840	2,170	1,580	1,130	935	1,020	834
20	1,300	1,210	1,890	1,630	2,420	1,780	2,110	1,530	1,130	884	1,100	849
21	1,210	1,170	1,780	1,530	2,470	1,780	2,110	1,480	1,090	903	947	870
22	1,300	1,210	1,730	1,580	2,420	1,780	2,110	1,480	1,090	900	947	872
23	1,340	1,130	1,580	1,680	2,350	1,780	2,110	1,440	1,090	893	935	835
24	1,300	1,390	1,530	1,730	2,230	1,840	2,060	1,390	1,070	900	882	894
25	1,260	1,580	1,580	1,680	2,170	1,840	2,000	1,390	1,050	988	871	1,010
26	1,210	1,300	1,730	1,840	2,350	1,780	1,940	1,300	1,010	863	900	1,020
27	1,170	1,210	1,580	2,000	2,530	1,840	1,940	1,300	1,050	882	868	935
28	1,090	1,210	1,630	2,350	2,530	1,890	1,890	1,260	970	860	867	910
29	1,130	1,730	3,380	2,290	2,470	2,110	1,890	1,260	1,010	846	864	888
30	1,090	2,970	3,680	2,350	-------	2,170	1,940	1,210	1,010	846	816	864
31	1,170	-------	2,970	2,290	-------	2,110	-------	1,210	-------	848	828	-------

Monthly discharge of Rogue River at Raygold, near Central Point, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,840	1,090	1,290	79,300
November	2,970	1,090	1,290	76,800
December	5,020	1,390	2,150	132,000
January	2,470	1,530	2,020	124,000
February	9,200	2,170	3,540	204,000
March	2,900	1,780	2,070	127,000
April	2,970	1,890	2,370	141,000
May	2,060	1,210	1,680	103,000
June	1,210	970	1,110	66,000
July	1,010	846	932	57,300
August	1,100	816	879	54,000
September	1,020	813	871	51,800
The year	9,200	813	1,670	1,220,000

CALIFORNIA OREGON POWER CO.'S FLUME NEAR PROSPECT, OREG.

LOCATION.—In NW. ¼ sec. 32, T. 32 S., R. 3 E., about 1½ miles above the lower end of flume,[4] half a mile below intake, and about half a mile northwest of Prospect, Jackson County.

RECORDS AVAILABLE.—August 1, 1913, to September 30, 1924.

GAGE.—Vertical staff in stilling box on right side of flume. Gage about 500 feet above fore bay in NW. ¼ sec. 6, T. 33 S., R. 3 E. used August 17, 1915, to November 14, 1923; an earlier gage near present location used August 1, 1913, to August 16, 1915.

DISCHARGE MEASUREMENTS.—Made from collar of flume.

CHANNEL AND CONTROL.—Wooden flume section supports of which are practically stable.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 185 second-feet February 7 (gage height, 3.83 feet); minimum discharge recorded, 161 second-feet November 26 (gage height, 3.40 feet).

1913–1924: Maximum stage recorded on old gage above fore bay 2.7 feet April 25, 26, 30, May 1–2, 1916, and December 12, 1919 (discharge, 212 second-feet). Flume dry at times.

ICE.—Stage-discharge relation apparently affected by ice January 1–5, 20, and 21; discharge interpolated.

ACCURACY.—Stage-discharge relation considered permanent. Rating curves for the two gages used fairly well defined. Staff read to hundredths daily. Daily discharge ascertained by applying gage height to rating table. Records good.

The California Oregon Power Co's. flume diverts water from Rogue River in SW. ¼ sec. 30, T. 32 S., R. 3 E., and extends about 2 miles to power house in NW. ¼ sec. 6, T. 33 S., R. 3 E. where a head of 500 feet is developed.

Discharge measurements of California Oregon Power Co.'s flume near Prospect, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 15	3.61	176	July 26	3.76	178	July 30	3.73	179
Mar. 17	3.49	166	July 28	3.71	178	Sept. 16	3.62	172
May 21	3.64	172						

[4] From maps of California Oregon Power Co. Location previously published is in error.

Daily discharge, in second-feet, of California Oregon Power Co.'s flume near Prospect, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	162	166		183	168	170	175	177	179	176	174
2	162	175	165		181	168	170	175	179	178	176	174
3	162	162	162	171	171	171	172	173	180	178	175	174
4	162	162	167		174	168	170	172	179	178	174	174
5	175	175	168		184	167	172	169	179	182	174	175
6	175	175	167	172	173	170	172	172	179	182	174	175
7	162	175	167	174	185	168	174	175	180	182	174	175
8	162	175	163	173	167	168	173	175	181	181	174	177
9	162	175	164	171	166	166	170	176	181	181	174	176
10	162	175	174	169	166	166	170	176	180	181	174	176
11	175	175	173	170	167	164	168	174	181	182	174	176
12	175	162	173	170	167	166	169	174	181	181	173	174
13	162	175	172	169	172	166	169	174	181	181	173	174
14	175	162	175	171	171	165	170	172	180	181	175	174
15	162	173	167	171	168	164	174	174	180	182	175	174
16	162	166	167	170	167	166	174	173	179	182	175	173
17	175	164	166	169	169	166	170	173	179	182	176	172
18	175	165	167	170	169	164	170	172	184	182	178	172
19	175	167	167	167	168	168	170	173	182	182	184	176
20	175	169	166	170	167	168	171	173	175	182	172	179
21	162	169	166		182	167	173	174	178	182	172	176
22	162	169	164	172	171	167	181	174	179	182	174	176
23	162	168	163	173	170	167	171	174	178	182	174	177
24	175	175	168	172	170	167	171	178	178	182	174	168
25	175	164	170	172	170	166	170	176	178	181	174	178
26	175	161	171	173	170	167	170	176	178	182	174	172
27	175	167	171	174	171	170	171	176	176	181	174	172
28	175	167	171	174	171	171	171	176	181	181	172	171
29	175	176	171	177	172	168	169	176	181	181	171	170
30	175	181	172	178	------	167	171	176	180	181	174	170
31	175	------	170	180	------	166	------	177	------	176	174	------

Monthly discharge of California Oregon Power Co.'s flume near Prospect, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	175	162	169	10,400
November	181	161	170	10,100
December	175	162	168	10,300
January	180	----------	172	10,600
February	185	166	172	9,890
March	171	164	167	10,300
April	181	168	171	10,200
May	178	169	174	10,700
June	184	175	179	10,700
July	182	176	181	11,100
August	184	171	174	10,700
September	179	168	174	10,400
The year	185	161	173	125,000

SOUTH FORK OF ROGUE RIVER NEAR PROSPECT, OREG.

LOCATION.—In SW. ¼ sec. 7, T. 33 S., R. 4 E., a quarter of a mile below mouth of Imnaha Creek and 9 miles (by road) southeast of Prospect, Jackson County.

RECORDS AVAILABLE.—April 26 to September 30, 1924.

GAGE.—Stevens eight-day recorder on left bank operated by employees of California Oregon Power Co.

DISCHARGE MEASUREMENTS.—Made from a cable 25 feet upstream from gage or by wading, measuring section fair.

CHANNEL AND CONTROL.—Bed composed of smooth gravel near right bank; large boulders and bedrock near left bank. Control is riffle over bedrock, overlain with a few large boulders, 20 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage April 26 to September 30 from water-stage recorder, 1.62 feet at 2 a. m. May 13 (discharge, 214 second-feet); minimum stage, 0.34 foot from 9 a. m. September 18 to 9 a. m. September 19 (discharge, 48 second-feet).

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Operation of water-stage recorder satisfactory, but record sheets were lost for period June 27 to July 9. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph; estimated, June 27 to July 9. Records fair.

Discharge measurements of South Fork of Rogue River near Prospect, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 26	1.30	190	June 26	0.75	100	July 29	0.54	70
Do	1.29	175	July 28	.52	82	Sept. 17	.37	52
May 22	1.19	150						

Daily discharge, in second-feet, of South Fork of Rogue River near Prospect, Oreg., for the period April 26 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	188	117		66	55	16	------	199	96	79	57	52
2	------	192	114		66	54	17	------	195	97	78	57	51
3	------	196	112		65	55	18	------	182	112	77	65	50
4	------	190	110		65	54	19	------	174	108	76	84	52
5	------	177	107	87	64	53	20	------	166	104	76	78	53
6	------	170	107		64	53	21	------	161	101	74	70	52
7	------	170	107		65	53	22	------	153	100	73	64	51
8	------	177	107		63	53	23	------	150	98	72	63	56
9	------	188	106		62	52	24	------	140	96	71	62	61
10	------	199	114	84	61	52	25	------	136	95	70	61	68
11	------	206	113	83	61	52	26	167	132	94	68	59	62
12	------	205	106	83	59	52	27	168	127		68	58	56
13	------	204	101	82	59	52	28	170	124	92	67	57	54
14	------	188	100	82	59	52	29	171	123		68	57	53
15	------	192	98	80	58	52	30	187	120		68	56	53
							31	------	118	------	68	55	------

Monthly discharge of South Fork of Rogue River near Prospect, Oreg., for the period April 26 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 26–30	187	167	173	1,720
May	206	118	169	10,400
June	117	92	103	6,130
July	----------	67	78.4	4,820
August	84	55	62.6	3,850
September	68	50	53.9	3,210
The period	----------	----------	----------	30,100

SOUTH FORK OF BIG BUTTE CREEK AT BUTTE FALLS, OREG.

LOCATION.—In NE. ¼ sec. 10, T. 35 S., R. 2 E., a quarter of a mile north of Butte Falls, Jackson County, the same distance below the falls of the creek, and 1 mile above mouth of North Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 23, 1922, to September 30, 1924. At station in section 11, about 1 mile upstream and above some inflow from springs, September 20, 1910, to October 5, 1911, August 5 to October 10, 1915, and October 31, 1917, to September 30, 1922.

GAGE.—Stevens continuous recorder on left bank; inspected by engineers of Eagle Point Irrigation District.

DISCHARGE MEASUREMENTS.—Made by wading near gage; no equipment for high-water measurements.

CHANNEL AND CONTROL.—Bed composed of rock, sand, and gravel; shifts slightly in high water.

EXTREMES OF DISCHARGE.—Maximum stage during period indicated by water-stage recorder, 2.65 feet while clock was stopped February 1–17 (discharge, 550 second-feet). Minimum stage from recorder, 0.80 foot 6 to 10 p. m. August 31 and 3 to 11 p. m. September 2 (discharge, 68 second-feet). Minimum including Eagle Point Irrigation District Canal, 92 second-feet September 3.

1922–1924: Maximum stage from recorder, 3.32 feet at 7 p. m. December 31, 1922 (discharge, 780 second-feet). Minimum natural discharge, 92 second-feet September 14, 1923, and September 3, 1924.

ICE.—None.

DIVERSIONS.—The canal of the Eagle Point irrigation district began diverting around gage April 29, 1924; a record has been kept of this diversion. (see p. 160.)

REGULATION.—Flow fluctuates occasionally for short periods owing to manipulation of dam at crest of falls, a quarter of a mile upstream; practically no effect in 1924.

ACCURACY.—Stage-discharge relation changed, due to excavation in channel February 2–18. Two rating curves used, well defined below 150 second-feet. Operation of water-stage recorder satisfactory except during a few periods in the winter when clock was allowed to run down. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good except those for December and February, which are fair.

Discharge measurements of South Fork of Big Butte Creek at Butte Falls, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 1	1.27	137	Aug. 23	0.86	75
June 14	.95	87	Sept. 24	.92	79

Daily discharge, in second-feet, of South Fork of Big Butte Creek at Butte Falls, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				230		184	177	138	100	86	78	69
2				190		191	186	138	94	86	79	69
3				220		205	222	138	93	86	79	69
4				200		198	218	134	90	86	78	70
5				180		191	215	134	89	86	78	70
6		120		180		188	222	136	89	85	76	70
7				180		188	222	127	89	85	75	70
8				180		186	230	119	90	84	74	70
9			210	180	330	184	235	125	89	85	73	70
10				180		184	228	115	93	84	73	70
11				180		179	222	115	94	84	72	72
12				180		175	218	110	90	83	70	72
13		124		170		173	215	116	89	81	72	73
14		145		170		168	215	125	85	80	74	73
15	138	131		170		168	205	123	85	80	75	73
16	131	127		170		164	191	106	85	76	74	73
17	130	124	160	180		166	186	106	86	72	76	73
18	126	123	170	180	212	160		105	94	76	83	73
19	124	118	170	180	208	152		104	93	76	102	74
20		115	170	180	203	164		99	108	75	89	75
21		115	160	180	200	160		105	110	78	85	76
22		115	160	170	191	158		111	100	85	79	76
23		117	160	160	196	164	165	111	88	85	76	78
24		130	152	160	188	160		111	89	78	76	83
25		123	170	160	188	152		113	89	75	74	89
26		119	170	170	193	148		113	89	76	73	86
27		118	160	180	196	158		111	105	76	72	80
28		118	170	190	191	168		111	108	76	70	78
29		170	332	210	186	177	138	111	96	76	69	75
30		190	295	240		171	138	111	105	78	69	74
31			252	240		175		110		78	69	

NOTE.—Mean discharge for braced periods taken as 30 per cent of that of Rogue River above Prospect based on comparisons.

Monthly discharge of South Fork of Big Butte Creek at Butte Falls, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October			[b] 130	7,990
November	190	115	125	7,440
December	[a] 400	130	200	12,300
January	240	160	185	11,400
February	[a] 400	186	275	15,800
March	205	148	173	10,600
April	235	138	190	11,300
May	138	99	117	7,190
June	110	85	93.5	5,560
July	86	72	80.5	4,950
August	102	69	76.2	4,690
September	89	69	74.1	4,410
The year	[a] 400	69	143	104,000

[a] Estimated from peak indicated by recorder graph.
[b] Estimated from incomplete record.

Combined monthly discharge of South Fork of Big Butte Creek and Eagle Point Irrigation District Canal below Butte Falls, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	----------	----------	[a] 130	7,990
November	190	115	125	7,440
December	[a] 400	130	200	12,300
January	240	160	185	11,400
February	[a] 400	186	275	15,800
March	205	148	173	10,600
April	235	146	195	11,600
May	149	114	128	7,870
June	133	99	114	6,780
July	111	97	105	6,460
August	111	93	99.1	6,090
September	113	92	97.5	5,800
The year	[a] 400	92	152	110,000

[a] Estimated.

NOTE.—Discharge from May to September includes estimated leakage of 3 second-feet from canal between intake and station on canal, which does not pass either gage.

EAGLE POINT IRRIGATION DISTRICT CANAL AT BUTTE FALLS, OREG.

LOCATION.—NE. ¼ sec. 10, T. 35 S., R. 2 E., 100 feet above a flume across South Fork of Big Butte Creek and half a mile north of Butte Falls, Jackson County.

RECORDS AVAILABLE.—April 29 to September 30, 1924.

GAGE.—Vertical staff in stilling box on left bank; read by William Chambers, ditch walker.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Canal is earth section on a steep hillside, with bed of clay, gravel, and boulders. Control is transition section, 90 feet downstream, at entrance to semicircular wooden flume.

EXTREMES OF DISCHARGE.—Maximum stage recorded during 1924, 1.76 feet, June 13–20 (discharge, 22.2 second-feet); canal dry up to April 28 and at times thereafter.

DIVERSIONS.—Eagle Point Irrigation District Canal diverts from South Fork of Big Butte Creek 1,200 feet above gage, for irrigation of lands chiefly north and east of Eagle Point.

ACCURACY.—Stage-discharge relation permanent during period of record. Rating curve well defined. Gage read to hundredths once a day; sometimes twice a day. Daily discharge ascertained by applying daily mean gage height to rating table; estimated by comparison with station on South Fork of Big Butte Creek, April 29–30 and May 2–6; interpolated for occasional single days. Records good, except those prior to May 7 which are fair.

Eagle Point Irrigation District Canal, completed in spring of 1924, diverts from South Fork of Big Butte Creek in NE. ¼ sec. 10, T. 35 S., R. 2 E. for irrigation of lands within the district in vicinity of Eagle Point; about 1,500 acres were irrigated in 1924. A considerable part of the return water finds its way to Little Butte Creek between station at Bieberstedt's ranch and station below Eagle Point at Crater Lake highway bridge.

Discharge measurements of Eagle Point Irrigation District Canal near Butte Falls, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 1	1.20	8.35	June 14	1.76	21.7	Aug. 23	1.72	21.8
May 13	1.55	15.5	July 21	1.74	21.7	Sept. 24	1.70	21.3
May 20	1.72	21.1						

Daily discharge, in second-feet, of Eagle Point Irrigation District Canal at Butte Falls, Oreg., for the period April 29 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	8.4	17.0	21.7	21.4	20.6	16	------	16.5	22.2	21.7	20.3	20.1
2	------	2.8	17.0	21.7	21.4	20.6	17	------	16.5	22.2	21.7	20.1	20.1
3	------	2.8	19.0	21.7	21.4	20.3	18	------	16.5	22.2	21.7	15.1	20.1
4	------	8.4	20.1	21.7	20.9	20.6	19	------	16.5	22.2	21.7	5.6	20.1
5	------	8.4	20.2	21.7	20.9	20.6	20	------	21.1	22.2	21.7	15.5	20.6
6	------	3.2	20.3	21.7	20.9	20.6	21	------	13.2	------	21.7	15.0	20.6
7	------	9.0	20.6	21.7	21.4	20.4	22	------	------	------	21.7	21.1	20.6
8	------	14.2	20.6	21.7	21.4	20.1	23	------	------	21.7	21.7	21.1	21.1
9	------	14.6	20.6	21.7	21.4	20.1	24	------	------	21.7	20.6	21.1	20.6
10	------	15.0	21.1	21.7	21.0	20.1	25	------	------	21.7	21.4	21.1	21.1
11	------	15.0	21.1	21.7	20.6	20.1	26	------	------	21.7	21.4	21.1	20.1
12	------	15.8	21.1	21.7	20.6	20.1	27	------	------	21.7	21.4	20.6	20.1
13	------	16.5	22.2	21.7	20.6	20.1	28	------	------	9.0	21.4	21.1	20.1
14	------	------	22.2	21.7	20.1	19.8	29	84	------	------	21.4	20.6	20.1
15	------	3.1	22.2	21.7	20.1	19.6	30	84	------	5.4	21.4	20.6	20.1
							31	------	3.0	------	21.4	20.6	------

NOTE.—Canal dry on days for which no discharge is given.

Monthly discharge of Eagle Point Irrigation District Canal near Butte Falls, Oreg., for the period April 29 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 29–30	8.4	8.4	8.4	33
May	21.1	0	7.76	477
June	22.2	0	18.0	1,070
July	21.7	21.4	21.6	1,330
August	21.4	5.6	19.8	1,220
September	21.1	19.6	20.3	1,210
The period				5,340

SOUTH FORK OF LITTLE BUTTE CREEK NEAR LAKECREEK, OREG.

LOCATION.[5]—In SE. ¼ sec. 29, T. 36 S., R. 2 E., one-fourth mile above intake of Rogue River Valley Canal Co.'s South Fork canal and 1½ miles southeast of Lakecreek post office, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 29, 1921, to September 30, 1924. At station in sec. 11, T. 37 S., R. 2 E., 5 miles above Lakecreek post office, November 26, 1910, to April 19, 1913.

GAGE.—Stevens eight-day recorder on left bank. Inspected by L. S. Brophy for the Rogue River Valley Canal Co.

CHANNEL AND CONTROL.—Bed composed of gravel and small boulders; probably somewhat shifting in floods.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 2.85 feet at 11 a. m. on February 7 (discharge, 545 second-feet); minimum stage recorded, 0.96 foot at 1 p. m. August 14 (discharge, 8.0 second-feet).

[5] Location revised on basis of map made by R. P. Cowgill for office of State engineer during 1925.

1910–1913; 1921–1924: Maximum discharge recorded, 1,580 second-feet February 17, 1912 (reading on old gage, 4.20 feet); minimum discharge, 5 second-feet, very uncertain, December 8, 1911 (reading on old gage, 0.60 foot).

ICE.—None during period of records.

DIVERSIONS.—Several hundred acres irrigated in small tracts above the station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent except for some apparent effect of aquatic plants during May and June. Rating curve well defined, correction curve for indirect method, used May 7 to June 22, fairly well defined. Operation of water-stage recorder satisfactory except for short periods. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of South Fork of Little Butte Creek near Lakecreek, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 24	1.47	45.2	Apr. 28	1.84	114	July 7	1.04	10.9
Feb. 5	2.09	201	May 5	1.80	104	July 16	1.06	12.1
Feb. 7	2.81	525	May 9	1.70	80	July 30	1.00	9.4
Mar. 24	1.56	59	May 27	1.38	31.6	Aug. 6	1.06	11.8
Apr. 9	2.05	182	June 3	1.26	24.2	Sept. 9	1.02	10.2
Apr. 10	2.06	189	June 4	1.26	22.4	Sept. 19	1.09	13.6
Apr. 22	1.95	147	June 26	1.12	15.9			

NOTE.—Measurements beginning June 3 made in canal, all water diverted.

Daily discharge, in second-feet, of South Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	43	58	104	151	95	86	109	25	14	10	12
2	20	44	51	100	144	104	91	112	25	13	11	11
3	25	46	47	100	131	220	134	112	23	13	12	11
4	39	41	42	78	161	161	138	109	21	13	11	11
5	29	39	43		200	134	131	107	19	13	12	9.1
6	82	37	122		204	126	134	95	19	14	12	11
7	66	35	253	90	460	118	151	86	20	11	11	13
8	47	34	134		391	109	171	80	22	12	10	11
9	38	33	107		300	109	186	80	22	11	11	9.9
10	33	33	89		253	102	193	78	22	11	11	11
11	36	32	78	97	224	100	189	73	21		11	10
12	39	31	89	91	200	93	189	69	19		11	9.1
13	33	36	97	77	182	91	193	68	20	12	11	9.4
14	31	66	89	73	164	89	196	64	20		9.1	11
15	33	48	75	68	148	82	189	58	20		9.4	11
16	37	40	69	64	138	78	178	54	19	12	12	10
17	36	36	69	59	138	78	178	48	19	12	11	9.9
18	32	34	77	59	123	77	168	46	21	13	15	11
19	31	33	69	54	112	73	157	40	20	13	24	13
20	29	32	60	54	118	73	151	38	20	12	18	15
21	31	31	55	50	118	75	148	35	18	12	15	14
22	59	31	55	49	107	69	148	35	16	9.9	15	13
23	50	31	52	49	109	68	148	37	15	10	15	14
24	41	38	50	49	100	66	141	36	15	10	14	20
25	37	40	55	49	100	66	131	35	15	10	13	27
26	34	34	52	51	100	61	123	33	15	11	13	21
27	33	32	51	60	104	71	118	31	14	11	12	18
28	32	31	59	64	100	78	115	30	13	12	12	15
29	31	54	261	69	95	78	112	30	14	11	13	15
30	36	77	157	80	-------	78	112	30	15	10	13	14
31	52	-------	123	97	-------	80	-------	27	-------	10	12	-------

NOTE.—Discharge interpolated June 23–25, 27, July 11–15 and 17; estimated by comparison with station on North Fork of Little Butte Creek near Lakecreek Jan. 2, 3, and 5–10.

Monthly discharge of South Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	82	20	37.8	2,320
November	77	31	39.1	2,330
December	261	42	86.7	5,330
January		49	73.7	4,530
February	460	95	168	9,660
March	220	61	93.6	5,760
April	196	86	150	8,930
May	112	27	60.8	3,740
June	25		18.9	1,120
July	14	9.9	11.7	719
August	24	9.1	12.6	775
September	27	9.1	13.0	774
The year	460	9.1	63.4	46,000

LITTLE BUTTE CREEK ABOVE EAGLE POINT, OREG.

LOCATION.—In NW. ¼ sec. 5, T. 36 S., R. 1 E., at Bieberstedt's ranch, 1 mile above intake of Eagle Point Canal and 3 miles east of Eagle Point, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 24, 1916, to September 30, 1924. Station at Tronson ranch, maintained July 13, 1907, to April 30, 1916, was below intake of Eagle Point Canal.

GAGE.—Vertical staff on right bank; read by Carl Bieberstedt. A staff gage one-fourth mile below was used April 24, 1916, to February 9, 1920.

CHANNEL AND CONTROL.—Bed of stream is bedrock overlain on one side by firm gravel; practically permanent. Control for old station was diversion dam of Eagle Point Canal which changed occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.86 feet at noon February 7 (discharge, 2,060 second-feet); minimum stage recorded, 0.10 foot at 7 p. m. June 17 (discharge, 6.0 second-feet).

1916–1923: Maximum stage recorded, 11.3 feet at lower station January 12, 1918 (discharge, 6,200 second-feet); minimum discharge recorded, that of 1924.

ICE.—Stage-discharge relation apparently unaffected by ice.

DIVERSIONS.—The Rogue River Valley Canal and Medford Irrigation District Canal divert water above the station, the records at Bradshaw drop showing about the quantity carried past the gage; also, the municipal water supply (about 7.5 second-feet) for Medford is taken out above. Several hundred acres are irrigated along the creek above the station. The Eagle Point Canal diverts just below this station, but above the old station at Tronson's ranch. For records see page 174.

REGULATION.—Water was being stored in Fish Lake Reservoir from December to June and released during October, November, July, August, and September. For record of stage of reservoir see page 166.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of Little Butte Creek above Eagle Point, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 24	1.03	107	Apr. 23	1.09	115	July 10	0.37	18.7
Feb. 2	1.86	319	May 5	.99	96	Aug. 6	.26	12.8
Feb. 5	2.16	414	May 10	.39	21.6	Aug. 22	.76	62
Feb. 7	4.83	1,540	May 27	.35	18.2	Sept. 22	.25	11.6
Mar. 24	1.04	112	June 2	.92	85			
Apr. 10	1.50	217	June 10	.55	34.2			

Daily discharge, in second-feet, of Little Butte Creek above Eagle Point, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		65	100	176	700	150	124	37	20	17	15	10
2		65	84	159	315	150	130	47	30	14	14	9.6
3		59	76	162	300	580	242	40	20	12	14	12
4		46	69	150	330	285	228	42	20	11	13	13
5		36	74	157	378	228	189	71	19	12	13	13
6		28	95	148	360	202	189	84	18	17	12	11
7		18	482	148	1,540	189	202	74	16	16	13	13
8	77	12	256	176	660	176	215	60	16	17	13	13
9		11	189	242	448	176	215	51	20	17	15	12
10		11	152	270	360	164	215	19	33	17	13	12
11		11	130	256	330	164	202	16	20	15	13	13
12		11	143	202	300	159	202	14	17	16	12	12
13		14	189	162	270	152	189	11	15	13	11	12
14		130	164	148	242	146	189	10	14	14	12	12
15		30	141	139	228	141	189	9.2	15	16	11	9.6
16	95	14	124	137	202	139	164	9.2	12	16	11	9.2
17	86	17	116	122	215	139	164	10	7.1	15	12	8.9
18	49	19	133	122	189	133	150	12	9.2	16	19	11
19	44	19	130	106	176	120	141	16	10	14	91	8.9
20	42	17	116	102	176	120	135	14	9.2	14	60	12
21	40	53	102	96	189	116	128	16	12	17	62	13
22	82	51	96	93	164	116	124	14	14	18	53	13
23	65	46	87	96	164	116	108	14	14	17	33	18
24	55	58	84	104	157	108	89	14	15	16	20	19
25	51	56	98	100	150	108	77	16	14	16	16	42
26	48	51	102	114	159	106	66	12	16	17	16	28
27	43	48	91	118	164	112	63	16	16	16	12	23
28	40	55	106	126	164	133	63	16	17	16	10	20
29	40	139	660	126	155	133	52	14	17	17	9.2	19
30	42	162	315	152	-------	116	47	13	16	14	8.9	17
31	96	-------	242	148	-------	120	-------	14	-------	13	8.9	-------

NOTE.—Mean discharge Oct. 1–15 estimated from records on North and South Forks, with allowance for intermediate diversions.

Monthly discharge of Little Butte Creek above Eagle Point, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	----------	40	66.9	4,110
November	162	11	45.1	2,680
December	660	69	160	9,840
January	270	93	147	9,040
February	1,540	150	317	18,200
March	580	106	161	9,900
April	242	47	150	8,930
May	84	9.2	26.0	1,600
June	33	7.1	16.4	976
July	18	11	15.4	947
August	91	8.9	20.5	1,260
September	42	8.9	14.6	869
The year	1,540	7.1	94.4	68,400

LITTLE BUTTE CREEK BELOW EAGLE POINT, OREG.

LOCATION.—In SW. ¼ sec. 3, T. 36 S., R. 1 W. at bridge on Crater Lake highway, one-half mile southwest of Eagle Point, Jackson County, and 1 mile above mouth of Antelope Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1 to September 20, 1924, with some miscellaneous measurements in 1923.

GAGE.—Vertical gage on right bank about 30 feet above bridge; read by G. W. Daley, deputy water master.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Control is rocky riffle overlain with small gravel and obstructed at times by growth of aquatic plants.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period May 1 to September 20, 2.00 feet at 2.30 p. m. August 19 (discharge, 103 second-feet); minimum stage recorded, 0.92 foot at 12.30 p. m. September 19 (discharge, 5.1 second-feet).

ICE.—None during period of record.

DIVERSIONS.—Station is below all diversions from Little Butte Creek and below practically all returnable seepage water from irrigation, including the lands of the Eagle Point Irrigation District watered from Big Butte Creek.

REGULATION.—Discharge is entirely controlled by the operation of irrigation diversions above.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Staff gage read to hundredths occasionally, May 10 to July 14, and daily, August 2 to September 20. Records poor, May 1 to August 1; good, August 2 to September 20.

Discharge measurements of Little Butte Creek below Eagle Point, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 27	1.17	14.3	June 28	0.96	6.0	Aug. 6	1.08	10.3
June 10	1.36	27.4	July 10	.99	6.5	Aug. 22	1.63	52
June 27	.98	6.5						

Daily discharge, in second-feet, of Little Butte Creek below Eagle Point, Oreg., for the period May 1 to September 20, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		9.4		11	6.0	16	8.6	11		6.5	7.0
2		9.4		14	6.5	17	9.4	10		6.2	5.6
3		11		12	6.8	18	9.4	10		11	5.1
4		10	9.0	12	7.4	19	9.4	11		103	7.0
5	45	10		8.6	7.0	20	10	11		64	9.4
6		9.4		11	7.8	21	10			60	-------
7		10	10	9.8	7.8	22	12			51	-------
8		9.3	9.4	6.5	8.6	23	11	12		40	-------
9		8.6	8.0	7.8	8.6	24	11		11	15	-------
10	16	27	6.5	8.2	10.0	25	10			12	-------
11	12		7.0	8.6	9.0	26	10	8.6		9.0	-------
12	7.8	16	7.4	9.4	9.0	27	15	6.5		7.8	-------
13	8.6			.6.5	9.0	28	16	6.5		7.8	-------
14	8.6	14	7.8	6.8	8.6	29	13	7.0		7.0	-------
15	10	12	11	6.2	7.4	30	13			6.8	-------
						31	9.4	-------		5.8	-------

NOTE.—Mean discharge for periods when gage was not read, as indicated by braces, estimated by comparison with records on Little Butte Creek above Eagle Point and on Eagle Point Canal; interpolated May 11, 18, 25, 29, 30, June 1, 4, 5, 8, 15, July 9, 11, and 12.

Monthly discharge of Little Butte Creek below Eagle Point, Oreg., for the period May 1 to September 20, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May		7.8	20.8	1,280
June			11.2	666
July			9.82	604
August	103	5.8	17.8	1,090
September 1–20	10	5.1	7.68	305
The period				3,940

FISH LAKE RESERVOIR NEAR LAKECREEK, OREG.

LOCATION.—At dam of Fish Lake Reservoir, in SW. ¼ sec. 3, T. 37 S., R. 4 E., 18 miles east of Lakecreek post office, Jackson County.

RECORDS AVAILABLE.—December 8, 1915, to September 30, 1924.

GAGE.—Vertical staff on outside of new outlet tower graduated to read heights above sea level. Prior to September 30, 1921, readings were made on gages with zero at elevation 4,799 feet. Gage read by employees of Rogue River Valley Canal Co.

EXTREMES OF STAGE.—Maximum stage recorded during year, 4,819.09 feet May 16 (storage, 4,903 acre-feet); minimum stage recorded, 4,801.10 feet September 29 and 30 (storage, 110 acre-feet.)

1915–1924: Maximum stage recorded, 4,820.35 feet, July 4, 1923 (storage 5,348 acre-feet); minimum storage, practically zero.

COOPERATION.—Gage readings and storage table furnished by Rogue River Valley Canal Co.

Gage height and contents of Fish Lake Reservoir near Lakecreek, Oreg., on last day of each month of the year ending September 30, 1924

Date	Gage height	Storage	Loss or gain during month	Date	Gage height	Storage	Loss or gain during month
	Feet	*Acre-feet*	*Acre-feet*		*Feet*	*Acre-feet*	*Acre-feet*
Sept. 30	4,801.38	135		May 31	4,816.22	3,910	−734
Oct. 31	4,806.92	1,156	+1,021	June 30	4,805.64	846	−3,064
Nov. 30	4,809.04	1,713	+557	July 31	4,801.98	195	−651
Dec. 31	4,812.30	2,664	+951	Aug. 31	4,801.59	155	−40
Jan. 31	4,814.01	3,193	+529	Sept. 30	4,801.10	110	−45
Feb. 29	4,815 49	3,672	+479				
Mar. 31	4,816.88	4,133	+461	The year			−25
Apr. 30	4,818.35	4,644	+511				

NORTH FORK OF LITTLE BUTTE CREEK AT FISH LAKE, NEAR LAKECREEK, OREG.

LOCATION.—In SE. ¼ sec. 4, T. 37 S., R. 4 E., at outlet of Fish Lake, 18 miles east of Lakecreek post office, Jackson County.

DRAINAGE AREA.—15 square miles.

RECORDS AVAILABLE.—October 21, 1914, to July 20, 1915; June 11 to November 5, 1916; and May 26, 1917, to September 30, 1924.

GAGE.—Stevens eight-day recorder about 500 yards below dam. New well and shelter installed September 30, 1921, about 6 feet upstream from former recorder which was installed July 10, 1918, and gage datum lowered 1 foot. Vertical staff just above wasteway in temporary dam, 1914–15; vertical staff at location of present recorder June, 1916, to July 10, 1918. Gage inspected by employees of Rogue River Valley Canal Co.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year from water-stage recorder, 2.92 feet on June 8, 9, and 14 (discharge, 98 second-feet); stream bed dry October 19–21 and October 23 to November 1 (gage height, 0.38 foot to 0.41 foot).

1914–1924: Maximum discharge recorded, 115 second-feet September 28, 1922 (gage height, 3.18 feet); minimum stage recorded 0.38 foot in 1923 and 1924, creek bed dry.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Discharge is controlled by reservoir dam at outlet of Fish Lake one-fourth mile above; a record has been kept of the height of water in reservoir and monthly run-off corrected.

ACCURACY.—Stage-discharge relation somewhat unstable. Well-defined rating curves used October 1–17 and October 18 to September 30. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of North Fork of Little Butte Creek at Fish Lake, near Lakecreek, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 26	1.37	10.5	June 16	2.90	96	Aug. 5	2.43	60
Apr. 21	1.50	13.3	June 17	2.56	70	Aug. 27	2.28	49.7
May 20	2.34	55	July 12	2.41	58	Sept. 25	1.98	34.4
May 30	2.58	69	July 22	2.25	49.2			

Daily discharge, in second-feet, of North Fork of Little Butte Creek at Fish Lake, near Lakecreek, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	0	1.4	4.8	7.5	10	11	14	91	72	59	42
2	26	.1	1.5	4.8	7.7	10	11	14	91	59	59	41
3	28	.1	1.5	5.0	7.7	10	12	15	92	49	59	40
4	29	.2	1.6	5.2	7.7	10	12	15	93	53	60	39
5	29	.2	1.7	5.4	7.9	10	12	15	94	55	61	39
6	32	.4	2.0	5.6	7.9	10	12	14	94	54	61	40
7	33	.4	2.0	5.7	8.4	11	12	14	95	53	62	38
8	32	.5	2.0	5.7	8.6	11	12	14	97	55	62	38
9	32	.7	2.0	5.7	8.6	11	12	14	96	57	64	36
10	32	.8	2.0	5.9	8.6	11	12	15	94	57	64	37
11	34	10	2.1	6.1	8.6	11	12	14	92	58	64	36
12	36	34	2.3	6.3	8.4	11	13	14	93	59	64	34
13	36	40	2.5	6.3	8.4	11	13	15	92	57	63	34
14	36	18	2.6	6.3	8.6	11	13	15	96	54	63	34
15	38	10	2.6	6.3	8.8	11	13	15	94	51	64	33
16	39	38	2.7	6.5	9.1	11	13	23	84	56	65	32
17	12	57	2.9	6.5	9.1	11	13	34	68	57	64	32
18	.1	59	3.0	6.7	8.8	11	13	37	68	48	66	32
19	-------	58	3.0	6.9	8.8	11	14	43	67	48	66	33
20	-------	31	3.0	6.7	8.8	11	14	56	68	49	62	33
21	-------	.9	3.1	6.9	9.4	11	14	66	71	48	60	32
22	.1	.8	3.3	6.7	9.4	11	14	65	71	49	58	30
23	-------	.8	3.3	6.9	9.6	11	14	64	74	51	58	32
24	-------	1.0	3.3	7.1	9.6	12	14	64	74	50	57	32
25	-------	1.0	3.5	7.1	9.6	12	14	64	75	53	55	32
26	-------	1.0	3.5	7.3	9.8	12	14	63	75	55	53	32
27	-------	1.0	3.6	7.3	9.8	12	14	62	73	58	51	30
28	-------	1.1	4.2	7.3	9.8	12	14	64	73	58	50	29
29	-------	1.4	4.7	7.3	9.8	12	14	65	73	57	48	28
30	-------	1.5	4.8	7.3	-------	11	14	68	73	57	47	28
31	-------	-------	4.8	7.3	-------	11	-------	76	-------	59	44	-------

NOTE.—Stream bed dry Oct. 19–21 and Oct. 23 to Nov. 1.

Monthly discharge of North Fork of Little Butte Creek at Fish Lake, near Lakecreek, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet		
	Maximum	Minimum	Mean	Observed	Gain or loss in storage	Corrected for storage
October	39	0	17.1	1,050	+1,021	2,070
November	59	0	12.3	732	+557	1,290
December	4.8	1.4	2.79	172	+951	1,120
January	7.3	4.8	6.35	390	+529	919
February	9.8	7.5	8.79	506	+479	985
March	12	10	11.0	676	+461	1,140
April	14	11	13.0	762	+511	1,270
May	76	14	36.5	2,240	−734	1,510
June	97	67	83	4,940	−3,064	1,880
July	72	48	54.7	3,360	−1,860	1,500
August	66	44	59.1	3,630	−1,940	1,690
September	42	28	34.3	2,040	−240	1,800
The year	97	0	28.3	20,500	−3,329	17,200

NOTE.—During July, August, and September the Cascade Canal diverted water from Fourmile Creek in the Klamath River Basin into Fish Lake. In order to obtain the natural run-off from the drainage basin of North Fork of Little Butte Creek the flow of this canal (1,210 acre-feet in July; 1,900 acre-feet in August, and 201 acre-feet in September) has been subtracted from the observed storage in the Fish Lake Reservoir. See record for Cascade Canal near Fish Lake, Oreg., in Water-Supply Paper 591.

NORTH FORK OF LITTLE BUTTE CREEK ABOVE MEDFORD INTAKE, NEAR LAKECREEK, OREG.

LOCATION.—In NW. ¼ sec. 36, T. 36 S., R. 2 E., 200 yards above intake of city of Medford water supply pipe, and 5 miles above Lakecreek post office and mouth of South Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 10, 1911, to March 31, 1913; May 26, 1922, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder on right bank, inspected by employees of Rogue River Valley Canal Co. Vertical staff 700 feet above intake used in 1911–1913.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders, fairly permanent. Control is a rocky riffle, 20 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage during period of record from water-stage recorder, 2.05 feet at 10 a. m. June 9 (discharge, 124 second-feet); minimum stage recorded, 1.31 feet October 27 and 28 (discharge, 21 second-feet). No record of stage about February 7, when maximum probably occurred.

1911–1913; 1922–1924: Maximum discharge recorded, 435 second-feet, February 17, 1912 (reading on old gage 4.3 feet); minimum discharge, 21 second-feet on December 17, 1922, and October 27 and 28, 1923.

ICE.—None.

DIVERSIONS.—Some minor diversions for irrigation about station. Hanley ditches and water supply pipe line of city of Medford divert just below gage.

REGULATION.—Discharge affected by storage in Fish Lake about 12 miles upstream. Monthly run-off figures corrected.

ACCURACY.—Stage-discharge relation changed during winter. Well-defined rating curves used October 1 to November 30 and March 15 to September 30. Operation of water-stage recorder satisfactory, except December 1 to March 14 and April 1–9. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of North Fork of Little Butte Creek above Medford intake, near Lakecreek, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 8	1.32	20.5	Apr. 30	1.65	51	July 22	1.76	66
Apr. 10	1.72	62	June 4	2.03	121	Do	1.76	66
Apr. 28	1.65	51	July 7	1.81	75	Aug. 5	1.83	79

Daily discharge, in second-feet, of North Fork of Little Butte Creek above Medford intake, near Lakecreek, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	24		66	52	113	96	76	58
2	53	24		66	52	113	87	78	58
3	55	23		66	52	113	74	78	57
4	57	23		69	52	118	76	78	55
5	55	23			50	120	78	78	55
6	76	22			50	120	78	78	55
7	64	21		65	50	120	78	78	54
8	60	21			49	122	78	78	54
9	58	21			49	120	81	79	53
10	58	21		61	49	118	81	79	52
11	60	21		61	49	115	81	79	52
12	60	52		61	48	115	79	79	52
13	60	62		61	48	118	78	79	52
14	60	57		61	48	120	76	79	52
15	62	26	48	61	46	120	72	81	50
16	64	52	48	58	50	113	74	81	50
17	48	72	49	58	64	96	79	81	49
18	24	76	48	57	69	98	71	85	48
19	23	76	48	57	72	94	66	88	50
20	22	64	48	57	83	92	69	81	50
21	23	25	48	55	94	96	68	79	49
22	24	24	48	55	92	96	68	78	48
23	23	23	48	55	92	98	71	74	48
24	23	25	48	54	92	98	71	74	49
25	22	24	48	54	92	98	71	72	53
26	22	24	48	53	92	98	71	71	49
27	21	24	49	53	88	96	74	68	48
28	21	24	54	52	90	96	74	66	45
29	21	37	57	52	92	96	74	64	45
30	24	40	55	52	94	98	74	63	45
31	29		55		98		74	60	

NOTE.—Discharge for Apr. 1–3 estimated from comparison with station above canal intake; discharge for Apr. 5–9 interpolated.

Monthly discharge of North Fork of Little Butte Creek above Medford intake, near Lakecreek, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet		
	Maximum	Minimum	Mean	Measured	Gain or loss in storage	Corrected for storage
October	76	21	42.7	2,630	+1,021	3,650
November	76	21	35.0	2,080	+557	2,640
March 15–31	57	48	49.8	1,680		
April		52	59.3	3,530	+511	4,040
May	98	46	67.7	4,160	−734	3,430
June	122	92	108	6,430	−3,060	3,370
July	96	66	75.5	4,640	−1,860	2,780
August	88	60	76.2	4,690	−1,940	2,750
September	58	45	51.2	3,050	−240	2,810

NOTE.—Stored run-off includes increase or decrease in storage in Fish Lake and the deduction necessitated by the diversion of water into the drainage basin from Fourmile Lake in July, August, and September.

NORTH FORK OF LITTLE BUTTE CREEK NEAR LAKECREEK, OREG.

LOCATION.—In NW. ¼ sec. 21, T. 36 S., R. 2 E., about one-eighth mile above intake of Rogue River Valley Canal, 1 mile above Lakecreek post office, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 20 to October 13, 1916; May 7, 1917, to September 30, 1919; and April 13, 1921, to September 30, 1924.

GAGE.—Stevens eight-day recorder on right bank inspected by employee of Rogue River Valley Canal Co.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of boulders and gravel; fairly permanent except in extreme floods.

EXTREMES OF DISCHARGE.—Maximum discharge during year from water-stage recorder, 2.18 feet at 7 a. m. February 7 (discharge, 293 second-feet); minimum stage from recorder, 0.71 foot at 6 a. m. October 30 (discharge, 14 second-feet).

1916–1919; 1921–1924: Maximum stage from high-water marks, 6.02 feet January 12, 1918 (discharge not computed); minimum discharge, that of October 30, 1923.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Pipe line for water supply of city of Medford, capacity about 7.5 second-feet, carries water past the gage. Several hundred acres irrigated above the station.

REGULATION.—Water was stored in Fish Lake Reservoir, 15 miles above the station, on which a gage-height record has been kept. (See p. 166.)

ACCURACY.—Stage-discharge relation permanent during year. Rating curve well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records excellent.

Discharge measurements of North Fork of Little Butte Creek near Lakecreek, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 7	0.74	16.0	Feb. 7	2.00	244	June 10	1.41	100
Nov. 8	.74	16.7	Mar. 24	1.03	44.8	July 7	1.11	55
Jan. 24	1.02	44.9	Apr. 9	1.22	71	July 30	1.14	60
Feb. 5	1.32	86	Apr. 22	.97	37.5	Aug. 5	1.16	61

Daily discharge, in second-feet, of North Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	24	33	56	72	43	59	36	100	81	59	43
2	43	23	28	61	64	51	60	34	102	78	56	41
3	51	19	26	49	69	144	83	33	102	54	57	39
4	52	19	28	48	72	75	81	37	106	56	59	38
5	53	17	29	51	78	64	75	36	104	59	61	39
6	128	17	56	48	73	59	73	37	106	59	63	38
7	67	16	102	48	169	56	75	38	104	56	66	38
8	59	16	57	59	100	53	77	35	106	57	66	40
9	57	17	51	66	83	53	73	32	108	63	67	40
10	54	17	41	63	73	53	70	32	112	64	67	39
11	59	17	37	60	69	52	66	32	110	63	66	38
12	56	42	43	56	64	51	63	35	106	64	59	35
13	54	56	45	51	60	49	64	34	102	63	60	34
14	57	98	41	47	60	48	63	35	104	61	59	34
15	64	27	37	45	57	48	64	34	106	60	59	34
16	69	43	35	46	51	47	61	33	102	60	60	34
17	52	70	36	43	52	51	59	43	81	64	61	33
18	20	75	39	41	49	47	56	51	89	56	73	33
19	17	77	40	38	48	47	51	54	81	51	91	39
20	16	72	38	37	49	46	51	63	75	53	67	37
21	16	23	34	36	51	46	51	73	78	52	64	34
22	20	20	35	36	48	46	43	77	78	52	61	30
23	17	17	31	37	51	46	38	75	80	53	61	36
24	19	19	31	39	47	46	39	75	81	53	60	41
25	18	19	36	40	47	46	37	73	83	53	56	51
26	17	18	36	43	47	45	38	73	83	56	54	39
27	15	19	36	43	47	46	36	75	77	59	52	37
28	15	19	42	43	45	54	35	73	78	61	51	36
90	15	48	153	47	43	61	35	73	78	60	48	35
31	19	49	77	49	-------	57	37	73	81	60	46	35
32	39	-------	64	52	-------	57	-------	80	-------	60	45	-------

Monthly discharge of North Fork of Little Butte Creek near Lakecreek, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet		
	Maximum	Minimum	Mean	Measured	Gain or loss in storage	Corrected for storage
October	128	15	41.4	2,550	+1,021	3,570
November	98	16	33.8	2,010	+557	2,570
December	153	26	45.7	2,810	+951	3,760
January	66	36	47.7	2,930	+529	3,460
February	169	43	63.4	3,650	+479	4,130
March	144	45	54.4	3,340	+461	3,800
April	83	35	57.1	3,400	+511	3,910
May	80	32	51.1	3,140	−734	2,410
June	112	75	93.4	5,560	−3,064	2,500
July	81	51	59.4	3,650	−1,860	1,790
August	91	45	60.5	3,720	−1,940	1,780
September	51	30	37.3	2,220	−240	1,980
The year	169	15	53.7	39,000	−3,329	35,700

NOTE.—Stored run-off includes increase or decrease in storage in Fish Lake and the deduction necessitated by the diversion of water into the drainage basin from Fourmile Lake in July, August, and September.

ROGUE RIVER VALLEY CANAL NEAR BROWNSBORO, OREG.

LOCATION.—In SW. ¼ sec. 8, T. 36 S., R. 1 E., at head of Bradshaw drop, 50 feet below intake of Medford Irrigation District Canal, 2 miles southwest of Brownsboro, 8 miles below intake, and 16 miles from Medford, Jackson County.

RECORDS AVAILABLE.—Irrigation seasons of 1913, 1915–1919, and 1921–1924.

GAGE.—Stevens eight-day water-stage recorder on right bank, a few feet downstream from location of gage used up to end of irrigation season of 1921.

DISCHARGE MEASUREMENTS.—Made by wading or from a plank.

CHANNEL AND CONTROL.—Control is a solid rock reef, about 50 feet below gage; practically permament.

EXTREMES OF DISCHARGE.—Maximum stage during season from water-stage recorder, 1.98 feet at noon April 16 (discharge, 54 second-feet); canal dry November 10 to March 19.

1913–1924: Maximum discharge recorded, 65 second-feet, June 1, 1923 (gage height, 2.13 feet). Canal dry each winter.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve well defined. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records excellent.

The Rogue River Valley Canal diverts water from North Fork of Little Butte Creek in NE. ¼ sec. 20, T. 36 S., R. 2 E., to irrigate about 4,300 acres in the basin of Bear Creek. Any seepage or return water from irrigation of about 300 acres above this point reaches Little Butte Creek above the station on Little Butte Creek above Eagle Point.

Discharge measurements of Rogue River Valley Canal near Brownsboro, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 21	1.23	16.5	June 13	1.82	43.5	Aug. 23	0.64	1.28
Apr. 9	1.67	36.1	July 1	1.54	28.9	Sept. 10	1.13	12.0
Apr. 11	1.70	37.3	July 9	1.46	24.6	Sept. 20	1.73	36.5
Apr. 16	1.90	48.7	July 29	1.30	17.8	Sept. 27	1.42	22.4
Apr. 29	1.86	45.6	Aug. 7	1.28	15.8			
June 4	1.64	34.1	Do	1.28	16.1			

Daily discharge, in second-feet, of Rogue River Valley Canal near Brownsboro, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	3.2		20	40	34	26	14	12
2	23	3.2		22	38	31	31	16	11
3	27	2.7		22	43	28	25	16	10
4	28	11		22	48	34	20	15	10
5	28	4.8		24	47	36	25	17	9.2
6	28	.5		21	46	38	20	17	11
7	16	.4		23	45	39	19	18	12
8	25	.5		27	45	42	17	18	11
9	15	.3		36	44	39	22	20	10
10	14			38	43	34	25	20	12
11	14			41	42	46	28	19	11
12	14			39	45	45	26	18	10
13	13			41	40	44	24	18	9.8
14	13			44	36	42	23	17	12
15	14			48	28	43	21	17	13
16	14			43	16	45	19	17	11
17	14			35	14	34	22	19	9.8
18	8.5			36	22	34	19	22	12
19	5.1			35	21	32	12	17	17
20	4.0		9.4	34	27	25	11	.3	31
21	4.2		15	37	32	22	13	.9	27
22	4.2		16	35	36	21	13	.5	28
23	4.0		16	37	34	22	13	1.9	30
24	2.8		16	45	34	22	14	18	30
25	3.3		17	38	32	22	12	18	28
26	2.7		18	39	32	24	13	17	24
27	3.8		18	39	32	19	14	14	24
28			21	35	32	18	16	13	21
29	3.2		24	42	32	20	17	13	28
30			21	42	29	24	16	12	32
31			20		30		15	11	

NOTE.—Discharge for Oct. 28 to Nov. 2 estimated; no gage-height record. Canal dry Nov. 10 to Mar. 18

Monthly discharge of Rogue River Valley Canal near Brownsboro, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	28		12.1	744
November 1–9			.89	53
March 19–31	24	9.4	6.82	419
April	48	20	34.7	2,060
May	48	14	35.0	2,150
June	46	18	32.0	1,900
July	31	11	19.1	1,170
August	22	.3	14.7	904
September	32	9.2	17.2	1,020
The year				10,400

NOTE.—No flow Nov. 10 to Mar. 18.

MEDFORD IRRIGATION DISTRICT CANAL NEAR BROWNSBORO, OREG.

LOCATION.—In SW. ¼ sec. 8, T. 36 S., R. 1 E., 100 yards below diversion from Rogue River Valley Canal, 2 miles southwest of Brownsboro, Jackson County.

RECORDS AVAILABLE.—May 14, 1922, to September 21, 1924.

GAGE.—Lietz water-stage recorder on right bank, inspected by L. S. Brophy, of the Rogue River Valley Canal Co.

DISCHARGE MEASUREMENTS.—Made from a footbridge near gage.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stagel recorder, 2.95 feet at 3 p. m. November 18 (discharge, 91 second-feet). Cana dry at times.

1922–1924: Maximum discharge, that of November 18, 1923.

REGULATION.—Flow regulated at diversion from company canal.

ACCURACY.—Stage-discharge relation affected by growth of moss. Standard rating curve well defined. Curve showing corrections for backwater due to moss is based on numerous measurements and is well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph with correction for backwater from moss. Records excellent.

Medford Irrigation District Canal diverts water from Rogue River Valley Canal in SW. ¼ sec. 8, just above Bradshaw drop, and extends along the east side of the Rogue River Valley to Phoenix, where its waters are conducted across Bear Creek in a siphon into the Phoenix Canal. About 8,120 acres were irrigated in 1924.

Discharge measurements of Medford Irrigation District Canal near Brownsboro, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 8	1.69	36.2	May 9	0.76	6.68	Aug. 6	1.94	32.8
Nov. 19	2.92	90.5	May 24	2.07	51.0	Aug. 7	2.01	35.2
Do	2.92	88.1	June 4	2.22	53.9	Aug. 23	1.82	29.6
Do	2.92	90.3	June 13	2.45	61.5	Sept. 3	1.56	20.8
Apr. 9	1.14	19.2	July 1	2.14	42.8	Sept. 10	1.59	21.4
Apr. 11	1.14	18.4	July 9	1.72	27.4	Sept. 20	.61	1.58
Apr. 16	1.56	33.1	July 15	1.70	27.2	Sept. 27	1.08	9.56
Apr. 22	1.78	39.6	July 18	1.71	26.9			
Apr. 29	2.21	58.0	July 29	1.85	30.5			

Daily discharge, in second-feet, of Medford Irrigation District Canal near Brownsboro, Oreg., for the year ending September 30, 1924

Day	Nov.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			16	55	51	42	27	23
2			16	55	51	43	26	23
3			16	50	50	31	27	20
4			16	48	55	26	29	21
5	4.9		16	28	53	26	32	21
6	20		17	5.2	55	26	33	20
7	31		17	7.8	58	26	34	20
8	36		18	7.8	59	26	35	23
9	35		18	18	58	28	35	22
10	35		18	53	55	27	37	21
11	35		18	51	61	27	37	22
12	36		27	52	61	27	35	20
13	50		30	52	61	26	35	19
14	64		29	48	60	26	35	19
15	55		29	47	61	26	34	19
16	65		37	46	62	26	33	22
17	82		43	45	58	26	35	19
18	86		40	49	57	26	35	17
19	89		40	48	57	25	28	18
20	86		40	49	54	26	16	9.6
21	11		40	51	53	25	12	7.6
22			40	53	53	25	10	4.1
23			40	52	53	24	28	1.8
24			49	51	53	25	34	4.1
25			55	50	53	23	35	13
26			56	50	53	22	34	11
27			55	50	51	22	32	9.4
28			52	50	47	26	29	9.4
29		8.8	55	51	43	29	26	4.4
30		15	55	49	42	30	24	.4
31		16		50		31	21	

NOTE.—Canal dry Oct. 1 to Nov. 4 and Nov. 22 to Mar. 28.

Monthly discharge of Medford Irrigation District Canal near Brownsboro, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 5–21	89		27.3	1,620
March 29–31	16		1.28	79
April	56	16	33.3	1,980
May	55	5.2	44.3	2,720
June	62	42	54.6	3,250
July	43	22	27.2	1,670
August	37	10	29.8	1,830
September	23	.4	15.5	922
The year				14,100

EAGLE POINT CANAL NEAR EAGLE POINT, OREG.

LOCATION.—In SE. ¼ sec. 31, T. 35 S., R. 1 E., halfway between point of diversion and point where canal crosses Eagle Point-Brownsboro road, 100 feet above intake of Pelouze lateral, and 2½ miles east of Eagle Point, Jackson County.

RECORDS AVAILABLE.—Irrigation seasons 1920 to 1924.

GAGE.—Vertical staff fixed to an alder tree on left bank. Read by Carl Bieberstedt and assistant water master.

CHANNEL AND CONTROL.—Artificial earth channel; banks high and uniform; no definite control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period May 1 to September 20, 1924, 2.20 feet June 10 (discharge, 27 second-feet); canal dry at times in winter.

1920–1924: Maximum stage recorded, 2.20 feet May 29–30, 1923, and June 10, 1924 (discharge, 27 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Flow in canal regulated by head gates.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve fairly well defined. Gage read to hundredths once or twice a day. Daily discharge ascertained by applying daily reading to rating table. Records good.

Eagle Point Canal of the Little Butte Irrigation Co. diverts water from Little Butte Creek in sec. 31, T. 35 S., R. 1 E. Water is used for irrigating in vicinity of Eagle Point.

Discharge measurements of Eagle Point Canal near Eagle Point, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 9	1.05	4.2	June 9	1.88	20.4	Aug. 6	1.73	14.8
Apr. 23	1.81	17.1	July 10	1.92	19.7	Sept. 9	1.60	14.3
May 10	1.79	16.3	July 28	1.89	20.4	Sept. 27	1.78	16.4
May 27	2.06	23.5	July 31	1.71	14.3			

Daily discharge, in second-feet, of Eagle Point Canal near Eagle Point, Oreg., for the irrigation season of 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	19	22	20	16	12	16	------	10	15	18	15	12
2	------	19	25	17	17	11	17	------	13	12	17	14	9.8
3	------	19	19	14	16	12	18	------	14	7.9	17	18	12
4	------	19	21	13	16	14	19	------	19	13	17	20	10
5	------	19	21	13	14	14	20	------	17	11	17	19	14
6	------	19	18	16	15	12	21	------	19	14	18	19	------
7	------	19	18	17	16	12	22	------	16	17	19	19	------
8	------	19	16	19	16	13	23	17	17	18	19	20	------
9	4.2	18	15	21	19	12	24	------	17	18	18	19	------
10	------	18	27	19	16	14	25	------	19	15	17	19	------
11	------	16	19	15	15	14	26	------	21	17	19	17	------
12	------	14	16	14	16	14	27	------	20	18	15	14	------
13	------	13	18	16	12	14	28	------	22	18	18	12	------
14	------	14	17	15	14	14	29	------	19	17	18	12	------
15	------	11	18	18	14	12	30	------	18	15	16	11	------
							31	------	14	------	14	10	------

Monthly discharge of Eagle Point Canal near Eagle Point, Oreg., for the irrigation season of 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May	22	10	17.1	1,050
June	27	7.9	17.2	1,020
July	21	13	16.9	1,040
August	20	10	15.8	972
September 1–20	14	9.8	12.1	480
The period				4,560

EMIGRANT CREEK NEAR ASHLAND, OREG.

LOCATION.—In SE. ¼ sec. 20, T. 39 S., R. 2 E., 200 feet above bridge on private road, 300 feet below Emigrant Gap reservoir site, and 8 miles by road above Ashland, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 27, 1920, to May 8, 1924, with some gaps during low-water periods.

GAGE.—Stevens continuous water-stage recorder on left bank, with inside and outside staff gages.

DISCHARGE MEASUREMENTS.—Made by wading, or from downstream side of highway bridge.

CHANNEL AND CONTROL.—Bed composed of gravel; channel fairly straight.

EXTREMES OF DISCHARGE.—Maximum stage during period, from water-stage recorder, 5.95 feet at noon February 7 (discharge, 281 second-feet). Stream bed practically dry beginning May 9.

1920–1924: Maximum stage, from water-stage recorder, 7.65 feet February 13, 1921 (discharge, 900 second-feet). Creek bed dry each summer.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Station is above practically all diversions in Rogue River Valley.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during year. Rating curve well defined. Operation of water-stage recorder satisfactory except for short periods. Daily discharge ascertained by applying to rating table mean gage height determined from gage-height graph by inspection. Records excellent.

Discharge measurements of Emigrant Creek near Ashland, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 7	4.29	18.0	Mar. 13	4.14	11.3
Feb. 1	5.02	92	Apr. 26	3.67	[a].8

[a] Estimated.

Daily discharge, in second-feet, of Emigrant Creek near Ashland, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1		3.5	1.8	13	61	11	20	0.6
2		3.1	1.3	13	45	11	20	.5
3		3.3	1.4	12	31	35	24	.5
4		2.8	3.0	10	35	23	27	.5
5		2.2	3.1	10	35	20	28	.5
6		2.2	8.0	9.7	45	18	28	.5
7		2.0	21	9.7	133	15	29	.5
8		2.0	12	9.7	107	13	28	.5
9		2.0	9.7	9.7	65	13	25	
10		2.0	7.6	13	48	13	23	
11		2.0	7.3	16	39	14	20	
12		2.2	7.3	14	34	13	18	
13		2.2	14	12	30	12	14	
14		3.7	16	10	27	12	12	
15		2.2	9.7	9.0	24	11	12	
16		1.2	9.0	9.0	22	11	7.3	
17		1.0	9.0	8.3	21	12	4.0	
18		.9	11	7.6	18	12	4.0	
19		.9	8.6	5.8	18	9.3	3.5	
20		.8	6.9	6.1	17	9.3	3.0	
21		.7	5.8	8.0	16	11	1.9	
22		.7	4.4	6.9	15	11	1.1	
23		.7	5.0	6.3	14	12	.9	
24		.7	5.8	6.3	13	12	.8	
25		.7	6.6	6.6	13	13	.7	
26		.7	6.6	8.0	13	15	.7	
27	1.2	.7	4.7	13	13	18	.8	
28	1.4	.6	5.0	19	12	23	.7	
29	1.3	.7	29	16	11	23	.7	
30	1.7	2.8	20	22		20	.8	
31	4.2		14	29		18		

NOTE.—No record Oct. 1–26. Discharge estimated Jan. 1, 2, and Apr. 17 and 18.

Monthly discharge of Emigrant Creek near Ashland, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 27–31	4.2	1.2	1.96	19
November	3.7	.6	1.71	102
December	29	1.3	8.86	545
January	29	5.8	11.2	689
February	133	11	33.6	1,930
March	35	9.3	15.0	922
April	29	.7	12.0	714
May 1–8	.6	.5	.51	8
The period				4,930

Monthly discharge of Emigrant Creek and East lateral near Ashland, Oreg., less Keene Creek Canal, for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 27–31	4.2	1.2	1.96	19
November	3.7	6	1.71	102
December	29	1.3	8.86	545
January	29	5.8	11.2	689
February	133	11	33.6	1,930
March	35	11	16.2	996
April	33		20.0	1,190
May			[a] 2.0	123
June			0	0
The period				5,590

[a] Estimated.

BEAR CREEK NEAR ASHLAND, OREG.

LOCATION.—In sec. 31, T. 38 S., R. 1 E., 300 yards below mouth of Butler Creek, 3 miles southeast of Talent, and 3 miles northwest of Ashland, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 30 to August 24, 1923; April 26 to July 6, 1924.

GAGE.—Stevens eight-day recorder on left bank; inspected by employees of Talent Irrigation District.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Gravel bar, 200 feet below gage, acts as control; channel divided at low stages, shifting in high stages, left bank high, right bank low, both wooded.

EXTREMES OF DISCHARGE.—Maximum stage during period of record from water-stage recorder, 1.06 feet at 4 p. m. April 19 (discharge, 20 second-feet); minimum stage by water-stage recorder, 0.52 foot at 5 p. m. June 9 and July 6 (discharge, 0.5 second-foot).

ICE.—None.

DIVERSIONS.—Station is below diversions of the Talent Irrigation District and above point of return of seepage water from area irrigated.

REGULATION.—None, except by irrigation diversions.

ACCURACY.—Stage-discharge relation stable during period of records. Rating curve well defined. Operation of water-stage recorder satisfactory April 26 to June 23. Daily discharge ascertained by applying to rating table mean gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of Bear Creek near Ashland, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 19	1.06	20.4	May 8	0.60	1.1	July 6	0.52	[a] 0.4
Apr. 26	.66	2.5	May 28	.58	[a] 1.0			

[a] Estimated.

Daily discharge, in second-feet, of Bear Creek near Ashland, Oreg., for the period April 19 to July 6, 1924

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1		1.0	0.9		16		4.3	1.1	
2		.9	.9		17		3.4	.9	
3		.9	.7	0.6	18		2.8	.7	
4		1.1	.7		19	20	2.8	.8	
5		1.0	.7		20		2.4	.7	
6		.9	.6	.5	21		2.4	.6	
7		.9	.5		22		2.6	.7	
8		1.0	.7		23		3.1	.9	
9		1.1	.5		24		1.1		
10		1.8	.6		25		.9		
11		3.1	5.6		26	1.6	1.0		
12		3.1	2.4		27	2.1	.9	.7	
13		7.9	1.1		28	1.8	.9		
14		6.0	1.0		29	1.4	.9		
15		5.0	1.4		30	1.6	1.0		
					31		.9		

NOTE.—Mean discharge estimated June 24 to July 5.

Monthly discharge of Bear Creek near Ashland, Oreg., for the period April 26 to July 6, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 26-30	2.1	1.4	1.7	17
May	7.9	.9	2.16	133
June	5.6	----------	.99	69
July 1-6	----------	----------	.58	7

BEAR CREEK NEAR TALENT, OREG.

LOCATION.—In sec. 23, T. 38 S., R. 1 W., 500 feet below intake of Phoenix Canal and 1 mile north of Talent, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 11 to October 12, 1923; April 11 to July 9, 1924.

GAGE.—Lietz eight-day water-stage recorder on left bank, referred to vertical staff gages in river and in well; inspected by employees of Medford Irrigation District.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Channel fairly straight; banks high and are not overflowed except during extremely high stages; riffle 100 feet downstream, where bed consists of gravel and boulders, forms a well defined and practically permanent control.

EXTREMES OF DISCHARGE.—Maximum stage during periods of record for year, 1.47 feet at 8 p. m. October 6, 1923 (discharge, 39 second-feet); minimum stage from recorder, 0.46 foot at 4 p. m. May 31 (stream bed practically dry).

1923–24: Maximum stage recorded, 1.50 feet June 26, 1923 (discharge, 42 second-feet).

DIVERSIONS.—Many diversions for irrigation above.

REGULATION.—None except by irrigation diversions.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspecting recorder graph. Records good.

Discharge measurements of Bear Creek near Talent, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 17	1.25	18.5	Apr. 24	0.72	1.0	May 28	0.62	[a] 0.2
Apr. 19	1.08	9.2	May 13	.82	2.1			

[a] Estimated.

Daily discharge, in second-feet, of Bear Creek near Talent, Oreg., for the year ending September 30, 1924

Day	Oct.	Apr.	May	June	July	Day	Oct.	Apr.	May	June	July
1	7.2			0.0	0.4	16			0.2	0.3	
2	6.9			.0	.4	17		18	.2	.4	
3	9.6			.1	.4	18			.2	.4	
4	19			.1	.4	19		9.2	.2	.4	
5	15			.1	.4	20			.2	.5	
6	31			.2	.4	21			.2	.4	
7	30			.1	.4	22			.2	.3	
8	21			.2	.4	23			.2	.3	
9	18			.2	.4	24		.9	.2	.4	
10	17			.2		25			.2	.4	
11	18			.2		26			.2	.4	
12	15			.2		27			.2	.4	
13			1.5	.2		28			.2	.4	
14			1.2	.2		29			.2	.4	
15			.7	.2		30			.2	.4	
						31			.1		

Monthly discharge of Bear Creek near Talent, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 1–12	31	6.9	17.3	412
May 13–31	1.5	.1	.34	13
June	.5	0	.27	16
July 1–9	.4	.4	.40	7

BEAR CREEK AT MEDFORD, OREG.

LOCATION.—In NW. ¼ sec. 30, T. 37 S., R. 1 W., just above Main Street Bridge in Medford, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 13, 1915, to September 30, 1924, with some breaks during low-water periods.

GAGE.—Lietz water-stage recorder on left bank beginning September 20, 1918. Vertical staff prior to that date, with datum 1 foot lower. Gage inspected by employees of Rogue River Valley Canal Co. and Medford Irrigation District.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel of loose gravel; a concrete sewer passing under stream forms an incomplete control.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.30 feet at 7 p. m. February 7 (discharge, 580 second-feet); minimum stage from recorder, 0.52 foot at 1 a. m. July 28 (discharge, 0.1 second-foot).

1915–1924: Maximum stage determined from high-water marks 6.8 feet in forenoon of February 9, 1919 (discharge, estimated from extension of rating curve, 2,400 second-feet); stream bed practically dry at times.

ICE.—No ice during year.

DIVERSIONS.—A large area is irrigated above the station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Operation of water-stage recorder satisfactory except for considerable periods during low water, when it was not attended regularly. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good except for November, August, and September for which they are fair.

Discharge measurements of Bear Creek at Medford, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 19	1.30	35.7	Feb. 8	2.59	314	May 10	0.78	3.9
Feb. 2	2.06	163	Mar. 21	1.43	49.7	July 8	.64	1.0
Feb. 7	2.94	439	Mar 25	1.46	56	Aug. 7	.58	.3
Do	3.22	543	Apr. 12	1.46	51	Sept. 27	.90	7.0

Daily discharge, in second-feet, of Bear Creek at Medford, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	30	39	66	129	50	60	6.3	3.0	1.8	0.2	
2	9.1	29	37	54	150	48	64	6.6	2.6	1.8	.3	
3	9.6		32	62	110	80	69	6.0	2.4	1.6	.2	
4	18		30	57	120	96	75	7.2	2.1	1.4	.2	
5	20		28	55	120	74	89	7.2	2.1	.3	.3	1.0
6	31		35	54	129	66	89	6.3	1.9	.6	.2	
7	51		94	55	328	62	94	5.4	2.6		.3	
8	39		82	52	302	57	92	5.1	4.0	.8	.3	
9	33		64	48	190	56	78	4.8	5.4	.8	.3	
10	31		56	56	150	55	64	4.2	5.4	.8	.2	1.4
11	30		52	59	135	57	60	5.4	6.3	.8	.3	1.4
12	34		54	64	118	54	54	5.4	5.7	.6	.4	1.3
13	25	27	57	56	108	51	33	6.0	4.5	.3	.4	1.2
14	24		82	52	96	48	39	6.0	4.2	.3	.3	1.0
15	23		66	47	85	50	39	5.1		.3	.3	1.0
16	23		60	45	80	47	36	4.8		.3	.3	.7
17	23		59	44	77	46	37	4.2	3.6	.3		
18	21		66	44	69	47	29	4.0		.2		
19	21		59	38	64	47	25	4.2		.2		
20	21		50	39	63	48	25	3.7		.3		
21			47	37	64	50	21	3.5	1.9	.3		2.5
22	22		44	38	60	51	14	3.0	1.8	.3		
23		25	40	38	56	54	12	3.0	1.9	2		
24		26	40	36	56	51	12	3.0	2.6	.2	.5	
25	22		42	35	56	48	8.6	3.3	2.6	.2		
26	21		42	36	56	48	7.2	3.7	2.1	.2		
27	21	32	36	43	57	51	6.9	4.0	2.4	.2		7.0
28	23		34	63	55	59	6.9	4.2	1.8	.2		
29	26		85	62	51	66	6.6	4.5	1.6	.2		5.0
30	30		105	80	-------	63	6.6	4.0	1.8	.2		
31	31	-------	82	85	-------	57	-------	3.3	-------	.2		-------

NOTE.—Mean discharge interpolated or estimated for periods of no gage-height record, as indicated by braced figures.

Monthly discharge of Bear Creek at Medford, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	51	9.1	24.5	1,510
November	----------	----------	28.1	1,670
December	105	28	54.8	3,370
January	85	35	51.6	3,170
February	328	51	108	6,210
March	96	46	56.0	3,440
April	94	6.6	41.8	2,490
May	7.2	3.0	4.75	292
June	6.3	1.6	3.14	187
July	1.8	.2	.53	33
August	----------	.2	.39	24
September	----------	----------	2.13	127
The year	328	.2	31.1	22,500

BEAR CREEK NEAR CENTRAL POINT, OREG.

LOCATION.—In sec. 2, T. 37 S., R. 2 W., 1 mile northeast of Central Point, Jackson County, on road to Agate station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 23 to September 30, 1923, and April 1 to September 30, 1924, with earlier miscellaneous measurements.

GAGE.—Barrett and Lawrence recorder on right bank 600 feet above highway bridge.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel, with cobblestone riffle about 300 feet below gage, somewhat shifting in floods. Left bank may be overflowed in extreme high water.

EXTREMES OF DISCHARGE.—Maximum stage during period April 1 to September 30, from water-stage recorder, 2.01 feet at 8 a. m. April 4 (discharge, 101 second-feet); stream bed practically dry at times.

1923–24: Maximum stage from recorder, 2.20 feet April 6, 1923 (discharge, 138 second-feet).

ICE.—No record during winter.

DIVERSIONS.—Station below all present diversions, at intake of proposed Oakleigh Canal. During irrigation season practically all water is diverted, the flow being mostly return water.

REGULATION.—Only by head gates of irrigation canals.

ACCURACY.—Stage-discharge relation somewhat unstable. Rating curve fairly well defined. Operation of water-stage recorder satisfactory, except July 30 to August 3 and September 17–19. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph; shifting-control method used May 10 to September 30. Records good.

Discharge measurements of Bear Creek near Central Point, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 25	1.84	73	May 10	1.15	5.8	Aug. 4	1.22	1.1
Apr. 12	1.73	58	June 11	1.30	4.5	Aug. 6	1.19	.8
Apr. 17	1.59	42.9	July 10	1.24	1.1	Sept. 8	1.32	1.8
Apr. 23	1.35	16.6	July 14	1.24	1.4	Sept. 20	1.46	2.7
May 6	1.20	9.5						

Daily discharge, in second-feet, of Bear Creek near Central Point, Oreg., for the period April 1 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	68	8.5	3.1	3.1		1.0	16	43	3.4	4.0	0.4	0.6	0.2
2	74	8.0	3.1	2.8	1.0	1.3	17	44	2.5	5.0	1.0	1.0	
3	78	8.0	3.4	3.4		1.9	18	40	2.5	5.5	.8	1.3	1.0
4	93	11	2.8	3.4	1.0	3.4	19	31	2.5	5.0	.8	5.0	
5	96	11	4.0	2.8	1.3	3.1	20	29	1.9	5.0	1.0	4.0	3.1
6	94	9.6	3.7	2.5	.2	3.1	21	26	1.9	5.0	.2	3.1	3.1
7	96	8.5	3.1	3.1	0	2.2	22	21	2.2	4.5	.0	2.5	3.1
8	96	8.0	3.7	2.5	0	1.9	23	18	3.7	4.5	.0	1.9	3.7
9	80	7.5	3.7	1.3	.4	2.2	24	16	4.0	2.8	.0	1.6	4.5
10	64	6.5	5.0	.6	.8	1.9	25	13	3.4	2.8	.6	1.6	13
11	57	5.0	5.5	.6	1.3	1.3	26	10	3.7	2.8	.6	1.6	6.5
12	55	5.0	6.5	.8	.6	.8	27	9.6	4.0	3.1	.4	1.0	3.7
13	40	4.5	6.0	1.0	.4	.8	28	9.0	4.0	3.7	.6	.6	3.7
14	40	4.0	5.0	.8	.2	.6	29	9.0	4.5	3.4	1.0	.4	3.4
15	44	4.0	6.5	.6	.4	.2	30	9.0	3.7	3.1	1.0	.4	3.0
							31	------	3.4	------		.8	------

NOTE.—Mean discharge estimated for periods of no gage-height records July 30 to Aug. 3, Sept. 17–19, and 30.

Monthly discharge of Bear Creek near Central Point, Oreg., for the period April 1 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April	96	9.0	46.8	2,780
May	11	1.9	5.17	318
June	6.5	2.8	4.18	249
July	3.4	0	1.25	77
August	5.0	0	1.19	73
September	13	.2	2.66	158
The period				3,660

EAST LATERAL NEAR ASHLAND, OREG.

LOCATION.—In SE. ¼ sec. 20, T. 39 S., R. 2 E., 500 feet below Emigrant Gap Dam and 7 miles southeast of Ashland, Jackson County.

RECORDS AVAILABLE.—April 23 to September 19, 1923; March 19 to July 17, 1924.

GAGE.—Stevens eight-day recorder on left bank; inspected by employees of Talent Irrigation District.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Concrete-lined section for short distance at gage, bottom below grade and some sediment may collect; earth section above and below; no defined control, aquatic plants cause unstable conditions.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 2.08 feet at 8 a. m. June 22 (discharge, 48 second-feet); canal dry at times.

ICE.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined; water-stage recorder started April 5; operation satisfactory, except April 11, 16–18, June 2, and July 2–8, when clock was stopped; and June 6–8, when inlet was plugged. Daily discharge ascertained by applying mean daily gage height to rating table; some days subdivided. Records fair.

East lateral of Talent Irrigation District diverts water from Emigrant Creek in SE. ¼ sec. 20, at Emigrant Gap Dam, for the irrigation of about 2,500 acres of land lying along the right or east side of Bear Creek Valley and extending to a point nearly opposite Medford.

Discharge measurements of East lateral near Ashland, Oreg., during the period March 19 to July 17, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 5	0.43	3.39	May 8	1.83	33.8	June 9	1.83	37.6
Apr. 19	1.13	15.7	May 28	1.74	34.0	July 9	.65	4.29
Apr. 26	1.02	13.4						

Daily discharge, in second-feet, of East lateral near Ashland, Oreg., for the period March 19 to July 17, 1924

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1			14	2	3	16		12	34	42	
2		3	23	28		17		15	33	42	
3			25	34		18		15	32	44	
4			25	40		19		15	31	44	
5		3	23	39	4	20		15	31	43	
6		3	22	38		21		14	30	45	
7		4	27	38		22		16	31	46	
8		4	33	38		23		24	33	45	
9		3	36	38	4	24		19	33	33	
10		3	31	38	3	25	3	15	33	4	
11		3	38	38	2	26		12	33	3	
12		4	38	39	1	27		10	34	3	
13		6	39	39	1	28		9	34	2	
14		9	37	39		29		12	34	2	
15		11	36	40		30		12	4	2	
						31			2		

NOTE.—Canal dry Oct. 1 to Mar. 18 and July 14 to Sept. 30. Discharge Mar. 19 to Apr. 4 and Apr. 16–18 estimated from statements of Talent Irrigation District employees; Apr. 11 and June 6–8 interpolated; June 2 and July 2–8 estimated by comparison with flow at station on Keene Creek Canal.

Monthly discharge of East lateral near Ashland, Oreg., for the period March 19 to July 17, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March 19–31		0	3.00	77
April	24	3	9.33	555
May	39	2	29.3	1,800
June	46	2	30.9	1,840
July 1–17		0	2.47	83
The period				4,360

NEIL CREEK NEAR ASHLAND, OREG.

LOCATION.—In SW. ¼ sec. 12, T. 39 S., R. 1 E., 100 feet above bridge on Dead Indian road and 3 miles east of Ashland, Jackson County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 15 to April 26, 1924. Record is not directly comparable, because of diversions and tributaries between gages, with record obtained June 30 to November 15, 1913, in sec. 31, T. 39 S., R. 2 E.

GAGE.—Water-stage recorder on left bank in wooden shelter, referred to vertical staff gages in well and outside.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed consists of gravel and shifting granite sand. Channel straight for 30 feet below gage; crooked above.

EXTREMES OF DISCHARGE.—Maximum stage by water-stage recorder, 1.24 feet at 11 a. m. February 7 (discharge, 30 second-feet); creek dry at times, after period of record.

DIVERSIONS.—Numerous small ditches divert above station for irrigation of lands along Neil Creek; return water from most of these lands reaches Neil Creek above gage.

ACCURACY.—Stage-discharge relation permanent. Operation of water-stage recorder satisfactory, except as indicated in footnote to table of daily discharge. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

Discharge measurements of Neil Creek near Ashland, Oreg., during the period January 15 to April 26, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 15	0.76	4.6	Mar. 13	0.70	3.8	Apr. 26	0.32	[a] 0.4
Feb. 1	1.01	15.0	Apr. 19	.64	2.7			

[a] Estimated.

Daily discharge, in second-feet, of Neil Creek near Ashland, Oreg., for the period January 15 to April 26, 1924

Day	Jan.	Feb.	Mar.	Apr.	Day	Jan.	Feb.	Mar.	Apr.
1		12	5.1	4.6	16	4.9	7.7	3.5	4.0
2		11	5.1	4.6	17	4.0	7.3	3.7	2.6
3		8.5	6.6	4.9	18		6.6	3.5	2.0
4		8.1	5.3	5.3	19		6.6	3.7	2.5
5		8.5	5.3	5.1	20	3.8	6.2	4.0	2.3
6		9.2	5.1	5.6	21		6.6	4.0	1.7
7		22	4.9	6.6	22	3.5	6.6	4.4	
8		18	4.9	5.6	23		5.8	4.9	
9		14	4.9	4.6	24		5.6	4.9	.3
10		12	4.9	4.6	25		5.3	4.9	
11		11	4.6	4.0	26	4.4	5.1	5.1	.3
12		9.2	4.4	3.5	27		5.1	5.1	
13		8.8	3.7	3.4	28		5.1	5.6	
14		8.1	3.4	3.7	29	5.3	5.1	5.1	
15	4.9	8.1	3.2	4.0	30	5.8		4.9	
					31	6.2		4.4	

NOTE.—Mean discharge interpolated Jan. 18–21 and 23–28; estimated Apr. 22–25.

Monthly discharge of Neil Creek near Ashland, Oreg., for the period January 15 to April 26, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January 15–31	6.2		4.48	151
February	22	5.1	8.73	502
March	6.6	3.2	4.62	284
April 1–26	6.6	.3	3.33	172
The period				1,110

TALENT LATERAL NEAR ASHLAND, OREG.

LOCATION.—In SW. ¼ sec. 33, T. 38 S., R. 1 E., at intake one-fourth mile above mouth of Ashland Creek, and half a mile east of Ashland, Jackson County.

RECORDS AVAILABLE.—Irrigation periods of 1920 to 1924.

GAGE.—Stevens eight-day recorder, inspected by employees of Talent Irrigation District; staff gage prior to 1923.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Excavated in earth and gravel; slightly shifting owing to growth of aquatic plants.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.04 feet at 3 a. m. May 11 (discharge, 22 second-feet); canal dry prior to April 30 and beginning June 25.

1920–1924: Maximum discharge recorded, 26 second-feet at midnight May 6, 1922 (gage height, 2.27 feet); canal dry at times.

ACCURACY.—Stage-discharge relation not permanent, owing to growth of moss in canal. Rating curve well defined; correction curve fairly well defined. Daily discharge for period April 5 to June 23 ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection; shifting-control method used May 11 to June 23. Records good.

Talent lateral diverts water from Bear Creek in SW. ¼ sec. 33, above mouth of Ashland Creek. Water from Ashland Creek may be diverted to enter Bear Creek above the intake of Talent lateral. Water from Talent lateral irrigated about 2,200 acres of land in Bear Creek Valley in 1924, lying principally on the left or southwest side of Bear Creek.

Discharge measurements of Talent lateral near Ashland, Oreg., during the period Mdrch 31 to June 24, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 11	1.18	7.25	Apr. 26	1.66	14.7	May 28	1.17	4.68
Apr. 19	1.59	13.6	May 8	1.09	6.56	June 9	1.20	2.02

Daily discharge, in second-feet, of Talent lateral near Ashland, Oreg., for the period March 31 to June 24, 1924

Day	Mar.	Apr.	May	June	Day	Mar.	Apr.	May	June
1			8.0	3.6	16		12	7.2	2.5
2		2.0	7.2	3.2	17		11	6.7	2.2
3			7.2	2.5	18		12	8.7	2.4
4			8.2	2.6	19		14	8.2	2.1
5		4.6	8.2	2.4	20		14	7.2	1.9
6		4.8	8.2	2.4	21		14	6.8	1.6
7		5.1	6.8	2.3	22		14	6.1	1.4
8		4.9	6.2	2.4	23		16	5.8	1.3
9		5.9	6.0	2.2	24		15	5.0	1.0
10		7.6	6.1	1.8	25		15	6.6	
11		7.3	9.0	.9	26		14	5.9	
12		8.7	7.6	1.5	27		14	5.5	
13		12	9.3	2.7	28		14	4.8	
14		12	8.2	2.4	29		10	3.3	
15		12	7.5	2.2	30		10	4.7	
					31	2.0		3.6	

NOTE.—Discharge estimated Mar. 31 to Apr. 4 and June 24.

Monthly discharge of Talent lateral near Ashland, Oreg., for the period March 31 to June 24, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April	15.9	[a] 2.0	9.72	578
May	9.3	3.3	6.77	416
June 1-24	3.6	.9	2.15	102
The period				1,100

[a] Estimated.

PHOENIX CANAL AT TALENT, OREG.

LOCATION.—In NW. ¼ sec. 23, T. 38 S., R. 1 W., 80 feet below intake, one-fourth mile below an old bridge across Bear Creek and half a mile north of Talent Jackson County.

RECORDS AVAILABLE.—April 19, 1916, to September 30, 1924.

GAGE.—Lietz water-stage recorder on right bank referred to vertical staff at end of concrete-lined section 50 feet downstream. Gage inspected by employees of Rogue River Valley Canal Co.

DISCHARGE MEASUREMENTS.—Made from footbridge.

CHANNEL AND CONTROL.—Concrete lining extends only a few feet below gage; no well-defined control; earth channel subject to moss growth.

EXTREMES OF DISCHARGE.—Maximum stage during season from water stage recorder, 1.82 feet at 2 p. m. April 17 (discharge, 25 second-feet). Canal dry in winter.

1916–1924: Maximum discharge recorded, 48 second-feet May 28, 1921 (gage height, 3.14 feet).

ACCURACY.—Stage-discharge relation continually changing, owing to growth of moss and flat gradient of canal; shifting-control method used. Operation of water-stage recorder unsatisfactory. Daily discharge ascertained by applying indirectly to rating table, mean daily gage height determined by inspecting recorder graph. Records poor.

Phoenix ditch diverts water from Bear Creek in NW. ¼ sec. 23, T. 38 S., R. 1 W., and furnishes a supplemental water supply for the part of the Medford irrigation district lying west of Bear Creek.

Discharge measurements of Phoenix Canal at Talent, Oreg., during the period April 1 to July 31, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 2	0.87	5.95	Apr. 24	0.82	6.23	June 11	1.13	7.85
Apr. 11	.84	6.91	May 3	.72	3.84	June 21	.81	2.42
Apr. 17	1.64	21.3	May 13	1.28	14.2	July 9	.61	.64
Apr. 21	1.18	12.4	June 6	.62	1.78	July 14	.56	.57

Daily discharge, in second-feet, of Phoenix Canal at Talent, Oreg., for the period April 1 to July 31, 1924

Day	Apr.	May	June	July
1	6.0	4.6		0.8
2	5.8			.4
3	5.9	4.2	2.6	.4
4	6.2			.4
5	6.4			.4
6	6.6	5.5	1.5	.6
7	7.0		2.2	.7
8	7.1			.6
9	7.0		5.0	.4
10	6.8	6.8		.4
11	6.8	9.4	7.9	.4
12	11			.5
13	16	12		.6
14		11		.7
15	20			.7
16	21		4.7	.5
17	21			.5
18	18			.5
19	17	8.3		.5
20	15			
21	12		1.5	
22	7.3		1.6	
23	6.4		1.5	
24	5.6	5.6	1.4	
25	5.3		1.3	.3
26	5.0	5.0	1.3	
27			1.2	
28	4.6	4.3	1.1	
29		4.0	1.0	
30			1.2	
31		3.8		

NOTE.—Mean discharge for braced periods estimated, generally by interpolation. Canal dry Oct. 1 to Mar. 31 and Aug. 1 to Sept. 30.

Monthly discharge of Phoenix Canal at Talent, Oreg., for the period April 1 to July 31, 1924

Month	Discharge in second-feet (mean)	Run-off in acre-feet
April	9.55	568
May	6.66	410
June	3.17	189
July	.44	27
The period		1,190

McDONALD CREEK CANAL NEAR TALENT, OREG.

LOCATION.—In NE. ¼ sec. 34, T. 39 S., R. 1 W., 8 miles by road south of Talent, Jackson County.

RECORDS AVAILABLE.—April 1 to August 10, 1923; April 10 to June 21, 1924.

GAGE.—Vertical staff on left bank 150 feet above weir at end of canal, where water is discharged into Wagner Creek; read by employees of Talent Irrigation District.

DISCHARGE MEASUREMENTS.—Made from footbridge 20 feet above gage.

CHANNEL AND CONTROL.—Channel is in smooth earth section. Control at low stages is a slight riffle 20 feet below gage; at higher stages is probably the weir 150 feet below gage. Slight changes in rating may be caused by shifting sand dunes.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 1.28 feet at 8 a. m. May 13 (discharge, 17.8 second-feet). Canal dry until April 9 and after June 22. 1923–24: Maximum stage recorded, 1.45 feet July 6, 1923 (discharge 24.2 second-feet).

ICE.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Gage read to hundredths twice a day. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

McDonald Creek Canal diverts water from McDonald Creek, tributary to Little Applegate River, practically on line between secs. 10 and 11, T. 40 S., R. 1 W., and discharges it into head of Wagner Creek, from which it is again diverted for irrigation of about 1,000 acres near Talent.

The following discharge measurements were made:

May 8, 1924: Gage height, 1.16 feet; discharge, 14.1 second-feet.

June 6, 1924: Gage height, 0.75 foot; discharge, 5.00 second-feet

June 19, 1924: Gage height, 0.70 foot; discharge, 4.23 second-feet.

Daily discharge, in second-feet, of McDonald Creek Canal near Talent, Oreg. for the period April 10 to June 21, 1924

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1		13.0	6.0	11	2.2	15.5	6.4	21	10.2	11.0	3.9
2		13.5	5.6	12	2.7	16.5	5.1	22	11.7	10.2	
3		13.5	5.3	13	3.9	17.2	4.9	23	11.9	8.3	
4		13.2	3.5	14	3.3	16.2	4.9	24	12.4	9.2	
5		13.0	5.1	15	2.6	14.4	4.6	25	12.4	8.7	
6		13.0	5.1	16	3.2	14.1	3.9	26	13.0	8.3	
7		14.1	5.3	17	3.8	13.0	4.2	27	12.4	7.9	
8		14.1	5.3	18	4.7	12.4	5.3	28	12.4	7.7	
9		14.4	5.5	19	6.6	12.2	4.0	29	12.4	7.1	
10	2.1	14.6	5.5	20	8.3	11.9	3.6	30	12.4	7.0	
								31		6.4	

NOTE.—Canal dry Oct. 1 to Apr. 9 and June 22 to Sept. 30.

Monthly discharge of McDonald Creek Canal near Talent, Oreg., for the period April 10 to July 21, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 10-30	13.0	2.1	7.84	327
May	17.2	6.4	12.0	738
June 1-21	6.4	3.6	4.99	208
The period				1,270

COQUILLE RIVER BASIN

SOUTH FORK OF COQUILLE RIVER AT POWERS, OREG.

LOCATION.—In SW. ¼ sec. 13, T. 31 S., R. 12 W., 200 feet above Bingham Creek, 1,000 feet below Salmon Creek, and one-fourth mile due west of Powers post office, Coos County, the present terminus of Marshfield branch of Southern Pacific Railroad.

DRAINAGE AREA.—168 square miles (measured on topographic map of United States Gelogical Survey and on Douglas County Abstract Co.'s map).

RECORDS AVAILABLE.—September 4, 1916, to September 30, 1924.

GAGE.—Inclined staff in three sections on left bank under footbridge. Gage read by Ray Brown.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge.

CHANNEL AND CONTROL.—Bed composed of gravel and solid rock; shifts during floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.4 feet at 5 p. m. December 6 (discharge, 8,840 second-feet); minimum stage recorded, 2.28 feet September 12, 14, 16, and 18 (discharge, 17 second-feet).

1916–1924: Maximum stage recorded, 13.0 feet, January 17, 1919 (discharge, 12,000 second-feet); minimum discharge that of September, 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve well defined. Gage read generally to half-tenths, daily December 5–7, December 28 to June 15, September 24–30, every other day the rest of the year. Daily discharge ascertained by applying daily gage reading to rating table or by interpolation for days when gage was not read. Records good.

Discharge measurements of South Fork of Coquille River at Powers, Oreg., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 20	2.70	56	Aug. 28	2.32	19.2
July 4	2.50	30.0	Do	2.32	18.5

Daily discharge, in second-feet, of South Fork of Coquille River at Powers, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	58	450	960	5,930	425	710	135	52	38	25	18
2	38	61	350	710	4,020	488	650	135	52	38	25	18
3	42	64	245	1,930	2,580	550	710	135	52	36	25	18
4	158	58	298	1,560	1,780	550	650	158	52	33	25	18
5	171	52	650	1,100	1,650	500	550	171	52	33	25	18
6	184	50	6,310	960	1,400	450	550	158	52	33	25	18
7	140	47	4,340	770	2,960	400	550	146	52	33	25	18
8	95	45	1,930	1,240	2,260	355	550	135	52	33	25	18
9	86	43	1,280	1,240	1,520	355	450	114	52	33	25	18
10	78	42	550	1,170	1,170	378	400	114	52	33	25	18
11	60	40	660	1,170	960	355	355	95	52	33	25	18
12	42	38	770	1,030	710	315	315	104	52	33	24	17
13	44	76	1,260	960	600	280	298	95	47	31	23	17
14	47	114	1,740	1,030	550	272	315	95	47	29	22	17
15	52	96	1,380	890	500	264	355	86	47	29	22	17
16	65	78	1,030	770	450	264	315	86	47	29	22	17
17	78	74	1,580	650	450	280	280	78	47	27	26	17
18	86	71	2,130	600	425	264	264	78	95	25	29	17
19	95	62	1,890	450	400	245	245	78	80	25	27	23
20	90	52	1,650	450	355	355	245	78	64	25	25	29
21	86	52	1,120	400	315	378	229	78	52	25	25	27
22	264	52	600	425	280	500	213	78	47	25	25	25
23	224	1,400	478	400	298	400	213	71	42	25	24	38
24	184	1,100	355	425	280	450	198	71	42	25	22	52
25	140	708	502	692	400	400	184	64	42	25	22	184
26	95	315	650	960	650	378	184	64	42	25	22	86
27	86	314	525	1,100	550	400	171	64	42	25	20	58
28	78	114	400	1,100	650	600	158	64	40	25	18	42
29	71	1,030	1,830	1,170	550	890	146	58	38	25	18	38
30	64	740	1,560	1,650	-------	770	146	58	38	25	18	33
31	61	-------	1,240	2,130	-------	740	-------	58	-------	25	18	-------

Monthly discharge of South Fork of Coquille River at Powers, Oreg., for the year ending September 30, 1924

[Drainage area, 168 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	264	33	98	0.584	0.67	6,030
November	1,400	38	232	1.38	1.54	13,800
December	6,310	245	1,280	7.62	8.78	78,700
January	2,130	400	971	5.78	6.66	59,700
February	5,930	280	1,190	7.09	7.65	68,400
March	890	245	424	2.52	2.90	26,100
April	710	146	353	2.10	2.34	21,000
May	171	58	96.8	.576	.66	5,950
June	95	38	50.4	.300	.34	3,000
July	38	25	29.2	.174	.20	1,800
August	29	18	23.5	.140	.16	1,440
September	184	17	31.7	.189	.21	1,890
The year	6,310	17	399	2.38	32.11	288,000

UMPQUA RIVER BASIN

SOUTH UMPQUA RIVER NEAR BROCKWAY, OREG.

LOCATION.—In sec. 15, T. 28 S., R. 6 W., at Winston's Bridge, 3 miles below Lookingglass Creek, 3 miles east of Brockway post office, 10 miles below Myrtle Creek, and 18 miles above the confluence of North and South Umpqua Rivers.

RECORDS AVAILABLE.—December 6, 1905, to June 30, 1912, and October 1, 1923, to September 30, 1924.

DRAINAGE AREA.—1,630 square miles (revised; measured on topographic and Forest Service maps).

GAGE.—Chain gage on bridge; no determined relation to datum of original gage. Gage read by John Lander.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading below control.

CHANNEL AND CONTROL.—One channel at all ordinary stages. Bed of stream at control, one-fourth mile below station, composed of gravel and boulders on left bank, bedrock on right bank; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.35 feet at 7:30 a. m. December 7 (discharge, 13,300 second-feet); minimum stage recorded, 0.54 foot September 17–19 (discharge, 49 second-feet).

1905–1912; 1924: Maximum stage recorded, 26.0 feet January 4, 1907, determined by leveling to high-water mark (discharge, obtained by extending rating curve for 1907 parallel to that for 1924, 71,000 second-feet); minimum discharge, that of September, 1924. Maximum stage for winter of 1886–1887 or 1887–1888 as determined by levels to high-water mark indicated by old resident, about 32 feet, datum of gage in 1924 (discharge, estimated by extension of rating curve, 85,000 second-feet).

ICE.—Practically none ever forms.

DIVERSIONS.—Numerous small diversions for irrigation above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent except during period June 12 to July 2, when drift was lodged on control, causing backwater. Rating curve well defined; corrections for shifting-control method fairly well defined for period June 12 to July 2. Chain gage read to hundredths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records good except for June, for which they are fair.

Discharge measurements of South Umpqua River near Brockway, Oreg., during the period September 27, 1923, to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Sept. 27	1.43	197	Jan. 7	5.01	2,620	June 30	1.22	104
Dec. 20	4.32	1,900	Feb. 9	7.72	6,900	Sept. 4	.59	53

Daily discharge, in second-feet, of South Umpqua River near Brockway, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	108	253	2,180	3,360	3,360	1,600	2,390	745	226	100	56	75
2	108	298	1,420	2,610	6,640	1,600	2,610	690	213	115	56	52
3	108	268	1,120	2,280	5,140	1,600	2,610	690	200	115	58	54
4	115	268	805	2,390	4,470	1,980	2,610	690	188	100	54	52
5	133	268	690	2,390	4,630	1,780	2,390	690	176	94	54	54
6	253	253	805	2,390	4,800	1,690	2,180	690	165	81	54	55
7	298	226	13,300	2,610	4,470	1,600	2,390	635	165	87	56	56
8	690	213	6,050	2,730	12,300	1,420	2,610	580	176	87	56	60
9	413	200	3,620	3,360	7,290	1,420	2,390	555	200	87	58	58
10	314	200	2,850	3,360	5,140	1,260	2,180	530	200	87	58	56
11	268	200	2,180	3,360	3,880	1,260	1,980	555	200	87	58	56
12	226	188	1,780	3,620	3,360	1,190	1,780	580	213	81	58	62
13	213	188	1,880	3,230	2,850	1,120	1,600	555	213	81	56	62
14	200	200	3,360	2,850	2,500	1,050	1,420	530	200	75	56	56
15	200	240	3,360	2,390	2,180	985	1,420	505	200	75	54	54
16	226	391	2,610	2,080	1,980	925	1,340	458	176	75	50	54
17	226	314	2,180	1,980	1,780	925	1,260	435	165	75	50	49
18	865	282	2,080	1,880	1,690	925	1,260	413	176	75	52	49
19	555	253	2,280	1,780	1,600	925	1,190	391	188	75	58	49
20	413	240	1,980	1,600	1,420	865	1,120	350	350	75	70	50
21	298	226	1,690	1,420	1,420	1,050	1,050	350	253	75	133	62
22	314	213	1,420	1,340	1,260	1,190	1,050	314	200	70	144	70
23	391	213	1,260	1,260	1,190	1,260	985	314	176	70	108	87
24	480	213	1,050	1,420	1,190	1,420	925	298	154	70	94	87
25	391	253	985	1,600	1,120	1,340	925	282	144	64	87	94
26	332	690	1,420	1,600	1,120	1,260	865	268	124	64	75	115
27	282	505	1,510	1,880	1,420	1,260	805	253	115	60	70	240
28	253	413	1,420	1,980	1,880	1,260	745	253	115	58	64	188
29	240	413	1,980	1,980	1,780	1,600	745	240	108	58	64	133
30	226	4,470	6,440	2,080	-------	2,390	745	240	104	56	54	115
31	226	-------	4,470	2,610	-------	2,390	-------	226	-------	54	56	-------

Monthly discharge of South Umpqua River near Brockway, Oreg., for the year ending September 30, 1924

[Drainage area, 1,630 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	865	108	302	0.185	0.21	18,600
November	4,470	188	418	.256	.29	24,900
December	13,300	690	2,590	1.59	1.83	159,000
January	3,620	1,260	2,300	1.41	1.63	141,000
February	12,300	1,120	3,240	1.99	2.15	186,000
March	2,390	865	1,370	.841	.97	84,200
April	2,610	745	1,590	.975	1.09	94,600
May	745	226	461	.283	.33	28,300
June	350	104	183	.112	.12	10,900
July	115	54	78.3	.0480	.06	4,810
August	144	50	66.8	.0410	.05	4,110
September	240	49	76.8	.0471	.05	4,570
The year	13,300	49	1,050	.644	8.78	761,000

UMPQUA RIVER NEAR ELKTON, OREG.

LOCATION.—In sec. 8, T. 23 S., R. 7 W., at the ferry crossing 4 miles south (by road) from Elkton, Douglas County, 8 miles (by river) above Elk Creek.

DRAINAGE AREA.—3,680 square miles.

RECORDS AVAILABLE.—October 18, 1905, to December 31, 1906; May 12, 1907, to September 30, 1924.

GAGE.—Staff in five sections. Low-water section inclined, the others vertical. Datum lowered 0.52 foot September 2, 1910. Gage read by Tod Gilbreth.

DISCHARGE MEASUREMENTS.—Made from car on ferry cable 100 feet below gage.

CHANNEL AND CONTROL.—Bed composed of gravel; somewhat shifting. Control of rock; practically permanent, except as affected by growth of aquatic plants in summer.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.5 feet at 5 p. m. December 7 (discharge, 39,100 second-feet); minimum stage recorded, —0.20 foot at 5 p. m. September 17 and 19 (discharge, 645 second-feet).

1905–1924: Maximum stage recorded, 38.5 feet (present datum) at 7 a. m. November 23, 1909 (discharge estimated from extension of rating curve, 163,000 second-feet); minimum stage recorded, that of September, 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—Numerous small diversions above station, mostly in South Umpqua Basin.

REGULATION.—Practically none.

ACCURACY.—Stage-discharge relation slightly unstable at low stages. Two fairly well-defined rating curves used, identical above 2,500 second-feet; shifting-control method used July 19 to September 30. Gage read twice a day to tenths to June 27; half-tenths thereafter. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

The following discharge measurements were made:

July 1, 1924: Gage height, 0.26 foot; discharge, 1,040 second-feet.

September 3, 1924: Gage height, —0.05 foot; discharge, 727 second-feet.

Daily discharge, in second-feet, of Umpqua River near Elkton, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr	May	June	July	Aug.	Sept.
1	1,250	1,430	10,800	12,600	10,800	6,400	7,890	2,990	1,300	1,040	790	750
2	1,250	1,430	8,600	9,100	22,700	5,630	7,890	2,990	1,300	1,040	790	750
3	1,250	1,430	4,730	7,660	20,200	5,630	8,360	2,840	1,300	1,000	790	715
4	1,250	1,430	3,910	7,890	14,700	6,010	9,100	2,840	1,190	1,000	790	750
5	1,250	1,430	3,290	7,660	15,700	6,010	8,360	2,990	1,190	1,000	790	750
6	1,340	1,430	3,590	7,440	17,100	5,630	7,440	3,290	1,190	955	790	750
7	1,520	1,340	37,100	8,120	17,800	5,260	7,890	2,990	1,140	955	790	715
8	2,840	1,340	28,000	8,850	33,500	4,900	9,100	2,840	1,090	955	790	715
9	2,300	1,340	15,400	10,500	22,700	4,560	8,600	2,690	1,090	955	830	750
10	1,950	1,340	11,400	10,800	16,400	4,560	7,220	2,690	1,090	955	790	750
11	1,520	1,340	8,600	10,800	12,900	4,230	6,400	2,550	1,190	910	790	750
12	1,430	1,340	6,800	11,100	10,200	3,910	6,010	2,690	1,190	910	790	750
13	1,430	1,340	6,010	10,200	8,600	3,910	5,630	2,690	1,190	910	790	790
14	1,340	1,340	7,660	8,600	7,890	3,590	5,260	2,690	1,190	910	790	750
15	1,340	1,340	12,000	7,660	7,010	3,590	5,080	2,550	1,190	910	790	750
16	1,340	1,340	8,600	6,400	6,400	3,290	4,900	2,420	1,090	910	790	680
17	1,950	1,340	7,660	6,010	6,010	3,140	4,560	2,290	1,090	910	790	680
18	4,070	1,430	6,800	5,820	5,630	3,290	4,390	2,160	1,090	870	790	715
19	3,290	1,430	6,010	5,630	5,260	3,290	4,390	2,160	1,090	870	790	680
20	2,420	1,430	6,010	5,260	4,900	3,290	4,230	1,900	1,540	830	790	715
21	1,950	1,430	5,630	4,900	4,560	3,910	4,070	1,900	1,240	830	910	715
22	1,730	1,340	4,900	4,560	4,560	4,230	3,910	1,780	1,190	830	870	715
23	2,180	1,340	4,230	4,390	4,230	4,230	3,750	1,720	1,190	830	790	750
24	2,180	1,430	3,910	4,390	4,070	4,230	3,590	1,660	1,090	830	830	830
25	1,730	3,590	3,590	4,900	4,070	4,070	3,590	1,540	1,090	830	750	870
26	1,620	3,290	4,900	4,900	3,910	4,390	3,590	1,540	1,090	830	750	1,000
27	1,620	2,840	6,010	4,900	4,900	4,230	3,290	1,420	1,090	830	750	1,360
28	1,520	2,180	5,630	5,630	6,800	4,230	2,990	1,420	1,090	830	750	1,040
29	1,430	1,950	10,500	6,400	6,800	5,630	2,990	1,420	1,040	830	790	1,000
30	1,430	14,400	26,900	6,800	-------	9,100	2,990	1,300	1,040	790	790	910
31	1,430	-------	17,800	7,660	-------	8,120	-------	1,300	-------	790	750	-------

Monthly discharge of Umpqua River near Elkton, Oreg., for the year ending September 30, 1924

[Drainage area, 3,680 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
October	4,070	1,250	1,780	0.484	0.56	109,000
November	14,400	1,340	2,050	.557	.62	122,000
December	37,100	3,290	9,580	2.60	3.00	589,000
January	12,600	4,390	7,340	2.00	2.31	451,000
February	33,500	3,910	10,700	2.91	3.14	616,000
March	9,100	3,140	4,730	1.29	1.49	291,000
April	9,100	2,990	5,580	1.52	1.70	332,000
May	3,290	1,300	2,270	.617	.71	140,000
June	1,540	1,040	1,160	.315	.35	69,000
July	1,040	790	898	.244	.28	55,200
August	910	750	793	.215	.25	48,800
September	1,360	680	795	.216	.24	47,300
The year	37,100	680	3,950	1.07	14.65	2,870,000

NORTH UMPQUA RIVER AT TOKETEE FALLS, OREG.

LOCATION.—In T. 26 S., R. 3 E. (unsurveyed), one-eighth mile below mouth of Clearwater River, half a mile above Toketee Falls, and 30 miles east of Hoaglin, Douglas County.

DRAINAGE AREA.—337 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 26, 1908, to July 20, 1909; December 19, 1914, to November 19, 1917, with missing periods; July 1 to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on left bank. Readings for 1908 and 1909 were made on staff gage at same location. Readings in 1924 referred to a datum 0.49 foot above that of earlier gages.

DISCHARGE MEASUREMENTS.—Made from cable about 75 feet below gage; good measuring section.

CHANNEL AND CONTROL.—Bed composed of boulders, rock, and heavy gravel; fairly smooth; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 1.10 feet at time of measurement June 19 (discharge, 685 second-feet); minimum stage from water-stage recorder, 0.82 foot September 2, 5, 6, and 14 (discharge, 530 second-feet).

1908–1909, 1915–1917, and 1924: Maximum stage recorded, 4.33 feet January 21, 1909 (discharge not computed); minimum stage recorded, that of September, 1924.

ICE.—Stage-discharge relation unaffected, as much of the water comes from springs.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation apparently permanent. Rating curve well defined. Operation of recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records for September, excellent; for July and August estimates are fair.

Discharge measurements of North Umpqua River at Toketee Falls, Oreg., during the period June 19 to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
June 19	1.10	694	Aug. 12	0.88	574	Sept. 18	0.82	561
July 16	.95	599	Aug. 28	.87	573			

Daily discharge, in second-feet, of North Umpqua River at Toketee Falls, Oreg., for the period June 19 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1				535	16		598		535
2				530	17				535
3		630		535	18				540
4				535	19	685			550
5				530	20				550
6			570	530	21			560	545
7				535	22				540
8				540	23				550
9				535	24		590		560
10		600		535	25				581
11				535	26				555
12			560	535	27			555	550
13				535	28			540	545
14			560	530	29			535	540
15				535	30			535	535
					31				

Monthly discharge of North Umpqua River at Toketee Falls, Oreg., for the period July 1 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July			600	36,900
August		535	561	34,500
September	581	530	541	32,200
The period				104,000

NORTH UMPQUA RIVER ABOVE ROCK CREEK, NEAR GLIDE, OREG.

LOCATION.—In NW. ¼ sec. 12, T. 26 S., R. 3 W., half a mile above mouth of Rock Creek, 7 miles above mouth of Little River, 7 miles east of Glide, Douglas County, and 25 miles northeast of Roseburg.

DRAINAGE AREA.—886 square miles (measured on Forest Service maps).

RECORDS AVAILABLE.—June 15 to September 30, 1924.

GAGE.—Water-stage recorder on left bank, inspected by J. H. Hayes.

DISCHARGE MEASUREMENTS.—Made from cable one-fourth mile above gage. Channel deep and current sluggish at low stages.

CHANNEL AND CONTROL.—One channel at gage at all stages. Control is a reef of solid rock, 200 feet below gage. Stream bed of rock and boulders at gage, permanent.

EXTREMES OF DISCHARGE.—Maximum stage during period June 15 to September 30 from water-stage recorder, 3.22 feet at 9 p. m. June 18 (discharge, 1,270 second-feet); minimum stage recorded, 2.15 feet from 9 a. m. to noon September 18 (discharge, 690 second-feet).

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—No diversions above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph. Records good.

The following discharge measurements were made:

June 15, 1924: Gage height, 2.64 feet; discharge, 916 second-feet.

July 2, 1924: Gage height, 2.48 feet; discharge, 827 second-feet.

September 4, 1924: Gage height, 2.20 feet; discharge, 707 second-feet.

Daily discharge, in second-feet, of North Umpqua River above Rock Creek, near Glide, Oreg., for the period June 15 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		840	750	710	16	915	772	730	690
2		840	750	710	17	915	772	710	690
3		840	730	710	18	1,060	772	750	690
4		840	730	710	19	1,100	772	840	710
5		818	730	710	20	970	772	795	730
6		818	730	690	21	915	772	750	730
7		818	730	710	22	890	772	750	710
8		818	730	730	23	890	772	730	730
9		818	730	710	24	890	750	730	795
10		795	730	710	25	865	750	730	1,060
11		795	730	710	26	865	750	730	890
12		795	730	710	27	865	750	730	772
13		795	730	710	28	840	750	730	750
14		795	730	690	29	840	750	730	730
15	915	795	730	690	30	840	750	710	730
					31		750	710	

Monthly discharge of North Umpqua River above Rock Creek, near Glide, Oreg., for the period June 15 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 15–30	1,100	840	911	28,900
July	840	750	787	48,400
August	840	710	737	45,300
September	1,060	690	734	43,700
The period				166,000

NORTH UMPQUA RIVER AT WINCHESTER, OREG.

LOCATION.—In NE. ¼ sec. 25, T. 26 S., R. 6 W., at Southern Pacific Railroad bridge in Winchester, 100 yards below new highway bridge, 300 yards below plant of California Oregon Power Co., and 5 miles north of Roseburg, Douglas County.

DRAINAGE AREA.—1,290 square miles (measured on topographic and Forest Service maps).

RECORDS AVAILABLE.—November 10, 1908, to December 31, 1913; October 1, 1923, to September 30, 1924.

GAGE.—Vertical staff in sections bolted to left railroad bridge pier. Datum of gage for 1924, 0.74 foot higher than that of earlier gage. Gage in tailrace of power plant used October 1 to January 6.

DISCHARGE MEASUREMENTS.—Made from railroad bridge at low and medium stages. High-water measurements may be made from old highway bridge above Winchester Dam.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; practically permanent; one channel at high and low stages, two at medium.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, −1.1 feet on tailrace gage at 8 a. m. December 29 (discharge, 20,200 second-feet); minimum stage recorded, 0.51 foot at time of afternoon reading August 15, 17, 29, and 30 (discharge, 660 second-feet). The flood in January, 1923, reached a stage of 19.7 feet, referred to the datum of the present gage as determined by leveling to high-water marks July 11, 1923 (discharge, 60,200 second-feet).

1908–1913; 1924: Maximum stage recorded, 28.1 feet on November 23, 1909 (discharge, 92,000 second-feet), information obtained from other gaging stations on the river and from residents indicated this to have been the highest flood in at least 50 or 60 years; minimum discharge recorded, that of August, 1924.

ICE.—Stage-discharge relation not affected by ice.

DIVERSIONS.—None.

REGULATION.—Considerable diurnal fluctuation occurs owing to operation of hydroelectric plant immediately above the station. One gage reading is made before the load comes on in the morning and one while the day load is on; both are supposed to be made after the flow of water has had time to become reasonably steady.

ACCURACY.—Stage-discharge relation practically permanent at both gages. Rating curves fairly well defined. Gage read to tenths daily to January 6, to hundredths twice a day thereafter; some gage readings bear evidence of not having been very carefully made. Daily discharge ascertained by applying mean daily gage height to rating table. Records fair.

Discharge measurements of North Umpqua River at Winchester, Oreg., during the period September 27, 1923, to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Sept. 27	1.19	1,080	Jan. 7	3.26	3,680	July 3	0.78	828
Dec. 21	2.52	2,630	Feb. 9	5.05	7,420			

Daily discharge, in second-feet, of North Umpqua River at Winchester, Oreg., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,180	1,280	2,260	4,420	13,300	2,730	2,040	1,920	1,130	940	715	688
2	1,080	1,280	2,140	3,120	11,000	2,430	4,370	1,920	1,090	940	715	688
3	1,680	1,180	2,020	2,990	12,400	2,290	4,370	1,920	1,090	940	715	745
4	1,380	1,080	2,990	3,390	12,700	3,180	4,370	1,920	1,010	940	715	745
5	1,380	1,080	3,120	3,250	8,300	3,180	4,190	1,920	1,050	905	715	775
6	1,380	1,180	3,250	3,120	8,300	3,030	4,010	1,920	1,050	905	715	745
7	1,480	1,180	12,000	3,830	11,500	2,580	4,010	1,920	1,010	775	688	745
8	1,380	1,080	5,200	3,830	8,820	2,580	4,750	1,920	1,010	775	715	745
9	1,480	1,280	5,400	3,650	7,790	2,580	4,370	1,920	1,010	775	715	775
10	1,580	1,180	5,200	3,830	6,190	2,160	4,190	1,800	1,010	775	688	745
11	1,680	1,180	4,800	3,830	5,550	2,160	4,010	1,800	1,010	775	688	775
12	1,180	1,280	4,050	3,830	4,940	2,040	3,180	1,800	1,010	775	688	745
13	1,180	1,280	3,540	3,830	3,650	2,040	3,030	1,800	1,010	745	688	745
14	1,280	1,180	3,390	3,650	3,330	2,040	3,030	1,800	1,010	745	688	745
15	1,780	1,280	2,860	3,650	3,330	2,040	3,030	1,680	1,010	775	688	745
16	1,580	1,280	3,120	3,650	3,330	2,040	3,030	1,680	1,010	745	688	775
17	1,680	1,480	3,870	3,650	3,180	1,920	2,730	1,680	1,010	715	688	775
18	1,680	1,580	3,870	3,650	3,180	1,920	2,580	1,680	1,010	745	688	775
19	1,480	1,480	2,860	3,650	2,430	1,800	2,430	1,680	1,010	715	715	775
20	1,480	1,680	2,860	3,650	2,430	1,920	2,430	1,680	1,010	715	715	775
21	1,680	1,780	2,860	2,290	2,430	2,040	2,160	1,680	1,010	715	715	775
22	1,480	1,900	2,140	2,580	2,430	1,920	2,160	1,580	1,010	745	688	745
23	1,480	1,900	2,140	2,580	2,430	2,040	2,160	1,580	1,010	715	688	775
24	1,480	1,900	2,020	2,730	2,290	2,160	2,160	1,580	1,010	715	688	775
25	1,380	1,780	2,020	2,580	2,290	2,160	2,160	1,580	975	715	688	775
26	1,380	2,020	1,900	2,730	2,430	2,040	2,040	1,580	975	745	688	775
27	1,480	2,020	2,620	2,730	2,730	2,040	2,040	1,490	975	715	688	775
28	1,380	2,140	2,260	2,880	2,580	2,040	2,040	1,490	975	715	688	775
29	1,380	2,380	16,300	2,880	2,580	2,160	2,040	1,180	975	715	688	775
30	1,380	2,380	9,460	3,180	-------	2,160	1,920	1,130	940	715	688	775
31	1,380	-------	5,600	3,330	-------	2,160	-------	1,130	-------	715	688	-------

Monthly discharge of North Umpqua River at Winchester, Oreg., for the year ending September 30, 1924

[Drainage area, 1,290 square miles]

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,780	1,080	1,450	89,200
November	2,380	1,080	1,520	90,400
December	16,300	1,900	4,130	254,000
January	4,420	2,290	3,320	204,000
February	13,300	2,290	5,440	313,000
March	3,180	1,800	2,240	138,000
April	4,750	1,920	3,030	180,000
May	1,920	1,130	1,690	104,000
June	1,130	940	1,010	60,100
July	940	715	776	47,700
August	715	688	698	42,900
September	775	688	758	45,100
The year	16,300	688	2,160	1,570,000

LAKE CREEK AT DIAMOND LAKE, NEAR FORT KLAMATH, OREG.

LOCATION.—In SW. ¼ sec. 30, T. 27 S., R. 6 E., 150 yards below outlet of Diamond Lake, Douglas County, and 35 miles north of Fort Klamath.

DRAINAGE AREA.—56 square miles (measured on Diamond Lake topographic sheet).

RECORDS AVAILABLE.—May 24 to November 17, 1922, April 12 to October 10, 1923, March 12 to September 30, 1924.

GAGE.—Vertical staff on right bank; read by P. B. Motschenbacher.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed composed of gravel and boulders, practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period March 12 to September 30, 1.57 feet, March 12 and 14 (discharge, 50 second-feet); minimum stage recorded, 0.91 foot September 12 (discharge, 12 second-feet).

1922–1924: Maximum stage recorded, 2.04 feet June 10 and 11, 1922 (discharge, 109 second-feet); minimum discharge, that of September 12, 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Temporary wooden dam about 100 yards above gage may cause some fluctuation in discharge.

ACCURACY.—Stage-discharge relation apparently permanent. Rating curve well defined. Gage read to hundredths once a day in October, two or three times a week March to September. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

COOPERATION.—Gage-height record furnished by State Fish Commission, which maintains an egg-taking station at this point.

The following discharge measurement was made:

September 12, 1924: Gage height, 0.91 foot; discharge, 11.9 second-feet.

Daily discharge, in second-feet, of Lake Creek at Diamond Lake, near Fort Klamath, Oreg., for the year ending September 30, 1924

Day	Oct.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20							
2	20							
3	20					26	20	
4	21		48	41	37			14
5	22							
6	25					31		
7	26						20	13
8	27			43	36			
9	27		46			22		
10	28			43			20	
11								13
12		50						12
13			46			25		
14		50		42	35		18	13
15								
16						24		
17		50	45		33		17	
18								13
19								
20			45			23		
21					31		16	14
22					30			
23		50	45	42		22		
24					29		16	15
25								
26		50	45	40				
27			44		28	22		
28							16	20
29					28			
30			43					
31				*37		21	15	

Monthly discharge of Lake Creek at Diamond Lake, near Fort Klamath, Oreg., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 1–10	28	20	23.6	468
March 12–31	50	50	50.0	1,980
April	48	43	45.2	2,690
May	43	37	41.1	2,530
June	37	28	31.9	1,900
July	31	21	24.0	1,480
August	20	15	17.6	1,080
September	20	12	14.1	839

NOTE.—Monthly mean discharge computed as average of days on which gage was read.

SILETZ RIVER BASIN

SOUTH FORK OF SILETZ RIVER AT VALSETZ, OREG.

LOCATION.—In NE. ¼ sec. 28, T. 8 S., R. 8 W., a quarter of a mile below log crib dam of Cobbs & Mitchell Co. and 1 mile northwest of terminus of Valley & Siletz Railroad and Valsetz post office, Polk County.

DRAINAGE AREA.—16.4 square miles; measured on special drainage basin map.

RECORDS AVAILABLE.—January 1 to March 31, 1924; station discontinued.

GAGE.—Vertical staff on left bank; read by D. P. Lamb and Thomas Hewitt.

DISCHARGE MEASUREMENTS.—Made from cable or by wading near gage. Measuring conditions only fair; bottom very rough.

CHANNEL AND CONTROL.—Bed composed of heavy angular boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period January 1 to March 31, 3.30 feet at 1 p. m. January 31 (discharge, 700 second-feet); minimum stage recorded, 0.69 foot at 10 a. m. January 1 (discharge, 19 second-feet), all of which is leakage through dam and seepage between dam and gage.

The highest stage in recent years occurred November 20, 1921, and reached a stage of about 7 feet on the gage. The maximum discharge over and through the dam has been computed as 6,700 second-feet or 408 second-feet per square mile.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of Cobbs & Mitchell Dam has a marked effect on the flow. Dam has an area of about 300 acres and is used for creating a log pond.

ACCURACY.—Stage-discharge relation practically permanent. Rating curve fairly well defined. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage readings to rating table. Records fair.

Discharge measurements of South Fork of Siletz River at Valsetz, Oreg., during the period January 1 to March 31, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 1	0.69	18.7	Jan. 22	1.74	101	Feb. 26	2.08	145
Jan. 22	1.74	95	Feb. 5	2.96	490			

Daily discharge, in second-feet, of South Fork of Siletz River at Valsetz, Oreg., for the period January 1 to March 31, 1924

Day	Jan.	Feb.	Mar.	Day	Jan.	Feb.	Mar.	Day	Jan.	Feb.	Mar.
1	19	570	144	11	72	88	94	21	106	128	80
2	19	450	136	12	144	77	72	22	100	152	82
3	20	450	128	13	144	106	54	23	100	152	82
4	21	540	111	14	152	172	51	24	94	140	82
5	21	540	94	15	136	242	51	25	88	128	82
6	21	450	94	16	128	152	54	26	88	152	82
7	22	480	94	17	128	210	58	27	88	144	88
8	24	188	94	18	120	113	65	28	94	162	108
9	26	77	94	19	120	120	72	29	302	153	128
10	29	113	94	20	113	120	77	30	319	------	136
								31	414	------	136

Monthly discharge of South Fork of Siletz River at Valsetz, Oreg., for the period January 1 to March 31, 1924

[Drainage area, 16.4 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
January	414	19	106	6.46	7.45	6,520
February	570	77	226	13.8	14.88	13,000
March	144	51	90.9	5.54	6.39	5,590

SILETZ RIVER AT LOGSDEN, OREG.

LOCATION.—In SE. ¼ sec. 33, T. 9 S., R. 9 W., at Logsden post office, just above the mouth of Rock Creek, 6 miles east of Siletz, Lincoln County.

DRAINAGE AREA.—133 square miles; measured on special drainage map prepared from subdivisional surveys.

RECORDS AVAILABLE.—January 13 to April 19, 1924; station discontinued.

GAGE.—Chain gage on county bridge; read by Waino Wilson.

DISCHARGE MEASUREMENTS.—Made from cable bridge about half a mile above gage and above Mill Creek, measured or estimated discharge of which is added to that at the measuring section.

CHANNEL AND CONTROL.—Bed composed of rock, boulders, and coarse gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the period January 13 to April 19, 6.15 feet at 8 a. m. February 5 (discharge, 6,420 second-feet); minimum stage recorded, 0.84 foot on March 15 (discharge, 445 second-feet).

Maximum stage of recent years occurred November 20, 1921. Crest stage, as determined by leveling to high-water marks in 1924, 23.3 feet (discharge estimated from extension of rating curve, 36,000 second-feet.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of the Cobbs & Mitchell mill at Valsetz may affect discharge at times during low and medium stages.

ACCURACY.—Stage-discharge relation practically permanent during year. Rating curve fairly well defined. Gage read once a day, generally to half-tenths. Daily discharge ascertained by applying daily gage readings to rating table. Records fair.

Discharge measurements of Siletz River at Logsden, Oreg., during the period January 6 to April 19, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 6	1.69	947	Jan. 29	2.08	1,560	Feb. 13	3.05	2,170
Jan. 12	2.49	1,900	Feb. 1	4.88	4,460	Feb. 19	2.04	1,310
Jan. 21	1.47	846	Feb. 7	4.34	3,740	Feb. 27	2.32	1,480

Daily discharge, in second-feet, of Siletz River at Logsden, Oreg., for the period January 13 to April 19, 1924

Day	Jan.	Feb.	Mar.	Apr.	Day	Jan.	Feb.	Mar.	Apr.
1		4,640	1,240	965	16	1,080	1,420	500	895
2		3,710	1,120	965	17	1,040	1,420	530	895
3		3,100	1,080	1,000	18	1,000	1,240	530	790
4		4,920	895	965	19	930	1,240	620	755
5		6,420	755	965	20	860	1,120	685	
6		4,920	720	860	21	720	1,080	650	
7		3,580	685	825	22	755	1,040	620	
8		2,420	685	755	23	790	1,240	560	
9		2,310	650	720	24	755	1,120	530	
10		1,600	590	650	25	685	1,040	560	
11		1,510	530	620	26	720	1,330	620	
12		1,700	530	620	27	685	1,510	685	
13	1,420	2,000	530	620	28	1,040	1,600	895	
14	1,240	1,800	530	720	29	1,240	1,420	1,000	
15	1,120	1,600	445	825	30	2,310		1,040	
					31	5,340		965	

Monthly discharge of Siletz River at Logsden, Oreg., for the period January 13 to April 19, 1924

[Drainage area, 133 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
January 13-31	5,340	685	1,250	9.40	6.64	47,100
February	6,420	1,040	2,210	16.6	17.90	127,000
March	1,240	445	709	5.33	6.14	43,600
April 1-19	1,000	620	811	6.10	4.31	30,600
The period						248,000

SILETZ RIVER AT SILETZ, OREG.

LOCATION.—In SW. ¼ sec. 9, T. 10 S., R. 10 W., at bridge on county road to Toledo and half a mile southwest of Siletz, Lincoln County.

DRAINAGE AREA.—204 square miles, measured on special drainage basin map prepared from subdivisional surveys.

RECORDS AVAILABLE.—November 25, 1905, to May 4, 1912, and January 1 to June 7, 1924.

GAGE.—Chain gage on highway bridge; read by S. C. Brassfield; staff gage, about one-fourth mile upstream, used 1905 to 1912.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of coarse gravel and sand, shifts in extreme floods.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period January 1 to June 7, 9.0 feet at 9 a. m. January 31 (discharge, 8,600 second-feet); minimum stage recorded, 0.80 foot June 4–7 (discharge, 186 second-feet).

1905–1912; 1924: Maximum stage, 24.6 feet about 2 p. m. November 22, 1909, determined by leveling to high-water marks in 1910 (discharge from extension of rating curve on basis of studies in 1924, 34,600 second-feet); minimum discharge recorded, 70 second-feet September 22–26, 1910 (gage height, 0.9 foot). The flood of November 20, 1921, reached a stage of 31.16 feet at bridge, as determined by leveling to a nail driven in pile by county surveyor (discharge by extension of rating curve, 40,800 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Operation of the Cobbs & Mitchell logging dam at Valsetz may affect discharge slightly at times, during low and medium stages.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined. Gage read to hundredths, generally once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

Discharge measurements of Siletz River at Siletz, Oreg., during the period January 1 to August 27, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 4	3.45	1,510	Jan. 23	2.86	1,070	Feb. 14	4.58	2,380
Jan. 10	4.92	2,880	Feb. 2	6.78	5,060	Feb. 29	4.11	2,000
Jan. 19	3.13	1,240	Feb. 4	7.88	6,870	Aug. 27	.31	85

Daily discharge, in second-feet, of Siletz River at Siletz, Oreg., for the period January 1 to June 7, 1924

Day	Jan.	Feb.	Mar.	Apr.	May	June	Day	Jan.	Feb.	Mar.	Apr.	May	June
1	1,800	6,650	1,740	1,220	520	191	16	1,430	1,910	820	1,030	600	------
2	1,700	5,180	1,580	1,220	540	191	17	1,430	2,000	795	1,030		------
3	1,580	3,960	1,430	1,290	540	191	18	1,430	1,660	770	970	540	------
4	1,430	6,650	1,360	1,150		186	19	1,220	1,660	770	970	500	------
5	1,290	7,120	1,150	1,150		186	20	1,150	1,740	770	870	440	------
6	1,220	5,180	1,150	1,150		186	21	1,030	1,430	695	770	340	------
7	1,290	4,760	1,090	1,030		186	22	1,000	1,430	770	720	360	------
8	1,740	3,840	1,030	1,030		------	23	1,030	1,660	770	670	300	------
9	1,740	3,010	1,030	970	600	------	24	970	1,620	770	620	270	------
10	2,490	2,190	1,030	920		------	25	920	1,580	695	560	240	------
11	3,360	1,740	970	820		------	26	920	1,800	695	540	226	------
12	2,590	2,290	1,000	795		------	27	870	2,000	720	500	212	------
13	2,290	2,900	920	795		------	28	1,220	2,090	770	500	207	------
14	1,910	2,490	895	820		------	29	2,000	2,000	770	520	207	------
15	1,660	2,090	845	920		------	30	3,360	------	820	520	199	------
							31	8,600	------	720	------	196	------

Monthly discharge of Siletz River at Siletz, Oreg., for the period January 1 to June 7, 1924

[Drainage area, 204 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
January	8,600	870	1,830	8.97	10.34	113,000
February	7,120	1,430	2,920	14.3	15.42	168,000
March	1,740	695	946	4.64	5.35	58,200
April	1,290	500	869	4.26	4.75	51,700
May	------	196	459	2.25	2.59	28,200
June 1–7	191	186	188	.922	.24	2,610
The period	------	------	------	------	------	422,000

ROCK CREEK NEAR LOGSDEN, OREG.

LOCATION.—In NE. ¼ sec. 12, T. 10 S., R. 9 W., at bridge on Southwell ranch, 3 miles southeast of Logsden post office and 11 miles from Siletz, Lincoln County.

DRAINAGE AREA.—39 square miles; measured on special drainage map prepared from subdivisional surveys.

RECORDS AVAILABLE.—January 1 to February 29, 1924; station discontinued.

GAGE.—Vertical staff on left pier of bridge; observers W. J. Southwell and Eva Chappel.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; practically permanent; one channel at all stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period January 1 to February 29, 5.2 feet February 5 and 6 (discharge, 980 second-feet); no record of minimum.

Maximum stage during recent years, 20.1 feet November 20, 1921, as determined by leveling to well-defined high-water marks during 1924 (discharge from extension of rating curve, 8,200 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent during period of record. Rating curve well defined below 600 second-feet. Gage read to hundredths once a day. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

Discharge measurements of Rock Creek near Logsden, Oreg., during the period January 1 to February 29, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 5	1.94	230	Jan. 21	1.65	160	Feb. 1	3.30	492
Jan. 13	2.69	377	Jan. 31	3.36	490	Feb. 27	2.33	309

Daily discharge, in second-feet, of Rock Creek near Logsden, Oreg., for the period January 1 to February 29, 1924

Day	Jan.	Feb.	Day	Jan.	Feb.	Day	Jan.	Feb.
1	200	485	11	560	345	21	158	194
2		485	12	405	345	22	158	185
3		535	13	365	345	23	158	194
4		890	14	287	325	24		185
5	221	980	15	230	287	25		194
6	194	980	16	230	268	26	150	230
7	212	660	17	230	230	27		296
8	268	425	18	249	230	28		306
9	230	425	19	230	230	29		306
10	385	325	20	176	194	30	185	
						31	510	

NOTE.—Discharge estimated Jan. 1–4 and 24–29.

Monthly discharge of Rock Creek near Logsden, Oreg., for the period January 1 to February 29, 1924

[Drainage area, 39 square miles]

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
January	560		237	6.08	7.01	14,600
February	980	185	382	9.79	10.56	22,000

EUCHRE CREEK NEAR SILETZ, OREG.

LOCATION.—In SE. ¼ sec. 16, T. 9 S., R. 10 W., at old highway bridge a quarter of a mile above mouth and about 4 miles north of Siletz, Lincoln County.

DRAINAGE AREA.—13 square miles; measured on special drainage map.

RECORDS AVAILABLE.—January 1 to May 3, 1924; station discontinued.

GAGE.—Chain gage on upstream side of bridge; read by E. J. Kosydar.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading. Conditions good.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period January 1 to May 3, 5.23 feet at 7.40 a. m. February 5 (discharge, 660 second-feet); minimum stage recorded, 1.52 feet May 2 and 3 (discharge, 29 second-feet.)

The highest water during recent years occurred November 20, 1921, when the river reached a stage of 26.5 feet (discharge, estimated at 5,400 second-feet, very uncertain on account of probable backwater from Siletz River).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation changed January 30. Two fairly well defined rating curves used. Gage read daily to hundredths. Daily discharge ascertained by applying daily gage reading to rating table. Records good.

Discharge measurements of Euchre Creek near Siletz, Oreg., during the period January 1 to May 3, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 4	1.94	111	Jan. 25	1.58	72	Feb. 16	2.48	154
Jan. 7	1.88	106	Feb. 2	3.25	311	Feb. 18	2.32	126
Jan. 11	2.70	270	Feb. 4	4.80	571	Feb. 28	2.55	173
Jan. 17	1.90	117	Feb. 12	3.20	282	Aug. 27	.74	8.9

Daily discharge, in second-feet, of Euchre Creek near Siletz, Oreg., for the period January 1 to May 3, 1924

Day	Jan.	Feb.	Mar.	Apr.	May	Day	Jan.	Feb.	Mar.	Apr.	May
1	150	312	132	102	31	16	124	148	42	108	-------
2		294	108	108	29	17	124	140	42	70	-------
3		276	95	124	29	18	108	124	42	116	-------
4	124	600	87	107	-------	19	100	108	56	80	-------
5	116	600	77	94	-------	20	100	108	51	67	-------
6	108	460	65	87	-------	21	85	101	44	62	-------
7	116	348	65	73	-------	22	80	101	49	60	-------
8	173	240	56	67	-------	23	82	108	53	53	-------
9	156	188	53	65	-------	24	72	94	51	49	-------
10	340	172	56	54	-------	25	67	108	50	42	-------
11	260	156	51	51	-------	26	70	164	42	38	-------
12	200	276	49	45	-------	27	60	164	87	35	-------
13	164	204	46	42	-------	28	70	164	164	34	-------
14	132	188	45	53	-------	29	191	148	148	33	-------
15	148	156	42	43	-------	30	348	-------	132	33	-------
						31	420	-------	116	-------	-------

Monthly discharge of Euchre Creek near Siletz, Oreg., for the period January 1 to May 3, 1924

Month	Discharge in second-feet				Run-off	
	Maximum	Minimum	Mean	Per square mile	Inches	Acre-feet
January	420	60	148	11.4	13.14	9,100
February	600	94	216	16.6	17.90	12,400
March	164	42	70.8	5.45	6.28	4,350
April	124	43	66.5	5.12	5.71	3,960
The period	----------	----------	----------	----------	----------	29,800

MISCELLANEOUS DISCHARGE MEASUREMENTS

Measurements of flow of streams at points other than those at which gaging stations were maintained are presented in the following table:

Miscellaneous discharge measurements in lower Columbia River and Pacific slope drainage basins in Oregon and Washington during the year ending September 30, 1924

Walla Walla River Basin

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec-ft.*
July 17	Mill Creek	Walla Walla River	Former gaging station 12 miles east of Walla Walla, Wash.	1.14	29.6
24	do	do	do	1.13	29.3
Sept. 5	do	do	do	1.12	28.2
May 26	do	do	Farren's Grove above Blue Creek, 9 miles east of Walla Walla, Wash.		[a] 58.0
26	do	do	do		[a] 68.2
July 17	do	do	do		28.5
24	do	do	do		27.8
Sept. 5	do	do	do		26.2
May 26	do	do	Above first large diversion at Kibler Station, 6 miles east of Walla Walla, Wash.		61.1
July 17	do	do	do		24.4
24	do	do	do		24.9
Sept. 5	do	do	do		26.0
July 17	do	do	Immediately above Yellowhawk Creek diversion 3 miles east of Walla Walla, Wash.		14.8
24	do	do	do		15.4
Sept. 5	do	do	do		15.4
July 17	do	do	Immediately below Yellowhawk Creek diversion 3 miles east of Walla Walla, Wash.		4.9
May 26	Blue Creek	Mill Creek	At mouth near Farren's Grove, 9 miles east of Walla Walla, Wash.		1.0

[a] Difference in discharge due to regulation at headworks of city of Walla Walla's municipal water supply.

Umatilla River Basin

Apr. 5	McKay Creek	Umatilla River	Former gaging station at dam site near Pendleton, Oreg.		176
Feb. 27	Stanfield drain	do	Near outlet, at Stanfield, Oreg		8.6
Mar. 11	do	do	do		8.7
Apr. 8	do	do	do		9.0
21	do	do	do		14.1
May 21	do	do	do		17.3
June 3	do	do	do		16.4
26	do	do	do		11.1
Aug. 4	do	do	do		5.1
Sept. 27	do	do	do		3.73
Mar. 6	Hermiston drain	do	Near outlet, Hermiston, Oreg		1.7
17	do	do	do		1.6
May 18	do	do	do		76
July 15	do	do	do		98
24	do	do	do		79
Aug. 20	do	do	do		87
Sept. 3	do	do	do		76
24	do	do	do		56

John Day River Basin

Apr. 7	Owens Creek	Camas Creek	Near Albee, Oreg	1.20	55

Miscellaneous discharge measurements in lower Columbia River and Pacific slope drainage basins in Oregon and Washington during the year ending September 30, 1924—Continued

Deschutes River Basin

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Aug. 19	Rock Creek	Cultus River	Below Forks, in Crane Prairie, Oreg.		15.5
Dec. 29	Fall River (including canal.)	Deschutes River	Above falls in SW. ¼ sec. 34, T. 20 S., R. 10 E.	0.69	116
Apr. 24	do	do	do	.71	122
July 7	do	do	do	.66	116
Sept. 17	do	do	do	.63	103
Feb. 17	Spring River	do	Mouth near Harper, Oreg., in NW. ¼ sec. 6, T. 20 S., R. 11 E.		189
Dec. 19	Davis Creek	do	In SE. ¼ sec. 4, T. 22 S., R. 8 E., 15 miles west of Lapine, Oreg.	.50	222
Apr. 26	do	do	do	.43	184
July 7	do	do	do	.45	200
Aug. 20	do	do	do	.38	185
Sept. 17	do	do	do	.34	174

Willamette River Basin

July 18	Power canal	Diverts from Middle Fork.	Springfield, Oreg., at outlet		115
Aug. 6	Tualatin River	Willamette River	Diversion dam of Oswego Lake Canal near Oswego, Oreg.		60

Lewis River Basin

Aug. 11	Lewis River	Columbia River	600 feet above mouth of Muddy Creek.		290
11	Muddy River	Lewis River	At former gaging station ½ mile above mouth.	−.05	117
11	Pine Creek	do	One-half mile above mouth		*135
Sept. 9	Cougar Creek	do	At bridge near mouth		38

* Estimated by floats.

Kalama River Basin

Nov. 10	Kalama River	Columbia River	Pigeon Springs above Gobar Creek, Wash.		176
July 10	do	do	do		182

Cowlitz River Basin

Apr. 8	Toutle River	Cowlitz River	At former gaging station near Silver Lake, Wash.	2.92	1,300

Miscellaneous discharge measurements in lower Columbia River and Pacific slope drainage basins in Oregon and Washington during the year ending September 30, 1924—Continued

Rogue River Basin

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Sept. 12	Rogue River	Pacific Ocean	Below Hamaker Creek, Oreg.		70
July 27	Mill Creek	Rogue River	Sec. 32, T. 32 S., R. 3 E.	0.62	54
Sept. 18	do	do	do	.61	48
July 28	Middle Fork of Rogue River.	do	NE. ¼ sec. 3, T. 33 S., R. 3 E.	1.28	117
Sept. 17	do	do	do	1.23	118
July 27	Red Blanket Creek	Middle Fork	Sec. 34, T. 32 S., R. 3 E.	1.91	47.9
Sept. 13	do	do	do	1.83	48.4
May 2	Spring Channel No. 1.	South Fork of Big Butte Creek.	6 miles east of Butte Falls, Oreg.		13.9
July 21	do	do	do		12.6
Aug. 23	do	do	do		12.8
May 2	Spring No. 2	do	do		.81
July 21	do	do	do		.71
May 2	Spring No. 3	do	do		2.91
July 21	do	do	do		3.10
21	Spring No. 4	do	do		5.52
Aug. 29	South Fork	Little Butte Creek	Road crossing in sec. 16, T. 37 S., R. 4 E.		8.0
June 26	do	do	3 miles below Soda Springs, Oreg.		18.6
July 22	North Fork	do	Gate tower of Fish Lake Reservoir		48.3
Feb. 26	Leak in tunnel	North Fork of Little Butte Creek.	Fish Lake Dam, Oreg.		5.3
Apr. 21	do	do	do		4.9
May 22	do	do	do		5.1
30	do	do	do		3.4
Apr. 21	Cold Spring Creek	do	Mouth, near Fish Lake, Oreg.		15.9
May 30	do	do	do		15.8
July 11	do	do	do		13.3
24	do	do	do		12.2
Aug. 8	do	do	do	.52	12.4
16	do	do	do	.50	12.1
27	do	do	do	.50	11.4
Sept. 25	do	do	do	.49	11.8
May 8	Wagner Creek	Bear Creek	Rating box, above East Fork near Talent, Oreg.	.71	14.2
June 9	do	do	do	.06	5.2
6	Little Applegate River	Applegate River	Above Farmer's ditch, near Ruch, Oreg.	.66	6.2
6	Farmers ditch	Diverts from Little Applegate River.	Intake near Ruch, Oreg.	.78	6.4

Coquille River Basin

June 11	Middle Fork	Coquille River	Below Camas Valley Oreg.		2.1
Aug. 27	do	do	do		.2
26	do	do	Sec. 10, T. 36 S., R. 9 W.		7
26	do	do	Sec. 27, T. 29 S., R. 12 W.		14.3
27	Myrtle Creek	Middle Fork	Above Rock Creek in NE. ¼ sec. 16, T. 30 S., R. 11 W.		.3
27	Rock Creek	Myrtle Creek	Mouth		2.2
July 5	North Fork	Coquille River	Sec. 13, T. 28 S., R. 12 W.		23.4
Aug. 31	do	do	Sec. 23, T. 28 S., R. 12 W.		13.1
July 5	East Fork	North Fork	SW. ¼ sec. 5, T. 28 S. R. 10 W.		26.2
Aug. 30	do	do	do		11.6

Miscellaneous discharge measurements in lower Columbia River and Pacific slope drainage basins in Oregon and Washington during the year ending September 30, 1924—Continued

Umpqua River Basin

Date	Stream	Tributary to or diverting from—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
July 25	South Umpqua River.	Umpqua River	Above Black Rock Creek, Oreg		9.0
24	do	do	Below Quartz Creek		19.5
26	do	do	do		34
28	do	do	Second bridge south of Roseburg, Oreg.		54
24	Fish Lake Creek	South Umpqua River.	Outlet of Fish Lake, Oreg		1.5
25	Black Rock Creek	do	Mouth, in T. 28 S., R. 2 E		3.8
26	South Fork	do	Mouth, at Tiller, Oreg		14.5
21	Cow Creek	do	Below Quines Creek, sec. 21 T. 32 S., R. 5 W.		3.9
Aug. 8	North Umpqua River.	Umpqua River	Above Lake Creek in Kelsay Valley, Oreg.		262
Sept. 12	do	do	do		251
13	do	do	Below Lemolo Falls, Oreg		306
Aug. 10	Lake Creek	North Umpqua River.	Mouth		18
18	Clearwater River	do	Elevation 3,700 feet		113
June 19	do	do	Near mouth	4.03	216
July 16	do	do	do	3.90	185
Aug. 12	do	do	do	3.84	184
June 18	Fish Creek	do	Below Camas Creek	4.52	113
July 15	do	do	do	4.11	42.7
Aug. 14	do	do	do	4.03	31.9
July 13	Steamboat Creek	do	Below Little Rock Creek		5.2
12	do	do	Steamboat Ranger station		22.2
June 17	do	do	Above Canton Creek		33.8
20	do	do	do	1.35	62.5
July 12	do	do	do	.97	25.8
Aug. 15	do	do	do	.83	20
June 17	Canton Creek	Steamboat Creek	Mouth		19.1
Sept. 5	Rock Creek	North Umpqua River.	Mouth near Glide, Oreg		18
5	Little River	do	do		17.2
July 7	Elk Creek	Umpqua River	Drain		4.9
7	do	do	Mouth, Elkton, Oreg		8.1

Siletz River Basin

Jan. 7	Cedar Creek	Siletz River	Bridge at mouth SE. ¼ sec. 8, T. 9 S., R. 10 W.	0.56	109
14	do	do	do	.52	141
17	do	do	do	.40	103
25	do	do	do	.08	66
Feb. 5	do	do	do	9.84	457
12	do	do	do	1.29	230
18	do	do	do	.55	127
28	do	do	do	.81	135

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