





George H Nielsen

R E P O R T

Of

==========

WATER SUPPLY, USE AND DUTY OF WATER. OF

HOOD RIVER AND ITS TRIBUTARIES

==========

Made in connection with the Adjudication

of

WATER RIGHTS

Under the Direction of

John H Lewis, State Engineer .

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Salem, Oregon.

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Water Supply, See Index on Subject	

Canal	Valley	Stream Water is secured.	Area under Irrigation in 1917.	Total area under ditch	Valley	Total Area in Valley. Irrigated in 1917	Total Area in Valley. Total area to be irrigated.
Dee Irrigation & Power Co.	Dee Flat	West Fk Hood R.	420	2,000	Upper	3,760	11,920
East Fk. Irr. District Canal	Upper	East Fk Hood River	193		Dee Flat	420	2,000
East Fk. Irr. District Canal	Middle	East Fk. Hood River	143		Lower	14.450	21.383
East Fk. Irr. District Canal	Lower	East Fk. Hood River	7,580	11,378	Middle	143	216
Farmer Irr. Co. Canal	Lower	Hood River	3,860	5,000			
Glacier Irr. Co. Ditch	Upper	Sand Creek, Trib. East Fork.	562	2,510			
Hood River Irr. District Canals.	Lower	Green Point Ditch Ck. Springs.	2,865	5,266			
Middle Fk. Irr. Co. Canal.	Upper	Mid. Fk. Hood River Trout Crk. & Evans.	2,460	7,800.			
Mt. Hood Water Co. Canal.	Upper	East Fk. Hood River	545	1,423			
Stanley Smith Lumber Co.	Lower	Green Point Ck. Res. & Springs.	144	144			
			18,770	35,520			

Quantity of water claimed for power development : Pacific Light & Power 750 sec. ft: Oregon Lumber Co. 323 sec. ft.

Maximum Carrying Capacity of Canals in 1917

	Sec. Ft.
East Fork Irrigation District Canal	143.0
Farmers Irrigation Company Canal	68.4
Glazier Irrigation Company Canal	23.5
Hood River Irrigation District	
High Line	9.5
Low Line	24.8
Middle Fork Irrigation Co. Canal	53.8
Mt. Hood Water Co. Canal.	20.5

The adjudication of the rights to the use of water of Hood River and its tributaries arose out of the case of the Oregon Lumber Company vs. The East Fork Irrigation District. This controversy on appeal to the Supreme Court was remanded to the Circuit Court with instructions to transfer the same to the State Water Board in accordance with the provisions of Section 6635, Lord's Oregon Laws, for the complete adjustment and determination of all rights in Hood River and its tributaries.

On September 29, 1916, the State Water Board entered the necessary order and survey and investigation of the stream was commenced, and the same was completed in 1917. This survey and investigations were made pursuant to the provisions of Section 6647, Lord's Oregon Laws, which reads in part as follows:

> "It shall be the duty of the State Engineer, or some qualified assistant, to proceed at the time specified in the notice to the parties on said stream to make an examination of said stream and the works diverting water therefrom, said examination to include the measurement of the discharge of said stream and of the carrying capacity of the various ditches and canals, and examination of the irrigated lands; and an approximate measurement of the lands irrigated or susceptible of irrigation from the various ditches and canals; and to take such other steps and gather such other data and information as may be essential to the proper understanding of the relative rights of the parties interested; which said observation and measurement shall be reduced to writing and made a matter of record in his office, and it shall be the duty of the State Engineer to make or cause to be made a map or plat on a scale of not less than one inch to the mile, showing with substantial accuracy the course of said stream, the location of each ditch or canal diverting water therefrom, and the legal subdivisions of lands which have been irrigated or which are susceptible of irrigation from the ditches and canals already constructed. (L 1909 c 216 p 325 Sec. 23.)"

The three branches which unite to form Hood River have their souce in the glaciers of Mount Hood. From their source they flow in a general Northerly direction, and the confluence of the East Fork and of the Middle Fork is a few miles above the point where the stream is joined by the West Fork.

The river follows a narrow canyon with high mountains on either side for about three miles below the junction of the Western Fork. Here the mountains give way forming a bench on either side of the river, while the river follows down a narrow gorge to the Columbia.

Between the Middle Fork and the East Fork there is a considerable body of land under irrigation, and this, together with a strip of land lying along the East side of the East Fork, is generally termed the Upper Valley. This area has been heavily timbered and much of the land has not yet been cleared.

The water of the East Fork is diverted in the Upper Valley, carried through a low divide behind the high mountains, which rise on the east side of Hood River, and used for the irrigation of the bench land on the east side of Hood River.

This bench is marked near the Southern end by a range of hills running in an easterly direction from the mountains on the east side of Hood River. Immediately south of this range of hills is a small valley often referred to as the Middle Valley and on the North side of this range of hills is a plateau known as Willow Flats. From Willow Flats the hills drop rather abruptly to the main bench, thus making a series of small valleys or plateaus near the southern end of the bench on the eastern side before the main body of land composing this bench is reached.

The main bench is cut by Odell, Neal and Whiskey Creeks and is marked by several abrupt hills, the most important of which is Van Horn and Lentz Butte. The bench on the west side of the river is similar to that on the east side, though slightly more well defined, and is not cut by any range of hills or marked by buttes, Indian Creek flows across this bench toward Hood River. Some of the water for the irrigation of this area is secured from the tributaries of Hood River, known as Green Point, Dead Point, Pine and Ditch Creeks.

which streams join Hood River in the mountains forming the canyon south of the bench. Some water is also diverted directly from Hood River and carried around for the irrigation of the bench land.

A short distance below the junction of the East and Middle Forks is the Power Plant and sawmill of the Oregon Lumber Company. At Tucker's Bridge on the main stream below the confluence of the West Fork, the Pacific Power and Light Company have a power plant, and the same company also has a plant some distance down the river at Powerdale.

SOURCES OF INFORMATION.

All areas as to irrigated land and ditch locations used in this report were obtained from claims filed with Geo. T Cochran, Water Superintendent Division No. 2, La Grande, Oregon, and the adjudication maps prepared under the direction of the State Engineer. These maps were made by means of a plane table with a compass control and distances determined by stadia, a scale of 4 inches equal one mile being used. All traverses were tied to the Government Survey.

Information relative to the water supply of Hood River and tributaries was secured by actual measurements made during 1916 and 1917 and data previously collected by the United States Geological Survey.

Data relative to the amount of precipitation and temperature were secured from the publications of the United States Weather Bureau.

DISCHARGE MEASUREMENTS.

A discharge is the quantity of water flowing past a certain point in a given time and may be obtained as the product of two factors.. (1) The area of the cross-section, which depends on the shape and dimensions of the bed and banks and on the stage: (2) The velocity, which depends on the surface slope, the roughness of the bed and banks, the hydraulic radius, and the channel conditions along the

stream. In general these governing factors are controlled by the stage. Therefore, the discharge may be considered as a function of the stage. (Hoyt-Grover, page 3, second add.)

From the above it is seen that if there be no change in the grade or bed of the stream, due to the action of the water, the discharge will be the same whenever the stream is at a given stage. By making measurements to determine the discharge at various stages, it is possible to construct a rating curve and table, from which the daily discharge is obtained, when the depth of water in the stream above a given datum is known. All rise and fall of streams at stations established on Hood River and its tributaries were obtained by installing plain staff gages, graduated to read feet and tenths, and fastened in a vertical position or by automatic self recording gages.

Two methods of making discharge measurements on streams and ditches were used: (1) By means of a weir and (2) Measuring the velocity with a Price Electric Current meter and measuring the cross sectional area.

CURRENT METER MEASUREMENTS.

In making current meter measurements, a cross-section is chosen and divided into strip by laying off on a line, perpendicular to the thread of the stream points at a distance of $\frac{1}{2}$ foot to 10 feet, depending upon the size and condition of the stream and dropping perpendiculars from these points. In the perpendiculars the depth and mean velocities are taken.

The area of each strip and average velocity having been determined, the discharge is computed.

The discharge of each strip is computed independently of each other. The discharge of the stream is the sum of the discharge of the strips.

In determining the velocity with a current meter, two methods were used: The six-tenths and two-point methods. In the six-tenths method,

the velocity was determined at a point of .6 of the depth. In the two point method, the velocity was determined at points two-tenths of the depth (0.2) and eight-tenths (0.8), the depth the mean of the two measurements being the average velocity. The method used depended upon the depth of water in the stream, depth being measured from the surface. The mean velocities being checked by means of vertical velocity curves.

DEFINITION OF TERMS.

Miners inch is a term originally used in mining operations and has since come into more or less general use in connection with irrigation. It is a certain quantity of water flowing through an aperature under pressure, both the character of the aperture and the pressure vary in different localities, consequently the amount of the flow of water constituting a miners inch varies. In this State, however, it is generally regarded as being one-fortieth of a cubic foot per second, and has been so defined by the Supreme Court in the case of Gardner vs. Wright, 49 Oregon, page 609. Therefore any reference to the miners inch in this report will be construed as one-fortieth of a cubic foot per second.

One horsepower is equal to 550 foot pounds per second or 33,000 foot pounds per minute. Assuming that one cubic foot of water weighs 62½ pounds, theoretical horsepower is determined by multiplying the amount of water in second feet by the fall in feet and dividing the product by 8.8. By substituting 11 for 8.8 the result will be a horsepower on a basis of eighty per cent efficiency.

SECOND FOOT.

A "second foot" is an abbreviation for a cubic foot per second, which represents a flow of water that will exactly fill a vessel

containing one cubic foot each second of time for as long a period as it is allowed to flow; hence a flow of one cubic foot per second delivers 60 cubic feet per minute or 3,600 cubic feet per hour, 86,400 cubic feet in 24 hours or 1.98 acre feet in 24 hours.

ACRE FOOT.

When large volumes of water are to be considered, the expression of the quantity in cubic feet would involve the use of such large numbers, that the same would be cumbersome. In order to simplify these expressions, the term "acre foot" is used. An acre foot represents sufficient water to cover an acre, one foot deep, or 43,560 cubic feet.

The use of this term has the additional advantage of being easily compared with acreage, as for example a reservoir containing 50,000 acre feet of water would furnish a depth of 2½ feet for 20,000 acres of land.

HYDROGRAPH.

A hydrograph is a plat representing graphically the daily flow of water in a stream and is valuable in studying the variations in flow. The hydrograph showing the flow in miners inches per acre was constructed by multiplying the flow in second feet by 40 to reduce to miners inches and dividing by the total number of acres that the water is to serve to reduce to miners inches per acre. These results were platted on the vertical and days on the horizontal.

CROPS.

The principal crop in Hood River Valley is fruit, while some alfalfa and clover are grown, particularly as a cover crop.

CLIMATE.

The climate of Hood River Valley is characterized by moderate winters and long comparatively cool summers, a fair amount of rainfall, and comparative freedom from damaging spring frosts.

The precipitation is much less than that upon the western slope of the Cascade Range. There is a rainy and a dry season. The latter may be regarded to extend from May 1st to the middle of October. Snow falls during January, February and March and in the Upper Valley many years reaches several feet in depth.

Statistics of the weather conditions in Hood River Valley given in the table below, are compiled from records of the Weather Bureau.

HOOD RIVER

PRECIPITATION FOR YEAR 1917.

	Precipitation	Normal
January	2.92	5.72
February	2.44	4.35
March	4.03	3.30
April	2.94	1.81
May	0.95	1.25
June	0.18	0.88
July	0.07	0.18
August	0.00	0.26
September	0.70	0.92
October	0.00	2.43
November	4.30	5.86
December	13.72	6.71
Annual Precipitation	30.25	31.67

PARKDALE

PRECIPITATION FOR YEAR 1917.

	Precipitation
January	4.58
February	2.48
March	4.64
April	3.80
May	0.93
June	0.84
July	0.07
August	0.00
September	0.91
October	0.00
November	4.84
December	16.51
	39.60

HOOD RIVER

TEMPERATURE FOR YEAR 1917

	Temperature	Normal
January	33.9	33.1
February	37.	36.5
March	38.8	42.9
April	45.8	50.0
May	52.8	56.1
June	59.7	61.3
July	67.6	67.8
August	68.3	66.8
September	60.2	59.6
October	53.2	51.8
November	43.6	42.1
December	44.7	35.7
Annual	50.5	50.3

PARKDALE

TEMPERATURE FOR YEAR 1917

	Temperature
January	31.8
February	34.2
March	34.1
April	42.6
May	49.2
June	55.4
July	64.6
August	65.0
September	56.7
October	51.8
November	41.6
December	42.8
	47.5

A soil survey has been made of the Hood River Valley and the results of the same have been published in the United States Department of Agriculture Bulletin, entitled, "Soil Survey of the Hood River, White Salmon River, Area, Oregon-Washington." The data relative to soils have been largely secured from this publication and the same may be referred to for more detailed information.

The agricultural lands on the west side of Hood River in the lower valley are of a loam, clay loam, sandy loam, gravelly sandy loam and a stony clay loam.

The lands found on the slope of all the mountains in and bordering the valley are of the same character and origin as the loam lying on the east side.

The stony clay loam lies west and south of the town of Hood River. This soil was evidently derived from glacial till or morainic deposit laid down by former glaciers. There is a large quantity of glacial boulders in this soil, the removal of which is necessary in order to render the lands tillable.

The gravelly, sandy clay, sandy clay, and clay lie south of the town of Hood River and is underlaid at a considerable depth by a stratum of gravel or basaltic rock, which offers a good drainage. This soil is apparently the result of alluvial agencies, but the material may be in part outwash material from former glaciers.

The soil of the upper valley is a loam, the mechanical analysis of which shows that 2.2 per cent. is fine gravel, 26.9 per cent sand, 46.7 silt and 11.4 per cent. clay. The subsoil is very similar to that of the soil. The area resembles in topographical features a glacial outward flow and it is believed that the fine superficial soil material consists predominantly of stream-laid glacial outwash material or of

thoroughly weathered material derived from the underlying drift.

The agricultural lands on the east side of Hood River in the lower valley are of two types, a silt loam and a loam. The area embraced by each of these classes is about equal. The silt loam is found on the low bench land. This soil from all appearance is of a fine glacial material deposited in beds of quiet water. The subsoil is a loam or silt loam resembling very much the texture of the soil. In places, the subsoil is very compact being locally referred to as hard pan.

A considerable similarity of soil conditions will be noted throughout the valley. The only condition which would affect irrigation is the varying per cent. of gravel and the varying compactness of the subsoil. However, these conditions require a variation in the manner of applying the water rather than in the quantity applied. Some of the soils would require frequent light applications of water applied quickly under a good irrigation head, while other soils are better served with more thorough irrigation at less frequent intervals. Taking into account the general similarity of the soil conditions in the Hood River Valley, it is believed by making provisions for rotation that the same quantity of water will serve all classes of land.

QUESTIONS INVOLVED.

The controversy that occasioned this adjudication was the rights of the East Fork Irrigation District to divert the water of the East Fork of Hood River and carry it away from the stream so that it is not available for use by the Oregon Lumber Company for its power plant at Dee, which is situated just below the junction of the East and Middle Forks.

The west side secures its supply from the tributary of the West Fork and from the main river and the use of this water cannot conflict in any way with irrigation rights in other parts of the stream system.

The same is true of the Upper Valley, which is well watered by the Middle Fork and East Fork, and no use of the water in that section can seriously interfere with other irrigation rights elsewhere. After determining, therefore, the quantity of water necessary for the proper irrigation of the land in these three sections into which the drainage system has been divided in this discussion, the question of most vital interest is the effect of the diversion of water from the East Fork for the irrigation of the lands on the east side bench and the diversion of water from the East and Middle Forks for the irrigation of lands in the Upper Valley on the water supply for the power plant at Dee, Tuckers Bridge and Powerdale. Also the effect that the diversion of water from the tributaries of the West Fork and main Hood River for the irrigation of lands on the west side bench will have on the Tuckers Bridge and Powerdale stations.

Keeping these questions in mind, we will take up first, the discussion of the irrigation on the east side; second, irrigation on the west side; third, the irrigation of the Upper Valley including those lands irrigated in the vicinity of Dee; and fourth, the power plants along Hood River; and in this connection will discuss the flow of the stream at various points, the amount of water obtained from the East Fork, the probable affect of diversion on the various forks and return seepage.

There are a number of other questions of less general importance which will be considered.

WATER SUPPLY DATA.

Intermittent records have been secured on various points on Hood River and its tributaries since 1897. Since 1897, stations have been maintained for short periods of time at Powerdale, Tuckers Bridge, Winans, Dee and immediately above Dee, East Fork above Dee and immediately above and below the diversion of the East Fork Ditch.

NEAL CREEK.

Rights to the use of waters of Neal Creek, a tributary of Hood River were determined in 1913, and the same will not be considered in this report except as such rights are incident to rights from Hood River and other tributaries thereto. It would appear that some land receiving water from Neal Creek is included in the East Fork Irrigation District, and as such, is entitled to water from the East Fork Canal, at least to the extent that may be necessary to supplement the supply of Neal Creek.

EAST FORK IRRIGATION DISTRICT.

This district includes practically all the tillable land in Hood River lying East of the river. The southern extremity of the district is about 1½ miles north of the Mt. Hood post office.

From a narrow strip at this point it gradually widens so as to include all the tillable land on the east side of the river and terminates in the precipitous bluffs along the Columbia River east of the city of Hood River. The district includes 11,378 acres of very valuable and highly developed land.

Of the above area, 7916 acres were under irrigation as determined by the survey made under the direction of John H Lewis, State Engineer, in 1917. According to the statement of proof filed with Geo. T Cochran, Water Superintendent of Division No. 2, it is the intention to place the

whole of the above area under irrigation as fast as the land can be prepared for cultivation.

Practically all of the land that is under irrigation is planted to orchard, much of which is now bearing fruit. It is the practice to grow a cover crop of alfalfa, or clover in the orchards, making it necessary to apply a larger quantity of water than if the orchards were clean cultivated.

WATER SUPPLY. The East Fork of Hood River Irrigation District secures its water from the East Fork of Hood River. The diversion point is located in NW¼ SW¼, Sec 4 Tp 1 S R 10 E W M. being above all other diversions except that of the Glacier Ditch, which secures water from Sand Creek, which is a tributary to the East Fork above this point.

The canal follows closely the bank of the river for a distance of about one mile so that all seepage along this section of the canal finds its way back into the stream without substantial loss. The canal then follows along the east edge of the valley until within the vicinity of the Middle Valley when the water is divided and carried to the place of use in three laterals known as the Neal Creek, Central and Odell laterals.

The main canal and the three main laterals are more than 60 miles in length. There are also many miles of underground pipe which carry water from the laterals to the place of use. The location of the canal together with the lands under irrigation are shown on Plate No. 1.

On June 19, 1913, the United States Geological Survey established a gaging station on the East Fork Irrigation District Canal in the SW¼ SW¼ Sec. 34 T 1 N R 10 E.W.M. and below all spillways and above all irrigated land. Records were secured during the following periods:

1913, June 17th to November 30th, inclusive.
1914, April 26th to October 31st, inclusive.
1915, July 21st to November 23rd, inclusive.
1916, May 1st to October 29th, inclusive.
1917, April 16th to November 30th, inclusive.

The results of these records are shown upon Plate No. 1.

Below is shown the maximum, minimum and mean flow of water in the East Fork Irrigation District Canal in second feet for 1917, together with the quantity in acre feet; also the depth of water per acre if applied uniformly to 7916 acres, the area irrigated in 1917.

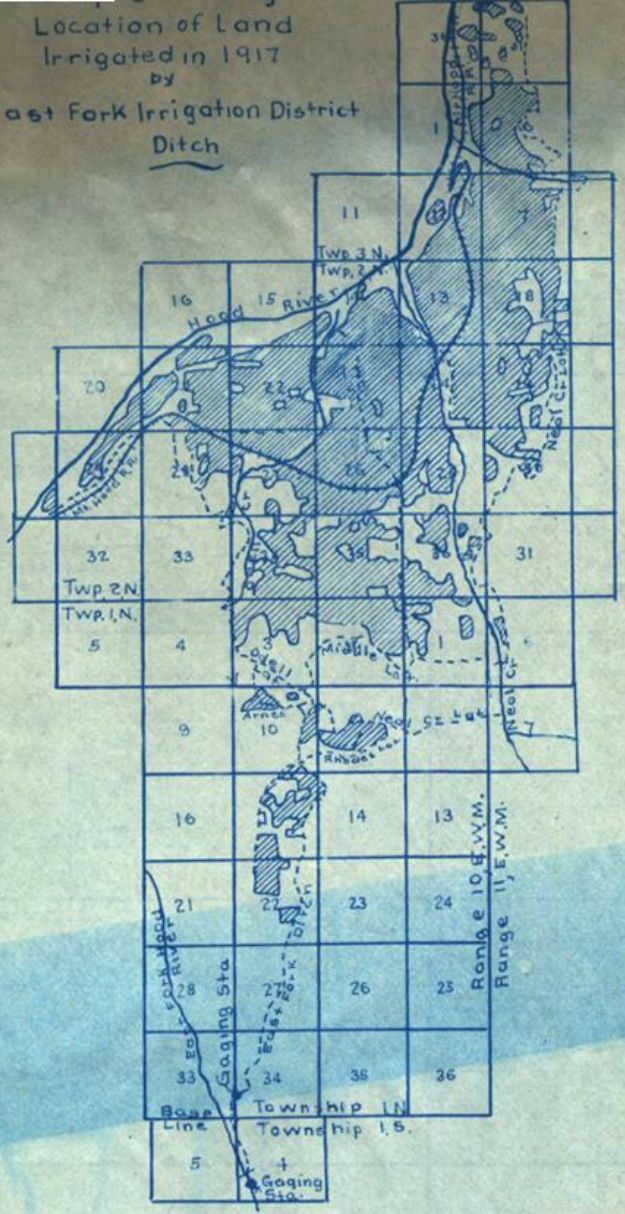
Date 1917	Max. Flow sec. ft.	Min. Flow sec. ft.	Mean Flow sec. ft.	Acre feet	Depth per acre
April 16th to 30th inc.	13	9	11.5	342	.04
May	28	7	21	1250	.16
June	120	30	85.7	5100	.64
July	143	116	125	7690	.96
Aug.	129	116	123	7560	.95
Sept.	116	34	61.1	3640	.46
Oct.	35	31	33.3	2050	.26
Nov.	35	11	3.07	1830	.23
				Total -	3.70

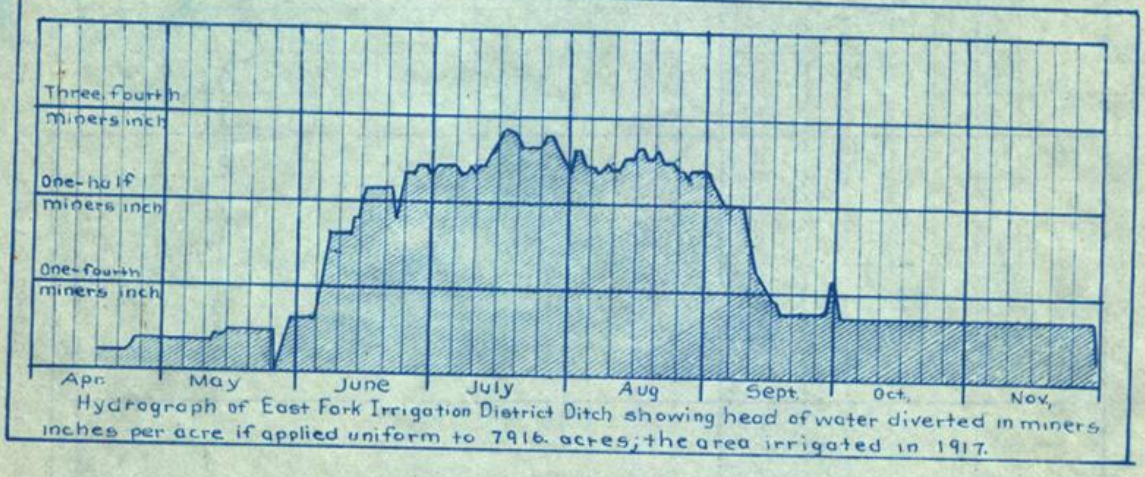
The water was turned into the East Fork Canal on April 16th, 1917 and allowed to flow until November 30th, when the ditch was turned dry. However, there was but little, if any, water used for irrigation purposes before June 1st, and after September 15th, the water in the early part of the season being used principally for spraying and domestic purposes and that after September for domestic use.

In addition to the above quantity some water was secured from Neal Creek during the early part of the season, but during the irrigation season the flow of the stream was such that there was but little if any, available for use through the East Fork Irrigation District Canal as the entire supply was used upon the lands that are irrigated directly from Neal Creek. The Neal Creek lateral maximum safe carrying capacity in 1917, measured 150 feet below the Neal Creek division box, was 35.7 second feet.

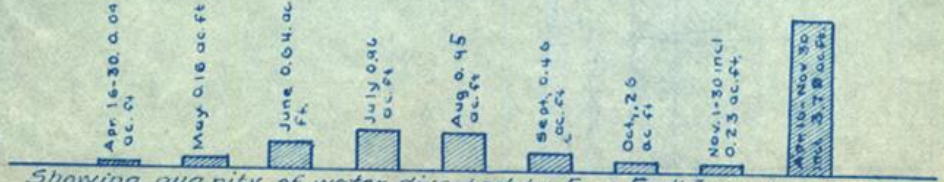
From the records it is seen that the average flow of water in the East Fork Irrigation District Canal during the month of July was

Location of Land
Irrigated in 1917
by
East Fork Irrigation District
Ditch



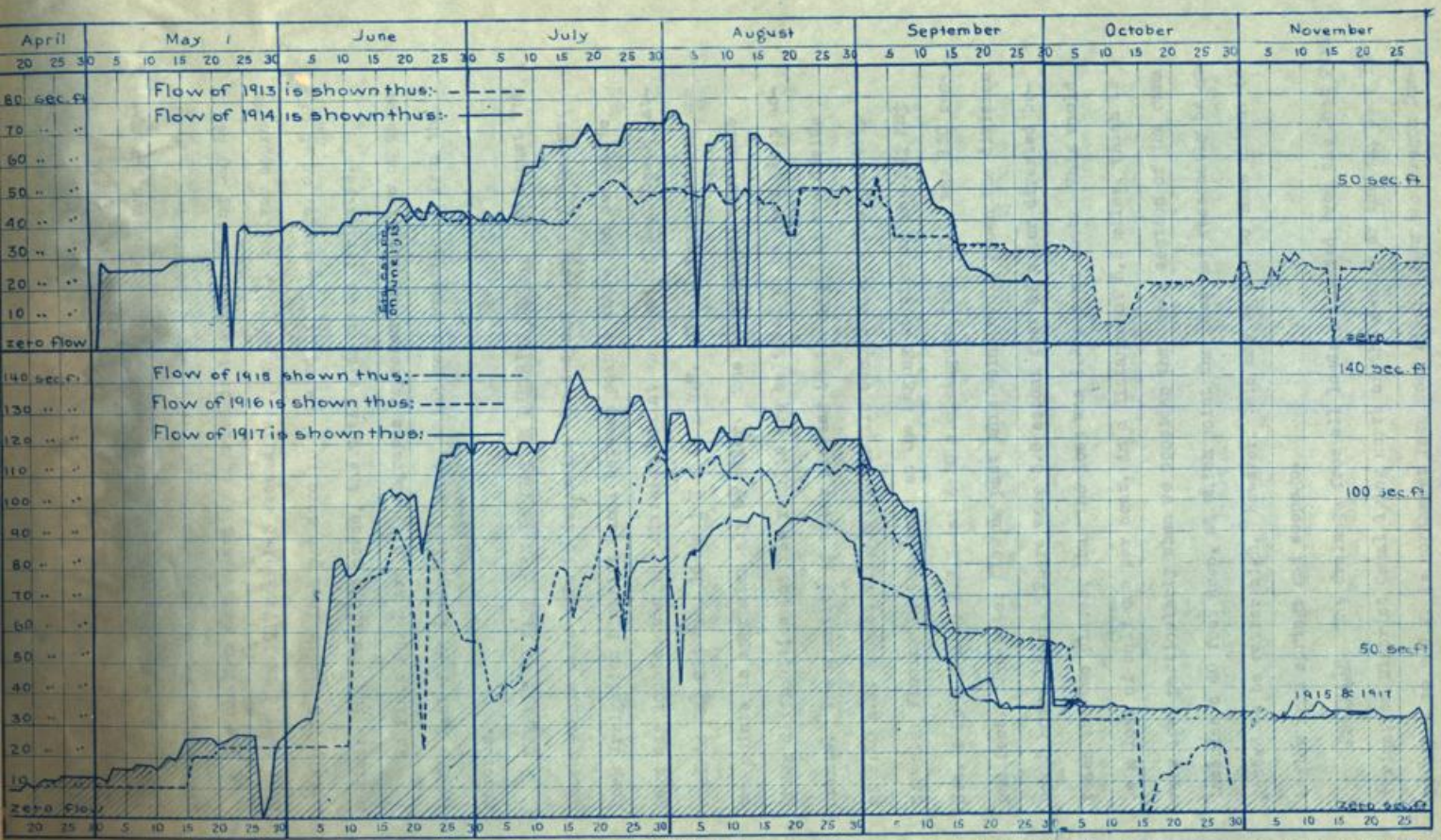


Hydrograph of East Fork Irrigation District Ditch showing head of water diverted in miners inches per acre if applied uniform to 7916. acres; the area irrigated in 1917.



Showing quanity of water diverted by East Fork Irrigation Dist. Ditch, in acre feet per acre, if applied uniform to 7916. ac. Area irrigated in 1917

Plate No. 1



Hydrograph of East Fork Irrigation District Ditch showing daily flow of water in second feet for the following years 1913-14-15-16&17

Plate No. 2

125 second feet. This quantity will deliver a head of a little more than .6 of a miners inch per acre to the area of 7916 acres, or approximately .95 of an acre foot per acre during the month.

The maximum mean quantity carried in the canal during any 24 hour period in 1917 was 143 second feet, which will deliver approximately .75 miners inch per acre to the area of 7916 acres, or .5 of a miners inch to 11378 acres, the total area to be irrigated.

On Plate No. 2 are 5 hydrographs representing the flow of water in the East Fork Irrigation Canal, which were constructed from the records.

SEEPAGE OF EAST FORK IRRIGATION DISTRICT CANAL. On August 7th measurements were made to determine the seepage losses in the East Fork Irrigation District Canal between points where the automatic gage was located and the division box at the head of Neal Creek lateral in NE¼ SE¼ Sec. 10 Tp 1 N R 10 E.W.M. The distance between the two points is approximately 5½ miles. The measurements were made under difficulties but the results are believed to be reasonably accurate. The quantity of water flowing in the canal at the divide at 9:30 a.m. August 7th, 1917, was 115 second feet. The quantity of water flowing in the canal at the gaging station in the NW¼ SW¼ Sec. 4 Tp 1 S R 10 E.W.M. at 6:30 a.m. August 7th, 1917, was 120 second feet. The water flowing past this point would reach the division box 3 hours later. There were 3.8 second feet of water diverted between the two places, thus the loss was 1.2 second feet. This would be a loss of only one per cent. in a distance of 5.2 miles, which is very low, particularly when we consider that this section of the canal includes a 40 foot drop, at which point the loss may reasonably be expected to be rather high. However, this may be due to some extent to inflow from springs and seepage.

DRAINAGE. The drainage from all lands irrigated from the East Fork Irrigation District Canal lying north of the center of the SE¼ Sec. 10 Tp 1 N R 10 E.W.M. is northwest into Hood River below the Oregon Lum-

ber Company's Mill at Dee and above the Pacific Light and Power Company at Powerdale. The drainage from all lands lying south of the above lines is southwest into the East Fork of Hood River above Dee.

In 1917, of the 7916 acres under irrigation from the East Fork Irrigation District Canal, only a very small part was located, so that the drainage would be into the East Fork of the Hood River above the Dee plant.

CROP 1917. The first crop of clover and alfalfa grown upon the lands irrigated from the East Fork Irrigation District Canal, was it is claimed, that of an average year, but the second crop of clover in many fields was badly damaged owing to the lack of moisture. This, it is believed, was not due to shortage of capacity of the main canal and laterals, but to the limited capacity of the distributing system, which rendered it impossible to work out a rotation system whereby an adequate head with which to irrigate could be secured.

As before stated the distribution system consists largely of pipes leading from the main canal or laterals to the land to be irrigated. These pipes were generally designed so that only the amount of water flowing continuously to which the land is entitled can be delivered through the pipes. This makes it impossible to secure an adequate irrigation head for economical or efficient irrigation. Owing to the fact that the system contains so much pipe, it has required the expenditure of a large sum in construction work and the canals and laterals and the distribution pipe, excepting for their limited capacity, are substantially constructed.

The highly developed lands now under irrigation give promise of what the remainder of the tract will become when it is placed under cultivation and irrigation.

Besides Neal Creek, Whiskey Creek and Odell Creek, all of which furnish a limited supply of water for irrigation and domestic supply,

there is a large number of springs which arise on the land in the district. It is probable that they are in a large measure due to the irrigation of the surrounding lands. The water of these springs is used for irrigation, domestic use and for running farm machinery. These sources of supply will doubtless increase as the irrigated area increases.

Like most other ditches in Hood River Valley, the East Fork Irrigation Canal is subjected to rather heavy seepage losses near its head. However, the seepage water readily finds its way back into the stream and for this reason, it would seem desirable to measure the water to which the East Fork District is entitled at a point below where this excessive loss occurs. The most satisfactory point will doubtless be near the place where the automatic gage was located in 1917.

WEST SIDE VALLEY.

The irrigated lands on the West side of the river receive their water supply largely from Green Point Creek, Dead Point Creek and springs arising along the course of the ditches and from the main Hood River. From the latter source the Farmers Irrigation Company receives its water supply, while the Hood River Irrigation District receives its supply from the two sources above referred to and springs along the course of its two canals.

The Stanley-Smith Lumber Company uses the waters of Green Point Creek and Dead Point Creek in connection with the manufacturing and transportation of its lumber to the railroad. Water diverted from its flumes is also used by a small group of farmers for the irrigation of lands lying adjacent to the Hood River Irrigation District.

The Davenport Lumber Flume also diverts water from Green Point Creek and springs along its course for the transportation of lumber.

The waters of Indian Creek are diverted and used for the development of power in the City of Hood River, and the waters of other springs and small streams crossing this area are used for irrigation and domestic supply and in connection with the small power developments.

THE FARMERS IRRIGATION COMPANY. The Farmers Irrigation Company is a corporation organized for the purpose of irrigating lands lying in the Lower Hood River Valley on the West side of the river.

The river forms the eastern and southern boundary, the precipitous bluffs along the bank of the Columbia River in the vicinity of the city of Hood River the northern, and the Hood River Irrigation District the western boundary. The location of these lands, together with that of the canal is shown on Plate No. 3. This project embraces an area of approximately 5,000 acres, the land of which has a decided slope to the east and north.

The survey of the irrigated lands made under the direction of John H Lewis, State Engineer, in 1917, shows 3860 acres under irrigation. This is in excess of the acreage claimed as irrigated. The discrepancy is doubtless due to the fact that acreage claimed is based upon the number of shares sold, while the water users applied the water delivered to them to a larger area than the number of shares would indicate. The area shown by the State Engineer's survey will be used in all computations in this report. These lands are in cultivation, being largely planted to orchards, with strawberries and cover crops among the trees.

The Farmers Irrigation Company secures its water from Hood River through a canal known as the Farmers Ditch. The diversion point of this canal is in the NW¼ SW¼ Sec. 31 T 2 N R 10 E.W.M. Some water is secured from Ditch Creek early in the season but this stream affords but little if any water during July and August.

On May 1st, 1917, a gaging station was established on the Farmers Ditch, being located in the SE¼ SW¼ Sec. 20, Tp 2 N R 10 E.W.M. The Station is below all spillways and above all laterals. Records were secured of the flow at this place from May 1st to September 1st inclusive 1917.

Water was turned in on or about May 1st, 1917. On September 1st the flow was decreased to 31 second feet, which quantity was allowed to flow through September and October, being chiefly used for domestic and stock during the apple harvest. But little water was used for irrigation purposes before June 1st or after September 1st. As is shown by the records, the average head carried during June, July, and August was 62.4, 65.2 and 62.9 second feet respectively. These quantities will deliver during the above calendar months to each of 3860 acres, 0.96, 1.04 and 1.00 acre foot per acre.

On Plate No. 3 is a hydrograph showing the flow in miners inches per acre should the quantity have been applied uniformly to 3860 acres. There is also shown graphically the quantity in acre feet per acre during any calendar month for which records are available had the water been applied uniformly to each of the 3860 acres.

Below is shown the maximum, minimum and average flow of water in the Farmers Irrigation Company Ditch during 1917, also the quantity in acre feet and depth per acre if applied uniformly to 3860 acres.

Date 1917	Max. Flow sec. ft.	Min. Flow sec. ft.	Mean Flow sec. ft.	Acre feet	Depth per acre
May	44.8	7.15	19.9	1224	0.31
June	68.4	54.0	62.4	3713	0.96
July	68.4	63.3	65.2	4009	1.04
August	63.3	60.2	62.9	3836	1.00
				Total	3.31

The maximum safe carrying capacity of the ditch in 1917 was 68.4 second feet, which will supply a head of slightly more than .70 of a miners inch per acre to the area of 3860 acres or a head of slightly in excess of .54 miners inch to the area of 5,000 acres.

The quantity of water diverted through the Farmers Irrigation Company Canal in 1917 was sufficient for the irrigation of all land under irrigation. However, it is believed that by working out a proper rotation system, thus giving the irrigator a larger head to work with, the lands can be more economically irrigated and the water be made to serve a larger area.

In view of the fact that th-e canal follows closely along Hood River for considerable distance so that the seepage returns directly to the stream, it seems proper that the water to which the Farmers Irrigation Company is entitled should be measured at some considerable distance below the diversion. It appears that the most satisfactory place would be in the vicinity of the gaging station on the canal.

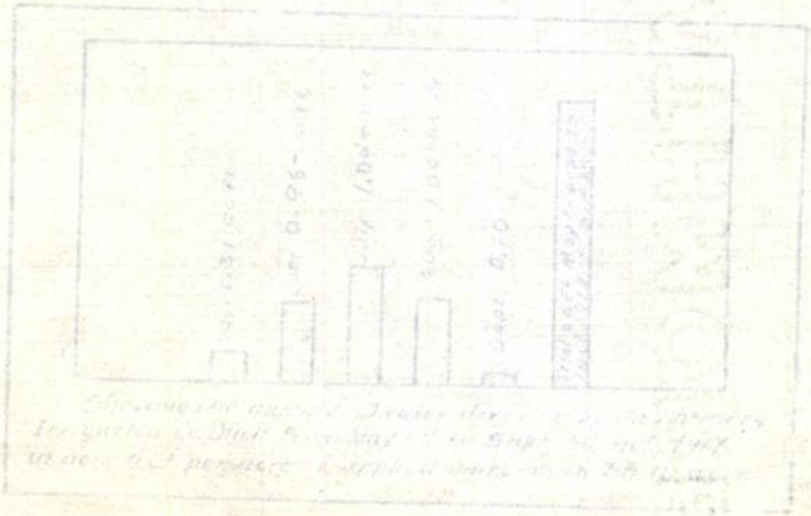
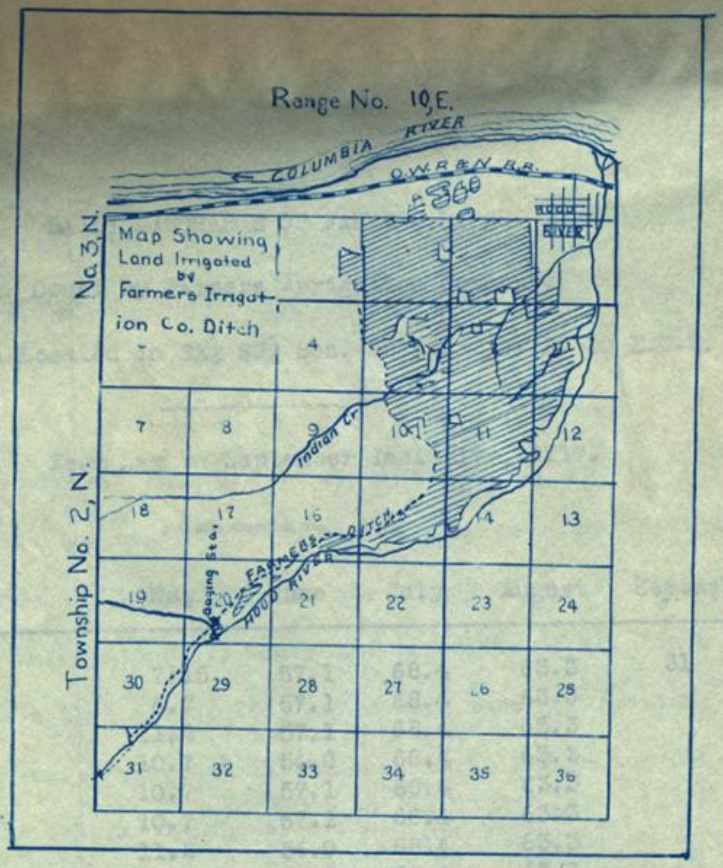
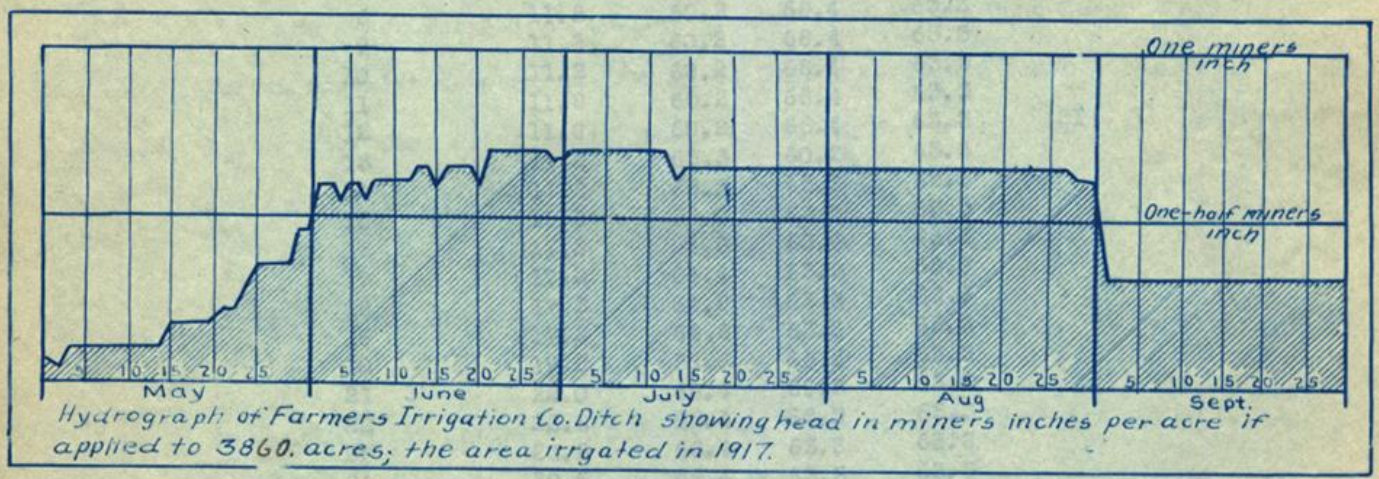
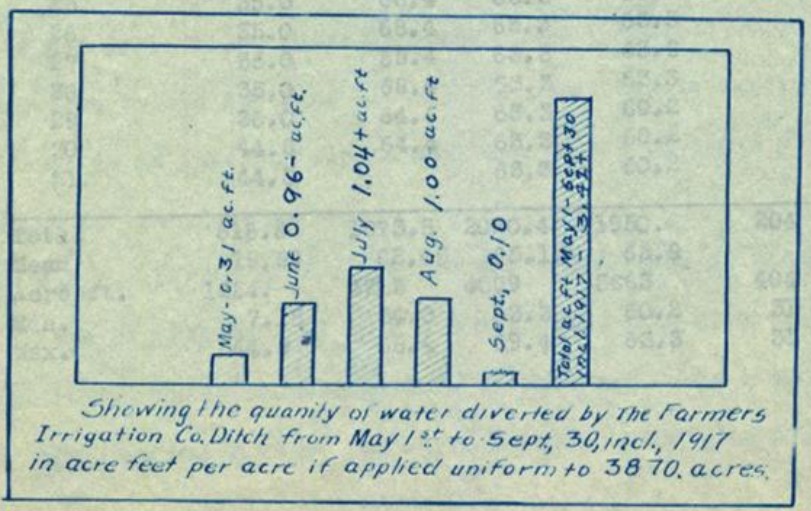


Plate No. 3





Hydrograph of Farmers Irrigation Co. Ditch showing head in miners inches per acre if applied to 3860. acres; the area irrgated in 1917.



Showing the quanity of water diverted by the Farmers Irrigation Co. Ditch from May 1st to Sept. 30, incl., 1917 in acre feet per acre if applied uniform to 3870. acres.

Plate No. 3

DAILY DISCHARGE OF FARMERS DITCH.

Owned by Farmers Irrigation Company.

Gaging Station Located in SE¼ SW¼ Sec. 20 Tp. 2 N. R. 10 E.W.M.

From May to September Inclusive, 1917.

Date 1917	May	June	July	August	September
1	7.15	57.1	68.4	63.3	31
2	6.7	57.1	68.4	63.3	
3	11.2	57.1	68.4	63.3	
4	10.7	54.0	68.4	63.3	
5	10.7	57.1	68.4	63.3	
6	10.7	57.1	68.4	63.3	
7	11.2	54.0	6814	63.3	
8	11.8	60.2	68.4	63.3	
9	11.2	60.2	68.4	63.3	
10	11.2	60.2	68.4	63.3	
11	11.8	60.2	68.4	63.3	
12	11.8	60.2	68.4	63.3	31
13	11.2	63.3	60.2	63.3	
14	11.2	63.3	63.3	63.3	
15	16.6	58.6	63.3	63.3	
16	17.2	64.8	63.3	63.3	
17	17.2	64.4	63.3	63.3	
18	17.2	64.8	63.3	63.3	
19	17.2	64.8	63.3	63.3	
20	19.2	58.6	63.3	63.3	
21	22.0	68.4	63.3	63.3	
22	22.8	68.4	63.3	63.3	
23	23.5	68.4	63.3	63.3	
24	29.5	68.4	63.3	63.3	
25	35.0	68.4	63.3	60.2	
26	35.0	68.4	63.3	63.3	
27	35.0	68.4	63.3	63.3	
28	35.0	68.4	63.3	63.3	
29	36.0	64.4	63.3	60.2	
30	44.8	64.4	63.3	60.2	
31	44.8		63.3	60.2	
Total	616.6	1873.5	2020.4	1950.	204
Mean	19.89	62.45	65.17	62.9	
Acre ft.	1224.	3713	4009	3863	404
Min.	7.15	54.0	63.3	60.2	31
Max.	44.8	68.4	69.4	63.3	31

HOOD RIVER IRRIGATION DISTRICT.

The Hood River Irrigation District embraces lands lying on the west side of the Lower Hood River Valley. This area lies on the west side and adjacent to the lands irrigated from the Farmers Irrigation Company Canal. Those lands of the western edge of the district have a steep slope to the east. This district embraces an area of 5266 acres, which it proposes to irrigate. In the survey of the irrigated lands in Hood River Valley in 1917, under the direction of the State Engineer, out of the above 5266 acres, 2865 acres were under irrigation, The location of the lands irrigated in the Hood River Irrigation District together with the canals is shown on Plate No. 4.

The water for the irrigation of the lands in the Hood River Irrigation District is secured from Ditch Creek, north and south forks of Pine Creek, Dead Point Creek, North and South Forks of Green Point Creeks and small springs along the course of the canals.

The water is carried to the lands by two main canals owned by the District which are known as Low and High Line Ditches.

The Hood River Irrigation District High Line Ditch diverts water from Dead Point Creek, North and South Forks of Pine Creek and springs, which is carried in an open ditch to within a short distance of Ditch Creek, where part of the water is turned into the Ditch Creek and picked up lower down by the Low Line Ditch. The remainder is carried across Ditch Creek in an inverted siphon and then in a wood stave pipe and open ditch to the place of use.

On May 2, 1917, a gaging station was established on the High Line Ditch in the SW¼ NW¼ Sec. 19 Tp 2 N R 9 E.W.M. being about 300 feet below where the water was turned into Ditch Creek. The records at this station show the water which was carried across Ditch Creek in the siphon.

Water was turned into the High Line Ditch on or about May 1st, 1917, which was used principally for spraying and domestic use, there being but little irrigation before June 1st. Thirteen measurements were secured during the month of May and from these measurements it is believed that the flow during the month of May can be determined with reasonable accuracy.

Owing to the difficulty in separating the lands irrigated from the High Line Ditch from those irrigated from the Low Line Ditch, the quantity diverted through the two ditches will be considered together.

On July 16, 1917, measurements were made to determine the seepage losses on the High Line Ditch of the Hood River Irrigation District, between Dead Point Creek and Ditch Creek. The flow of water in the canal immediately below Dead Point Creek was 9.5 second feet. Just above Ditch Creek, or a distance of approximately four miles below Dead Point Creek, the ditch was carrying 7.00 second feet. Between the two points .20 of a second foot was gained from springs. The loss between the two places was 2.70 second feet. It is believed that this, under normal conditions, represents a maximum loss as the weather was hot and dry.

The Low Line Ditch diverts water from the Green Point Creek, Dead Point Creek, Pine Creek and springs along its course.

The diversion point from Green Point Creek is in the SW¼ of Sec. 3 Tp. 1 N R 9 E.W.M., from Dead Point Creek in the SW¼ of Sec. 35 Tp 2 N R 9 E. W. M.; from Pine Creek in the SE¼ of Sec. 25 Tp. 2 N. R. 9 E.W.M. and from Ditch Creek in the NW¼ SW¼ of Sec. 19 Tp. 2 N R 10 E.W.M.

On May 2, 1917, a gaging station was established on the Low Line Ditch of the Hood River Irrigation District, and measurements were secured of the flow of water from May 2nd to September 3rd, 1917, inclusive. The station was located about 50 feet below the diversion from Ditch Creek, being within the NW¼ SE¼ Sec. 19, Tp. 2 N.R. 10 E W.M. Water was turned into the ditch on or about May 1st, 1917, which was used chiefly for spraying purposes, there being but little irrigation until about June 1st. Only nine measurements were secured of the flow during the mouth of May, but they were so distributed through the month that the total quantity flowing past the station can be determined with reasonable accuracy. Daily measurements were secured of the flow from June 1st to September 2nd 1917, inclusive.

Measurements were made on July 16, 1917, to determine the seepage loss in the Low Line Ditch between Ditch Creek and Dead Point Creek. The flow of the canal immediately below the diversion point from Dead Point Creek was 13.6 second feet at Ditch Creek, a distance of 4½ miles below the flow as 12.2 second feet. There was gained from Pine Creek and springs 0.9 of a second foot. There was diverted into laterals between the two points 0.3 second feet; the loss was 2.0 second feet in this section of the canal.

The whole of 13.6 was secured from Dead Point Creek, as owing to a break in the ditch between Dead Point and Green Point Creeks no water was being secured from the latter stream.

On August 24, 1917, measurements were made to determine the loss in the canal between Dead Point and Green Point Creeks. Immediately below the diversion from Green Point Creek, the ditch was carrying 17.6 second feet. Immediately above Dead Point Creek, the ditch was carrying 9.1 second feet, the loss between the two points being 8.5 second feet.

The maximum quantity of water carried in the Low Line Ditch below Dead Point Creek in 1917 was 23.6 second feet.

Below is shown the maximum, minimum and mean flow from May 1st to September 3, inclusive, 1917, also the flow in acre feet of the High Line Ditch.

Date 1917	Max. Flow Sec. feet.	Min. Flow Sec. feet.	Ave. Flow Sec. feet.	Acre feet
May	2.75	1.06	1.80	110
June	5.36	3.90	5.06	301
July	5.36	4.50	4.78	294
August	5.36	4.65	5.26	323
September 1-3 inc.	4.95	4.95	4.95	9.8
			Total	1037.8

Below is shown the maximum, minimum and mean flow of the Low Line Ditch from May 1st to August 31st, 1917, inclusive, also the flow in acre feet.

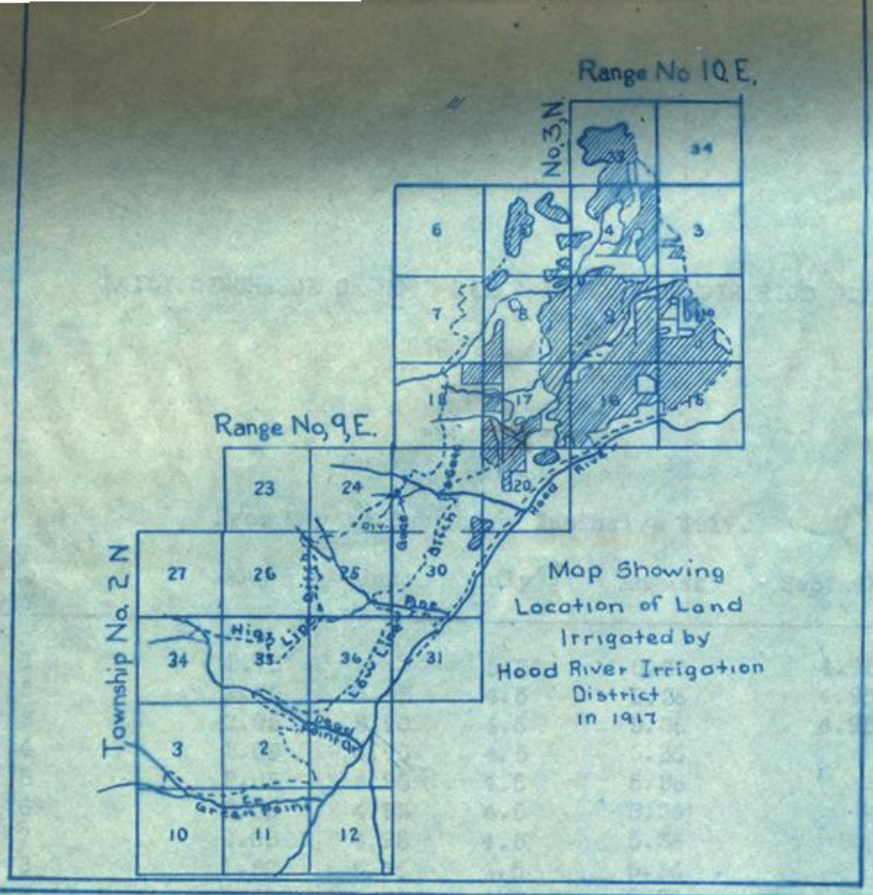
Date 1917	Max. flow Sec. feet.	Min. flow Sec. feet.	Ave. flow Sec. feet.	Acre feet
May	17.6	6.9	10.7	658
June	24.8	14.8	23.2	1380
July	24.8	19.0	20.5	1260
August	19.0	14.8	17.1	1051
			Total	4349

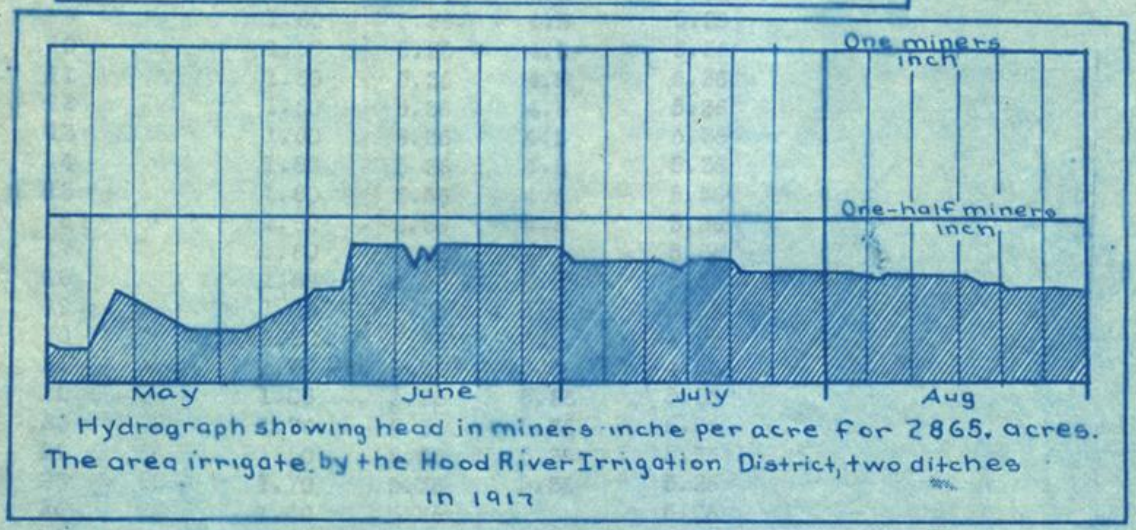
Below is shown for any calendar month, the combined maximum, minimum and average flow in second feet of the High Line and Low Line Ditches, together with the quantity in acre feet and depth furnished to each acre, had the water been uniformly distributed to 2865 acres, the area irrigated in 1917.

Date 1917	Max. flow Sec. feet.	Min. flow Sec. feet	Ave. flow Sec. feet.	Acre Feet	Depth of Water if applied uniformly to 2865 acres.
May	20.35	7.96	12.5	768	0.26
June	30.16	18.7	28.26	1681	0.58
July	30.16	23.65	25.28	1554	0.54
Aug.	24.36	19.45	22.36	1374	0.48

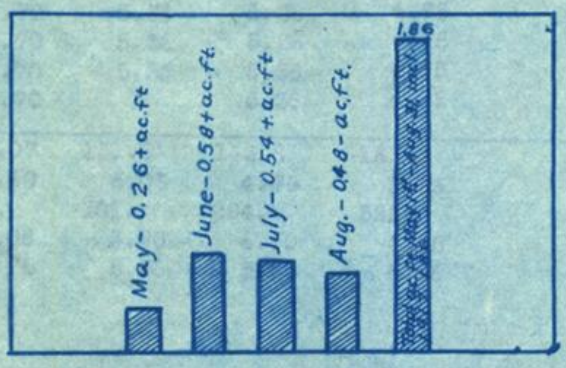
On Plate No. 4 is a hydrograph showing the head in miners inches per acre furnished by the two ditches of the Hood River Irrigation District for the area of 2865 acres, it is seen that the maximum head available was less than 0.43 of a miners inch per acre and the acreage had during July and August was less than 0.36 of a miners inch per acre. It was noticed in several instances that the hay crop was damaged due to the lack of moisture. This could no doubt have been remedied to some extent by a proper rotation system. Likewise had the excessive seepages along the canal been eliminated, more water would have been available for the irrigation of these lands. It is believed that even under a reasonably economical system of distribution involving rotation that more water than the available supply during 1917 could have been beneficially applied to the 2865 acres of land that were irrigated in 1917.

Both the Upper and Lower Ditches are subject to rather excessive seepage losses and pick up water from various springs and streams along their course, making it necessary to measure the water to which the district is entitled at points below all the various diversions. It is believed that the measurements should be made upon both canals in the vicinity of Ditch Creek.





Hydrograph showing head in miners inche per acre for 2865. acres. The area irrigate by the Hood River Irrigation District, two ditches in 1917



Showing the quanity of water, in acre feet per acre, diverted by the two ditches of the Hood River Irrigation District, from May 1st - Aug 31st Incl, 1917 If applid uniform to 2865. acres.

Plate No. 4

DAILY DISCHARGE OF HOOD RIVER IRRIGATION DISTRICT DITCH.

HIGH LINE DITCH.

At Station.

From May to September Inclusive 1917.

Date 1917	May	June	July	August	September
1	2.75		5.36	5.36	4.95
2	2.75	4.95	4.5	5.36	4.95
3	2.05	3.90	4.5	5.36	4.95
4	2.05	4.95	4.5	5.36	
5	2.05	4.95	4.5	5.36	
6	2.05	4.95	4.5	5.36	
7	2.05	4.95	4.5	5.36	
8	1.80	5.36	4.5	5.36	
9	1.80	5.36	4.5	5.36	
10	1.80	5.36	4.5	5.36	
11	1.80	5.36	4.5	5.36	
12	1.80	5.36	4.5	5.36	
13	1.80	5.36	4.5	5.36	
14	1.80	5 36	4.5	5.36	
15	1.80	5.36	4.5	5.36	
16	1.80	5.36	4.5	5.36	
17	1.80	5.36	4.5	5.36	
18	1.80	5.36	4.5	5.36	
19	1.80	5.36	4.5	5.36	
20	1.80	5.36	4.5	4.95	
21	1.06	5.36	4.5	4.50	
22	1.06	5.36	5.36	5.36	
23	1.70	5.36	5.36	5.36	
24	1.50	5.36	5.36	5.36	
25	1.70	5.36	5.36	5.36	
26	1.60	5.36		5.36	
27	1.50	5.36	5.36	5.36	
28	1.70	5.36	5.36	4.95	
29	1.70	5.36	5.36	4.95	
30	1.70	5.36	5.36	4.95	
31	1.70		5.36	4.95	
Total	56.07	151.9	143.6	163.0	
Mean	1.80	5.06	4.78	5.26	
Acre ft.	110.	301.	294.	323.	
Min.	1.06	3.90	4.50	4.65	
Max.	2.75	5.36	5.36	5.36	

DAILY DISCHARGE OF HOOD RIVER IRRIGATION DISTRICT DITCH.

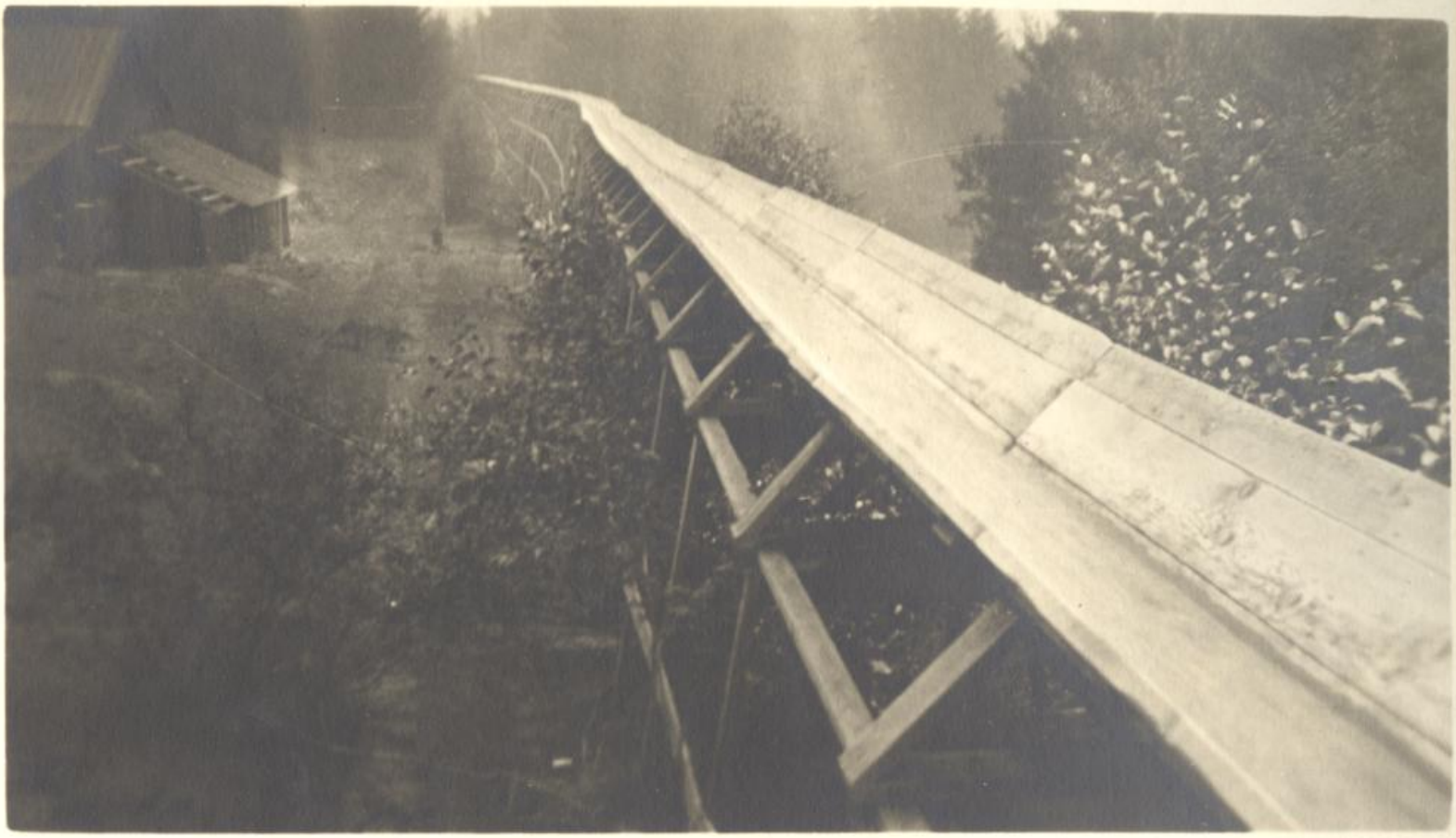
LOW LINE DITCH.

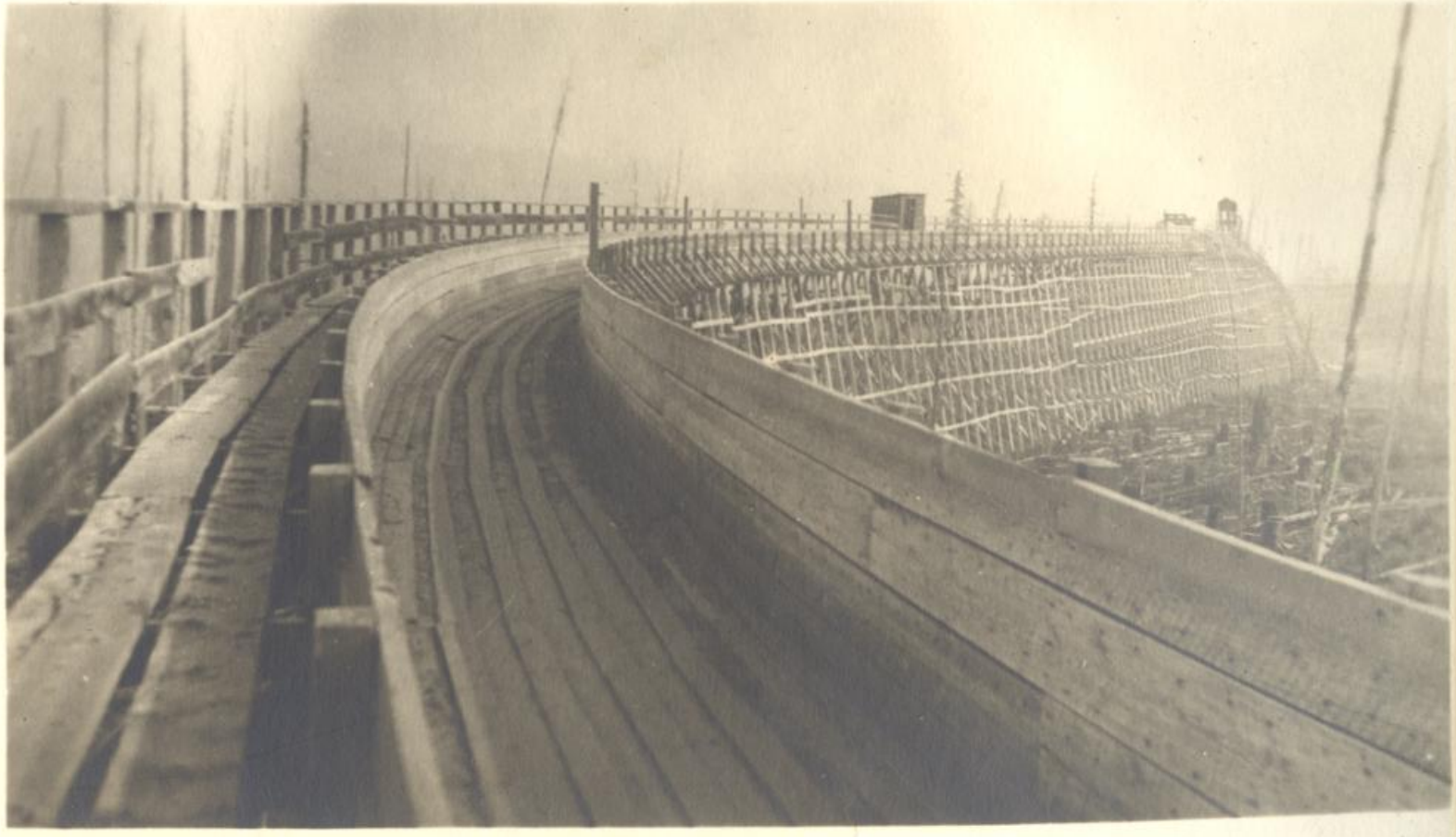
At Station.

Date 1917	May	June	July	August	September
1	6.9	14.8	24.8	19.0	14.8
2	6.9	14.8	20.8	19.0	13.5
3	6.9	16.2	21.6	19.0	
4	6.9	16.2	21.6	19.0	
5	7.6	24.8	21.6	18.3	
6	8.3	24.8	21.6		
7	13.0		21.6	17.6	
8	17.6	24.8	21.6	17.6	
9	12.5	24.8	21.6	17.6	
10	7.4		21.6	17.6	
11	7.9	24.8	21.6	16.9	
12	8.4	20.8	21.6	17.6	
13	8.9	24.0	20.8	17.6	
14	9.4	22.5	20.8	17.6	
15	9.9	24.8	19.0	17.6	
16	10.4	24.8		17.6	
17	10.4	24.8		16.9	
18	10.4	24.8	21.6	16.9	
19	10.4	24.8		16.9	
20	10.4	24.8		16.9	
21	10.4	24.8	19.0	16.9	
22	10.4	24.8	19.0	16.9	
23	10.4	24.8	19.0		
24	11.2	24.8	19.0	16.9	
25	12.0	24.8	19.0	15.5	
26	12.8	24.8	19.0	15.5	
27	13.6	24.8	19.0	15.5	
28	14.4	24.8	19.0	15.5	
29	15.2	24.8	19.0	15.5	
30	16.2	24.8	19.0	14.8	
31	15.5		19.0	14.8	
Total	332.6	649.3	532.8	495.	
Mean	10.7	23.2	20.5	17.1	
Acre ft.	658.	1380.	1260.	1051.	
Min.	6.9	14.8	19.0	14.8	
Max.	17.6	24.8	24.8	19.0	









STANLEY-SMITH LUMBER COMPANY.

The Stanley-Smith Lumber Company operates a saw mill which is known as the Green Point Mill, the location of which is in the SE¼ of Sec. 22 T 2 N R 9 E.W.M.

The logs were conveyed to the mill by means of a flume which has been extended from time to time until the flume is now approximately 5 miles in length. The lumber is carried from the mill to Ruthton, a point upon the railroad in a V-shaped flume, which is some 10 miles in length.

The extreme south end of the log flume is in the NW¼ NW¼ Sec 31 Tp 2 N R 9 E.W.M.

The Stanley-Smith Lumber Company secures its water for the log flume from the head of Green Point Creek and springs along its course. A small quantity is secured during the low water period from what is known as the North Lake, the drainage of which is directly into the Columbia River and will herein receive no further consideration.

To supplement the low water flow, two reservoirs have been constructed, one at Rainy Lake, located in Sec. 25 Tp. 2 N R 8 E.W.M., which has a storage capacity of 90 acre feet. The other at Black Lake located in Sec. 36 Tp. 2 N R 8 E.W.M., with a storage capacity of 42.5 acre feet. It is probable that these reservoirs are drawn down and filled several times during the season.

All diversions of the Stanley-Smith Lumber Company are above those of the Hood River Irrigation District and the Davenport Lumber Flume. Should the log flume furnish a surplus of water above that required to operate the lumber flume, this would drain into Ditch Creek and be available for irrigation in the Hood River Irrigation Ditches below.

Upon Plate No. 5 is shown the location of the log flume, lumber flume, the two reservoirs and a cross-section of the log and lumber flumes, also the profiles of the two flumes. That of the lumber flume representing the fall from the mill to the divide between Ditch Creek and Phelps Creek. The latter stream flows directly into the Columbia River and is not involved in the Hood River adjudication.

The log flume is constructed of dressed lumber with a depth of 3.9 feet and a width of 5.35 feet. The bottom of the flume is built practically level, drops being constructed to take care of the fall. The manner of this construction can best be seen from the photographs on Plate A.

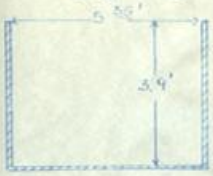
In order to conserve the water, gates were placed in the flume immediately above each drop. Thus operated, the flume is more in the nature of locks, the logs being conveyed through it by means of men pushing them with pike poles, the gate being left open only when letting the logs through.

As the mill was not being operated during 1917, no opportunity was had to study the quantity of water used. The quantity would doubtless depend upon the number of logs carried down the flume and the flow of the streams along the course of the flume.

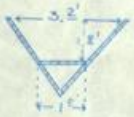
In 1917, the only water available for the log flume after August 1st was that furnished by the tributaries of Green Point Creek, all the other sources being dry.

On July 17, 1917, the log flume immediately below the diversions in the SE¼ SW¼ Section 30 Tp. 2 N R 9 E.W.M. was carrying water to the depth of 1.5 feet. All gates below which would affect the flow in the section of the flume were open. This water was measured and

Cross Section of Stanley Smith Log Flume



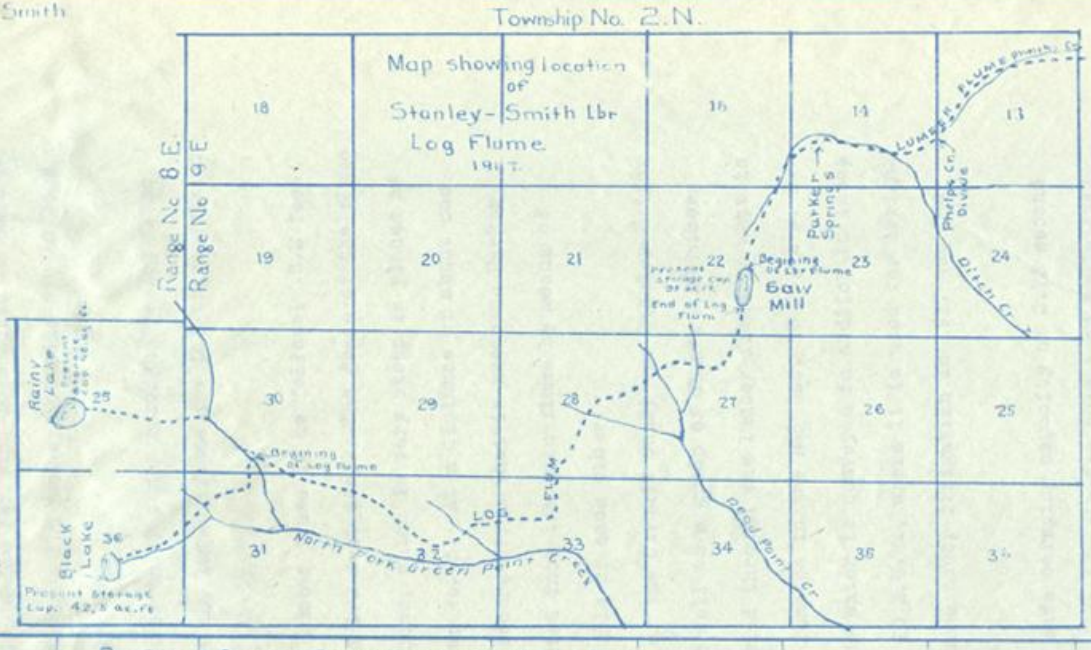
Cross Section of Stanley Smith Lumber Flume



Flume is made of lumber.

Township No. 2.N.

Map showing location of Stanley-Smith Lbr Log Flume. 1917.



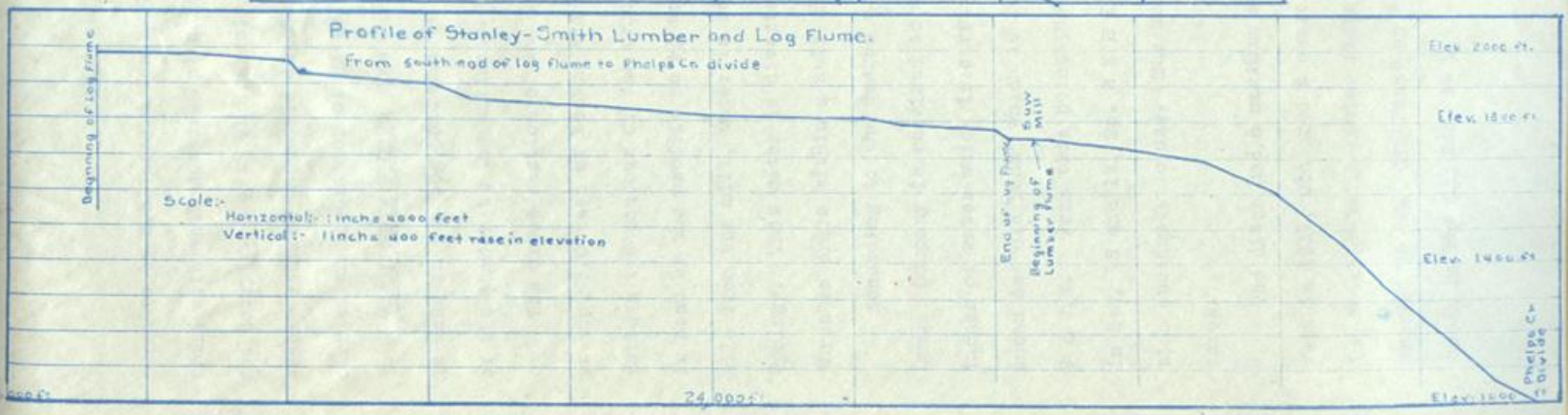


Plate No. 5

found to be 3.32 second feet. Computing the maximum capacity of the flume with this measurement as a basis gives 13.6 second feet while not carrying logs. The capacity while carrying logs would be considerably reduced and would depend upon the number and size of the logs carried and operation of gates.

THE LUMBER FLUME. The water which comes through the log flume is used in the log pond and in the lumber flume for the transportation of the lumber to the railroad.

The cross-section of the lumber flume is as follows: 3.2 feet at top, 1.0 feet at bottom and 1.2 feet deep. The grade of the flume follows the contour of the ground, which is very steep in places as is seen by the profile on Plate No. 5. At a distance of about one mile from the mill, water is secured from what is known as Parker Springs. This water is diverted into the main flume by means of three laterals within a half mile of each other.

According to the decree of the Circuit Court the Stanley-Smith Lumber Company is required to sell to a group of farmers 50 miners inches of water which is carried through the lumber flume to what is known as "Old Pond" which is located in the NW¼ Sec. 13 Tp. 2 N. R. 9 E.W.M. From this point the water is conveyed in a ditch to lands in Sec. 18 and 19, Tp. 2 N R 10 E.W.M., where it is used for irrigation and domestic use. The area under irrigation In 1917 was 144 acres.

The ditch had a maximum safe carrying capacity of 3.73 second feet in 1917, measured a short distance below "Old Pond." In 1917, the Stanley-Smith Lumber Flume not being operated, the water was carried to the "Old Pond" by means of a ditch diverting from Ditch Creek in the SE¼ Sec. 14 Tp. 2 N R 9 E.W.M.

DAVENPORT LUMBER FLUME.

The Davenport Lumber Flume was constructed to transport lumber from a sawmill located in Sec. 35 Tp. 2 N R 9 E.W.M. to a point on the Mt. Hood Railroad, being within the NE¼ SE¼ Sec. 1 Tp. 1 N. R. 9 E.W.M. The length of the flume is approximately 2¼ miles.

The water for the Davenport Lumber flume is secured from a spring which rises in the NW¼ of Sec. 35, Tp. 2 N R 9 E.W.M. and also from Dead Point Creek. The lumber flume has a width at top of 2.9 feet, at bottom of 0.95 foot, and a depth of 1.0 foot. The grade follows the contour of the ground and in some places is very steep.

There are five laterals in all, which divert water directly in to the flume from Dead Point Creek. Two of these laterals divert water below the Hood River Irrigation District diversion.

The Davenport Lumber Flume in the vicinity of the lower diversion of the Hood River Irrigation district has a grade of 60 feet to the 1,000 feet and it is estimated that with a flume flowing full the water would have a velocity of 17.5 feet per second and would carry 33.5 cubic feet per second. However, with the flume carrying lumber, both the velocity and the cross-sectional area of the water would be greatly decreased. The amount of water that the flume would carry under ordinary working conditions would depend upon the amount of lumber it was called upon to carry and could only be determined by a study of the flume in operation. Unfortunately, the flume was not in operation in 1917 and no study of actual working conditions could be made.

In fact, several sections of the flume had been burned out and it was not therefore in a condition to carry water. It appears that no claim has been filed in the Hood River adjudication proceedings for the diversion and use of water through this flume.

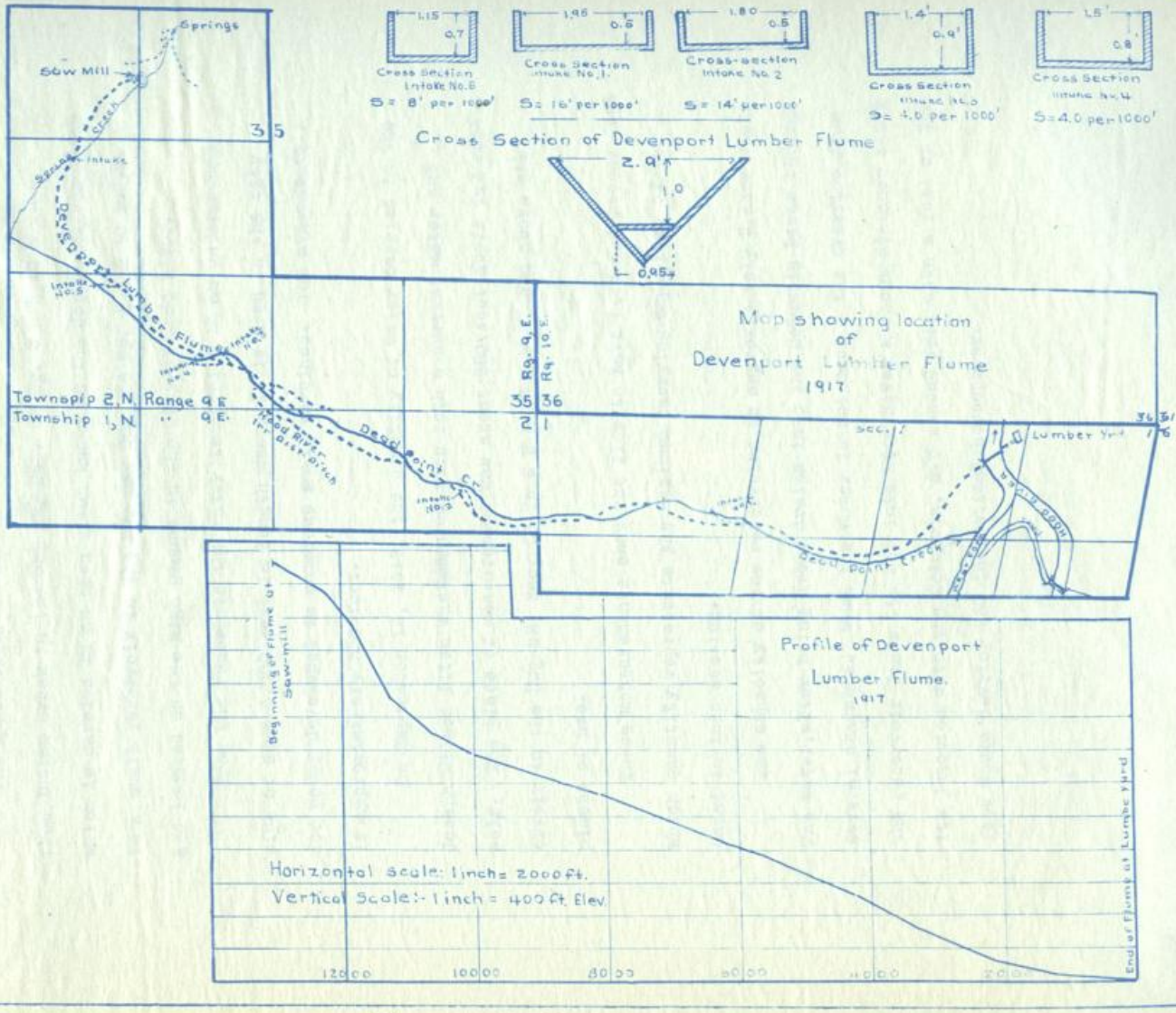

Springs
Saw Mill
Creek
Intake
Intake No. 5
Township 2 N. Range 9 E
Township 1 N. " 9 E.
Rg. 9 E.
Rg. 10 E.
35
36
2
1
Dead Point Cr.
Intake No. 3
Intake No. 2
Intake No. 1
Lumber Yrd
Dead Point Creek
Cross Section Intake No. 5
S = 8' per 1000'
Cross Section Intake No. 1.
S = 16' per 1000'
Cross-section Intake No. 2
S = 14' per 1000'
Cross Section Intake No. 3
S = 4.0 per 1000'
Cross Section Intake No. 4
S = 4.0 per 1000'
Cross Section of Devenport Lumber Flume
2.9'
1.0
0.95
Map showing location of Devenport Lumber Flume 1917
Profile of Devenport Lumber Flume. 1917
Beginning of Flume at Saw-mill
End of Flume at Lumber Yard
Horizontal Scale: 1 inch = 2000 ft.
Vertical Scale:- 1 inch = 400 ft. Elev.
12000
10000
8000
6000
4000
2000

Plate No. 6

The location of the Davenport Lumber Flume is shown upon Plate No. 6, also the profile of and cross-section of the flume.

APPLE GROWERS ASSOCIATION.

The Apple Growers Association of Hood River diverts water from Indian Creek in the SE¼ SE¼ Sec. 35 Tp. 2 N R 10 E.W.M. which is carried in an open ditch known as the Joseph Wilson Ditch to a small reservoir in the NW¼ SE¼ Sec. 36 Tp. 2 N R 10 E.W.M. and located on the high ground in the City of Hood River.

From the reservoir the water is carried in an underground pipe of some 4,000 feet in length where it is used in the city for power developed in numerous small turbines. The average fall is approximately 350 feet.

On September 12, 1917, the quantity of water carried in the Joseph Wilson Ditch was measured with both a current meter and weir. The place of measurement was about 250 feet above the reservoir in the NW¼ NE¼ Sec. 35 Tp 2 N R 10 E.W.M. and above all places of use.

These measurements show the flow to have been 6.3 second feet which quantity represents the maximum carrying capacity of the canal in this section.

The capacity of the reservoirs is approximately 2 acre feet. The water, after being used, drains into the Columbia River through several channels. When the water is not used , the overflow from the reservoir finds its way into Hood River a short distance above its junction with the Columbia, 6.3 second feet with a fall of 350 feet would develop 250 theoretical horsepower.

UPPER HOOD RIVER VALLEY

MIDDLE FORK IRRIGATION COMPANY.

The Middle Fork Irrigation Company is a corporation which was organized for the purpose of irrigating approximately 7,800 acres of land in the Upper Valley.

This land lies between the East and Middle Forks of Hood River and extends well up to the foot of Mt. Hood. The slope is north, so that all drainage water is available for use in the development of power below. The location of these lands, together with that of the canal, is shown upon Plate No. 7.

In the survey made under the direction of the State Engineer in 1916 and 1917, it was found that 2,460 acres were under irrigation.

The Middle Fork Irrigation District secures its water from two tributaries of the Middle Fork of Hood River, which is carried through a canal known as the Middle Fork Ditch. The locations of these diversions are shown upon Plate No. 7. The diversion points are on unsurveyed land.

On June 22, 1917, a gaging station was established on the Middle Fork Ditch and daily measurements were secured up to September 13th, the ditch being turned dry on that date. The station was above all laterals and below the two diversions and all waste gates, so that the records represent the total quantity received from the tributaries of the Middle Fork of Hood River. The location of the station is shown on Plate No. 7.

Some water was carried through the ditch prior to June 23rd. Of this quantity no measurements are available. However, but little irrigation was done prior to June 23rd.

A small quantity of water was secured from Evans and Trout Creeks of which no measurements are available as water was turned into these streams from the Middle Fork of Hood River. This water was taken out in many small ditches, rendering it difficult to secure data as to their flow.

Below is the maximum, minimum and mean flow of the Middle Fork Ditch, also the quantity in acre feet and depth per acre if applied uniformly to 2460 acres.

Date 1917	Max. Flow Sec. ft.	Min. Flow sec. ft.	Mean Flow sec. ft.	Acre feet	Depth per acre
June 22 to 30th incl.	51.0	45.0	47.5	846	0.34
July	53.8	36.0	48.8	3000	1.22
August	52.2	42.0	50.3	3093	1.25
Sept. 1st to 13th inc.	52.1	36.0	42.3	1091	0.44
					3.25

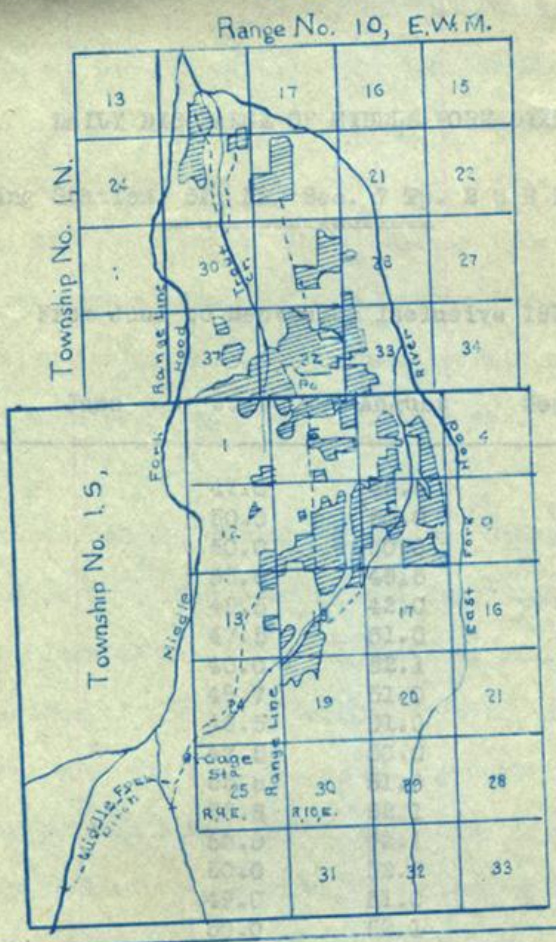
The maximum safe carrying capacity of the Middle Fork Ditch in 1917 was 53.8 second feet. The controlling section lies below the gaging station. 53.8 second feet will deliver slightly less than 0.88 of a miners inch per acre to 2460 acres and slightly less than 0.26 of a miners inch to the area of 7800 acres. The mean flow during June, July and August was 47.5, 48.8 and 50.3 second feet respectively. These quantities will deliver a head of approximately 0.80 of a miners inch per acre to 2460 acres.

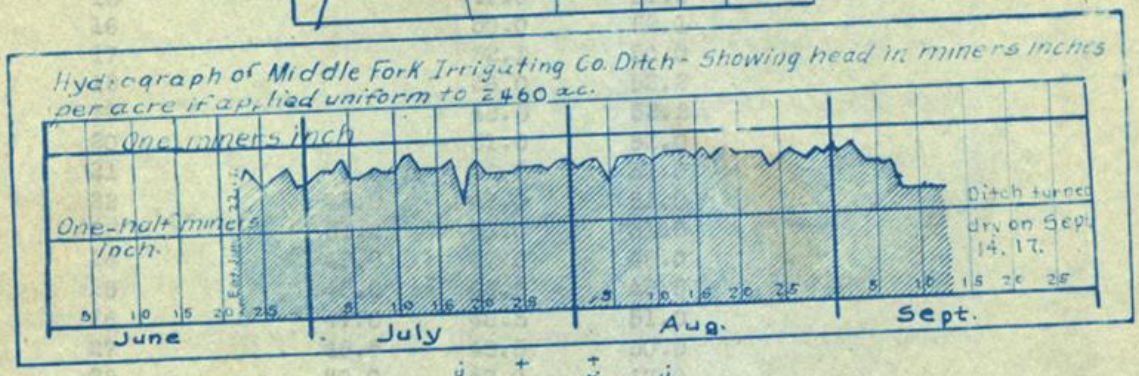
SEEPAGE LOSS. On August 20th, 1917, measurements were made to determine the seepage loss in the western feed canal between the diversion point and where the water is turned over the divide into the eastern branch. The distance between the two points is 1½ miles, 36.1 second feet were flowing in the canal at the intake and at the divide the flow was 28.8 second feet or 7.3 second feet less than at the intake. The canal through this sec-

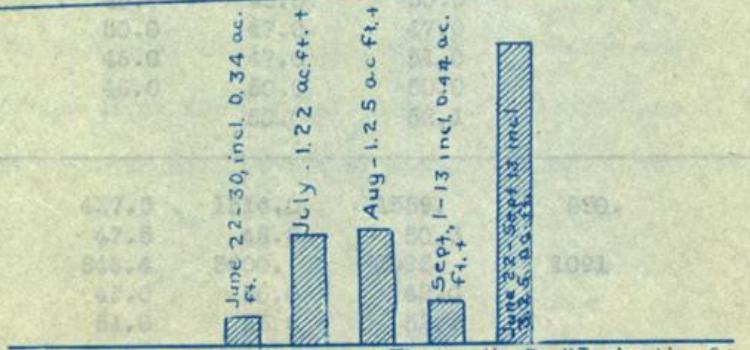
tion is constructed through a gravelly material which accounts for the heavy seepage loss. This section is being lined with concrete as fast as means are available.

In view of the fact that the heavy seepage loss near the head of the canal finds its way back into the Middle Fork and is being checked as rapidly as possible, no injury will result from a measurement of the water to which this company is entitled at some convenient point below the second diversion, preferably in the vicinity of the gaging station as located in 1917. However, in determining the quantity of water to which the company is entitled at this point, due allowance should be made for the supplemental supply secured from Evans and Trout Creeks.

Map Showing Land Irrigated by Middle Fork Irrigation Co. Ditch In 1917







Showing quanity of water diverted by The Middle Fork Irrigating Co. Ditch from June 22 - Sept 13 incl 1917, in acre feet per acre if applid uniform to 2460. ac. The area irrigated in 1917

Plate No. 7.

DAILY DISCHARGE OF MIDDLE FORK DITCHES.

At Gaging Station, SE¼ NE¼ Sec. 7 Tp. 2 S R 10 E. W. M.

From June to September Inclusive 1917.

Date 1917	June	July	August	September
1		47.0	48.5	50.0
2		50.0	50.0	52.1
3		50.0	50.0	50.0
4		53.8	48.5	45.0
5		48.5	42.0	46.0
6		47.5	51.0	45.0
7		48.0	52.1	46.0
8		49.7	51.0	36.0
9		48.5	51.0	36.036.
10		47.5	50.0	36.0
11		53.8	51.0	36.0
12		53.8	52.1	36.0
13		50.0	52.1	36.0
14		50.0	52.2	
15		49.0	51.0	
16		50.0	52.1	
17		52.1	50.0	
18		36.0	52.2	
19		48.5	52.2	
20		51.0	51.0	
21		48.5	51.0	
22	45.0	47.0	51.0	
23	51.0	47.0	51.0	
24	49.0	47.0	46.0	
25	45.0	48.5	48.5	
26	47.0	48.5	51.0	
27	48.5	48.5	50.0	
28	50.0	47.0	47.0	
29	46.0	47.0	51.0	
30	46.0	50.0	50.0	
31		50.0	52.1	
Total	427.5	1514.0	1559.	550.
Mean	47.5	48.8	50.3	
Acre ft.	846.4	3000.	3093.	1091
Min.	45.0	36.0	42.0	
Max.	51.0	53.8	52.2	

THE GLACIER IRRIGATION COMPANY.

The Glacier Irrigation Company secures water from Sand Creek by means of a ditch known as the Glacier Ditch for the irrigation of some 2570 acres of land lying in the southeastern end of the Upper Valley. Of the above the survey made under the direction of John H Lewis, State Engineer, in 1916 and 1917, 562 acres were found to be under irrigation.

The Glacier Irrigation Company has a permit from the State to extend the Glacier Ditch so as to secure water from Fall Creek.

The character of the ground through which the Glacier Ditch is constructed is of a loose, sandy soil deposited by the glaciers. The loss of water through the soil is large.

The locations of the lands irrigated by the Glacier Ditch, together with the canal line, gaging station, hydrographs showing head in miners inches per acre, if the flow were uniformly applied to 562 acres, are shown on Plate No. 8.

On June 23, 1917, a gaging station was established on the Glacier Ditch, the location of which was in the SE¼ NE¼ of Sec. 7 Tp. 2 S R 10 E.W.M., being below all spillways and above all laterals, with the exception of a small ditch used to irrigate 3.2 acres. Measurements were secured at this station of the flow of water in the Glacier Ditch from June 23rd to September 13th, inclusive, 1917. Water was turned into the ditch for irrigation purposes about June 23rd, and allowed to flow until September 14th, when the ditch was turned dry.

Below is shown the maximum, minimum and average flow of water in the Glacier Ditch, also the quantity in acre feet and depth per acre, if applied uniformly to 562 acres.

Date 1917	Max. flow sec. ft.	Min. flow sec. ft.	Mean flow sec. ft.	Acre feet	Depth per acre
June 23 to 30 incl.	16.0	13.0	14.1	224	0.40
July	23.5	13.0	20.9	1285	2.10
August	23.5	8.5	22.3	1371	2.44
Sept. 1-13 incl.	23.5	13.0	12.0	508	0.90
				Total	5.84

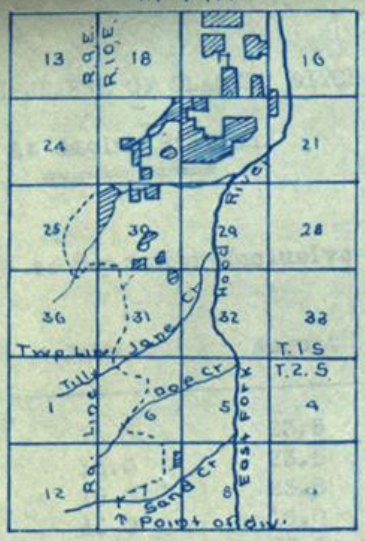
In addition to the above, a small quantity was secured from a spring creek lying below the station which furnished on June 23rd, 1917, 0.25 second feet. The maximum capacity of the canal is 23.5 second feet, or slightly less than 1.7 of a miners inch per acre to 562 acres or 0.36 of a miners inch to 2570 acres.

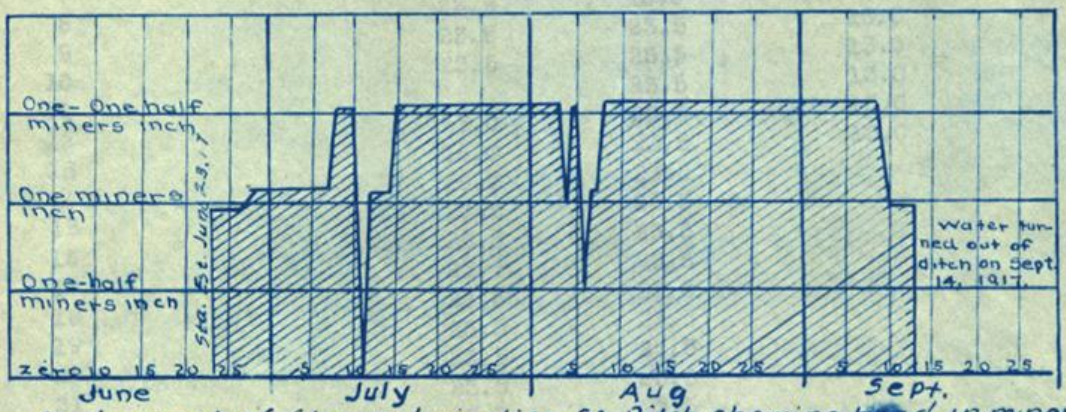
On July 22nd, 1917, measurements were made to determine the seepage loss in the Glacier Ditch. The first measurement was made at the gaging station, the flow being 23.5 second feet. At a distance of approximately 3 miles below, the flow was 15.2 second feet. There was 0.15 of a second foot gained between the two points and 0.25 of a second foot was diverted into laterals. The loss due to seepage between the two points was 8.3 second feet.

It would seem proper to measure the quantity of water to which the company is entitled as near the land to be irrigated as practical in order that the excessive seepage in the glacial sand may not have to be reckoned with.

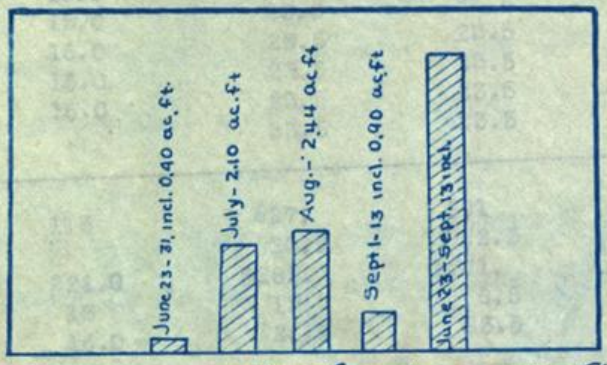
It is suggested that the water be measured immediately above the first diversion from the canal.

Map Showing
Land Irrigated
by
Glacier Irrigation Co Ditch
in 1917





Hydrograph of Glacier Irrigation Co Ditch showing head in miners inches per acre, if applied uniform to 562. ac., area irrigated in 1917.



Showing quanity of water in acre.ft. per acre, diverte by the Glacier Irrigation Co. Ditch in 1917, if applied uniform to 562 ac. The area irrigated in 1917.

Plate No. 8

DAILY DISCHARGE OF GLACIER DITCH.

At Gaging Station.

From June to September Inclusive 1917.

Date 1917	June	July	August	September
1		16.0	23.5	23.5
2		16.0	23.5	23.5
3		16.0	23.5	23.5
4		16.0	16.0	23.5
5		16.0	23.5	23.5
6		16.0	8.5	23.5
7		16.0	16.0	23.5
8		23.5	16.0	23.5
9		23.5	23.5	16.0
10		23.5	23.5	13.0
11			23.5	13.0
12		13.0	23.5	13.0
13		16.0	23.5	13.0
14		16.0	23.5	
15		23.5	23.5	
16		23.5	23.5	
17		23.5	23.5	
18		23.5	23.5	
19		23.5	23.5	
20		23.5	23.5	
21		23.5	23.5	
22		23.5	23.5	
23	13.0	23.5	23.5	
24	13.0	23.5	23.5	
25	13.0	23.5	23.5	
26	13.0	23.5	23.5	
27	13.0	23.5	23.5	
28	16.0	23.5	23.5	
29	16.0	23.5	23.5	
30	16.0	23.5	23.5	
31		23.5	23.5	
Total	113	627.	691	256
Mean		20.9	22.3	12
Acre feet	224.0	1285.	1371.	508
Min.	13	13	8.5	13
Max.	16.0	23.5	23.5	23.5

THE MT. HOOD WATER COMPANY.

The Mt. Hood Water Company is a corporation formed for the purpose of irrigating lands lying on the east side of the East Fork of Hood River, which lie in the vicinity of Mt. Hood Post Office. The total area that is proposed to be placed under irrigation is 1423 acres, including the lands under the Cooper Lateral. Of this area, the survey of the irrigated lands made in 1916 and 1917, under the direction of the State Engineer, shows that 545 acres were under irrigation.

The principal crops grown upon the lands are hay and grain, while a considerable area is planted to orchard.

The Mt. Hood Water Company secures its water from the East Fork of Hood River, which is carried through a ditch known as the Mt. Hood Ditch. The diversion point is located in SE¼ NE¼, Sec. 5 Tp. 1 S R 10 E.W.M. The Mt. Hood Ditch at the upper end is an enlargement of a ditch formerly known as the Cooper Ditch and the water which was carried through the Cooper Ditch is now carried through the Mt. Hood Ditch to a point in the SE¼ NE¼ Sec. 33 Tp. 1 N R 10 E.W.M., where it is carried to the place of use in what is known as the Cooper Lateral.

During the Irrigation season of 1917, the Mt. Hood Water Ditch Company through an agreement with the East Fork Irrigation District secured 0.96 second feet of water from the East Fork Canal. This water was turned out above the gaging station on the East Fork Canal and used upon lands lying above other laterals. This quantity is not included in the discharge records of this ditch.

The drainage from the lands irrigated from the Mt. Hood Ditch is west into the East Fork of Hood River. When the water in the Mt. Hood Ditch is not used for irrigation, it is allowed to flow through the ditch to its lower end, where it finds its way back into the East Fork of Hood River.

On May 18, 1917, a gaging station was established upon the Mt. Hood Ditch, the location of which was in the SE¼ NE¼ Sec. 5 Tp. 1 S R 10 E.W.M. The gage was read from two to seven times a week and the readings are so distributed that it is believed that the quantity diverted can be determined with reasonable accuracy from May 18th to September 6th, 1917, but little if any water was used for irrigation purposes before June 1st, or after September 1st.

Below is given the maximum, minimum and average flow in second feet of the Mt. Hood Ditch, also the quantity in acre feet and depth per acre, if applied uniformly to 545 acres.

Date 1917	Max. flow sec. ft.	Min. flow sec. ft.	Av. flow sec. ft.	Acre feet	Depth per acre
May 18-31 incl.	11.3	5.56	6.76	197	0.36
June	19.0	13.1	15.2	904	1.66
July	20.5	13.1	16.6	1020	1.87
August	14.4	10.5	13.0	799	1.44

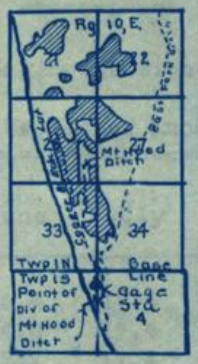
The quantity secured from the East Fork Ditch from May 18th to August 31st, inclusive, 1917, which is not included in the above data is estimated at 200 acre feet, making the total quantity diverted through the Mt. Hood Ditch 5.70 acre feet per acre. Some of this water is known to have been turned back into the East Fork of Hood River unused. However, no measurements were made of this water and it is therefore impossible to determine the quantity of water that was beneficially used on these lands. If the entire amount diverted through the ditch in 1917 were applied to the 1423 acres for which

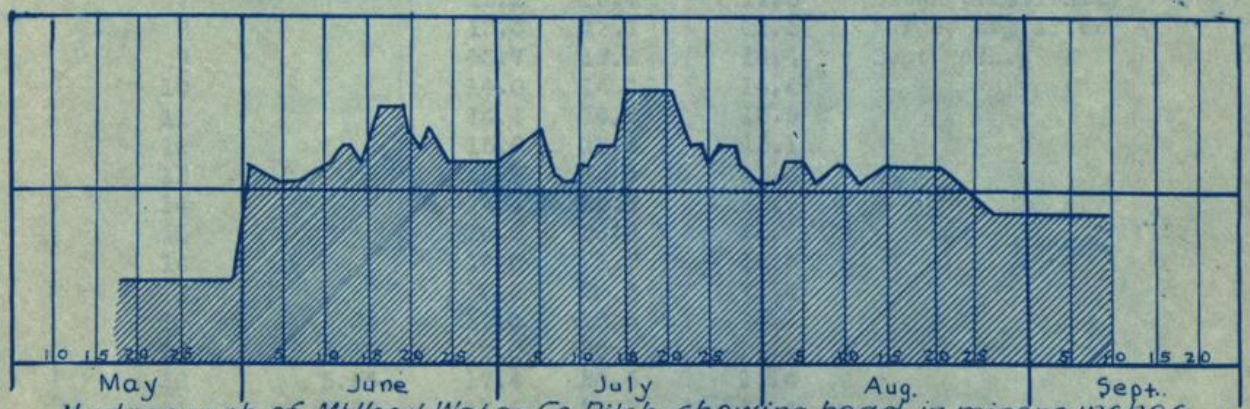
a right is claimed, each acre would have received approximately 2.2 acre feet. Owing to the fact that all unused water together with the returned seepage from the irrigated lands under this ditch finds its way back into the East Fork of Hood River and is available for use by the Dee Power Plant and other rights below, the diversion of an excessive amount of water to the Mt. Hood Ditch is of little consequence. However, the soil and the topography of these lands are equally as favorable for irrigation as most of the lands in the Hood River Valley and they will not, therefore, require more water for their irrigation than other lands in the Valley.

Upon Plate No. 9 is shown the location of the Mt. Hood Ditch together with lands irrigated and a hydrograph showing the head the miners inches per acre.

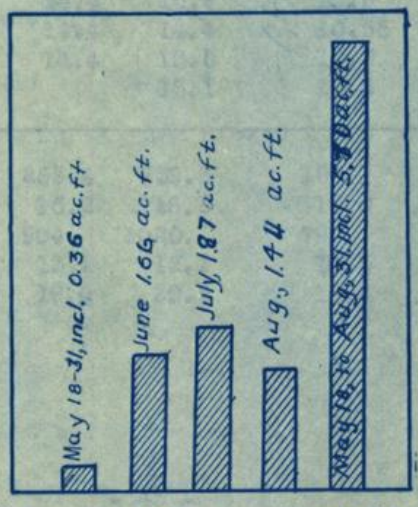
The measurement of water in this ditch can probably best be made a short distance above the head of the Cooper lateral, or in case other laterals are taken out above this point, then it should be measured above all such laterals. All seepage occurring above the head of the Cooper Lateral will readily find its way back into the East Fork.

Map Showing
Location of Land Irrigated
from
Mt Hood Water Co. Ditch
in 1917





Hydrograph of Mt Hood Water Co Ditch - showing head in miners inches per acre if applied uniform to 545. acres the area irrigated in 1917. There is included in the above hydrograph the water received from the East Fork Irrigation District Ditch.



Showing quanity of water diverted by the Mt Hood Water Ditch Co including that received thru the East Fork Irrigation District Ditch, in acre feet per acre. Using 545. ac. the area irrigated in 1917.

Plate No. 9.

DAILY DISCHARGE OF MR. HOOD RIVER COMPANY DITCH.

At Gaging Station.

From May to September Inclusive 1917.

Date 1917	May	June	July	August	September
1		14.4	17.4	13.1	10.55
2		14.0	17.4	13.1	10.55
3		13.7	17.4	14.4	10.5
4		13.4	17.4	14.4	10.55
5		13.1	17.4	13.4	10.5
6		13.1	15.9	12.6	10.55
7		13.1	14.4	11.3	(Ditch practically
8		13.4	13.1	13.1	turned dry after
9		13.7	13.1	14.4	Sept. 6th.)
10		14.0	14.4	14.4	
11		14.4	14.4	13.8	
12		15.9	15.9	13.1	
13		15.9	14.4	13.5	
14		14.4	14.4	13.9	
15		15.9	20.5	14.4	
16		19.0	20.5	14.4	
17		19.0	20.5	14.4	
18	5.56	19.0	20.5	14.4	
19	5.56	19.0	20.5	14.4	
20	5.56	17.4	20.5	14.4	
21	5.56	17.4	20.5	14.4	
22	5.56	16.6	18.2	14.4	
23	5.56	15.9	15.9	13.1	
24	5.56	15.2	15.9	11.8	
25	5.56	14.4	14.4	11.3	
26	5.56	14.4	15.9	10.9	
27	5.56	14.4	15.9	10.55	
28	5.56	14.4	15.9	10.5	
29	8.43	14.4	14.4	10.55	
30	11.30	14.4	13.8	10.5	
31	13.80		13.1	10.5	
Total	44.66	263.4	339.5	186.1	
Mean	6.76	15.2	16.6	13.0	
Ac. ft.	197.0	904.	1020.	799.	
Min.	5.56	13.1	13.1	10.5	
Max.	11.3	19.0	20.5	14.4	

DEE IRRIGATION & POWER COMPANY.

The Dee Irrigation & Power Company diverts water from the West Fork of Hood River in the SE¼ NE¼ Sec. 29 Tp 1 N R 9 E.W.M. which is used for the irrigation of lands lying West of Dee between the West Fork and Hood River. The right is based on State Engineer's Permit No. 165, and covers the irrigation of 2,000 acres of which 420 acres were being irrigated in 1917.

QUANTITY OF WATER USED IN IRRIGATING CERTAIN TRACTS.

During 1917, the water actually used in the irrigation of certain tracts in the Lower Hood River Valley was measured and on some tracts the quantity applied to certain parts was varied in order to determine the results produced by the application of different quantities.

J. J. Knapp Tract. A tract of land owned and farmed by J J Knapp was selected for the purpose of irrigating by applying different quantities of water and noting the results. The land was in orchard with a cover crop of clover. This tract lies on the west side of Hood River in the Lower Valley and receives its water from the Farmers Irrigation Company Canal. This tract is in the W½ NE¼ SE¼ Sec. 2 T 2 N R 10 E.W.M. The land has a gentle slope to the north and east, and was irrigated by dividing it into three plats and each plat irrigated by using a different quantity of water. The yield of cured hay grown upon each plat was determined and the water applied was measured over a Cippoletti weir.

The water was carried from the main lateral in ditches constructed along each row of trees and the land lying between

irrigated by flooding. Below is shown the quantity of water applied.

Plat.	No. of irriga-tions.	Crop	Date of applying Water from	to	Acre feet applied	Head in sec. feet Max.	Min.
No. 1	1st.	1st.	May 14 8 a.m.	May 16 6 p.m.	1.102	0.23	0.23
No. 1	1st.	2nd	July 1 6 p.m.	July 3 8:30 a.m.	.732	0.23	0.23
No. 1	2nd	2nd	July 29 1 p.m.	July 30 2 p.m.	.475	0.23	0.23
No. 1	3rd	2nd	Aug. 13 8 a.m.	Aug. 14 6 p.m.	.646	0.23	0.23
No. 2	1st	1st.	May 16 6 p.m.	May 18 7 p.m.	.566	0.23	0.23
No. 2	1st	2nd	July 3 8:30 a.m.	July 4 10:40 a.m.	.499	0.23	0.23
No. 2	2nd	2nd	July 30 2 p.m.	July 31 7 a.m.	.247	0.23	0.23
No. 2	3rd	2nd	Aug. 15 8 a.m.	Aug. 15 4 p.m.	.152	0.23	0.23
No. 3	1st.	1st	May 18 7 p.m.	May 21 1 p.m.	1.530	.396	.188
No. 3	1st	2nd	July 4 10:40 a.m.	July 8 7 a.m.	1.762	0.23	0.23
No. 3	2nd	2nd	July 30 5 p.m.	Aug. 2 11 a.m.	1.064	0.23	0.23
No. 3	3rd	2nd	Aug. 14 12 p.m.	Aug. 16 7 p.m.	.799	0.23	0.23

Plat	Area Acres	Crop	Quantity of water applied in acre feet per acre		Yield per acre
No. 1	0.62	1st		1.77	1.53 tons
No. 1	"	2nd	1st Irrigation	1.18	
			2nd "	.77	
			3rd "	1.04	
			Total ----------	2.99	1.27 tons
No. 2	0.76	1st		0.74	1.66 tons
		2nd	1st Irrigation	.656	
			2nd "	.325	
			3rd "	.200	
			Total -------	1.181	1.08 tons
No. 3	0.79	1st		1.93	1.71 tons
		2nd	1st Irrigation	2.23	
			2nd "	1.34	
			3rd "	0.98	
			Total -------	4.55	1.40 tons

From the above data, it is seen that to produce the first crop, that 1.77 acre feet per acre was used upon Plat No. 1, 0.74 of an acre foot per acre on Plat No. 2, and 1.93 acre feet per acre upon Plat No. 3. From Plat No. 1, 1.53 tons per acre of hay was cut. From Plat No. 2, 1.66 tons per acre, and from Plat No. 3, 1.93 tons per acre. For the second crop, 2.99 acre feet per acre was applied to Plat No. 1, 1.18 acre feet per acre to Plat No. 2 and 4.55 acre feet per acre to Plat No. 3. The yield of hay from Plat No. 1 was 1.27 tons per acre, from Plat No. 2, 1.08 tons per acre and from Plat No. 3, 1.40 tons per acre.

It was noticed upon adjacent land that was producing the same kind of crop, which has not been irrigated during the growing of the second crop, that the clover was very badly damaged due to the lack of moisture.

Ray D Smith Tract. A weir was installed to measure the water used by Ray D Smith in irrigating 3.14 acres of clover, but owing to insufficient data, both as to quantity of water used and the crop produced, no definite conclusions can be reached. The data indicate that 11 acre feet per acre of water were used to produce the second crop and the yield as estimated by Mr. Smith was 5 tons for the entire tract. This tract is in the S½ SE¼ NE¼ Sec. 10 Tp 2 N R 11 E.W.M., and received water from the Farmers Ditch and a tile drain.

E N Benson Tract. The quantity of water used by E N Benson in irrigating a tract of 6.94 acres of orchard with a cover crop of clover was measured and the results are shown below. This land is on the west side of Hood River in the Lower Valley and within the SW¼ NW¼ Sec. 1 Tp 2 N R 10 E.W.M. The water is secured from the Farmers Irrigation Company Ditch. The soil is a sandy loam with a good under drainage. The land was irrigated by means of rills varying in length from 180 to 300 feet and three feet apart. The slope of the ground was such that by constructing the rills directly with the ground, a grade sufficient for the water to flow easily was secured.

Quantity applied to crop of clover in acre feet per acre	1.18

H M Vannier Tract. The water used by H M Vannier in irrigating 3.62 acres of orchard with a cover crop of alfalfa was measured and the results are shown below. This tract is on the east side of Hood River in the Lower Valley and located in Sec. 7 Tp 2 N R 11 E.W.M. The land was irrigated by the flood

Nb. of Irrigation	Crop	Date of Applying Water 1917 From	to	Acre feet applied	Head in second feet Max.	Min.
1st	1st	May 3 7 a.m.	May 16 6 p.m.	6.646	.278	.235
2nd	1st	May 31 7 a.m.	June 10 6 p.m.	4.83	.330	.264
1st	2nd	June 17 7 a.m.	June 26 6 p.m.	5.55	.300	.292
2nd	2nd	July 5 7 a.m.	July 22 6 p.m.	9.46	.300	.292
1st	3rd	July 29 7 a.m.	Aug. 13 6 p.m.	9.16	.300	.292
2nd	3rd	Aug. 27 7a.m.	Sept 3 6 p.m.	5.72	.300	.295
Used on Orchard		Sept 13 7 a.m.	Sept 27 6 p.m.	8.195	.292	.278

Area acres	Crop	Quantity of Water applied in acre feet per acre.	
6.94	1st	1st Irrigation	0.96
		2nd "	0.69
		Total ----------	1.65
	2nd	1st Irrigation	0.80
		2nd "	1.36
		Total	2.16
	3rd	1st Irrigation	1.32
		2nd "	0.82
		Total ----------	2.14

Quantity applied to Apple Crop after last crop of clover in acre feet per acre ---------- 1.18

H M Vannier Tract. The water used by H M Vannier in irrigating 3.62 acres of orchard with a cover crop of alfalfa was measured and the results are shown below. This tract is on the east side of Hood River in the Lower Valley and located in Sec. 7 Tp 2 N R 11 E.W.M. The land was irrigated by the flood

system, the water being secured from the East Fork Irrigation District Canal. This land has a gentle slope to the north. There was sufficient moisture in the ground, together with the rainfall to produce the first crop so the only water used was for the second crop.

No. of Irrigation	Crop	Date of applying Water, 1917 From	to	Acre feet applied	Head in sec. ft. Max.	Min.
1st	2nd	June 26 8 a.m.	July 3 9 a.m.	3.491	0.25	0.25
2nd	2nd	July 10 8 a.m.	July 14 4 p.m.	2.148	0.25	0.25
3rd	2nd	Aug. 20 9 a.m.	Aug. 30 8 p.m.	5.185	0.25	0.25

Area	Crop	Quantity of Water applied in acre feet per acre	
3.62	1st	No water applied	
	2nd	1st Irrigation	0.96
		2nd Irrigation	0.59
		3rd Irrigation	1.43
		Total --------	2.98

Yield of cured hay per acre ---------- 2 tons.

Peter Mohr Tract. The water used in the irrigation of 9.91 acres of alfalfa owned by Peter Mohr was measured and the results are shown below. This land is in the NE¼ NW¼ Sec. 18 Tp 2 N R 11 E.W.M. and has a steep slope to the west. This tract was irrigated by flooding, the supply being secured from the East Bork Ditch. While some water was applied to the land before the cutting of the first crop, it was for the purpose of providing moisture so that the second crop would begin growing immediately after cutting the first crop and this will be considered as the first irrigation of the second crop.

No. of Irrigation	Crop	Date of Applying water, 1917 From	to	Acre ft. applied	Head in sec. ft. Max.	Min.
1st	2nd	June 20th 8 a.m.	June 25th 8 p.m.	1.909		
1st	2nd	June 27th 8 a.m.	June 28th a p.m.	8.181	1.05	.582
2nd	2nd	July 15th 8:30 p.m.	July 25th 6 p.m.	15.095	.774	.709

Area acres	Crop	Quantity of Water Applied in acre feet per acre			Yield
9.91	1st	No water applied			2½ tons
	2nd	1st Irrigation	1.01		
		2nd "	1.62	Estimated	
		Total --------	2.63	Yield	1½ tons

There was some water applied to the land after the cutting of the second crop for the purpose of making fall pasture. Of this quantity no measurements were secured.

H K Krussow Tract. The water used by H K Krusson in irrigating 5.2 acres of orchard with a cover crop of alfalfa was measured and the results are shown below. This tract is on the east side of Hood River in the Lower Valley in the SE¼ NE¼ Sec. 24 Tp. 2 N R 10 E.W.M. The land was irrigated by the flood system, the water supply being secured from the East Fork Irrigation District Canal. The land has a gentle slope to the west.

DUTY OF WATER.

Hood River and its tributaries have a substantial flow throughout the year and does not go dry during the summer months as do many of the irrigation streams of Eastern Oregon.

For this reason and for the further reason that the water not diverted for irrigation above is used at the three power plants located on the stream which plants require a regular flow, it seems desirable that the various rights to the use of water should be limited in terms of continuous flow. Any rotation necessary to secure an irrigation head should be worked out between the various users from the large canals which divert water from the streams rather than between two or more canals.

The excessive seepage loss which seems to be characteristic of the canals near their intake, will have a marked effect upon the amount of water necessary for the lands thereunder for the reason that it does not seem economical to prevent this seepage loss as the water finds its way readily back into the stream. This condition renders it advisable to measure the quantity to which certain large ditches are entitled at a point considerably below the diversion point of the canal.

This condition is applicable to the Middle Fork Irrigation Canal, the Hood River Irrigation District Canal, the Middle Fork Ditch, the Glacier Ditch, Mt. Hood Ditch and to some extent the Farmers Ditch. It is suggested, therefore, that the water for the irrigation of lands under these canals be measured at the respective points hereinbefore suggested.

No. of Irrigation	Crop	Date of applying Water, 1917 From	To	Acre ft. Applied	Head in sec. ft Max.	Min.
1st	2nd	June 26 4 p.m.	July 1st 1 p.m.	3.385	.347	.107
2nd	2nd	July 6 7 a.m.	July 10 2 p.m.	.770	.107	.08
2nd	2nd	July 13 7 a.m.	July 20 2 p.m.	1.696	.279	.07
2nd	2nd	July 22 7 a.m.	July 29 2 p.m.	1.729	.279	.08
3rd	2nd	Aug. 13 7 a.m.	Aug. 25 1 p.m.	4.356	.228	.109

Area Acres	Crop	Quantity of Water Applied in acre feet per acre.	
5.2	1st	No water applied	
	2nd	1st Irrigation	0.65
		2nd "	0.80
		3rd "	0.83
		Total ----------	2.28

DUTY OF WATER.

Hood River and its tributaries have a substantial flow throughout the year and does not go dry during the summer months as do many of the irrigation streams of Eastern Oregon.

For this reason and for the further reason that the water not diverted for irrigation above is used at the three power plants located on the stream, which plants require a regular flow, it seems desirable that the various rights to the use of water should be limited in terms of continuous flow. Any rotation necessary to secure an irrigation head should be worked out between the various users from the large canals which divert water from the streams rather than between two or more canals.

The excessive seepage loss which seems to be characteristic of the canals near their intakes, will have a marked effect upon the amount of water necessary for the lands thereunder for the reason that it does not seem economical to prevent this seepage loss as the water finds its way readily back into the stream. This condition renders it advisable to measure the quantity to which certain large ditches are entitled at a point considerably below the diversion point of the canal.

This condition is applicable to the East Fork Irrigation Canal, the Hood River Irrigation District Canal, the Middle Fork Ditch, the Glacier Ditch, Mt. Hood Ditch and to some extent the Farmers Ditch. It is suggested, therefore, that the water for the irrigation of lands under these canals be measured at the respective points hereinbefore suggested.

The use of water for irrigation has a tendency to increase the available supply in the small creeks and springs on the irrigated land. It is difficult to determine the quantity of water which may be available from this source, but it probably will not be large and as it mingles with water secured from the principal source and is easily accessible to the lands, it should be available for use thereon and the various companies, districts and individual water users should be entitled to the use of this water in addition to the amount which they are allowed to divert from the stream. However, in case of the larger projects, this additional supply should not inure to the exclusive benefit of the particular water user upon whose land water rises or flows, but should be considered a part of the supply for the entire district or project. Anyone receiving water from these springs or streams should be entitled to receive a proportionally less quantity from the canal system for irrigation purposes. However, the rights of any company, district or individual to such rights should be subject to any right heretofore acquired therein.

It is difficult to determine the quantity of water necessary for the irrigation of land in the Hood River Valley. However, as we have heretofore noted, there is a certain similarity of soil conditions which it is believed will make the requirements for the various types of soil practically the same except as to the method of applying water. In determining the rights to the use of the waters of Neal Creek, 1/80 of a cubic foot to the second per acre was allowed with certain additional restrictions in case of rotation. This will amount to approximately three acre feet per acre in one hundred and twenty days and without taking into account seepage and other losses,

will permit a ½ acre foot irrigation every three weeks. While the Neal Creek determination seems to have proven satisfactory and this quantity of water would probably prove sufficient for the irrigation of the remainder of the lands in Hood River Valley, it is deemed advisable to withhold any definite recommendation on this subject until all data and testimony which may be secured are available for consideration.

The capacities of the East Fork Canal, Hood River Irrigation District Canal, Farmers Ditch, Middle Fork Ditch, and Glacier Ditch in miners inches per acre irrigated in 1917, are 0.75, 0.43, 0.70, 0.88 and 1.70 respectively; and for the number of acres for which a water right is claimed therefrom, 0.50, 0.23, 0.54, 0.26 and 0.36 respectively. While these figures do not in all cases represent the maximum quantity that could be forced through the canal, they are based on the maximum amount that was carried through the canals in 1917 and all the canals should be called upon to carry in their present condition. Both the Farmers Ditch and the East Fork Canal are constructed in a substantial manner and give indications of having been completed. This may also be said of the Hood River Irrigation District Canal, though the prevention of the excessive seepage would furnish much needed additional water for this canal. The Middle Fork and Glacier Ditches irrigate only a small part of the land for which a right is claimed through them and it is probable that their capacities will be considerably increased.

The experimental data collected indicate that an increase in the water applied to the irrigation of land does not produce a corresponding increase in the crop produced, while insofar as the experiments extended, the maximum application produced the maximum crops

Undoubtedly the reasonably economical use of water limits the quantity to which an irrigator is entitled and in determining this quantity, due consideration whould be given to the danger of leaching or water logging the land.

The available water supply must also be taken into consideration in fixing the quantity to which the various water users are entitled. For example, should all the lands for which a right is claimed for water diverted above Dee be allowed 1 miners inch per acre, the entire drainage area above Dee would not supply sufficient water to satisfy the irrigation rights alone through the entire irrigation season for the years 1914, 1915, and 1917. The above are the only years for which records are available giving this information. Such an award would result in depriving certain of the later water right claimants of water, the use of which they have heretofore enjoyed. This points out the necessity of limiting all water right claimants to a reasonably economical use of water.

THE OREGON LUMBER COMPANY.

The Oregon Lumber Company operated a saw mill at Dee being within the SW¼ NE¼ Sec. 7 Tp 1 N R 10 E.W.M., or one-half of a mile below the junction of the East and Middle Forks of Hood River and about 1½ miles above the confluence of the West Fork. Both hydro-electric and steam generated power are used in the operation of the mill.

In 1917, the plant was equipped with a single side double cut saw with work being done to make it a double side mill, and a planing mill, which was being operated with a 115 horse power motor. The plant was operated by electrical power developed by the steam turbine, which is an Ellis-Chalmers No. 624, with a capacity of 1,000 horsepower. The

generator is an Ellis-Chalmers No. 106226 Volts 550, 3-Phase ampere 984 maximum R.P.M. 3600.

When the saws were not in operation the planing mill was run from power furnished by the hydro-electric plant.

A log crib dam of some 30 feet in height, 140 feet in length at top and 50 feet at bottom raises the water which is carried to the water wheel in an open flume of some 260 feet in length and after passing through the wheel it is returned to the stream.

It is the practice during the low water to place flash boards upon the dam for the purpose of storing water to be used to supplement the flow and to make a log pond to facilitate the unloading of the logging trains. The height that these boards can be placed is limited due to the fact that water would back into the mill, stopping the operation. When the maximum number of flash boards is in place, the top of the penstock is 4.1 feet below the crest of the dam and the tops of the caps of the flume at the penstock is 1.8 feet below the crest of the dam.

The water wheel used by the Oregon Lumber Company in the Dee plant is an S Morgan Smith, double wheel thirty-nine inches in diameter inward flow designed for open flume operation . It has a steel draft tube 10 feet in length. When the flow of Hood River was 980 second feet and the wheel not being operated, the end of the draft tube was submerged to a depth of 1.60 feet, when the flow water was 278 second feet. The end was submerged to a depth of 0.5 of a foot.

Under the direction of John H Lewis, State Engineer, V H Reineking, who was formerly associated with Daniel W. Mead, for ten years, and has had wide experience in construction of power plants,

made a test of the Oregon Lumber Company's water wheel and reports as follows:

"I went to Hood River on August 31 and September 1, and together with Mr. Stricklin and Mr. Donnelly, made a test on the water wheels installed in The Oregon Lumber Company's mill at Dee, Oregon, to determine the efficiency of the water wheel installation.

In order that the difficulties of making an accurate test at this place may be fully understood, I will give a brief description of the plant and hydraulic installation.

The plant consists essentially of a log dam across the Hood River, from which the water is conducted to the water wheels by a wooden flume about 260 feet long, having a cross-section about 13 feet wide and about 10 feet deep. The top boards on the river side of the flume have been removed so that this side of the flume acts as a spillway when the water in the flume reaches a depth of about 10 feet. The water is let into the flume thru two gates each having a width of about five feet. The elevation of the water surface in the flume was, during the test, about six feet below the water surface in the pond. On account of this head on the gates, and the short length of the flume, the flow in the flume is very irregular, the water surface is rough and minor surges are always present when the water wheels are in service, making it diffucult to get accurate gage and meter readings. The water wheels are set in an open penstock and are twin horizontal S. Morgan Smith wheels, the size of which I was not able to determine, but which I understand you have available in your office. A steel vertical draft tube extends to a point about 6 inches above the water surface of the tail race, when the wheels are not running and the end of the draft tube is submerged to a depth of about 1½ feet when the wheels are in service. Immediately below the draft tube, the tail race has a depth of about 8 feet, but the remainder of the tail race is filled with large boulders which obstruct the flow and cause the water to rise about two feet when the wheels are running. It was impractical to measure the flow in the tail race on account of the presence of these large boulders.

The water wheels are belt connected to a Bullock Generator, rated as follows: 525 amperes, 550 volts, 60 cycle, 3-phase, 600 R.P.M. A belt driven exciter is connected to the generator. The switch board consists of a voltage regulator and one volt meter and three ampere meters. When carrying no current, two of these amperemeters showed a minus reading, the amount of which could not be determined. The third ampere meter indicated a reading of 15 amperes when carrying no current. This ampere meter was the only one used in the tests and the correction of 15 amperes was applied to each reading.

"The load driven by the generator consists of a planing mill and a saw mill . Four tests were made, the first test when only the load of the planing mill was connected to the generator, and the other three tests when both the saw mill and the planing mill were carried by the generator. When the saw mill is in operation, the load is continuously changing and the variation will range from 75 to 750 kilo watts. The installation of water rheastat to supply a uniform load for the test was not practical. Time and material for this were not available and the instruments at hand were not suitable for such a test.

Four gages were installed and read at frequent intervals during the test. Number 1 gage was placed in the tail race as near to the draft tube as possible but sufficiently far away from it so that accurate readings could be taken. Number 2 gage was placed in the penstock as close to the turbine as practical. The difference between these two gages is the effective head on the turbines. Number 3 gage was placed at the gaging station in the flume, which was located about 90 feet from the penstock at a point where the flow in the flume seemed to be the most uniform. Number 4 gage was placed in the pond about 75 feet above the flume intake.

Two sets of readings were taken with the water wheel running but with no load on the generator. Vertical velocity curves were obtained to determine the points of average velocity in the sections. The results showed that average velocities would be obtained by taking meter readings at two-tenths and at eight tenths of the depth. On account of the great and continuous variation in load, and also on account of the rapidly changing elevation of water in the pond, which necessitated the frequent changing in the position of the headgates and the consequent disturbances of the flow in the flume, it was thought advisable to make each test as quickly as possible. Current meter readings were therefore taken at five vertical sections in the flume and at two-tenths and at eight-tenths of the depth of water in the flume.

The volt meter and ammeter were read at intervals of about 15 seconds thruout the tests and the load carried by the generator computed by averaging these readings. Each test extended over a period of about ten minutes. As no power factor meter was available, the power factor thruout the test was assumed at 75 per cent. which is about the average for a load consisting entirely of motors. The generator efficiency was assumed at 90 per cent. This is somewhat low for a good generator, but I consider it a fair average for this machine. The mechanical efficiency of the belt, etc. was assumed at 95 per cent. The horsepower of the turbine was computed by computing the kilo volt amperes from the volt and ammeter and applying the above efficiencies. The results of the tests are shown on the following sheet.

I enclose herewith a sketch showing the general layout of the plant, with the location of the gages, etc. I enclose also a curve showing the efficiencies secured by the test, on which I have sketched in pencil a typical horse power efficiency curve."

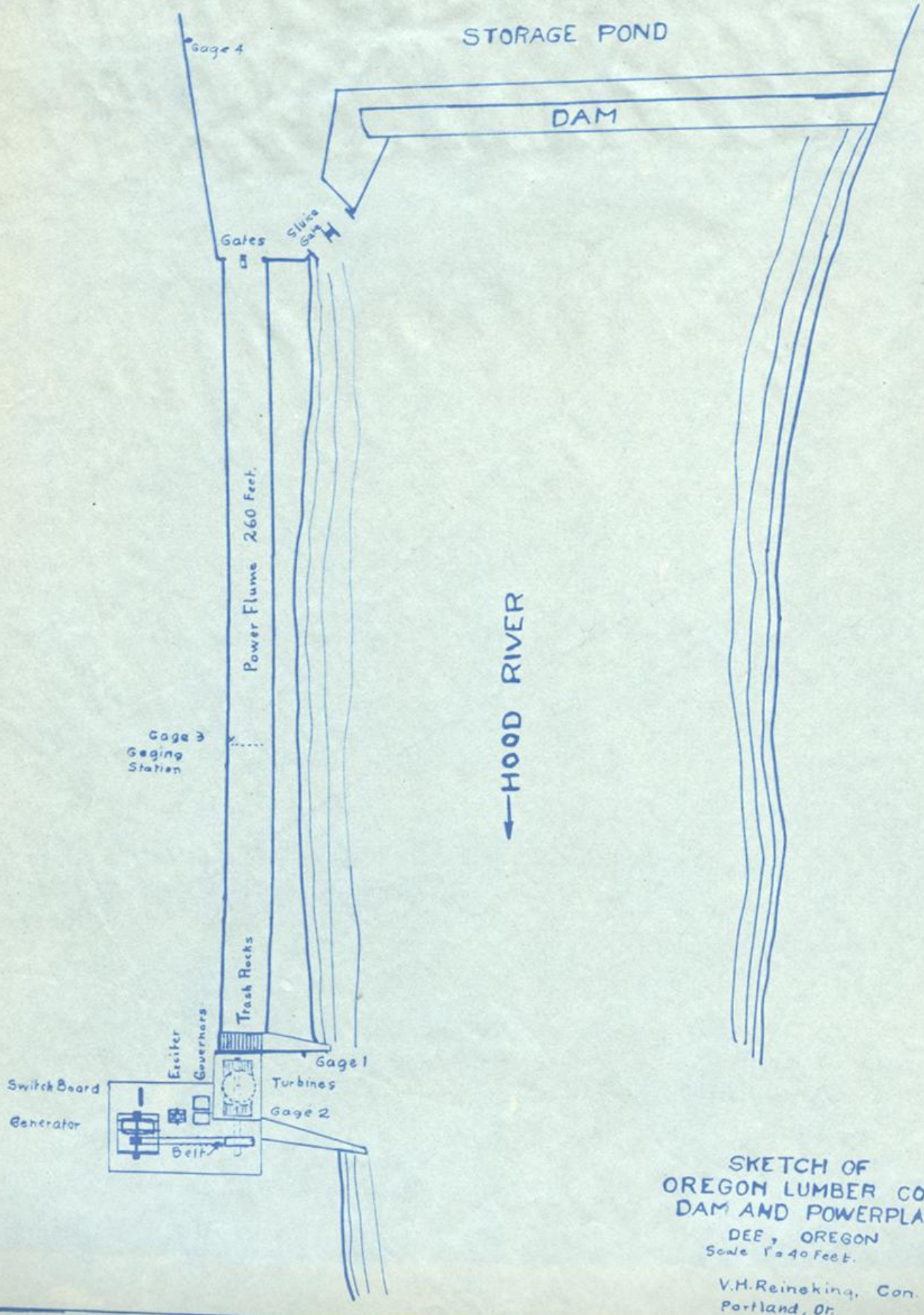
TEST ON HYDRAULIC TURBINES, OREGON LUMBER COMPANY, DEE, OREGON.

September 1, 1917.

Test No.	Generator Output K.V.A.	Computed Turbine Output K.W.	Computed Turbine Output H.P.	Head feet	Discharge sec.ft.	Theoretical H.P.	Efficiency.
1.	121.8	107	143.5	30.32	180	620	23.1%
2.	487.3	427	573	30.17	328.5	1125	50.9%
3.	368.2	323	433	30.11	300	1025	42.2%
4.	437.6	384	515	29.98	322.5	1098	46.8%

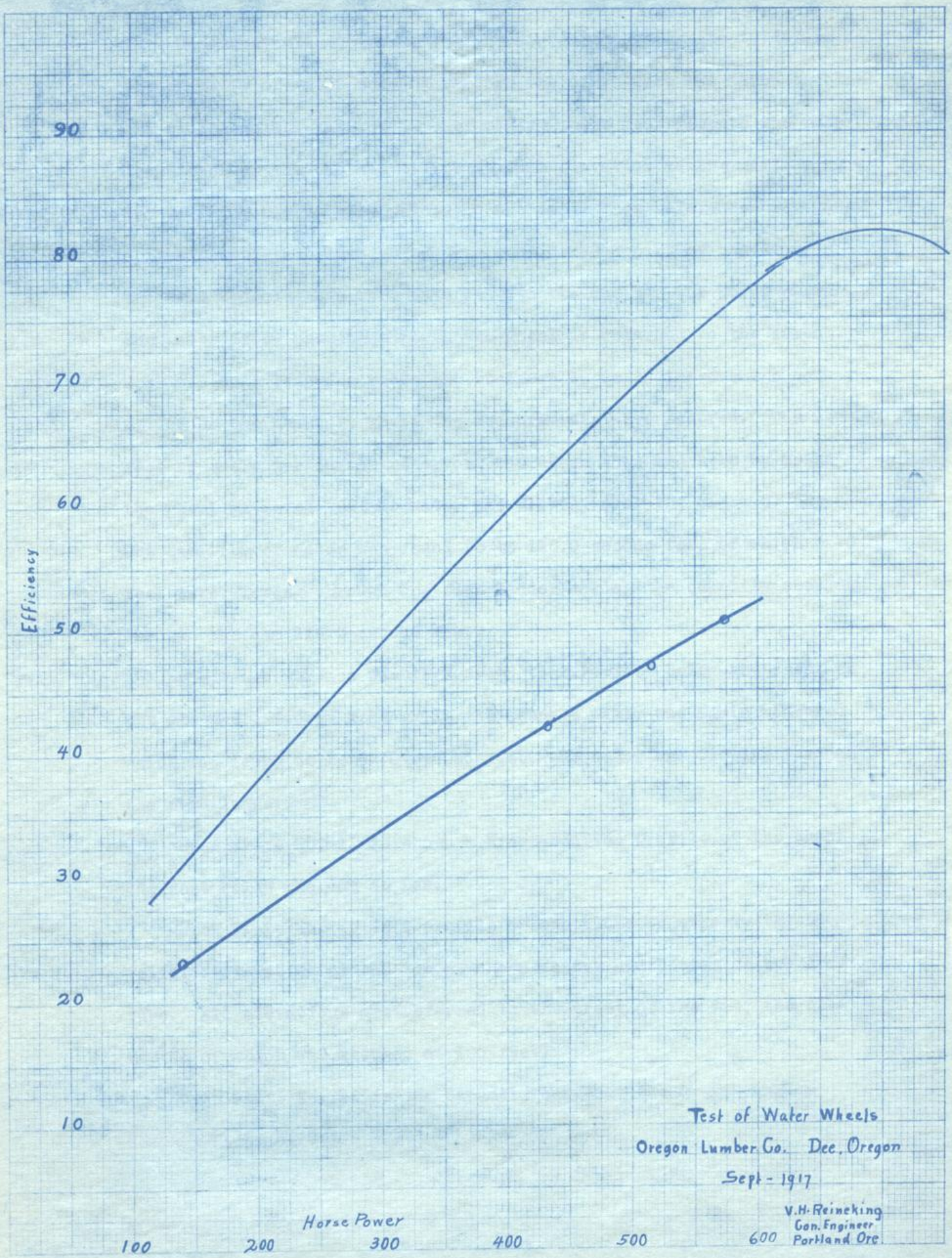
It is seen from the above data that the effective head is slightly over 30 feet in three of the four tests. When the flow of Hood River is high, the effective head will be less due to the back water. However, it is believed that in computing the horsepower during the low water period 30 feet should be used as the effective head instead of 29 feet, as used as a basis for the claim of The Oregon Lumber Company.

The quantity of water stored in the reservoir is somewhat of a variable amount, due to the large quantity of sediment which is carried by the East and Middle Forks of Hood River and deposited above the dam. It is the practice to sluice this sediment out through the gates in the dam. Measurements were taken to determine the amount of the storage on September 3, 1917, the sediment having been sluiced out on September 2nd and the quantity of water stored below the crest of the dam with the flash boards in place was found to be approximately 29.5 acre feet. Of this storage the upper feet or approximately 20 acre feet are available to supplement the flow without a sacrifice of some of the working head.



SKETCH OF
OREGON LUMBER CO'S
DAM AND POWERPLANT
DEE, OREGON
Scale 1" = 40 Feet.

V.H. Reineking, Con. Eng.
Portland, Or.
Sept. 3 - 1917.


90
80
70
60
Efficiency
50
40
30
20
10
Horse Power
100
200
300
400
500
600
Test of Water Wheels
Oregon Lumber Co. Dee, Oregon
Sept - 1917
V.H. Reineking
Con. Engineer
Portland Ore.

On August 27th to 30th, 1917, measurements were made to determine the quantity of water seeping through the dam. Care was taken to close all sluice gates. At the time of making these measurements the water level back of the dam was at its maximum elevation as the maximum number of flash boards were placed on the dam. When references are made to the crest, the flash boards are considered a part of the dam.

All measurements were made between the dam and the point where the water after passing through the wheel is returned to the stream. Work was done removing rocks and boulders so as to improve the condition of the channel, where the measurements were secured. The surface of the water in the reservoir was drawn down and held by means of the wheel gates so that no water was flowing over the crest of the dam. The quantity of water was found to be 118.0 second feet of which 3.70 feet were flowing through the fish ladder making the quantity seeping through the dam 114.3 second feet.

The water surface was then drawn to 3.24 feet below the crest of the dam where it was held while the seepage water was again measured which was found to be 93.0 second feet. No water was flowing through the fish ladder.

Upon Plate No. 11 is shown a cross-section profile of the channel one foot below the dam at Dee.

Upon Plate No. 10 is a profile of the flume together with the relative elevation at the top of the penstock and bottom of the draft tube. All elevations are referred to the crest of the dam, the elevation of which was assumed at 100 feet.

Upon Plate No. 12 is the capacity curve of the Oregon Lumber Company Reservoir.

It was urged in the suit between the Oregon Lubmer Company and the East Fork Irrigation District that the height of the flume should be

raised so as to use the additional head of 4.1 feet as the necessary power could then be developed with less water.

The quantity of water claimed by the Oregon Lumber Company is 323 second feet with a 29 foot head, which will develop approximately 1065 theoretical horsepower. Should this be done using the head of 30 instead of 29, the effective head with the flume raised as above noted, would be 34 feet. To develop 1065 theoretical horsepower with a head of 34 feet would require approximately 276 second feet. The advantage of the storage under present conditions can best be illustrated by an example. When the flow of the river is 240 second feet, by means of the storage to supplement the flow, the mill could be operated at full capacity for 9 hours out of 10 working hours as by beginning at 7 a.m. with a full reservoir, the mill could be operated at full capacity until 10 a.m. When by closing the gate one-half an hour sufficient water could be stored to run until 12. By closing the gate during the noon hour, the reservoir would be filled so as to begin at 1 p.m. A flow of 240 second feet will fill a reservoir of 20 acre-feet in one hour. The mill then could be operated until 4 p.m. when closing the gate for one-half hour the mill could be operated from 4:30 to 6 p. m. Again, when the flow of Hood River at Dee is 267 second feet, by starting with a full reservoir in the morning, the plant could be operated to its full capacity throughout a ten hour day by allowing the reservoir to be filled during the noon hour. Thus it is seen that by the use of the storage, the plant can be operated to its full capacity for a greater length of time, than if no storage were provided. If, however, the flume was built up in such a manner as to render it possible to use the additional head which might be available, due to the flash boards and at the same time draw on

the storage supply whenever necessary, some saving of water would result. Under this condition, a steady power would be maintained by increasing the flow of water through the turbines by drawing on the storage as the head decreased. The most economical use of water would result if the average head was approximately 32 feet and the storage exhausted in a five hour period and the reservoir refilled during the noon hour. Under these conditions the power plant could be operated at its full capacity when the river carried 246 second feet. In the above discussion no consideration has been given to seepage through the dam, but an allowance of 3 second feet has been made for the fish ladder and all figures are approximate.

Another point urged in the above suit was that the effective head could be increased by lengthening the draft tube or lowering the wheel. On August 27, 1917, when the flow of Hood River at Dee was 295 second feet, the surface of the water in the river opposite the draft tube was 0.2 feet lower than the end of the draft tube so nothing would be gained by lowering the wheel unless the channel of the river was dredged deeper for a considerable distance down stream.

From the testimony taken in the suit between the Oregon Lumber Company and the East Fork Irrigation District it is seen that in 1913 the entire plant of the Oregon Lumber Company with the exception of the dam, flume, water wheel and generator was destroyed by fire. The evidence shows the plant had the following equipment: A double side mill one side, a two way cut, the other a single cut with the capacity of 120,000 feet per day. There was also a planing mill. The entire plant was operated by 12 motors of the aggregate capacity of 825 horse power capable of withstanding 50 per cent overload for a time.

Eliminating the matter of seepage through the dam, it would seem that the plant is designed and operated with reasonable efficiency and will require 312 second feet under a 30 foot head for its operation at its maximum capacity with 3 second feet additional for the operation of the fish ladder.

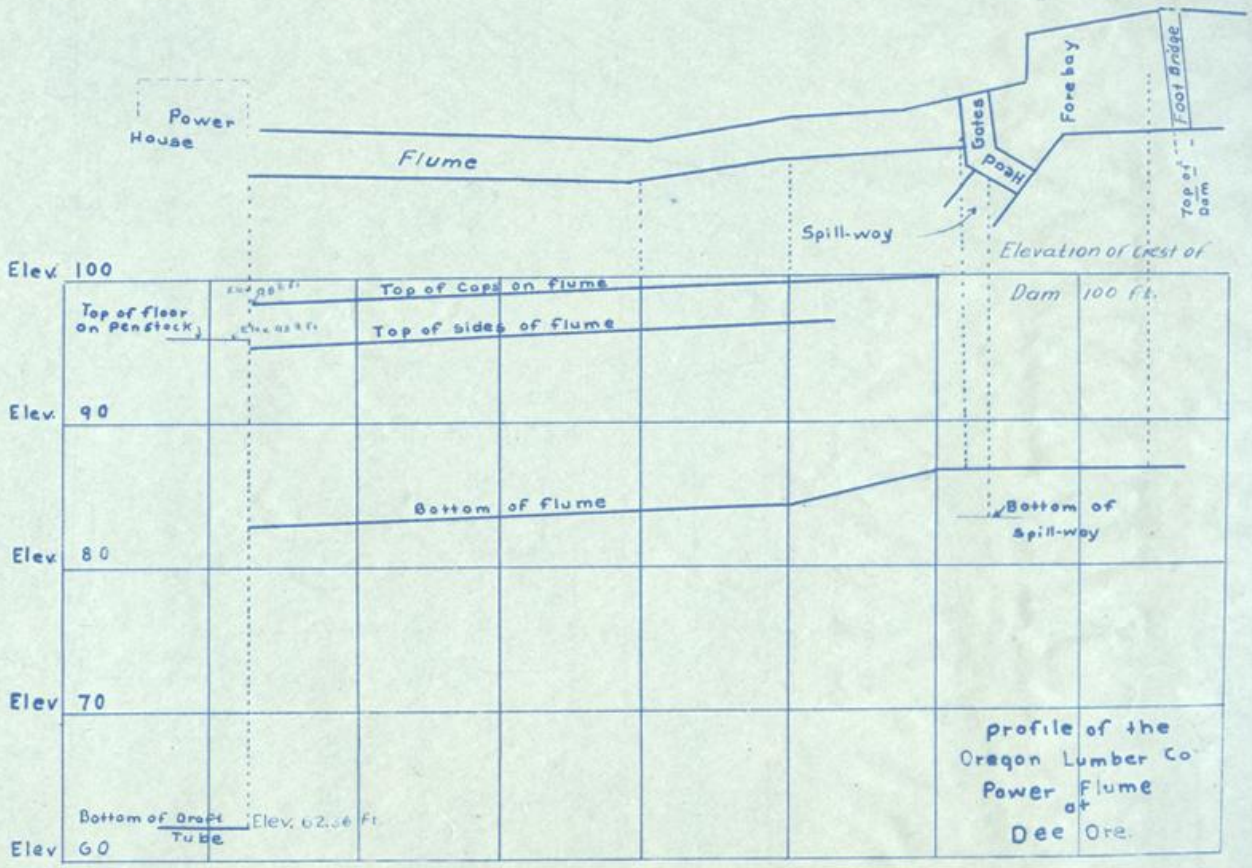
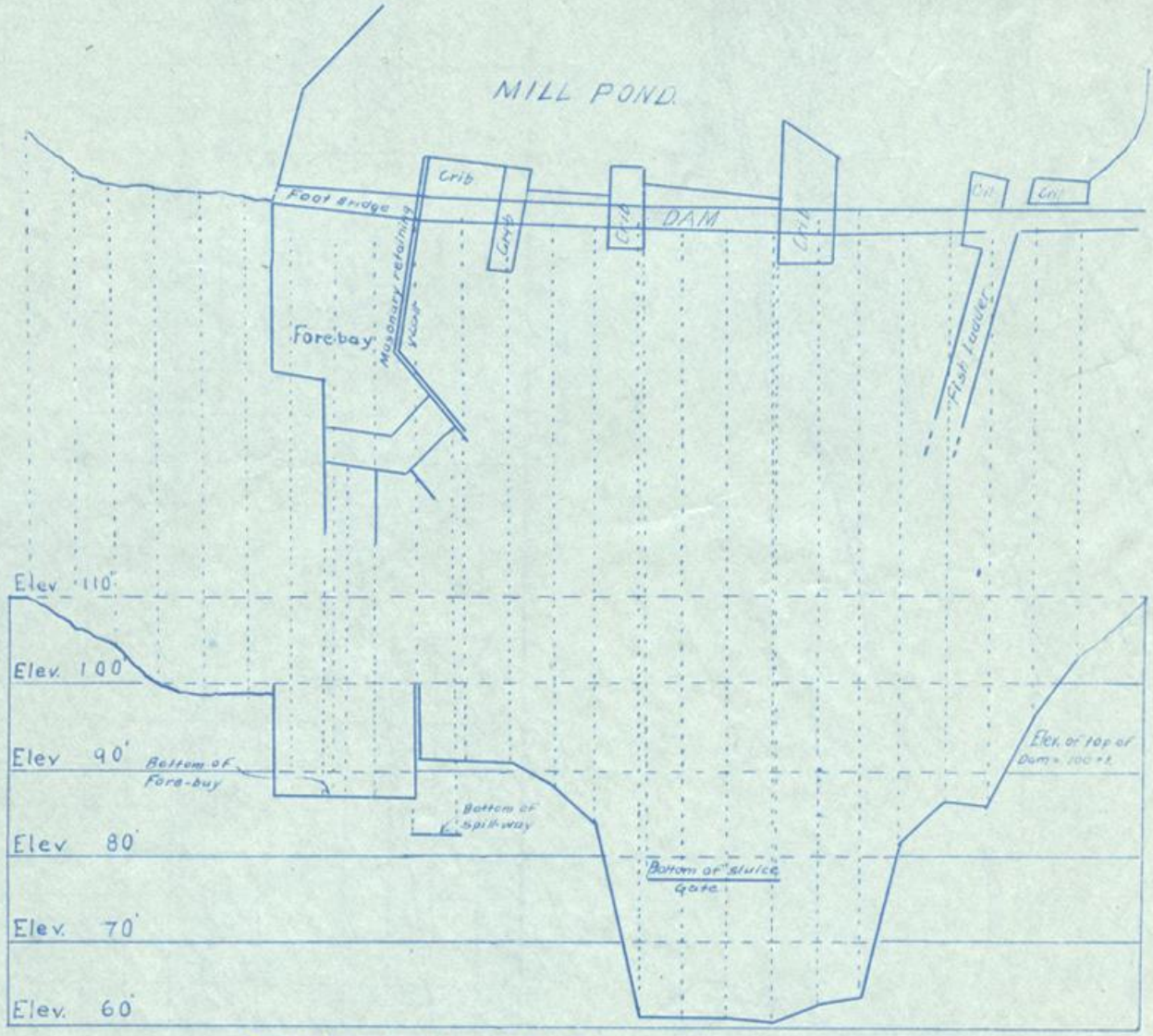

Power House
Flume
Gates
Head
Fore bay
Foot Bridge
Top of dam
Spill-way
Elevation of Crest of Dam 100 Ft.
Elev. 100
Top of floor on penstock
Top of caps on flume
Top of sides of flume
Elev. 90
Bottom of flume
Bottom of Spill-way
Elev. 80
Elev. 70
Bottom of Draft Tube
Elev. 62.56 Ft.
Elev. 60
profile of the Oregon Lumber Co Power Flume at Dee Ore.

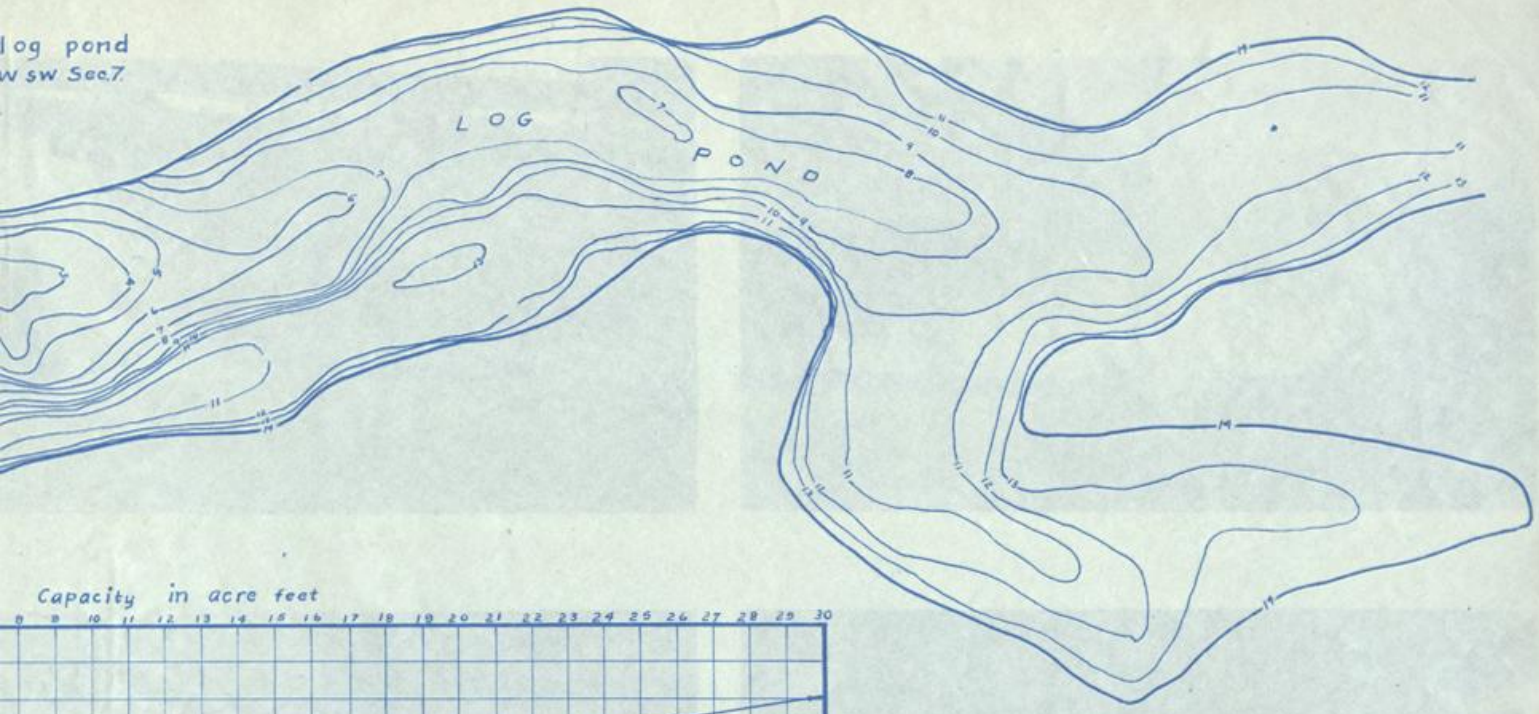
Plate No. 10

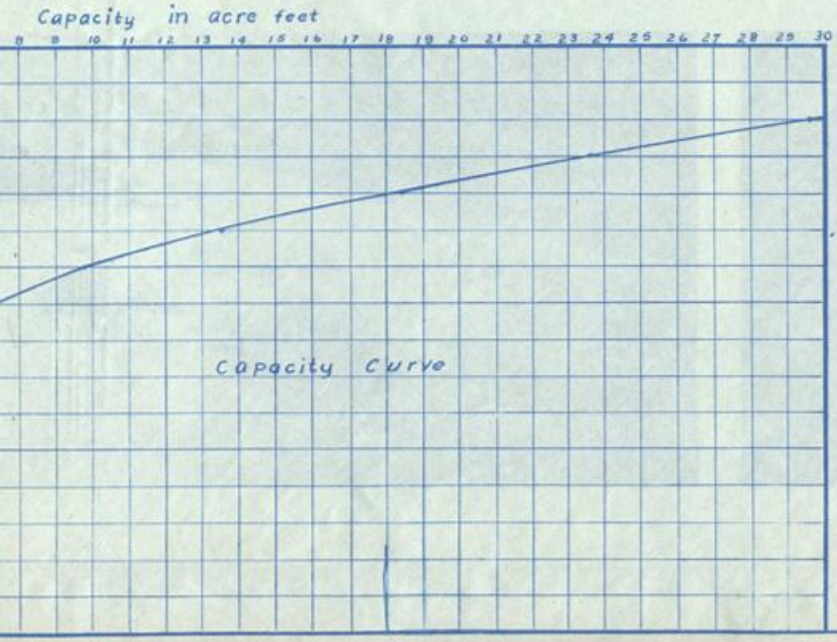


Cross-sectional Profile of Hood River
At
One foot below the dam of the Ore. Lumber Co. at Dee Oregon

Plate No. 11

log pond
w sw Sec. 7





ORE. LBR. CO. LOG POND
and
CAPACITY CURVE
Aug. 30-1917

Plate No. 12.









However, a part of this quantity in case of shortage may be made up from the storage in the reservoir as indicated herein.

PACIFIC LIGHT & POWER PLANTS ON HOOD RIVER.

The Pacific Light & Power Company diverts water from Hood River for the development of electrical power, some of which is sold in Hood River Valley, the remainder being carried to The Dalles and other points. This power is developed in two plants, one located at Powerdale and the other at Tuckers Bridge. These plants will be taken up in detail.

The Pacific Light & Power Plant at Powerdale is located in the NE¼ NE¼ Sec. 36 Tp 3 N R 10 E.W.M. being about 1½ miles above the mouth ot Hood River and below all tributaries with the exception of Indian Creek. The water under the present development is diverted from Hood River and conveyed to the place where it is used in a wood stave pipe 3,060 feet long and 5 feet in diameter. The diversion point is in the NW¼ NE¼ Sec. 1 Tp 2 N R 10 E.W.M. This water is returned to Hood River in SW¼ NE¼ Sec. 36 Tp 3 N R 10 E.W.M. or about 600 feet below the power plant.

The effective head varies directly with the fluctuation of the flow of the stream. The difference in elevation of the crest of the diversion dam in 1917 and the bottom of the draft tube was 57 feet.

The Pacific Light & Power Company at Powerdale is equipped with a Bullock Generator No. 16,824 of the following rating, Amperes 62.5 Volts 2300, Phase 3 R.P.M. 600, which would develop with no overload 250 K.V.A. The exciter is a Bullock No. 20,872 with the following rating, Volts full load 120, Ampere 75 R.P.M. 1,150.

The turbine is a 16-inch double runner, S Morgan Smith Turbine with a conical steep draft tube. The wheel was equipped with a Lombard Governor No. 1,826. It is claimed the wheel was designed to develop 650 Horse Power under a 65 foot head. The wheel was directly connected to the generator.

Owing to the giving away of the trestle which carried the pipe line across Hood River on the night of July 26, 1917, the Powerdale Plant was not operated for a period of about two months.

On October 13, 1917, measurements were made to determine the quantity of water being used at the Powerdale Plant. The gates were open so as to take the maximum quantity of water and this measured at a place about 30 feet below the discharge of the draft tube, being the place where the records of the United States Geological Survey are secured. This section is below all surging of the water. A small quantity of water was flowing into the canal between the end of the draft tube and the section where the measurement was made. This was measured over a weir and deducted from the total quantity to get the amount passing through the turbine, which was found to be 92 second feet.

The difference in the elevation between the water surface at the intake and the water surface on the tail race at the draft tube was 55.4 feet. The loss of head in the pipe is 3 feet, which was computed by the use of Table No. 7 in Bulletin No. 376, United States Department of Agriculture, giving the effective head as 52.4 feet.

As no power factor indicator was available, the power factor was assumed at 80 per cent and the generator efficiency at 95 per cent. The horse power of the turbine was computed by the kilowatt volt ampere from the volt and ammeters and applying the above coefficients. The results are as follows:

TEST OF PACIFIC LIGHT & POWER COMPANY PLANT AT POWERDALE.

Generator Output K.V.A.	Computed Turbine Output K.W.	Computed Turbine Output H.P.	Head feet.	Disc. sec. ft.	Theoretical H.P.	Efficiency
270	227	304	52.4	92.0	548	55.5%

Work was started sometime back upon a power plant at Powerdale, which was very much more extensive than the one now in operation. After the completion of the concrete saddles, which are to carry the pipe line, the work was stopped, and had not been resumed up to the end of 1917.

TUCKERS BRIDGE PLANT. The Pacific Light & Power Plant, at Tuckers Bridge, is located in the NE¼ SE¼ Sec. 15 Tp 2 N R 10 E.W.M. being about 5 miles above the junction of Hood River with the Columbia River below all of the principal tributaries of Hood River excepting Neal, Whiskey and Indian Creeks, the flow of which is relatively small.

The water for the development of power at this plant is diverted from Hood River in the SW¼ SW¼ Sec. 15 Tp 2 N R 10 E.W.M. and is carried to the turbine in a ditch and open flume of approximately 1400 feet in length.

The water wheel was a 33-inch double runner turbine, belt connected to the generator. Designed, it is claimed to develop approxmately 400 horsepower. The wheel was built by the Platt Iron Works of Ohio for use in another plant. The generator was a 300 K.W. Westinghouse A.C. Generator of 60 Cycle, 3-phase 514 R.P.M. 6,600 volts No. 729,422.

The exciter was a Westingthouse of the following rating,- 17 K.W. 125 volts, R.P.M. 1,125 Style No. 31,575 B, Serial No. 761,192.

The plant was equipped with a power factor indicator. On October 27, 1917, measurements were made to determine the quantity of water used. The wheel gates of the turbine were opened so as to take the maximum quantity of water. This quantity was measureed, also the effecctive head and the K.S. generated.

A board had been removed from the flume immediately above the penstock thus providing a wasteway through which the excess water was allowed to flow. While making the measurement, this board was replaced and the flow regulated so that no water was flowing over the sides of the flume. Therefore, 273 second feet represent the maximum quantity of water that can be carried through both the flume and wheel. However, with the board removed and water flowing through the opening, considerable more water can be carried through the flume.

The quantity of water was measured in the flume at a place about 200 feet above the penstock. The flow was regulated so that no water was wasting over the sides of the flume. The horsepower of the turbine was computed by means of the above data and assuming the efficiency of the generator at 95 per cent and the loss in the belt at 5 per cent, the results are as follows:

TEST OF PACIFIC LIGHT & POWER COMPANY AT TUCKERS BRIDGE.

Generator Output K.V.A.	Computed Turbine Output H.P.	Computed Turbine Output H.P.	Head feet	Disc. s. ft.	Theoretical H.P.	Efficiency
285	316	423	27.5	273	353	49.6

RELATIVE FLOW OF HOOD RIVER AND TRIBUTARIES AT VARIOUS STATIONS.

The data on the gaging stations of Hood River and its tributaries were furnished by the Water Resources Branch of the United States Geological Survey.

East Fork of Hood River near Mt. Hood Postoffice. On June 17, 1913, a gaging station was established on the East Fork of Hood River, the location of which was in the NE¼ Sec. 5 Tp 1 S R 10 E.W.M., being a short distance below the East Fork Irrigation District Canal, and Mt. Hood Ditch. The water stage was determined by a plain staff gage. Records were secured of the flow at this location from June 17, 1913 to November 14, 1914. On July 22, 1915, this station was moved up stream so

as to be above the two ditch diversions, and the water stages were recorded by a Stevens' 8-day automatic gage, so that excellent results were secured. All records of the flow of water in the East Fork of Hood River near Mt. Hood Postoffice since July 22, 1915, were secured at this station, which was located in the SW¼ Sec. 4 Tp 1 S R 10 E.W.M. 1,000 feet above the intake of the East Fork Irrigation District Canal.

East Fork of Hood River near Dee. On June 26th, 1917 a gaging station was established on the East Fork of Hood River near Dee, being near the center of Sec. 18 Tp 1 N R 10 E.W.M. being one-fourth of a mile above the Middle Fork and 40 feet below where Trout Creek flows into the East Fork of Hood River.

The stage of the water was measured by a Stevens' 8-day Automatic Recorder. Records were secured from June 26th to August 24th, 1917, inclusive. The results secured at this station are excellent.

Hood River at Dee. On May 21st, 1913, a gaging station was established on Hood River about 400 feet below the Power Dam of the Oregon Lumber Company, being in the NW¼ Sec. 7 Tp. 1 N R 10 E.W.M. Records were secured of the flow at this place from May 21, 1913, to December 31, 1914. The stage of the stream was measured by means of a vertical staff gage. On February 1, 1915, this station was moved up stream and located just above the back water of the dam and one-half mile below the junction of the Middle Fork and East Fork of Hood River. This station is in the SW¼ SW¼ Sec. 7 Tp 1 N R 10 E.W.M. All gage heights up to May 18, 1917, were secured by means of a vertical staff gage. On May 18, 1917, a Stevens' 8-Day Automatic Gage was installed and used up to December 15, 1917, when the station was discontinued. The records available are from February 1st 1915 to January 15, 1916, and from May 9th to December 15, 1917.

Hood River at Winans. On November 7, 1905, a gaging station was established on Hood River which was one-half of a mile North of Winans Station, being 300 feet below the mouth of the West Fork of Hood River. This station was in Sec. 1 Tp 1 N R 9 E.W.M. The gage was an inclined vertical staff in two sections. Records of the flow of Hood River at this station are available for the following periods:

November 7, 1905 to March 16, 1907
January 16, 1910 to February 7, 1912
September 4, 1913 to October 18, 1913.

Hood River at Tuckers Bridge. On October 20, 1897, a station was established on Hood River at Tuckers Bridge, which is in the NE¼ SE¼ Sec. 15 Tp 2 N R 10 E.W.M.

The water stage with the exception of a short period was measured by a chain gage attached to the wagon bridge spanning Hood River. On July 24, 1915, an automatic gage was installed one-third of a mile above the intake of the power flume and records were secured up to December 12, 1915, when the gage was washed out by a flood.

The records of the flow of Hood River at Tuckers Bridge are available during the following periods:

October 20, 1897, to December 31, 1899,
August 27, 1913, to September 30, 1914.
July 24, 1915, to September 3, 1917.

The records at Tuckers Bridge were secured under difficulties due to the manner of storing and releasing water at Dee and the discharge of the power canal at Tuckers Bridge, which backs the water upon the gage to some extent. However, it is believed that these results are sufficiently accurate to establish the increase of the flow of the Hood River between Powerdale and Tuckers Bridge.

HOOD RIVER AT POWERDALE. On March 31, 1913, a gaging station was established on Hood River at Powerdale, which is about 1½ miles above

the mouth. This station which is below all tributaries with the exception of Indian Creek, is in the NE¼ SE¼ Sec. 36, Tp. 3 N. R. 10 E. W. M. The quantity of water carried around the gage in the pipe line was measured so that the total flow in the river at this point can be determined. The water stage was determined by means of a vertical staff gage, excepting from July 27th to December 21st 1915, when this was secured by means of an automatic gage. Records of the flow of Hood River at this station are available from March 31, 1913, to the present date.

Upon Plate No. 14 are hydrographs showing the flow of the East Fork of Hood River near Mt. Hood Postoffice from 1913 to 1917.

Upon Plate No. 15, are two hydrographs showing the relative flow of the East Fork of Hood River near Mt. Hood Postoffice and of Hood River at Dee for 1917. The hydrograph at Dee includes the quantities diverted into the East Fork and Mt. Hood Ditches.

Upon Plate No. 16 are hydrographs representing the flow of Hood River at Powerdale and Dee and the East Fork of Hood River near Mt. Hood Postoffice for 1913.

Plate No. 17 represents the flow at the above places for 1914.

Upon Plate No. 18 are three hydrographs representing the flow for 1915, of Hood River, at Powerdale and Dee and the East Fork of Hood River near Mt. Hood Postoffice.

Plate No. 19 represents the flow of Hood River at Powerdale and the East Fork of Hood River near Mt. Hood Postoffice for 1916.

Plate No. 20 represents the flow of Hood River at Powerdale and Dee and the East Fork of Hood River near Mt. Hood Postoffice for 1917. The hydrograph at Powerdale includes the quantity diverted into the Farmers, East Fork and Mt. Hood Ditches and the power canal at Powerdale.

The hydrograph at Dee includes the quantities carried by Mt. Hood and East Fork Ditches.

In the following discussion it should be carried in mind that the Upper Station on the East Fork of Hood River since 1914 has been located above the East Fork and Mt. Hood Ditches. That the Lower Station on the East Fork is below the mouth of Trout Creek and about one-half mile above the junction of the East and Middle Forks and located so as to secure all return seepage from springs and small creeks flowing in the East Fork below the upper station.

That the station at Dee is located below the junction of the East and Middle Forks of Hood River and above the mouth of the West Fork, also the records of the flood of water in the East Fork Ditch were secured below all excessive seepage losses.

From the records of the flow of water in the East Fork of Hood River, Hood River at Dee and the quantity diverted in the Mt. Hood and East Fork Ditches in 1917, the following is seen:

The quantity flowing in the East Fork above the East Fork Ditch from May 9th to May 31st, 1917, inclusive, was 21,800 acre feet were furnished by the Middle Fork and water which supplements the flow of the East Fork between the two stations.

During June, 1917, the runoff of the East Fork above the East Fork Ditch was 32,500 acre feet. The flow of Hood River at Dee together with the quantity diverted into the Mt. Hood and East Fork ditches during June was 58,800 acre feet showing a gain of 26,300 acre feet. The quantity flowing past the Upper Station on the East

Fork from June 26th to June 30th 1917 inclusive, was 5100 acre feet; the quantity flowing past the Lower Station on the East Fork of Hood River was 4520 acre feet or only 580 acre feet less than the flow at the Upper Station. During this period of time the Mt. Hood and East Fork ditches diverted 1310 acre feet which shows a gain of 730 acre feet between the two stations or 16% of the water flowing past the Lower Station is gained below the Upper Station.

During the month of July, 1917, the flow of the East Fork of Hood River at the Upper Station was 29,500 acre feet and at Hood River at Dee, 45,300 acre feet. The quantity diverted into the Mt. Hood and East Fork Ditches was 8710 acre feet, which shows that 24,500 acre feet were furnished by the Middle Fork of Hood River and water supplementing the flow of the East Fork of Hood River at the Lower Station.

The records of the flow of the East Fork at the Lower Station show the runoff during July, 1917, to have been 23,600 acre feet or 5,900 acre feet less than at the Upper Station. Considering the quantity diverted in the Mt. Hood and East Fork Ditches, there was a gain of 2,800 acre feet between the two stations, or 9½% of the flow of the East Fork at the Lower Station was gained between the two stations.

The runoff of the East Fork during August, 1917, was 15,900 acre feet and the runoff of Hood River at Dee during the same period was 23,000 acre feet and the quantity diverted by the Mt. Hood and East Fork ditches was 8,360 acre feet which shows that practically one-half of the water comes from the Middle Fork and from water supplementing the flow of the East Fork below the Upper Station.

The runoff of the East Fork at the Upper Station from August 1st to August 24th, 1917, inclusive, was 12,800 acre feet. The flow during the same period of time at the Lower Station was 7,420 acre feet.

- 72 -

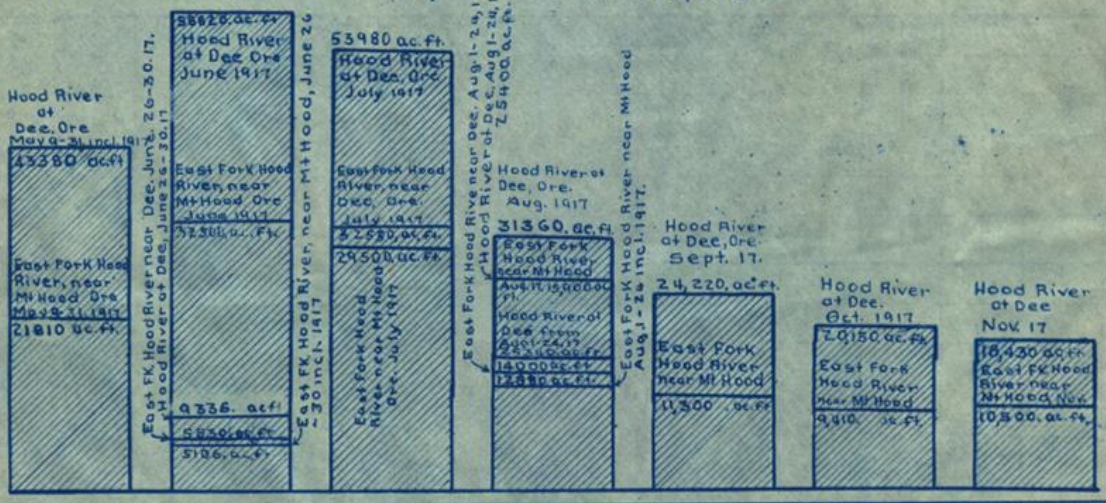
The quantity diverted into the Mt. Hood and East Fork Ditches during the above period of time was 6,590 acre feet showing a gain of 1,210 acre feet between the two stations or 9.4 per cent of the flow at the Lower Station was gained between the two stations.

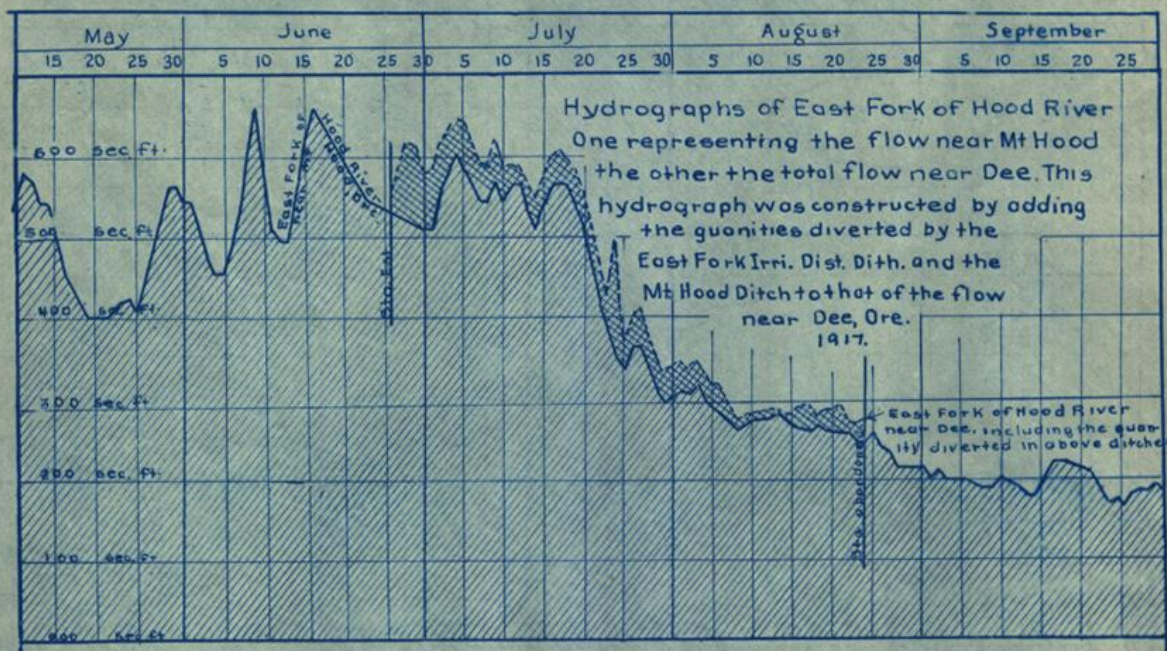
The runoff of the East Fork at the Upper Station during September, 1917, was 11,300 acre feet, while that of Hood River was 20,500 acre feet. There was diverted into the East Fork and Mt. Hood Ditches during the above period of time 2,760 acre feet which shows that practically one-half of the water comes from the Middle Fork and water supplementing the East Fork below the Mt. Hood Ditch diversion. This same ratio is true for the month of October. From the other records, which are given in the following table, it is seen that approximately 50 per cent of the water that would flow down Hood River at Dee is secured from other sources than that from the East Fork above the diversion of the Mt. Hood and East Fork Ditches.

Month	Year	East Fork near Mt. Hood P.O.	Hood River near Dee	East Fork Irrigation Dist.Canal	Mt. Hood Ditch	Hood River at Dee	Difference in flow(See note below)
November	"	11,400	- - - - - - - - -	1,290			
December	"	17,000					
January	"	11,600					
February	"	16,400					
March	"	24,100					
April	"	26,100					
May	"	28,600	- - - - - - - - -	1,010			
June	"	37,000		3,310			
July	"	31,700		4,830			
August	"	18,300		6,700			
September	"	13,100		4,210			
October	"	10,900		1,420			
November	"	10,400					
December	"	9,840					
January	1917	9,350					
February	"	8,890					
March	"	9,220					
April	"	15,000		342			
May	"	27,200		1,250			
May 9-31	"	21,800	June 26-30	1,010	197	41,700	21,100
June	"	32,800	4,520	5,100	904	52,800	26,300
July	"	29,800	28,600	7,690	1,020	45,300	24,600
Aug.	"	15,900	7,420 -Aug. 1-24	7,550	799	23,000	15,400
September	"	11,300		3,540	120	20,500	12,960
October	"	9,410		2,050		18,100	10,700
November	"	10,500		1,930		16,000	17,900
Dec. 1-15		6,600				15,000	8,400

Month	Year	East Fork near Mt. Hood P.O.	Hood River near Dee	East Fork Irrigation Dist.Canal	Mt. Hood Ditch	Hood River at Dee	Difference in flow(See note below)
June 17 -30	1913	14,900		1,180		48,600	6,990
July	"	23,200		2,780		38,400	15,200
August	"	12,500		2,960			
September	"	9,760		2,080			
October	"	11,600		1,220		20,300	8,700
November	"	8,810		1,430		19,600	10,990
December	"	7,260		1,210		16,700	9,440
January	1914	15,700				36,600	20,900
February	"	10,300				26,600	15,300
March	"	18,800				39,200	20,400
April	"	20,100		36		37,500	17,400
May	"	19,700		1,750		35,500	15,800
June	"	13,400		2,530		25,500	12,100
July	"	10,300		3,730		22,900	12,600
August	"	6,950		3,470		21,800	14,850
September	"	9,400		2,260		16,700	7,300
October	"	10,600		984		22,800	12,200
Nov. 1-14	"	5,480				23,000	
Dec	"	- - - - - - - - - - - - - - - - - - - -				12,100	6,620
[illegible]	"	- - - - - - - - - - - - - - - - - - - -				[illegible]	
January	1915					15,400	
February	"						
March	"						
April	"						
May	"						
June	"	- - - - - - - - - - - - - - - - - - - -				19,000	
July 22-31	"	3,090		1,560		4,880	3,350
July	"					17,500	
August	"	9,840		5,490		16,100	11,750
September	"	7,560		3,040		11,100	6,580
October	"	7,810		2,060			
November	"	11,400	- - - - - - - - -	1,290			
December	"	17,000					
January	"	11,600					
February	"	16,400					
March	"	24,100					
April	"	26,100					
May	"	28,600	- - - - - - - - -	1,010			
June	"	37,000		3,310			
July	"	31,700		4,530			
August	"	18,300		6,700			
September	"	13,100		4,210			
October	"	10,900		1,420			
November	"	10,400					
December	"	9,840					
January	1917	9,350					
February	"	8,890					
March	"	9,220					
April	"	15,000		342			
May	"	27,200		1,250			
May 9-31	"	21,800	June 26-30	1,010	197	41,700	21,100
June	"	32,500	4,520	5,100	904	52,800	26,300
July	"	29,500	23,600	7,690	1,020	45,300	24,500
Aug.	"	15,900	7,420 -Aug. 1-24	7,560	799	23,000	15,400
September	"	11,300	[illegible]	3,640	120	20,500	12,960
October	"	9,410		2,050		18,100	10,700
November	"	10,500		1,830		16,000	17,900
Dec. 1-15		6,600				15,000	8,400

Showing the quanity of water flowing in Hood River at Dee, Ore. and the East Fork of Hood River near Dee, Ore and Mt. Hood Ore, during the below periods of time. The quanity of water diverted through the East Fork Irrigation District Ditch and Mt Hood Ditch is included in the records of the East Fork of Hood River at Dee and Hood River at Dee, Ore.





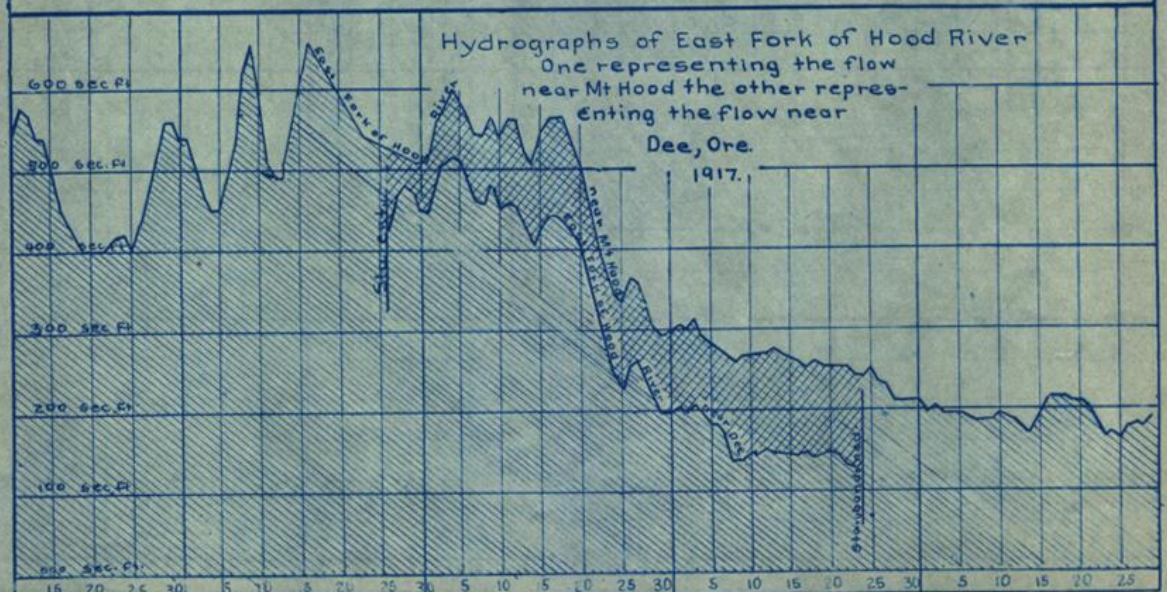


Plate No. 13

Hydrographs of East Fork of Hood River near Mt Hood representing flow in 1913-14-15-16 & 17.

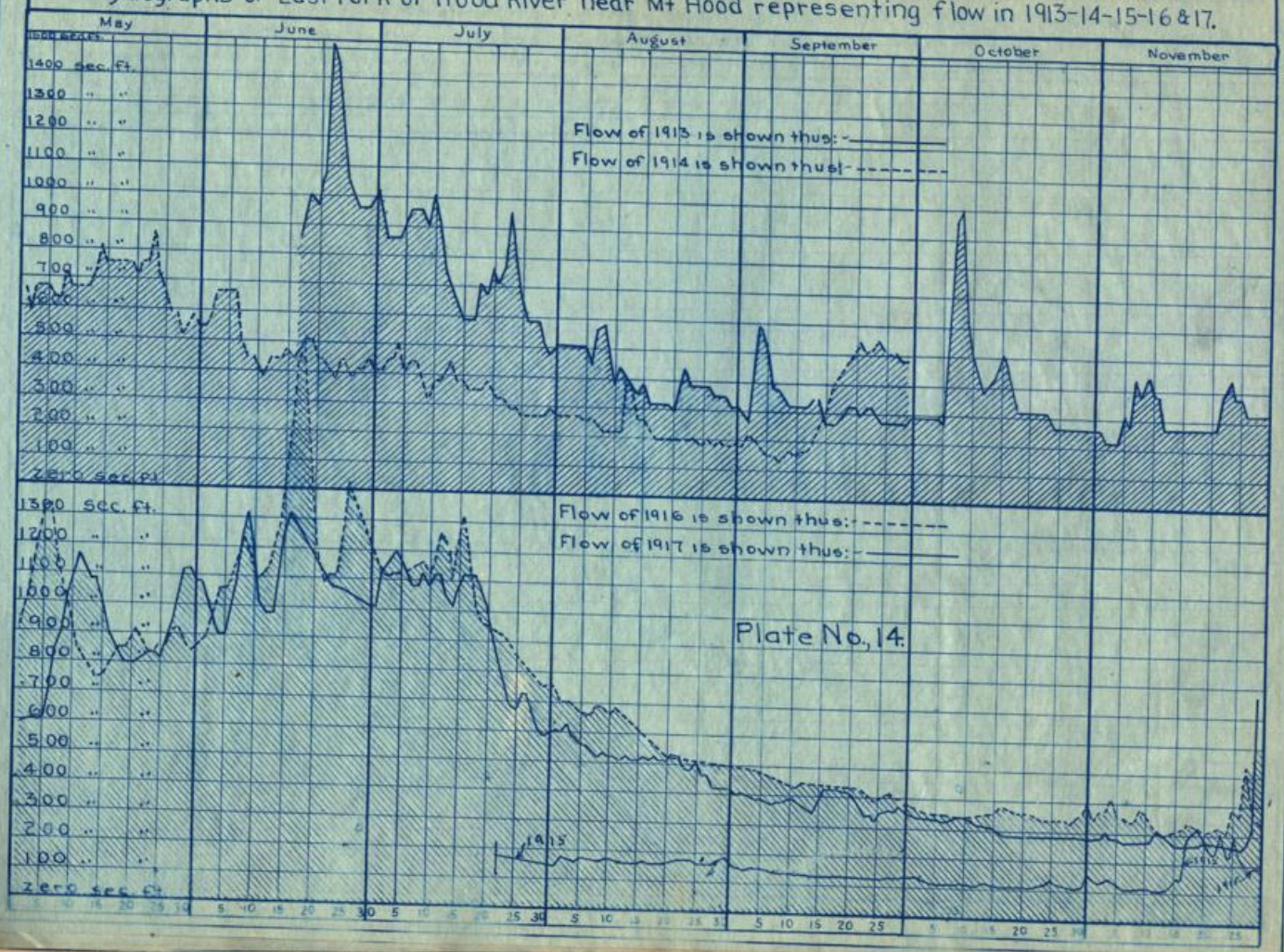


Plate No. 14.

Hydrographs showing flow of water in, the East Fork of Hood River at the Upper Station and Hood River at Dee, Oregon, in 1917. The hydrograph at Dee represents the total flow of the East Fork of Hood River. together with that of the Middle Fork of Hood River. The flow of the Mt Hood and East Fk, Ditches are included.

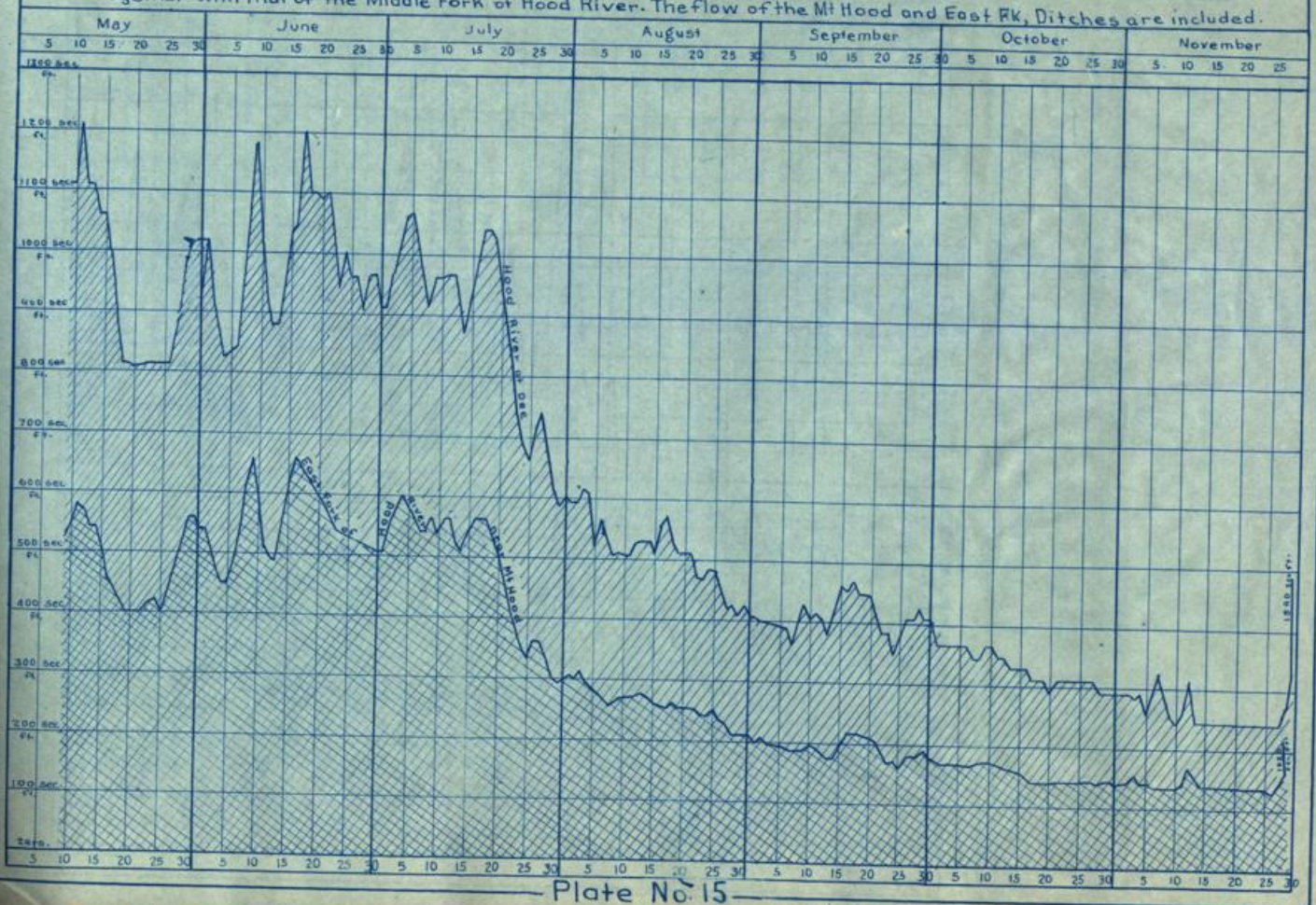


Plate No. 15

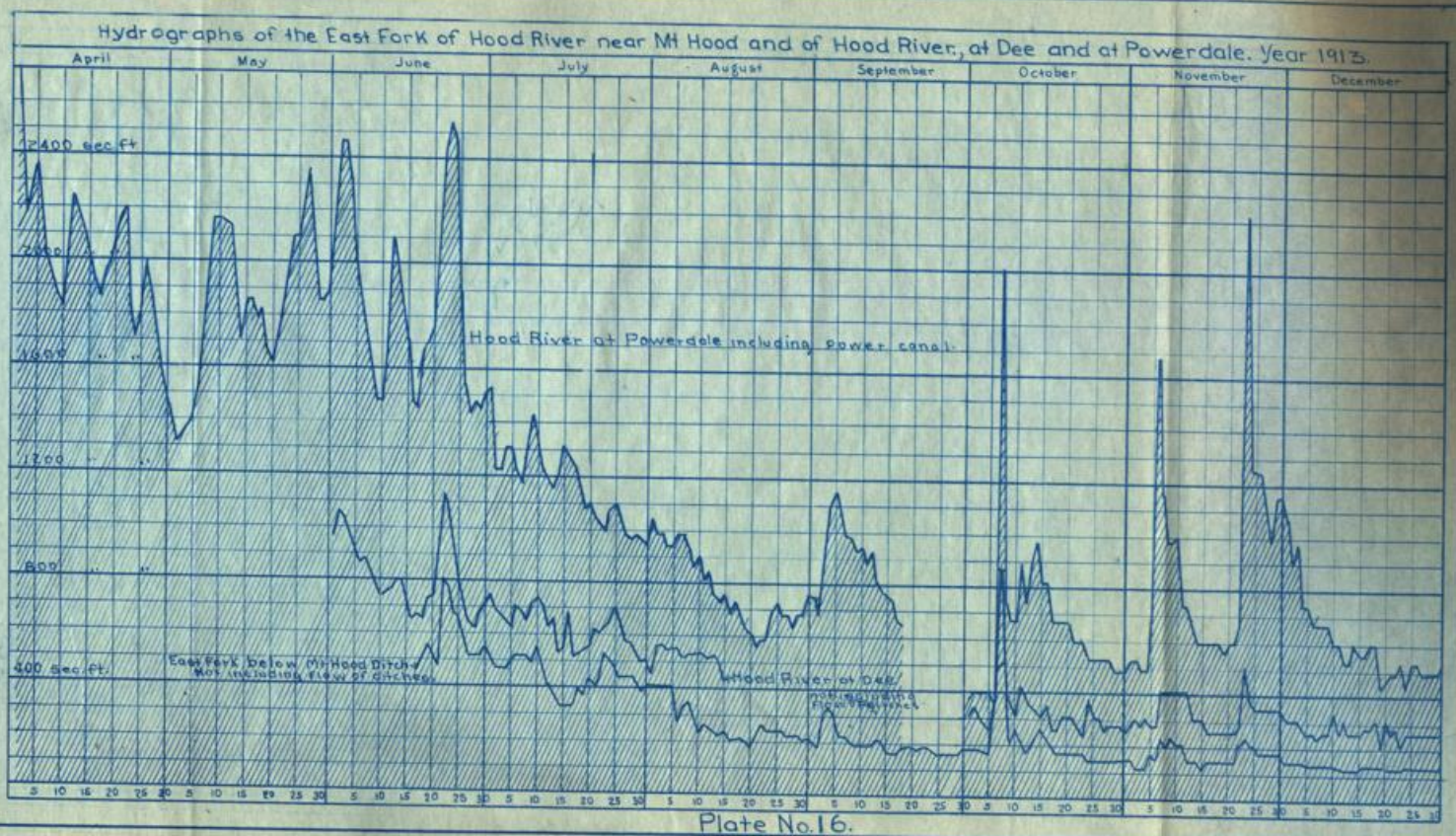

Hydrographs of the East Fork of Hood River near Mt Hood and of Hood River, at Dee and at Powerdale. Year 1913.
April
May
June
July
August
September
October
November
December
2400 sec ft
2000
1600
1200
800
400 Sec. ft.
Hood River at Powerdale including power canal
East Fork below Mt Hood Ditch
Hood River at Dee
5 10 15 20 25 30

Plate No. 16.

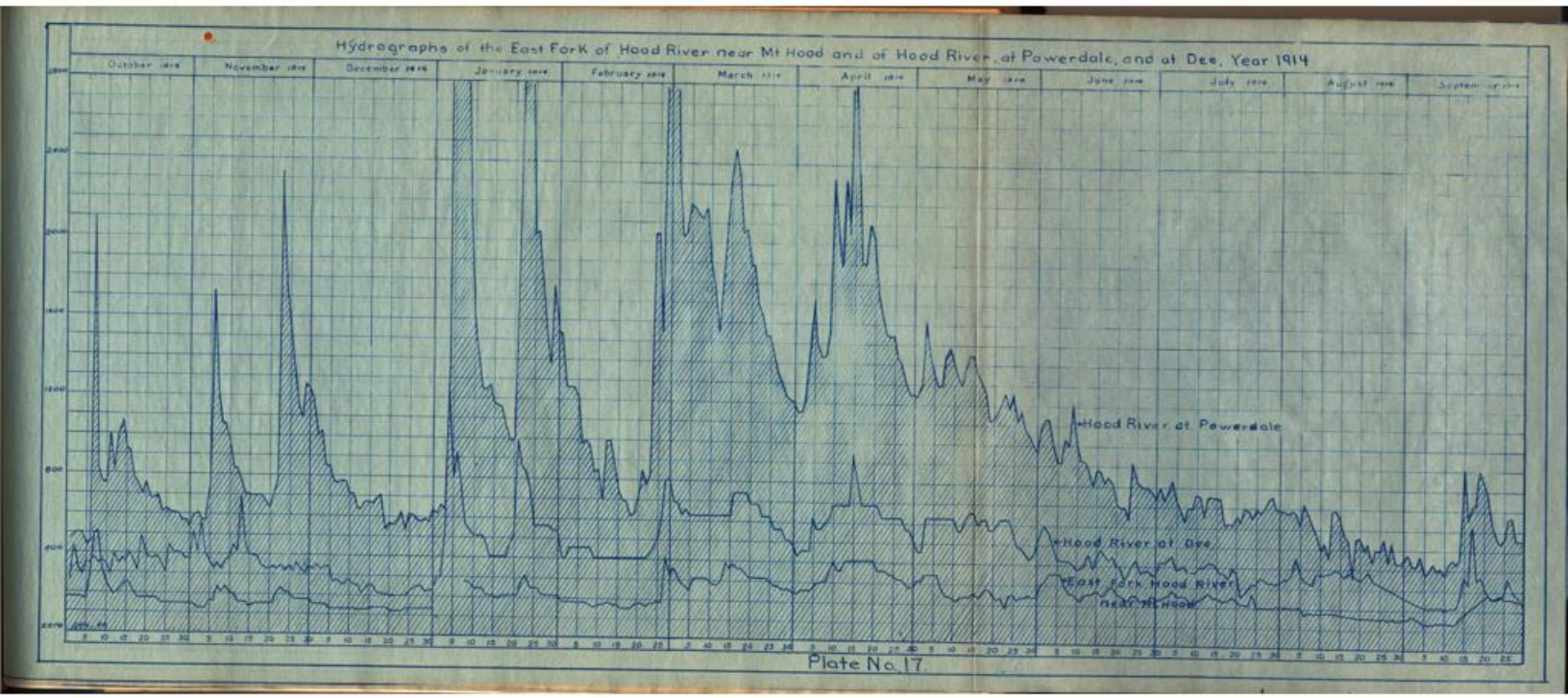
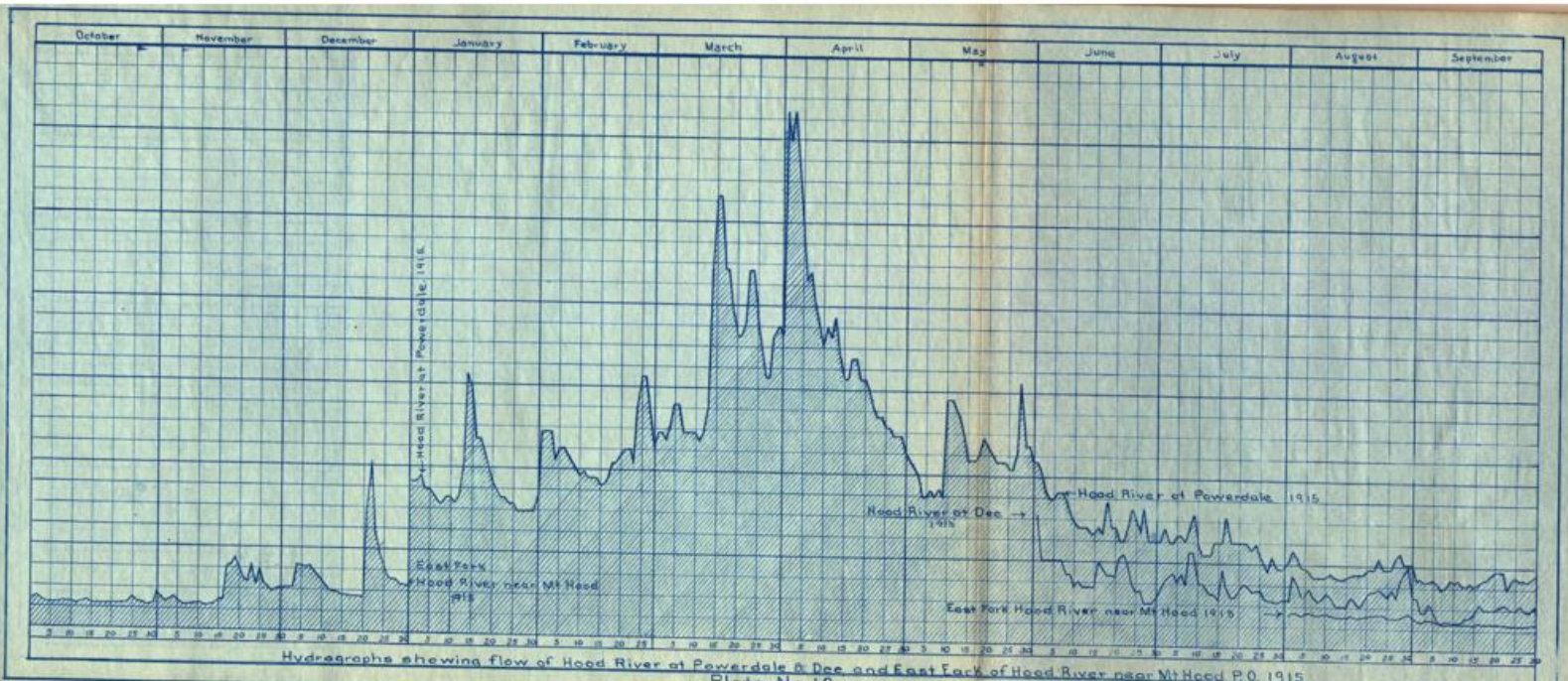

Hydrographs of the East Fork of Hood River near Mt Hood and of Hood River at Powerdale, and at Dee, Year 1914
October 1913
November 1913
December 1913
January 1914
February 1914
March 1914
April 1914
May 1914
June 1914
July 1914
August 1914
Hood River at Powerdale
Hood River at Dee
East Fork Hood River near Mt Hood

Plate No. 17



Hydrographs shewing flow of Hood River at Powerdale & Dee and East Fork of Hood River near Mt Hood P.O. 1915

Plate No. 18

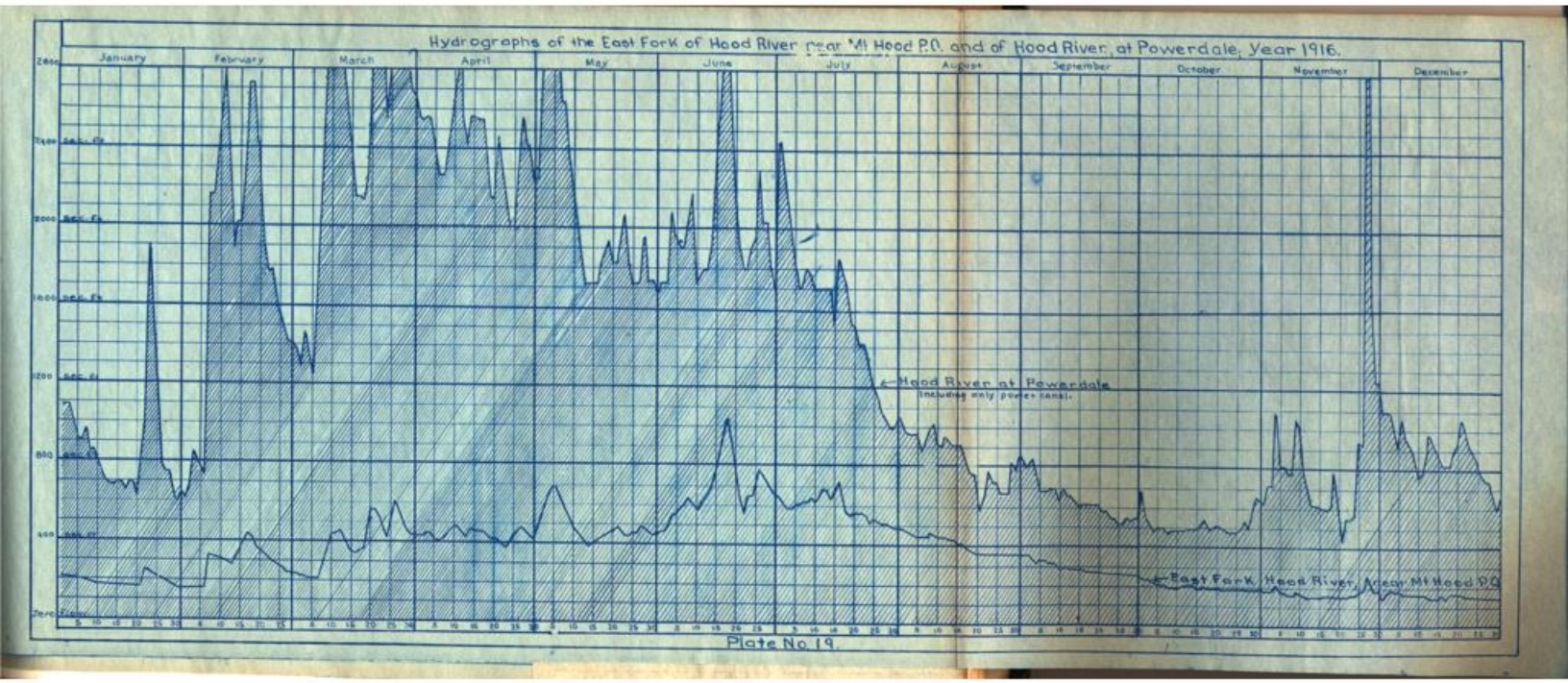

Hydrographs of the East Fork of Hood River near Mt Hood P.O. and of Hood River at Powerdale, Year 1916.
January
February
March
April
May
June
July
August
September
October
November
December
Hood River at Powerdale
Including only power canal.
East Fork Hood River near Mt Hood PO

Plate No 19.

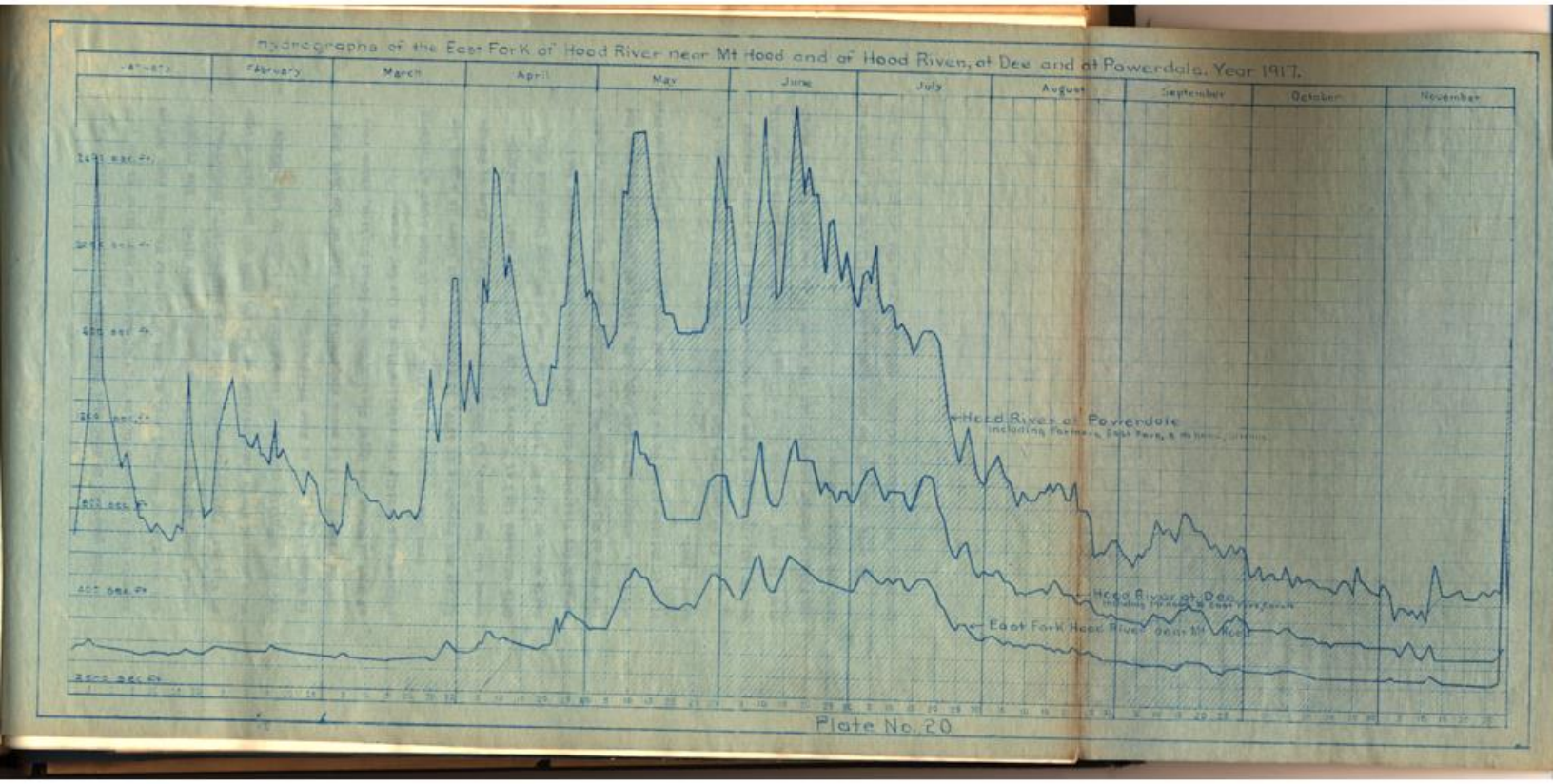

Hydrographs of the East Fork of Hood River near Mt Hood and of Hood River, at Dee and at Powerdale. Year 1917.
January
February
March
April
May
June
July
August
September
October
November
Hood River at Powerdale
Hood River at Dee
East Fork Hood River near Mt Hood

Plate No. 20

The quantity in acre feet shown under "Difference in Flow" represents the difference in the flow of water in Hood River at Dee , and the flow of the East Fork of Hood River near Mt. Hood Post Office should none have been diverted in the East Fork ditch. The records on the East Fork covering the period from 1915 to 1917, inclusive, were secured above the diversion of the Mt. Hood and East Fork Ditches. The quantity carried in these ditches as shown by the records is added to the flow of Hood River at Dee.

On Plate No. 13 is shown graphically the flow of the East Fork of Hood River at the Upper Station and the Lower Station, which represents more vividly the relative flow at the two places.

From the records of the flow of water in Hood River at Tuckers Bridge and Powerdale in 1917, it is evident that there is a gain between the two points, as during the month of July the flow at Powerdale exceeded that at Tuckers Bridge by 9300 acre feet. Measurements made on July 26, 1917, of the flow of Whiskey Creek and Neal Creek a few feet above their junction with Hood River shows that the flow of Whiskey Creek was 4.0 second feet and Neal Creek 7.6 second feet. Measurements made August 22, 1917, at these places show the flow of Whiskey Creek to be 9.7 second feet and that of Neal Creek 27.6 second feet.

It is evident that the increase in the flow of these streams is due to the irrigation above and doubtless much of the return seepage finds its way into Hood River without flowing in well defined channels. The return seepage accounts for the increase in the flow between Powerdale and Tuckers Bridge.

We have seen that the same conditions prevail from the results of irrigation in the Upper Valley. Undoubtedly as the irrigated area in-

creases so will the seepage increase and it is probable that the longer the lands are irrigated the more seepage water will find its way back into the stream.

As much of the data in this report is based upon the record of flow for 1917, attention is called to the fact that the flow for this year is above the normal and the following table shows the relation between the 1917 flow and that of other years for which records are available.

FLOW OF HOOD RIVER AS SHOWN BY THE RECORDS FOR THE MONTHS OF JUNE, JULY AND AUGUST.

Station	Year	June	July	August
Tuckers Bridge	1898	73,900	52,400	42,100
"	1899	145,000	104,000	66,800
Winans	1906	73,000	61,500	41,400
"	1910	54,400	44,800	37,600
"	1911	66,600	48,100	31,100
Powerdale	1913	111,000	71,300	47,800
"	1914	52,500	41,900	34,400
"	1915	36,300	29,600	23,300
"	1916	120,000	97,800	52,400
"	1917	118,000	80,900	45,300

MUNICIPAL SUPPLY

HOOD RIVER. Hood River secures its water supply for municipal purposes from two springs, one of which rises within the city limits and then flows directly into the Columbia River, consequently the rights are not involved in this determination. The other spring which is known as Tuckers Spring rises in the NE¼ NW¼ Sec. 21 Tp. 2 N R 10 E.W.M., and flows into Hood River. The right to the use of the water from Tuckers Spring is covered by the State Engineer's Permit No. 113. The water from Tuckers Spring is carried in a pipe of approximately 2,910 feet in length to a reservoir located in the city limits.

THE DALLES. The Dalles secures its water supply for municipal purposes from two sources, Mill Creek which flows directly into the Columbia River and Dog River which is a tributary of the East Fork of Hood River. Only the supply secured from the latter stream will receive consideration in this report.

The water from Dog River is diverted in the NE¼ SW¼ Sec. 11, Tp. 2 S R 10 E.W.M. which is carried in a 20-inch wooden pipe to the divide between Mill Creek and Dog River or a distance of 17,300 feet. From this divide the grade having been increased, the water is carried in a 14-inch pipe and open ditch to the South Fork of Mill Creek.

At a distance of 1,270 feet below the diversion from Dog River there is constructed a settling tank and weir. From this point to the divide or a distance of approximately 17,000 feet the pipe is laid to a hydraulic gradient line of 0.146 per cent with horizontal curves not exceeding 14 degrees. This pipe has a maximum carrying capacity of approximately 6.0 second feet.

CONCLUSION.

It has been the intention in this report to present all available data together with an analysis of the same, to show its application to conditions as they now exist and conditions as may be reasonably anticipated under the proposed developments.

As practically all the large appropriations are claiming large inchoate rights, which render it difficult to show the relation between the available water supply and the amount required to satisfy the rights, definite recommendations as to the quantity required for irrigation have been reserved. Records of the U. S. Geological Survey are hereto attached.

Respectfully submitted.

Chas. E Stricklin.

MONTHLY DISCHARGE OF HOOD RIVER AT DEE, OREGON, FOR 1913-1914.

Month	Discharge in second feet Maximum	Minimum	Mean	Run-off total in ac. ft.	Accuracy
1913					
June	1,130	618	817	48,600	A.
July	774	493	624	38,400	A.
1913-14					
October	870	238	330	20,300	A.
November	515	260	332	19,800	A.
December	330	215	271	16,700	A.
January	1,250	305	595	36,600	A.
February	810	405	461	25,600	A.
March	750	488	638	39,200	A.
April	935	432	630	37,500	A.
May	660	432	578	35,500	A.
June	600	335	429	25,500	A.
July	460	260	372	22,900	A.
August	460	1,600	354	21,800	B.
September	630	206	281	16,700	B.
The Year	1,250	206	439	318,000	

MONTHLY DISCHARGE OF HOOD RIVER AT WINANS, OREGON, FOR 1905-1907 and 1910-1912.

Month	Discharge of second feet Maximum	Minimum	Mean	Run-off in ac. ft. Total	Accuracy
1905-06					
Nov. 19-30	1,160	555	709	16,900	B.
December	1,420	555	804	49,400	B.
January	2,460	690	1,030	63,300	B.
February	2,560	760	1,400	77,800	B.
March	2,060	1,150	1,280	78,700	D.
April	1,970	1,240	1,590	94,600	D.
May	1,600	1,070	1,280	78,700	D.
June	1,600	990	1,240	73,800	D.
July	1,320	690	1,000	61,500	B.
August	760	555	674	41,400	B.
September	990	490	586	34,900	B.
The Period				671,000	
1906-07					
October	1,780	555	1,100	67,600	B.
November	6,460	620	1,890	112,000	B.
December	6,580	835	1,740	107,000	B.
January	2,580	910	1,280	78,700	D.
February	5,140	1,600	2,230	124,000	C.
March 1-16	1,780	1,070	1,470	46,700	
The Period				536,000	
1910					
Jan. 16-31	3,150	1,000	1,800	57,300	B.
February	3,150	1,000	1,350	75,000	B.
March	5,500	1,680	2,680	165,000	C.
April	2,350	1,500	1,850	110,000	B.
May	2,250	1,160	1,580	97,200	B.
June	1,160	770	914	54,400	B.
July	840	635	729	44,800	B.
August	635	510	612	37,600	B.
September	570	450	502	29,900	B.
The period					
1910-11					
October	1,160	510	637	39,200	B.
November	3,670	635	1,790	107,000	B.
December	2,050	1,000	1,390	85,500	B.
January	1,820	760	992	61,000	B.
February	1,110	510	734	40,800	A.
March	1,570	395	967	59,500	A.
April	1,570	825	1,110	66,000	A.
May	2,320	1,040	1,390	85,500	A.
June	1,490	825	1,120	66,600	A.
July	965	570	783	48,100	A.
August	570	450	605	31,100	A.
September	1,730	450	764	45,500	A.
The year	2,320	395	1,020	736,000	
1911-12					
October	760	395	507	31,200	A.
November	2,230	395	1,220	72,600	A.
December	1,260	695	909	55,900	A.
January	6,000	450	1,770	109,000	A.
Feb. 1-7	2,320	1,900	2,000	27,800	
The period				296,000	

MONTHLY DISCHARGE OF HOOD RIVER AT TUCKERS BRIDGE, NEAR HOOD RIVER, OREGON FOR 1897-1899.

Month	Discharge in Second feet			Run-off Total in acre ft.	Accuracy
	Maximum	Minimum	Mean		
1897-98					
October 20-31	600	452	524	12,500	B
November	9,150	452	1,990	118,000	B
December	9,150	992	3,300	203,000	c
January	2,550	936	1,430	88,200	B
February	8,700	882	2,870	159,000	B
March	1,510	830	1,160	71,700	B
April	2,700	830	1,350	80,400	B
May	1,590	1,170	1,430	87,700	B
June	1,510	882	1,240	73,900	B
July	992	732	853	52,400	B
August	830	522	684	42,100	B
September	1,300	486	583	34,700	B
The period	9,150	452	1,490	1,020,000	
1898-99					
October	1,370	486	668	41,100	B
November	4,650	486	1,190	70,900	B
December	3,150	642	1,300	79,700	B
January	12,200	642	2,940	181,000	C
February	5,400	1,300	2,450	136,000	B
March	6,900	992	1,720	106,000	B
April	5,550	1,050	2,420	144,000	B
May	3,000	1,440	1,840	113,000	B
June	3,900	1,810	2,440	145,000	B
July	2,000	1,300	1,690	104,000	B
August	1,900	936	1,090	66,800	B
September	992	686	804	47,800	B
The year	12,200	486	1,710	1,240,000	
1899					
October	3,300	522	928	57,100	B
November	6,450	642	1,780	106,000	B
December	9,150	1,300	2,430	149,000	B
1913					
September	1,150	486	641	38,100	C
1913-14					
October	1,190	495	805	49,500	B
November	2,080	590	919	54,700	C
December	880	525	618	38,000	B
January	4,520	525	1,570	96,500	B
February	2,760	740	1,110	61,600	B
March	2,260	980	1,610	99,000	B
April	2,460	880	1,360	80,900	B
May	1,290	740	1,030	63,300	B
June	785	625	715	42,500	C
July	700	495	574	35,300	C
The period				621,000	

MONTHLY DISCHARGE OF EAST FORK IRRIGATION CANAL NEAR MT. HOOD, OREGON FOR

1913-14.

Month	Discharge in second feet Maximum	Minimum	Mean	Run-off Total in acre ft.	Accuracy
1913					
June 17-30	46	38	42.6	1,180	A
July	54	40	45.2	2,780	A
August	53	36	48.1	2,960	A
September	54	30	35.0	2,080	A
The Period				9,000	
1913-14					
October	32	7	19.9	1,220	A
November	30	0	24.1	1,430	A
December	24	9	19.6	1,210	A
January	0	0	0	0	-
February	0	0	0	0	-
March	0	0	0	0	-
April	16	0	.6	36	C
May	41	0	28.4	1,750	A
June	48	38	42.6	2,530	A
July	72	41	60.7	3,730	A
August	76	0	56.5	3,480	A
September	58	20	37.9	2,260	A
The Year	76	0	24.4	17,600	

STATE OF OREGON)
) ss.
County of Marion.)

I, John H Lewis, State Engineer of the State of Oregon, do hereby certify that Charles E Stricklin, who made the foregoing report and whose signature is thereto attached, is my duly appointed assistant, and was authorized to, and did make an examination of rights to the use of water of said stream by the State Water Board, and did under my direction and authority prepare the foregoing report pursuant to the provisions of Section 6647 Lord's Oregon Laws.

IN WITNESS WHEREOF I have hereunto set my hand this 8th day of October, 1918.

John H Lewis,

State Engineer of the State of Oregon.

UNITED STATES GEOLOGICAL SURVEY. (WATER RESOURCES BRANCH.)

Daily gage height, in feet, and discharge, in second-feet, of E. Fk. Irrigation Canal near Mt. Hood, Oreg. for 1913

Drainage area ..... square miles. (E. H. Gordon, observer.)

436

Day	JANUARY. Gage height	JANUARY. Discharge.	FEBRUARY. Gage height.	FEBRUARY. Discharge.	MARCH. Gage height.	MARCH. Discharge.	APRIL. Gage height.	APRIL. Discharge.	MAY. Gage height.	MAY. Discharge.	JUNE. Gage height.	JUNE. Discharge.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17											1.60	38
18											1.75	42
19											1.80	44
20											1.70	41
21											1.80	44
22											1.85	46
23											1.80	44
24											1.80	44
25											1.80	44
26											1.75	42
27											1.70	41
28											1.70	41
29											1.70	41
30											1.80	44
31												
Total.												546
Mean												42.6
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet												1,180
Maximum												46
Minimum												38
Accuracy												A

UNITED STATES GEOLOGICAL SURVEY. (WATER RESOURCES BRANCH.)

Daily gage height, in feet, and discharge, in second-feet, of E. Fk. Irrigation Canal near Mt. Hood, Oreg. for 1913

Drainage area ..... square miles. (E. H. Gordon, observer.)

436

Day	JULY. Gage height	JULY. Discharge.	AUGUST. Gage height	AUGUST. Discharge.	SEPTEMBER. Gage height.	SEPTEMBER. Discharge.	OCTOBER. Gage height.	OCTOBER. Discharge.	NOVEMBER. Gage height.	NOVEMBER. Discharge.	DECEMBER. Gage height.	DECEMBER. Discharge.
1	1.75	42	2.00	51	1.85	46						
2	1.70	41	2.00	51	1.80	44						
3	1.70	41	2.00	51	2.10	54						
4	1.70	41	1.95	49	1.85	46						
5	1.70	41	1.95	49	1.80	44						
6	1.75	42	1.90	48	1.50	35						
7	1.75	42	2.00	51	1.50	35						
8	1.70	41	2.05	53	1.50	35						
9	1.70	41	1.95	49	1.50	35						
10	1.75	42	1.85	46	1.50	35						
11	1.70	41	1.85	46	1.50	35						
12	1.70	41	1.95	49	1.50	35						
13	1.65	40	2.00	51	1.50	35						
14	1.65	40	1.95	49	1.50	35						
15	1.65	40	1.90	48	1.45	34						
16	1.70	41	1.85	46	1.40	32						
17	1.80	44	1.85	46	1.40	32						
18	1.90	48	1.85	46	1.40	32						
19	1.95	49	1.75	42	1.40	32						
20	1.95	49	1.55	36	1.40	32						
21	2.00	51	1.55	36	1.40	32						
22	2.05	53	2.00	51	1.40	32						
23	2.10	54	2.00	51	1.40	32						
24	2.05	53	2.00	51	1.35	30						
25	2.00	51	2.00	51	1.35	30						
26	1.90	48	2.00	51	1.35	30						
27	1.85	46	1.90	48	1.35	30						
28	1.90	48	1.90	48	1.35	30						
29	1.95	49	2.00	51	1.35	30						
30	1.95	49	1.95	49	1.40	32						
31	2.00	51	1.90	48								
Total.		1400		1442		1051						
Mean		45.2		48.1		35.0						
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		2,780		2,960		2,080						
Maximum		54		53		54						
Minimum		40		36		30						
Accuracy		A		A		A						

436

Year period

Gage ht. copied by E.S.F. Dist. Div.

Gage ht. checked from obs. book

Discharge computed by C.A.B. Gage ht. copied by C.A.B.

Discharge checked by P.V.H. Gage ht. checked by C.A.B.

U. S. GOVERNMENT PRINTING OFFICE: 1914

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH.]

Daily gage height, in feet, and discharge, in second-feet, of E.F.K. IRRIGATION CANAL near MT. HOOD, ORE. for 1913-14

Drainage area ..... square miles. (E. H. Gordon, observer.)

436

Day	OCT Gage height	OCT Discharge	NOV Gage height	NOV Discharge	DEC Gage height	DEC Discharge	JAN Gage height	JAN Discharge	FEB Gage height	FEB Discharge	MAR Gage height	MAR Discharge
1	1.40	32	1.20	26	1.15	24						
2	1.40	32	.90	18	1.15	24						
3	1.40	32	.90	18	1.15	24						
4	1.35	30	.90	18	1.15	24						
5	1.35	30	1.15	24	1.15	24						
6	1.30	29	1.00	20	1.15	24						
7	1.30	29	1.30	29	1.15	24						
8	.60	11	1.20	26	1.15	24						
9	.40	7	1.30	29	1.15	24						
10	.40	7	1.20	26	1.15	24						
11	.40	7	1.20	26	1.15	24						
12	.40	7	1.15	24	1.10	23						
13	.45	8	1.15	24	1.10	23						
14	.70	13	1.15	24	1.10	23						
15	.90	18		0	1.10	23						
16	.90	18	1.15	24	1.10	23						
17	1.00	20	1.15	24	1.10	23						
18	1.00	20	1.15	24	1.10	23						
19	1.00	20	1.15	24	1.10	23						
20	1.00	20	1.15	24	1.05	22						
21	1.00	20	1.15	24	1.05	22						
22	1.00	20	1.25	28	1.05	22						
23	1.00	20	1.35	30	1.05	22						
24	1.00	20	1.30	29	.50	9.						
25	1.05	22	1.30	29	.50	9.						
26	1.00	20	1.20	26	.50	9.						
27	1.00	20	1.20	26	.50	9.						
28	1.00	20	1.20	26	.50	9.						
29	1.00	20	1.20	26	.50	9.						
30	1.00	20	1.20	26	.50	9.						
31	1.20	26			.50	9.						
Total		618		722		608						
Mean		19.9		24.1		19.6		0		0		0
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		1,220		1,430		1,210		0		0		0
Maximum		32		30		24						
Minimum		7		0		9						
Accuracy		A		A		A						

U. S. GOVERNMENT PRINTING OFFICE: 1914

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH.]

Daily gage height, in feet, and discharge, in second-feet, of E.F.K. IRRIGATION CANAL near MT. HOOD, ORE. for 1913-14

Drainage area ..... square miles. (E. H. Gordon, observer.)

436

Day	APR Gage height	APR Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG Gage height	AUG Discharge	SEPT. Gage height	SEPT. Discharge	Day
1				0	1.65	40	1.70	41	2.7	76	2.2	58	1
2			1.30	29	1.70	41	1.70	41	2.7	76	2.2	58	2
3			1.20	26	1.70	41	1.80	44	2.6	72	2.2	58	3
4			1.20	26	1.65	40	1.75	42	2.6	72	2.2	58	4
5			1.20	26	1.60	38	1.80	44		0	2.2	58	5
6			1.20	26	1.60	38	1.70	41	1.6	38	2.2	58	6
7			1.20	26	1.60	38	1.80	44	2.4	65	2.2	58	7
8			1.20	26	1.60	38	2.00	51	2.4	65	2.2	58	8
9			1.20	26	1.60	38	2.2	58	2.5	68	2.2	58	9
10			1.20	26	1.70	41	2.2	58	2.6	68	2.2	58	10
11			1.20	26	1.70	41	2.2	58	2.5	68	2.0	51	11
12			1.20	26	1.80	44	2.3	62		0	1.85	46	12
13			1.25	28	1.80	44	2.4	65		0	1.80	44	13
14			1.30	29	1.80	44	2.4	65	2.5	68	1.80	44	14
15			1.30	29	1.80	44	2.4	65	2.5	68	1.75	42	15
16			1.30	29	1.80	44	2.4	65	2.4	65	1.35	30	16
17			1.30	29	1.80	44	2.4	65	2.4	65	1.20	26	17
18			1.30	29	1.90	48	2.5	68	2.3	62	1.15	24	18
19			1.30	29	1.90	48	2.6	72	2.2	58	1.15	24	19
20			1.30	29	1.90	48	2.5	68	2.2	58	1.10	23	20
21			.65	12	1.80	44	2.4	65	2.2	58	1.05	22	21
22			1.70	41	1.75	42	2.4	65	2.2	58	1.00	20	22
23				0	1.75	42	2.4	65	2.2	58	1.00	20	23
24			1.60	38	1.90	48	2.4	65	2.2	58	1.00	20	24
25			1.65	40	1.80	44	2.6	72	2.2	58	1.00	20	25
26	.020	3	1.60	38	1.80	44	2.6	72	2.2	58	1.00	20	26
27		0	1.60	38	1.80	44	2.6	72	2.2	58	1.05	22	27
28		0	1.60	38	1.80	44	2.6	72	2.2	58	1.00	20	28
29		0	1.60	38	1.80	44	2.6	72	2.2	58	1.00	20	29
30	.80	16	1.60	38	1.70	41	2.6	72	2.2	58	1.00	20	30
31			1.60	38			2.6	72	2.2	58			31
Total		19		879		1279		1881		1750		1138	Year record
Mean		.6		28.4		42.6		60.7		56.5		37.9	24.4
Sec.-ft. per square mile													
Run-off, depth in inches													
Run-off in acre-feet		36		1,750		2,530		3,730		3,470		2,260	17,600
Maximum		16		41		48		72		76		68	76
Minimum		0		0		38		41		0		20	0
Accuracy		A		A		A		A		A		A	

Gage ht. checked from obs. book. Dist. Eng.

Computed by C.H.J. Discharge applied by C.H.J. Gage ht. copied by C.H.J.

Checked by P.V.H. Discharge checked by C.H.J. Gage ht. checked by P.V.H.

9—192-a Feb. 1914

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of E. Fork Irrigation Canal River at / Creek near At Mount Hood, Ore. for the year ending Sept. 30, 1915

Drainage area ____ square miles

OLD STATE GAGE

J.A. Robertson, observer. 1915

Gage read to ____ once / twice a day Angus McDonald

East Fork Irrigation Canal

Mt. Hood, Ore.

436

File Number { Washington / District ____ ft. sec.

Table of rates: Hall's ____ Used rating table dated ____

Day	OCT. Gage height	OCT. Discharge.	NOV. Gage height.	NOV. Discharge.	DEC. Gage height.	DEC. Discharge.	JAN. Gage height.	JAN. Discharge.	FEB. Gage height.	FEB. Discharge.	MAR. Gage height.	MAR. Discharge.	APR. Gage height.	APR. Discharge.	MAY Gage height.	MAY Discharge.	JUNE Gage height.	JUNE Discharge.	JULY Gage height.	JULY Discharge.	AUG. Gage height.	AUG. Discharge.	SEPT. Gage height.	SEPT. Discharge.	Day
1	1.00	20																			2.44	71		77	1
2	1.00	20																			1.92	42		76	2
3	1.00	20																			2.60	82		75	3
4	1.05	22																			2.64	85		74	4
5	1.05	22																			2.66	86		73	5
6	1.05	22																			2.68	88		72	6
7	1.05	22																			2.75	92		71	7
8	1.05	22																			2.76	93	2.42	70	8
9	1.05	22																			2.77	94	2.36	63	9
10	1.10	23																			2.80	96	2.26	61	10
11	1.10	23																			2.79	95	2.26	61	11
12	1.05	22																			2.78	95	2.26	61	12
13	1.05	22																			2.79	95	2.21	58	13
14	1.10	23																			2.82	98	1.86	38	14
15	1.10	23																			2.81	97	1.85	38	15
16	1.10	23																			2.80	96	1.87	40	16
17	1.10	23																			2.56	79	1.89	40	17
18	1.10	23																			2.74	92	1.90	41	18
19	1.05	22																			2.76	92	1.92	42	19
20	1.05	22																			2.78	93	1.96	44	20
21	.70	13																	2.60	82	2.78	95	1.90	41	21
22	.40	7.0																	2.59	81	2.79	95	1.78	35	22
23	.70	13																	2.54	78	2.80	96	1.79	36	23
24	.20	3.0																	2.26	57	2.78	95	1.77	35	24
25	.30	5.0																	2.52	76	2.77	94	1.77	35	25
26	.70	13																	2.57	80	2.77	94	1.77	35	26
27		0																	2.60	82	2.77	93	1.78	35	27
28		0																	2.60	82	2.78	91	1.79	35	28
29		0																	2.62	83	2.68	88	1.78	36	29
30		0																	2.60	82	2.65	86	1.78	35	30
31		0																	2.62	83	2.62	77			31
Total.		495.																866		2768		1533			Year ended
Mean		16.0																787		893		511		718	
Sec.-ft. per square mile.																									
Run-off, depth in inches.																									
Second-feet.																		1720		5490		3040		10,200	
Maximum		23																83		98		77		98	
Minimum		0																57		42		35		35	
REMARKS																		A		A		A			

Note—

CAB

CAB

PYK

CAB

PYK

9-172-a

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

File Number: Washington District 436

Daily gage height, in feet, and discharge, in second-feet, of EAST FORK IRRIGATION CANAL (River—at Creek—near) MOUNT HOOD, OREG. for the year ending Sept. 30, 1916

Drainage area ____ square miles. (U. S. Engineer, observer.)

Gage read to Stevens 8 day (Inches or tenths)

Table of rise: Half tenths. 2.00 ft. to ____ ft.

Used rating table dated (Explain by Cert. used Oct 6 1915 Sept 30 1916 Cert used Oct 6 1915)

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1	1.79	36		31								
2	1.80	36		31								
3	1.79	36		31								
4	1.79	36		30								
5	1.78	35		30								
6	1.78	35		30								
7	1.76	34	1.65	30								
8	1.74	34	1.66	30								
9	1.74	34	1.66	30								
10	1.74	34	1.66	30								
11	1.74	34	1.66	30								
12	1.74	34	1.66	30								
13	1.74	34	1.67	31								
14	1.75	34	1.68	31								
15	1.74	34	1.70	32								
16	1.74	34	1.70	32								
17	1.73	33	1.70	32								
18	1.73	33	1.70	32								
19	1.72	33	1.70	32								
20	1.72	33	1.70	32								
21		33	1.70	32								
22		33		0								
23		32		0								
24	1.71	32										
25	1.72	33										
26	1.71	32										
27	1.70	32										
28	1.69	32										
29	1.69	32										
30	1.69	32										
31	1.68	31										
Totals		1040		649								
Mean		33.5		21.6	0		0		0		0	
Sec.-ft. per square mile												
Runoff, depth in inches												
Runoff in acre-feet		2060		1290	0		0		0		0	
Maximum		36		32	—		—		—		—	
Minimum		31		0	—		—		—		—	
Accuracy		B		B								

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1							2.23	56	3.03	108	3.08	112
2							2.02	45	3.04	109	2.97	101
3							1.86	37	3.06	111	2.88	98
4							1.88	38	3.04	109	2.80	92
5							1.95	43	3.03	108	2.77	90
6							1.97	42	3.05	112	2.73	87
7							1.98	43	3.07	112	2.72	86
8							2.13	50	3.11	115	2.72	87
9							2.19	54	3.06	111	2.66	82
10							2.18	53	3.02	108	2.61	79
11					2.51	73	2.38	65	3.03	108	2.60	78
12					2.55	75	2.43	68	3.03	108	2.59	77
13					2.58	77	2.66	76	3.00	106	2.61	78
14					2.57	77	2.63	80	3.04	109	2.74	62
15					2.60	78	2.67	79	3.06	111	2.57	58
16					2.62	79	2.36	64	3.04	109	2.26	58
17					2.71	86	2.53	74	3.00	106	2.26	58
18					2.82	93	2.69	77	2.92	100	2.26	58
19					2.75	88	2.57	76	2.90	99	2.26	58
20					2.63	82	2.68	84	2.97	104	2.28	59
21					2.30	60	2.78	91	2.95	104	2.21	59
22					1.95	92	2.81	93	3.01	107	2.28	59
23					2.71	86	2.72	86	3.04	109	2.27	58
24					2.66	82	2.30	60	3.07	112	2.25	57
25					2.60	78	2.83	98	3.08	112	2.24	56
26					2.40	66	2.97	97	3.07	112	2.22	55
27					2.35	63	2.98	106	3.04	109	2.24	56
28					2.26	58	3.07	112	3.06	111	2.22	55
29					2.25	57	3.09	113	3.07	112	2.22	55
30					2.35	57	3.11	115	3.06	111	2.22	55
31							3.10	114	3.05	112		
Totals				516		1667		2284		3374		2121
Mean		0		16.6		55.6		73.7		109		70.7
Sec.-ft. per square mile												
Runoff, depth in inches												
Runoff in acre-feet		0		1010		3310		4530		6,700		4210
Maximum		—		—		93		115		115		112
Minimum		—		—		—		37		99		55
Accuracy				D		D		A		A		A

Year 1916 — 23110 — 115 — 0

Max. 3.15 on July 30 and Aug. 5

Note: Gage read by observer Nov. 1st

9-192-a

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of EAST FORK IRRI. DIST. CANAL near MT. HOOD, ORE. for the year ending Sept. 30, 1917

Drainage area ____ square miles. (F. A. McDONALD, observer.) Gage read to Stevens Roby.

Table of rates: Hall truths. Used rating table dated ____

File Number: 1916 Oct. 1st 436

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge	Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge	Day
1	2.20	54											1			1.29	13	1.75	30	3.09	120	3.16	129	3.07	116	1
2	2.19	54											2			1.27	12	1.81	31	3.08	120	3.18	129	2.98	110	2
3	2.18	53											3			1.39	16	1.78	32	3.09	120	3.20	129	2.98	110	3
4	1.96	42											4			1.40	16	1.77	32	3.10	120	3.12	120	2.91	105	4
5	1.68	30											5			1.40	16	1.93	90	3.10	120	3.12	120	2.88	102	5
6	1.68	30											6			1.41	16	2.10	48	3.05	116	3.11	120	2.88	102	6
7	1.68	30											7			1.42	17	2.40	67	3.07	116	3.07	116	2.85	98	7
8	1.68	30											8			1.43	17	2.62	82	3.12	120	3.10	120	2.81	97	8
9	1.68	30											9			1.42	17	2.63	83	3.08	120	3.13	124	2.82	98	9
10	1.68	30											10			1.41	16	2.59	77	3.07	116	3.09	120	2.56	78	10
11	1.68	30											11			1.44	17	2.56	78	3.11	120	3.08	120	2.36	64	11
12	1.69	31											12			1.49	20	2.62	82	3.11	120	3.12	120	2.18	53	12
13	1.69	31											13			1.48	19	2.66	85	3.08	120	3.17	124	2.11	49	13
14	1.69	31											14			1.56	22	2.78	92	3.13	124	3.17	124	2.13	50	14
15		0											15			1.65	26	2.82	98	3.22	129	3.16	124	2.08	47	15
16		0											16	1.17	9	1.65	26	2.90	104	3.30	138	3.20	129	2.00	43	16
17		10											17	1.17	9	1.65	26	2.91	105	3.33	143	3.19	129	1.90	38	17
18	1.12	12											18	1.17	9	1.65	26	2.89	103	3.28	138	3.15	124	1.87	36	18
19	1.13	12											19	1.22	11	1.65	26	2.90	104	3.25	134	3.13	124	1.87	36	19
20	1.18	13											20	1.19	10	1.60	24	2.88	102	3.25	134	3.17	124	1.86	36	20
21	1.24	15											21	1.23	11	1.62	25	2.90	104	3.22	129	3.20	129	1.85	36	21
22	1.24	16											22	1.27	12	1.66	26	2.65	84	3.20	129	3.13	124	1.82	34	22
23	1.36	19											23	1.27	12	1.67	27	2.81	97	3.20	129	3.13	124	1.83	34	23
24	1.42	21											24	1.28	12	1.67	27	2.94	107	3.20	129	3.15	124	1.82	34	24
25	1.44	21											25	1.29	13	1.67	27	3.07	116	3.20	129	3.12	120	1.84	35	25
26	1.46	22											26	1.30	13	1.67	27	3.07	116	3.25	134	3.08	120	1.83	34	26
27	1.45	22											27	1.30	13	0.68	0	3.07	116	3.26	134	3.07	116	1.82	34	27
28	1.42	21											28	1.29	13	1.08	7	3.10	120	3.20	129	3.10	120	1.82	34	28
29	water off 9AM	8											29	1.30	13	1.63	22	3.11	120		124	3.08	120	1.82	34	29
30													30	1.30	13	1.62	25	3.07	116	3.12	120	3.10	120	2.22	55	30
31													31			1.69	28			3.07	116	3.10	120			31
TOTAL		717													173		629		2,571		3,890		3,806		1,932	
Mean		266													11.5		21.0		85.7		125		123		61.1	
Sec.-ft. per square mile	27 days													1 day		1 day										
Run-off, depth in inches																										
Run-off in acre-feet		1420													342		1,250		5,100		7,690		7,560		3840	27,000
Maximum		54												5	13	30	28		120		143		129		116		
Minimum		8													9		7		30		116		116		34		
Accuracy																										

NOTE:

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH]

Daily gage height, in feet, and discharge, in second-feet, of E. Fork Hood River at Mt. Hood Oreg. for 1913

Drainage area ..... square miles. (E. H. Gordon, observer.)

435

Day	JANUARY. Gage height.	JANUARY. Discharge.	FEBRUARY Gage height.	FEBRUARY Discharge.	MARCH Gage height.	MARCH Discharge.	APRIL Gage height.	APRIL Discharge.	MAY Gage height.	MAY Discharge.	JUNE Gage height.	JUNE Discharge.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17											6.00	428
18											6.10	478
19											6.15	503
20											6.10	478
21											6.20	528
22											6.65	762
23											6.60	734
24											6.40	628
25											6.20	528
26											6.15	503
27											6.10	478
28											6.10	478
29											6.10	478
30											6.15	503
31												
Total												7507
Mean												536
Sec.-ft. per square mile												
Runoff, depth in inches												
Runoff in acre feet												14,900
Maximum												762
Minimum												428
Accuracy												B

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH]

Daily gage height, in feet, and discharge, in second-feet, of E. Fork Hood River at Mt. Hood Oreg. for 1913

Drainage area ..... square miles. (E. H. Gordon, observer.)

435

Day	JULY Gage height.	JULY Discharge.	AUGUST Gage height.	AUGUST Discharge.	SEPTEMBER Gage height.	SEPTEMBER Discharge.	OCTOBER Gage height.	OCTOBER Discharge.	NOVEMBER Gage height.	NOVEMBER Discharge.	DECEMBER Gage height.	DECEMBER Discharge.	Day
1	6.10	478	5.60	256	5.25	146							1
2	6.00	428	5.60	256	5.20	133							2
3	6.00	428	5.60	256	5.60	256							3
4	6.00	428	5.60	256	5.70	294							4
5	6.05	453	5.60	256	5.60	256							5
6	6.10	478	5.50	222	5.40	190							6
7	6.10	478	5.65	275	5.40	190							7
8	6.10	478	5.70	294	5.35	175							8
9	6.05	453	5.60	256	5.30	160							9
10	6.15	503	5.40	190	5.30	160							10
11	6.05	453	5.50	222	5.30	160							11
12	5.90	380	5.45	206	5.30	160							12
13	5.85	358	5.40	190	5.35	175							13
14	5.75	316	5.35	175	5.35	175							14
15	5.70	294	5.40	190	5.80	133							15
16	5.70	294	5.30	160	5.20	133							16
17	5.70	294	5.30	160	5.20	133							17
18	5.85	358	5.30	160	5.25	146							18
19	5.80	336	5.30	160	5.30	160							19
20	5.90	380	5.25	146	5.30	160							20
21	5.85	358	5.40	190	5.25	146							21
22	5.90	380	5.50	222	5.30	160							22
23	6.10	478	5.40	190	5.30	160							23
24	6.05	453	5.40	190	5.25	146							24
25	5.80	336	5.40	190	5.20	133							25
26	5.70	294	5.40	190	5.20	133							26
27	5.70	294	5.35	175	5.20	133							27
28	5.70	294	5.35	175	5.20	133							28
29	5.60	256	5.35	175	5.20	133							29
30	5.55	239	5.30	160	5.25	146							30
31	5.60	256	5.30	160									31
Total		11706		6303		4918							
Mean		378		203		164							
Sec.-ft. per square mile													
Runoff, depth in inches													
Runoff in acre feet		23,200		12,500		9760							60,400
Maximum		503		294		294							
Minimum		239		146		133							
Accuracy		B		B		B							

Gage ht. adjusted for ice effect. [illegible]

Discharge applied by CAB. Gage ht. adjusted by E.H.T.

Discharge checked by C.E.S. Gage ht. checked by [illegible]

Gage ht. checked from obs. book.

Compiled by CAB. Discharge checked by P.V.H.

9—192-a Oct. 1914 DEPARTMENT OF THE INTERIOR UNITED STATES GE

Daily gage height, in feet, and discharge, in second-feet, of EAST FORK OF HOOD RIVER for 1915 River at Creek near

434 Drainage area ..... square miles. [J. A. Robertson, observer.]

Day.	OCT.		NOV.		DEC.		JAN.		FEB.		MAR.	
	Gage height	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	5.45	193	5.45	193								
2	5.45	193	5.45	193								
3	5.50	208	5.45	193								
4	5.40	178	5.45	193								
5	5.30	151	5.40	178								
6	5.25	139	5.45	193								
7	5.25	139	5.45	193								
8	5.30	151	5.45	193								
9	5.35	164	5.40	178								
10	5.40	178	5.45	193								
11	5.35	164	5.50	208								
12	5.35	164	5.55	224								
13	5.25	139	5.55	224								
14	5.30	151	5.50	208								
15	5.30	151										
16	5.35	164										
17	5.40	178										
18	5.40	178										
19	5.35	164										
20	5.35	164										
21	5.30	151										
22	5.30	151										
23	5.30	151										
24	5.40	178										
25	5.40	178										
26	5.45	193										
27	5.50	208										
28	5.45	193										
29	5.50	208										
30	5.50	208										
31	5.50	208										
TOTAL		5,338		2,764								
Mean		172		197								
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		10,600	14 DAYS	5,480								
Maximum		208		224								
Minimum		139		178								
Accuracy		B.		B.								

NOTE.— Table of use: Half tenths 5.5 ft to 7 oft. Feb. 4, 1915.

9—212b

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
WATER-RESOURCES BRANCH

File No. Washington... Field 435

Daily ~~gage height, in feet,~~ discharge, in second feet of EAST FORK OF HOOD RIVER ABOVE INTAKE NEAR MT HOOD, ORE. for the year ending Sept. 30, 1915

DAY.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.
1												
2											156	142
3											169	138
4											165	142
5											156	145
6											161	143
7											169	136
8											163	132
9											158	132
10											160	132
11											165	136
12											160	133
13											156	135
14											152	132
15											151	128
16											151	125
17											160	133
18											156	132
19											152	133
20											156	132
21											160	132
22											161	133
23									167	165	132	
24									165	165	127	
25									165	163	122	
26									161	156	125	
27									158	156	124	
28									152	151	121	
29									151	156	122	
30									149	163	125	
31									142	180	128	
									149	161		
Mean									156	160	127	
Acre-feet									3,090	9840	7560	
Max.									167	180	145	
Min.									142	151	121	

April, 1915

9-102-a Oct. 1914

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of EAST FORK OF HOOD River at MOUNT HOOD, ORE. for the year ending Sept. 30, 1916.

Drainage area ____ square miles

(Measurements by J.M. Hopping and F.A. McDonald)

Gage read to Stevens & Gay Tape & Any

File Number { Washington / District 235

Table of rat: Hale scale

Used rating table dated [illegible]

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge	Day	APR. Gage height	APR. Discharge	MAY. Gage height	MAY. Discharge	JUNE. Gage height	JUNE. Discharge	JULY. Gage height	JULY. Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge	Day
1	1.42	143	1.44	145	1.75	205	–	220	[illegible]	158	1.86	230	1	2.56	436	2.62	457	2.87	840		583	2.31	371		347	1
2	1.47	151	1.39	136	1.76	207	1.80	216		159	1.82	221	2	2.56	436	2.73	497	2.58	443	2.87	554	2.33	359		346	2
3	1.38	138	1.42	142	1.76	207	–	210		161	1.81	218	3	2.57	440	2.88	557	2.64	471	2.87	503		352	1.87	345	3
4	1.27	121	1.51	158	2.20	320	–	204		163	1.78	212	4	2.57	440	3.06	629	2.87	533		558		349		348	4
5	1.29	119	1.39	136	2.19	317	–	198		164	1.76	207	5	2.52	428	3.14	662	2.91	529		543		336		332	5
6	1.28	119	1.30	122	2.15	311	–	198	1.55	165	1.77	209	6	2.49	412	3.15	668	2.84	541		567	2.32	329		324	6
7	1.30	122	1.28	119	2.17	317	–	186		335	1.75	205	7	2.51	418	2.98	597	2.73	577		571	2.31	327		330	7
8	1.32	125	1.31	124		292		188		326	2.46	220	8	2.58	443	2.84	549	2.62	613		576	2.28	345		327	8
9	1.32	125	1.32	126		268	1.60	174		317	2.36	368	9	2.63	460	2.75	508	2.77	593	2.77	581	2.27	342		323	9
10	1.31	124	1.32	125		243	1.60	174		307	2.54	429	10	2.76	485	2.92	657	2.89	561	2.70	565	2.23	332	1.75	319	10
11	1.28	119	1.29	121		219		174		297	2.59	446	11	2.68	478	2.52	422	2.86	549	2.82	577	2.25	337	1.75	319	11
12	1.27	118	1.24	114	1.70	194	–	176		287	2.62	457	12	2.67	470	2.48	408	2.88	557	3.06	624	2.24	334	1.79	323	12
13	1.35	130		118	1.69	192	–	174	2.04	275	2.65	432	13	2.65	432	2.42	387	2.94	631	3.02	613	2.22	329	1.79	323	13
14	1.37	133	1.30	124		184	–	174	2.17	311	2.40	380	14	2.65	468	2.38	374	3.06	649	2.87	583		319	1.75	314	14
15	1.30	122	1.46	149	1.61	176	–	174	2.31	353	2.31	353	15	2.66	471	2.39	377	2.53	789		606		309	1.76	321	15
16	1.28	119	1.43	148	1.62	178	1.60	174	2.51	418	2.27	341	16	2.63	460	2.42	387	3.26	816	3.13	658		299	1.76	321	16
17	1.28	119	2.08	306	1.59	178	1.60	174	2.58	443	2.30	350	17	2.64	464	2.47	404	3.25	805	2.70	565		289	1.75	319	17
18	1.27	118	2.19	317	1.57	169	1.60	174	2.51	418	2.24	362	18	2.58	443	2.52	422	3.16	780	2.74	581		279	1.75	319	18
19	1.28	119	2.30	350	1.56	167	1.61	176	2.44	384	2.60	418	19	2.61	418	2.53	426	3.52	840	2.68	478		269	1.79	319	19
20		120		296	1.57	169	1.62	178	2.30	350	2.92	573	20	2.48	408	2.57	440	3.16	678		474	1.93	259	1.93	316	20
21		121	1.91	242	2.29	611	1.61	176	2.43	328	2.70	665	21	2.49	412	2.62	457	2.91	573		469		258	1.72	315	21
22		121	1.84	235	3.43	808	1.95	252	2.46	308	2.90	526	22	2.43	390	2.54	436	2.53	537		460		257	1.73	315	22
23		122	2.21	328	2.63	460	1.90	240	2.11	293	2.62	457	23	2.41	384	2.59	418	2.37	583	2.81	460		256	1.70	308	23
24	1.35	130	1.81	218	2.40	380	–	228	2.06	280	2.61	418	24	2.46	401	2.59	415	2.81	587	2.58	448		255	1.69	308	24
25	1.49	164	2.13	299		322	–	216	2.03	272	2.54	638	25	2.55	432	2.55	432	3.04	621		432		254	1.65	198	25
26	1.37	133	1.87	233	2.00	266	–	249	1.99	262	2.80	605	26	2.62	457	2.55	432	3.26	711		420		253	1.67	202	26
27	1.31	124		210	1.96	255	–	192	1.95	252	2.88	557	27	2.69	482	2.61	454		670		408		254	1.71	210	27
28	1.29	121	1.66	186	1.92	251	–	186	1.90	240	2.72	493	28	2.62	457	2.63	460		648		397		251	1.68	206	28
29	1.28	119	1.75	205	1.88	226	–	168	1.88	235	2.60	480	29	2.56	436	2.57	440		634		385		250	1.66	202	29
30	1.29	118	1.76	207	–	230	1.50	156			2.53	426	30	2.52	422	2.53	426		610	2.38	374		249	1.66	200	30
31	1.69	172			–	226		153			2.53	422	31			2.53	426			2.40	320		249			31
Total		3936		5726		8559		5869		8262		12139			13847		14415		18686		15860		9295		6095	Total
Mean		127		191		276		189		295		392			438		465		622		515		290		220	Mean
Max. [illegible]																										
Min. [illegible]																										
Run-off [illegible]		7810		11400		17000		11600		16400		24100			26100		28600		37000		31700		18300		13100	
Maximum		172		350		808		252		443		605			488		668		950		698		321		247	
Minimum		118		114		167		156		158		209			384		374		840		374		246		200	
Accuracy		B		B		B		C		B		B			B		B		B		B		C		B	

Note: Daily gage height, in feet, and discharge, in second-feet, of East Fork of Hood River at Mount Hood, Ore., for the year ending Sept. 30, 1916.

9—192-a Oct. 1914 DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGICAL SURVEY WATER RESOURCES BRANCH

File Number Washington 12[illegible]

Daily gage height, in feet, and discharge, in second-feet, of EAST FORK OF HOOD River at or near MT. HOOD ORE for the year ending Sept. 30, 1917.

Drainage area ____ square miles. (____, whether ____)

Gage read to ____ once a day

Table of use: Half truths ____ ft. to ____ ft.

Used rating table dated ____

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1	1.60	188	1.51	174	1.51	174	1.39	150	1.37	148	1.34	143
2	1.57	182	1.56	184	1.52	176	1.48	168	1.43	158	1.38	149
3	1.56	181	1.57	186	1.60	192	1.49	170	1.51	174	1.30	137
4	1.54	177	1.68	210	1.55	182	1.51	174	1.49	170	1.40	152
5	1.53	175	1.54	180	1.53	178	1.65	203	1.48	168	1.43	158
6	1.53	175	1.53	178	1.49	170	1.50	172	1.47	166	1.34	143
7	1.52	174	1.50	172	1.48	168	1.46	164	1.46	164	1.34	143
8	1.49	168	1.50	172	1.49	170	1.44	160	1.45	162	1.33	142
9	1.48	165	1.62	196	1.45	162	1.43	158	1.44	160	1.32	140
10	1.49	168	1.56	184	1.44	160	1.42	156	1.43	158	1.30	137
11	1.51	172	1.46	164	1.44	160	1.41	154	1.43	158	1.30	137
12	1.52	174	1.37	148	1.47	166	1.40	152	1.44	160	1.29	136
13	1.53	175	1.37	148	1.46	164	1.39	150	1.43	158	1.28	136
14	1.55	179	1.40	152	1.42	156	1.36	146	1.42	156	1.27	132
15	1.56	181	1.42	156	1.40	152	1.34	143	1.44	160	1.27	132
16	1.60	188	1.43	158	1.45	162	1.29	136	1.62	196	1.26	131
17	1.60	190	1.48	168	1.41	154	1.29	136	1.50	172	1.27	132
18	1.58	184	1.46	164	1.43	158	1.31	138	1.49	170	1.29	136
19	1.56	181	1.43	158	1.44	160	1.35	144	1.47	166	1.30	137
20	1.56	181	1.41	154	1.43	158	1.35	144	1.45	162	1.31	138
21	1.55	179	1.42	156	1.44	160	1.35	144	1.43	158	1.31	138
22	1.52	174	1.44	160	1.41	154	1.32	140	1.42	156	1.31	138
23	1.49	168	1.43	158	1.41	154	1.31	138	1.41	154	1.36	146
24	1.49	168	1.42	156	1.40	152	1.31	138	1.40	152	1.41	154
25	1.49	168	1.61	194	1.39	150	1.32	140	1.38	149	1.36	146
26	1.48	168	1.53	178	1.37	148	1.32	140	1.38	149	1.34	143
27	1.50	172	1.92	265	1.35	144	1.44	160	1.36	146	1.50	172
28	1.45	162	1.64	201	1.35	144	1.39	150	1.35	144	1.63	199
29	1.52	176	1.55	182	1.35	144	1.36	146			1.78	232
30	1.54	180	1.53	178	1.34	143	1.35	144			1.62	196
31	1.64	201			1.35	144	1.35	146			1.54	180
TOTAL		5,476		5234		4959		4,709		4,494		4,635
Mean		177		174		160		152		160		150
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		10,900		10,400		9840		9,350		8,890		9,220
Maximum		201		268		192		203		196		232
Minimum		162		148		143		136		144		131
Accuracy												

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	1.54	180	2.04	294	2.79	540	2.72	505	2.07	302	1.63	199
2	1.53	178	2.06	297	2.72	505	2.85	560	2.06	300	1.65	202
3	1.49	170	2.06	300	2.62	470	2.92	580	2.11	313	1.63	199
4	1.55	182	2.06	297	2.54	452	2.96	600	2.03	292	1.61	194
5	1.74	223	2.07	302	2.51	452	2.92	580	1.99	282	1.61	194
6	1.74	223	2.26	358	2.67	488	2.85	560	1.97	277	1.59	190
7	1.96	274	2.46	421	2.82	540	2.79	540	1.93	267	1.56	184
8	1.96	274	2.56	452	3.00	620	2.80	540	1.90	260	1.58	188
9	1.87	253	2.77	522	3.08	660	2.84	560	1.92	265	1.58	188
10	1.84	246	2.81	540	2.89	580	2.81	540	1.89	258	1.62	196
11	1.88	255	2.90	580	2.72	505	2.86	560	1.94	270	1.59	190
12	1.82	241	2.87	560	2.63	488	2.83	560	1.94	270	1.56	184
13	1.78	232	2.82	540	2.66	488	2.73	522	1.96	274	1.52	176
14	1.76	227	2.78	540	2.81	540	2.71	505	1.93	272	1.50	172
15	1.73	221	2.68	505	2.98	620	2.80	540	1.91	262	1.62	196
16	1.69	212	2.56	452	3.10	660	2.85	560	1.90	260	1.71	216
17	1.65	203	2.49	432		643	2.86	560	1.87	253	1.70	214
18	1.63	199	2.42	407		626	2.84	560	1.90	260	1.70	214
19	1.64	201	2.40	400		608	2.80	540	1.87	253	1.68	210
20	1.71	216	2.39	397		591	2.72	505	1.87	253	1.68	210
21	1.73	221	2.40	400		574	2.57	452	1.92	265	1.65	203
22	1.74	223	2.41	404		557	2.44	414	1.91	262	1.58	188
23	1.87	353	2.45	418	2.80	540	2.32	376	1.82	241	1.47	166
24	1.84	270	2.46	421		535	2.22	346	1.82	241	1.49	170
25	2.23	349	2.41	404		530	2.18	334	1.86	250	1.44	160
26	2.34	382	2.49	432		525	2.27	361	1.79	234	1.52	176
27	2.29	367	2.62	470		520	2.27	361	1.77	229	1.54	180
28	2.22	346	2.76	522		515	2.18	334	1.68	210	1.53	178
29	2.17	331	2.86	560		510	2.07	302	1.68	210	1.58	188
30	2.10	310	2.84	560	2.72	505	2.03	292	1.69	212	1.54	180
31			2.80	540			2.04	294	1.68	210		
TOTAL		7,562		13,727		16,387		14,845		8,007		5,706
Mean		252		443		546		479		258		190
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		15,000		27,200		32,500		29,500		15,900		11,300
Maximum		382		580		660		600		313		216
Minimum		170		294		462		292		210		160
Accuracy												

Year (calendar) 1916: 190,000 / 460 / 131

Year (water) 1917: 95,734 / 2.62

Note.

Oct. 8 1915 — 1-5-10 — Oct. 8 — Dec. 8 — 1-4-10 — Jan. 4. 1918 — Dec. 8 — Dec. 8 — Dec. 8

OLOGICAL SURVEY

CE, ORE.

East Fork Hood at Dee, Ore.

WATER RESOURCES BRANCH

for the year ending Sept. 30, 1917

File Number: Washington / Division 3 / 31

Table of use: ~~Hall-Smith as recorded~~

Gage read to ... once a day

Used rating table dated 1/14/15

Day	APR. Gage height.	APR. Discharge.	MAY Gage height.	MAY Discharge.	JUNE Gage height.	JUNE Discharge.	JULY Gage height.	JULY Discharge.	AUG. Gage height.	AUG. Discharge.	SEPT. Gage height.	SEPT. Discharge.	Day.
1							1.86	446	1.34	201			1
2							1.92	482	1.33	197			2
3							1.96	506	1.35	204			3
4							1.97	512	1.33	197			4
5							1.96	506	1.29	185			5
6							1.92	482	1.28	180			6
7							1.88	458	1.25	170			7
8							1.87	452	1.14	137			8
9							1.92	482	1.14	137			9
10							1.87	452	1.16	143			10
11							1.89	458	1.17	146			11
12							1.87	452	1.19	151			12
13							1.83	428	1.18	148			13
14							1.79	405	1.16	143			14
15							1.83	428	1.16	143			15
16							1.85	440	1.17	146			16
17							1.85	440	1.18	148			17
18							1.84	434	1.15	140			18
19							1.83	428	1.17	146			19
20							1.78	400	1.18	148			20
21							1.70	360	1.17	146			21
22							1.63	325	1.12	132			22
23							1.55	288	1.10	126			23
24							1.46	248	1.13	134			24
25							1.41	227					25
26					1.82	422	1.47	252					26
27					1.88	458	1.49	261					27
28					1.92	482	1.43	236					28
29					1.91	476	1.37	212					29
30					1.86	446	1.33	197					30
31							1.33	197					31
						2284		11,894		3746			
						457		384		156			
					5 days	4530		23,600	24 days	7,430			
						482		512		201			
						422		197		126			

Year period

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH.]

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Dee, Oreg. for 1913

Drainage area ..... square miles. (G. R. Ford, observer.)

Day.	JANUARY. Gage height.	JANUARY. Discharge.	FEBRUARY Gage height.	FEBRUARY Discharge.	MARCH Gage height.	MARCH Discharge.	APRIL Gage height.	APRIL Discharge.	MAY Gage height.	MAY Discharge.	JUNE Gage height.	JUNE Discharge.
1											5.64	961
2											5.98	1060
3											5.95	1040
4											5.86	974
5											5.74	896
6											5.68	858
7											5.72	885
8											5.65	840
9											5.56	786
10											5.48	738
11											5.54	774
12											5.59	804
13											5.55	798
14											5.55	798
15											5.42	702
16											5.34	654
17											5.36	666
18											5.34	654
19											5.47	732
20											5.48	738
21											5.63	828
22											6.08	1130
23											6.02	1080
24											5.77	916
25											5.58	798
26											5.45	720
27											5.34	654
28											5.28	618
29											5.39	684
30											5.46	726
31												
TOTAL											24510	
Mean											817	
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet											48,600	
Maximum											1130	
Minimum											618	
Accuracy											A	

UNITED STATES GEOLOGICAL SURVEY. [WATER RESOURCES BRANCH.]

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Dee, Oreg. for 1913

Drainage area ..... square miles. (G. R. Ford, observer.)

Day.	JULY Gage height.	JULY Discharge.	AUGUST Gage height.	AUGUST Discharge.	SEPTEMBER Gage height.	SEPTEMBER Discharge.	OCTOBER Gage height.	OCTOBER Discharge.	NOVEMBER Gage height.	NOVEMBER Discharge.	DECEMBER Gage height.	DECEMBER Discharge.
1	5.54	774	4.99	454			0					
2	5.40	690	5.18	559			0					
3	5.38	678	5.19	564			0					
4		654	5.16	548								
5	5.30	630	5.16	548								
6	5.42	702	5.15	542								
7	5.40	690	5.11	520								
8	5.34	654	5.12	526								
9	5.43	708	5.12	526								
10	5.48	738	5.13	532								
11	5.44	714	5.13	532								
12	5.32	642	5.11	520								
13	5.35	660	5.13	532								
14	5.12	526	5.10	515								
15	5.15	542	4.92	416								
16	5.40	690	4.87	390								
17	5.08	504										
18	5.12	526										
19	5.14	537										
20	5.18	559										
21	5.28	618										
22	5.26	606										
23	5.31	636										
24	5.34	654										
25	5.42	702										
26	5.30	630	5.00	480								
27	5.20	570										
28	5.20	570										
29	5.14	537										
30	5.06	493										
31	5.07	498										
TOTAL		19332										
Mean		624										
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		38400										
Maximum		774										
Minimum		493										
Accuracy		A										

Gage ht. copied by E.S.T. Discharge applied by [illegible] Dist. Engr.

Gage ht. checked from ob. book P.V.H. Discharge checked by P.V.H. Gage ht. checked by [illegible]

Computed by C.L.J. Checked by

Year period

9-196 UNITED STATES GEOLOGICAL SURVEY. (WATER RESOURCES BRANCH)

Daily gage height, in feet, and discharge, in second-feet, of ~~EAST~~ HOOD River at DEE, ORE. for 1913-14

Drainage area ..... square miles. (Harry Wirrick, observer.)

Day	JANUARY OCT		FEBRUARY NOV		MARCH DEC		APRIL JAN		MAY FEB		JUNE MAR	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	4.70	305	4.65	282	4.70	305	4.70	305	4.90	405	5.40	690
2	4.80	355	4.70	305	4.70	305	4.70	305	4.90	405	5.40	690
3	4.70	305	4.65	282	4.70	305	5.20	570	5.00	460	6.30	630
4	4.65	282	4.70	305	4.65	282	6.25	1250	5.00	460	6.35	660
5	4.60	260	4.65	282	4.60	280	5.55	780	5.00	460	5.30	630
6	4.75	330	4.65	282	4.60	260	5.80	935	5.00	460	5.30	630
7	5.70	870	4.90	405	4.55	238	5.50	750	5.00	460	6.30	630
8	4.90	405	4.90	405	4.60	260	5.20	570	5.00	460	5.30	630
9	4.80	355	4.90	405	4.60	260	5.15	542	4.90	405	5.30	630
10	4.70	305	4.90	405	4.75	330	5.10	515	4.90	405	5.30	630
11	4.95	432	4.90	405	4.60	260	5.10	515	4.90	405	5.30	630
12	4.85	380	4.90	405	4.70	305	5.10	515	4.90	405	5.30	630
13	4.80	355	4.70	305	4.60	260	5.05	488	4.90	405	5.30	630
14	4.75	330	4.70	305	4.60	260	4.90	405	4.90	405	5.30	630
15	4.70	305	4.70	305	4.60	260	4.90	405	4.90	405	5.30	630
16	4.80	355	4.60	260	4.65	282	4.90	405	4.90	405	5.50	750
17	4.60	260	4.60	260	4.65	282	4.90	405	4.90	405	5.50	750
18	4.60	260	4.60	260	4.70	305	4.90	405	4.90	405	5.50	750
19	4.70	305	4.60	260	4.50	215	5.00	460	4.90	405	5.50	750
20	4.70	305	4.60	260	4.70	305	5.10	515	4.90	405	5.40	690
21	4.70	305	4.60	260	4.60	260	5.30	1000	4.90	405	5.40	690
22	4.60	260	4.65	282	4.65	282	5.70	870	4.90	405	5.40	690
23	4.55	238	5.10	515	4.50	215	5.65	840	4.95	432	5.30	630
24	4.85	380	4.85	380	4.60	260	5.50	750	5.00	460	5.30	630
25	4.70	305	4.80	355	4.60	260	5.20	570	5.10	515	5.30	630
26	4.70	305	4.80	355	4.60	260	5.20	570	5.30	630	5.20	570
27	4.60	260	4.80	355	4.60	260	5.20	570	5.60	810	5.20	570
28	4.65	282	4.80	355	4.60	260	5.20	570	5.60	810	5.20	570
29	4.65	282	4.80	355	4.60	260	5.20	570			5.10	515
30	4.65	282	4.80	355	4.60	260	5.15	542			5.10	515
31	4.60	260			4.65	282	5.15	542			5.05	488
Total.		10218		9950		8398		18434		12897		19788
Mean		330		332		271		595		461		638
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		20,300		19,800		16,700		36,600		25,600		39,200
Maximum		870		515		330		1250		810		750
Minimum		238		260		215		305		405		488
Accuracy		A		A		A		A		A		A

UNITED STATES GEOLOGICAL SURVEY. (WATER RESOURCES BRANCH)

Daily gage height, in feet, and discharge, in second-feet, of ~~EAST~~ HOOD River at DEE, ORE. for 1913-14

Drainage area ..... square miles. (Harry Wirrick, observer.)

Day	APRIL APR		MAY MAY		JUNE		JULY		AUG.		SEPT.		Day
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	
1	4.95	432	5.00	460	5.20	570	4.94	427	4.80	355		255	1
2	5.00	460	5.00	460	5.25	600	4.93	422	4.80	355		245	2
3	5.00	460	5.30	630	5.20	570	4.96	438	4.84	375		235	3
4	5.00	460	5.30	630	5.05	488	5.00	460	5.00	460		225	4
5	5.30	630	5.30	630	4.95	432	4.88	395	4.85	380	4.50	215	5
6	5.20	570	5.30	630	4.95	432	4.88	395	4.78	345	4.50	215	6
7	5.20	570	5.30	630	4.94	427	4.92	416	4.76	335	4.50	215	7
8	5.25	600	5.30	630	4.94	427	4.84	375	4.74	325	4.50	215	8
9	5.30	630	5.30	630	4.92	416	4.84	375	4.85	380	4.50	215	9
10	5.40	690	5.30	630	4.85	380	4.86	385	4.84	375	4.48	206	10
11	5.40	690	5.20	570	4.87	390	4.89	400	4.84	375	4.50	215	11
12	5.40	690	5.20	570	4.91	410	4.90	405	4.85	380	4.50	215	12
13	5.40	690	5.30	630	5.00	460	4.93	422	4.86	385	4.50	215	13
14	5.40	690	5.35	660	4.86	385	4.94	427	4.90	405	4.65	282	14
15	5.80	935	5.35	660	4.95	432	4.90	405	4.88	395	4.85	380	15
16	5.60	810	5.25	600	5.05	488	4.84	375	4.81	360	4.75	330	16
17	5.40	690	5.30	630	5.00	460	4.94	375	4.85	380	5.30	630	17
18	5.40	690	5.30	630	4.96	438	4.79	350	4.86	385	4.80	355	18
19	5.40	690	5.20	570	5.00	460	4.89	400	4.80	355	4.85	380	19
20	5.40	690	5.20	570	4.90	405	4.86	380	4.78	345	4.75	330	20
21	5.40	690	5.25	600	4.89	400	4.60	260	4.82	365	4.65	282	21
22	5.30	630	5.30	630	4.76	335	4.69	278	4.86	385	4.62	269	22
23	5.30	630	5.30	630	4.82	365	4.69	300	4.79	350	4.62	269	23
24	5.30	630	5.30	630	4.94	416	4.74	325		340	4.65	282	24
25	5.30	630	5.20	570	4.99	427	4.73	320		330	4.65	282	25
26	5.30	630	5.05	488	4.82	365	4.80	355		320	4.82	365	26
27	5.30	630	5.05	488	4.86	385	4.79	350		310	4.70	305	27
28	5.20	570	5.00	460	4.86	385	4.75	330		300	4.65	282	28
29	5.20	570	4.95	432	4.81	360	4.75	330		290	4.60	260	29
30	5.10	515	4.98	449	4.81	360	4.74	325		275	4.60	260	30
31			5.04	488			4.76	335		265			31
Total.		18892		17915		12868		11535		10980		8429	160304
Mean		630		578		429		372		354		281	439
Sec.-ft. per square mile													
Run-off, depth in inches													
Run-off in acre-feet		37,500		35,500		25,500		22,900		21,800		16,700	318,000
Maximum		935		660		600		460		460		630	1,250
Minimum		432		432		335		260		—		206	206
Accuracy		A		A		A		A		B		B	

Gage-height values for Aug. 24-Sept. 4, 1913, during which water stood above gage, are missing; see form 9-230.

Gage-height values for Jan. 1-31, 1914, are missing; see form 9-230.

Compiled by P.W.H. Gage-his. copied by C.A.B.

Discharge applied by [illegible] Gage-his. checked by P.W.H.

Discharge checked by C.A.B.

year 1914

9—192-a Oct. 1914 DEPARTMENT OF THE INTERIOR UNITED STATES GE

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Dee, Oregon. River at Creek near

434 Drainage area ..... square miles. [Frank N. Peck, observer.]

Day.	OCT.		NOV.		DEC.		JAN.		FEB.		MAR.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	4.60	260	5.10	515	4.76	330						
2	4.98	449	4.92	416	4.80	355						
3	4.75	330	5.20	570	4.75	330						
4	4.65	282	4.90	405	4.78	345						
5	4.80	355	4.85	380	4.58	251						
6	4.80	355	4.75	330	4.60	260						
7	4.85	380	4.82	365	4.65	282						
8	4.80	355	4.75	330	4.60	260						
9	4.82	365	4.82	365	4.60	260						
10	4.80	355	4.85	380	4.65	282						
11	4.65	282	4.98	449	4.60	260						
12	4.90	405	4.92	416	4.60	260						
13	4.80	355	5.40	690	4.50	215						
14	4.85	380	5.00	460	4.55	238						
15	4.80	355	4.88	395	4.58	251						
16	4.90	405	4.90	406	4.58	251						
17	4.82	365	4.88	395	4.50	215						
18	4.70	305	4.78	345	4.50	215						
19	5.08	504	4.72	315	4.50	215						
20	4.90	405	4.75	330	4.48	206						
21	4.85	380	4.78	345	4.52	200						
22	4.85	380	4.75	330	4.70	200						
23	4.88	395	4.78	345	4.80	200						
24	4.80	355	4.72	315	4.58	200						
25	4.70	306	4.80	355	4.52	244						
26	4.98	449	4.72	315	4.55	238						
27	4.92	416	4.82	365	4.60	260						
28	4.92	416	4.75	330	4.60	260						
29	4.90	405	4.70	305	4.52	224						
30	4.85	380	4.80	355	4.55	238						
31	4.85	380			4.55	238						
Total.		11,308		11,616		7,763						
Mean		371		387		250						
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		22,800		23,000		15,400						
Maximum		504		690		355						
Minimum		260		305		200						
Accuracy		B		B		B						

NOTE.—

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Dee, Ore River or Creek near Hood River for the year ending Sept. 30, 1915

H 34 — Drainage area ____ square miles. — Gage read by J.W. West, observer. — 1915

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge	Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge	Day
1									1.22		1.28		1	2.40		1.35		1.40	625	0.68	265	0.80	225	0.95	250	1
2									1.20		1.25		2	2.30		1.35		1.10	400	.95	306	1.02	348	.70	180	2
3									1.15		1.25		3	2.30		1.35		1.18	400	1.00	335	.95	306	.70	180	3
4									1.05		1.30		4	2.10		1.35		1.10	400	1.02	348	.95	250	.80	225	4
5									1.10		1.30		5	2.05		1.35		1.12	400	.95	306	.85	250	.70	180	5
6									1.10		1.25		6	2.00		1.35		1.10	400	1.02	348	.92	287	.60	140	6
7									1.05		1.22		7	2.00		1.35		1.10	400	.92	287	.85	250	.58	134	7
8									1.05		1.20		8	1.80		1.35		1.00	335	1.18	456	.80	225	.60	140	8
9									1.05		1.18		9	1.90		1.50		1.00	335	1.18	456	.82	235	.60	140	9
10									1.02		1.20		10	1.90		1.55		.90	275	.95	306	.88	265	.58	134	10
11									1.02		1.20		11	1.90		1.55		.95	306	.95	306	.85	250	.58	134	11
12									1.02		1.20		12	1.85		1.50		.90	275	.90	275	.78	216	.60	140	12
13									1.02		1.22		13	1.85		1.40		.90	275	.85	250	.75	202	.65	160	13
14									1.05		1.22		14	1.70		1.45		.90	275	.85	250	.75	202	.65	160	14
15									1.05		1.60		15	1.70		1.45		.90	275	.80	225	.75	202	.70	180	15
16									1.05		1.70		16	1.65		1.45		1.10	400	1.05	368	.85	250	.80	225	16
17									1.05		1.65		17	1.80		1.50		.88	265	.90	275	.80	225	.72	202	17
18									1.08		1.65		18	1.75		1.50		.82	235	.82	235	.75	202	.75	202	18
19									1.08		1.65		19	1.75		1.50		.82	235	.82	235	.80	225	.75	202	19
20									1.08		1.55		20	1.70		1.50		.80	225	.88	265	.88	265	.75	202	20
21									1.08		1.55		21	1.65		1.60		1.12	414	.95	306	.90	275	.78	216	21
22									1.08		1.55		22	1.60		1.55		1.15	435	.92	287	.90	275	.80	225	22
23									1.10		1.70		23	1.70		1.40		1.08	387	.88	265	.92	287	.78	216	23
24									1.30		1.70		24	1.70		1.55		.92	287	.88	265	.88	265	.75	202	24
25									1.28		1.65		25	1.60		1.45		.85	250	.90	275	.85	250	.75	202	25
26									1.18		1.65		26	1.60		1.35		.88	265	.82	235	.92	287	.80	225	26
27									1.20		1.58		27	1.65		1.45		.75	202	.80	225	.85	250	.75	202	27
28									1.28		1.58		28	1.65		1.70		.75	202	.78	225	.98	323	.72	189	28
29											1.58		29	1.55		1.40		.75	202	.80	216	1.05	368	.75	202	29
30											1.58		30	1.50		1.45		.80	225	.80	225	1.10	400	.78	216	30
31											1.70		31			1.45				225		0.95	250			31
TOTAL																		9,604		9,841		8109		5,605	
Mean																		320		285		262		187	
Sec.-ft. per square mile																									
Run-off, depth in inches																									
Run-off in acre-feet																		19,000		17,500		16,100		11,100	
Maximum																		625		456		400		250	
Minimum																		202		216		202		134	
Accuracy																		C		B		B		B	

Year period

H 34

H 34

H 34

H 34

Year Ending Sept. 30, 1916

9–192-a Oct. 1914 DEPARTMENT OF THE INTERIOR UNITED STATES GE

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Dee, Oregon River at Creek near

Drainage area ..... square miles. (Jos. W. West, observer.)

District 434

Day	OCT.		NOV.		DEC.		JAN.		FEB.		MAR.	
	Gage height	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			.95	305	1.40	625	1.00	510				
2			.98	323	1.30	545	.95	485				
3	0.85	250	.95	305	1.40	625	.90	460				
4	.80	225	.88	265	1.35	585	.85	437				
5	.75	202	.85	250	2.40		.80	415				
6	.70	180	.80	225	1.80		.75	392				
7	.70	180	.78	216	1.75		.75	329				
8	.70	180	.82	235	1.70		.75	392				
9	.70	180	.80	225	1.80		.72	379				
10	.68	172	.78	216	1.70		.70	370				
11	.68	172	.90	275	1.60		.62	338				
12	.68	172	.80	225	1.50	705	.55	310				
13	.85	250	.78	216	1.40	625	.60	330				
14	.80	225	.78	216	1.35	585	.60	330				
15	.72	189	1.22	485	1.35	585	.55	310				
16	.72	189	.98	323	1.30	545						
17	.70	180	2.85		1.25	508						
18	.70	180	2.20		1.22	485						
19	.70	180	1.95		1.20	470						
20	.72	189	1.50	705	1.20	470						
21	.70	180	1.85		330							
22	.70	180	1.45	665	3.30							
23	.88	265	2.05		2.10	1100						
24	1.05	368	1.55		1.70	875						
25	.98	323	2.10		1.70	875						
26	.92	287	1.80		1.40	710						
27	.82	235	1.58		1.30	660						
28	.80	225	1.50	705	1.30	660						
29	.78	216	1.70		120	610						
30	.75	202	145	665	1.10	560						
31	1.30	545	.....	.....	1.05	535						
TOTAL												
Mean												
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet												
Maximum												
Minimum												
Accuracy												

NOTE.—

9–192–a DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGICAL SURVEY WATER RESOURCES BRANCH

File No. Washington / District 434

Daily gage height, in feet, and discharge, in second-feet, of HOOD River at Creek near DEE, OREG for the year ending Sept. 30, 1917.

Drainage area ____ square miles. (____, observer.)

Gage read to ____ feet. Table of discharges based on ____ gage readings per day. Used rating table dated ____

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge	Day
1																	1.78	780	1.37	780	0.72	450	0.24	278	1
2																	1.63	880	1.52	830	0.72	450	0.25	278	2
3																	1.47	830	1.62	890	0.77	472	0.26	278	3
4																	1.37	780	1.70	930	0.74	472	0.24	278	4
5																	1.37	780	1.67	930	0.65	430	0.24	278	5
6																	1.44	780	1.56	890	0.66	430	0.23	278	6
7																	1.61	890	1.46	830	0.58	410	0.21	260	7
8																	1.76	980	1.44	780	0.52	370	0.31	295	8
9																	1.85	980	1.95	1,080	1.37	830	0.49	370	0.38	330	9
10																	1.75	980	1.72	930	1.48	830	0.49	370	0.39	330	10
11																	2.05	1180	1.62	830	1.49	830	0.48	870	0.46	350	11
12																	1.90	1,080	1.37	780	1.46	930	0.54	390	0.43	350	12
13																	1.90	1,080	1.36	780	1.38	780	0.56	390	0.41	330	13
14																	1.80	1,030	1.48	830	1.34	730	0.53	390	0.52	370	14
15																	1.80	1,030	1.72	930	1.43	780	0.52	370	0.60	410	15
16																		950	1.94	1,030	1.54	830	0.58	410	0.62	410	16
17																		860	1.98	1,080	1.57	880	0.63	430	0.64	430	17
18																	1.32	780	1.82	980	1.62	880	0.56	390	0.62	410	18
19																	1.30	780	1.84	980	1.60	880	0.49	370	0.61	410	19
20																	1.29	780	1.75	980	1.44	780	0.52	370	0.59	410	20
21																	1.29	780	1.80	980	1.30	730	0.49	370	0.52	370	21
22																	1.29	780	1.68	930	1.17	680	0.39	330	0.45	350	22
23																	1.33	780	1.49	830	1.04	585	0.39	330	0.46	350	23
24																	1.34	780	1.62	890	0.90	540	0.45	350	0.37	312	24
25																	1.30	780	1.54	830	0.83	518	0.44	350	0.44	350	25
26																	1.34	780	1.45	830	0.94	562	0.37	312	0.50	370	26
27																	1.53	880	1.45	780	1.01	585	0.32	295	0.50	370	27
28																	1.65	980	1.52	830	0.92	540	0.29	295	0.57	390	28
29																	1.85	980	1.53	830	0.76	472	0.27	278	0.48	370	29
30																	1.82	980	1.43	780	0.71	450	0.28	295	0.44	350	30
31																	1.78	980			0.73	472	0.27	278			31
Totals																		20,990		26,600		22,834		11,587		10,345	
Mean																		913		887		737		374		345	
Sec.-ft. per square mile																									
Run-off, depth in inches																									
Run-off in acre-feet																		41,700		52,800		45,300		23,000		20,500	
Maximum																		1,190		1,080		930		472		430	
Minimum																		780		780		450		278		260	

2nd page

Year packed

Note.—

9—192-a Oct. 1914

DEPARTMENT OF THE INTERIOR

UNITED STATES GE

Daily gage height, in feet, and discharge, in second-feet, of HOOD RIVER near Dee, Ore 1917 River at ~~Creek~~ near D

434 Drainage area ..... square miles. [..... observer.]

Day.	OCT.		NOV.		DEC.		JAN.		FEB.		MAR.	
	Gage height	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	0.41	330	0.21	260	1.40	780						
2	.40	330	.22	260	.52	370						
3	.41	330	.45	350	.45	350						
4	.39	330	.20	260	.50	370						
5	.40	330	.10	225	.44	350						
6	.40	330	.20	260	.45	350						
7	.36	312	.30	295	.36	312						
8	.36	312	.20	260	.35	312						
9	.40	330	.10	225	.32	295						
10	.40	330	.06	210	.28	295						
11	.37	312	.12	225	.27	278						
12	.33	312	.24	278	.60	410						
13	.29	295	.06	210	1.90	1030						
14	.32	295	.06	210	2.28	1230						
15	.32	295	.06	210	1.50	830						
16	.29	295	.06	210								
17	.23	278	.06	210								
18	.23	278	.06	210								
19	.24	278	.06	210								
20	.22	260	.06	210								
21	.26	278	.06	210								
22	.26	278	.06	210								
23	.25	278	.06	210								
24	.24	278	.06	210								
25	.25	278	.06	210								
26	.26	278	.06	210								
27	.23	278	.06	210								
28	.18	260										
29	.21	260										
30	.22	260										
31	.21	260										
TOTAL		9,148		8,568		7,562						
Mean		295				504						
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		18,100				≥ 15,000						
Maximum		330				≥ 1,230						
Minimum		260		210		278						
Accuracy												

NOTE.—

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Tucker's Bridge near Hood River, Oreg. for the year ending Sept. 30, 1916.

Drainage area ____ square miles. (at F. J. Knebloch ____ elevation.) Gage read to ____ feet, once a day.

File Number ____ Washington District H-33. Table of use: Half tenths. Used rating table dated ____

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1		346		670		2180	2.82	1180		560	2.82	1140
2		408		590		1040	2.74	1120		670	2.95	1160
3		411		582		1010	2.66	1050		800	2.87	1180
4		340		532		1030	2.57	1080		760	2.80	1130
5		325		510		2850	2.56	960		730	2.74	1090
6		318		600		2240	2.38	880		680	3.24	1420
7		310		456		2080	2.32	860	4.02	2840	3.34	1420
8		298		466		1890	2.26	830	4.18	2180	4.00	2020
9		296		443		2230	2.22	870	4.05	2090	4.90	2900
10		305		443		1780	2.20	800	4.65	2630	5.15	3210
11		313		443		1440	2.20	750	4.87	2890	5.15	3210
12		314		450		1360	2.22	710	4.20	2200	5.14	3200
13		316		418		1180	2.03	690	3.70	1760	5.05	3110
14		446		393		1070	2.24	690	3.84	1780	4.44	2400
15		329		840		975		690	3.98	2,000	4.02	2040
16		309		1290		900		640	4.26	2250	3.83	1880
17		296		2540		830		650	4.00	2020	3.92	1950
18		310		3110		790		690	4.20	2200	4.01	2030
19		322		3420		790		690	4.45	2060	4.08	2090
20		314		1860		770		630	3.72	1780	5.48	3650
21		308		1730		5100	2.93	780	3.65	1440	5.31	3440
22		310		1900		11,300	2.38	890	3.34	1480	5.45	3640
23		402		3960		4100	2.78	1820	3.21	1390	4.90	2980
24		410		3120		2600	3.24	1480	3.12	1320	—	2500
25		621		3690		2200	—	1200	2.97	1230	6.58	5560
26		825		2800		8050	2.75	1180	2.86	1170	7.32	7040
27		368		1700		1700	2.82	1020	2.85	1180	6.41	5220
28		366		1400		1800	2.42	910	2.85	1160	6.58	5840
29		293		1650		1450	2.30	850	2.85	1160	4.72	2700
30		372		1350		1250		800			4.45	2430
31		610				1150		800			4.42	2400
Totals		10,935		42,043		48,16		27,960		45,840		84,000
Mean		353		1400		1550		902		1,580		2710
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		21,700		83,300		[illegible],400		55,500		90,900		167,000
Maximum		610		3960		[illegible]		1820		2690		7040
Minimum		293		393		770		630		640		1090
Accuracy		A		A		C		B		B		B

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	4.50	2480	4.15	2150	3.50	1600			2.32	860	1.86	630
2	4.56	2540	4.25	2430	3.40	1490			2.25	825	1.84	720
3	4.45	2430	4.00	2290	3.65	1720			2.40	915	1.89	810
4			5.02	3650	3.72	1950			2.20	850	1.83	615
5			5.18	3250	3.85	1880			2.32	900	1.79	596
6			5.15	3210					2.30	800	1.68	528
7			4.75	2740					2.17	785	1.60	520
8			4.70	2680					2.16	780	1.62	528
9			4.30	2290					2.14	770	1.81	605
10			4.10	2150					2.16	780		562
11			3.85	1880					2.16	780	1.60	520
12			3.60	1680					2.16	760	1.58	512
13			3.45	1580					2.08	740	1.56	504
14			3.60	1680					2.07	735	1.48	473
15			3.48	1580					2.09	745	1.58	512
16	4.46	2440	3.50	1600					2.04	720	1.59	516
17	4.55	2530	3.78	1820			3.57	1660	2.27	775	1.59	516
18	4.40	2380	3.90	1930			3.38	1450		713	1.61	534
19	4.18	2180	3.90	1930			3.62	1280		691	1.61	534
20	4.05	2060	3.70	1760			3.10	1310		668	1.58	512
21	4.80	2480	3.72	1780			5.90	1250		644	1.58	512
22	4.20	2200	3.80	1840			2.96	1230		621	1.58	512
23	3.95	1980	3.90	1760			—	1180	1.80	600	1.56	504
24	4.00	2020	3.58	1660			2.82	1140	1.86	630	1.50	480
25	4.05	2060	3.72	1780			2.70	1070	1.86	630	1.48	476
26	4.15	2160	3.65	1720			2.58	1000	1.88	640	1.48	473
27	4.50	2480	3.65	1720			2.44	920	1.94	670	1.52	488
28	4.45	2430	3.68	1720			2.36	880	1.92	670	1.48	473
29	4.30	2280	3.70	1760			2.30	850	1.78	582	1.48	473
30	4.20	2280	3.65	1720			—	870	1.74	576	1.47	470
31			3.58	1660			2.38	890	1.64	536		
Totals		70,740		63,240		55,830		45,750		22,192		16,088
Mean		2360		2040		1860		1480		716		536
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet		140,300		125,000		111,000		91,000		44,000		31,900
Maximum				3850						915		810
Minimum		1980		1660		—		850		536		470
Accuracy		A		A		C		C		B		B

Year ending: 84,93 / 1,0 / 1,320 / 272

Notes: Discharge interpolated for days when no gage height is given. Discharge interpolated for days when no gage height is given. Discharge interpolated for days when no gage height is given.

9—192-a Oct. 1914 DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGICAL SURVEY WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Tucker Bridge for the year ending Sept. 30, 1917

Drainage area ____ square miles. (E. I. Knablock, observer.) Gage read to ____ once a day

File Number: Washington District 433

Table of use: Half tenths to 190 ft.

Used rating table dated 12/20/15 by A.C.A.

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1	1.42	445	1.50	600	2.44	1,070		640	2.14	750	1.90	650
2	1.42	445	1.96	700	2.46	950	2.00	700	2.09	800	1.86	650
3	1.40	445	2.06	750	2.79	1,070		900	2.27	1,130	1.80	600
4	1.38	445	2.52	1130	2.94	1,190		1100	2.28	1,130		700
5	1.36	428	2.04	700	2.90	1,120	4.44	2480	2.36	1,130	2.54	950
6	1.38	445	2.19	750	2.63	950		1900	2.28	1,190	2.30	850
7	1.40	445	2.19	750	2.49	900		1800	2.21	1,070	2.25	800
8	1.38	445	2.26	750	2.38	850	2.58	1,190	2.24	1,070	2.20	800
9	1.37	428	2.59	1,010		800	2.76	1130	2.59	1,010		785
10	1.36	428	2.43	900	2.06	750	2.67	1,070		1,070		770
11	1.38	445	2.15	800	2.00	700	2.58	1,010	2.25	1,130		750
12	1.36	428	1.88	650		800	2.46	950	2.72	1,070		730
13	1.38	445	1.84	600	2.36	900		900	2.48	950		715
14	1.50	480	1.75	580	2.20	800		850	2.44	950	2.00	700
15	1.60	480	1.78	600	2.39	800	2.24	800	2.46	950	2.52	700
16	1.58	480	1.79	580	2.30	800	2.07	750	2.35	1,130	1.49	650
17	1.54	500	1.74	580	2.01	700	2.68	750		1040	1.63	650
18	1.56	500	1.76	580	2.13	760	2.04	700	2.46	950	1.90	650
19	1.61	480	1.64	540	2.25	800	2.04	700	2.45	900	1.96	700
20	1.49	462	1.59	520	2.38	900		700	2.40	900	2.06	750
21	1.44	462	1.64	540	2.51	950		700	2.20	850	2.16	750
22	1.47	445	1.61	520	2.45	900	2.00	700	2.20	850	2.06	750
23	1.40	445	1.62	520	2.37	900		675	2.13	750	2.26	850
24	1.41	445	1.63	540	2.46	850	1.86	650		725	2.09	1,250
25	1.44	445	2.00	1,010		800	1.87	650	2.01	700	2.53	1,010
26	1.44	445	2.70	1,070	2.05	750	1.90	650	2.25	700	2.45	900
27	1.87	500	4.18	2,110	2.09	700	3.44	1,520	2.81	700	2.58	1,010
28	1.48	462	3.30	1,520	1.95	700	2.60	1,010	1.96	700	2.35	1,310
29	1.90	650	2.86	1,160	1.87	650	2.44	900			2.33	1,840
30	1.87	650	2.93	1,190	1.34	600	2.42	900			3.14	1,810
31	2.44	900			1.27	580	2.18	800			2.51	1,190
TOTAL	14,948		24,250		26,050		29,775		26,295		26,720	
Mean	482		808		940		960		939		862	
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet	29,600		48,100		51,600		59,000		52,100		53,000	
Maximum	900		2110		1190		2480		1190		1840	
Minimum	428		520		580		640		700		600	
Accuracy												

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	2.59	1,190	3.69	1680		1900	3.39	1,520	2.08	750	1.98	445
2	3.02	1,250	3.48	1520		1820	3.42	1,680	2.08	750		
3	2.88	1,190	3.46	1600		1700	3.52	1,760	2.14	750	1.36	428
4	2.75	1250	3.35	1520		1,600	3.85	1,840	2.09	700		
5	2.75	1,840	3.79	1380	3.50	1,600	3.90	1,680	1.95	700		
6	3.49	1,600	3.46	1600	3.45	1,760	3.53	1,680	1.96	700		
7	4.45	2,380	4.00	2200	4.05	2,020	3.36	1,520	1.86	650		
8		2300	4.05	2200	4.25	2,290		1560	1.81	600		
9	3.98	1,930	4.60	2580	4.75	2,790	3.50	1,600	1.77	580		
10	3.46	1,600	4.30	2480		2100	3.31	1,520	1.78	600		
11	3.79	1,760	4.56	2580		1950	3.28	1,450	1.73	580		
12	3.62	1,680	4.58	2580		1600	3.96	1,450	1.80	600		
13	3.46	1,450	4.48	2480		1600	3.14	1,310	1.82	600		
14		1,380	4.24	2200		1800	3.06	1,310	1.74	580		
15	3.36	1,310	4.10	2110		2200	3.17	1,380	1.78	560		
16	3.00	1,250	3.87	1930		2490	3.28	1,450	1.77	580		
17	2.92	1,190	3.67	1680	4.24	2,290	3.46	1,520	1.81	600		
18	2.75	1,130	3.45	1620	4.17	2,200	3.24	1,450	1.77	580		
19	2.76	1,130	3.60	1680	4.17	2,200	3.31	1,450	1.77	580		
20	2.93	1,190		1640	3.94	2,020	3.15	1,380	1.78	560		
21	2.87	1,190	3.46	1600	4.14	2,200	3.36	1,190	1.75	580		
22	2.86	1,190	3.46	1600	3.97	2,020	2.71	1,070	1.72	560		
23	2.91	1,600	3.42	1520		1,700	2.64	1,010	1.72	560		
24	3.46	1,600	3.38	1820		1950	2.52	950	1.68	560		
25	4.03	2,110	3.37	1520		1,950	2.36	900	1.63	520		
26	4.39	2,290		1520		1,800	2.40	900		491		
27	4.06	2,110		1600	3.57	1,690	2.40	900	1.96	462		
28	3.98	1,930	3.66	1760		1800	2.36	900	1.94	462		
29	3.65	1,760	3.65	1680		1700	2.32	850	1.95	462		
30	3.62	1,690		1,760		1600	2.10	750	1.98	462		
31			3.80	1840			2.10	750	1.39	445		
TOTAL	47,460		57,080		58,310		40,680		18,164			
Mean	1580		1840		1940		1310		586			
Sec.-ft. per square mile												
Run-off, depth in inches												
Run-off in acre-feet	94,000		113,000		115,000		80,600		36,000			732,000
Maximum	2390		2580		2790		1840		750			
Minimum	1130		1380		1600		750		445			
Accuracy												

Note—

Year period

Quarter: 1st, 2nd, 3rd, 4th; Crested, Dated; Discharge, Gage height; Dam, Pond, Reservoir, Flashboards, Pick-up, Date

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Powerdale for the year ending Sept. 30, 1917.

Drainage area ____ square miles. (A. Rogers, observer)

File Number: Washington / Hood River 437

Table of rating: Half tenths. Used rating table dated ____

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1	2.00	600	1.85	665	2.6	1,060	2.00	600	2.15	705	2.10	670
2	1.81	467	2.04	635	2.5	980	2.25	780	2.15	705	2.10	670
3	1.76	436	2.05	625	3.0	1,420	2.40	900	2.6	1,060	2.05	635
4	1.70	400	2.55	1020	2.8	1,240	2.7	1,150	2.8	1,240	2.15	705
5	1.73	418	2.20	740	2.8	1,240	3.8	2,340	2.8	1,240	2.6	1,060
6	1.72	412	2.15	705	2.6	1,060	3.5	1,940	2.9	1,330	2.40	900
7	1.71	406	2.15	705	2.35	860	3.0	1,420	2.7	1,150	2.40	900
8	1.72	412	2.15	705	2.30	820	2.8	1,240	2.6	1,060	2.30	820
9	1.70	400	2.5	980	2.25	780	2.7	1,150	2.6	1,060	2.30	820
10	1.70	400	2.45	940	2.25	780	2.6	1,060	2.6	1,060	2.25	780
11	1.70	400	2.25	780	2.15	705	2.50	980	2.6	1,060	2.25	780
12	1.70	400	1.98	586	2.25	780	2.40	900	2.7	1,150	2.25	780
13	1.72	412	1.90	530	2.40	900	2.50	980	2.6	1,060	2.20	740
14	1.72	412	1.90	530	2.35	860	2.45	940	2.6	1,060	2.30	820
15	1.72	412	1.88	516	2.35	860	2.25	780	2.50	980	2.25	780
16	1.75	430	1.88	516	2.30	820	2.10	670	2.7	1,150	2.20	740
17	1.79	454	1.86	502	2.30	820	2.10	670	2.50	980	2.20	740
18	1.72	412	1.90	530	2.30	820	2.04	635	2.6	1,060	2.20	740
19	1.71	406	1.85	495	2.40	900	2.00	600	2.50	980	2.20	740
20	1.76	436	1.82	474	2.45	940	2.05	635	2.45	940	2.25	780
21	1.74	424	1.80	460	2.6	1,060	2.10	670	2.40	900	2.20	740
22	1.72	412	1.82	474	2.45	940	1.98	586	2.35	860	2.20	740
23	1.70	400	1.83	481	2.40	900	1.96	572	2.30	820	2.35	860
24	1.70	400	1.84	488	2.30	820	1.96	572	2.45	940	3.0	1,420
25	1.70	400	2.6	1,060	2.30	820	2.05	635	2.40	900	2.8	1,240
26	1.71	406	2.6	1,060	2.25	780	1.96	572	2.35	860	2.6	1,060
27	1.80	460	4.2	2,970	2.20	740	2.9	1,330	2.70	740	2.8	1,240
28	1.72	412	3.2	1,610	2.10	670	2.6	1,060	2.15	705	2.9	1,330
29	2.02	600	2.8	1,240	2.00	600	2.40	900			3.4	1,820
30	1.98	586	2.8	1,240	1.88	516	2.30	820			3.4	1,820
31	2.35	860			2.05	635	2.10	670			2.9	1,330
TOTAL	13,895		27,172		27,126		28,757		27,755		24,200	
Mean	448		806		875		928		991		942	
Sec.-ft. per square mile												
Run-off in inches												
Acre-feet	27,500		48,000		53,800		57,100		55000		57,900	
Maximum	860		2,970		1,420		2340		1,330		1,820	
Minimum	400		460		516		572		705		635	
Accuracy												

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	2.80	1240	3.25	1710	3.60	2070	3.17	1610	2.35	860	1.94	558
2	3.08	1510	3.24	1610	3.46	1940	3.32	1710	2.38	900	1.92	544
3	2.90	1330	3.20	1610	3.35	1820	3.22	1710	2.45	940	1.90	530
4	2.85	1240	3.10	1510	3.24	1610	3.28	1710	2.38	900	1.86	502
5	3.38	1820	3.07	1510	3.24	1610	3.35	1820	2.28	820	1.94	558
6	3.26	1710	3.20	1610	3.37	1820	3.25	1610	2.32	820	1.93	551
7	3.84	2340	3.68	2200	3.54	1940	3.06	1510	2.23	780	2.00	600
8	3.85	2340	3.70	2200	3.67	2200	3.16	1610	2.16	7.5	2.01	600
9	3.60	2070	3.86	2490	3.90	2490	3.18	1610	2.26	780	2.15	740
10	3.41	1820	3.88	2490	3.62	2070	3.04	1420	2.19	740	2.13	705
11	3.48	1940	3.90	2490	3.48	1940	3.00	1420	2.20	740	2.16	705
12	3.71	1820	3.89	2490	3.25	1610	3.02	1420	2.20	740	2.18	740
13	3.29	1710	3.93	2340	3.83	1610	2.95	1420	2.26	780	2.13	705
14	3.15	1610	3.72	2200	3.45	1820	2.90	1330	2.24	780	2.12	670
15	3.08	1510	3.57	2070	3.69	2200	3.00	1420	2.28	820	2.31	820
16	2.98	1420	3.36	1820	3.90	2490	3.04	1420	2.26	780	2.31	820
17	2.86	1330	3.32	1710	3.84	2340	3.04	1420	2.31	820	2.26	780
18	2.79	1240	3.30	1710	3.69	2070	3.02	1420	2.30	820	2.24	740
19	2.76	1240	3.26	1710	3.70	2200	2.96	1420	2.22	740	2.23	740
20	2.88	1240	3.25	1610	3.68	2070	2.86	1330	2.22	740	2.18	740
21	3.00	1420	3.25	1610	3.61	2070	2.78	1240	2.28	820	2.10	670
22	2.99	1420	3.20	1610	3.52	1940	2.58	1060	2.16	705	2.06	635
23	3.23	1710	3.20	1610	3.30	1710	2.50	980	2.17	705	2.08	670
24	3.34	1710	3.19	1610	3.48	1940	2.40	900	2.16	705	1.98	586
25	3.59	2070	3.20	1610	3.48	1940	2.31	826	2.12	670	1.97	579
26	3.78	2340	3.17	1610	3.35	1820	2.34	860	1.84	484	2.03	635
27	3.59	2070	3.20	1610	3.31	1710	2.65	1060	1.88	516	2.04	635
28	3.52	1940	3.56	2070	3.35	1820	2.53	980	1.90	530	2.07	600
29	3.42	1820	3.76	2340	3.34	1710	2.35	860	1.92	544	2.04	635
30	3.35	1820	3.66	2200	3.18	1610	2.32	820	1.96	572	2.00	600
31			3.56	2070			2.31	820	1.96	572		
TOTAL		50,800		57,040		58,190		40,740		22828		18593
Mean		1690		1,900		1940		1,310		736		653
Sec.-ft. per square mile												
Run-off in inches												
Acre-feet		101,000		117000		115,000		80600		45300		38,900
Maximum		2340		2490		2,490		1820		940		820
Minimum		1240		1810		1,610		820		484		502
Accuracy												

Note —

Year 1917

Total 702,086

1,100

G—192-a

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

File Number | Washington | District 137

Daily gage height, in feet, and discharge, in second-feet, of Hood River at Hood River, Oregon for the year ending Sept. 30, 1916

Drainage area ____ square miles. [____], observer.

Rated at: Mar. 5 to 15 & Apr. 25 to ____ Inspected by F ____

DAILY DISCHARGE FOR OCT-DEC IS TOTAL FLOW OF RIVER JAN TO SEPT RECORDS ON GAGE OPPOSITE POWER PLANT. DISCH OF TAILRACE MUST BE ADDED. 334. Max stage 7.90 (may 18th) discharge 19,000 sec. ft. Min stage 1.90 (may 22nd) discharge 774 sec. ft.

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1		360	2.20	690	3.30	1160	2.70	1,080	2.00	530	2.90	1,280
2	2.40	495	3.50	560	3.15	1120	2.70	1,080	2.10	600	2.80	1,180
3	2.20	380	2.50	560	3.10	970	2.65	1,040	2.40	520	3.60	1,380
4	2.10	340	2.40	495	3.15	970	2.50	900	2.30	740	2.90	1,230
5	2.10	340	2.40	495	4.15	2160	2.40	820	2.25	705	2.85	1,230
6	2.10	340	2.30	435	4.10	2040	2.35	804	2.20	670	3.4	1,820
7	2.10	340	2.35	465	4.05	1910	2.35	780	3.6	2,070	3.2	1,590
8	2.10	340	2.40	495	3.90	1730	2.35	780	3.6	2,070	3.8	2,340
9	2.10	340	2.30	435	3.15	2070	2.35	780	3.7	2,200	4.3	3,140
10	2.05	325		465	3.70	1660	2.30	740	3.7	2,490	4.4	3,320
11	2.00	310	2.40	495	3.60	1460	2.20	670	4.3	3,140	4.5	3,500
12	2.00	310	2.30	435	3.45	1300	2.15	635	3.9	2,490	4.5	3,500
13	2.10	340	2.30	435	3.35	1200	2.10	600	3.4	1,820	4.4	3,320
14	2.30	435	4	490	3.25	1080	2.10	600	3.5	1,940	3.9	2,490
15	2.30	380	0	850	3.10	970	2.10	600	3.5	1,940	3.7	2,200
16	2.10	340	0	1260	3.00	900	2.10	600	3.7	2,200	3.6	2,070
17	2.05	325	4	2600	2.90	830	2.05	565	4.0	2,640	3.6	2,070
18	2.10	340	4.45	3640	2.85	795	2.10	600	4.0	2,640	3.6	2,070
19	2.10	340	4.65	2890	2.85	795	2.10	600	3.8	2,340	3.7	2,200
20	2.80	340	3.75	1560	2.82	774	2.00	530	3.6	2,070	4.5	3,500
21	2.10	340	3.70	1530	.58	5180	2.20	670	3.4	1,820	4.6	3,700
22	2.10	340		1990	6.6		2.50	900	3.3	1,700	4.6	3,700
23	2.30	435	5.00	3410	4.8	4,1 0	3.4	1,820	3.3	1,700	4.1	2,800
24	2.40	495	4.00	1910	4.0	2,640	3.2	1,590	3.2	1,590	3.9	2,490
25	2.60	625		3670	3.8	2,340	2.90	1,280	3.1	1,480	5.4	5. 0
26	2.45	528	4.45	2550	3.6	2,070	2.70	1,080	3.0	1,380	5.9	
27	2.40	495	3.90	1730	3.3	1,700	2.60	990	2.95	1,330	5.3	
28	2.30	435	3.60	1450	3.4	1,820	2.50	900	3.0	1,380	4.5	3,500
29	2.30	380	3.70	1560	3.1	1480	2.40	820	3.0	1,380	4.2	2,970
30	2.20	380	3.50	1380	2.90	1280	2.40	820			4.0	2,640
31	2.20	830			2.80	1,180	2.35	780			4.0	2,140
Total	12343	39760					26454	49875				
River Tailrace	348	1330					853 327	1,720 746				898
Total means	398	1330					931	1,790				
Total	24,500	79,100		1 ,000			57,200	103,000		1 ,000		
Maximum	625	3670					1820+88=1910	3140+18=3320				
Minimum	310	400				774	530+192=622	1320+180=1500		1230+118=1348		
	B	B		B		B	B	B		B		

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	3.9	2,490	3.7	2,200	3.3	1,710	3.8	2,340	2.45	940	2.20	740
2	3.9	2,490	4.0	2,640	3.3	1,710	3.8	2,340	2.40	900	2.20	740
3	3.9	2,490	4.1	2,800	3.3	1,710	3.6	2,070	2.40	900	2.30	820
4	3.9	2,490	4.2	2,970	3.6	2,070	3.5	1,940	2.40	900	2.10	670
5	3.8	2,340	4.3	3,140	3.5	1,940	3.3	1,710	2.40	900	2.00	600
6	3.7	2,200	4.3	3,140	3.4	1,820	3.2	1,610	2.35	860	2.01	600
7	3.7	2,200	4.0	2,640	3.4	1,820	3.2	1,610	2.30	820	2.00	600
8	3.8	2,340	4.0	2,640	3.5	1,940	3.3	1,710	2.40	900	2.00	600
9	3.9	2,490	3.8	2,340	3.6	2,070	3.3	1,710	2.45	940	2.00	600
10	4.0	2,640	3.7	2,200	3.3	1,710	3.2	1,610	2.30	820	2.00	600
11	4.1	2,800	3.5	1,940	3.3	1,710	3.2	1,610	2.30	820	2.00	600
12	3.9	2,490	3.4	1,820	3.3	1,710	3.2	1,610	2.35	860	1.95	565
13	3.8	2,340	3.3	1,710	3.3	1,710	3.2	1,610	2.40	900	1.95	565
14	3.9	2,490	3.3	1,710	3.4	1,820	3.2	1,610	2.30	820	1.90	530
15	3.9	2,490	3.3	1,710	3.7	2,200	3.0	1,420	2.30	820	1.90	530
16	3.9	2,490	3.3	1,710	3.9	2,490	3.4	1,820	2.30	820	1.90	530
17	3.9	2,490	3.4	1,820	4.0	2,640	3.3	1,710	2.20	740	1.90	530
18	3.8	2,340	3.5	1,940	4.2	2,970	3.2	1,610	2.15	700	1.90	530
19	3.6	2,070	3.4	1,820	3.9	2,490	3.0	1,420	2.10	670	1.90	530
20	3.6	2,070	3.4	1,820	3.6	2,070	3.0	1,420	2.10	670	1.90	530
21	3.9	2,490	3.5	1,940	3.4	1,820	2.90	1,330	1.85	495	1.85	495
22	3.7	2,200	3.6	2,070	3.3	1,710	2.90	1,330	1.95	565	1.95	495
23	3.6	2,070	3.4	1,820	3.3	1,710	2.95	1,380	2.15	705	1.80	460
24	3.5	1,940	3.3	1,710	3.4	1,820	2.75	1,200	2.05	635	1.80	460
25	3.5	1,940	3.4	1,820	3.5	1,940	2.65	1,100	2.05	635	1.75	430
26	3.7	2,200	3.4	1,820	3.7	2,200	2.60	1,060	2.10	670	1.75	430
27	3.9	2,490	3.4	1,820	3.5	1,940	2.50	980	2.15	705	1.80	460
28	3.8	2,340	3.5	1,940	3.5	1,940	2.45	940	2.10	670	1.80	460
29	3.8	2,340	3.4	1,820	3.3	1,710	2.40	900	2.20	740	1.80	460
30	3.7	2,200	3.4	1,820	3.2	1,610	2.50	980	2.15	705	1.80	460
31			3.3	1,710			2.50	980	2.25	780		
Total	70450		65000		58,710		46670		24005		16620	
	2350		2,100		1960		1,510		775		554	
	648		180		82.9		75.9		285		280	
	2,410		2,120		2920		1,690		852		633	
Total	143,000		139000		120,000		97,800		52,400		37,700	
Maximum	2880+64=2960		3140+78=3218		2970+14=2980		2340+90=3430		940+86=1030		820+100=920	
Minimum	940+64=2006		1710+3=1210		1610+82=1700		900+90=990		495+89=579		420+96=516	
	B		B		B		B		B		B	

Year: 334 2,204 57 1,017

41 0,000

310

9-192-a (Oct. 1914) DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGICAL SURVEY WATER RESOURCES BRANCH

Daily gage height, in feet, and discharge, in second-feet, of Pacific Power & Light Co tailrace ~~River~~ ~~Creek~~ near at Powerdale Hood River Oreg. for the year ending Sept. 30, 1917.

Drainage area ____ square miles. (A. Rogers, observer)

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Discharge	JAN. Gage height	JAN. Discharge	FEB. Gage height	FEB. Discharge	MAR. Gage height	MAR. Discharge
1	1.75	80	1.65	73		0	1.60	70	2.00	97	1.65	73
2	1.78	82	1.65	73		0	1.60	70	2.00	97	1.75	80
3	1.79	82	1.66	73		0	1.95	94	2.00	97	1.70	76
4	1.80	83	1.60	70		0	1.95	94	1.05	40	1.25	50
5	1.76	80	1.60	70	1.60 2 day	35	1.95	94	1.90	90	1.55	67
6	1.78	82	1.60	70		0	2.00	97	2.00	97	1.35	55
7	1.75	80	1.55	67	1.95	94	1.50	64	2.00	97	1.40	58
8	1.20	47	1.65	73	1.90	94	2.00	97	1.98	94	1.80	83
9	1.83	85	1.65	73	1.90	94	2.00	97	1.90	90	1.85	86
10	1.80	83	1.55	67	.50	14	1.90	90	1.30	52	1.90	90
11	1.80	83		0	1.85	86	1.95	94	1.05	40	1.85	86
12	1.80	83	1.85	86	1.85	86	1.95	94	1.05 2 day	20	1.90	90
13	1.80	83	1.85	86	1.85	86	1.80	83		0	2.00	97
14	1.80	83	1.85	86	1.20	47	.50	14		0		0
15	1.75	80	1.85	86	.50	14	1.95	94	1.70 2 day	38		0
16	1.80	83	1.85	86	.30	6	1.95	94	1.75	80	1.75	80
17	1.80	83	1.85	86	.20	3	1.90	90	1.70	76	1.05	40
18	1.80	83	1.85	86	.20	3	2.00	97	1.05	40	1.65	73
19	1.80	83	1.75	80	.20	3	2.00	97	1.80	83	1.70	76
20	1.75	80	1.70	76	.20	3	1.95	94	1.65	73	1.05	40
21	1.70	76	1.70	76	.20	3	1.05	40	1.75	80	1.05	40
22	1.80	83	1.70	76	1.60	70	1.95	94	1.70	76	1.90	90
23	1.70	76	1.65	73	.50	14	1.95	94	1.30	52	1.85	86
24	1.75	80	1.65	73	1.70	76	1.95	94	1.40	58	1.45	61
25	1.70	76	1.55	67	.50	14	2.00	97	1.40	58	1.05	40
26	1.80	83	1.50	64	.50	14	2.00	97	1.60	70	1.80	83
27	1.80	83	1.55 4 day	34	.50	14	2.00	97	1.70	76	1.75	80
28	1.80	83		0	1.70	76	1.65	73	1.70	76	1.75	80
29	1.80	83		0	1.70	76	2.00	97			1.80	83
30	1.80	83		0	1.70	76	1.50	64			1.80	83
31	1.80	83			.50	14	2.00	97			1.70	76
Totals		2,497		1,930		1,115		2,662		1,847		2,102
Mean		80.5		74.2		42.9		85.9		71.0		72.5
Sec.-ft. per square mile												
Runoff, depth in inches												
Runoff in acre-feet		4,950		3,830		2210		5280		3,660		4,170
Maximum		85		86		94		97		97		97
Minimum		47		34		3		14		20		40
Accuracy												

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	1.05	40	1.00	40	1.90	90	0.50	14		0		0
2		0	1.04	40	1.85	86	1.50	64				
3	1.90	90	1.03	40	.50	14	1.65	73				
4	1.80	83	1.03	40		0	40	10				
5	1.75	80	1.60	70		0	1.60	70				
6	1.70	76	.50	14	.40	10	1.55	67				
7	1.75	80	1.75	80	.40	10	1.60	70				
8	1.05	40	1.50	64	.40	10	.50	14				
9	1.70	76	1.60	70	1.40 1.60	40		0				
10	1.75	80	1.60	70	1.80	83	2.00	97				
11	1.75	80	1.55	67	1.60	70	1.60	70				
12	1.75	80	1.55	67	1.60	70	1.65	73				
13	1.80	83	.50	14	1.55	67	1.65	73				
14	1.75	80		0	1.60	70	1.50	64				
15	1.05	40	1.50	64	1.60	70	.60	18				
16	1.03	40	1.50	64	1.55	67	1.55	67				0
17	1.80	83	.30	6	.20	3	1.50	64			.06	19
18	1.75	80	.30	6	1.60	70	1.60	70			6	1.5
19	1.80	83	.30	6	1.50	64	1.60	70				0
20	1.70	76	.30	6	1.60	70	2.00	97				0
21	1.75	80	.30	6	1.60	70	1.90	90			1.25	50
22	1.60	70	.30	6	1.60	70	1.85	86			.90	32
23	1.65	73	.30	6	1.60	70	1.90	90			.90	32
24	1.65	73	.30	6	1.55	67	1.95	93			1.70	76
25	1.60	70	.30	6	1.55	67	1.90	90			1.15	46
26	1.65	73	.30	6	1.60	70	1.90	90			1.25	49
27	1.65	73	2.00	97	.50	14		0			1.30	51
28	1.60	70	1.80	83	1.00 .50	42		0			1.15	48
29	.50	14	1.80	83	1.55	67		0			1.20	52
30	1.05	40	1.80	83	1.55	67		0				44
31			1.90	90				0		0		
Totals		2,006		1,300		1,568		1,684		0		523
Mean		69.2		43.3		56.0		67.4				43
Sec.-ft. per square mile												
Runoff, depth in inches												
Runoff in acre-feet	29 days	3,980	30 days	2,580	28 days	3,110	25 days	3,340			12 days	1040
Maximum		90		97		90		97				76
Minimum		14		6		3		10				18
Accuracy												

Total for year 19,434

9-1928

DEPARTMENT OF THE INTERIOR — UNITED STATES GEOLOGICAL SURVEY — WATER RESOURCES BRANCH

File Number { Washington District 439

Daily gage height, in feet, and discharge, in second-feet, of PACIFIC POWER & LIGHT Co's PENSTOCK. River at POWERDALE, Creek near HOOD RIVER, OREG. for the year ending Sept. 30, 1916

Drainage area ____ square miles. Gage at R. ROGERS, elevation [illegible] feet above sea level.

Table of rates: Half tenths ____ ft. to ____ ft.

Third rating table dated 3/5/17 by CWS. Applies to gage heights 2.0 ft. to 2.2 ft.

Day	OCT. Gage height	OCT. Discharge	NOV. Gage height	NOV. Discharge	DEC. Gage height	DEC. Power used	JAN. Power used K.W.	JAN. Discharge	FEB. Power used K.W.	FEB. Discharge	MAR. Gage height	MAR. Discharge
1								15		85		86
4								15		72		83
3								16		40		76
4								90		73		85
5								96		72		15
6								96		58		15
7								84		85		98
8								78		87		86
9								75		86		96
10								75		85		92
11								84		85		92
12								81		86		69
13								91		70		62
14								94		86		96
15								100		87		96
16								97	1.80	86	1.80	83
17								84	1.80	86	1.80	83
18								99	1.48	86	1.48	63
19								91	1.50	82	1.50	64
20								92	1.50	66	1.50	64
21								93	1.48	84	1.48	63
22								72	1.42	72	1.42	59
23								88	1.40	81	1.40	58
24								85	1.50	83	1.50	64
25								78	1.60	83	1.60	70
26								78	1.60	82	1.60	70
27								76	1.50	83	1.50	64
28								73	1.40	15	1.40	58
29								90	1.50	15	1.50	64
30								43			1.50	64
31								85			1.30	26
Total								2410		2161		2164
Mean								77.7		74.5		69.8
Sec.-ft. per square mile												
Runoff, depth in inches												
Run-off in acre-feet								4,780		4290		4,290
Maximum								100		87		98
Minimum								15		15		15
Accuracy								C		C		C

Day	APR. Gage height	APR. Discharge	MAY Gage height	MAY Discharge	JUNE Gage height	JUNE Discharge	JULY Gage height	JULY Discharge	AUG. Gage height	AUG. Discharge	SEPT. Gage height	SEPT. Discharge
1	1.60	70	1.60	50	.35	8.0	1.90	90	1.85	86	1.82	84
2	1.30	52	1.70	76	.40	10	.45	12	1.85	89	1.40	58
3	1.60	70	1.70	76	.40	10	1.85	86	1.80	83	.40	10
4	1.50	64	1.60	70	.40	10	.50	14	1.82	84	1.88	89
5	1.55	67	1.62	71	.40	10	1.85	86	1.86	87	1.85	86
6	1.50	64	.20	3.0	1.75	80	1.90	90	.50	14	1.85	86
7	1.50	64	.20	3.0	1.80	83	1.90	90	1.89	89	1.86	87
8	1.40	58	.20	3.0	1.80	83	1.85	86	1.90	90	1.88	89
9	1.30	52	.20	3.0	1.80	83	1.50	64	1.80	83	1.87	88
10	1.50	64	.20	3.0	.40	10	1.80	83	1.90	90	.90	32
11	1.50	64	.20	3.0	1.20	47	1.90	90	1.78	82	1.82	84
12	1.52	65	.20	3.0	1.80	83	1.90	90	1.85	86	1.86	87
13	1.60	70	.20	3.0	1.80	83	1.90	90	.85	30	1.85	86
14	1.60	70	.20	3.0	1.80	83	1.90	90	1.85	86	1.88	89
15	1.60	70	.20	3.0	1.80	83	1.90	90	1.85	86	1.62	71
16	1.50	64	.20	3.0	1.80	83	.50	14	1.84	86	1.80	83
17	1.60	70	.20	3.0	1.80	83	1.90	90	1.85	86	1.75	80
18	1.60	70	.20	3.0	.50	14	1.88	89	1.85	86	1.80	83
19	1.70	76	.20	3.0	1.75	80	1.90	90	1.85	86	1.75	80
20	1.60	70	.20	3.0	1.80	83	1.90	90	.45	12	1.70	76
21	1.50	64	.20	3.0	1.80	83	1.90	90	1.82	84	1.75	80
22	1.60	70	.20	3.0	1.80	83	1.90	90	1.89	89	1.85	86
23	1.30	52	.20	3.0	1.80	83	.50	14	1.82	84	1.80	83
24	1.50	64	.20	3.0	1.85	86	1.90	90	1.86	87	1.75	80
25	1.52	65	.20	3.0	.50	14	1.90	90	1.89	89	1.85	86
26	1.50	64	.25	4.5	1.85	86	1.90	90	1.86	87	1.86	87
27	1.50	64	.35	8.0	1.85	86	1.90	90	1.40	58	1.85	86
28	1.70	76	.35	8.0	1.85	86	1.90	90	1.86	87	1.70	76
29	1.60	70	.35	8.0	1.86	86	1.90	90	1.82	84	1.78	82
30	1.10	42	.35	8.0	1.85	86	.45	12	1.70	76	1.80	83
31			1.40	58			1.80	83	1.85	86		
Total		1945		497.5		1888		2353		2432		2357
Mean		64.8		16.0		62.9		75.9		78.5		78.6
Sec.-ft. per square mile												
Runoff, depth in inches												
Run-off in acre-feet		3,860		984		3,740		4,670		4,830		4,680
Maximum		76		76		86		90		90		89
Minimum		42		3		8		12		12		10
Accuracy		B		B		B		B		B		B

36,100

Water in canal ½ day.

Water in canal 17 hrs

RCB 2-16-17

RCB CWS 3-14-17

RCB 1-25-17