

STATE OF IDAHO
DEPARTMENT OF RECLAMATION

BOISE

May 6, 1924

To His Excellency, Charles C. Moore,
Governor of Idaho,
Boise, Idaho.

Sir:--

I have the honor to submit herewith the report of G. Clyde Baldwin, Deputy Commissioner of Reclamation, relating to distribution of water in District No. 36, comprising Snake River, for the year 1923; containing, among other things, tables showing quantities of water delivered to the various rights during the year, records of Snake River flows at the various base stations, and a general outline of the policies adopted and the methods employed in carrying on the work.

The report does not contain all of the detailed data gathered, but only such information as will likely be of value to the water users in the District and the State, and such facts as are necessary to an understanding of the methods employed, the cost of the service, and the apportionment of such cost among the water users.

I should be ungrateful if I failed to recognize the splendid service performed by Mr. Baldwin and his organization in the performance of this work, and I take this opportunity to express my appreciation for the splendid cooperation of the majority of water users in the District.

Respectfully yours,

Commissioner of Reclamation.

STATE OF IDAHO
C. C. MOORE, GOVERNOR
DEPARTMENT OF RECLAMATION
W. G. SWENDSEN, COMMISSIONER
BOISE

Idaho Falls, Idaho,
April 25, 1924.

Mr. W. G. Swendsen,
Commissioner of Reclamation,
Boise, Idaho.

Dear Sir:

There is submitted herewith the technical report covering all regular water distribution and hydrometric operations in Water District No. 36 for the irrigation season of 1923.

U. S. Geological Survey methods have been used throughout as a standard for the collection and compilation of hydrometric data. Most of the latter which are included have been recomputed since the close of the irrigation season, and in this, as well as in other respects, the report is similar to and consistent with reports for the four preceding years.

While the special investigation conducted during the year under the supervision of Consulting Engineer R. I. Meeker has been referred to herein, such reference has been incidental to other matters and without desire to repeat unnecessarily material which has already been made public.

The so-called Normal Flow Fund was continued as a means of financing that portion of the work eventually paid for under the annual Water Master Bill. This fund was maintained during 1923 through the advance of money by the Water Users Protector Association of the North Fork of Snake River and Tributaries, the Farmers Protective Irrigation Association, the Upper Snake River Union of Water Users, the Twin Falls Canal Co. and the North Side Canal Company, Limited.

Special acknowledgements are due to the North Fork Reservoir Co., the Snake River Valley Irrigation District and the Aberdeen-Springfield Canal Co. for gage readings and to Mr. D. G. Martin, the Utah Power and Light Co., the Upper Snake River Union of Water Users, the U. S. Bureau of Reclamation, the Twin Falls Canal Co. and the North Side Canal Company, Limited, for gage readings, results of current meter measurements and other data which were furnished without charge.

The cooperation and assistance so freely given throughout the season by the members of the Water Users Committee of Nine of District No. 36, both as an advisory committee and also as individuals, was very much appreciated.

Much credit should be given to the hydrographers, deputy water masters and other members of the regular organization for the conscientious manner in which their duties were performed and for the willing assistance and hearty cooperation which they so freely rendered.

For valued assistance in the preparation of this report acknowledgement is accorded to C. A. McClelland, to L. L. Bryan and to Mrs. Bessie M. Rees.

Respectfully yours,

W. G. Swendsen
Deputy.

WATER DISTRIBUTION AND HYDROMETRIC WORK

In District No. 36

1923

by G. Clyde Baldwin

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INTRODUCTION

On January 30, 1923, a special meeting of the water users of District No. 36 was held at Idaho Falls, Idaho for the purpose of considering those problems or phases of water distribution which were not defined by court decrees and concerning which differences of opinion had for some time existed. This meeting was called by W. G. Swendsen, Commissioner of Reclamation and was attended by representatives of more than sixty of the largest canals in the District. There appeared to be a desire on the part of those present to have all disputed points amicably settled without recourse to the courts and with this end in view a committee of nine men representing different factions and sections of the District was created. The following letter of inquiry which was forwarded by the Chairman of this Committee to a number of prominent consulting engineers outlines the general situation as it appeared in February, 1923.

"Water District No. 36, State of Idaho, includes over a million acres of land irrigated from the Snake River above Milner Dam, point of diversion for the two Twin Falls projects. Geographically it is divided into three parts comprising lands irrigated (a) from the North Fork (b) from the South Fork and main river and (c) from the main river by diversion at the Minidoka and Milner Dams.

The district above American Falls was the first to be settled and has the oldest water rights. These are administered under court decrees dated December 16, 1910.

The water rights of the lower valley are also defined by decrees, but of a later date. On account of the inferior rights of the lower valley to the natural flow of the river, the projects in this part of the district were the first to acquire stored water. This was provided by the construction of a reservoir of a capacity of 847,000 acre-feet approximately and was provided on the head waters of the South Fork by the three projects in the lower valley. Subsequently 102,000 acre-feet in the reservoir were sold to about fifteen projects in the upper valley.

Under the State statutes, the natural flow of a stream is administered by a water master who is elected by the water users of the district and who reports to the State Commissioner of Reclamation. Whenever the distribution of natural flow is complicated by the introduction of stored water a Special Deputy is appointed by the Commissioner of Reclamation to see that the stored water is delivered properly and to supervise the work of the water master.

During the past fifteen years that the stored water has been delivered from the Jackson Lake reservoir, there has been a great deal of negotiation and some controversy over the amount of loss that should be charged to the stored water in transit and in regard to some other points involving the natural storage in the lake prior to the construction of the dam, bank storage, etc.

At a recent meeting of the water users of District No. 36 a committee of nine men was appointed to work out if possible a system of distribution that would take into account all of these facts and give justice to all.

The committee was also authorized to employ an impartial engineer to review all the available information and render as much assistance as possible to the committee in the solution of its problems.

If you would be interested in taking this matter up with us, we would be pleased to know upon what terms you would care to do so. Kindly let us know immediately as the next meeting of the committee will be held on the 27th day of February, 1923, at Idaho Falls."

Other important activities of this committee are described and the authority delegated to the committee by the water users is recorded in the minutes of the annual water master election for Water District No. 36, held at Idaho Falls, Idaho, March 5, 1923.

Portions of these minutes are therefore quoted:

"The following resolution which was unanimously adopted at the meeting of the Committee of Nine held in Idaho Falls February 27, 1923, was then read:

Whereas, a division of Water District No. 36 would necessarily involve a large question and should only be undertaken after it has been ascertained that the rights of the water users above American Falls can not be satisfactorily protected otherwise, and

Whereas, the purpose of this committee is to determine which method of operation is fair to all water users,

We, therefore, recommend that no action be taken at this time relative to dividing the district until this committee has concluded its work and made its final report.

The following motion was then presented by C. R. Moon and seconded by John E. Kelley:

I move that the action of the meeting of the water users of District No. 36, State of Idaho, at Idaho Falls on January 30, in appointing a Committee of Nine to work out a more satisfactory system of water distribution be ratified and that this committee be authorized to employ an engineer or engineers to assist in the investigation and fix his terms of employment; that the personal expenses of the members of the committee be borne by the divisions which they represent, and that any and all other cost and expense incurred by said committee in making said investigations be borne by the stored and natural water users of the district in proportion to the amount of water diverted by each during the season of 1923, to be collected as distribution expense. Motion unanimously carried.

Mr. Moon then presented the following motion which was seconded by P. J. Davis:

I move that the Committee of Nine supersede the present Advisory Committee of Three and with the advice of the Water Master and Special Deputy, be authorized to fix the number and wages of the distribution organization not fixed at this meeting, with the understanding that the cost, exclusive of the cost of the special investigation to be conducted by the Committee of Nine, be limited to actual cost for the season of 1923. Motion unanimously carried.

Moved by Geo. A. Pincock and seconded by William Sauer, that the meeting approve and adopt the resolution with respect to a division of Water District No. 36 which had been previously read by Chairman Hart, as the action which already had been taken by the Committee of Nine. Motion carried."

G. Clyde Baldwin was elected Water Master of District No. 36 for the season of 1923 and, at a special meeting of the Committee of Nine held immediately after the election, R. I. Meeker of Denver, Colorado was employed as their consulting engineer.

Committee meetings of March 30 and May 7 respectively were devoted largely to plans for 1923 water distribution and special investigations. In consequence the minutes of these two meetings are quoted herein to the extent deemed necessary to afford an official record of the more important features.

Special meeting of Committee of Nine of Water District No. 36 held at Idaho Falls, Idaho March 30, 1923.

Members present: John W. Hart, F. A. Banks, C. R. Moon, W. O. Cotton, W. C. Sollenberger, John E. Kelley, F. A. Miller and Harvey Hurlbeaus (substituting for R. E. Shepherd and Ivan G. Lincoln.)

"The purpose of the meeting was to consider the plan and budget submitted by the Water Master, G. Clyde Baldwin, for the season of 1923.

The budget as presented by Mr. Baldwin was read by F. A. Banks and is included herewith as a part of the minutes of this meeting."

(Portion of minutes containing itemized budget and detailed action of Committee thereon, omitted.)

"Summarizing the annual budget for water distribution and hydrometric work as finally approved by the committee shows a saving to the normal flow water users over the 1922 expense as follows:

Total estimated cost for year as approved by Committee	\$23,122.50
Estimated amount of funds available for hydrometric work from State, U. S. Geological Survey and U. S. Indian Service	<u>5,000.00</u>
Net amount to be paid by water users	\$18,122.50
Estimated 40 per cent payable by Stored Water Users	<u>7,249.00</u>
Balance payable by Normal Flow Water Users	\$10,873.50
1922 Water Master bill (General Charge)	<u>12,036.00</u>
Net reduction	\$ 1,162.50

Moved by C. R. Moon, seconded by F. A. Banks, that the committee recommend the appointment of G. Clyde Baldwin both as Deputy and Special Deputy Commissioner of Reclamation for Water District No. 36, and that the chairman be designated to advise the Commissioner of Reclamation by letter concerning this action. Motion unanimously carried.

Moved by F. A. Banks, seconded by F. A. Miller, that in the event the North Fork Reservoir Company should request the appointment of a Special Deputy to handle the distribution of water stored in the Henrys Lake Reservoir, the committee recommend the appointment of C. A. McClelland upon the understanding that he should work under the direction of G. Clyde Baldwin as Deputy Commissioner of Reclamation. Unanimously carried.

Moved by C. R. Moon, seconded by John E. Kelley, that the committee favor the division of all expenditures chargeable to the water users of District No. 36 upon the basis of 40 per cent payable by the Stored Water Users and 60 per cent payable by Normal Flow Users, and that 1923 contracts be prepared in so far as possible upon this basis. Motion unanimously carried.

Moved by F. A. Banks, seconded by C. R. Moon, that the committee recommend the advancing of the sum of \$12,000 to finance the water distribution and hydrometric work during the 1923 season, this amount to be provided as follows:

- \$2,500 to be advanced by the Water Users' Protector Association of the North Fork of Snake River and Tributaries
- 2,500 to be advanced by the Farmers Protective Irrigation Assn.
- 2,000 to be advanced by the Upper Snake River Union of Water Users
- 5,000 to be advanced by the lower valley canal companies

This motion further provided that interest be computed on all money so advanced, and that this interest be included in the annual water master's bill and when collected be repaid to the parties making the advances. Motion unanimously carried."

(Balance of minutes of meeting of March 30, 1923 omitted.)

Special meeting of the Committee of Nine of Water District No. 36
Held at Idaho Falls, Idaho, May 7, 1923.

Members present: John W. Hart, R. E. Shepherd, F. A. Banks, W. C. Sollenberger, W. O. Cotton, John E. Kelley, C. R. Moon and F. A. Miller. Absent: Ivan G. Lincoln.

"The purpose of the meeting was to listen to the Preliminary Report of Engineer R. I. Meeker, based upon investigations conducted during the preceding two months. This report was read by Mr. Meeker.

Moved by F. A. Miller, seconded by F. A. Banks, that Mr. Meeker's report be received, filed with the secretary and made a part of the proceedings of the committee. Motion unanimously carried.

Mr. Meeker then distributed copies of his report to each committee member and to the secretary of the committee.

Moved by C. R. Moon, seconded by John E. Kelley, that the 1923 recommendations contained in paragraphs 1, 2 and 3 on page three of the report of R. I. Meeker this day submitted and filed, be approved and adopted as a temporary method of distribution, pending further field examination and report by Mr. Meeker. Roll call on this motion showed all members voting in the affirmative.

The following motion was then offered by R. E. Shepherd and seconded by F. A. Miller:

BE IT RESOLVED, That Mr. Baldwin be authorized and instructed to carry out the recommendations contained in paragraphs (a), (b), (c), and (d) on page six of Mr. Meeker's report and that he further be authorized to incur the necessary expense therefore. Unanimously carried."

(Portion of minutes omitted.)

Moved by R. E. Shepherd, seconded by W. C. Sollenberger, that the date for beginning the 1923 employment of river riders, deputy water master and hydrographers be left to the judgment of Mr. Baldwin. Unanimously carried.

Moved by R. E. Shepherd, seconded by John E. Kelley, that the amount to be charged as storage transmission loss between Henrys Lake reservoir and the headings of canals making use of Henrys Lake storage be referred to Mr. Meeker for a report at a future meeting of the committee. Unanimously carried.

Copies of the proposed contract between the U. S. Reclamation Service, representing the Jackson Lake Stored Water Users and the State of Idaho for the year ending May 31, 1924, were presented to each member of the committee and to the secretary by F. A. Banks. The essential portions of this contract were then read by Mr. Banks, following which, on motion by W. C. Sollenberger, seconded by John E. Kelley, the contract was unanimously approved.

Moved by R. E. Shepherd and seconded by F. A. Banks, that Mr. Baldwin's bond as Treasurer of the Normal Flow Fund of Water District No. 36 be fixed at \$5,000 for the coming year, and that this bond should be made out to the Chairman of the Committee of Nine as representative of the water users of District No. 36. Unanimously carried."

(Portion of minutes omitted.)

The portions of Mr. Meeker's preliminary report referred to in the preceding minutes are as follows:

1923 RECOMMENDATIONS

- (1) "That, pending field examination of the Moran to Heise section of the river, and checking of information now in hand, the present deduction of 2 $\frac{1}{2}$ % for transmission losses of storage water between Moran and Heise continue temporarily until recommendations on this section of the river are made sometime in July.
- (2) That, the necessary engineering investigations be immediately commenced by the present hydrographic organization to determine losses in transit in the Snake River section between Heise and Butte Bridge near Menan. Also that pending such determination an arbitrary deduction of 3% be charged reservoir water through the Heise-Butte Bridge section for channel losses.
- (3) That between Butte Bridge and Blackfoot the present methods of determining losses in transit of stored water be continued, viz. Butte Bridge to Woodville by progressive two day mean and Woodville to Blackfoot by a deduction of 6% pending the securing of additional information concerning losses in this section."

"It should be recognized at the outset that determination of channel losses in the Snake River between Heise and Butte Bridge will be a difficult problem requiring the following equipment and information:

- (a) Establishment of a gaging station on the Snake River at the Butte Bridge near Meran. The establishment of such a station will divide the present 50 mile river section into a 20 mile section (Heise to Butte Bridge) and a 30 mile section (Butte Bridge to Woodville.) An automatic register will be required.
- (b) The establishment of a gaging station on the Great Feeder near its head. A cable and automatic gage will be required.
- (c) Records of elevation of the water table in wells in the area lying roughly between Heise and Menan and between Rigby and Rexburg during the period of May to October.
- (d) Measurement of river losses and gains in the Heise-Butte Bridge section at various stages of the river flow and during different times of the year similar to the special measurements made in 1919 between Heise and Lorenzo during August and September.

Intelligent treatment of the channel losses in the river between Heise and Butte Bridge requires the above engineering information. An engineering assistant will have to be added to the present hydrographic force for at least six months and the estimated cost of the work for one year will be about \$2,500. Continuance of such work beyond the present season will rest on the results secured this year, but would probably be advisable for a two-year period."

Except for the modifications indicated in the preceding portion of this report the same general plan under which water distribution and hydrometric work were carried on during the years 1919 to 1922 inclusive was again effective during 1923. Under this plan all work of both classes is handled from one office in Idaho Falls. The State of Idaho and the U. S. Geological Survey, through a cooperative agreement, provide funds for hydrometric work of a general interest character, the U. S. Indian Service pays the actual cost of a small amount of specific work which is done for the benefit of their Fort Hall Project, while all water distribution and hydrometric work conducted primarily for distribution purposes are sustained through funds made available by normal flow and stored water users. This plan has been outlined in greater detail in the 1919 and 1921

Wm. Burton	Deputy Water Master, Swan Valley Canals
Fred J. Anderson	" " " Minidoka Dam
W. N. McConnel	" " " & Hydrographer, Milner Dam
J. M. McGinn	" " " & Gate Tender, Henrys Lake Dam
Joseph Markham	Superintendent Jackson Lake Dam
Frances Woodburn	Forwarding Agent Ashton, Idaho

Harold Fuqua, Hortense Cartier, O. L. Kofoed, J. A. Clough, E. L. Jennings, A. J. Ayers, E. Luetjen and Ira Moore, Gage Readers.

NOTE: Roy B. Johnson was employed primarily for investigation work under direction of R. I. Meeker, Consulting Engineer, but assisted for short periods of time in the regular distribution and hydrometric work to offset, in part, time which some of the regular personnel devoted to special investigation work.

DESCRIPTIVE OUTLINE OF 1923 DISTRIBUTION

Snow reports received during the latter part of April indicated that the accumulated supply in the mountains near Jackson Lake was slightly less both in depth and also in water content than the average of the three preceding years.

Climatic conditions during April and May in general were nearly normal. June on the other hand contained an unusually large number of cloudy and rainy days with total precipitation generally above and mean temperature below normal.

River discharge during May was very similar to that of the preceding year, but throughout the month of June in 1923 a considerable deficiency was noted.

When the outlet gates of Jackson Lake Reservoir were finally shut down on October 14, 1922, there remained unused storage to the amount of 255,650 acre-feet which could be carried over for use during the next season. The gates remained closed until June 19, 1923 when with reservoir again filled nearly to capacity they were raised slightly and an increasing amount released until June 21st. From June 22d to July 7th inclusive



STATION

[illegible]

AUXILIARY STATIONS

A SNAKE RIVER AT SOUTH BOUND YELLOW STONE PARK
WENDY'S FORK AT WARM RIVER IDA
WARM RIVER AT WARM RIVER IDA
ROBINSON CREEK WAT WARM RIVER IDA
HENRYS FORK AT LAKE IDA
F SNAKE RIVER NEAR MENAN IDAHO
S GREAT FEEDER CANAL NEAR NIPIC IDAHO



the reservoir was maintained at its full capacity of 847,000 acre-feet, while the entire normal flow of the river was allowed to pass the dam.

At the Heise gaging station Snake River reached its maximum discharge for the year (24,100 second-feet mean for the day) on May 27th. Since water was being stored at Jackson Lake throughout the entire period of normal peak discharge it is obvious that this reservoir was again of material benefit in the prevention of floods. Heise discharges during the last half of the month of June varied between 14,400 and 18,200 second-feet. Because of unusually cool rainy weather the irrigation demand was comparatively light throughout most of this period but increased rapidly about July 1st. From a discharge of 18,200 second-feet for the regular midnight to midnight day on July 2d the stage at Heise dropped steadily to less than 15,000 second-feet on July 6th, increased slightly on the 7th, then dropped again on the 8th on which date all canals were cut to record rights and the first storage was released.

All permit and license rights were cut off on July 13th and thereafter decreed rights were cut as follows:

July 21	Rights having a priority date subsequent to Mar. 26, 1903
" 24	" " " " " " " " " Oct. 11, 1900

Unusually heavy rains which occurred July 23d to 25th resulted in such an increase in the available normal flow that rights were reinstated back to a priority date of March 26, 1903 on July 27th and back to Oct. 7, 1905 on July 28th.

Thereafter cuts were again effective as follows:

July 31	Rights having a priority date subsequent to Mar. 26, 1903
Aug. 3	" " " " " " " " " Oct. 11, 1900
Aug. 4	" " " " " " " " " June 1, 1899
Aug. 5	" " " " " " " " " July 8, 1896
Aug. 7	" " " " " " " " " Feb. 5, 1895
Aug. 8	" " " " " " " " " Jan. 8, 1895

Decreased demand by canals which began about the middle of August resulted in reinstatement of rights in accordance with the following table which shows those which were invalid on the respective dates:

Aug. 15	Rights having a priority date subsequent to Feb. 6, 1895						
Aug. 17	"	"	"	"	"	"	Mar. 22, 1895
Aug. 18	"	"	"	"	"	"	Jan. 1, 1896
Aug. 19	"	"	"	"	"	"	July 9, 1896
Aug. 21	"	"	"	"	"	"	June 1, 1899
Aug. 22	"	"	"	"	"	"	Oct. 11, 1900
Aug. 23	"	"	"	"	"	"	Mar. 26, 1903

Had climatic conditions been similar to those of 1922 it seems probable that after Aug. 25th regulation would have been practically at an end in the upper valley.

River conditions at this time together with tentative plans for September work are outlined in the following letter:

Idaho Falls, Idaho.
August 27, 1923.

"Members of the Water Users' Committee of Nine of District No. 36.

Gentlemen:

The following general program for river operations during the balance of the present season is submitted for your approval and consideration:

(1) The services of all river riders to be discontinued at the end of the present month with the exception of one man employed for about three days for the purpose of securing canal gage readings while the last return flow investigation between the Heise and Menan gaging stations is in progress.

(2) Daily reports from most of the special gage readers to be discontinued at the end of this month. Exceptions to this proposal will be reports from the station on Snake River near Blackfoot and for stations farther down the river where supervision of both stored and normal flow distribution will doubtless be required throughout the entire month of September.

(3) All hydrographers to be retained until the end of September when the services of Messrs. Beckman and Dawson will be terminated.

The above program is practically the same as that which was followed in both 1921 and 1922. Based on the experience of these two years, it seems unlikely that any canal regulation will be required throughout

the Upper Valley during the month of September, although this of course, cannot be absolutely predicted in advance. No storage has been released from Jackson Lake Reservoir since the afternoon of August 23d, while the release of stored water from the Henrys Lake and Two Ocean-Emma Matilda Reservoirs was discontinued a few days earlier. Decreed rights are now in good standing, back as far as March 26, 1903, which practically means, at this low river stage, that Upper Valley diversions are restricted only by the ability of the individual canals to divert water from the river.

It is proposed to supply lower valley canals by drawing upon storage in Lake Walcott and thus conserving the maximum possible amount in Jackson Lake Reservoir as protection against a period of deficient run-off. Should we have a prolonged period of hot, dry weather, the available supply in Lake Walcott might be insufficient to cover the needs for the balance of the irrigation season; in which event, it would of course become necessary to again draw upon Jackson Lake storage, which procedure would probably necessitate further regulation of canals in the Upper Valley. Everything considered, however, it is believed that the reduction in force at the end of this month is justified, since it will result in a material saving in expense.

If the above program is adopted, daily readings will not, of course, be attempted for the canal gaging stations after August 31st. Each canal will be visited at intervals, however, as in the two former years, which makes it possible by means of interpolation between visits to include September records in the final report, although they will not, of course, be as accurate as those for the preceding period when daily readings were secured.

It has been customary during preceding years to utilize the September low water period as a time for doing necessary new construction work and repairs at the more important gaging stations. Usually we have attempted to reconstruct the equipment for at least one major river station to make it practically permanent in character. Under ordinary conditions, the station on Snake River above the Woodville bridge would probably be the next to receive attention in this way. The recording gage house at this station, which is of wood, has begun to decay particularly near the ground surface, and since it is one of our most important stations, it would probably be good policy to replace the present wood installation with a concrete structure. However, the present structure can without doubt be used satisfactorily for at least one more year.

Practically the entire equipment at the gaging station on Blackfoot River, above its mouth, is in need of replacement and if possible the inclined staff gage which has been in use for so many years should be replaced by a substantial recording gage installation. The flow past this station is subject to sudden, irregular, and some times very large fluctuations and in consequence staff gage readings cannot be depended upon to accurately represent the mean flow for the day. Some repair work at this station will be almost essential but because of the fact that the U. S. Indian Service is trying to drain their Blackfoot-Marsh Reservoir this year it seems probable that the low water conditions which would be desirable at the time of a recording gage installation may not again be experienced at this station during the present season and for this reason it

might be better to postpone this work until next year.

Another thing which must be considered in connection with any program of construction work is the limitation in available personnel resulting from the demands of special work which it is necessary to do in order to complete the investigations recommended by Mr. Meeker and already approved by your committee. Chief among these during the next two months will probably be the running of level lines necessary to tie in the wells which have been under observation during the season. Work of this character will take up a large part of the time of employees who might otherwise be available for construction work. I would suggest, therefore, that you leave the matter of construction and repairs largely to my judgment, upon the understanding that we will try to do as much work of this character as practicable without interference with the regular or special work already authorized.

Since it will probably not be expedient to convene another meeting of your committee before September 1st, I will have to depend upon approval by letter of the above outlined program and would suggest that if you are opposed to any part of it, you notify me immediately. Failure to receive such notice before the end of this month will be considered as equivalent to your approval of the program as outlined. I hope, however, that even if these plans are approved you will feel free, individually as committee members, to write to me and offer suggestions or comments as desired."

Sincerely yours,

(Signed) G. Clyde Baldwin

Water Master

Unseasonably hot dry weather began, however, about the time this letter was written and resulted in an increasingly heavy demand for irrigation water. Upper valley canals used almost all the normal flow available above Blackfoot and it was soon evident that the Lake Walcott supply would be insufficient to supply the full demand of the lower valley canals.

Since the Twin Falls canals would benefit most by a large holdover in Jackson Lake the situation was presented in full at a meeting with their representatives which was held in American Falls on September 1, 1923. These representatives felt that they were not warranted in making any agreement which would deprive their settlers of water which was then

available simply to insure a full reservoir for the year 1924. Consequently storage was again released from Jackson Lake beginning September 2d and continuing until September 21st inclusive.

This late storage delivery, coming as it did when the flow in the river was at a low stage, removed the natural draft limitations which had been effective in the case of many upper valley canals and necessitated renewed and somewhat drastic regulation as outlined in the following table which shows the rights which were invalid on the respective dates.

Sept. 4	Rights having a priority date subsequent to July 9, 1896						
Sept. 5	"	"	"	"	"	"	Feb. 5, 1895
Sept. 6	"	"	"	"	"	"	Aug. 17, 1894
Sept. 20	"	"	"	"	"	"	Feb. 5, 1895
Sept. 23	"	"	"	"	"	"	Mar. 22, 1895
Sept. 24	"	"	"	"	"	"	July 9, 1896
Sept. 25	"	"	"	"	"	"	Oct. 11, 1900

In order to handle this necessary regulation three deputy water masters or river riders were employed during a large part of September.

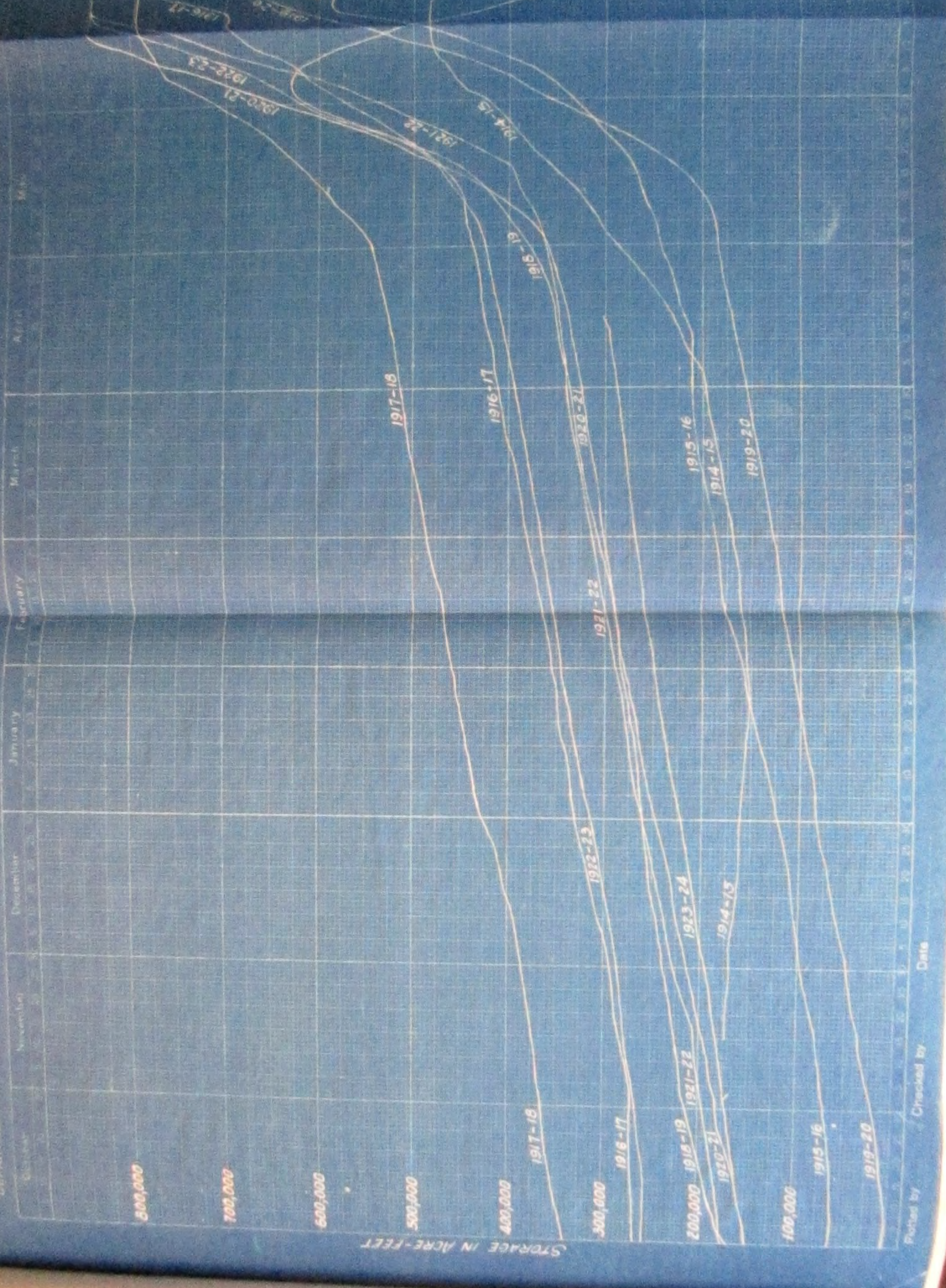
The only new construction work accomplished was the renewal or replacement of the cable and car measuring equipment at the station on Blackfoot River near its mouth.

Normal flow only was allowed to pass the outlet of Jackson Lake from September 22d to 26th inclusive and on September 27th after several days of rainy weather the gates were closed entirely to begin storage for the next year with a hold-over amounting to 142,730 acre-feet.

Plate II illustrates graphically the rate at which Jackson Lake Reservoir was filled or drawn down during the period from November 15, 1914 to March 31, 1924 inclusive. All graphs are plotted on the basis of 1919 capacity tables.

WATER SUPPLY

If the comparison of annual run-off at the Moran and Neeley gaging



Plotted by _____
Checked by _____
Date _____

UNITED STATES GEOLOGICAL SURVEY WATER RESOURCES BRANCH
HYDROGRAPH FOR JACKSON LAKE BEGINNING NOVEMBER 15, 1914. PLATE II



stations which has been included in the three preceding reports is extended to include the year ending September 30, 1923, the data may be summarized as follows:

Station	Mean annual run-off for 20 years ending September 30, 1923	Run-off for year ending September 30, 1923	% of mean
Moran	1,120,000	944,500	84.3
Neeley	6,754,000	5,630,000	83.4

In this tabulation all Moran records beginning with the year 1910, have been corrected to take account of the storage in Jackson Lake which is held over from one climatic year to another. Neeley records, on the other hand, have not been subjected to any storage corrections, but represent actual totals measured at the gaging station. Variations in the amount diverted for irrigation as well as in the quantity of inflow entering between the two stations also affect the Neeley comparisons. Since annual run-off comparisons are not necessarily applicable as a true measure of the summer water supply and because of the difficulty encountered in computing any dependable storage and diversion corrections for application to the Neeley record, no attempt has been made to apply such corrections to the 1923 results.

The data presented under this heading suffice to show in a general way the 1923 deficiency in total run-off while the tables given on Plate XIV afford additional information concerning the normal flow water supply available during the irrigation season.

STORAGE VERSUS FLOOD WATER DIVERSIONS

The fact that Jackson Lake was filled to capacity nearly three weeks before any regulation in Idaho became necessary eliminated any possible conflict with respect to the right to store water there as opposed to the use of

normal flow under prescriptive or non-record rights.

Storage of water in Henrys Lake Reservoir was continued, however, until July 8th when, coincident with the beginning of canal regulation, the outlet gates were opened sufficiently to permit normal flow to pass the dam. Several complaints were received from water users having small decreed or permit rights for diversions from Henrys Lake outlet below the dam. Investigation showed that in these cases sufficient water was in the stream channel at the canal headings to fill the respective rights, although it could not well be utilized (because of the low stage) without the construction of new diverting works. Since this seemed to be largely a matter for adjustment between the individual users and the Reservoir Company no action was taken by the State or water district officials.

DOMESTIC WATER

No domestic water allowances were granted during the 1923 irrigation season.

The amount of Jackson Lake storage available for seasonal sale or rental was materially reduced by the completion of contracts providing for the permanent use of 12,500 acre-feet by the New Sweden Irrigation District, 10,000 acre-feet by the Snake River Valley Irrigation District and 15,000 acre-feet by the Milner Low Lift Irrigation District. Some 571 acre-feet were disposed of from this source, however, at the old rate of \$1.00 per acre-foot for the season. In addition, nearly 4,000 acre-feet of Henrys Lake storage was sold or rented for the season upon a similar basis.

MUNICIPAL WATER RIGHTS

Neither St. Anthony nor Idaho Falls is as yet supplied with any permanent water right which can be depended upon to remain valid throughout

the entire irrigation season.

During 1923 one hundred acre-feet of Henrys Lake storage was purchased for the city of St. Anthony and this, together with water made available at times through temporary transfer from canals with valid rights, proved sufficient to cover their use during that portion of the season when their own decreed rights were inadequate.

The city of Idaho Falls was supplied during the deficiency period by temporary transfers from the Kennedy and Idaho Canals, respectively.

TEMPORARY TRANSFERS

The recognition of temporary transfers, under which water is shut out of one canal and turned into another upon submission of a written request from the canal having the valid right, was continued. The pooling system modification of this principle which was used to advantage for several seasons in the North or Henrys Fork area was supplanted in 1923 by the use of Henrys Lake storage and straight temporary transfers.

The Water Master was again authorized to aid canals which were especially in need of water through temporary transfers from the Reservation Canal. This canal was shut dry during a considerable part of the season, due to the fact that, with the draining of the Blackfoot-Marsh Reservoir which was in progress, a sufficient supply of water was available from that source for lands under the Fort Hall irrigation system. The transfer authorization was given, as in 1922, upon the express understanding that it should in no way jeopardize the Snake River rights of the Reservation Canal. Because of the belief that decreed rights should, in general, benefit from the situation in the order of their priority, little use was made of this blanket transfer privilege during the 1923 season.

EXCHANGE OF NORMAL FLOW FOR STORAGE

Early in 1923 a plan was submitted to the Water Users Committee of Nine of District No. 36 which, if adopted, would have permitted the exchange of normal flow for storage upon a very general basis. Objections to this plan were raised, however, by a number of the younger right canals on the ground that its general use would result in cutting their rights earlier than would otherwise be necessary. Consequently practical application of the change was never approved.

Two small exchanges of storage for normal flow were made during the season with the Lenroot and Peoples Canals, respectively, each of which owns storage rights in Jackson Lake. These exchanges were completed under the same regulations followed in other seasons described in the 1921 report.*

Stored water from Henrys Lake Reservoir sold to canals diverting from Fall River involved an exchange of this character, since actual delivery was made from normal flow, while storage was given to other canals in lieu of the normal flow so deducted.

LITIGATION

During the past year two cases involving decreed water rights in District No. 36, which were decided in the District Court, were appealed to the State Supreme Court.

One of these, Koon vs. Empey, et al, was for the purpose of determining the present ownership and place of use of twelve second-feet of water originally decreed to O. H. Olive as of date June 1, 1889. Part of the land to which this water was originally decreed was washed away by the river and the hearing brought out various points relative to ownership and

*Water Distribution and Hydrometric Work in District No. 36, 1921
by G. Clyde Baldwin

transfer of decreed water rights and the application of water to beneficial use through sub-irrigation. The lower court decision favored the plaintiff, Koon, but an appeal was made by O. H. Olive and C. H. DeCamp as intervenors.

The second case, that of the Fall River Irrigation Co. vs. W. G. Swendsen, et al, was one in which the plaintiff company sought to have the priority date of their decreed water right advanced from June 1, 1889 to June 1, 1865, upon the ground that the former date was the result of a clerical error and not in accord with the original testimony as presented. The district court in this case held against the plaintiffs who recently have appealed from this decision.

On July 28, 1923 a temporary injunction was issued by the Judge of the Ninth Judicial District of Idaho restraining the Commissioner of Reclamation, Water Master of District No. 36 and others from in any way interfering with the diversion, by the Independent Irrigation Co., of 2,000 inches of water from Scott Slough, a tributary of the Snake River. (See Page 14, "Water Distribution and Hydrometric Work in District No. 36, 1922" for summary of preceding Independent Irrigation Co. litigation.)

This matter was presented to the Water Users Committee of Nine of District No. 36 at their meeting of August 2, 1923. They decided to take no action on the part of the District, but directed the Water Master to send copies of the legal papers in this case to each of the three Upper Valley water users associations and to the principal lower valley canals. Following this action counsel was retained by several of these particularly interested associations or canals and a complaint in intervention was filed in the name of the North Side Canal Co. Ltd., the New Sweden Irrigation

District, the Snake River Valley Irrigation District and the Idaho Irrigation District.

After several postponements this case finally came up for trial at Rigby, Idaho, on March 19, 1924 before Judge O. R. Baum. Early in the progress of the trial, however, the Judge announced that after reading the entire complaint and becoming more familiar with the case he felt it necessary in the interest of justice to disqualify himself as trial judge because of his relationship to J. W. Hays, the man to whom the Independent Irrigation Co. sold the water credited to them under the 1910 court decree. The trial was therefore halted and shortly afterwards was reset for hearing before Judge Robert M. Terrell at Rigby, Idaho on April 28, 1924.

CANAL DELIVERIES

The total amount diverted daily through each canal heading either in the South Fork or main river for the four months ending September 30, 1923 is shown on Plates III, IV, V and VI.

Following the practice inaugurated in the 1919 report, except for a few of the smaller canals where estimates were used, all data were recomputed prior to their presentation herein. This practice affords opportunity to more thoroughly analyze the records at each station than is possible in the limited time available during the field season. Wherever changes in rating have been noted, either because of the growth of vegetation, variation of checks or for any other reason, all meter measurements, notes and other data have been carefully reviewed to the end that the final computed data may represent the most reasonable interpretation of these changes, particularly as regards time. On days when more than one stage has been observed mean discharges have been recorded. Daily summaries

DISTANCE IN SECOND FEET OF CANALS										RIVER FOR JUNE 1923										
STATION	DATE	TIME	WIND	TEMP	HUMID	WAVE	SWELL	SEA	STATE	STATION	DATE	TIME	WIND	TEMP	HUMID	WAVE	SWELL	SEA	STATE	
1	1923	10:00	10	65	75	10	10	10	10	1	1923	10:00	10	65	75	10	10	10	10	10
2	1923	11:00	10	65	75	10	10	10	10	2	1923	11:00	10	65	75	10	10	10	10	10
3	1923	12:00	10	65	75	10	10	10	10	3	1923	12:00	10	65	75	10	10	10	10	10
4	1923	13:00	10	65	75	10	10	10	10	4	1923	13:00	10	65	75	10	10	10	10	10
5	1923	14:00	10	65	75	10	10	10	10	5	1923	14:00	10	65	75	10	10	10	10	10
6	1923	15:00	10	65	75	10	10	10	10	6	1923	15:00	10	65	75	10	10	10	10	10
7	1923	16:00	10	65	75	10	10	10	10	7	1923	16:00	10	65	75	10	10	10	10	10
8	1923	17:00	10	65	75	10	10	10	10	8	1923	17:00	10	65	75	10	10	10	10	10
9	1923	18:00	10	65	75	10	10	10	10	9	1923	18:00	10	65	75	10	10	10	10	10
10	1923	19:00	10	65	75	10	10	10	10	10	1923	19:00	10	65	75	10	10	10	10	10
11	1923	20:00	10	65	75	10	10	10	10	11	1923	20:00	10	65	75	10	10	10	10	10
12	1923	21:00	10	65	75	10	10	10	10	12	1923	21:00	10	65	75	10	10	10	10	10
13	1923	22:00	10	65	75	10	10	10	10	13	1923	22:00	10	65	75	10	10	10	10	10
14	1923	23:00	10	65	75	10	10	10	10	14	1923	23:00	10	65	75	10	10	10	10	10
15	1923	00:00	10	65	75	10	10	10	10	15	1923	00:00	10	65	75	10	10	10	10	10
16	1923	01:00	10	65	75	10	10	10	10	16	1923	01:00	10	65	75	10	10	10	10	10
17	1923	02:00	10	65	75	10	10	10	10	17	1923	02:00	10	65	75	10	10	10	10	10
18	1923	03:00	10	65	75	10	10	10	10	18	1923	03:00	10	65	75	10	10	10	10	10
19	1923	04:00	10	65	75	10	10	10	10	19	1923	04:00	10	65	75	10	10	10	10	10
20	1923	05:00	10	65	75	10	10	10	10	20	1923	05:00	10	65	75	10	10	10	10	10
21	1923	06:00	10	65	75	10	10	10	10	21	1923	06:00	10	65	75	10	10	10	10	10
22	1923	07:00	10	65	75	10	10	10	10	22	1923	07:00	10	65	75	10	10	10	10	10
23	1923	08:00	10	65	75	10	10	10	10	23	1923	08:00	10	65	75	10	10	10	10	10
24	1923	09:00	10	65	75	10	10	10	10	24	1923	09:00	10	65	75	10	10	10	10	10
25	1923	10:00	10	65	75	10	10	10	10	25	1923	10:00	10	65	75	10	10	10	10	10
26	1923	11:00	10	65	75	10	10	10	10	26	1923	11:00	10	65	75	10	10	10	10	10
27	1923	12:00	10	65	75	10	10	10	10	27	1923	12:00	10	65	75	10	10	10	10	10
28	1923	13:00	10	65	75	10	10	10	10	28	1923	13:00	10	65	75	10	10	10	10	10
29	1923	14:00	10	65	75	10	10	10	10	29	1923	14:00	10	65	75	10	10	10	10	10
30	1923	15:00	10	65	75	10	10	10	10	30	1923	15:00	10	65	75	10	10	10	10	10
31	1923	16:00	10	65	75	10	10	10	10	31	1923	16:00	10	65	75	10	10	10	10	10
32	1923	17:00	10	65	75	10	10	10	10	32	1923	17:00	10	65	75	10	10	10	10	10
33	1923	18:00	10	65	75	10	10	10	10	33	1923	18:00	10	65	75	10	10	10	10	10
34	1923	19:00	10	65	75	10	10	10	10	34	1923	19:00	10	65	75	10	10	10	10	10
35	1923	20:00	10	65	75	10	10	10	10	35	1923	20:00	10	65	75	10	10	10	10	10
36	1923	21:00	10	65	75	10	10	10	10	36	1923	21:00	10	65	75	10	10	10	10	10
37	1923	22:00	10	65	75	10	10	10	10	37	1923	22:00	10	65	75	10	10	10	10	10
38	1923	23:00	10	65	75	10	10	10	10	38	1923	23:00	10	65	75	10	10	10	10	10
39	1923	00:00	10	65	75	10	10	10	10	39	1923	00:00	10	65	75	10	10	10	10	10
40	1923	01:00	10	65	75	10	10	10	10	40	1923	01:00	10	65	75	10	10	10	10	10
41	1923	02:00	10	65	75	10	10	10	10	41	1923	02:00	10	65	75	10	10	10	10	10
42	1923	03:00	10	65	75	10	10	10	10	42	1923	03:00	10	65	75	10	10	10	10	10
43	1923	04:00	10	65	75	10	10	10	10	43	1923	04:00	10	65	75	10	10	10	10	10
44	1923	05:00	10	65	75	10	10	10	10	44	1923	05:00	10	65	75	10	10	10	10	10
45	1923	06:00	10	65	75	10	10	10	10	45	1923	06:00	10	65	75	10	10	10	10	10
46	1923	07:00	10	65	75	10	10	10	10	46	1923	07:00	10	65	75	10	10	10	10	10
47	1923	08:00	10	65	75	10	10	10	10	47	1923	08:00	10	65	75	10	10	10	10	10
48	1923	09:00	10	65	75	10	10	10	10	48	1923	09:00	10	65	75	10	10	10	10	10
49	1923	10:00	10	65	75	10	10	10	10	49	1923	10:00	10	65	75	10	10	10	10	10
50	1923	11:00	10	65	75	10	10	10	10	50	1923	11:00	10	65	75	10	10	10	10	10
51	1923	12:00	10	65	75	10	10	10	10	51	1923	12:00	10	65	75	10	10	10	10	10
52	1923	13:00	10	65	75	10	10	10	10	52	1923	13:00	10	65	75	10	10	10	10	10
53	1923	14:00	10	65	75	10	10	10	10	53	1923	14:00	10	65	75	10	10	10	10	10
54	1923	15:00	10	65	75	10	10	10	10	54	1923	15:00	10	65	75	10	10	10	10	10
55	1923	16:00	10	65	75	10	10	10	10	55	1923	16:00	10	65	75	10	10	10	10	10
56	1923	17:00	10	65	75	10	10	10	10	56	1923	17:00	10	65	75	10	10	10	10	10
57	1923	18:00	10	65	75	10	10	10	10	57	1923	18:00	10	65	75	10	10	10	10	10
58	1923	19:00	10	65	75	10	10	10	10	58	1923	19:00	10	65	75	10	10	10	10	10
59	1923	20:00	10	65	75	10	10	10	10	59	1923	20:00	10	65	75	10	10	10	10	10
60	1923	21:00	10	65	75	10	10	10	10	60	1923	21:00	10	65	75	10	10	10	10	10
61	1923	22:00	10	65	75	10	10	10	10	61	1923	22:00	10	65	75	10	10	10	10	10
62	1923	23:00	10	65	75	10	10	10	10	62	1923	23:00	10	65	75	10	10	10	10	10
63	1923	00:00	10	65	75	10	10	10	10	63	1923	00:00	10	65	75	10	10	10	10	10
64	1923	01:00	10	65	75	10	10	10	10	64	1923	01:00	10	65	75	10	10	10	10	10
65	1923	02:00	10	65	75	10	10	10	10	65	1923	02:00	10	65	75	10	10	10	10	10
66	1923	03:00	10	65	75	10	10	10	10	66	1923	03:00	10	65	75	10	10	10	10	10
67	1923	04:00	10	65	75	10	10	10	10	67	1923	04:00	10	65	75	10	10	10	10	10
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69	1923	06:00	10	65	75	10	10	10	10	69	1923	06:00	10	65	75	10	10	10	10	10
70	1923	07:00	10	65	75	10	10	10	10	70	1923	07:00	10	65	75	10	10	10	10	10
71	1923	08:00	10	65	75	10	10	10	10	71	1923	08:00	10	65	75	10	10	10	10	10
72	1923	09:00	10	65	75	10	10	10	10	72	1923	09:00	10	65	75	10	10	10	10	10
73	1923	10:00	10	65	75	10	10	10	10	73	1923	10:00	10	65	75	10	10	10	10	10
74	1923	11:00	10	65	75	10	10	10	10	74	1923	11:00	10	65	75	10	10	10	10	10
75	1923	12:00	10	65	75	10	10	10	10	75	1923	12:00	10	65	75	10	10	10	10	10
76	1923	13:00	10	65	75	10	10	10	10	76	1923	13:00	10	65	75	10	10	10	10</	

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM SNAKE RIVER FOR AUGUST 1928

[illegible]

SHANE RIVER FOR SEPTEMBER																															
NAME OF CANAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
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ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
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ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
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ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
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ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208	228	258	288	318	348	378	408	438	468	498	528	558	588	618	648	678	708	738	768	798	828	858	888	918	948	978	
ALBERTSON	120	182	167	208																											

showing the total diversions between river gaging stations have also been included.

River riders were employed on the Heise, Rigby and Blackfoot divisions from about September 3d to 23d inclusive, but with these exceptions data for the month of September are based upon the smaller number of gage readings which it was possible for the remainder of the organization to secure in connection with other work and for this reason canal records for this month are probably less reliable than those for the balance of the record period. Discharges listed for days for which no gage readings are available have, with few exceptions, been interpolated.

Beginning July 9 after a dike to exclude river water had been constructed across the slough from which the Morgan and Rostan canals divert, records of the flow through these canals were discontinued. Thereafter they were supplied from other adjacent canal systems.

Laterals which divert from several of the canals above the main gaging stations are, in these tables, in each case included with the flow in the main canal.

The canals are listed by divisions, each of which represents the territory covered by a deputy water master or river rider. The canals of each division in general are shown in down stream order.

RIVER DATA

The extensive tables found on Plates VII and VIII summarize data in regard to total flow, normal and stored water segregation, diversions, losses and gains for each section of the river between Jackson Lake and Milner.

1022 DISTRIBUTION WATER DISTRICT NO 36

[illegible]

DAILY SUMMARY										PORTERVILLE										WOODPORT										BLACK RIVER										BLACK										SNAKE										RIVER									
WOODVILLE					HEISE-WOODVILLE					DIV					WOODPORT					PORTERVILLE					WOODPORT					BLACK RIVER					BLACK					SNAKE					RIVER																								
TH	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT	TH	DISCH	STO	NAT																																
15268	965	15780			1748	14032	692	13960		638	302	14262	250	14012	832	14190		638	302	14262	250	14012	832	14190		638	302	14262	250	14012	832	14190		638	302	14262	250	14012	832	14190																													
14318	949	15160			1611	13948	676	13920		602	282	13452	250	13202	802	13430		602	282	13452	250	13202	802	13430		602	282	13452	250	13202	802	13430		602	282	13452	250	13202	802	13430																													
12229	906	13320			1540	11980	647	11970		765	525	12495	237	12258	765	12100		765	525	12495	237	12258	765	12100		765	525	12495	237	12258	765	12100		765	525	12495	237	12258	765	12100																													
11360	897	12800			1327	11300	638	11220		878	619	11799	227	11572	749	11490		878	619	11799	227	11572	749	11490		878	619	11799	227	11572	749	11490		878	619	11799	227	11572	749	11490																													
11957	889	12870			1542	11300	638	11300		720	446	11666	232	11434	749	11400		720	446	11666	232	11434	749	11400		720	446	11666	232	11434	749	11400		720	446	11666	232	11434	749	11400																													
12315	898	13270			1615	11300	638	11300		715	434	11814	232	11582	749	11540		715	434	11814	232	11582	749	11540		715	434	11814	232	11582	749	11540		715	434	11814	232	11582	749	11540																													
12397	900	13380			1709	11300	638	11300		726	459	11839	234	11605	762	11640		726	459	11839	234	11605	762	11640		726	459	11839	234	11605	762	11640		726	459	11839	234	11605	762	11640																													
13131	916	13900			1799	11300	638	11300		750	498	12238	236	12002	771	12310		750	498	12238	236	12002	771	12310		750	498	12238	236	12002	771	12310		750	498	12238	236	12002	771	12310																													
13812	930	14510			1676	11300	638	11300		743	486	12226	240	12002	771	12310		743	486	12226	240	12002	771	12310		743	486	12226	240	12002	771	12310		743	486	12226	240	12002	771	12310																													
14113	940	14810			1687	11300	638	11300		742	484																																																										

RIVER GAGING STATIONS FROM JACKSON LAKE WYOMING TO MILNER IDAHO																												
FOOT		PORT-BLACK			CORR		NEELEY			B-N		LAKE WALCOTT			NS-MINC			NS+SS MIN CAN			MINIDOKA							
STD	NAT	TOTEN	LS	STAG	NAT	DATE	GAGE	DISCH	STD	NAT	GAIN	1923	GAGE	CAPAC	FT	DRIFT	GAGE	DISCH	GAGE	DISCH	TOTEN	STD	NAT	TH BAL	GAGE	DISCH	STD	NAT
178						Jun 2	8.31	17470			3280	Jun 3	45.59	103500		182	8.17	1180	4.27	693	1873			18179	9.88	15210		
228						3	8.07	16810			3380	4	45.58	102170		671	8.14	1170	4.25	688	1850			15623	9.30	14960		
158						4	7.76	15910			3310	5	45.61	102390		-187	8.12	1170	4.26	688	1858			15365	8.87	12760		
142						5	7.59	14650			3250	6	45.70	103620		-544	8.13	1170	4.37	714	1894			12232	8.67	12000		
34						6	7.67	14580			3180	7	45.76	104390		-363	8.16	1180	4.43	727	1907			12310	8.20	12110		
42						7	7.59	14660			3120	8	45.82	105070		-360	8.17	1180	4.47	735	1913			12371	8.13	12380		
35						8	7.62	14800			3160	9	45.86	105550		-242	8.18	1180	4.44	730	1910			12648	8.87	12760		
392						9	7.75	15370			3060	10	45.88	105790		-121	8.18	1280	4.48	732	2012			13237	8.58	13190		
246						10	7.83	15720			2980	11	45.87	105670		60	8.17	1230	4.52	820	2180			13630	8.04	13420		
249						11	7.88	15950			2920	12	45.87	105670		0	8.17	1230	4.52	820	2180			13634	8.04	13110		
142						12	7.97	16360			2820	13	45.88	105790		-60	8.18	1230	4.52	820	2180			13634	8.04	13110		
397						13	7.84	15770			2710	14	45.89	105910		-60	8.19	1230	4.52	820	2180			13634	8.04	13110		
179						14	7.83	15720			2580	15	45.94	105910		-302	8.19	1230	4.52	820	2180			13634	8.04	13110		
12						15	7.92	16130			2650	16	45.92	105910		731	8.17	1230	4.52	820	2180			13634	8.04	13110		
1012						16	7.70	15150			2660	17	45.94	105910		242	8.17	1230	4.52	820	2180			13634	8.04	13110		
113						17	7.34	13590			2930	18	45.65	103020		182	8.38	1480	5.43	976	2456			13116	8.57	10940		
11						18	7.15	12800			2790	19	45.86	105530		-1275	9.41	1490	5.43	973	2463			9062	7.83	9140		
129						19	7.38	13760			2670	20	45.93	106390		-424	9.39	1490	5.43	973	2463			10073	8.30	10640		
120						20	7.32	13510			2620	21	45.92	106270		60	8.19	1230	5.27	927	2297			11273	8.33	10750		
59						21	7.11	12630			2780	22	46.93	106390		-60	8.11	1170	4.85	810	1980			10590	8.30	10930		
212						22	7.27	13300			2900	23	46.02	107740		681	8.13	1170	4.56	787	1907			12074	8.63	11850		
187						23	7.61	14750			3040	24	46.02	107740		126	7.88	1110	4.21	653	1765			13111	8.39	14830		
349						24	8.08	16860			3050	25	45.88	105910		887	7.71	1070	3.88	579	1649			16068	9.90	17000		
5						25	8.41	18420			3150	26	45.85	105430		102	7.68	1070	3.72	549	1649			16383	9.38	17350		
75						26	8.39	18330			3180	27	45.88	105790		-182	7.65	1060	3.64	536	1596			16532	9.65	15920		
136						27	8.02	16580			3260	28	46.01	107360		-732	7.68	1070	3.67	542	1612			14176	8.97	13150		
79						28	7.80	15590			3100	29	45.99	107110		126	7.82	1100	3.95	606	1706			14010	8.97	13150		
429						29	7.60	14710			3280	30	46.10	108490		-696	7.50	1120	4.82	672	1792			12222	8.99	13330		
347						30	7.26	13260			3190	Jul 1	46.08	108240		126	7.94	1130	4.69	794	1924			11442	8.09	9740		
163						Jun 1	6.99	12150			3030	2	46.01	107360		-444	8.02	1140	4.91	854</								

DATE	MIL LIFT CAN			55TF CANAL			MIL LIFT CAN			MILNER			M-M		
	GAGE	DISCH	GAGE	DISCH	TOTAL	STD	NAT	GAGE	DISCH	STD	NAT	GAGE	DISCH	STD	NAT
1923	10.90	2.02	59	8.66	2930	2989						9048	13.00	8900	
163	10.90	2.02	59	8.65	2920	2979						8321	11.98	7730	-148
165	10.92	2.02	59	8.64	2920	2974						6609	10.96	6610	-591
192	10.92	2.02	59	8.65	2920	2979						5824	10.64	6250	
200	10.92	2.02	59	8.64	2920	2979						5384	10.31	6530	
277	10.91	2.02	59	8.64	2920	2976						6227	11.14	6800	426
112	10.92	1.99	57	8.60	2900	2957						7691	12.50	8300	566
47	10.94	1.99	57	8.64	2920	2977						6790	11.98	7070	673
110	10.82	1.98	57	8.58	2890	2947						7332	11.06	7200	609
514	10.90	1.98	57	8.62	2910	2967						6725	11.87	7060	280
271	10.90	1.98	57	8.61	2900	2957						7297	11.57	7200	-612
10	10.92	2.01	59	8.60	2900	2959						7117	11.38	7070	337
282	10.92	2.01	59	8.62	2910	2969						7057	11.07	6730	-17
435	10.92	2.01	59	8.60	2900	2959						6676	10.33	5910	-47
149	10.92	2.02	59	8.60	2900	2959						5616	9.38	4890	-327
776	10.92	2.01	59	8.60	2900	2959						4456	8.32	3800	-766
78	10.93	2.01	59	8.61	2900	2959						2986	8.77	4250	-726
233	10.96	2.02	59	8.60	2900	2959						4700	9.91	5450	-656
529	10.92	2.02	59	8.60	2900	2959						4920	9.98	5530	1264
340	10.89	2.02	59	8.60	2900	2959						5094	10.87	6510	750
224	10.96	2.02	59	8.60	2900	2959						6009	11.97	7720	610
719	10.92	2.02	59	8.61	2900	2959						9340	14.90	11700	1416
932	10.79	2.02	59	8.57	2850	2909						14274	16.74	15300	1711
367	10.85	2.02	59	8.59	2900	3060						12540	11.0	12400	2360
632	10.92	2.03	60	8.59	3000	3060						10065	12.32	8100	1026
926	10.91	2.04	61	8.60	3010	3071						7292	11.97	7720	-190
860	10.91	2.03	60	8.59	3000	3060						7303	11.32	7000	-1965
892	10.92	2.03	60	8.59	3000	3060						5230	8.17	3650	-303
722	10.92	2.03	60	8.59	3000	3060						3315	8.42	3900	-1580
120	10.88	2.03	60	8.58	3000	3060						2982	6.73	2250	585
708	10.92	2.03	60	8.59	3000	3060						2018	8.01	3490	-732
221	10.92	2.03	60	8.57	2990	3059						3641	7.53	3010	1472
614	10.89	2.02	59	8.58	3000	3059						2281	7.10	2600	-651
225	10.88	2.02	59	8.58	3000	3059						2252	H.D.	1230	319
095	10.89	2.03	60	8.59	3000	3060						150	2.77	99	-1022
083	10.99	2.03	60	8.66	3040	3100						-30	2.30	52	-51
177	10.92	2.03	60	8.61	3010	3070						-213	2.06	36	82
52	10.92	2.03	60	8.61	3010	3070						-387	2.02	33	249
358	10.72	2.01	59	8.42	2920	2978						-375	1.94	29	420
260	10.80	2.02	59	8.34	2860	2909						-375	1.94	29	404
137	10.90	2.02	59	8.58	3000	3059						-319	1.97	30	349
490	11.05	2.02	59	8.71	3060	3119						-364	H.D.	41	0
804	10.98	2.02	59	8.67	3040	3099						595	5.40	1120	0
660	11.04	2.02	59	8.69	3050	3109						603	4.70	682	0
320	11.02	2.04	61	8.68	3050	3111						616	5.04	880	0
584	11.03	2.03	60	8.68	3030	3110						759	5.60	1270	0
250	10.91	2.04	61	8.36	2880	2941						651	2.58	78	0
962	10.72	1.78	45	8.19	2800	2845						190	1.96	30	-573
222	10.78	1.78	45	8.21	2810	2855						373	1.88	26	0
213	10.82	H.D.	21	8.23	2830	2851						400	1.86	24	0
392	10.90	H.D.	9	8.35	2880	2889						400	1.86	24	0
466	11.02	H.D.	42	8.63	3020	3062						204	1.86	24	0
694	11.02	2.03	60	8.65	3030	3090						287	1.88	26	0
436	11.04	2.02	59	8.65	3030	3089						221	3.61	254	0
72	11.06	2.02	59	8.65	3030	3089						239	3.33	188	0
834	10.98	2.02	59	8.62	3020	3079						352	6.72	2240	0
993	11.06	2.02	59	8.68	3050	3109						400	4.70	2840	0
273	10.88	2.03	60	8.56	2990	3050						2361	H.D.	2840	0
169	11.10	2.03	60	8.76	3090	3150						1523	2.60	80	0
227	11.10	2.03	60	8.72	3070	3130						466	3.19	161	0
822	11.09	2.02	59	8.69	3050	3109						79	2.28	50	0
927	11.00	2.02	59	8.67	3040	3099						81	H.D.	1660	0
												1360	H.D.	528	0
												39	H.D.	322	0
												177	2.22	46	0

ALL DISCHARGE QUANTITIES ARE GIVEN IN CUBIC FEET PER SECOND.

LAKE RIVER GAGING STATIONS FROM JACKSON LAKE WYOMING TO MINN										LAKE WYOMING TO MINN														
PORT-BLACK					NEELEY					WALCOTT					NS+SS MINCAN					DISCH				
STO	NAT	TOTAL	LOSS	DATE	DISCH	GAGE	STO	NAT	GAIN	DATE	GAGE	DISCH	GAGE	DISCH	TOTAL	STO	NAT	TH BAL	GAGE	DISCH				
6116	-	56	175	31	194	578	323	194	3	1923	882	939	1490	564	1000	2490	2490	7292	6.73	6150				
6116	-	400	-	29	21	1131	-	553	4	1923	1275	940	1490	567	1010	2500	2500	6835	6.71	6100				
6116	-	848	98	28	126	2093	-	962	5	1923	1275	939	1490	567	1010	2500	2500	6165	6.74	6150				
6116	-	299	89	26	115	2504	-	411	6	1923	1275	939	1490	567	1010	2500	2500	6315	6.73	5930				
6116	-	900	133	28	161	3529	-	1025	7	1923	1275	939	1490	567	1010	2500	2500	5670	6.64	5830				
6116	-	291	128	27	155	3967	-	438	8	1923	1275	939	1490	567	1010	2500	2500	5709	6.61	5850				
6116	-	88	-	7	28	21	4232	-	265	9	1923	1275	939	1490	567	1010	2500	5792	6.61	5830				
6116	-	40	25	29	54	4432	-	200	10	1923	1275	939	1490	567	1010	2500	2500	5760	6.60	5660				
6116	-	103	30	31	61	4711	-	279	11	1923	1275	939	1490	567	1010	2500	2500	5453	6.53	5660				
6116	-	12	41	32	73	4926	-	215	12	1923	1275	939	1490	567	1010	2500	2500	6144	6.56	5730				
6116	-	274	95	33	128	4869	-	57	13	1923	1275	939	1490	567	1010	2500	2500	6070	6.48	5530				
6116	-	393	245	31	276	4602	-	267	14	1923	1275	939	1490	567	1010	2500	2500	6105	6.46	5480				
6116	-	439	161	29	190	4383	-	209	15	1923	1275	939	1490	567	1010	2500	2500	6320	6.49	5560				
6116	-	570	282	27	309	3969	-	424	16	1923	1275	939	1490	567	1010	2500	2500	6373	6.50	5580				
6116	-	916	232	24	256	3373	-	596	17	1923	1275	939	1490	567	1010	2500	2500	5490	6.34	5200				
6116	-	838	101	21	122	2942	-	431	18	1923	1275	939	1490	567	1010	2500	2500	5776	6.39	5320				
6116	-	756	95	19	114	2553	-	309	19	1923	1275	939	1490	567	1010	2500	2500	5881	6.44	5440				
6116	-	631	177	17	194	2260	-	293	20	1923	1275	939	1490	567	1010	2500	2500	5234	6.30	5100				
6116	-	825	90	15	105	1845	-	415	21	1923	1275	939	1490	567	1010	2500	2500	5059	6.19	4850				
6116	-	1459	57	12	69	910	-	935	22	1923	1275	939	1490	567	1010	2500	2500	5485	6.12	4690				
6116	-	1799	112	10	122	328	-	1238	23	1923	1275	939	1490	567	1010	2500	2500	5069	6.04	4510				
6116	-	2005	61	5	66	1130	-	802	24	1923	1275	939	1490	567	1010	2500	2500	4948	6.00	4420				
6116	-	1857	98	3	101	1130	-		25	1923	1275	939	1490	567	1010	2500	2500	4985	6.09	4620				
6116	-	1752	31	1	32	1130	-		26	1923	1275	939	1490	567	1010	2500	2500	5222	6.23	4940				
6116	-	71	-	71	-	1130	-		27	1923	1275	939	1490	567	1010	2500	2500	5303	6.32	5150				
6116	-	16	-	16	-	1130	-		28	1923	1275	939	1490	567	1010	2500	2500	4539	6.27	5030				
6116	-	75	-	75	-	1130	-		29	1923	1275	939	1490	567	1010	2500	2500	4997	6.24	4960				
6116	-	90	-	90	-	1130	-		30	1923	1275	939	1490	567	1010	2500	2500	4680	6.21	4690				
6116	-	80	-	80	-	1130	-		31	1923	1275	939	1490	567	1010	2500	2500	4558	6.12	4690				
6116	-	78	-	78	-	1130	-		32	1923	1275	939	1490	567	1010	2500	2500	4471	6.11	4660				
6116	-	83	-	83	-	1130	-		33	1923	1275	939	1490	567	1010	2500	2500	4362	6.10	4640				
6116	-	25	-	25	-	1130	-		34	1923	1275	939	1490	567	1010	2500	2500	4426	6.10	4640				
6116	-	36	-	36	-	1130	-		35	1923	1275	939	1490	567	1010	2500	2500	3707	6.08	4600				
6116	-	1315	-	843	-	1073	-	57	36	1923	1275	939	1490	567	1010	2500	2500	2764	6.09	4620				
6116	-	1645	-	1645	-	1079	-	39	37	1923	1275	939	1490	567	1010	2500	2500	3524	6.10	4640				
6116	-	776	-	86	-	1126	-	69	38	1923	1275	939	1490	567	1010	2500	2500	4165	6.10	4640				
6116	-	48	-	344	-	1126	-	310	39	1923	1275	939	1490	567	1010	2500	2500	4240	6.09	4620				
6116	-	91	-	315	-	126	-	198	40	1923	1275	939	1490	567	1010	2500	2500	4338	6.08	4600				
6116	-	154	-	216	-	143	-	125	41	1923	1275	939	1490	567	1010	2500	2500	4278	6.08	4600				
6116	-	108	-	143	-	143	-	148	42	1923	1275	939	1490	567	1010	2500	2500	4046	5.96	4330				
6116	-	126	-	117	-	143	-	91	43	1923	1275	939	1490	567	1010	2500	2500	3524	5.54	3460				
6116	-	30	-	101	-	143	-	83	44	1923	1275	939	1490	567	1010	2500	2500	3483	5.60	3580				
6116	-	110	-	63	-	143	-	45	45	1923	1275	939	1490	567	1010	2500	2500	3212	5.35	3480				
6116	-	93	-	64	-	143	-	46	46	1923	1275	939	1490	567	1010	2500	2500	3394	5.51	3400				
6116	-	176	-	55	-	143	-	36	47	1923	1275	939	1490	567	1010	2500	2500	3400	5.53	3440				
6116	-	71	-	38	-	143	-	56	48	1923	1275	939	1490	567	1010	2500	2500	3397	5.42	3380				
6116	-	733	-	24	-	143	-	38	49	1923	1275	939	1490	567	1010	2500	2500	3240	5.29	3230				
6116	-	1100	-	134	-	143	-	143	50	1923	1275	939	1490	567	1010	2500	2500	2907	5.14	2990				
6116	-	1219	-	141	-	143	-	147	51	1923	1275	939	1490	567	1010	2500	2500	3029	5.03	2730				
6116	-	1116	-	48	-	143	-	52	52	1923	1275	939	1490	567	1010	2500	2500	2358	5.03	2550				
6116	-	1017	-	58	-	143	-	61	53	1923	1275	939	1490	567	1010	2500	2500	3237	4.95	2430				
6116	-	1096	-	65	-	143	-	38	54	1923	1275	939	1490	567	1010	2500	2500	1737	4.93	2430				
6116	-	854	-	37	-	143	-	25	55	1923	1275	939	1490	567	1010	2500	2500	2774	4.76	2400				
6116	-	132	-	50	-	143	-	26	56	1923	1275	939												

DOGA	N-M		DATE	L MIL		PA LAT		NSTFCAN		PA+NSTFCAN		SSTF CANAL		MIL LIFT CAN		MIL		MILNER		M-M	
	STD	NAT	LOSS	1923	GAGE	DISCH	GAGE	DISCH	TOTAL	STD	NAT	GAGE	DISCH	STD	NAT	GAGE	DISCH	STD	NAT	GAGE	DISCH
3043	3107	1142	1142	6	10.82	2.03	60	847	2940	3000	2634	366	10.23	3440	699	2741	2.88	98	98	1.88	26
3137	2963	735	735	6	10.82	2.03	60	847	2940	3000	2634	349	10.22	3430	816	2614	2.87	98	98	1.70	16
3386	2994	15	15	7	10.82	2.02	59	846	2940	2999	2670	329	10.22	3430	945	2465	2.88	98	98	1.70	16
3228	2922	165	165	8	10.76	2.02	59	838	2900	2959	2615	344	10.21	3430	852	2578	2.88	98	98	1.70	16
3055	2875	260	260	9	10.72	1.75	43	777	2520	2563	2225	338	10.28	3470	939	2537	2.88	98	98	1.66	15
2923	2907	121	121	10	10.74	1.74	43	779	2530	2573	2231	342	10.28	3470	905	2565	2.88	98	98	1.62	13
2883	2967	58	58	11	10.76	1.74	43	779	2530	2573	2224	349	10.36	3520	902	2618	2.87	98	98	1.62	13
2930	2930	70	70	12	10.74	1.74	43	777	2520	2563	2218	345	10.33	3500	915	2585	2.88	98	98	1.62	13
2644	2976	192	192	13	10.64	1.74	43	773	2500	2543	2193	350	10.13	3380	754	2626	H.O.	86	86	1.61	12
2707	2953	207	207	14	10.70	1.74	43	777	2520	2563	2215	348	10.27	3460	855	2605	2.88	98	98	1.60	12
2693	3037	414	414	15	10.78	1.75	43	780	2540	2583	2226	357	10.39	3540	860	2680	2.88	98	98	1.61	12
2474	3056	548	548	16	10.80	1.75	43	780	2540	2583	2224	359	10.03	3320	623	2697	2.88	98	98	1.60	12
2340	3120	625	625	17	10.79	1.75	43	780	2540	2583	2216	367	10.00	3300	547	2753	H.O.	95	95	1.61	12
2474	3006	760	760	18	10.82	1.74	43	782	2550	2593	2230	363	10.03	3320	597	2723	2.70	90	90	1.60	12
2340	3240	783	783	19	10.84	1.74	43	779	2530	2573	2192	381	10.03	3320	461	2859	H.O.	67	67	1.64	14
1863	3337	290	290	20	10.80	1.74	43	772	2500	2543	2150	393	10.07	3340	396	2944	H.O.	78	78	1.72	18
1973	3347	456	456	21	10.87	1.75	43	773	2500	2543	2149	394	10.09	3350	397	2953	2.70	89	89	1.62	13
2122	3318	441	441	22	10.90	1.76	44	773	2500	2544	2154	390	10.09	3350	422	2928	2.70	88	88	1.62	13
1770	3330	134	134	23	10.74	1.74	43	761	2450	2493	2101	392	9.86	3220	282	2938	H.O.	76	76	1.62	13
1450	3400	209	209	24	10.64	1.73	42	741	2360	2402	2002	400	9.47	2990	-	3000	2.36	73	73	1.60	12
1290	3400	795	795	25	10.48	1.73	42	735	2320	2362	1962	400	9.48	2990	-	3000	2.36	73	73	1.58	11
1110	3400	559	559	26	10.22	1.74	43	734	2320	2363	1843	520	9.28	2880	-	3000	2.36	73	73	1.58	11
1020	3400	528	528	27	10.06	1.74	43	732	2310	2353	1753	620	9.10	2780	-	3000	2.36	73	73	1.58	11
1220	3400	365	365	28	10.02	1.73	42	730	2300	2342	1712	630	9.08	2770	-	3000	2.36	73	73	1.58	11
1540	3400	282	282	29	10.08	1.73	42	733	2310	2352	1772	580	9.17	2820	-	3000	2.36	72	72	1.59	12
1750	3400	155	155	30	10.14	1.73	42	729	2290	2332	1922	410	9.47	2990	-	3000	2.36	72	72	1.59	12
1630	3400	-	491	31	10.10	1.74	43	723	2260	2303	1903	400	9.57	3040	40	3000	H.O.	66	66	1.58	11
1560	3400	37	37	32	10.09	1.73	42	721	2260	2302	1862	440	9.42	2960	-	3000	2.36	71	71	1.58	11
1490	3400	-	210	33	10.05	1.73	42	718	2240	2282	1822	460	9.39	2940	-	3000	2.36	71	71	1.58	11
1290	3400	-	132	34	9.96	1.73	42	704	2180	2222	1622	600	9.14	2800	-	3000	2.30	68	68	1.59	12
1260	3400	-	249	35	10.02	1.73	42	698	2150	2192	1592	600	9.14	2800	-	3000	2.30	68	68	1.58	11
1300	3340	-	278	36	10.00	1.73	42	695	2130	2172	1602	570	9.09	2770	-	3000	2.30	68	68	1.58	11
1370	3270	-	214	37	10.03	1.73	42	697	2140	2182	1692	490	9.11	2780	-	3000	2.30	68	68	1.58	11
1622	2978	-	893	38	10.00	1.74	43	695	2130	2173	1823	350	9.12	2790	162	2628	2.30	68	68	1.58	11
1841	2779	-	1656	39	10.00	1.73	42	694	2130	2172	1845	327	9.11	2780	328	2452	2.30	68	68	1.57	10
1850	2790	-	1116	40	9.94	1.73	42	691	2110	2152	1824	328	9.09	2770	308	2462	H.O.	54	54	1.56	10
1662	2978	-	475	41	10.01	1.72	41	693	2120	2161	1811	350	9.11	2780	152	2628	1.86	48	48	1.56	10
1633	2987	-	380	42	10.01	1.74	43	694	2130	2173	1822	351	9.12	2790	154	2636	1.85	48	48	1.56	10
1664	2936	-	262	43	10.01	1.74	43	689	2110	2153	1808	345	9.12	2790	199	2591	1.86	48	48	1.56	10
1674	2926	-	322	44	10.01	1.74	43	683	2080	2123	1779	344	9.12	2790	208	2582	1.86	48	48	1.56	10
1343	2987	-	284	45	9.92	H.O.	34	H.O.	1190	1224	873	351	9.08	2770	134	2636	1.87	49	49	1.57	10
460	3000	64	64	46	9.77	1.52	30	439	1040	1070	717	353	9.02	2730	83	2647	1.86	48	48	1.56	10
538	3022	-	97	47	9.93	1.52	30	440	1030	1060	704	356	9.08	2770	104	2666	1.87	49	49	1.56	10
446	3034	-	268	48	10.14	1.52	30	442	1030	1060	703	357	9.13	2790	113	2677	1.86	48	48	1.56	10
408	2992	-	6	49	10.06	1.52	30	443	1040	1070	718	352	8.96	2690	50	2640	1.86	48	48	1.56	10
538	2882	-	32	50	10.18	1.52	30	444	1040	1070	731	339	8.91	2670	127	2543	1.86	48	48	1.56	10
330	3050	350	350	51	10.26	1.52	30	445	1040	1070	660	410	8.88	2640	-	-	1.86	48	48	1.56	10
106	3124	167	167	52	10.25	1.52	30	444	1040	1070	486	584	8.68	2540	-	-	1.86	48	48	1.56	10
-	144	3134	250	53	10.20	1.52	30	444	1040	1070	396	674	8.55	2460	-	-	1.86	48	48	1.56	10
-	451	3181	177	54	10.03	1.52	30	444	1040	1070	309	761	8.46	2420	-	-	1.86	48	48	1.54	10
-	582	3132	479	55	9.72	1.52	30	441	1020	1050	308	742	8.41	2390	-	-	1.86	48	48	1.54	10
-	529	3109	-	56	9.64	1.52	30	439	1020	1050	301	749	8.37	2360	-	-	1.86	48	48	1.54	10
-	674	3104	807	57	9.38	1.52	30	440	1020	1050	236	814	8.24	2290	-	-	1.86	48	48	1.54	10
-	950	3350	-	58	9.52	1.52	30	447	1050	1080	-	-	8.10	2260	-	-	1.86	48	48	1.54	10
-	1150	3300	624	59	9.38	1.52	30	445	1040	1070	-	-	8.11	2220	-	-	1.86	48	48	1.54	10
-	1160	3160	-	60	9.13	1.52	30	440	1040	1070	-	-	7.88	2100	-	-	1.86	48	48	1.54	10
-	1124	3044	-	61	8.97	1.50	29	428	1020	1050	-	-	7.73	2030	-	-	1.76	44	44	1.53	9
-	-	-	-	62	8.16	H.O.	10	370	774	784	-	-	7.43	1980	-	-	H.O.	17	17	1.53	9
-	-	-	-	63	8.46	DRY	0	2.87	517	517	-	-	7.55	1940	-	-	H.O.	24	24	1.53	9
-	-	-	-	64	8.79	DRY	0	H.O.	282	282	-	-	7.43	1890	-	-	DRY	0	0	1.57	10
-	-	-	-	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	73	-	-	-	-													

These tables are prepared upon the following time interval basis:

Time from Jackson Lake in hours	Gaging Station	Period used for comparable daily means
0	Jackson Lake and Moran	Day ending at 4 a.m.
24	Heise	Day ending at 4 a.m.
28	Rexburg	1st day following Day ending at 8 a.m.
42	Woodville	1st day following Day ending at 10 p.m.
48	Porterville	1st day following Day ending at 4 a.m.
54	Blackfoot	2nd day following Day ending at 10 a.m.
68	Neeley	2nd day following Day ending at 12 midnight;
92	Minidoka	2nd day following Day ending at 12 midnight;
116	Milner	3rd day following Day ending at 12 midnight;
		4th day following

This schedule for time of transmission is the same as the one adopted for the four preceding years, and while not exactly correct for all stages of the river, it is believed to be fairly representative of average conditions, and on this account was used throughout the entire period of record.

The dates given on these two plates are those which agree most nearly with the midday hour on this schedule, but the discharges for all river stations have been computed from recording gage records and agree exactly with the schedule. The summaries of diversions or canal totals are for the dates indicated on the tables.

The river stations were maintained continuously but, as previously explained, records of the upper valley diversions were not secured every day in September; hence canal discharges for this month have been partially interpolated.

Storage released from the small Emma Matilda and Two Ocean Lake

Reservoirs is shown under the heading, Twin Lakes.

SEGREGATION OF FLOW

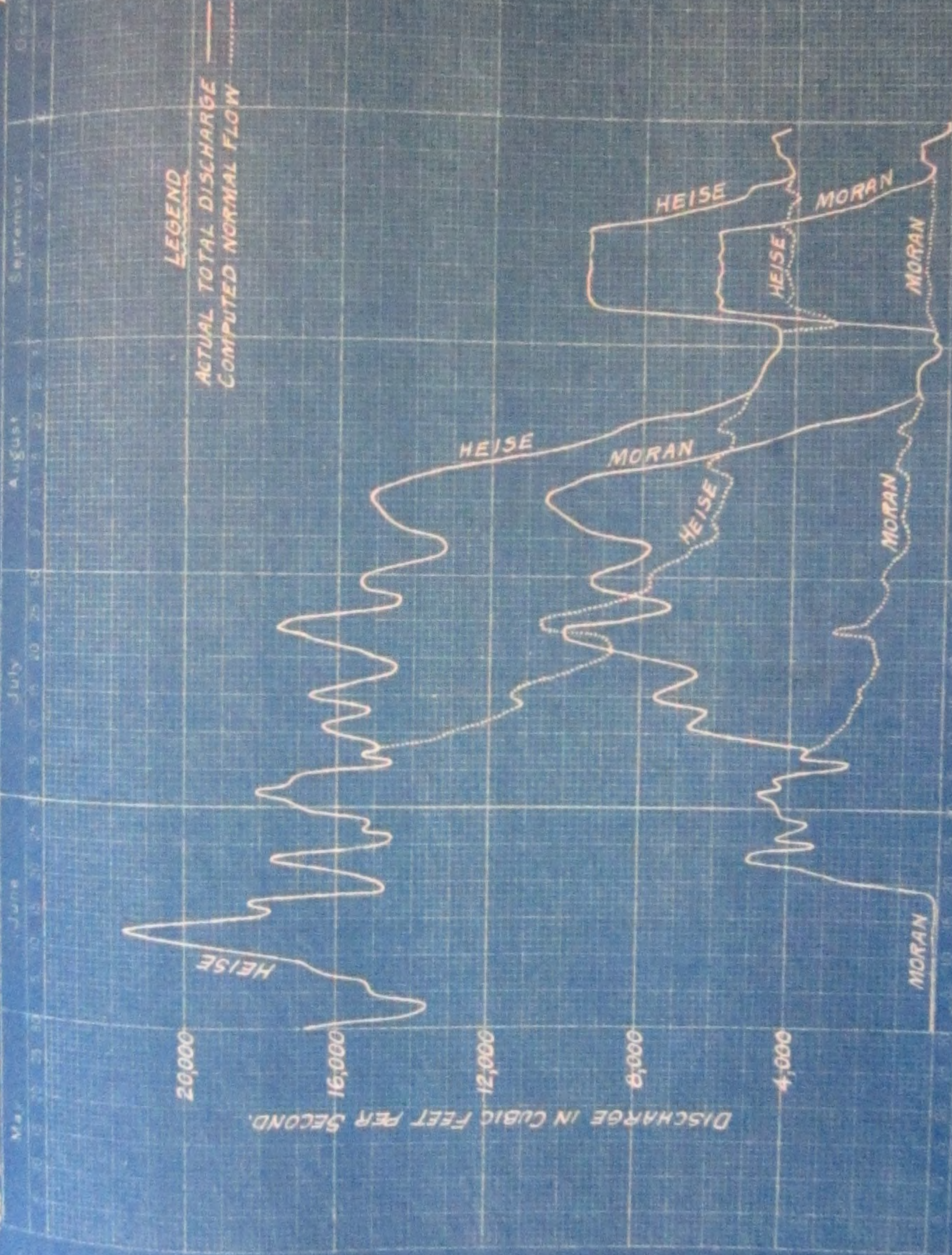
Plate IX shows graphically both the actual total and the computed normal flow past the Moran and Heise gaging stations during the season of 1923. The difference between the total and normal flow graphs on any date of course indicates storage.

These graphs are plotted from the special day discharges with the time interval adjusted to make them coincide with the nearest regular day at Heise. For example, the Heise data shown for July 15 really represent mean quantities for the 24 hour period ending at 4 a.m. on July 16, while the indicated Moran data for July 15 are means for the 24 hour period ending at 4 a.m. on July 15.

While these diagrams are merely a graphical representation of some of the numerical quantities contained in the tables on Plates VII and VIII, they will be of interest and perhaps of some assistance in connection with the explanations and discussions which have preceded as well as those which follow.

The unreasonably low indicated normal flow at the Heise station on September 3 and 4 is probably chiefly due to the fact that the single time interval used is too short for the low river stages pertaining immediately prior to the release of the September storage. Partial confirmation of this theory is afforded by the less pronounced but still noticeable increase in the Heise normal flow during the more gradual falling stage from September 16 to 22 inclusive. It also seems reasonable to assume that the applied storage transmission loss of $2\frac{1}{2}\%$ is inadequate to cover actual losses or lag on such runs as the one in question where the river had been at a much lower stage for some time previous to the release of the storage

HYDROGRAPHS SHOWING TOTAL FLOW AND NORMAL FLOW AT MORAN AND HEISE GAGING STATIONS 1923 DISTRIBUTION WATER DISTRICT NO. 36 PLATE II



head. As explained elsewhere in this report it is rather unusual under present methods of operation to release storage in this manner after the season's run has once terminated, so a similar situation may not exist again for many years.

JACKSON LAKE STORAGE DELIVERIES

The amount of stored water released each day from Jackson Lake was determined from the reservoir capacity tables by noting the quantity corresponding to the daily decrease in stage indicated by the lake gage readings. Occasional irregularities in the latter, attributable to wind effect, were largely eliminated by short period interpolations or adjustments.

This method of determining the proportion of the total daily flow passing the dam and the Moran gaging station, which is stored water, has been in use for several years. Its use assumes a certain balancing of comparatively unknown factors. Normal flow rights should obtain the benefit of such natural storage as would have been created in the old lake during flood periods and they should not be required to stand the extra evaporation loss attributable to the larger flooded area of the present reservoir. On the other hand the storage owners should obtain the benefit of all the additional ground or bank storage which results from the increased elevation of the water surface in the lake.

Consulting Engineer R. I. Meeker of Denver, Colo. in his report to the Water Users Committee of Nine of District No. 36 dated February 9, 1924 makes the following statements with respect to this practice:

"Under present methods of operation reservoir bank storage return is credited to natural-flow rights in lieu of natural lake storage, and without material impairment to direct-flow rights."

"Reservoir evaporation chargeable against stored water is a comparatively small item per year, ranging from 2500 to 3300 acre-feet.

Under present methods of reservoir operation, reservoir bank storage practically takes care of this item, except in low-water years."

1923 storage transmission losses between the Moran and Blackfoot gaging stations were applied in accordance with the schedule agreed upon by the Committee of Nine (see page 6) which, because of the net gain shown at the Woodville station throughout the storage delivery period, was equivalent to the following flat percentage deductions:

Moran to Heise	2 $\frac{1}{2}$ %
Heise to Woodville	3%
Woodville to Blackfoot	6%

In the final computed records contained on Plates VII and VIII where data for the Porterville river station are included, 5 $\frac{1}{2}$ per cent loss was applied between Woodville and Porterville and one half of one per cent between Porterville and Blackfoot.

Losses for all storage delivered to canals diverting above the Blackfoot gaging station were computed upon the basis of the losses to the Woodville station, as specified in the purchase contracts. Obviously it would be impracticable to calculate losses to the heading of each individual canal and this group method was doubtless originally adopted to avoid the necessity for such procedure. Since more than half the Jackson Lake storage owned in the upper valley is diverted above the Woodville station and the balance within a distance of about twelve miles below that point, this grouping of losses would seem to be at least a reasonably fair one. 1923 calculations show that these upper valley canals should have received at their headings 94.575 per cent of the storage turned out for them at Moran.

Storage released for the Minidoka and Twin Falls canals was charged with prorata losses to the Blackfoot gaging station, hence deliveries to these canals were upon the basis of 89.9005 per cent of amounts released

from Jackson Lake (88,9265 per cent as tabulated with the division at Porterville.)

The difference between these applied losses and those of the preceding year is attributable to the increase in the loss charged between Heise and Woodville which amounted in the aggregate to about 17,200 acre-feet.

Plate X contains a summary of the daily and total deliveries of Jackson Lake storage to each company or canal owning rights therein. Deliveries are shown in second-feet for actual dates at the head of the respective canals. In cases where storage rights were sold for delivery through other canals, both the parties owning the right and those receiving the water are indicated in the first column or by footnotes.

Lake Walcott deliveries were limited to the Minidoka Canals during the time when there was Jackson Lake storage in the river. This fact accounts for the minus quantities which are shown on five different dates as stored in Lake Walcott. Storage delivered to the canals diverting at Milner during the period August 29 to September 6 inclusive and after September 26 was necessarily from Lake Walcott, but was authorized by the U. S. Reclamation Service officials in order to conserve a larger hold-over supply in Jackson Lake than would otherwise have been possible.

The minus deliveries shown in the accounts of the Lenroot and Peoples canal companies represent credits on prearranged exchanges of normal flow for storage, while the small minus charge against the North Side Canal Co. Ltd. on July 13 and similar charges against the Twin Falls Canal Co. on August 24 and 25 represent storage credits on account of underdelivery which were made for the purpose of simplifying the tabulated record.

More storage was released from Jackson Lake Reservoir during 1923 than during any preceding year. When account is taken of the draft upon

WAC

1

[illegible]

TWIN LAKES STORAGE DELIVERIES

[illegible]

JACKSON LAKE STORAGE DELIVERIES

[illegible]

LAKE WALCOTT STORAGE DELIVERIES

4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	5-1	2	3	4	5	6	7	8	
54	364	1655	1403	1142	813	412	105	0	0	0	0	0	0	0	357	345	664	689	297	253	748	144	105	487	1085	1624	1872	2048	2109	2216	2230	2101	2009	2019	1924	
																									72	72	66	71	70	68	68	68	68	68	68	68
																									0	0	46	0	0	0	0	0	0	0	0	0
																									1784	1934	1908	1873	1834	1639	1603	1613	1703			

✓ 1446 ACRE FT STORAGE RELEASED OF WHICH 555 ACRE FT WAS NOT USED BY 056000, THE EQUIVALENT BEING CREDITED TO JACKSON LAKE STORAGE AT WOODVILLE.

4 310810 ACRE FT JACKSON LAKE
RIGHT LESS: 12500 ACRE FT PERMIT
RIGHT SOLD TO NEW SWEDEN IRR
DISTRICT; 10000 ACRE FT PERMIT
RIGHT SOLD TO SNAKE RIVER
VALLEY IRR. DISTRICT; AND 571
ACRE FT SOLD TO OTHER
COMPANIES FOR SEASONAL USE.

✓ 322007 ACRE FT JACKSON LAKE
RIGHT PLUS 571 ACRE FT
PURCHASED FROM USFS FOR
SEASONAL USE.

[illegible][illegible]

Lake Walcott, more storage was likewise actually delivered to canals within the district than during any preceding year. This was largely due to the hot dry weather which continued from the latter part of August throughout the greater part of September and resulted in an unusually heavy demand for water during this part of the season.

Most of the upper valley canals used practically their entire available storage rights. This would not have been the case, however, had it been possible for the lower valley canals to get along without Jackson Lake storage during September, since natural draft limitations imposed by low river stages would then have permitted deliveries of normal flow to the majority of these canals. In other words the September run of storage water proved decidedly beneficial to many canals having no storage rights whatsoever, because the higher resulting river stage permitted them to draw water under their decreed rights which they could not otherwise have obtained without considerable expenditures for repairing diversion dams.

Water delivered to the Osgood canal of the Utah-Idaho Sugar Co. from the small Emma Matilda-Two Ocean or Twin Lakes Reservoirs is also tabulated on Plate X. Some difficulty is experienced in releasing any large quantity of water at one time through the outlets to these reservoirs, so in order to insure an adequate supply when needed, water was released somewhat in advance of the actual demand period and a credit thus established with the Jackson Lake Users. More of the Osgood decreed rights remained valid throughout the season than was at first thought would be the case, hence the final tabulations show a total of 555 acre-feet of Twin Lakes storage released for credit in excess of what was actually needed to complete the Osgood delivery requirements.

MINIDOKA AND MILNER ADJUSTMENTS

As noted on Plate X water was wasted past Milner Dam to an amount in excess of the normal leakage through the dam on fourteen different days during the period of Jackson Lake storage delivery. All of this extra water has been classed as stored water though, in practically every instance, it was caused by unexpected increases in the normal flow attributable either to breaks in upper valley canals or to summer rains. Therefore, in order to balance all storage accounts, charges must be adjusted in some way to include this surplus which really benefitted none of the canals.

The same plan followed during the three preceding seasons has been used herein. In brief, this provides for prorating this extraordinary waste between the Minidoka and Milner canals in accordance with their respective total storage diversions during the Jackson Lake delivery period.

The entire 11,753 second-feet classed as extra waste which actually passed Milner Dam was distributed directly in accordance with this method since no special corrections on account of excess deliveries or under-acceptances were considered necessary.

Beginning August 26 and continuing throughout the remainder of the season the North Side Canal Co. Ltd. was credited, under a temporary transfer, with unused normal flow to which the Twin Falls Canal Co. was entitled under the Foster decree. Late in September when the combined draft of the Milner canals failed to equal their combined normal flow right, the difference was allowed as normal flow available to the Minidoka canals upstream. Both of these arrangements are similar to those which were effective for a time during 1922.

Ordinary leakage or waste through Milner Dam prior to August 26 was charged against the two large Milner canals in proportion to their ownership of the dam, viz. 6/11 against the Twin Falls Canal Co. and 5/11 against the North Side Canal Co. Ltd. After that time all ordinary waste was charged against the storage rights of either the North Side Canal Co. Ltd. or the Minidoka Project, depending upon which one was at the time receiving the benefit of the Twin Falls Canal Co. normal flow underdraft.

On Plate X all normal waste or ordinary leakage past Milner Dam has been combined and included with the regular storage charges against the respective canals.

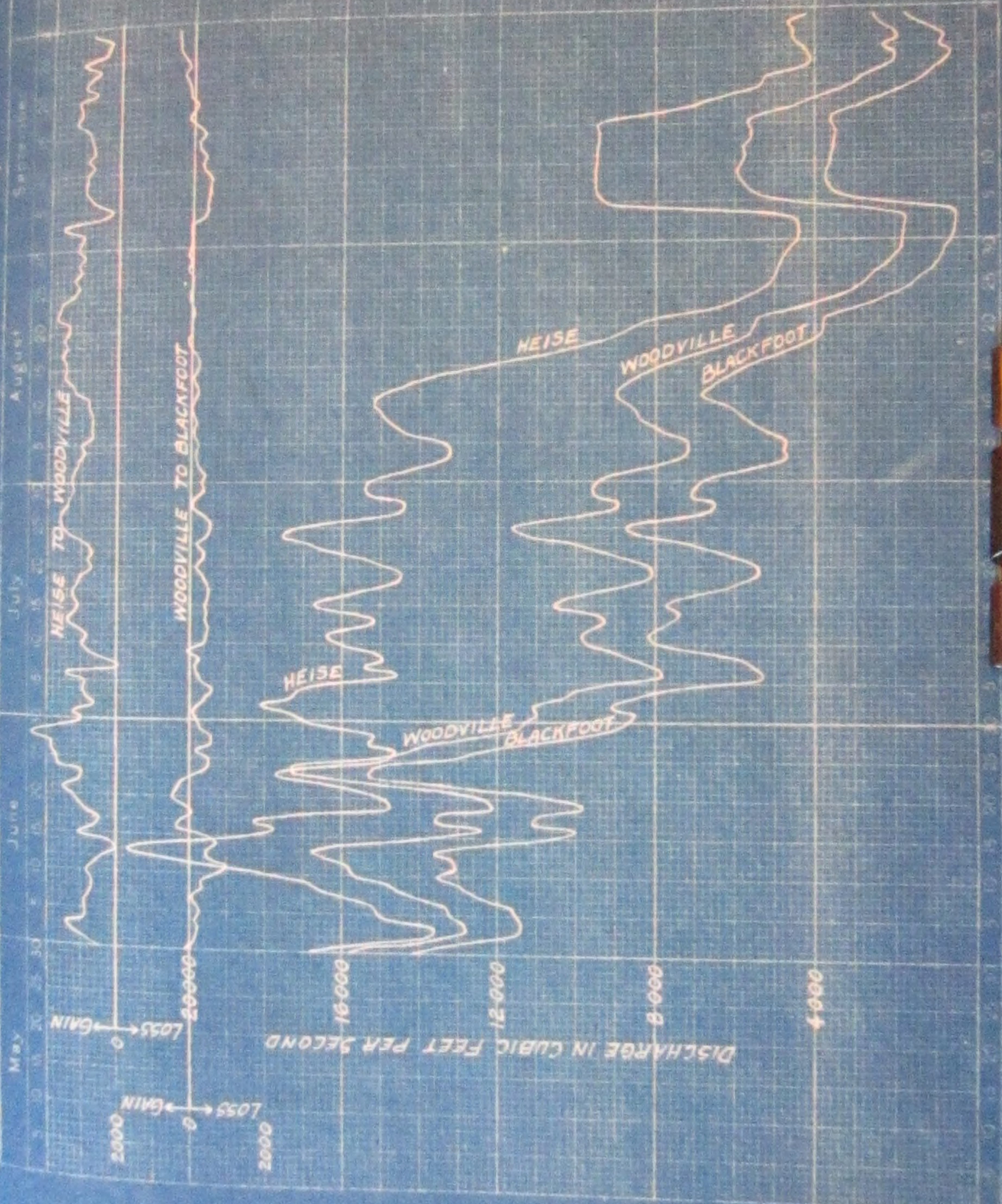
RIVER LOSSES AND GAINS

Losses and gains throughout different sections of Snake River are included in the data contained on Plates VII and VIII, but the changes in the quantities and the relation which these changes have to discharge of the river at different points are much more readily noted when indicated graphically.

Plate XI contains hydrographs of the total flow passing the Heise, Woodville and Blackfoot gaging stations during the period from June to September together with graphs showing the net losses and gains in the two intervening sections. All graphs are plotted to the same scale and with a time interval allowance to make them coincide with the Heise dates.

The tendency, which has been noted during previous seasons, toward increased losses coincident with sharp rises in river stage and the reverse of decreased losses or increased gains at the time of rapid drops in the river is again evidenced.

While the general characteristics of these graphs differ but



little from those of preceding years certain variations will of course be noted in any careful comparisons. For example, the return flow or gain between Heise and Woodville is larger in amount than for several years and contrary to the experience of most seasons no loss was shown in this section at any time during the month of June. This latter fact is probably best explained by the presumptive increase in waste water from the different canal systems resulting from the unusually rainy weather noted during that month. The occurrence of peak river stages for the season during May, as in 1922, undoubtedly helped to raise the ground water level and probably might also be considered as a contributory cause.

The increased loss shown between Woodville and Blackfoot during the September peak river stage period was to be expected and should require no special comment. On the other hand the comparatively well sustained return flow between Heise and Woodville during this time is not so readily understood, but may perhaps again be explained by larger waste from canal systems, since, because of the high river stages existing, September diversions in this section were considerably in excess of the ordinary amount.

Variations in the quantity of water diverted by intervening canals, in the amount of return flow or loss and in the discharge of tributary streams account for the difference noted in the shape of the three hydrographs.

In accordance with previous practice, no diagrams have been prepared for the Porterville station although complete data are listed on Plates VII and VIII.

During 1921 and 1922 a total of five sets of measurements were obtained covering all surface waste or return flow entering the river

between the Woodville and Blackfoot gaging stations. These tests have been summarized and discussed in the reports for the respective seasons during which they were secured. The reasonableness of the storage transmission loss of 6 per cent which has been applied through this section of the river during the past two years can only be determined by investigations of this or a more comprehensive character and in consequence two additional similar tests were completed in 1923 and are tabulated as follows:

Right Bank River

Left Bank River

<u>Name</u>	<u>Date</u>	<u>Amt.</u>	<u>Date</u>	<u>Amt.</u>	<u>Name</u>	<u>Date</u>	<u>Amt.</u>	<u>Date</u>	<u>Amt.</u>
Fugal Gulch	7/23	0.00	8/23	0.00					
Roadside	"	0.00	"	0.20					

Woodville Bridge

井	1	7/23	0.30	8/23	0.00	# 1	7/23	0.20	8/23	8.0
井 2	"	0.04	"	0.00	# 2(Tile drain)	"	0.04	"	0.1	
井 3	"	0.04	"	0.10						
井 4 (Woodville)	"	2.06	"	8.34						
井 5	"	0.00	"	0.10						
井 6	"	0.00	"	0.15						
井 6a	"	0.00	"	0.10						
井 7 (Woodville)	"	0.00	"	9.29						
井 8 (Wood Flume)	"	0.10	"	0.05						
井 9 (New Sweden)	"	3.93	"	58.60						

Lower Shelley Bridge

#	7/23	8/23	#	7/23	8/23
#10	0.30	0.00	# 3	0.00	0.10
#11	0.00	0.00	# 4)		
#12	0.00	0.00	# 4a)	0.30	0.20
#13	0.00	0.00	# 4b)		
#14	0.30	0.20	# 5 (Cox Ranch)	0.20	0.00
#15	0.00	0.00	# 6	0.00	0.00
#16	0.10	0.60	# 7	0.00	0.10
#17-18	0.20	0.10	# 8	0.10	0.35
#19 (Wood Plume)	0.00	0.00	# 9	0.00	0.00
#20	0.00	0.00	#10	0.00	0.00
#21	0.10	0.20			
#22	0.04	0.00			
#23-25	0.00	0.00			

Firth Bridge

Name	Date	Amt.	Date	Amt.	Name	Date	Amt.	Date	Amt.
	7/24	0.00	8/24	0.50	#11	7/24	1.50	8/24	1.00
#25a	"	0.00	"	0.30	#12	"	1.50	"	0.00
#25b	"	0.00	"	12.79	#12a	"	0.00	"	0.00
#26 (New Sweden)	"	0.00	"	0.00	#13	"	0.00	"	0.00
#26a	"	0.00	"	0.00	#14	"	0.00	"	0.00
#27	"	0.04	"	0.40	#15	"	0.00	"	0.00
#28	"	0.00	"	0.00	#16	"	0.20	"	0.75
#29	"	0.00	"	0.00	#17	"	0.00	"	0.00
#30	"	0.04	"	0.50	#18	"	0.00	"	0.00
#31	"	0.06	"	0.40	#19	"	0.10	"	0.00
#31a	"	0.00	"	3.50	#20	"	0.50	"	2.00
#32 (New Lavaside)	"				#21	"	0.00	"	0.00

Porterville Bridge

#33-35	7/25	0.00	8/25	0.00	#22	7/25	0.00	8/25	0.10
#36	"	0.10	"	0.00	#23	"	0.14	"	10.40
#37-43	"	0.00	"	0.00	#23a)	"	0.00	"	0.00
#44 (Regular					#23b)				
Wasteway)	"	10.50	"	20.80	#24 (Blackfoot)	"	31.03	"	15.01
#45	"	0.20	"	0.00	#24a	"	0.10	"	4.00
					#25	"	6.00	"	1.00

Lower Blackfoot Bridge

#46-47	7/25	0.00	8/25	0.00	#26	7/25	0.00	8/25	0.00
#48	"	0.30	"	0.50	#27	"	0.30	"	0.10
#49	"	0.36	"	0.00	#28	"	0.10	"	0.10
#50	"	0.00	"	0.00	#29	"	0.20	"	0.10
#51 (Trego)	"	3.00	"	0.00	#30	"	0.10	"	0.10
#52	"	0.00	"	0.00	#31	"	0.00	"	0.00
#53 (Parsons)	"	0.30	"	0.00					
#53a	"	0.00	"	0.00					
#54	"	0.20	"	4.00					
#55 (Combined									
Wasteway)	"	34.29	"	41.80					
#55a	"	0.10	"	1.50					
#56 (Peoples)	"	3.00	"	20.78					
#57-58	"	0.00	"	0.00					

Blackfoot Gaging Station on Snake River

Total Right Bank	60.00	185.80	Total Left Bank	42.61	43.51
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Most of the larger quantities noted in this summary were actually measured with a current meter, while those not measured were estimated as closely as possible by the hydrographers who made the investigation.

Analysis of these results in the same manner as those of preceding years by adding this surface waste as measured inflow shows the following:

1st test - A net average loss is increased from 381 second-feet to 483.61 second-feet or 5.46 per cent of the average total flow passing the Woodville and Blackfoot Snake River gaging stations during the three day period.

2nd test - A net average loss or gain of zero is changed to a net average loss of 229.31 second-feet or 7.07 per cent of the average total flow passing the Woodville and Blackfoot Snake River gaging stations during the three day period.

While the results of the first of these tests check very closely with the first one secured during 1922, the 7.07 per cent loss indicated by the second test is much larger than would be expected from a study of the river hydrographs and reference to the percentages shown by the two tests carried on under somewhat similar river conditions during August, 1922.

This apparent discrepancy might be due to an error in the Woodville discharge record which was based on interpolated gage heights for about twenty-four hours during the time this investigation was in progress, to failure of the single daily gage heights secured at the Blackfoot River station to correctly indicate the mean 24 hour stages or to undetected fluctuations in the visible waste or return flow during the period covered by the test.

A recapitulation of the results of the seven tests thus far completed on this section of the river is here added for convenience.

Test	Dates	River Conditions Preceding 5 Days	*River During Progress of Test	Indicated % Loss
1	July 28-29 & Aug. 2-3, 1921	No pronounced change	(-250 (+650	6.0
2	Aug. 30, Sept. 8 & 22-23, 1921	Generally higher	Falling stage	6.1
3	July 13-15, 1922	Considerably lower	(+100 (-400	5.5
4	Aug. 9-11, 1922	" higher	-500	0.8
5	Aug. 28-30, 1922	" "	-1150	-1.3 (Gain)
6	July 23-25, 1923	Appreciably lower	+2000	5.5
7	Aug. 23-25, 1923	Considerably higher	-1500	<u>7.1</u>

Algebraic average 4.24

* Except for 2nd test approximate increases (+) or decreases (-) in discharge in second-feet at the Woodville station are shown in this column.

From the above tabulation, therefore, an allowance of 6 per cent throughout the season to cover storage transmission loss between the Woodville and Blackfoot gaging stations would seem to be ample. However, because of the many physical uncertainties which affect the solution of this problem and because of possible injury which might result from the adoption of a loss schedule based upon inadequate data, it is believed that these investigations should be continued as opportunity is afforded and temporary deductions for losses in this section be fixed for single year application only, pending the acquisition of additional data.

Plate XII contains graphs similar to those shown on Plate XI but covering the section between the Blackfoot and Neeley gaging stations. The average net gain for the four months amounts to 2,701 second-feet which is the largest summer gain indicated for this section for the last five years, at least.

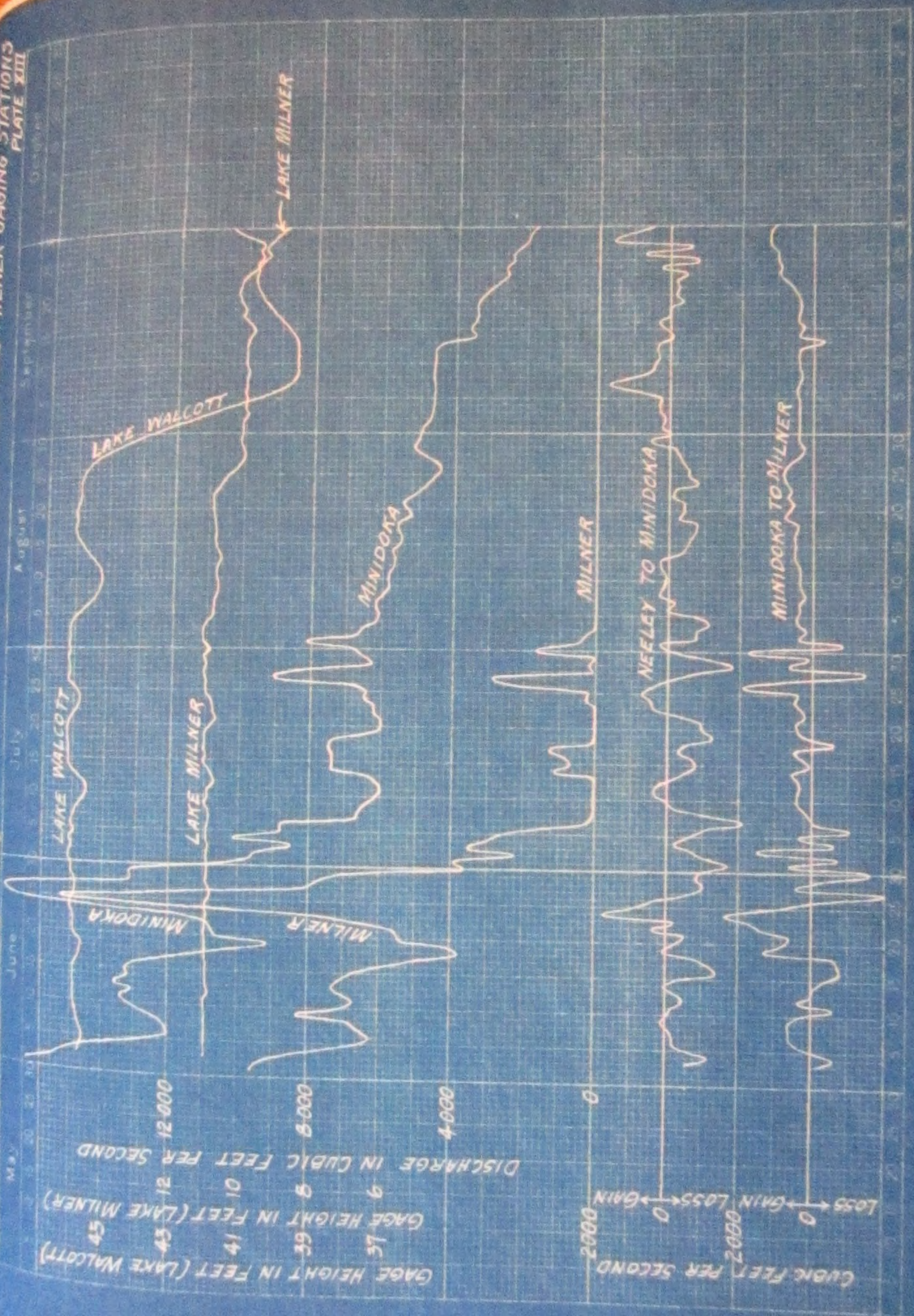
HYDROGRAPHS ILLUSTRATING NET GAINS BETWEEN BLACKFOOT AND NEELEY GAGING STATIONS 1923 DISTRIBUTION WATER DISTRICT NO. 36 PLATE XII



It is interesting to note that with the exception of the section from Woodville to Blackfoot, which shows very little change, gains in return flow or decreases in net losses in comparison with preceding years are indicated on practically all other sections of the main river during 1923. A comprehensive ground water study extending over a considerable period of time is needed if the real cause of such variations is to be determined, but it seems doubtful whether this knowledge would be of sufficient value to justify the necessary expense.

Plate XIII shows net gain or loss graphs for the two sections between the Neeley and Minidoka and the Minidoka and Milner gaging stations respectively. It also includes graphs showing the fluctuations in water surface elevation at both Lake Walcott and Lake Milner, together with hydrographs for the river stations below the Minidoka and Milner dams. All graphs are plotted to coincide with Lake Walcott or Minidoka dates.

Because of the demand for power on the Minidoka Project a stage of 45.33 feet was again set as the minimum level for Lake Walcott prior to about August 15th. Following this date a schedule was submitted which permitted lowering this reservoir to 45.00 feet on August 18, 44.00 feet on August 31, 40.00 feet on September 15 and 38.50 feet on September 30. This allowed rather heavy draft upon the Walcott storage to fill the demands of lower valley canals during the latter part of the season, but in view of the extreme hot, dry weather which prevailed during much of this time an adequate supply could not be maintained from this source supplemented only by normal flow. Hence Jackson Lake storage was again requisitioned in September as previously explained. The use of about 70,000 acre-feet of storage from the lower reservoir aided materially, however, in the conservation of water for the 1924 season at Jackson Lake.



The periods of extraordinary waste past Milner Dam are clearly indicated on the Milner graph. That portion of this waste occurring from July 14-18 (Minidoka dates) was due to a bad break which necessitated shutting all water out of the large Aberdeen-Springfield Canal for a corresponding slightly earlier time. Extra waste during the latter part of July and the first few days of August was attributable to the effect of summer rains which were particularly heavy throughout the actual valley irrigated sections about July 24th and which resulted in a subsequent material decrease in the use of water. During the latter period especially, efforts were made through the reinstatement of rights and through personal contact with watermasters to encourage larger upper valley use of water, but little could be accomplished in this respect at times when a surplus was known to be available. The total extra waste of 11,753 second-feet during the storage delivery period amounted to 3.31 per cent of the storage released from Jackson Lake Reservoir, a quantity large enough to warrant some criticism of the judgment exercised in river control by the Special Deputy. However, the exact net effect of an extensive summer rain storm is very difficult to estimate in advance and for this reason it is extremely hard to anticipate just how much storage should be released from Jackson Lake at such times in order to completely fill requirements without waste and without undue drawdown of Lake Walcott.

The general trend of the loss curves, as well as the irregularities noted therein, differ but little from those of former years and can probably be similarly explained.

From June 3 to August 26 when Lake Walcott was practically full the average daily net loss in the section from Neeley to Minidoka was 399 second-feet while from August 27 to September 13, during the rapid drop

and low stage period for this reservoir, an average daily net gain of 340 second-feet is indicated for the same section.

This affords another illustration of reservoir bank storage, an item whose exact amount seems to depend somewhat upon the rapidity with which the water surface is lowered as well as upon the length of time the stage is maintained at a relatively low point. Records of the past five years suffice, however, to show that it is of material consequence and can be depended upon in this case to increase the late season water supply available for lower valley irrigation use, provided the river flow is so regulated as to bring about the requisite drop and continued low stage in Lake Walcott.

No account is taken in this report of the storage capacity of Lake Milner, and this, together with wind effect on the two lakes and the failure of a single time interval to apply throughout the entire season probably affords an explanation for most of the irregularities in the loss graphs.

From Neeley through to Milner the average daily net gain for the regular 122 day season amounts to 156 second-feet, an increase of 60 second-feet over 1922 and the largest average gain noted in this section for the last five years.

NORMAL FLOW COMPARISON

The monthly summary which was included in the 1922 report for the purpose of showing the normal flow water supply available during different irrigation seasons for the so-called Idaho Falls area has been extended to include 1923, and appears herein as Plate XIV.

In this tabulation an attempt has been made to show by months the principal component parts which make up the normal flow supply and also

**SUMMARY BY MONTHS OF NORMAL FLOW
CONDITIONS BETWEEN THE HEISE-REXBURG
AND BLACKFOOT GAGING STATIONS
IRRIGATION SEASONS 1919 1920 1921 1922 ^{AND} 1923**

1923 DISTRIBUTION WATER DISTRICT NO 36

PLATE NO XIV

YEAR	HEISE NORMAL FLOW	REXBURG	BLACKFOOT RIVER	RETURN FLOW HEISE TO BLACKFOOT	NORMAL FLOW GAIN FROM STORED LOSS	TOTAL NORMAL FLOW SUPPLY	TOTAL DIVERSIONS HEISE TO BLACKFOOT	STORED DIVERSIONS HEISE TO BLACKFOOT	NORMAL FLOW DIVERSION HEISE TO BLACKFOOT	BALANCE AT BLACKFOOT STATION	NORMAL FLOW PASSING BLACKFOOT STATION
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JUNE

1919	241439	22477	400	-18994	16728	262050	264752	10433	254319	7731	7731
1920	552010	84910	3205	-14579	0	625546	310026	0	310026	315520	315520
1921	683677	153110	5039	-33854	0	807972	277462	0	277462	530510	530510
1922	595489	113110	8190	-2304	0	714485	331545	0	331545	382940	382940
1923	482579	90200	11597	23918	0	608294	262414	0	262414	345880	345880

JULY

1919	121226	21652	14	-4693	12321	150520	180218	35521	144697	5823	5823
1920	353997	31670	4810	8812	6048	405337	317285	7089	310196	95141	95141
1921	308767	30480	3213	5651	7803	355914	323826	11031	312795	43119	43119
1922	297375	31066	6471	25067	10796	370725	321988	4681	317307	53468	53468
1923	365108	28661	5864	22459	10881	432973	328971	4020	324951	108022	108022

AUGUST

1919	98839	19894	78	3938	5123	127872	129054	2217	126837	1035	1035
1920	177244	24553	5266	34866	6390	248319	259201	25851	233350	14969	14969
1921	182975	35843	8209	29756	5620	262403	260670	10608	250062	12341	12341
1922	192659	34222	6897	37086	7071	277935	252849	15156	237693	40242	40242
1923	178904	28659	5979	35700	11008	260250	265384	23833	241551	18699	18699

SEPTEMBER

1919	87115	22501	345	2234	0	112195	107517	0	107517	4678	4678
1920	66389	21130	2290	10585	521	100915	71638	0	71638	29277	29277
1921	129235	50960	4525	26655	184	211559	149132	0	149132	62427	62427
1922	133751	39758	1996	15950	0	191455	142769	0	142769	48686	48686
1923	120623	30825	3798	23299	5571	184116	194718	22851	171867	12249	12249

REFERENCE NOTES

- ALL DISCHARGE QUANTITIES ARE LISTED IN SECOND FEET.
- INCLUDES EMMA MATILDA AND TWO OCEAN LAKE STORAGE.
- RECORDS FOR SEPTEMBER, 1-15 (INCLUSIVE), ONLY.

show the extent to which the latter is used in the territory between the Heise and Rexburg gaging stations at the upper end and the Blackfoot station at the lower end of the central irrigated territory.

The quantities listed are all summarized from the more extensive river data tables contained in the water distribution reports for the years 1919 to 1923, inclusive. Time intervals have been adhered to and all records as presented have been adjusted to correspond as nearly as practicable to the actual dates of canal diversions in the Idaho Falls district.

The following brief explanation of this table will perhaps facilitate its interpretation by the reader:

Columns 1-4 Sufficiently described by headings.

Column 5 Net gain in the section. To be complete it should probably have added to it the quantities contained in the same lines in Column 6.

Column 6 If the storage transmission loss is correctly determined, any indicated normal flow gain from that source is really additional return flow. The quantities shown in this column reflect changes in transmission loss schedules which should be taken into account in comparing the data for different years.

Column 7 The algebraic sum of the quantities listed in the five preceding columns.

Columns 8-10 Headings afford sufficient explanation.

Column 9 "Total Normal Flow Supply" less "Normal Flow Diversion Heise to Blackfoot."

Column 10 Equivalent to Column 9 on which it affords a check as the results here given are taken direct from the river data sheets.

Analysis of 1923 conditions by comparison with other years as summarized on this plate illustrates very plainly a number of pronounced peculiarities, some of which have already been mentioned.

- (1) Return flow from Heise to Blackfoot is greater than for any of the other years during the month of June and is uniformly large for the other three months.
- (2) The total normal flow supply was relatively small during June and September, but was the largest for the five year period during July and was fairly good for August.
- (3) Total diversions during June were the smallest and during each of the three later months were the largest in amount for the five years. The extremely heavy diversions of both stored water and normal flow indicated for September are especially noticeable. Total diversions for the entire four months were slightly greater during 1923 than for any of the other years.
- (4) The amount of normal flow passing the Blackfoot station was unusually large for July and very small for September.

Taken as a whole 1923 is shown to have been a very satisfactory year for upper valley normal flow water users. While the total available supply was slightly less than for some of the preceding years, most of this deficiency occurred during June when a minor shortage simply means less unused water wasting past Milner Dam.

WATER DISTRIBUTION AND HYDROMETRIC WORK
IN THE HENRYS FORK-FALL RIVER-TETON AREA

C. A. McClelland again filled the position of hydrographer and deputy water master in direct charge of hydrometric work and water distribution in the so-called North Fork section and in addition acted as Special Deputy for the delivery of stored water from Henrys Lake Reservoir. All other deputies and assistants working in this section reported to and received their instructions from him, while he in turn worked under general supervision from the office at Idaho Falls.

An office was maintained during the summer in the St. Anthony Bank & Trust Co. building at St. Anthony, and a part time clerk was employed from June 15 to August 31, inclusive, to look after this office and to assist with correspondence, checking of computations, etc.

The following abstract from a report prepared by Mr. McClelland affords a brief summary of the work in this part of District No. 36.

In addition to the usual work of securing gage readings and meter measurements and to minor construction and repair of gaging station equipment, the new Au continuous water stage recorder was installed at the station on Henrys Fork at Warm River during the early part of the season.

W. R. Wayman assisted with this program during the period from May 12 to 31, inclusive. On the latter date W. F. Dawson arrived and took up the work on Teton River while Mr. Wayman continued his services in the capacity of river rider and deputy water master on the Henrys Fork division.

Regular daily gage readings and reports began June 1 and continued until the end of August.

While no very high water was experienced, stream flow in this section was generally well sustained throughout the month of June, but dropped rapidly during the early part of July coincident with increased demand on the part of the canals. Regulation was therefore soon required and canals with young rights were necessarily shut down to provide adequate supply for those having older priorities.

Pooling arrangements which had been of so much assistance to these late right canals in former years were no longer effective, but fortunately

the North Fork Reservoir Co. was in a position to dispose of some of their Henrys Lake storage upon a season use or rental basis. Several canals purchased some of this stored water while some others were able to secure temporary transfers from neighbor canals to assist them during this shortage period.

Henrys Fork was practically dry (estimated 20 second-feet leakage passing the Consolidated Farmers diversion dam) as early as July 17 and irrigation supply prospects began to look decidedly serious. The heavy rain storm of July 24 was therefore of immense benefit and relieved the situation to such an extent that in spite of the second deficiency period which occurred during the early part of August, valid normal flow rights when readjusted through the medium of individual temporary transfers and supplemented by Henrys Lake storage deliveries proved sufficient to prevent any serious crop loss for the season.

By the end of August irrigation demands had decreased so materially that almost no regulation was necessary and in consequence the services of Deputies Luetjen and Wayman and also of Miss Mitchell, the part time clerk in the St. Anthony office, were discontinued. Temporary transfers, from assuredly valid rights and sufficiently extensive to cover all September demands, made it seem unnecessary to reinstate these employees, even during the late season run of Jackson Lake storage when so many normal flow rights were again cut off.

No attempt was made by the depleted personnel to secure daily records of canal diversions during September. Each station was visited once each week or oftener, two or more meter measurements were secured at most stations and all river records were continuously maintained. During the last half of the month this work was all handled by Mr. Dawson as Mr. McClelland was engaged on work in another part of the district in connection with the Meeker special investigation.

While the preceding descriptive outline of work applies particularly to Henrys Fork and Fall River it is almost equally applicable to the Lower Teton where W. F. Dawson acted in the combined capacity of hydrographer, deputy water master and river rider. This section did not benefit from the Henrys Lake storage but the deficiency in water supply was not of enough magnitude to cause any material crop loss.

From the standpoint of continuous operation the canals of this area had a good season since, with the possible exception of the Marysville, none of them suffered any bad breaks which interfered with their deliveries.

The value of the Henrys Lake storage reservoir was amply demonstrated and may be expected to stimulate the water users of both Fall and Teton Rivers to further efforts looking toward the development of storage possibilities on those streams. As might be expected during the first year of operation of any reservoir some complications developed which must be adjusted in the future before the most satisfactory utilization of this additional water supply can be attained. Lack of present adequate outlet capacity, in particular, should be remedied.

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR JUNE 1923

FALL RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
YELLOWSTONE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MARRIAGEFIELD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MARTINSVILLE	0	0	0	0	65	73	0	59	62	104	128	148	147	156	160	164	0	0	165	164	167	154	153	129	126	104	104	139	0	0	2625
TOTAL DIV ABOVE SQUIRREL	0	0	0	0	65	73	0	59	62	104	128	142	147	156	160	164	0	0	165	164	167	154	153	129	126	104	104	139	0	0	2625
FARMERS OWN	0	0	0	0	0	0	0	0	0	0	0	0	0	30	30	30	32	32	33	36	36	39	27	26	25	31	30	30	32	33	534
ENTERPRISE	48	48	48	50	51	51	72	82	89	91	130	131	151	148	155	0	62	62	131	143	144	148	143	143	141	151	142	154	148	151	5313
BELL RIVER	356	338	360	356	352	368	385	397	400	402	427	431	435	402	389	418	446	431	381	368	385	344	248	238	231	314	343	344	400	412	1106
FALL RIVER	8	8	6	6	6	7	9	10	10	10	12	12	12	11	10	9	11	11	5	4	4	5	8	5	4	2	2	2	3	3	281
MCBEE	70	96	96	96	96	101	105	109	110	110	115	114	117	114	105	107	94	90	77	75	76	84	91	84	80	73	72	69	111	116	2853
CHESTER	16	14	10	10	10	12	18	19	19	20	24	25	26	23	22	18	26	26	11	10	10	11	22	21	12	11	6	6	7	8	478
SILKEY	28	28	25	24	25	27	28	15	15	16	25	26	34	33	30	32	5	18	19	15	16	17	19	18	16	16	25	24	46	47	712
CURR	4	4	4	4	4	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	77
WHITE																															
TOTAL DIV. SQUIRREL TO CHESTER	543	556	551	552	577	630	645	655	661	746	752	788	774	752	752	626	689	684	669	660	680	660	577	552	523	611	635	640	752	781	19445

HENRY'S FORK CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
DEWEY	27	27	28	27	26	28	21	22	22	22	25	24	24	23	22	26	27	25	27	26	27	27	22	22	22	21	21	25	29	30	785
LAST CHANCE	88	86	80	81	0	0	0	74	81	82	84	95	95	94	96	105	108	101	91	89	92	92	69	68	62	61	68	68	92	92	2294
ST ANTHONY UNION	438	429	428	425	458	436	425	427	0	411	445	454	540	544	574	501	577	510	281	310	309	310	315	287	283	315	364	383	398	463	14501
FARMERS FRIEND	472	220	214	207	216	223	231	232	216	228	209	210	245	231	245	279	262	204	184	181	174	144	119	120	105	104	103	105	130	199	5802
TWIN GROVES	179	166	152	127	133	129	132	130	129	159	167	168	169	169	167	171	128	84	102	94	92	79	65	72	71	71	70	94	118	165	3782
SALEM UNION	186	181	180	172	178	178	184	208	217	238	236	238	238	230	217	220	126	122	116	56	56	59	61	60	59	58	57	99	163	193	4555
TOTAL DIV. ASHTON TO ST ANTHONY	1190	1103	1043	1039	1011	994	993	1023	656	1119	1168	1187	1311	1281	1321	1102	1017	946	801	756	800	711	651	629	801	630	687	784	944	1135	28619
EGIN	317	313	313	327	320	281	283	310	312	329	329	329	319	294	264	291	151	209	184	188	189	191	191	191	171	213	234	256	254	279	7904
ST ANTHONY UNION FEEDER	81	80	72	71	70	71	65	61	60	58	60	67	80	84	81	64	54	39	37	37	38	50	23	47	45	53	68	68	67	74	1825
INDEPENDENT	317	309	316	309	309	318	331	329	309	320	327	327	377	386	396	309	289	183	172	242	244	199	150	179	175	244	231	243	250	307	8352
CONSOLIDATED FARMERS	247	242	238	233	236	238	256	235	242	240	245	247	249	244	229	224	251	244	220	215	220	220	224	188	142	139	187	139	142	151	6487
TOTAL DIV. ST ANTHONY TO REXBURG	244	239	240	240	245	248	248	248	248	247	247	247	1025	1008	910	888	725	673	613	681	681	660	588	585	525	549	670	711	713	841	24561

TETON RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
SIDDEWAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WILFORD	123	115	118	131	115	118	125	128	127	129	133	140	140	176	172	153	185	130	160	162	151	152	159	163	154	117	117	113	116	132	4234
TETON IRRIGATION	33	61	66	61	67	72	75	76	78	81	71	71	76	80	82	81	71	74	74	64	66	66	64	62	61	62	72	74	91	90	2132
GOOD LUCK	8	6	7	7	8	8	9	18	16	16	17	13	13	14	16	15	17	19	17	17	7	7	8	7	7	9	9	9	13	14	358
PIONEER	9	11	12	12	11	11	14	18	6	6	14	21	44	44	42	32	34	32	31	21	18	18	19	17	17	10	11	10	14	15	574
STEWART	14	15	13	13	7	7	9	15	22	23	23	25	0	0	20	33	36	36	34	22	21	22	23	21	20	21	21	21	22	23	587
PINCOCK BYINGTON	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	13	13	12	13	13	13	12	13	12	13	14	441	
PINCOCK GARNER	28	26	26	26	26	26	29	30	32	34	32	32	32	31	28	32	29	26	24	22	18	17	17	15	21	19	18	16	17	17	441
TETON ISLAND FEEDER	305	296	302	296	299	299	313	316	321	316	307	313	321	327	313	310	313	307	302	285	280	258	264	263	166	175	180	182	180	239	8344
ROXANA	17	16	16	9	10	9	11	11	31	32	33	32	31	35	33	33	31	3	3	3	2	2	2	2	1	1	2	3	3	3	423
ISLAND WARD	34	36	36	19	21	19	22	23	23	23	23	23	23	23	23	23	23	23	20	20	19	23	25	24	25	24	24	26	25	1097	
WOODMANSEE JOHNSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITY OF REXBURG	65	63	64	57	57	58	60	63	69	69	67	73	72	74	71	70	66	65	58	55	57	60	60	56	61	60	53	53	49	49	1856
REXBURG IRRIGATION	152	198	200	175	179	181	183	191	237	239	243	247	252	256	245	249	252	227	225	200	203	208	215	221	205	207	185	187	169	185	6366
TOTAL DIVERSIONS	863	862	876	811	787	874	921	979	1084	1092	1090	1130	1139	1196	1175	1193	1174	1117	1019	921	890	881	909	902	784	767	749	741	753	863	28559

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR JULY 1928.

FALL RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
YELLOWSTONE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HARRIGFIELD	15	15	19	20	21	20	23	25	24	35	32	31	0	32	38	38	36	0	0	0	0	0	0	0	0	0	12	11	10	10	8	209
MARYSVILLE	0	107	156	142	153	172	169	184	195	222	206	204	208	207	208	209	205	208	0	0	20	26	146	0	110	138	160	162	154	140	128	4321
TOTAL DIV ABOVE SQUIRREL	15	125	159	162	174	192	192	209	219	257	238	245	217	260	268	274	266	244	7	0	20	26	157	11	121	160	181	182	176	158	148	5057
FARMERS OWN	34	36	37	38	40	39	38	40	42	42	38	46	47	43	42	43	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENTERPRISE	146	150	152	158	153	153	155	145	137	137	133	130	134	132	131	138	109	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BELL	8	7	8	7	6	8	9	6	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FALL RIVER	442	444	460	454	442	467	473	493	426	342	326	304	346	390	322	360	359	350	342	350	350	348	352	350	350	346	348	343	348	336	372	11473
MCBEE	3	8	10	8	10	10	14	12	11	2	1	4	11	6	10	14	16	15	9	11	11	11	10	10	9	9	11	10	9	5	18	295
CHESTER	124	152	147	151	138	155	152	136	109	83	54	41	56	44	26	16	42	90	12	6	14	14	14	14	14	14	14	14	14	14	14	14
SILKEY	18	19	16	19	19	20	27	20	16	4	5	9	10	8	11	2	14	14	7	19	19	19	20	19	18	17	0	0	0	0	0	0
CURR	33	39	44	49	47	48	42	37	22	19	15	17	20	18	15	23	24	31	37	41	33	33	33	35	36	34	34	33	31	22	24	568
WHITE	2	4	3	4	2	3	3	3	1	2	0	3	2	2	1	2	1	4	4	4	4	4	4	5	5	5	4	4	4	3	3	3
TOTAL DIV SQUIRREL TO CHESTER	810	859	877	884	857	903	913	792	668	634	573	556	626	588	558	598	597	599	419	439	447	513	479	476	654	629	638	578	572	500	611	18632

HENRY'S FORK CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
DEWEY	22	22	24	23	27	27	27	26	24	21	24	25	24	23	21	20	19	20	4	2	2	2	2	2	2	2	2	2	2	2	2	2
LAST CHANCE	96	96	91	94	92	90	90	88	70	54	52	54	51	42	40	34	51	56	54	64	62	62	62	62	62	61	57	53	54	52	44	1887
ST ANTHONY UNION	471	477	474	477	493	400	402	447	440	461	486	519	440	432	425	467	474	468	447	420	418	416	409	470	441	441	447	447	401	308	341	12832
FARMERS FRIEND	105	225	230	242	252	253	265	162	150	143	132	129	111	111	128	119	120	49	36	37	36	24	16	13	126	123	112	131	126	111	113	3930
TWIN GROVES	109	197	155	132	154	167	116	140	136	132	126	129	127	128	137	138	139	123	98	103	130	136	136	134	134	134	121	89	93	91	85	3394
SALEM UNION	227	222	265	267	249	200	204	193	156	147	129	127	149	178	170	170	132	134	158	163	202	196	233	230	61	103	100	179	111	104	102	4231
TOTAL DIV ASHTON TO ST ANTH.	1186	1197	1239	1245	1167	1157	1004	1056	976	958	949	983	902	914	921	948	935	850	817	789	850	830	908	903	545	577	641	673	706	720	752	28308
EGIN	310	313	279	279	302	260	202	223	253	300	302	304	241	231	249	287	291	298	321	287	310	292	342	313	275	214	164	184	181	245	220	8338
ST ANTHONY UNION FEEDER	81	80	68	66	65	66	52	55	62	68	62	53	50	44	36	33	29	31	39	67	62	60	55	52	18	17	29	31	37	34	39	1541
INDEPENDENT	333	329	316	300	302	312	316	267	246	183	159	126	162	134	115	127	115	124	164	242	244	234	211	209	127	127	236	223	201	207	195	6592
CONSOLIDATED FARMERS	186	231	238	242	244	244	262	261	226	190	175	166	139	125	81	100	100	103	168	247	262	268	229	233	244	238	227	227	217	193	191	6249
TOTAL DIV ST ANTH TO REXBURG	310	309	301	287	313	288	232	796	792	741	658	651	592	584	481	547	535	558	632	843	878	854	837	807	644	596	656	645	636	679	645	22717

TETON RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
JUDGWAY	16	15	14	13	13	20	19	18	17	16	15	16	15	16	15	15	17	16	14	13	12	12	10	0	16	16	16	16	15	15	11	451
WILFORD	176	180	185	179	172	174	169	162	154	147	146	142	137	128	124	125	119	114	111	109	108	109	104	123	123	128	125	121	120	120	118	4250
TETON IRRIGATION	86	92	92	89	89	99	100	100	96	97	89	99	97	81	78	88	93	89	81	79	78	74	44	47	71	70	68	78	64	71	62	2534
GOOD LUCK	15	15	23	23	20	19	19	18	16	15	14	32	30	28	25	24	22	23	21	20	19	18	18	20	20	18	18	15	14	13	13	578
PIONEER	35	35	35	35	32	32	28	22	21	21	17	11	10	26	25	23	23	23	21	20	19	18	18	20	20	20	18	16	14	14	13	674
STEWART	44	45	45	44	43	39	39	38	35	34	32	32	31	28	27	27	27	26	25	23	22	22	22	26	27	27	24	25	23	23	22	950
PINCOCK BYINGTON	12	12	12	11	10	10	9	8	6	6	6	4	4	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	162
PINCOCK BARBER	15	16	14	13	10	11	26	26	23	20	35	30	28	24	23	24	21	19	17	12	10	8	13	17	17	18	17	15	15	14	10	581
TETON ISLAND FEEDER	253	269	272	266	268	285	341	335	324	302	291	258	253	247	244	242	239	239	239	231	205	200	210	231	221	242	221	210	205	200	198	7734
BOIANA	4	20	21	19	14	8	8	8	8	21	16	14	8	7	7	5	5	1	0	1	1	1	1	7	9	10	10	8	8	8	9	284
ISLAND WARD	30	61	59	56	13	63	59	55	32	77	81	74	72	62	56	55	57	47	40	30	32	29	27	17	17	16	16	16	16	16	16	1633
WOODMANSEE JOHNSON	32	42	43	41	42	38	38	36	36	32	31	26	24	20	20	20	20	18	13	18	16	16	16	24	28	24	23	22	20	12	14	818
CITY OF REXBURG	47	46	46	48	48	46	62	61	52	51	49	50	48	43	40	44	44	43	30	31	32	28	25	36	33	37	37	35	33	31	31	554
REXBURG IRRIGATION	199	201	209	211	210	171	219	221	179	165	172	145	141	140	136	140	139	134	128	142	140	130	159	164	173	182	182	175	164	161	184	5242
TOTAL DIVERSIONS	948	1023	1066	1045	980	1045	1131	1108	1062	1004	994	933	898	853	828	835	817	781	741	729	692	642	613	753	792	836	819	784	747	735	743	27034

DAILY DISCHARGE IN SECOND FEET OF CANALS DIVERTING FROM HENRY'S FORK AND TRIBUTARIES FOR AUGUST 1923

FALL RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
TELEPHONE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
HARRISFIELD	11	10	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
HARRISVILLE	100	116	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
TOTAL BY ABOVE SQUIPPEL	119	134	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
FARMERS OWN	34	34	33	32	34	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
ENTERPRISE	0	67	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
BELL	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
FALL RIVER	356	344	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340
MCBEE	14	14	3	2	3	1	1	12	10	11	11	10	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CHESTER	80	76	32	34	31	29	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SILKEY	12	11	6	6	5	4	3	3	11	14	13	12	12	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CURR	26	25	12	16	22	19	21	41	35	36	34	33	26	30	27	28	25	20	19	21	21	21	21	21	21	21	21	21	21	21	21	21
WHITE	4	4	5	2	2	2	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
TOTAL DIV SQUIPPEL TO CHESTER	582	581	565	570	570	540	495	561	540	523	446	423	427	475	474	475	470	384	364	330	410	417	413	396	412	409	395	387	395	391	410	14250

HENRY'S FORK CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
DEWEY	17	16	16	18	18	4	4	3	0	0	3	23	54	51	40	54	51	56	54	54	54	54	54	54	54	54	54	54	54	54	54	54
LAST CHANCE	96	94	91	94	92	90	90	88	70	54	52	54	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416	416
STANTHONY UNION	337	336	332	336	339	337	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338	338
FARMERS FRIEND	110	101	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
TWIN GROVES	79	69	7	7	122	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111
SALEM UNION	138	136	133	134	163	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187	187
TOTAL DIV ASHTON TO STANTHONY	777	802	816	798	829	843	847	848	851	831	758	820	787	744	642	530	488	535	549	534	552	532	532	532	532	532	532	532	532	532	532	532
EGIN	232	223	213	209	245	261	241	263	263	241	220	231	223	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231
STANTHONY UNION FEEDER	43	43	37	39	46	46	43	60	60	59	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
INDEPENDENT	211	205	203	225	209	205	183	183	174	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254	254
CONSOLIDATED FARMERS	187	213	208	209	202	195	173	206	213	218	211	215	220	190	199	190	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191	191
TOTAL DIV STANTHONY TO REEDBURY	673	684	661	681	702	697	640	702	700	772	749	764	764	736	634	445	670	637	596	534	572	448	439	441	449	447	448	450	447	443	442	442

TETON RIVER CANALS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL
SIDDEWAY	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
WILFORD	119	114	111	109	110	109	105	97	85	84	86	88	86	81	85	87	83	80	83	86	86	86	85	85	85	85	85	85	85	85	85	85
TETON IRRIGATION	64	67	63	63	64	65	72	77	69	17	18	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
GOOD LUCK	14	13	12	11	11	11	10	10	10	9	8	8	8	8	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
PIONEER	13	11	10	9	8	8	8	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
STEWART	22	20	20	19	19	20	16	18	18	16	13	14	14	12	8	12	15	14	14	15	16	15	15	15	15	15	15	15	15	15	15	15
PINGOCK BYINGTON	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
PINGOCK GARNER	9	7	11	10	10	10	10	11	11	10	10	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
TETON ISLAND FEEDER	133	132	130	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
ROXANA	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
ISLAND WARD	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
WEDDMANEE JOHNSON	15	10	10	9	9	9	10	13	29	29	34	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
CITY OF HEABURG	53	42	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
HEABURG IRRIGATION	181	176	132	129	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
TOTAL DIVERSIONS	741	706	644	633	634	632	605	614	580	544	549	572	591	530	439	445	621	564	546	536	634	637	608	587	589	573	570	568	563	567	569	569

FALL RIVER CANALS

HENRY'S FORK CANALS

TETON RIVER CANALS

JETON RIVER CANALS																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL
SIDDOWAY	10	10	10	10	10	10	10	9	9	9	9	9	8	8	7	6	6	5	5	5	5	4	4	4	4	4	4	4	4	4	804
WILFORD	49	49	49	49	48	48	48	48	47	48	48	49	50	50	50	50	50	50	50	50	58	67	75	83	92	100	100	100	100	100	1,854
JETON IRRIGATION	35	40	45	50	53	52	52	51	50	50	49	49	46	43	40	37	34	31	36	42	41	40	40	39	38	37	37	37	37	1,263	
GOOD LUCK	2	2	2	2	3	3	3	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	53	
PIONEER	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	110	
STEWARD	17	17	17	17	17	17	17	16	16	16	16	15	15	15	15	15	15	15	15	15	14	14	14	14	13	13	13	13	13	13	453
PINCOCK BYINGTON	12	11	11	11	11	11	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	8	8	8	8	8	8	8	8	235
PINCOCK GARNER	10	10	9	9	9	9	10	10	10	10	9	9	9	9	9	9	9	9	9	8	7	6	6	6	6	6	6	6	6	4	233
JETON ISLAND FEEDER	301	198	184	190	189	188	187	186	185	184	183	182	180	178	177	175	173	172	170	168	166	164	162	160	158	156	156	156	156	156	5,253
ROXANA	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	21
ISLAND WARD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WOODMANSEE JOHNSON	26	26	26	26	25	25	24	24	24	24	24	24	24	24	24	24	24	24	26	28	31	33	35	38	40	42	42	42	42	42	883
CITY OF PEKSBURG	42	42	41	39	39	38	38	39	38	37	38	37	38	38	38	38	38	38	38	38	38	38	38	38	38	37	37	37	37	37	1,148
PEKSBURG IRRIGATION	187	180	142	134	127	119	119	118	118	117	115	114	117	120	124	127	130	133	131	129	127	126	124	123	120	118	118	118	118	118	3,739
TOTAL DIVERSIONS	864	820	651	641	634	625	623	619	614	611	607	605	603	601	600	597	594	593	595	594	593	592	592	591	592	594	594	594	594	594	15,511

Actual deliveries to the canals diverting from Henrys Fork, Fall and Teton Rivers are shown on Plates XV, XVI, XVII and XVIII.

Plates XIX and XX summarize data in regard to the flow of the three principal streams, diversions therefrom, losses and gains throughout different sections, in so far as it is practicable to show all these facts from the existing data.

The time interval basis used for the computation of records from the river gaging stations as presented in these tables is as follows:

Time from Henrys Lake in hours	Gaging Station	Period used for comparable daily means
0	Henrys Lake Outlet nr. Lake	Day ending at 2 p.m.
40	Henrys Fork at Warm River	Day ending at 6 a.m. 2nd day following
50	Henrys Fork near Ashton	Day ending at 4 p.m. 2nd day following
	Fall River near Squirrel	*Day ending at 10 a.m. 2nd day following
	Fall River near Chester	Day ending at 5 p.m. 2nd day following
54	Henrys Fork at St. Anthony	Day ending at 8 p.m. 2nd day following
	Teton River near St. Anthony	Day ending at 6 p.m. 2nd day following
66	Henrys Fork near Rexburg	Day ending at 8 a.m. 3rd day following

* Approximate means used. No recording gage records available.

This schedule is so arranged as to make the data correspond to the river records on Plates VII and VIII. The dates indicated on the tables are for the nearest midnight to midnight or calendar days.

No satisfactory sites have been found for gaging stations located immediately below the lowest canals diverting from Henrys Fork and Teton River, and on this account data have been included in the columns headed "Estimated Balance Below Diversions" only for days when these quantities were determined either by actual measurements or by estimates.

CONSERVATION WATER DIST NO 96.

HENRY'S FORK.

FALL RIVER

[illegible]

DATA AT AND BETWEEN GAGING STATIONS ON HENRY'S FORK AND TRIBUTARIES.

FALL RIVER

HENRY'S FORK

5000									
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HENRY'S FORK										TETON RIVER					THEO. BAL. HEN. FK. STANTH. + TETON RIVER	HEN. FK. NR. RELOC.	GAIN BELOW ST. ANTH.
NO.	STANTH. STATION				GAIN ASH. TO STANTH.	DIVERS. BELOW STANTH.		THEO. BAL. BELOW DIVERS.	EST. BAL. BELOW DIVERS.	STANTH. STA.							
	GAGE	DISCH	STOR.	NOR.		STOR.	NOR.			GAGE	DISCH	DIVERS	THEO. BAL. BELOW DIVERS.	EST. BAL. BELOW DIVERS.			
267	433	2630	0	2630	63	0	939	1691		182	1330	875	455		2146	2730	584
411	419	2320	0	2320	-91	0	940	1380		186	1350	811	539		1919	2480	561
359	420	2340	0	2340	-19	0	945	1395		192	1390	797	593		1988	2350	362
476	428	2520	0	2520	44	0	908	1612		207	1490	874	616		2228	2520	292
397	439	2760	0	2760	63	0	915	1845		225	1620	921	699		2544	2790	246
287	443	2850	0	2850	123	0	935	1915		254	1830	979	851		2766	3010	244
374	446	2900	0	2900	-274	0	923	1977		265	1910	1084	826		2803	3140	337
791	459	3220	0	3220	429	0	947	2273		272	1960	1092	868		3141	3330	189
282	448	2960	0	2960	73	0	961	1999		292	2120	1090	1030		3029	3380	351
263	452	3060	0	3060	97	0	970	2090		327	2400	1130	1270		3360	3530	170
289	455	3120	0	3120	131	0	1025	2095		357	2640	1139	1501		3596	3620	24
639	435	2670	0	2670	11	0	1008	1662		343	2520	1196	1324		2986	3390	404
229	412	2170	0	2170	-59	0	910	1260		272	1960	1175	785		2045	2860	815
288	406	2050	0	2050	-233	0	888	1162		248	1780	1193	587		1749	2470	721
663	428	2520	0	2520	-143	0	785	1735		250	1800	1176	624		2359	2860	501
974	449	2990	0	2990	16	0	675	2315		256	1840	1117	723		3038	3700	662
399	423	2410	0	2410	11	0	613	1797		216	1560	1019	541		2338	3590	1252
374	419	2320	0	2320	6	0	682	1638		190	1380	921	459		2097	3310	1213
240	418	2300	0	2300	60	0	691	1609		188	1370	890	480		2089	3170	1081
669	434	2650	0	2650	-19	0	660	1990		198	1430	881	549		2539	3530	991
219	457	3170	0	3170	-49	0	588	2582		222	1600	909	691		3273	4140	867
881	445	2900	0	2900	19	0	585	2315		206	1490	902	588		2903	4200	1297
729	437	2710	0	2710	-19	0	575	2135		192	1390	784	606		2741	3930	1189
2400	421	2360	0	2360	-40	0	649	1711		179	1310	757	553		2264	3430	1166
2133	409	2110	0	2110	-23	0	670	1440		173	1270	749	521		1961	2930	969
826	396	1850	0	1850	24	0	711	1139		169	1240	761	479		1618	2500	882
686	389	1720	0	1720	34	0	713	1007		166	1230	753	477		1484	2160	676
605	389	1720	0	1720	115	0	841	879		176	1290	863	427		1306	2020	714
1604	382	1600	0	1600	-4	0	910	690		193	1400	968	432		1122	1750	628
1583	381	1580	0	1580	-3	0	959	621		202	1460	1053	407		1028	1620	592
541	379	1540	0	1540	-1	0	901	639		204	1470	1066	404		1043	1520	477
1395	374	1460	0	1460	65	0	887	573		193	1400	1045	355		928	1410	482
413	372	1420	0	1420	7	0	913	507		188	1370	980	390		897	1330	433
1403	371	1410	0	1410	7	0	888	522		186	1350	1015	335		857	1300	443
526	378	1530	0	1530	4	0	832	698		180	1320	1131	189		887	1300	413
1240	360	1230	0	1230	-10	0	796	434		171	1260	1108	152		586	1200	614
1052	348	1060	0	1060	8	0	792	268		160	1190	1062	128		396	1070	674
753	332	854	0	854	101	0	741	113		155	1160	1004	56		169	923	734
683	325	775	0	775	92	0	698	77		146	1110	994	116		193	857	664
708	321	781	0	781	23	0	651	80		134	1030	933	97		177	810	633
688	315	670	0	670	-18	0	592	78		125	982	898	84		162	716	554
696	313	650	0	650	-46	0	584	66		120	952	853	99		165	706	541
560	308	602	0	602	42	0	481	121		120	952	823	129		250	654	404
489	302	548	0	548	59	0	547	1		119	946	835	111		112	614	502
564	301	539	0	539	-25	0	535	4		115	923	817	106		110	587	477
623	302	548	0	548	-75	0	558	-10	20	110	894	781	113		103	565	462
696	314	660	0	660	-36	0	692	-32	20	102	848	741	107	10	75	548	473
873	327	797	0	797	-76	0	843	-46	20	098	825	729	96	10	50	552	502
915	330	830	0	830	-85	0	878	-48	20	095	808	692	116	10	68	587	519
864	327	797	0	797	-67	1	853	-57	20	100	836	682	154	10	97	536	439
779	320	720	-174	894	-59	2	835	-117	20	098	825	673	152	10	35	519	484
864	327	797	66	741	-67	1	806	-10	20	110	894	753	141	10	131	536	405
1346	351	1100	-78	1178	-246	2	662	436		113	911	792	119	10	555	852	297
1295	363	1280	-182	1412	-15	1	595	684		117	935	836	99	10	783	1170	387
1131	354	1140	188	952		0	656	484		115	923	819	104	10	588	1060	472
930	339	938	242	696		0	665	273		104	859	786	73	10	346	945	599
832	332	854	138	716		0	636	218		100	836	747	89	10	307	879	572
688	324	764	27	737		0	679	85		095	808	735	73	10	158	805	647
667	322	742	27	715		0	645	97		095	808	743	65	10	162	740	578
771	329	819	27	792		0	673	146		093	796	741	55	10	201	750	549
716	325	775	-12	787		2	682	91		086	757	706	51	10	142	721	579

SUMMARY OF DATA AT AND BETWEEN GAGING STATIONS ON HENRY'S FORK AND TRIBUTARIES.

FALL RIVER

HENRY'S FORK

ASHTON STATION										SQUIRREL										DIVERSIONS										HENRY'S FORK										TETON																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
DATE	GAGE	STOR	NOR	DATE	GAGE	DISCH	CANAL AMOUNT STA.	SOURCE CANALS	DATE	TOTAL	STOR	NOA	THRO	DATE	GAGE	DISCH	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	NOA	THRO	

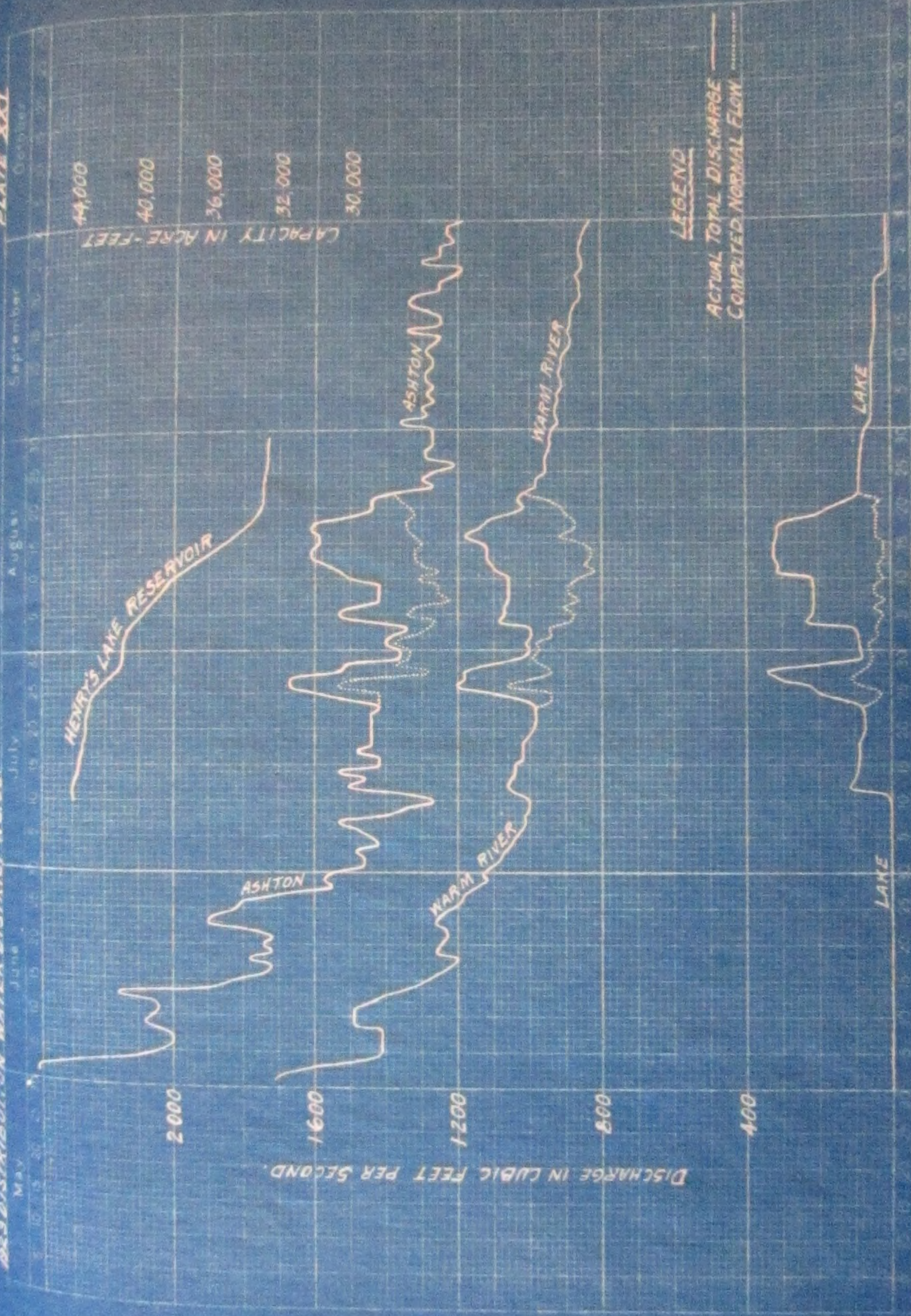
The period during which the quantity of water passing the lowest canal on Henrys Fork was limited to leakage through the diversion dam was of about the same duration as in 1922, but in the case of the Teton River this condition apparently pertained for somewhat more than the usual length of time. In fact, the latter stream probably contributed very little water to Henrys Fork, aside from return flow entering too near the mouth to be again used in that section, after the middle of July.

Plate XXI contains a curve showing the way in which storage was drawn from Henrys Lake Reservoir together with actual total and computed normal flow hydrographs for Henrys Fork at the Lake, Warm River and Ashton gaging stations. These graphs are all plotted with time interval adjusted to coincide with the nearest calendar day at the Ashton station.

The small amount of storage draft indicated for the period prior to July 24 and subsequent to August 21 (Ashton dates) has been neglected, for the reason that it was unintentional and attributable to faulty regulation of the reservoir outlet gates.

Especial attention is directed to the decreased normal flow indicated at all three river stations during the storage delivery period. While this is not large in amount it is evidently a very considerable percentage of the summer normal flow to be expected at the Lake station. The exact reason for this apparent discrepancy probably cannot be determined without study of all the different factors involved, which in turn may necessitate field investigations. Perhaps in the neighborhood of 20 second-feet might be accounted for as evaporation loss from the average increased flooded area, but this in itself hardly seems enough to make up the deficiency.

TOTAL AND NORMAL FLOW AT THE LAKE, WARM RIVER AND ASHTON GAGING STATIONS.
 DISTRIBUTION IN WATER DISTRICT NO. 96.
 PLATE XXI



HENRYS LAKE STORAGE DELIVERIES

Although construction work on the dam at the outlet of Henrys Lake was not completed until some time in July, 1923, enough work had been done to permit the storage of all run-off available after September 21, 1922. When it became necessary on July 9, 1923 to open the gates to allow normal flow to pass, the capacity tables indicated that a total of 44,040 acre-feet of usable storage had been impounded.

A new gaging station was established on the outlet below the dam, a recording gage was installed and a foot bridge constructed. Measurements were secured at this station as soon as possible after the first release of water, but a good rating had not yet been developed when the first orders for the release of storage became effective on the afternoon of July 21. Likewise the time which should be allowed for the transmission of this water from the reservoir to points of use near St. Anthony had not been thoroughly established and no schedule of losses in transit had yet been agreed upon.

J. M. McGinn, a rancher living about two miles from the dam, had been employed as gate tender and was also appointed deputy water master. Reports and instructions were forwarded to and from the St. Anthony office via telephone, but as it was necessary to depend in part upon a line of the U. S. Forest Service which was frequently out of order, this means of communication was far from satisfactory and resulted in some waste of storage. In fact, after the heavy rain of July 24, when repeated efforts to establish telephone connection had failed, orders to reduce the outlet discharge were forwarded by automobile tourists and finally by telegraph and special messenger from Big Springs.

Uncertainties concerning the proper segregation of flow past the outlet gaging station were also soon indicated since the application of

methods in use at the Jackson Lake Reservoir to determine the relative amounts of stored water and normal flow resulted in the inconsistency already emphasized in the discussion of the Plate XXI.

The foregoing facts are cited in order to explain the somewhat crude and inaccurate way in which the Henrys Lake storage was handled during the 1923 season.

Plate XXII contains the final summary account of all storage released from Henrys Lake. Canal deliveries are shown for the actual diversion dates and amounts at the respective headings. Where a minus quantity is given on the "Unused Storage" line an excess storage delivery is indicated or in other words normal flow was actually delivered to the canals instead of storage. This line shows at a glance the irregularities of the actual delivery together with the compensating character of the individual day errors. The algebraic total of unused storage for the entire period amounting to 794 second-feet at the reservoir might be considered as a penalty imposed upon the storage owners to reimburse normal flow rights for the reduction in computed normal flow at the outlet of the lake which has already been commented upon. Since the Henrys Lake equivalent of this unused storage would amount to an average continuous flow for the entire period of about 25 second-feet, such an adjustment would appear to be at least reasonably fair to all concerned.

The exact method used in the final segregation and summary of Henrys Lake storage is described as follows:

- (1) The amount of stored water released from the reservoir each day was determined from the capacity tables by noting the quantity corresponding to the daily decrease in stage indicated by the lake gage readings. Short period interpolations or adjustments were sometimes made in order to

HENRY'S LAKE STORAGE DELIVERIES

	22	23	24	25	26	27	28	29	30	31	AUG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	TOTAL SECT.	TOTAL ACRE FT.
MARYSVILLE		146	0	110	138																												394	782	
FARMERS OWN		28	28	28	28															28	28	28	28	28	28	28	28	28	28				364	722	
ENTERPRISE				106	104						67	122	122	121	121	121	121	121	120	120	67												1191	2362	
DEWEY																						6	6	6	6	6	6						30	60	
CITY-STANTH	1	2	1	2	1						2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	39	77
INDEPENDENT																		72	43	44	254	254	254	257	263	234	238	242						2155	4274
TOTAL DELIV.	1	176	29	246	271						69	123	124	122	124	122	123	194	165	165	351	289	290	292	299	269	274	271	30	1	2	1	2	4173	8277
UNUSED STORAGE	-1	-176	-55	-80	-133	-188	-242	-138	-27	-27	-27	-14	-68	-70	-72	-42	0	0	0	0	-157	-15	-27	-3	-10	20	-11	-8	215	161	106	80	-2	765	1517
AVAILABLE AT ASHFORD STN.	0	0	84	166	138	188	242	138	27	27	27	55	55	55	194	194	165	194	165	165	194	268	263	289	288	289	263	263	245	162	108	81	0	4938	9794

HENRY'S LAKE EQUIVALENT.

TOTAL DELIVERIES	1	180	30	251	276							70	125	127	124	126	198	169	169	358	298	304	307	315	283	288	285	31	1	3	1	2	4322	8573
UNUSED STORAGE	-1	-180	-55	-81	-135	-198	-242	-141	-28	-28	-28	-14	-69	-71	-74	-43	0	0	0	-158	-16	-28	-3	-11	21	-12	-9	218	164	105	82	-2	794	1575
																																	5116	10148

TOTAL DRAFT FROM RESERVOIR IN ACRE FEET JUL 22-AUG 22-----10148

eliminate irregularities presumably attributable to wind effect. This is exactly the same plan followed in segregating storage from normal flow at the outlet of Jackson Lake.

(2) Transmission losses were applied in accordance with the schedule recommended in the report of Consulting Engineer R. I. Meeker dated August 14, 1923, viz. 2 per cent when the discharge past the Henrys Lake Outlet gaging station was not in excess of 300 second-feet and 5 per cent when larger quantities were being run. The latter charge is somewhat in the nature of a penalty to be removed when the outlet channel is so straightened and improved as to eliminate excessive overflow at the higher stages. These transmission losses were applicable between the reservoir and points of use in the vicinity of St. Anthony. In preparing the tables shown on Plates XIX and XX one half of one per cent was applied between the Warm River and Ashton gaging stations and the balance between the Lake and Warm River stations.

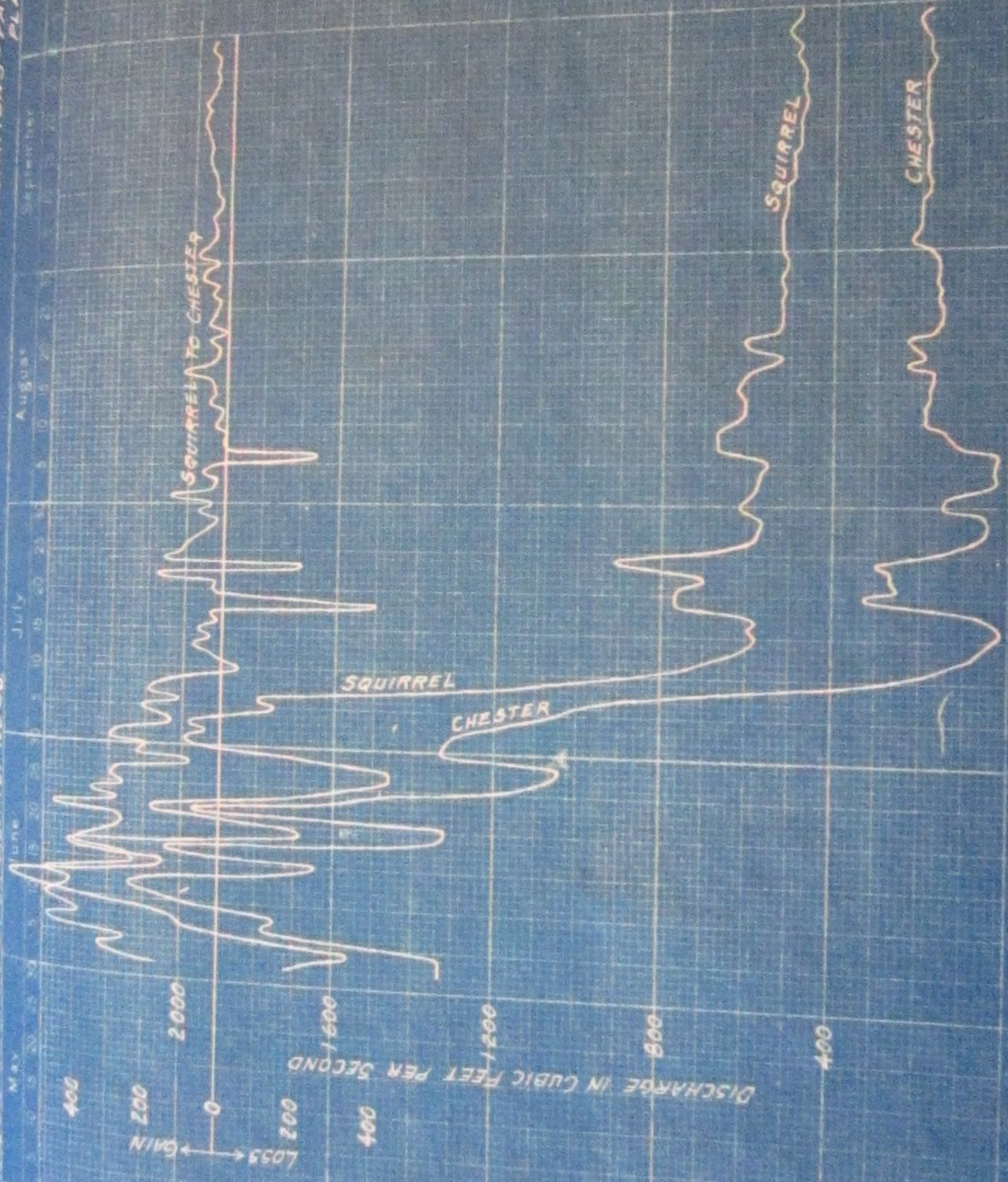
In actual field operation prior to the time Mr. Meeker's report was made a total transmission loss of $1\frac{1}{2}$ per cent was charged against all storage released from Henrys Lake.

Plate XXIII contains hydrographs for the two gaging stations on Fall River and a graph showing indicated net gains above the lower or Chester station. These are plotted to coincide with the dates at the upper station.

The large gains noted during June undoubtedly can be attributed chiefly to unmeasured inflow from Squirrel Creek and other small tributaries which later in the season may not reach the main river.

Some of the irregularities in the net gain graph are rather difficult to explain, but it seems probable that many of them are due to the fact that the Squirrel station is not equipped with a recording gage and

SET FLOODS AND GAINS BETWEEN THE SQUIRREL AND CHESTER GAGING STATIONS - FALL RIVER
 1928 DISTRIBUTION WATER DISTRICT NO. 36
 PLATE XXXII



hence does not afford exact mean daily discharge records.

Contrary to the conditions noted for most sections on Snake River the average 1923 net gain between the two Fall River stations is somewhat smaller than for either 1921 or 1922.

The hydrograph for the Rexburg station and graphs showing gains and losses on Henrys Fork above and below St. Anthony are included on Plate XXIV. These curves are all plotted to agree with the Rexburg dates.

On the whole the shape and general characteristics of these graphs differ but little from those of former years. Less return flow is indicated between the Ashton and St. Anthony stations, but an increase of almost the same amount is shown between St. Anthony and Rexburg.

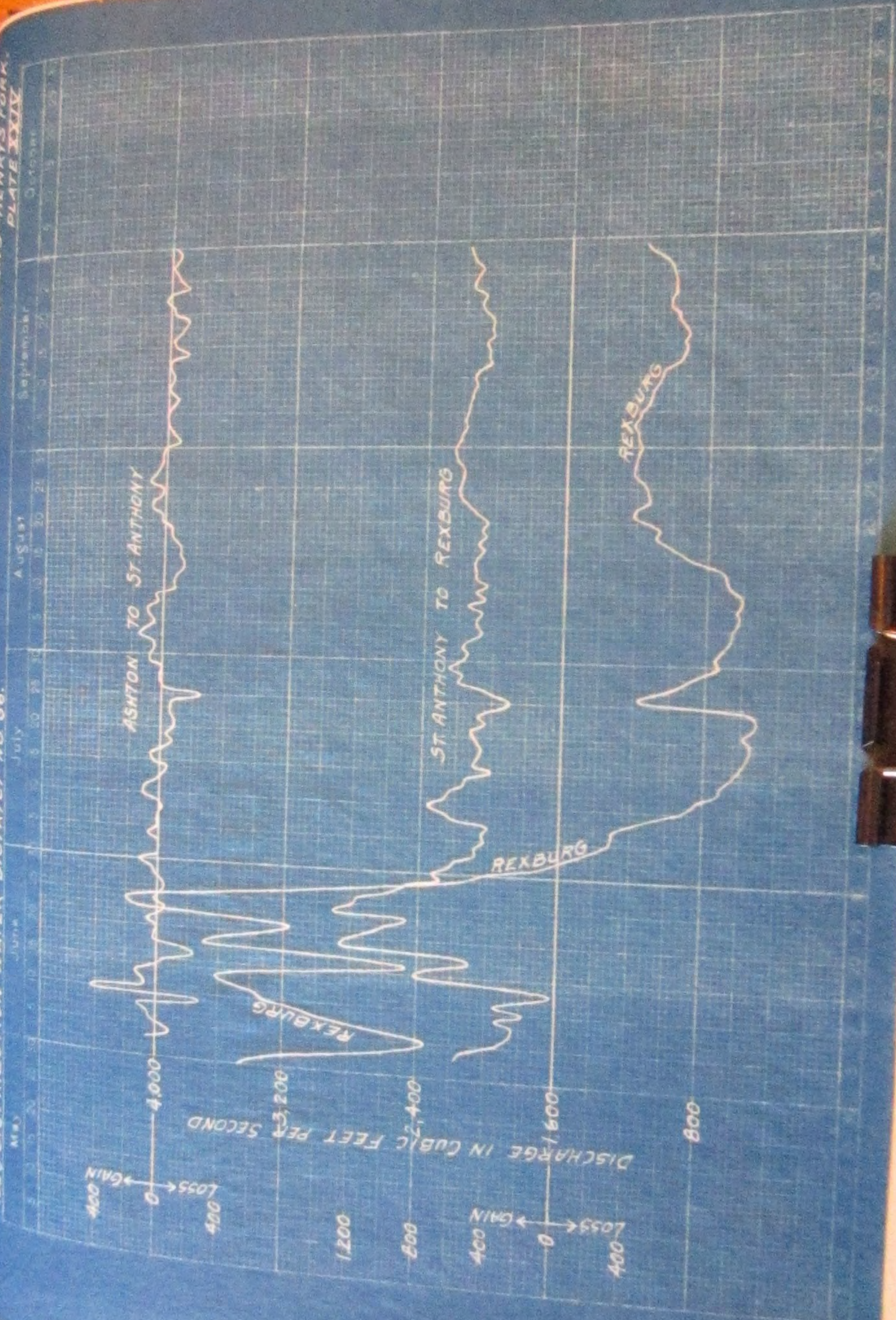
DISTRIBUTION IN SWAN VALLEY

Swan Valley water distribution was handled in the same manner during the years 1920, 1921 and 1922. A deputy water master was appointed for this section but his salary and other expenses incident to the work were paid directly by the local water users; hence no charges against the canals in this area were included in the annual water master's bill. Copies of all instructions regarding cuts and reinstatements were forwarded to this deputy, who was directed to regulate diversions in accordance with these orders.

DISTRIBUTION ON SAND CREEK, FREMONT COUNTY

Water distribution on Sand Creek in Fremont County in 1923 was handled strictly as a local problem. No request for the appointment of a deputy water master was made and since this stream is really not a surface tributary to Henrys Fork during the ordinary regulation period, it was entirely neglected in the District No. 36 distribution.

NET LOSSES AND GAINS BETWEEN THE ASHTON AND REXBURG GAGING STATIONS - HENRY'S FORK.
 1933 DISTRIBUTION WATER DISTRICT NO 36.
 PLATE XXXIV



CLIMATOLOGICAL DATA

The monthly and annual 1923 climatological summaries prepared by the United States Weather Bureau for Wyoming and Idaho contain many facts of interest in connection with Upper Snake River water supply and crop production.

Idaho averages for the entire calendar year show very slight variation from normal either as regards temperature or precipitation. Wyoming on the other hand reports that for the state as a whole the year was with one exception the wettest since records were begun in 1899. Analysis of the individual station records shows that this excess precipitation occurred mostly in the form of intense summer rains frequently approaching the cloudburst type and was confined almost exclusively to parts of the state not included in the Snake River drainage area.

In both states pronounced variations from normal were shown during individual months. June and September in particular were unusual as shown from the following quotations from the annual summary for Idaho:

"The month was cool and very wet--with but one exception the wettest June of record."

"The warmest September of record and the driest since 1916."

No very damaging spring frosts occurred and aside from slightly delayed growth during the cool weather of June and damage to hay by the excessive moisture during that period, crop growth and development was nearly normal. Weather was favorable for harvesting during September, but potato and beet digging in October was hampered somewhat by cool rainy weather. No serious frost damage resulted, however.

The amount and distribution of precipitation at the principal observation points throughout District No. 36 territory is shown graphically

for the four summer months of 1923 on Plates XXV and XXVI.

Summarizing these records by months for those of the stations at which data have been secured for ten or more years gives the following:

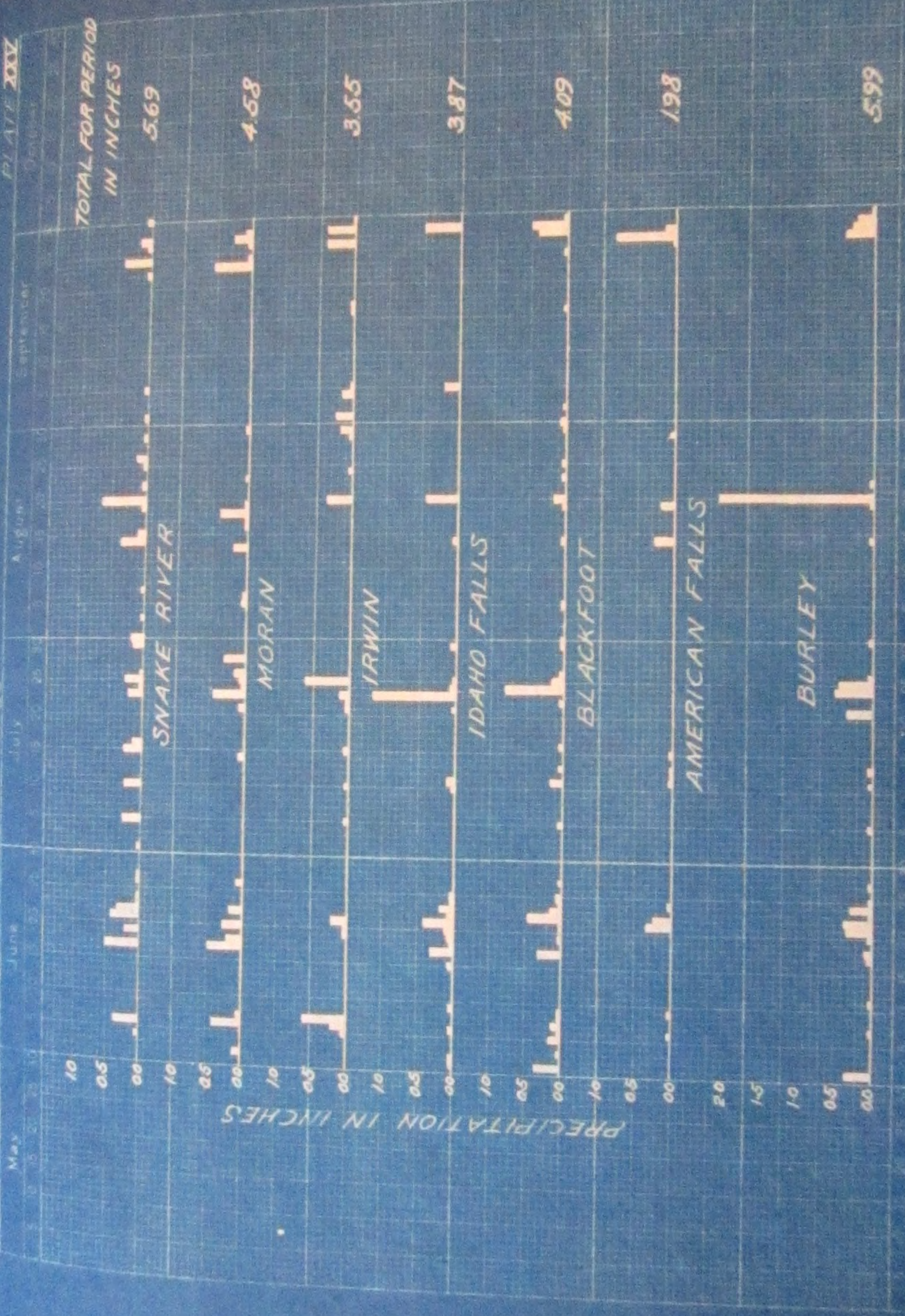
Month	Number of Stations	Number above Normal	Number below Normal	Mean Departure from Average Amount in Inches
June	10	6	3	+0.28
July	10	6	4	+0.21
August	10	4	6	-0.14
September	10	3	7	-0.13

With the single exception consisting of a slight excess above normal at the Moran station during the month of June, each of the three stations on the upper main river, viz. Snake River, Moran and Irwin, show precipitation below normal for every one of the four summer months and also yearly accumulated deficiencies, the latter ranging from 0.31 inch to 3.77 inches. On the other hand practically all of the valley stations show totals which are above normal during June and July, while stations at Blackfoot and farther down Snake River show annual totals ranging from 0.65 inch to 2.52 inches in excess of normal. Only three valley stations, at which the rain during the last five days of the month was unusually heavy, show September totals which are above normal.

These facts correspond with water supply conditions which have previously been described since the deficiency in stream run-off for the year is explained by the below normal precipitation throughout the upper or principal water producing portion of the drainage area while the favorable normal flow conditions which pertained during the first half of the irrigation season can be attributed largely to the extensive rains over the valley sections.

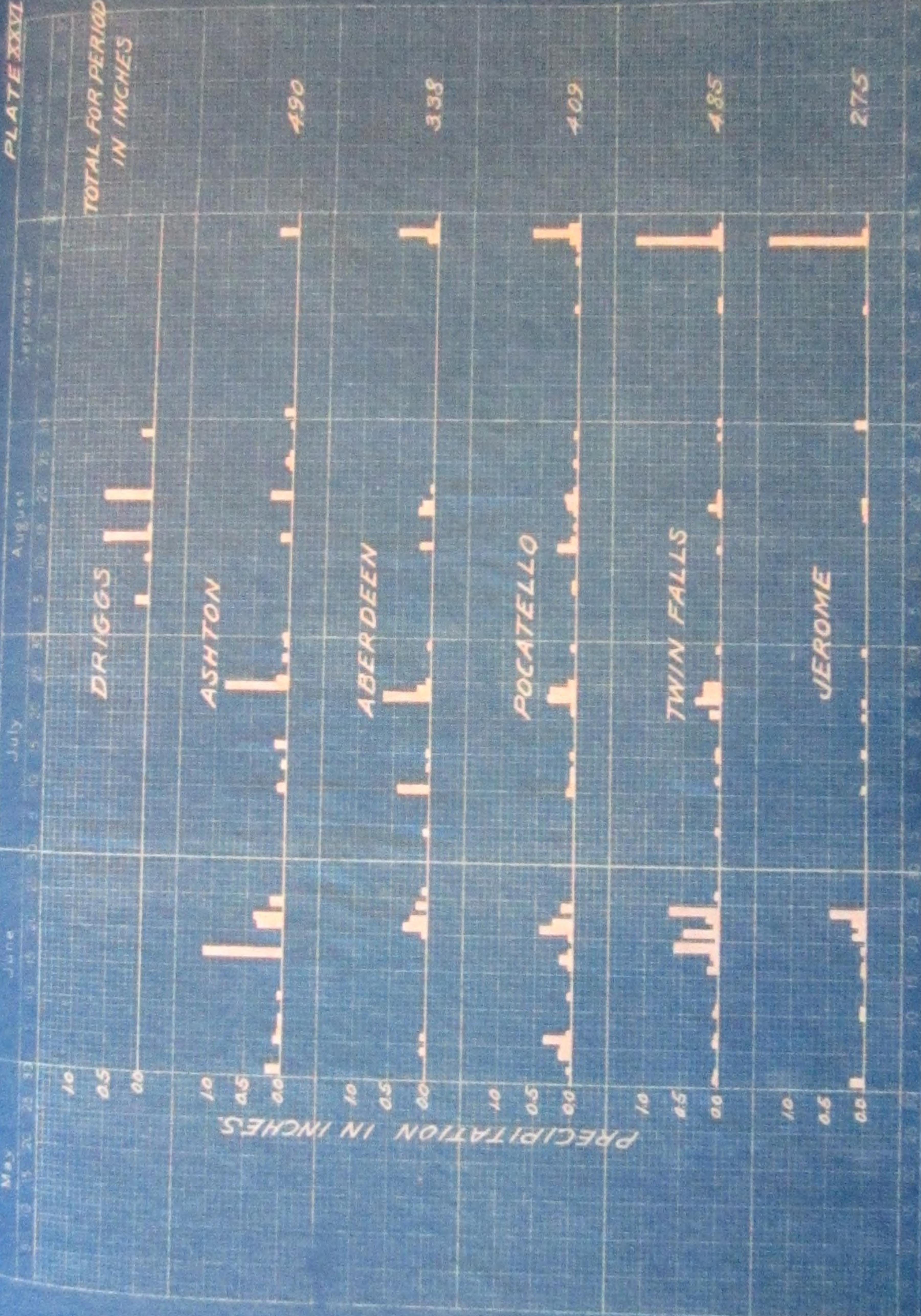
1923 DAILY PRECIPITATION DIAGRAM - SNAKE RIVER AREA
 1923 DISTRICT WATER DISTRICT NO. 36

PLATE XXV



1923 DAILY PRECIPITATION DIAGRAM - SNAKE RIVER AREA
 1923 DISTRIBUTION WATER DISTRICT NO 36.

PLATE XXVI



EVAPORATION

The evaporation records available for stations within or close to District No. 36 territory have been tabulated for 1923 and are presented on Plate XXVII in substantially the same form used for the previous year's report.

No attempt has been made on this plate to apply any coefficients to reduce the records to a comparable basis; hence the following information concerning the different stations is listed for the benefit of those who may desire to make practical application of the data.

Arrowrock, Deer Flat and Jerome

Class "A" stations of the U. S. Weather Bureau, equipped with a galvanized iron evaporation pan 48 inches in diameter and 10 inches deep, placed with the bottom level with the ground. The depth of water in the pan is maintained at 6 to 8 inches and the evaporation is measured with a Marvin hook gage and still-well. A Robinson cup anemometer, maximum and minimum thermometers and standard 8 inch rain gage complete the station equipment.

Jackson Lake

Equipped with a pan constructed by lining a box with zinc and soldering all breaks or holes. Size, 3 feet square by 14 inches deep. Set slightly into the ground with earth banked around sides to water level which was maintained at a depth of 12 inches. Measurements were made daily by adding or removing enough water to bring the level up to the top of a sharp point set in the center of the pan. The temperature of the water varied through a range of 10 or 15 degrees Fahrenheit above and below mean air temperature, and on several occasions, early in June and late in September, the pan was frozen during the early part of the day.

A lake pan was also installed in 1922 but no satisfactory records were obtained, due to spray from breaking waves which could not be entirely eliminated.

Mud Lake

Used a galvanized iron circular pan 6 feet in diameter and 30 inches deep. Painted black on the outside. Set on one inch boards laid flat on ground surface. Water surface maintained within about three inches of top of pan. In all other respects this station is equipped with standard Class "A" U. S. Weather Bureau instruments, and daily measurements were secured to one thousandth of an inch.

A floating pan of galvanized iron, 4 feet in diameter and 3 feet deep, mounted on a raft of 2 x 12 inch planks was also installed in a somewhat protected arm of Mud Lake about five miles northeast of the location of the land pan. With the aid of a stilling-well measurements were made daily to the nearest sixteenth of an inch.

EVAPORATION
SUMMARY BY MONTHS FOR STATIONS
MAINTAINED IN SNAKE RIVER DRAINAGE
IRRIGATION SEASON OF 1923.

1923 DISTRIBUTION WATER DISTRICT NO. 36

PLATE XXVII

NAME OF STATION AND KIND OF EVAPORATION PAN	ALTITUDE IN FEET	MEAN TEMP. DEGREES FAHRENHEIT	TOTAL PRE- CIPITATION INCHES	TOTAL EVAP. INCHES	MEAN DAILY EVAP. INCHES	RECORD FURNISHED BY
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JUNE

ARROW ROCK LAND PAN	3230	60.8	2.41	5.493	0.183	U.S.W.B.
DEER FLAT " "	2510	61.8	1.93	5.289	0.176	U.S.W.B.
JEROME " "	3893	61.3	1.03	6.495	0.216	U.S.W.B.
JACKSON LAKE " "	6770	50.3	1.74	4.824	0.161	U.S.R.S.
MUD LAKE " "	4790	57.0	1.80	7.613	0.254	U.S.G.S.
MUD LAKE LAKE PAN	4780	57.0	1.80	7.360	0.245	U.S.G.S.

JULY

ARROW ROCK LAND PAN	3230	74.8	0.27	10.097	0.326	USWB
DEER FLAT " "	2510	72.8	0.21	7.877	0.254	USWB
JEROME " "	3893	74.4	0.08	9.790	0.316	USWB
JACKSON LAKE " "	6770	61.2	1.08	5.508	0.178	USRS
MUD LAKE " "	4790	70.3	1.40	11.425	0.369	USGS
MUD LAKE LAKE PAN	4780	70.3	1.40	9.430	0.304	USGS

AUGUST

ARROW ROCK LAND PAN	3230	72.9	0.63	9.213	0.297	USWB
DEER FLAT " "	2510	71.4	0.18	7.200	0.232	USWB
JEROME " "	3893	70.1	0.27	7.642	0.246	USWB
JACKSON LAKE " "	6770	55.8	0.75	3.672	0.118	USRS
MUD LAKE " "	4790	65.3	1.05	9.187	0.296	USGS
MUD LAKE LAKE PAN	4780	65.3	1.05	8.172	0.264	USGS

SEPTEMBER

ARROW ROCK LAND PAN	3230	65.4	0.67	6.666	0.222	USWB
DEER FLAT " "	2510	63.6	0.59	5.336	0.178	USWB
JEROME " "	3893	63.4	1.37	5.761	0.192	USWB
JACKSON LAKE " "	6770	49.3	1.01	2.460	0.082	USRS
MUD LAKE " "	4790	58.4	0.50	7.203	0.240	USGS
MUD LAKE LAKE PAN	4780	58.4	0.50	6.306	0.210	USGS

REFERENCE NOTES

ALTITUDE OF PANS AT JACKSON LAKE AND MUD LAKE APPROX.
 OUTSIDE OF JACKSON LAKE PAN BANKED WITH EARTH

Some difference in exposure, due to the location of the respective stations, also exists, but is not believed to be of sufficient importance to warrant including more detailed descriptions herein.

NEW CONSTRUCTION AND REPAIRS

A recording gage was installed by the U. S. Reclamation Service at the lower end of Jackson Lake and was used during most of the season to supplement the inclined staff gage readings for the reservoir although the latter, because of its location and to preserve the continuity of the record was used as the reference standard.

Recording gages were installed at the stations on Henrys Lake Outlet below the new dam and on Henrys Fork above the mouth of Warm River. At the former station the construction work was done by the North Fork Reservoir Co. while at the latter station this same company paid for the installation.

In connection with the Meeker investigation recording gages were installed at the new stations on Snake River near Menan and at the head of the Great Feeder Canal near Ririe. The latter station was also outfitted with complete cable measuring equipment. Records at these two stations were obtained during the irrigation season and are available to the public although they are not included in this report.

The cable measuring equipment at the station on Blackfoot River near its mouth was completely rebuilt during the latter part of the season.

EXPENDITURES

A complete statement of expenditures covering the year ending March 21, 1924, follows. This statement includes all items which appeared in the annual water master's bill for the season of 1923, as well as everything pertaining to the work of the Idaho Falls office. No attempt has been made, however, to segregate expense for strictly hydrometric work from that for water distribution, as in many respects these phases are too closely related to warrant more than an arbitrary separation.

The items shown in the column headed "Regular Work" correspond to the total expenditures of preceding seasons except for the fact that they are not subdivided into summer and winter totals. Beginning June 1, 1923 all charges against the water users of District No. 36 on account of expenditures for regular work were prorated on the basis of 60 per cent against the normal flow and 40 per cent against the stored water users. After July 1 the stored water totals were in turn prorated between the three principal reservoirs in the district in proportion to their approximate 1923 available capacities, viz. 847 for Jackson Lake, 40 for Henrys Lake and 5 for Twin Lakes.

The items in the "Special Work" column represent the total cost of the special investigation conducted under the supervision of Consulting Engineer R. I. Meeker of Denver, Colorado and are not limited exactly to the year ending March 31, 1924, but include all expenditures incurred while Mr. Meeker was connected with the work. This work was paid for by the water users of the district and by agreement was prorated in accordance with the relative 1923 total deliveries of stored water and normal flow or 12.863737 per cent by the stored water users and 87.116263 per cent by normal flow users.

EXPENDITURES FOR WATER DISTRIBUTION AND HYDROMETRIC WORK

April 1, 1923 to March 31, 1924.

Regular
Work

Special
Work

Water Master, Special Deputy and Deputy

G. Clyde Baldwin, Salary Apr.1-May 9, May 11-Nov.21; Dec.1-25 & Jan.1-Mar.15, 11 mo. at \$400.	\$4400.00	
Expenses do	321.31	
Auto hire do	208.68	
Salary May 10, 1/30 mo. at \$400.		\$ 13.33
Auto hire do		7.28

Hydrographers

T. B. Newell, Salary Apr.1-June 6, 2 6/30 mo. at \$250.	550.00	
Expenses do	3.50	
Auto hire do	52.20	
C. A. McClelland, Salary Apr.1-30, 1 mo. at \$175.	175.00	
Salary May 1-Sept.17 & Sept.30-Mar.31, 10 18/30 mo. at \$200.	2120.00	
Expenses do	100.59	
Auto hire do	702.16	
Salary Sept.18-29, 12/30 mo. at \$200.		80.00
Expenses do		5.46
Auto hire do		53.69
L. L. Bryan, Salary May 1-8,10,13,14,16-20,28-31; June 3-July 18, July 20-30; Aug.1-12, Aug.15-26, & Aug.31-Mar.31, 10 12/30 mo. at \$200.	2080.00	
Expenses do	175.23	
Auto hire do	813.02	
Salary May 9,11,12,15,21-27; June 1-2, July 19 & 31; Aug.13,14,29,30, 18/30 mo. at \$200.		120.00
Expenses do		18.10
Auto hire do		110.24
F. A. Backman, Salary May 16-June 25; July 1-11,15-28; Aug.2-12,17-27; Sept.1-9 & 17-30, 3 20/30 mo. at \$140.	513.34	
Expenses do	56.02	
Auto hire do	599.82	
Salary June 26-30, July 12-14,29-31, Aug.1, 13-16,28-31; Sept.10-16, 25/30 mo. at \$140		116.66
Expenses do		25.67
Auto hire do		141.75
W. H. Wayman, Salary May 12-31, 19/30 mo. at \$100.	63.33	
Expenses do	1.30	
Auto hire do	51.61	

		Regular Work	Special Work
R. B. Johnson,	Salary May 9-June 7; June 13,16-21,24-30; July 1-8,12-20,30,31;Aug.1-7,11-14, 16-21,28-31;Sept.1-6,8-30;Oct.1- Nov.10, 5 mo. at \$135.		675.00
	Expenses do		154.45
	Auto hire do		836.94
	Salary June 8-12,14,15,22-23;July 9-11,21- 29;Aug.8-10,15,22-27 & Sept.7, 1 2/30 mo. at \$135.	144.00	
	Expenses do	12.40	
	Auto hire do	164.84	
W. F. Dawson,	Salary May 31-Sept.30, 4 1/30 mo. at \$135.	544.50	
	Expenses do	66.35	
	Auto hire do	716.17	

Consulting Engineer

R. I. Meeker,	Salary Mar.3-10,(1/2 day);Mar.25-26,(1/2 day); Apr.18-May 8;July 31-Aug.15;Sept.2-4; Dec.26-30;Jan.1,5,6,12-14,16-20,26-28; Feb.1-7,9,10;Mar.1-5,(1/2 day),Mar.28- Apr.2,(1/2 day), 85 days at \$25.		2125.00
	Expenses do		534.54
	Auto hire do		25.00

Deputy Water Masters

Ernest Luetjen,	Salary June 1-Aug. 31, 3 mo. at \$50.	150.00	
	Auto hire do	150.00	
W. R. Wayman,	Salary June 1-Aug. 31, 92 days at \$4.	368.00	
	Auto hire do	299.00	
W. N. McConnel,	Salary June 1-Sept. 30, 4 mo. at \$40.	160.00	
Ira Moore,	Salary June 1-Sept. 25, 117 days at \$4.	468.00	
	Auto hire do	409.50	
Wm. Sauer,	Salary June 1-Aug. 31, Sept. 3-23, 113 days at \$4.	452.00	
	Auto hire do	367.25	
R. S. Wilson,	Salary June 1-Aug. 31, 92 days at \$4.	368.00	
	Auto hire do	322.00	
Lynn Johnson,	Salary June 1-Aug. 31, Sept. 4-23, 112 days at \$4.	448.00	
	Auto hire do	196.00	

Stenographers

Mrs. Edith M. Cure,	Salary April 1-9,11,14-30,27/30 mo at \$120.	108.00	
	April 10,12,13; May 1-Oct. 31, 6 3/30 mo. at \$130.	793.00	
Dorothy Mitchell,	Salary June 15-Aug.31, 2 16/30 mo. at \$40.	101.33	
Lois Warner,	Salary Aug. 23-25 & 27, 25 hrs. at 50¢	12.50	
Mrs. Bessie M. Rees,	Salary Oct.1-Nov.28; Dec.2-Mar.31, 5 27/30 mo. at \$110.	649.00	

		Regular Work	Special Work
<u>Readers</u>			
Blair Cuthbert, Jack Ellsworth,	Salary Sept. 19-22, 24-26, 28-29, 9 days at \$3. Salary Sept. 22 & 24-29, 7 days at \$3.		27.00 21.00
<u>Gate Readers</u>			
Thelma Tanner,	Salary May 9-Sept. 30, 4 22/30 mo. at \$5. Salary Oct. 1-Nov. 3, 1 3/30 mo. at \$5.	5.50	23.67
Hortense Cartier,	Salary June 1-Aug. 31, Sept. 4-23, 112 days at 75¢ Salary Apr. 18-May 31, Sept. 1-3 & 24-30, 1 23/30 mo. at \$5.	84.00 8.83	
Harold Fuqua,	Salary June 1-Aug. 31, 3 mo. at \$12. Salary Apr. 16-May 31, Sept. 1-30, 2 1/2 mo at \$5.	36.00 12.50	
O. L. Kofoed,	Salary June 8-Aug. 31, Sept. 5-24, 105 days at \$1 Salary May 11-June 7, Sept. 1-4, 25-30, 1 7/30 mo. at \$7.50	105.00 9.25	
J. A. Clough,	Salary Apr. 1-May 31, Oct. 1-Mar. 31, 8 mo. at \$10.	80.00	
E. L. Jennings, A. J. Ayers, Ira Moore,	Salary June 1-Sept. 30, 122 days at \$1. Salary July 8-Aug. 31, 55 days at \$1. Salary Apr. 1-May 31 (adjusted) Salary Apr. 1-May 31, Oct. 1-Dec. 8, 4 8/30 mo. at \$7.50	122.00 55.00 39.02 33.13	
E. Luetjen,	Salary Apr. 7-Dec. 1, 35 trips at \$2. Salary Apr. 1-May 31, Sept. 1-Mar. 31, 9 mo. at \$9.	70.00 81.00	
H. E. Sheppard,	Salary Apr. 1-July 15, Oct. 21-Mar. 31, 8 25/30 mo. at \$15.	132.50	
J. F. Pincock, Mrs. J. P. Johnson, P. W. Wernette, R. E. Reid, C. H. Kemper, M. A. Jensen, W. R. Wayman,	Salary July 16-Oct. 20, 3 5/30 mo. at \$10. Salary May 27-Sept. 30, 4 4/30 mo. at \$8. Salary Apr. 17-May 31, 1 14/30 mo. at \$5. Salary Apr. 1-Mar. 31, 12 mo. at \$5. Salary Apr. 1-Mar. 31, 12 mo. at \$10. Salary Apr. 1-Dec. 15, 8 15/30 mo. at \$4. Salary May 8-31, 23/30 mo. at \$9. Salary Apr. 21 & 28, 2 trips at \$1.	31.67 33.07 7.33 60.00 120.00 34.00 6.90 2.00	
<u>Secretary. Water Users Committee of Nine</u>			
John Lee,	Salary 19 days during period Feb. 1923 to April 1924 at \$5. Expenses do Auto hire do		95.00 28.60 41.75

	Regular Work	Special Work
Materials, labor and equipment for gaging stations		212.92
do	983.57	
Rent, St. Anthony office, June 1-Sept. 15, 3 $\frac{1}{2}$ mo. at \$20.	70.00	
Premium & filing fees on official bonds	45.30	
Telephone & telegraph	402.55	
Field & Office supplies	391.79	
Interest on borrowed money	<u>197.96</u>	
Total expenditures on regular work, Apr. 1-Mar. 31	\$23716.82	
Total expenditures on special work		\$5492.96

SOURCES OF REVENUE

Normal Flow Fund	10949.72	4785.26
Stored Water Users (through State) Jackson Lake	6872.65	672.00
U. S. Geological Survey	1601.24	
State of Idaho (Cooperative Stream Measurement Fund)	2682.32	
U. S. Indian Service	1227.27	
U. S. Treasury (Federal Salary Bonus)	44.67	
Water Users of the North Fork of Snake River and Tributaries (Special)	26.00	
North Fork Reservoir Co. (through State)	284.77	31.73
Utah-Idaho Sugar Co.	<u>28.18</u>	<u>3.97</u>
	\$23716.82	\$5492.96

*FUNDS AVAILABLE APRIL 1, 1924

	\$343.81
Normal Flow Fund (a)	25.03
U. S. Geological Survey (b)	
U. S. Indian Service (b)	673.90
Actual expenditures not exceeding	
State of Idaho (c)	790.81
Cooperative Stream Measurement Fund	
North Fork Reservoir Co. (d)	242.75
Jackson Lake Stored Water Users (a)	<u>27.83</u>
	\$2104.13

* Amounts given in this table represent funds in bank or definitely known to be available after all regular March bills and all accounts properly chargeable to the Meeker special investigation have been settled.

- (a) Additional funds probably available about May 1, 1924.
- (b) Represents amount available for expenditure prior to July 1, 1924.
- (c) Amount allotted for expenditure prior to July 1, 1924.
(subject to slight change)
- (d) Represents unexpended portion of money advanced in July, 1923.

Two important items are not included in these summaries for the reason that their exact value is not definitely known. These are:

(1) The rent equivalent of the office quarters and furniture in the Federal Building at Idaho Falls. Because of the cooperation with the U. S. Geological Survey this very desirable office space and equipment is made available without charge.

(2) The cost of securing the necessary prints for and the binding of 50 copies of the 1922 report which was paid direct by the State Commissioner of Reclamation.

Comparison with the cost of work during the preceding year shows a reduction in the total cost of all regular work amounting to \$738.40 and a reduction of \$1245.71 in the cost of that portion of the regular work

paid for by the water users. The consolidation of the positions of Special Deputy and Water Master probably accounts for the largest single item contributing toward this saving. Had it been possible to dispense with the services of all river riders in September 1923, as was done during the preceding year, a still better financial showing would have resulted.

WATER RIGHTS

No permanent changes of consequence were recorded during the past year in any of the decreed rights of District No. 36. Therefore, the inclusion herein of the water right diagrams and summaries which have been a part of the reports of previous years was deemed unwarranted.

As far as can be determined from conversation with canal company officers and individual water users public sentiment now seems to be fairly well crystallized in opposition to the permanent transfer of decreed rights except, perhaps, under very unusual circumstances.

RECOMMENDATIONS

Under this heading it seems proper to again urge hearty cooperation and support for the Committee of Nine on the part of all who are in any way concerned with water rights or water distribution within District No. 36. This committee has labored earnestly and the individual members have given generously of their time in a public spirited effort to reach a fair and amicable agreement on the many doubtful points incident to the transmission and delivery of water within the district. The personnel of the committee represents practically all of the different sections, factions and interests owning water rights within District No. 36 and if adequately supported should be able through their efforts to eventually settle the different

water problems without resort to litigation.

In previous reports attention has been called to the need for legislation to provide a more satisfactory means of financing the work of water distribution and to revise the existing statutes governing the selection and compensation of water masters and special deputies. Bills have been introduced in different legislatures for the purpose of accomplishing these two reforms, but because of too extensive scope or for other reasons have always failed of final passage. The need for these changes still exists, therefore, and should receive attention at the next session of the state legislature.