STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

1927–1928

GEO. W. MALONE
State Engineer of Nevada

CARRIAGE, NEVADA

STATE PRINTING OFFICE

1928
STATE OF NEVADA

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1929
REPORT OF STATE ENGINEER

DEPARTMENT REPORT

STATE OF NEVADA

DAVID B. KRISTMAN, State Engineer, for the year ending July 1, 1938.

1. S. 237. Description: Ledge Spring; Rock water; No action.
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<td>Proofs of Valuations Filed, 1957</td>
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<td>Water Certificates issued, 1957 and 1958</td>
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<td>Record of Adjudications Proceedings since creation of Office of State Engineer</td>
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<td>Certification of Adjustments by the Office of the State Engineer</td>
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The following tabulations give details of all applications filed during years 1927-1928.

**STATUS OF APPLICATIONS FILED DURING THE BIENNIAL 1927-1928**

Following is a condensed statement giving the salient data in connection with applications filed during the calendar years 1927-1928, in the order of:

1. Application Serial Number.
2. Date of Filing.
3. Name of Applicant.
5. Purpose of Appropriation.
6. Action on Application.
7. Status of Permits as of December 31, 1928.

**1927**

CHAPTER III—APPLICATION FOR WATER RIGHTS

During the biennium covered by this report 841 applications have been filed. Of this number 136 applications have not as yet been sent to publication, having been returned to the applicant for correction, or being held pending the receipt of a supporting map.

During the years 1927 and 1928 positive action of some kind has been taken on 447 applications, representing action on 209 applications filed during the present biennium and 238 applications which were filed prior to January 1, 1927. This leaves on January 1, 1929, out of a total of 8,881 applications which have been filed since the creation of the office of the State Engineer, 4,474 applications which are now pending action by this office, 67 of which applications are protested.

There has been a perceptible increase in the number of applications filed for stock watering purposes during recent years, and at the same time a marked decrease in the number filed for irrigation purposes, indicating that with the possible exception of underground waters, the point of complete utilization of irrigation water supply has practically been reached.

The major portion of the applications for stock watering purposes represent filings of isolated springs and water holes. In numerous instances it is obvious that the primary object in filing these applications is either to acquire and perfect valid stock watering rights on lands of the public domain previously utilized for stock grazing purposes, or to run a foothold on public range used by other persons and whose stock watering rights, either vested or applied, are probably somewhat questionable. For this reason it has been the policy of the office to proceed slowly in the granting of permits, unless it had some previous knowledge to the effect that prior or existing rights would not be impaired by the approval of an application.

In the administration of the stock watering Act the State Engineer is required to make numerous decisions affecting the appropriation of water for stock watering purposes, and in making these decisions he has pursued the past policy of the office in giving the prior user every benefit of the doubt in the matter of legal requirements governing the appropriation of water.

During the past biennium hearings have been held on protests against the granting of permits under 18 applications. In connection with these hearings and hearings conducted prior to the present biennium the State Engineer has made decisions affecting the rights asserted by the protestants. Appeals from the findings of the State Engineer in the matter of 18 of these applications are now pending in the District Courts within the counties in which the water rights involved are situated.

In order to secure more definite and accurate locations of sources applied for, the office now requires that a supporting map be submitted with each application before publication is made. It is found that such a procedure not only facilitates and simplifies the handling of records in connection with water rights but, it is believed, will ultimately result in saving appropriations considerable expense and needless trouble.
CHAPTER II—ADMINISTRATION, APPEALS AND RULINGS

The years 1927-1928 were characterized by a continuance of subnormal precipitation and consequent shortage in water supply for irrigation and stock watering purposes. Such periods are extremely trying for both water users and the office of the State Engineer, which is charged with the duty of administering and regulating water rights. The past biennium has therefore been prolific of complaints and problems in connection with regulation and distribution of water, all of which required careful investigation and study upon which to predicate administrative action. Appeals, requesting rulings on water controversies, have come in from every nook and corner of the State and it has been the earnest endeavor of the State Engineer to give careful consideration and relief, where possible, in response to each appeal.

Although he has no legal jurisdiction over distribution and regulation of water on undivided streams, appeals are frequently made for him to act as friend and refer to him for effecting settlements of water controversies on such streams. A notable example of the good that can be accomplished in this manner is afforded by a settlement of a dispute between two water users on Wood's Gulch near Tuscarora, in Elko County. At the request of the water users the State Engineer, after an extended conference, was successful in getting the parties to amicably stipulate as to their relative rights. In this case, there being no other water users on the stream, the stipulation will afford the basis for a speedy adjudication and resulting court decree defining the water rights involved.

In addition to settling controversies similar to the foregoing on undivided streams, many appeals have been made from decisions of water commissioners on streams, the relative right to the use of water on which have been determined. It has been the general administrative policy not to hamper the activities of water commissioners by undue interference, since it is realized that the commissioner who is in the field and in close personal touch with the water users and their problems is, other things being equal, much better qualified to settle controversies which may arise than is the State Engineer, personally, or any of his office force, who at best have only a long range perspective regarding intimate details of water distribution throughout the State.

It has therefore been the policy to refer complaints and appeals from decisions of local water commissioners back to the commissioners themselves for further investigation and detailed report to the State Engineer. This usually results in the Commissioner and the aggrieved water user coming to an amicable and just settlement. However, in certain instances it has been necessary for the State Engineer to make a personal investigation in the field upon which to base a decision. Thus, during the past biennium, he has made field investigations in connection with appeals from water commissioner's decisions on the Humboldt River, Six Mile Creek, Dakwater and Current Creeks, Clear Creek, in Ormsby County, and White River.
State Engineer, in addition to exercising general supervision over the work performed in all groups, handles and is responsible for the department of water right applications; the Deputy State Engineer coordinates the adjudication of vested water rights, the various supervising water commissioners are directly responsible for the distribution of water on the larger streams such as the Humboldt and Carson Rivers; while the State Engineer, in addition to supervising all the above, personally evaluates work in connection with the related activities.

The considerable volume of miscellaneous work which cannot be grouped exclusively under any one of the above heads is accomplished jointly by the entire office force.

The potential possibilities of the office of the State Engineer as a departmental agency contributing to the permanent economic development of the state water and range resources are limited only by the lack of adequate funds with which to carry on. There can be no question as to the value of the ultimate complete development of the State’s water resources, and this can best be accomplished by the speedy and full determination of water rights. This becomes doubly important since the passage of the stock watering Act of 1955, which made it possible for the State Engineer to control and stabilize water in public range areas through the administration of stock watering rights. It therefore logically follows that the interests of the state agricultural and stockraising industries can best be served by making it possible, by adequate legislative appropriation, for the State Engineer to function fully and efficiently.

**PERSONNEL**

**DEPARTMENT OF STATE ENGINEERS**

**Carson City Office**

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<tr>
<th>Name</th>
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<tr>
<td>Geo. W. Madison</td>
<td>State Engineer</td>
<td>Carson City</td>
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<tr>
<td>H. W. Stegall</td>
<td>Assistant State Engineer</td>
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<tr>
<td>J. E. Boyle</td>
<td>Deputy State Engineer</td>
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<tr>
<td>Adele F. Parker</td>
<td>Clerk</td>
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<tr>
<td>Charles T. McCauley</td>
<td>Office Engineer</td>
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<tr>
<td>W. J. Nettleton</td>
<td>Clerk</td>
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<tr>
<td>Ross E. Page</td>
<td>Clerk</td>
<td>Carson City</td>
</tr>
<tr>
<td>Susan Blackwell</td>
<td>Stenographic</td>
<td>Carson City</td>
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<tr>
<td>Lesta L. Hamman</td>
<td>Special Assistant to the State Engineer</td>
<td>Carson City</td>
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**WATER DISTRIBUTION**

Humboldt River, 1927

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<tr>
<td>J. A. Miller</td>
<td>Supervising Water Commissioner</td>
<td>Elko District</td>
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<td>N. Ottenhouse</td>
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<td>Alfred Quill</td>
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<td>C. C. Price</td>
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<tr>
<td>O. L. Hudson</td>
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<tr>
<td>Elbert Carson</td>
<td>Commissioner</td>
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<tr>
<td>W. H. Kolby</td>
<td>Hydrographer</td>
<td>Winnemucca District</td>
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<tr>
<td>J. Dinsmore</td>
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<tr>
<td>C. H. White</td>
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<tr>
<td>Elko District</td>
<td>Office</td>
<td>Winnemucca Office</td>
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(Resigned May 1, 1927. Resigned April 1, 1928.)

Carson River, 1927

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<tr>
<td>F. N. Davidson</td>
<td>Commissioner</td>
<td>Elko District</td>
</tr>
<tr>
<td>C. E. W. Hunsberg</td>
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1929

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<tr>
<td>M. J. Gipson</td>
<td>Commissioner</td>
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<tr>
<td>H. F. MacEOHN</td>
<td>Commissioner</td>
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<td>C. H. White</td>
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<td>Elko District</td>
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<tr>
<td>A. D. Melser</td>
<td>Hydrographer</td>
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(Resigned September 13. Resigned July 25. Resigned August 14.)

West Fork

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REPORT OF STATE ENGINEER

Chapter I—Introductory and General

The Legislative Act of 1903 created the office of the State Engineer primarily for the purpose of providing a method for determination and regulation of existing water rights in line with the then modern theory evolved in the western and semiarid states. This Act, while providing a method for adjudication of water rights which had become vested or were then in the process of initiation, neglected to provide a specific method by which future rights could be legally acquired; hence the Twenty-second Session of the Legislature passed an amendatory law approved March 1, 1909, providing the exclusive method of subsequently initiating and perfecting a water right by application to the State Engineer for permission to appropriate and apply water to beneficial use.

Other amendments to the water law have since been made from time to time, however, they have been primarily for the purpose of facilitating the administration of the fundamental Act of 1903 as amended in 1905.

To begin with, constructive results under the new law were slow of accomplishment, as might be expected, due to the necessity of working out details of administration. Later the State Engineer was hampered by court actions seeking to restrain him from proceeding under the water law, and vigorously attacking its constitutionality. These actions are a matter of record and will not be dealt with in detail. Through-out this period of constructive evolution, however, the water law emerged triumphant thus leaving the State Engineer free to carry out the provisions of the statute without further question as to its validity.

From a state officer charged primarily with administering the water law, the State Engineer's duties have gradually increased and expanded to embrace many activities not originally contemplated when the office was created. Thus, in addition to being a member of the Public Service Commission, a post which requires a great deal of extra work and travel, he is secretary of the Irrigation District Board Commission, member of the Bureau of Industry, Agriculture and Irrigation, and member of the Colorado River Commission. These related activities of the State Engineer are covered in detail in Chapter VIII of this report.

In general, the activities of the office of the State Engineer may be divided into four classes, each of which is more or less separate and distinct.

2. Adjudication of vested water rights.
3. Distribution of water on adjudicated streams.
4. Related activities and miscellaneous.

The office and field personnel has therefore been organized to accord with the aim of placing limited responsibility upon various individuals in conformity with the above grouping. Thus, the Assistant
BIENNIAL REPORT OF STATE ENGINEER, 1927-1928

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3. Distribution of water on unappropriated streams.
4. Related activities and miscellaneous.

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State Engineer, in addition to exercising general supervision over the work included in all groups, handles and is responsible for the department of water right applications; the Deputy State Engineer conducts the adjudication of vested water rights, the various supervising water commissioners are directly responsible for the distribution of water on the larger streams such as the Humboldt and Carson Rivers; while the State Engineer, in addition to supervising all the above, personally evaluates work in connection with the related activities.

The considerable volume of miscellaneous work which cannot be grouped exclusively under any one of the above heads is accomplished jointly by the entire office force.

The potential possibilities of the office of the State Engineer as a departmental agency contributing to the permanent economic development of the state water and range resources are limited only by the lack of adequate funds with which to carry on. These can be no question as to the value of the ultimate complete development of the State's water resources, and this can best be accomplished by the steady and full determination of relative rights. This becomes doubly important since the passage of the stock watering Act of 1925, which now makes it possible for the State Engineer to control and stabilize values in public range areas through the administration of stock watering rights. It therefore becomes of the utmost interest as to what is being done to secure adequate legislative appropriations, for the State Engineer to function fully and efficiently.

PERSONNEL

DEPARTMENT OF STATE ENGINEERS

Carson City Office

Gene O. McWhorter. State Engineer
H. W. Beckett. Assistant State Engineer
J. F. Shade. Deputy State Engineer
J. F. Parker. Clerk
Charles F. Holbrook. Office Engineer
E. L. Miller. Office Engineer
C. H. Stein. Clerk
M. C. Blackwell. Wateralogist
E. E. Hume. Special Assistant to the State Engineer

Humboldt River, 1927

J. C. Miller, Supervising Water Commissioner. Elko District
S. Corneaux, Commissioner. Fallon District
A. W. Wilson, Commissioner. Jarbidge District
A. C. Kenyon, Commissioner. Winnemucca District
J. C. Karner, Commissioner. Winnemucca District
H. B. White, Hydrographer. Winnemucca District
J. M. Harshbarger, Hydrographer. Winnemucca District

 Atatürk, Filling Clerk. Winnemucca Office

Humboldt, Winnemucca Office

Carson River, 1927

P. C. Day, Supervising Water Commissioner. Elko District
J. W. Burns, Commissioner. Winnemucca District

Carson River, Winnemucca Office

Carson River, 1928

P. C. Day, Supervising Water Commissioner. West Fork
G. W. Burgin, Commissioner. West Fork

Carson River, West Fork Office

CARSON RIVER:

John F. Miller. Marysville Water Commissioner, Marysville, California

EAST AND WEST FORKS:

P. C. Miller. Bureau Water Commissioner. Chico, California

EAST AND WEST FORKS:

CHAPTER II—ADMINISTRATION, APPEALS AND RULINGS

The years 1927-1928 were characterized by a continuance of abnormal precipitation and consequent shortage in water supply for irrigation and stock watering purposes. Such periods are extremely trying for both the water users and the office of the State Engineer, which is charged with the duty of administering and regulating water rights. The past historian has therefore been prolific of complaints and problems in connection with regulation and distribution of water, all of which required careful investigation and study upon which to predicate administrative action. Appeals, requesting rulings on water controversies, have come in from every nook and corner of the State and it has been the earnest endeavor of the State Engineer to give careful consideration and relief, where possible, in response to each appeal.

Although he has no legal jurisdiction over distribution and regulation of water on manmade irrigation streams, appeals are frequently made for him to act as friend and referee to aid in effecting settlements of water controversies on such streams. A notable example of the good that can be accomplished in this manner is afforded by a settlement of a dispute between two water users on the Woods Gulch, near Turlock, in Stanislaus County. At the request of the water users the State Engineer, after an extended conference, was successful in getting the parties to amicably stipulate as to their relative rights. In this case, there being no other water users on the stream, the stipulation will afford the basis for a speedy adjudication and resulting court decree defining the water rights involved.

In addition to settling controversies similar to the foregoing on manmade irrigation streams, many appeals have been made from decisions of water commissioners on streams, the relative right to the use of water on which have been determined. It has been the general administrative policy not to hamper the activities of water commissioners by undue interference, since it is realized that the commissioner who is in the field and in close personal touch with the water users and their problems is, other things being equal, much better qualified to settle controversies which may arise than is the State Engineer, personally, or any of his office force, who at best have only a long range perspective regarding intimate details of water distribution throughout the State.

It has therefore been the policy to refer complaints and appeals from decisions of (local) water commissioners back to the commissioners themselves for further investigation and detailed report to the State Engineer. This usually results in the Commissioner and the approving water user coming to an amicable and just settlement. However, in certain instances it has been necessary for the State Engineer to make a personal investigation in the field upon which to base a decision. Thus, during the past biennium, he has made field investigations in connection with appeals from water commissioner's decisions on the Humboldt River, Six Mile Creek, Diamond and Current Creeks, Clear Creek, in Orleans Country, and White River.
CHAPTER III—APPLICATION FOR WATER RIGHTS

During the biennium covered by this report 841 applications have been filed. Of this number 106 applications have not as yet been sent to publication, having been returned to the applicant for correction, or being held pending the receipt of a supporting map.

During the years 1927 and 1928 positive action of some kind has been taken on 647 applications, representing action on 239 applications filed during the present biennium and 408 applications which were filed prior to January 1, 1927. This leaves on January 1, 1929, out of a total of 8,501 applications which have been filed since the creation of the office of the State Engineer, 2,474 applications which are now pending action by this office, 307 of which applications are protested.

There has been perceptible increase in the number of applications filed for stock watering purposes during recent years, and at the same time a marked decrease in the number filed for irrigation purposes, indicating that, with the possible exception of underground waters, the point of complete utilization of irrigation water supply has practically been reached.

The major portion of the applications for stock watering purposes represent filings on isolated springs and water holes. In numerous instances it is evident that the primary object in filing these applications is either to acquire and perfect valid stock watering rights on lands of the public domain previously utilized for stock grazing purposes or to run a federal on public range used by other persons and whose stock watering rights, either vested or applied, are probably somewhat questionable. For this reason it has been the policy of the office to proceed slowly in the granting of permits, unless it had some previous knowledge to the effect that prior or existing rights would not be impaired by the approval of an application.

In the administration of the Stock Watering Act the State Engineer is required to make numerous decisions affecting the appropriation of water for stock watering purposes, and in making these decisions he has pursued the past policy of the office in giving the prior user every benefit of the doubt in the matter of legal requirements governing the appropriation of water.

During the past biennium hearings have been held on protests against the granting of permits under 10 applications. In connection with these hearings and hearings conducted prior to the present biennium, the State Engineer has made decisions affecting the rights asserted by 29 applications. Appeals from the findings of the State Engineer in the matter of 18 of these applications are now pending in the District Courts, within the counties in which the water rights involved are situated.

In order to secure more definite and accurate locations of sources applied for, the office now requires that a supporting map be submitted with each application before publication is made. It is found that such a procedure not only facilitates and simplifies the handling of records in connection with water rights but, it is believed, will ultimately result in saving appropriations considerable expense and needless trouble.

LETTER OF TRANSMITTAL

STATE OF NEVADA
OFFICE OF THE STATE ENGINEER
CARSON CITY, JANUARY 1, 1929

To the Excellency, E. D. RAZEL, Governor, Carson City, Nevada:

Sir: I hereby submit to you my report as State Engineer of the State of Nevada for the years 1927 and 1928.

Respectfully submitted,

GEO. W. MASON
State Engineer.
The following tabulations give details of all applications filed during years 1927-1928:

**Status of Applications Filed During the Biennium 1927-1928**

Following is a condensed statement giving the salient data in connection with applications filed during the calendar years 1927-1928, in the order of:

1. Application Serial Number.
2. Date of Filing.
3. Name of Applicant.
5. Purpose of Appropriation.
6. Action on Application.
7. Status of Permits as of December 31, 1928.

**1927**

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STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

1927-1928

GEO. W. MALONE
State Engineer of Nevada

CARSON CITY, NEVADA

STATE PRINTING OFFICE
JOE BARKWORTH, SUPERINTENDENT

1929
All the storage water on both the East and West Forks of the Carson River was consumed. The mild weather during the first part of the growing season was beneficial in offsetting to some extent the water shortage. The cutting of alfalfa began as early as June 3. Generally two crops of alfalfa were cut. There was sufficient water to mature all grain crops.

For the purpose of making a study of the duty of water a hydrometer was employed in addition to the water commissioner.

**MIDWAY RIVER** (Clark County)

Irrigation season on this stream usually begins about April 1 and ends on November 1 each year.

Distribution during the past season has been successful, no complaints of any kind having been received from water users. One part-time commissioner at $50 per month attends to the entire stream, with the result that unit distribution costs are exceedingly low, or approximately 22 cents per acre on 2,748 acres.

**FAHRANAGAT LAKE AND TERRITORIES** (Lincoln County)

Distribution of water on this source has been as successful as can be expected during years of water shortage.

One water commissioner was employed continuously during the irrigation season to deliver irrigation water to 4,065 acres of cultivated lands.

**CURRENT AND UNDERWATER ORDERS** (Nye County)

The distribution on these creeks during the irrigation seasons of 1927 and 1928 has been satisfactory. The water supply on Current Creek held up fairly well, while Buckwater Creek maintained its usual consistent spring-fed flow.

One water commissioner handled distribution on both these sources to the general satisfaction of the water users. But one major complaint was received and this, upon investigation proved to be without foundation.

**SIX MILE CREEK, Elko County**

Water was not distributed on this source during the 1927 irrigation season. However, early in the season of 1928, at the urgent request of Mr. John Taylor, one of the two water users on the stream, the State Engineer reluctantly appointed a commissioner to distribute water between the two users involved. Mr. C. C. Plunkett was duly appointed for this purpose and served for ten days from May 18 to the 25th, inclusive, then resigned, advising that no commissioner was necessary and the cost of same out of proportion to the rights involved.

There is, in reality, no need for distribution on this creek, all disputes and trouble being the result of personal differences between Mr. Taylor and Mr. Jack, the other water user.

An adequate system of simple rotation in the ratio fixed by the court decree defining the relative rights could easily be worked out and adhered to with the cooperation of the users.
CARSON RIVER
By F. N. Packer, Supervising Water Commissioner
Season of 1926

Due to heavy snowfall during the winter months and to some rain, a good supply of water was maintained in the Carson River and its forks until about the middle of July, at which time it became necessary for water commissioners’ services. Two men were placed in the distribution; one on the East Fork and the Carson River proper, who also supervised the entire river system, the other in the West Fork, including the Alpine district in California.

During the irrigation season on the East Fork there was sufficient water to satisfy all priorities up to 1900 rights. Those and the younger rights purchased water to nurture their crops from the Alpine Irrigation and Reservoir Company in the extent of 255.70 acre feet. The Doughty and Livestock Company released 322.57 acre feet of water from their storage in Humon Lake for their own use.

On the West Fork there was sufficient water until the first part of August when some shortage began to be felt. From this time on the water was distributed by the rotation system, with satisfactory results. Individual owned storage water on this fork was also released beginning the first part of August.

Along the Carson River proper some shortage of water occurred during the latter part of August and the first part of September. From September 10 the flow in the river steadily increased.

In order to obtain a complete record of the amount of water used by each district on the Carson River and its forks, to supply discharge data to water commissioners, and to obtain further data for future storage, water level recording instruments were installed at the head of each irrigation district. A record of the flow of the ditches was kept and a report of the distribution rendered. The crop production on this system was about normal. The late fall and freezing weather in the month of May and the cold nights in June were unfavorable for crop development. The growing season was terminated around the 7th of September when the first killing frost appeared. Freezing potatoes, turnips, rutabagas, and white mustard "ran.

Season of 1926

The 1926 irrigation season was very dry as an account of a mild winter with insufficient snow storage in the upper reaches of the Carson River.

The heavy rain and snow that fell during the latter part of March increased the flow of the rivers but caused considerable damage in that it destroyed the snow storage, and therefore as early as July 6 a shortage of water began to be felt and the elimination of water of the young priorities began. By the latter part of July there was only sufficient water to satisfy rights up to and including 1861.
used, which represents about 20% over and above the required quota.

In the Battle Mountain district irrigation started on about March 25 and continued until July 5. There were 129,528.23 acre-feet of water used, which represents at least 20% over and above the quota set forth in the 1950 Order of Determination.

Gauge readings were taken and complete records kept of the U.S. (1 ft. Hydrometric Station at Pioche, Cua, and Oceana. The record of the Rock Creek Station was not complete.

Some difficulty was experienced in securing a water commissioner in the Elko district, and it was not until the latter part of May that a man was placed in this district. In view of this late start it was therefore impossible to obtain a complete record. In the majority of cases irrigation started in this district on about May 1, and continued until September 1. After the irrigation season a water commissioner continued to regulate stock water until November.

The commission concentrated its efforts in the Star, Lamoille, and South Fork valleys. All the ditches in these valleys were measured and a record kept of the daily delivery.

In the entire Humboldt system there were 302,001 acres of land subject to irrigation, and the total cost of distribution was $14,444,13, or a cost of 49.47¢ per acre.

Summer of 1928

In view of the fact that a mild winter occurred during 1927-1928, an acute shortage of water was anticipated. With this shortage in mind, a new plan of distribution was adopted and carried out. All of the early flow was delivered to the Lovelock district; the second flow to the Winnemucca and Battle Mountain districts; the third flow of high mountain run-off to the Elko district. Irrigation started in the Lovelock district March 15, and was practically ended April 28. During this period 30,352.43 acre-feet of water were used, representing 49% of the total quota.

Irrigation started in Battle Mountain and Winnemucca districts on or about April 20, and ended the latter part of June. An acute drop in flow of the rivers during the latter part of April, and nearly all of the month of May paralyzed the above-mentioned scheme, and as a result the irrigation of these two districts was not successful. However, there was 10,097.77 acre-feet of water or 52% of the total quota used in the Winnemucca district, and 49,903.68 acre-feet of water or 61% of the total quota used in the Battle Mountain district.

Irrigation in the Elko district began on or about May 15. This date applies to vested water rights. The appropriators having a water right by virtue of a permit from the State Engineer were not allowed to irrigate until June 1. Again the commission's efforts were concentrated in the Star, Lamoille and South Fork valleys. However, general distribution were carried on throughout the rest of the Elko district. In the majority of cases in the three above-named valleys the water used amounted to about 35% of the total quota.

A part-time water commissioner carried on distribution work in Pioche valley,ureka County.

After the irrigation season was over, one water commissioner distributed stock water until November 1. Records were kept at the
CHAPTER V—WATER DISTRIBUTION

The Nevada water law vests the State Engineer with legal authority to distribute water only to those streams where the relative rights to the use of water have been completely determined or adjudicated, or where the adjudication has reached a stage of completion where the State Engineer's Order of Determination has been officially filed with the District Court.

Of the streams covered in this chapter and which are under the jurisdiction of the State Engineer, the adjudication of rights has been completed on all but the Humboldt and Owyhee Rivers.

On the Humboldt River, pending the District Court's Final Decree of Determination, division of water has been made during the irrigation by the State Engineer in accordance with his Order of Determination. This stream system presents many unique and difficult problems in distribution which have been exceptionally well handled during the past two seasons by Supervising Water Commissioner J. A. Miller.

The Carson River in some respects presents a more difficult problem for the reason that the State Engineer has had no legal authority, but has distributed water at the request and by the consent of the various water users, reserving each time as the Order of Determination could be prepared and filed with the District Court. Thus without legal authority to enforce any distribution schedule the job has been one of nature judgment and diplomacy which has been efficiently handled during the irrigation by Mr. F. N. Bearden, as supervising water commissioner. During subsequent irrigation seasons, however, the commissioner will have legal distribution authority on this stream by virtue of the filing, on December 21, 1928, of the Final Order of Determination with the First Judicial District Court at Carson City, Nevada.

The present administration has inaugurated the policy of requiring all water commissioners to prepare daily distribution reports which, when compiled over a period of years, will furnish the basis for determination of duty of water, transportation losses, and magnitude of return flow to the streams.

At the close of the irrigation season each commissioner prepares a detailed report of the season's activities, which include a complete record of stream and ditch flow and individual deliveries.

Following is a brief review of distribution activities on the streams under the jurisdiction of the office:

HUMIDITY RIVERS

By J. A. MILLER, Supervising Water Commissioner

In the year 1927, distribution work started in the Lovelock Valley on March 15 and ended the first week of September. There were 3,512,000 acre feet of water delivered to the district from the stored water delivered by the Humboldt-Lovelock Irrigation Light and Power Co. This volume of water represents 80% of the required quota in the Order of Determination.

In the Winnemucca district irrigation started on or about March 15 and continued until July 5. There were 35,756.33 acre feet of water
CHAPTER IV—ADJUDICATION OF WATER RIGHTS
The work of determination of relative rights to the water resources of the State during the past half-century has progressed as rapidly as possible considering the fact that the officer and field personnel of this department of water rights was limited to a minimum under the present appropriation.

The scope of activities in connection with the adjudication of the various sources during the bicentennial may best be considered in order of their importance for irrigation.

CARSON RIVER
This adjudication embraces all lands in Nevada irrigated from the Carson River above Lahontan Reservoir of the United States Bureau of Reclamation (now Truckee-Carson Irrigation District), commonly referred to as the Upper Carson lands.

A. B. Chandler, Nevada's first State Engineer from May, 1903, to May, 1906, attempted a determination of the relative rights to the use of water on those lands by having certificates of water rights in accordance with the statutes then in force. These constitute the so-called "Chandler Findings."

Subsequent litigation, however, was successful in attacking the constitutionality of that portion of the statutes under which Chandler found authority for making his findings, hence former State Engineer J. S. Moberg, by notice to claimants dated April 20, 1926, initiated adjudication proceedings under the water law of 1913 as amended by the Statutes of 1915. As a subsequent result, on March 28, 1927, former State Engineer Robert A. Allen officially filed the completed order of Determination in the files of the State Engineer.

The present State Engineer, in accordance with the provisions of the water law, proceeded to collect, organize and prepare in orderly and intelligible shape all evidence, transcripts of testimony before the State Engineer, maps and other related data for filing with the District Court.

After conferring with the Judges of the two judicial districts in which the stream system is situated, it was decided to hold the court proceedings in the First Judicial District Court at Carson City, Nevada. Before November 21, 1928, the State Engineer filed the Order of Determination together with the original evidence, etc., with the Clerk of said Court. Time for hearing exceptions to the Order was set by Judge U. A. Julliard for February 4, 1929.

The exclusive time of one office assistant for approximately three months was required in assembling data in complete and orderly form for filing with the Court.

The total amount of 525,000 acres of irrigated lands is embraced in the State Engineer's Order of Determination.

LITTLE HUMBOLDT RIVER
The Little Humboldt Stream System comprises, in addition to the main stream, Martin, Cottonwood, Indian, Colony, Merce, Dooley, Haulioco, Hamem and Stonelake Creeks as tributaries. Approximately 50,000 acres of land are irrigated from these sources. Although
From the standpoint of gross area this stream system is of greater magnitude than the Carson River basin, but in many respects the Carson River basin is more intensively cultivated.

Proofs of Appropriation were first filed with the State Engineer during the period 1899-1916. These, however, were merely general, since an Abstract of Claims was filed in 1911, and found in large measure on these proofs was of little value. From this point speculative and interregional attempts to further the proceedings available little.

At the present request of many water users involved, and realizing the importance of completing the determination of rights on this important stream system, the present State Engineer has aggressively furthered the proceedings to a point where the Preliminary Order of Determination will soon be prepared and printed. The revival of this proceeding and its progress to date has been made possible by a voluntary contribution of $3,000 from the water users on the stream system. With a portion of this fund already deposited in trust with the office, a special assistant has been employed, who devotes his entire time to this adjudication. Much field and office work, incidental to the completion of the proceedings, has already been accomplished.

THOUSAND SPRINGS CREEK

The principal tributaries, Truck and Silver or Christine Creeks, are situated in Elko County, in the extreme northeastern portion of the State, 1,587.4 acres of land are involved in this adjudication, all of which is owned by the Utah Construction Company, successors in interest to the Vineyard Land and Stock Company.

This adjudication was initiated in April, 1929, upon petition of the Utah Construction Company. Warrants of notice, under section 36(h), chapter 53, State laws of 1927, were served by the State Engineer, and a special assistant has been employed. The Order of Determination is now in process of preparation and will be filed with the Court before the irrigation season of 1929.

CRUMP AND WILLSON CREEKS

Crump and Wilson Creeks, situated in Lander County, comprise a total area of 61.3 acres. The adjudication proceedings involving these lands were completed by the entry of a final decree, May 26, 1928, in the Third Judicial District Court at Austin, Nevada. 

Clayton Kel. and Martin Pilgrim entered into these proceedings as claimants, and their claims were heard and determined May 26, 1928, in the Third Judicial District Court at Austin, Nevada.

CARRICO CREEK

Carrico Creek and its tributaries, Ladd and Inoa Creeks, in Lander County, some forty miles north of Austin, Nevada, the
COUNTY COURT

Tony Creek and its principal tributaries, Chemung and Porcupine Creeks, is situated in Huron County, approximately forty miles north of Winnsboro, in the Quan River basin. Some of the water from Tony Creek ever reaches the Quan River. Tony Creek was considered as a separate and distinct source.

An Abstract of Claims and Preliminary Order of Determination was prepared. Following the period of inspection of proofs, abstract and preliminary order, objections to the latter were received and hearings held to dispose of same at Winnsboro on May 1, 1928, by Deputy State Engineer G. F. Eagle. Following the hearing the Order of Determination was prepared which, together with all evidence, maps and transcript of testimony, was filed with the Sixth Judicial District Court at Winnsboro on July 9, 1928.

Hearing was held November 1, 1928, by the Court on exceptions to the order of Determination. The attorneys for both sides were present and the case was heard.

A total of 13.52 acres is embraced in the Order of Determination in this proceeding.

BAKER AND LEHMAN CREEKS

Adjudication proceedings initiated in 1925 have not advanced during the past biennium due to extension of time for filing proofs of appropriation which have been requested and granted.

SILVER CREEK

Upon petition of W. D. and M. E. Cotton, water users on Silver Creek, In the County of Huron, an investigation was made on March 7-11, 1928, which disclosed that facts and conditions warranted initiation of adjudication proceedings on this source. Three claimants are involved, two of whom have submitted proof of their claims. When all proofs have been received the proceedings will be advanced under the provisions of section 360, chapter 106, Statutes of 1924, notices of notice having been signed by all claimants.

K-C CREEK

Upon petition of Moss, Boshell and Windhall, water users on K-C Creek, Huron County, adjudication proceedings have been initiated.

COUNTY COURT

Tony Creek and its principal tributaries, Chemung and Porcupine Creeks, is situated in Huron County, approximately forty miles north of Winnsboro, in the Quan River basin. Some of the water from Tony Creek ever reaches the Quan River. Tony Creek was considered as a separate and distinct source.

An Abstract of Claims and Preliminary Order of Determination was prepared. Following the period of inspection of proofs, abstract and preliminary order, objections to the latter were received and hearings held to dispose of same at Winnsboro on May 1, 1928, by Deputy State Engineer G. F. Eagle. Following the hearing the Order of Determination was prepared which, together with all evidence, maps and transcript of testimony, was filed with the Sixth Judicial District Court at Winnsboro on July 9, 1928.

Hearing was held November 1, 1928, by the Court on exceptions to the order of Determination. The attorneys for both sides were present and the case was heard.

A total of 13.52 acres is embraced in the Order of Determination in this proceeding.

BAKER AND LEHMAN CREEKS

Adjudication proceedings initiated in 1925 have not advanced during the past biennium due to extension of time for filing proofs of appropriation which have been requested and granted.

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Upon petition of W. D. and M. E. Cotton, water users on Silver Creek, In the County of Huron, an investigation was made on March 7-11, 1928, which disclosed that facts and conditions warranted initiation of adjudication proceedings on this source. Three claimants are involved, two of whom have submitted proof of their claims. When all proofs have been received the proceedings will be advanced under the provisions of section 360, chapter 106, Statutes of 1924, notices of notice having been signed by all claimants.

K-C CREEK

Upon petition of Moss, Boshell and Windhall, water users on K-C Creek, Huron County, adjudication proceedings have been initiated.
On November 27, 1928, a notice and order for taking proofs was entered and served on interested claimants involved in the proceeding.

**Proofs of Appropriation and Certificate of Water Rights**

During the biennium the following proofs of appropriation, accompanied by cultural maps in support of the rights claimed, have been accepted and filed for future use in determination of rights on various sources of water supply within the boundaries of the State.

**Proofs of Appropriation Filed During the Years 1927-28**

Following is a condensed statement giving the salient data in connection with proofs of Appropriation filed during the years 1927-28, in the order of:

1. Proof Serial Number
2. Date Filed
3. Name of Claimant
4. Source of Water Supply
5. Use Claimed under Appropriation in Terms of Acres Irrigated, Stock Watered, etc.
6. Purpose of Appropriation

**1927**

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Claimant</th>
<th>Source of Water</th>
<th>Use Claimed</th>
<th>Purpose of Appropriation</th>
</tr>
</thead>
<tbody>
<tr>
<td>11K-1-01</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-02</td>
<td>Williams Estate Company</td>
<td>Assiniboia Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-03</td>
<td>Williams Estate Company</td>
<td>Rock Creek</td>
<td>21.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-04</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>12.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-05</td>
<td>Williams Estate Company</td>
<td>Cold Springs Creek</td>
<td>25.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-06</td>
<td>Williams Estate Company</td>
<td>Cimmaron Creek</td>
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<td>Irrigation and livestock</td>
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<tr>
<td>11K-1-07</td>
<td>Williams Estate Company</td>
<td>Irons Creek</td>
<td>18.0 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>11K-1-08</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-09</td>
<td>Williams Estate Company</td>
<td>West Cherry Creek</td>
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<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-1-10</td>
<td>Williams Estate Company</td>
<td>Little Apple Creek</td>
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<td>Stock water</td>
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<tr>
<td>11K-1-11</td>
<td>Williams Estate Company</td>
<td>Assiniboia Creek</td>
<td>9.5 acres</td>
<td>Stock water</td>
</tr>
<tr>
<td>11K-1-12</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Stock water</td>
</tr>
<tr>
<td>11K-1-13</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
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<td>Stock water</td>
</tr>
<tr>
<td>11K-1-14</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Stock water</td>
</tr>
<tr>
<td>11K-1-15</td>
<td>Williams Estate Company</td>
<td>Assiniboia Creek</td>
<td>9.5 acres</td>
<td>Stock water</td>
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<tr>
<td>11K-1-16</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Stock water</td>
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<tr>
<td>11K-1-17</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
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<td>Stock water</td>
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<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Stock water</td>
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<tr>
<td>11K-1-19</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Stock water</td>
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<tr>
<td>11K-1-20</td>
<td>Williams Estate Company</td>
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<td>Stock water</td>
</tr>
<tr>
<td>11K-1-21</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Stock water</td>
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</tbody>
</table>

**1928**

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Claimant</th>
<th>Source of Water</th>
<th>Use Claimed</th>
<th>Purpose of Appropriation</th>
</tr>
</thead>
<tbody>
<tr>
<td>11K-2-01</td>
<td>Williams Estate Company</td>
<td>Daisy Creek</td>
<td>2.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-02</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-03</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-04</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-05</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-06</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-07</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-08</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-09</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-10</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>11K-2-11</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-12</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-13</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-14</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-15</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-16</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-17</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-18</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
<tr>
<td>11K-2-19</td>
<td>Williams Estate Company</td>
<td>Rocky Creek</td>
<td>50.0 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>11K-2-20</td>
<td>Williams Estate Company</td>
<td>Cherry Creek</td>
<td>9.5 acres</td>
<td>Irrigation and livestock</td>
</tr>
</tbody>
</table>

**Concluding Remarks**

The certificates of water right listed were based upon completion of adjudication proceedings by order of the Court's final decree of determination in the matter of the adjudication of Ovals and Wilson Creeks.
On November 24, 1928, a notice and order for taking proofs was entered and served on interested claimants involved in the proceeding.

**PROOFS OF APPROPRIATION AND CERTIFICATES OF WATER RIGHTS**

During the biennial following the previous proofs of appropriation, accompanied by cultural maps in support of the rights claimed, have been accepted and filed for future use in determination of relative rights on various sources of water supply within the boundaries of the State. The certificates of water right listed were based upon completion of adjudication proceedings by entry of the Court's final decree of determination in the matter of the adjudication of Commons and Wilson Creeks.

**PROOFS OF APPROPRIATION FILED DURING THE YEARS 1925-28**

Following is a condensed statement giving the salient data in connection with proofs of Appropiation filed during the years 1925-1928, in the order of:

1. Proof Serial Number.
2. Date Filed.
3. Name of Claimant.
5. Use Claimed under Appropriation in Terms of Acres Irrigated, Stock Watered, etc.
6. Purpose of Appropriation.

### 1925

<table>
<thead>
<tr>
<th>Proof Serial Number</th>
<th>Date Filed</th>
<th>Name of Claimant</th>
<th>Source of Water Supply</th>
<th>Use Claimed under Appropriation</th>
<th>Purpose of Appropriation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1851</td>
<td>1-10-25</td>
<td>J. D. Wilson</td>
<td>Rock Creek, 13.5 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>1852</td>
<td>1-10-25</td>
<td>F. J. Wilson</td>
<td>Rock Creek, 8.0 acres</td>
<td>Irrigation and livestock</td>
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<td>1-10-25</td>
<td>J. D. Wilson</td>
<td>Rock Creek, 13.5 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>1854</td>
<td>1-10-25</td>
<td>F. J. Wilson</td>
<td>Rock Creek, 8.0 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>1855</td>
<td>1-10-25</td>
<td>J. D. Wilson</td>
<td>Rock Creek, 13.5 acres</td>
<td>Irrigation and livestock</td>
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### 1926

<table>
<thead>
<tr>
<th>Proof Serial Number</th>
<th>Date Filed</th>
<th>Name of Claimant</th>
<th>Source of Water Supply</th>
<th>Use Claimed under Appropriation</th>
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<td>1858</td>
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### 1927

<table>
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<th>Proof Serial Number</th>
<th>Date Filed</th>
<th>Name of Claimant</th>
<th>Source of Water Supply</th>
<th>Use Claimed under Appropriation</th>
<th>Purpose of Appropriation</th>
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<td>1861</td>
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<td>1863</td>
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<td>Rock Creek, 13.5 acres</td>
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<td>1864</td>
<td>1-10-27</td>
<td>F. J. Wilson</td>
<td>Rock Creek, 8.0 acres</td>
<td>Irrigation and livestock</td>
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<tr>
<td>1865</td>
<td>1-10-27</td>
<td>J. D. Wilson</td>
<td>Rock Creek, 13.5 acres</td>
<td>Irrigation and livestock</td>
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### 1928

<table>
<thead>
<tr>
<th>Proof Serial Number</th>
<th>Date Filed</th>
<th>Name of Claimant</th>
<th>Source of Water Supply</th>
<th>Use Claimed under Appropriation</th>
<th>Purpose of Appropriation</th>
</tr>
</thead>
<tbody>
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<td>J. D. Wilson</td>
<td>Rock Creek, 13.5 acres</td>
<td>Irrigation and livestock</td>
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</tbody>
</table>
county seat. Approximately 1,029 acres are involved in the adjudication proceedings initiated in response to a petition of July 29, 1927, by J. C. Whaley, a water user under application rights on the source. All claims having waived the usual notices and publications thereof, the State Engineer made a field investigation and report, prepared an Abstract of Claims and an Order of Determination which was filed during May, 1928, with the District Court at Austin.

Toney Creek and its principal tributaries, Chimney and Porcupine Creeks, is situated in Humboldt County, approximately forty miles north of Winnemucca, in the Quail River basin. Since some of the water from Toney Creek ever reaches the Quail River, Toney Creek was considered as a separate and distinct source. An Abstract of Claims and Preliminary Order of Determination was prepared. Following the period of inspection of proofs, abstract and preliminary order, objections to the latter were received and hearings held to dispose of same at Winnemucca on May 1, 1926, by Deputy State Engineer G. F. Eagle. Following the hearing the Order of Determination was prepared which, together with all evidence, maps and transcript of testimony, was filed with the Sixth Judicial District Court at Winnemucca on July 9, 1926.

Hearing was held November 1, 1928, by the Court on exceptions to the Order of Determination. Atorneys for Baum and Repasee, one of the two claimants on the source, vigorously attacked the Order of Determination on the grounds that valid appropriation of water can be made subsequent to the year 1900 by actual diversion and beneficial use without making application to the State Engineer. A vital point is involved here which, if decided in favor of claimants Baum and Repasee, would virtually result in throwing the present water law into the discard. During the hearing the State Engineer was represented by Assistant Attorney-General Wm. J. Forman and Deputy State Engineer G. F. Eagle.

A total of 13,562 acres is embraced in the Order of Determination in this proceeding.

BAKER AND LEHMAN CREEKS

Adjudication proceedings initiated in 1925 have not advanced during the past biennium due to extensions of time for filing proofs of appropriation which have been requested and granted.

SILVER CREEK

Upon petition of W. D. and M. E. Cottam, water users on Silver Creek, Lander County, an investigation was made on March 7, 1928, which disclosed that facts and conditions warrants initiation of adjudication proceedings on this source. Three claimants are involved, two of which have submitted proof of their claims. When all proofs have been received and filed the proceedings will be advanced under the provisions of section 36b, chapter 136, Statutes of 1921, notices of hearing having been signed by all claimants.

K-C CREEK

Upon petition of Moses, Rowell and Windell, water users on K-C Creek, Elko County, adjudication proceedings have been initiated.
From the standpoint of gross area this stream system is of greater magnitude than the Carson River system, not only because of the area it is in the wild hay and meadows pasture land places it served in importance to the Carson River lands, most of which are intensively cultivated.

Proofs of Appropriation were first filed with the State Engineer during 1899-1916. These, however, were merely excess, hence an Abstract of Claims enabled in 1915, and based in large measure on these proofs was of little value. From this point speculative and interplant attempts by former State Engineers to further the proceedings resulted little.

At the present request of many water users involved, and realizing the importance of completing the determination of rights on this important stream system, the present State Engineer has aggressively pushed the proceedings to a point where the Preliminary Order of Determination will soon be prepared and printed. The revival of this proceeding and its process to date has been made possible by a voluntary contribution of $4,000 from the water users on the stream system. With a portion of this fund already deposited in trust with this office, a special assistant has been employed, who devotes his entire time to this adjudication. Much field and office work, incidental to the completion of the proceedings, has already been accomplished.

THOUSAND SPRINGS CREEK

The actual Springs Creek and its principal tributaries, Rain and Silver or Crystal Springs Creeks, are situated in Elko County in the extreme northeastern portion of the State. The area of land and/or water under consideration is in the Spring Creek and Rain Creek Company, owners of the land and stock company.

This application was initiated in April, 1929, upon petition of the Utah Construction Company. Waivers of notice, under section 46a, chapter 136, Stats. of 1917, were signed by all claimants and interested parties. The State Engineer proceeded in accordance therewith. Field investigations and maps were made and an Abstract of Claims prepared and submitted to the claimants involved. The Order of Determination is now in process of preparation and will be filed with the Court prior to the irrigation season of 1930.

CROOK AND WILSON CREEKS

Crook and Wilson Creeks, situated in Lander County, terminate a total area of 61,422 acres. The adjudication proceedings involving these lands were completed by the entry of a final decree, May 26, 1928, in the Third Judicial District Court at Austin, Nevada.

Claimants R. D. and Martin Philipson entered into these proceedings as perpetuators and interveners in April 1929, and thereafter took a step forward which was entered into with claimant Elbert Parks Adams who served as the basis for the final determination of the rights involved.

CARRICO CREEK

Carrico Creek and its tributaries, Hali and Jana Creeks, is located in Lander County, some forty miles north of Austin, Nevada, the

CERTIFICATES ISSUED UNDER PROCEEDINGS OF APPROPRIATION, 1899-1928

The following information is given in order of:

1. Certificate Number
2. Date Issued
3. Total Acreage
4. Name of Claimant
5. Source of Water Supply
6. Purpose of Appropriation
7. Number of Acres Irrigated
8. Date Certificate Issued

<table>
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<th>Certificate Number</th>
<th>Date Issued</th>
<th>Total Acreage</th>
<th>Name of Claimant</th>
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<tr>
<td>120</td>
<td>1899-1900</td>
<td>2,345</td>
<td>Martin and R. J. Philipson</td>
<td>Springs Creek</td>
<td>Irrigation and domestic</td>
<td>400</td>
<td>1899-1900</td>
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<td>1899-1900</td>
<td>2,345</td>
<td>Frank Adams</td>
<td>Wilson Creek</td>
<td>Irrigation and domestic</td>
<td>425</td>
<td>1900-1901</td>
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<td>1899-1900</td>
<td>2,345</td>
<td>David Parke Adams</td>
<td>Crook and Wilson Creeks</td>
<td>Irrigation and domestic</td>
<td>425</td>
<td>1901-1928</td>
</tr>
</tbody>
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RECORD OF ADJUDICATION PROCEEDINGS SINCE CREATION OF OFFICE OF STATE ENGINEER

Although one of the chief reasons for the enactment of a water law was to provide a method for the determination of relative rights to the water resources of the State, the results of accomplishment along this line by the office of the State Engineer during the past 25 years has never, so far as is known, been collected and sampled in one source for ready reference and information. In considering the matter of adjudication of the streams of the State the first questions that present themselves are: What streams have been the subject of adjudication proceedings, when were the proceedings initiated, have they been completed, and if so for how long have they been adjudicated?

The following table has therefore been prepared to show this information. It has been difficult to obtain much of the data presented owing to the incomplete state of the preliminary adjudication records and files. There may be errors or omissions discovered which will justify amendment of the table in the future. It is hoped succeeding State Engineers will keep the record up-to-date in their biennial report, making it more extensive and complete, however, by the addition of headings to show location of stream system, cultural areas embraced and any other data which may seem advisable.

ADJUDICATIONS BY DEPARTMENT OF STATE ENGINEERS

The following information is presented in the order of:
1. Name of Stream System
2. Date Adjudication Proceedings Initiated
3. Date Toward Completion of, or if Completed, Date of Final Determination
4. General Remarks

<table>
<thead>
<tr>
<th>General Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson River—1914, The Door of Service filed with Clerk of Court; case set for hearing on October 1, 1920, in State Board of District Court, Walker River—1920, March 30, 1920,Filed in district suit No. 771 in United States District Court of Nevada.</td>
</tr>
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</table>
CHAPTER IV—ADJUDICATION OF WATER RIGHTS

The work of determination of relative rights to the water resources of the State during the past half-century has progressed as rapidly as possible considering the fact that the office and field personnel of this department of water rights was limited to a minimum under the present appropriation.

The scope of activities in connection with the adjudication of the various sources during the biennium may best be considered in order of their importance for irrigation.

CARSON RIVER

This adjudication embraces all lands in Nevada irrigated from the Carson River above Lahontan Reservoir of the United States Bureau of Reclamation (now Truckee-Carson Irrigation District), commonly referred to as the Upper Carson lands.

A. R. Chandler, Nevada's first State Engineer from May, 1903, to May, 1905, attempted a determination of the relative rights to the use of water on these lands by having certificates of water rights in accordance with the statutes then in force. These constitute the so-called "Chandler Findings."

Subsequent litigation, however, was successful in attacking the constitutionality of that portion of the statutes under which Chandler found authority for making his findings, hence former State Engineer J. A. Bowman, by notice to claimants dated April 20, 1925, initiated adjudication proceedings under the water law of 1913 as amended by the Statutes of 1915. As a resultant result, on March 28, 1927, former State Engineer Robert A. Allen officially filed the completed order of Determination in the files of the State Engineer.

The present State Engineer, in accordance with the provisions of the water law, proceeded to collect, examine, and prepare in orderly and intelligible shape all evidence, transcripts of testimony before the State Engineer, maps and other related data for filing with the District Court.

After confering with the Judges of the two judicial districts in which the stream system is situated, it was decided to hold the court proceedings in the First Judicial District Court at Carson City, Nevada, December, on November 21, 1928, the State Engineer filed the Order of Determination together with the original evidence, etc., with the Clerk of said Court. Time for hearing exceptions to the Order was set by Judge (U. A. Judd) for February 4, 1929.

The exclusive time of one office assistant for approximately three months was required in assembling data in complete and orderly form for filing with the Court.

A total of 25,405 acres of irrigated lands is embraced in the State Engineer's Order of Determination.

LITTLE HUMBOLDT RIVER

The Little Humboldt Stream System comprises, in addition to the main stream, Martin, Cattowood, Indian, Mercy, Deepy, Havilock, Hamer and Stonehouse Creeks as tributaries. Approximately 50,000 acres of land are irrigated from this source. Although
CHAPTER V—WATER DISTRIBUTION

The Nevada water laws vest the State Engineer with legal authority to distribute water only in those streams where the relative rights to the use of water have been completely determined or adjudicated, or where the adjudication has reached a stage of completion where the State Engineer's Order of Determination has been officially filed with the District Court.

Of the streams covered in this chapter and which are under the jurisdiction of the State Engineer, the adjudication of rights has been completed on all but the Humboldt and Carson Rivers.

On the Humboldt River, pending the District Court's Final Decree of Determination, division of water has been made during the irrigation by the State Engineer in accordance with his Order of Determination. This stream system presents many unique and difficult problems in distribution which have been exceptionally well handled during the past two seasons by Supervising Water Commissioner J. A. Millar.

The Carson River in some respects has presented a more difficult problem for the reason that the State Engineer has had no legal authority, but has distributed water at the request and by the consent of the various water users, reserving each time as the Order of Determination could be prepared and filed with the District Court. Thus without legal authority to enforce any distribution schedule the job has been one of mature judgment and diplomacy which has been efficiently handled during the irrigation by Mr. F. N. Bandow, as supervising water commissioner. During subsequent irrigation seasons, however, the commissioner will have legal distribution authority on this stream by virtue of the filing on November 21, 1928, of the Final Order of Determination with the First Judicial District Court at Carson City, Nevada.

The present administration has inaugurated the policy of requiring all water commissioners to prepare and distribute reports which, when compiled over a period of years, will furnish the basis for determination of duty of water, transportation losses and magnitude of return flow to the streams.

At the close of the irrigation season each commissioner prepares a detailed report of the season's activities, which include a complete record of stream and ditch flow and individual deliveries.

Following is a brief review of distribution activities on the streams under the jurisdiction of the office:

HUMIDITY RIVERS

BY J. A. MILLER, Supervising Water Commissioner

In the year 1927, distribution work started in the Los Lobos Valley on March 15 and ended the frequent of September. There were 35,706.20 acres of water distributed in this district during the storage water delivered by the Humboldt-Las Vegas Irrigation District. This volume of water represents 80% of the required quota in the Order of Determination.

In the Winnemucca district irrigation started on or about March 15 and continued until July 4. There were 35,706.20 acres of water
used, which represents about 20% over and above the required quota.

In the Battle Mountain district, irrigation started on about March 25 and continued until July 8. There were 109,289.23 acres feet of water used, which represents at least 20% over and above the quota set forth in the Final Order of Determination. Grazing readings were taken and complete records kept of the U. S. G. S. Hydrographer Stations at Pahsade, Caras, and Oceana. The record of the Rock Creek Station was not complete.

Some difficulty was experienced in securing a water commissioner in the Elk Range district, and it was not until the latter part of May that a man was placed in this district. In view of this late start it was therefore impossible to obtain a complete record. In the majority of cases irrigation started in this district on or about May 1, and continued until September 1. After the irrigation season a water commissioner continued to regulate stock water until November 1.

The commission concentrated its efforts in the Star, Lamoille, and South Fork valleys. All the ditches in these valleys were measured and a record kept of the daily delivery.

In the entire Humboldt system there were 392,016.64 acres of land subject to irrigation, and the total cost of distribution was $14,464.12, or a cost of 64.04¢ per acre.

Season of 1928

In view of the fact that a mild winter occurred during 1927-1928, an acute shortage of water was anticipated. With this shortage in mind, a new plan of distribution was adopted and carried out. All of the early flow was delivered to the Lodeock district; the second flow to the Winnemucca and Battle Mountain district; the third flow of high mountain run-off to the Riske district. Irrigation started in the Lovelock district March 15, and was practically ended April 28. During this period 30,829.43 acres feet of water were used, representing 20% of the total quota.

Irrigation started in Battle Mountain and Winnemucca districts on or about April 20, and ended the latter part of June. An acute drop in flow of the rivers during the early part of April and nearly all of the month of May paralyzed the above-mentioned scheme, and as a result the irrigation of these two districts was not successful. However, there was 19,007.77 acre feet of water or 90% of the total quota used in the Winnemucca district, and 49,803.68 acre feet of water or 61% of the total quota used in the Battle Mountain district.

Irrigation in the Riske district began on or about May 15. This date applies to vested water rights. The appropriators having a water right by virtue of a permit from the State Engineer were not allowed to irrigate until June 1. Again the commission's efforts were concentrated in the Star, Lamoille, and South Fork valleys. However, general distribution was carried on throughout the rest of the Riske district. In the majority of cases in the three abovenamed valleys the water used amounted to about 80% of the total quota.

A part-time water commissioner carried on distribution work in Pine Valley, Eureka County. After the irrigation season was over, one water commissioner distributed stock water until November 1. Records were kept at the
CARSON RIVER
By F. X. Moran, Supervising Water Commissioner
Season of 1926

Due to heavy snowfalls during the winter months and to some rain, a good supply of water was maintained in the Carson River and its forks until about the middle of July, at which time it became necessary for water commissioners’ services. Two men were placed in the distribution: one on the East Fork and the Carson River proper, who also supervised the entire river system, the other in the West Fork, including the Alpine district in California.

During the irrigation season on the East Fork there was sufficient water to satisfy all priorities up to 1906 rights. Those until the younger rights purchased water to saturate their crops from the Alpine Land and Reservoir Company in the extent of 951.70 acre feet. The Dougherty Land and Livestock Company released $22.57 more feet of water from their storage in Hoover Lake for their own use.

On the West Fork there was sufficient water until the first part of August when some shortage began to be felt. From this time on the water was distributed by the rotation system, with satisfactory results. Individual owned storage water on this fork was also released beginning the first part of August.

Along the Carson River proper some shortage of water occurred during the latter part of August and the first part of September. From September 10 the flow in the river steadily increased.

In order to obtain a complete record of the amount of water used by each district on the Carson River and its forks, to supply discharge data to water commissioners, and to obtain further data for future storage, water level recording instruments were installed at the head of each irrigation district. A record of the flow of the ditches was kept and a report of the distribution rendered. The crop production on this system was about normal. The late frost and freezing weather in the month of May and the cold nights in June were unfavorable for crop development. The growing season was terminated around the 7th of September when the first killing frost appeared. Freezing potatoes, timothy, canarygrass, and other winter ryes.

Season of 1926

The 1926 irrigation season was very dry in account of a mild winter with insufficient snow storage in the upper reaches of the Carson River.

The heavy rain and snow that fell during the latter part of March increased the flow of the rivers but caused considerable damage in that it killed the snow storage, and therefore as early as July 6 a shortage of water began to be felt and the elimination of water of the young priorities began. By the latter part of July there was only sufficient water to satisfy rights up to and including 1901.
All the storage water on both the East and West Forks of the Carson River was consumed.

The mild weather during the first part of the growing season was beneficial in offsetting to some extent the water shortage. The cutting of alfalfa began as early as June 3. Generally two crops of alfalfa were cut. There was sufficient water to mature all grain crops.

For the purpose of making a study of the duty of water a hydrographer was employed in addition to the water commissioner.

MUDY RIVER (Clark County)

Irrigation season on this stream usually begins about April 1 and ends on September 1 of each year.

Distribution during the past irrigation has been successful, no complaints of any kind having been received from water users. One part-time commissioner at $50 per month attends to the entire stream, with the result that unit distribution costs are exceedingly low, or approximately 22 cents per acre on 2,743 acres.

FAHRANGAAT LAKE AND TRIBUTARIES (Lyon County)

Distribution of water on this source has been as successful as can be expected during years of water shortage.

One water commissioner was employed continuously during the irrigation season to deliver irrigation water to 4,860 acres of cultivated lands.

CURRANT AND UNDERWATER ORDERS (Nye County)

The distribution on these creeks during the irrigation season of 1927 and 1928 has been satisfactory. The water supply on Current Creek held up fairly well, while Backwater Creek maintained its usual consistent spring-fed flow.

One water commissioner handled distribution on both these sources to the general satisfaction of the water users. But one major complaint was received and this, upon investigation, proved to be without foundation.

SIX MILE CREEK, Elko County

Water was not distributed on this source during the 1927 irrigation season. However, early in the season of 1928, at the urgent request of Mr. John Taylor, one of the two water users on the stream, the State Engineer reluctantly appointed a commissioner to distribute water between the two users involved. Mr. T. C. Plunkett was duly appointed for this purpose and served for ten days from May 18 to the 27th, inclusive, then replaced, advising that no commissioner was necessary and the cost of same out of proportion to the rights involved.

There is, in reality, no need for distribution on this creek; all disputes and troubles being the result of personal differences between Mr. Taylor and Mr. Jack, the other water user.

An adequate system of simple rotation in the ratio fixed by the court decree defining the relative rights could easily be worked out and adhered to with the cooperation of the users.
representing irrigation, power development, water distribution and agriculture as well as snow surveys and stream run-off forecasting. A representative of the California Division of Water Rights was present.

The results of snow surveys and forecasting were discussed, and also programs for extending the work and methods of planning.

For several years the State of California cooperated in the work, but for about the last five or six years has not rendered actual financial aid except to permit Nevada to use equipment which had been paid for by California.

Except for the aid of various other interests the work would have been much less effective than it has been.

The Pacific Gas and Electric Company has for years furnished the help of its employees in making the surveys near Summit and at numerous other points in the South Yuba Basin, and has gladly cooperated in other ways.

The Sierra Pacific Power Company, formerly the Truckee River Power Company, has regularly furnished its employees for snow surveys, and in addition has for several biennia contributed cash to supply the deficiencies of the last year of the biennium, so that the most important snow courses might be surveyed.

The Elko-Lawrence Power Company has furnished employees and transportation to aid in the Lawrence Canyon snow surveys, and the use of a cabin to permit of a two days' trip to cover a high level snow course at the 9,000 foot altitude.

In recent years the Truckee-Carson Irrigation District and the Walker River Irrigation District have also helped out financially. The latter contributed the labor cost for the construction of a cabin at the fork of Hackey Creek, a tributary of the East Walker River, to afford shelter for snow surveys close to the important Center Mountain snow survey course which is at an altitude of 9,330 feet, and one of the most difficult of access in the central Sierra region.

As a concrete example, the financial contribution of the Sierra Pacific Power Company for the 1927-1928 biennium was as follows:

- Salaries of employees while engaged in snow survey work, 1927-1928: $10,500
- Salaries of employees while engaged in snow survey work, 1928-1929: $2,500
- Salaries of employees while engaged in snow survey work, 1929-1930: $4,000
- Cash for use of cabin at fork of Hackey Creek, April 1928: $1,000

Total for biennium: $16,000

Throughout the whole period of development of the Church system of snow surveys many students of the University of Nevada and young men of Rebo have taken part in this work for small pay, and frequently no pay at all when the funds were short. Their enthusiasm prompted largely by love of outdoor life and adventure has contributed greatly to the success of the enterprise, but let no one think it is all sport. It is hard work at any time, and especially so when storms are encountered causing exhaustion and real danger. It is worth much higher wages than most of the men engaged in it receive.

The following is a summary statement of the receipts and expendi-
CHAPTER VI—OFFICE ENGINEERING AND MISCELLANEOUS GENERAL OFFICE WORK

A considerable volume of office engineering work has been accomplished in connection with the various branches of activities under supervision of the State Engineer.

In addition to many maps and drawings prepared in connection with adjudication proceedings, a complete set of standard maps was prepared for the purpose of showing the select data and general form required by the water law and the regulations of the State Engineer in the preparation of maps for submission in connection with appropriation of water. This set of six maps was designed primarily for the use and instruction of licensed State water right surveyors, to whom it was distributed in the form of bound blue print folders. These have received favorable comment and have resulted in standardization of maps submitted, not only as to general form and group but also as to presentation of data.

In conjunction with the standard maps a pamphlet was prepared and printed covering in detail the regulations of the State Engineer and requirements of the water users concerning the preparation of maps to be submitted in connection with water right filings.

In addition to other pamphlets were prepared and printed embracing respectively the Water laws of Nevada, revised and brought up to date, the Nevada Irrigation District Act, the Nevada Drainage District Act, and the Nevada Improvement District Act. All of these pamphlets were distributed throughout the State to attorneys, engineers, county agents, water users and other persons directly or indirectly interested in legislation affecting water and water rights.

The new stock watering and range control policy of the administration has called for the preparation of a State range map, which has required the part-time work of one man throughout the past two years. At the present time approximately 200 individual stock range areas have been included in this map.

Much work has been accomplished in connection with preparation and assembling data incident to computing abstracts of claims and Orders of December 12th to adjudication proceedings. In the matter of the Carson River adjudication alone the entire time of one man for approximately three months was spent in preparing data and exhibits for filing with the court.

The office engineering force is frequently called upon to aid in the compilation and analysis of individual water problems by water users throughout the State. It has been the policy to assist and instruct water users generally in the solution of hydraulic and irrigation problems.

Much of the work of the engineering office force consists of careful examination and checking of maps in support of water right filings submitted to the office. Three hundred and fifteen maps in support of applications and approximately 200 filed in support of proofs of beneficial use under permits, in addition to 143 similar maps in support of proofs of appropriation, were examined and checked during the biennium.

DISCUSSION OF 1928 RESULTS

The results on the Truckee at Inverness were close and the maximum level of Lake Tahoe, while it was reached nearly three weeks earlier than expected and seven weeks earlier than in 1927, was a close choice with the predicted "Possible Maximum." This was as it should have been since, as in 1927, there was little April-July precipitation after the snow storms of April 1-4.

For the Carson River only one pair of courses was measured viz., at Blue Lakes, just over the divide on the Middlefork Irrigated. Because of extensive diversions in the Carson Valley a few years ago a naturally extra low in run-off at Climax, and in the 1928 forecast apparently too much was allowed for this factor. Probably the heavy rains of March 24-28 set the ground so thoroughly that less was diverted than usual in April and May, leaving a larger proportion than expected to pass down to Climax. Also the ground must have taken up considerably of the March 24-28 rain and given it to the river early in April.

The snow surveys in the Walker basins were made earlier than usual—March 15-19, at the request of the Walker River Irrigation District, and probably not enough additional was allowed in estimating the snow storage as of April 5, the date immediately following the heavy snowfall which was included in most of the surveys from Blue Lakes north.

The Humboldt forecasts at Ft. Pierre, while not close, were not bad considering the number data available as a guide. This is the water shed in most need of extension of snow surveys and at best will be a difficult one to forecast because of heavy diversions and altitudes of large portions of the basin, leading to early melting of snows.

INCREASING USE OF SNOW SURVEYS

During the winter of 1927-1928 letters addressed to Dr. Church came from Twin Falls Canal Company of Twin Falls, Idaho, and the State Engineer's Office of Oregon asking for detailed information concerning his system of snow surveys and the equipment and supplies needed for field operations. We answered as best we could, and actual snow surveys were started last spring by both organizations. The engineers' chief work for Oregon came in a conference in the summer, at which time he explained by maps that they have already begun on a large scale on the watersheds of several of the Oregon rivers.

The Division of Water Rights, California Department of Public Works, is now investigating snow surveys with a view to applying it to California water rights not already secured. Questionnaires sent out to various power companies, irrigation districts and other organizations and individuals interested in the use of water coming from the mountains snow fields of California, brought favorable replies from a large proportion of those questioned, so it is to be hoped that in a result this work will within a few years be applied the full length of the Sierra Nevada on both slopes.

SNOW SURVEY CONFERENCE

In line with a suggestion made by you last spring, a snow survey conference was held in Reno, December 14, 1929, attended by persons
Compilation of crop census reports, working up hydrographic data and preparation of seasonal reports on distribution of water on the Pahquod and Cessa Rivers have occupied the office time of the supervising water commissioners in the interim between irrigation seasons.

In addition to the foregoing, office engineering and general miscellaneous office work has included the study of transcripts of testimony taken during the hearings on water rights and preparation of resultant tariffs; preparation of reports resulting from field investigations; extensive study of the stock watering and range problems; partial preparation of a State Engineer's handbook for use of irrigators, water commissioners and others; investigation of a personal record of employees; organization of the office filing system; supplying information and data on water filings for the general public; preparation and filing of permits and certificates, filing of proofs and applications for water rights; preparing certified copies of documentary records, and investigating complaints over distribution of water.

Giving prompt and detailed attention to daily routine office correspondence has occupied much time. The magnitude of this work can best be judged by the volume of mail leaving the office. During the past two years 1,669 registered letters have been sent out from this office in addition to approximately 13,000 articles of regular mail.

It is estimated that over 1,000 persons have visited the office during the biennium on matters chiefly pertaining to water and water rights. Every visitor takes up from a few minutes to several hours' time of one or more of the office force. It is estimated that each visitor has taken up at least an average of one-half hour's time, which is the equivalent of one office employee devoting approximately 67 working days to the requirements of office visitors.

Many other activities and accomplishings could be listed, however, it is believed the foregoing will serve to give some conception of the volume of office engineering and miscellaneous general office work accomplished during the biennium.
CHAPTER VII—HYDROGRAPHY

In the biennial report of the State Engineer for the years 1925-1926, Dr. J. E. Church, Director of the Nevada Cooperative Snow Surveys, reviewed the snow survey work for the prior ten years of State direction, hence no effort will be made to give a historical account of this work since its inception.

In both seasons of 1927 and 1928 snow surveys were made near the end of March continued for several days in April and most of the snow surveys were made after these storms. In the 1927 forecast the “seasonal percentages” of normal were adjusted as of April 1 as has been Dr. Church’s custom, but in 1928 the committee in charge of making the forecasts, in the absence of Dr. Church, adjusted the results of the earlier surveys to the date of April 5. The reason for this as stated in the forecast was that the “committee thinks, since the principal use of the bulletin is to forecast water available for the coming season, that it is advisable to include the effects of a heavy storm occurring so soon after April 1 even if it leads to discounting slightly the expected April-May precipitation to follow.”

The comparison of the forecasts and actual April-July run-offs on various streams for 1927-1928 appears on the following page.

CIRCUMSTANCES OF THE HEAVY RAINS

As will be seen from the table the discharge of the Truckee at Independence was 7% of normal relative to the forecast.

The rise of Lake Tahoe shocked almost exactly the April forecast in spite of the fact that the May forecast lowered the estimate because of deficiency in precipitation after the storm of about March 30-April 4. The deficiency in precipitation continued, and yet the lake reached the maximum estimate by 91 feet. The Rubicon Peak course was not surveyed and the Lake Tahoe course only partly so because of an accident to the apparatus. Had these important courses been completely surveyed probably the estimate would have been increased so that the seasonal forecast would have been closer to the actual rise.

The forecasts for the Carson and East and West Walker Rivers were much too high to 1927 as disclosed by actual run-offs. The snow surveys showed high percentage of normal at Horsetail Lake in the Carson basin and at Center Mountain in the East Walker, close to the divide between the East and West Walker. However, at Blue Lakes, close to the divide between the Carson and Mokelumne and at Walker Flat and Beehve Meadows in the Walker basin the percentages of normal were very, very much lower. Dr. Church has considered Center Mountain a very reliable course, but it apparently was not reliable in 1927. Probably one more well located course in the East Walker and one more in the West Walker basin and perhaps one at 7,600 to 7,700 altitude on the East Carson would in time give a useful check on the present courses. In the Truckee and Tahoe basins where the surveys have been carried on longer and more courses are used such erroneous forecasts are rare if not entirely avoided.

CHAPTER IX—SNOW SURVEYS

By Professor H. F. Bremigan, Chairman of Forest Committee in Charge of Snow Surveying
On December 31, 1928, there were being maintained on Nevada streams the following structures:

- Humboldt River at Fallon.
- Humboldt River near Reno.
- South Fork of Humboldt River near Elko.
- Martin Creek near Paradise Valley.
- Cottonwood Creek near Paradise Valley.
- H. L. L. & P. Can. outlet canal near Humboldt.
- Carson River near Fort Churchill.
- East Carson near Gardnerville.
- Oxchar River at Minden City.
- Walker River near Virginia City.
- Walker River at Schurz.
- West Walker near Cassicville, Calif.
- East Walker near Bridgeport, Calif.

*Complete records of publication prepared by United States Bureau of Reclamation.
*Excerpts of same reviewed by United States Bureau of Reclamation.
*Prepared in cooperation with Walker River Irrigation District.
CHAPTER VIII—RELATED ACTIVITIES OF STATE ENGINEER

THE COLORADO RIVER

The State Engineer was made a member of the Colorado River Commission of Nevada in January, 1927, and since that time has attended various Lower Basin and Seven-State Conferences, over a period of two years, including Los Angeles, San Francisco, and the Conference of Governors in Denver during August and October, 1927, during which power experts and others were employed and a determined effort made to get at the facts both economic and legal, so that the position taken by Nevada might be both reasonable and fair to the other States in the Colorado River basin, as well as to our own.

In January, 1928, he appeared before the Senate Committee on Reclamation and Irrigation in Washington, D.C., and presented Nevada’s position on the pending legislation, the Swing-Johnson Bill. His work relating Nevada’s position is more fully set forth in a report on the “Boulder Canyon, Lower Colorado River Power and Water Survey,” January 1, 1928. This report was presented to the Senate Committee on Reclamation and Irrigation January 30, 1928, and a statement referred to that committee together with a transcript of cross-examination before the committee at that time was presented in a second pamphlet “Boulder Canyon, Colorado River Development.” These documents are on file in the Governor’s office and also in the State Engineer’s office, who has been made Secretary of the Commission.

The upper basin States were visited in connection with a report on the physical data relating to the development of the lower Colorado River during September and October, 1928, and considerable time was spent in the Bureau of Reclamation’s office in Denver, Colorado, in the compilation of this report.

In this work all of the authentic reports bearing on the Colorado River development situation that have been put out in the past two years were examined and summarized and a general setup made of the entire situation on the construction features, methods of development of the river, the power situation, and the water supply, so that a balanced idea of the situation could be gathered without loss of time, and so that detailed data could be made available for future conferences among the States.

This report was presented to the United States Senate by Senator Teddy L. Odell, and has been ordered printed as Senate Document No. 144, and will be available about the first of the year. This has entailed an enormous amount of work, but should be well worth the effort in the interest of the settlement of the situation in future conferences among the States.

Following is a brief outline of the provisions of the Bill as passed by the United States Congress and signed by the President December 21, 1928:

1. That 87 1/2% of any moneys collected by the Secretary of the Interior above the amounts due the Government shall go to Arizona and Nevada.

STATE IRRIGATION DISTRICT BOND COMMISSION

Texas were elected Directors. George M. Bacon of Utah was appointed Secretary, and Reno, Nevada, was selected for the 1929 convention to be held in November.

STATE IRRIGATION DISTRICT BOND COMMISSION

During the biennium of 1927-1928 the State Irrigation District Bond Commission, of which the State Engineer is a member, acted upon the following applications:

On April 1, 1927, the Board approved an application by the Lovelock Irrigation District to sell $100,000 in bonds for the purpose of investigation, surveys, etc.

On July 1, 1927, upon application of the Truckee-Carson Irrigation District, Westlands Project, the board approved the sale of bonds to the amount of $42,000 for the purpose of the construction of an electrical distribution system.

On July 10, 1927, upon application of the Truckee-Carson Irrigation District, the board approved the sale of $20,000 in bonds for the construction of an electrical distribution system in Local Improvement District No. 1.

On July 19, 1927, upon application of the Truckee-Carson Irrigation District, the board approved the sale of $17,000 in bonds for the construction of an electrical distribution system in Local Improvement District No. 3.

On October 21, 1927, upon application of the Truckee-Carson Irrigation District, the board approved the sale of bonds in amount of $30,000 for the purpose of construction of an electrical distribution system in Local Improvement District No. 5.

On November 3, 1927, upon application of the Truckee-Carson Irrigation District, the board approved the sale of $23,000 in bonds to the amount of $43,000 for the purpose of construction of an electrical distribution system in Local Improvement District No. 6.

On November 3, 1927, upon application of the Truckee-Carson Irrigation District, approval was given for the sale of bonds in amount of $14,000 for the purpose of construction of an electrical distribution system in Local Improvement District No. 3.

On December 2, 1927, upon application of the Lovelock Irrigation District, approval was given for the sale of bonds in amount of $14,000 for the purpose of construction and improvement within the district.

On December 3, 1927, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $14,000 for the purpose of construction and improvement within the district.

On April 10, 1928, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $20,000 for the purpose of construction and improvement within the district.

On April 18, 1928, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $20,000 for the purpose of construction and improvement within the district.

On June 6, 1928, upon application of the Walker River Irrigation
Oklahoma, Kansas, Nebraska, North Dakota, North Dakota, Minnesota, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon, and California make up the organization.

All of the irrigated area in the United States is included in this Association, which has been formed to exchange experiences and ideas relative to the administration of water rights and to work out and establish policies for the appropriation,use, and use of water so that the highest beneficial use may be obtained, be lost of this limited and valuable commodity.

The last annual meeting of the Association was held in Salt Lake City, Utah, October 28-31, 1928, at which practically all of the States were represented, and the following papers were read and discussed:


"Proper State Control and Protection of Individual Appropriators of Underground Waters."—By Harold Cunegle, Division of Water Rights, Department of Public Works, Sacramento, California.

"Duty of Water with Special Reference to Control by Adjustment."—By M. C. Hamberg, State Engineer, Denver, Colorado.

"Measuring Devices and their Relation to the Appropriation of Water Among Individual Water Users, Including the Use of Fish Screens and Service for Clarification Purposes."—By Edward Wyatt, Jr., State Engineer, Sacramento, California.

"National Legislation of Common Interest to our Irrigated States."—By John A. Whiting, State Engineer, Cheyenne, Wyoming.


"Requirements for the Establishment of a Valid Stock Watering Right in the Open Range."—By Geo. N. Carter, Commissioner, Department of Reclamation, Boise, Idaho.

"Irrigation and Drainage District Laws with Special Reference to Standardization Whenever Practicable."—By Theo. H. King, Consulting Engineer, Reno, Nevada.

"Interstate River Compacts and their Place in Water Utilization."—By Deolph K. Carpenter, Interstate Rivers Commissioner, Denver, Colo.

"Relation of the Federal Government to the States, Relative to Control of Water within the States."—By Surtin Sansomefield, Attorney at Law, Reno, Nevada.

Following the presentation of each of the papers, general discussion was had, during which the experience of each State in that particular matter was outlined in considerable detail.

A complete "Proceedings" was kept of the meeting and will be printed very soon, including all of the papers and discussions, and copies can be secured through this office.

The State Engineer of Nevada was elected Temporary President of the Association in Denver, Colorado, in 1927, and made President of the permanent organization at the Salt Lake City meeting in October, 1928; while R. K. Tiffany of Washington and John A. Norcia of
Representatives of our State consider the provisions of this legislation fair if properly administered, and will do everything in their power to secure early ratification by the seven States.

It is certain that great benefits will accrue to the State by reason of this legislation.

The State Administration, early in 1927, demanded that two definite issues be included in the legislation, viz.,

(a) That Nevada and Arizona be allowed to benefit by this development, if constructed by the Government, in lieu of the taxes they would receive if developed by private capital.

(b) That we be allowed to purchase power at cost at the switchboard for use within the State.

Both of these recommendations were included in the legislation as passed by Congress and signed by the President.

The 37-1/2\% of the net earnings of the project above payments due to the Government assures the State of an income that could very well amount to several hundred thousand dollars per year during the 50 year construction period, and after the Government is repaid, the income will be substantially increased, and should make possible a material reduction in State taxes or furnish funds for further development.

The power at cost, for use within the State, has unlimited possibilities if any of our people elect to take advantage of that feature for development of mining properties, etc.

In addition to the direct returns the indirect benefits are almost incalculable, since the expenditure of approximately $15,000,000 within our State will encourage all other lines of business.

PUBLIC SERVICE COMMISSION

The State Engineer by virtue of his position is also an ex officio member of the Public Service Commission.

This body has been gaining in importance during the last few years due to the increase in public utility business within the State, it having their function to pass upon the rates charged by all public utilities within the State and requires no small amount of time to properly care for this branch of their work.

Since April 1, 1927, the State Engineer has held the greater part of the out-of-state hearings of the Commission in the State, including work at Battle Mountain, Molina, Elko, Ely, Yerington, Caliente, Las Vegas and Storey County, and sitting jointly with other members of the Commission in various hearings at Carson City, Reno, Winnemucca and Elko.

The total number of hearings held by the State Engineer for the Commission totals approximately 30, and no expense account has been rendered to the Public Service Commission for this service, the trips to the various hearings being arranged so to coincide with the State Engineer's business upon other matters.

WESTERN ASSOCIATION OF STATE ENGINEERS

This association was formed at Denver, Colorado, in 1927, and includes seventeen of the western States, all with water problems; Texas,
15. That any money accruing from the (3.5%) of the net profits, after the $25,000,000 set aside for flood control has been reduced, shall be expended within the States of New Mexico, Colorado, Wyoming, Utah, Nevada, Arizona, and California.

16. That the water the States may have to the water within their boundaries or the right to adopt policies and enact such laws as they may deem necessary with respect to apportionment, control, and use of the water within their borders shall not be interfered with except as modified by inter-State agreements.

The following recommendations were submitted to the Senate Committee on Reclamation and Irrigation, January 20, 1928, by the Nevada Colorado River Commissioners:

1. That Nevada and Arizona should benefit from the proposed development, at least to the extent that they would benefit if developed by private enterprise, secured only to Government payments and any reasonable return.

2. That the power be not sold as low as the repayments to the Government will permit, but should be sold at a competitive figure comparable with the cost of power available elsewhere for these markets.

3. That arrangements be made for the sale of the power so that the Government may be paid and that legitimate benefits be not handicapped.

4. That suitable readjustment periods be arranged for power charges per KWH and also for the proper charges for other services rendered.

5. That proper charges be made for other services rendered, flood control, and irrigation water storage, and domestic water storage.

6. That the States shall have the right to withdraw, upon proper notices, certain blocks of power to be used within their own States.

7. That a board be appointed for the three lower States to assist the Secretary of the Interior or any agency supervising the sale of the power and other services rendered, in an advisory capacity to fix the proper charges per KWH and proper charges for other services rendered.

8. That an attempt be made to equalize, in some manner, between the three States the benefits from reclamation financing.

9. That after Government enforcement is entirely expended, the benefits from this development accrue to the States.

It will be seen that the first eight of the nine recommendations are included in the bill as passed, none of which were included in the original bill; these recommendations are found in the Colorado River Commissioners' report, "Colorado River Power and Water Set-up" of January 1, 1928, and printed in the Congressional Record of April 10, 1928.

If the power generated by this construction is disposed of on a competitive basis in the market by the Secretary of the Interior, 35% of the net returns over the payments due the Government should provide benefits to Nevada and Arizona at least equal to the amount they would receive from the project through taxes if developed by private capital, and should amount to a substantial sum annually.

Representatives of our State consider the provisions of this legislation fair if properly administered, and will do everything in their power to secure early ratification by the seven States.

It is certainly that great benefits will accrue to the State by reason of this legislation.

The State Administration, early in 1927, demanded that two definite facts be included in the legislation, viz:

(a) That Nevada and Arizona be allowed to benefit by this development, if constructed by the Government, in lieu of the taxes they would receive if developed by private capital.

(b) That we be allowed to purchase power at cost at the switchboard for use within the State.

Both of these recommendations were included in the legislation as passed by Congress and signed by the President.

The $375,000 of the net returns of the project above payments due to the Government assures the State of an income that could very well amount to several hundred thousand dollars per year during the 50 year construction period, and after the Government is repaid, the income will be substantially increased, and should make possible a material reduction in State taxes or furnish funds for further development.

The power at cost amendment, for use within the State, has unlimited possibilities if any of our people elect to take advantage of that feature for development of mining properties, etc.

In addition, to the direct returns the indirect benefits are almost incalculable, since the expenditure of approximately $15,000,000 within our State will encourage all other lines of business.

PUBLIC SERVICE COMMISSION

The State Engineer by virtue of his position is also an ex officio member of the Public Service Commission.

This body has been gaining in importance during the last few years due to the increase in public utility business within the State, it has taken a very active part in the approval of new rates charged by all public utilities within the State and requires a small amount of time to properly care for this business.

Since April 1, 1927, the State Engineer has held all the meetings of the Commission for the State, including the meetings at Salt Lake, Utah, and Idaho, as well as all the meetings held in Ogden, Utah, and Salt Lake City, Utah.

The total number of hearings held by the State Engineer for the Commission totals approximately 50, and no expense account has been rendered to the Public Service Commission for these services, the trip to the various hearings being arranged so to coincide with the State Engineer's business upon other matters.

WESTERN ASSOCIATION OF STATE ENGINEERS

This association was formed at Denver, Colorado, in 1927, and includes seventeen of the western States, all well represented; Texas, etc.
2. That the power be sold at a price that seems justified by competitive conditions at the distributing point.
3. That the provisions of the Federal Water Power Act and regulations of the Federal Power Commissioner shall be conformed with in connection with the protection of the investor and the consumer.
4. That there shall be readjustment periods for the sale of the power, the first to be at the end of 15 years and every 10 years thereafter.
5. That water can be sold for public purposes outside of Imperial and Cochella valleys.
6. That preference be given the States for purchase of power at the outlet for use in the State.
7. That a board be appointed consisting of one representative from each State to confer in an advisory capacity with the Secretary of the Interior on matters relative to the States.
8. That the All-American Canal shall be constructed under the Reclamation Act, which provides that all expenditures be undertaken by the lands benefited prior to beginning the construction.
9. That the sum of $25,000,000 be set aside for flood control, and in the event it shall not be replaced out of power sales during the amortization period it shall be replaced thereafter out of the remaining 32½% of the net profits.
10. That California shall be limited to a diversion of 1,450,000 acre-feet of water from the Colorado River; Nevada, 300,000 acre-feet of water; Arizona, 2,000,000 acre-feet of water; and that California must ratify this provision through its Legislature before the Bill shall become effective.
11. That it be constructed to a height of 500 feet with a capacity of 28,000,000 acre feet (24 billion cubic feet) for flood control, flood control and storage.
12. That power plants of 1,000,000 horsepower installed capacity to be constructed that will furnish 550,000 (b.h.p.)
13. That firm contracts be made by the Secretary of the Interior for the sale of power generated and for the use of the water to generate power that will replace the Government investment in the dam and power plants within 50 years, before construction shall be undertaken.
14. That the consent of Congress is given to the seven States of Colorado, New Mexico, Wyoming, Utah, Arizona, California and Nevada to enter into a compact or agreement supplemental to and in conformity with the Colorado River Compact.
15. That the consent of Congress is given to the three States of California, Arizona, and Nevada to enter into an agreement which shall provide that the 7,500,000 acre-feet annually apportioned to the lower basin of the seven-State compact shall be divided as follows: 3,500,000 acre-feet to Nevada; 2,000,000 acre-feet to Arizona; and 1,500,000 acre-feet to California.
16. That Arizona shall have the exclusive beneficial consumptive use of the Gila River and its tributaries within the boundaries of that State.
17. That the Department of Interior investigate through surveys, etc., the possibilities for development of the upper basin States and also of the Gila River project in Arizona, and lands susceptible of irrigation from the Colorado River in Nevada.
CHAPTER VIII—RELATED ACTIVITIES OF STATE ENGINEER

THE COLORADO RIVER

The State Engineer was made a member of the Colorado River Commission of Nevada in January, 1927, and since that time has attended various Lower Basin and Seven-State Conferences, over a period of two years, including Los Angeles, San Francisco, and the Conference of Governors in Denver during August and October, 1927, during which power experts and others were employed and a determined effort made to get at the facts, both economic and legal, so that the position taken by Nevada might be both reasonable and fair to the other States in the Colorado River basin, as well as to our own.

In January, 1928, he appeared before the Senate Committee on Reclamation and Irrigation in Washington, D. C., and presented Nevada's position on the pending legislation, the Swing-Johnson Bill. His work outlining Nevada's position is now fully set forth in a report on the "Boulder Canyon, Lower Colorado River Power and Water Supply," January 1, 1928. This report was presented to the Senate Committee on Reclamation and Irrigation January 30, 1928, and a statement referred to that committee together with a transcript of cross-examination before the committee at that time was presented in a second pamphlet "Boulder Canyon, Colorado River Development." These documents are on file in the Governor's office and also in the State Engineer's office, who has been made Secretary of the Commission.

The upper basin States were visited in connection with a report on the physical data relating to the development of the lower Colorado River during September and October, 1928, and considerable time was spent in the Bureau of Reclamation's office in Denver, Colorado, in the compilation of this report.

In this work all of the authentic reports bearing on the Colorado River development situation that have been put out in the past ten years were reviewed and referenced and a general setup made of the entire situation on the construction features, methods of development of the river, the power situations and the water supply, so that a balanced idea of the situation could be gathered without loss of time, and so that detailed data could be made available for future conferences among the States.

This report was presented to the United States Senate by Senator Thomas L. Odell, and has been ordered printed as Senate Document No. 134, and will be available about the first of the year. This has entailed an enormous amount of work, but should be well worth the effort in the interest of the settlement of the situation in future conferences so that the work may proceed as outlined by the legislation.

Following is a brief outline of the provisions of the bill as passed by the United States Congress and signed by the President December 21, 1928:

1. That 371/2% of any money collected by the Secretary of the Interior above the amounts due the Government shall go to Arizona and Nevada.

STATE IRRIGATION DISTRICT BOND COMMISSION

Texas were elected Directors. George M. Bacon of Utah was appointed Secretary, and René Nevada, was selected for the 1929 convention to be held in November.

STATE IRRIGATION DISTRICT BOND COMMISSION

During the biennium of 1927-1928 the State Irrigation District Bond Commission, of which the State Engineer is a member, acted upon the following applications:

On April 1, 1927, the Board approved an application by the Lowake Irrigation District to sell $10,000 in bonds for the purpose of construction of an electrical distribution system.

On July 1, 1927, upon application of the Truckee-Carson Irrigation District, the bond board approved the sale of $30,000 in bonds for the construction of an electrical distribution system in Local Improvement District No. 4.

On July 19, 1927, upon application of the Truckee-Carson Irrigation District, the bond board approved the sale of $30,000 in bonds for the construction of an electrical distribution system in Local Improvement District No. 1.

On October 24, 1927, upon application of the Truckee-Carson Irrigation District, the bond board approved the sale of $30,090 in bonds for the purpose of construction of an electrical distribution system in Local Improvement District No. 3.

On November 3, 1927, upon application of the Truckee-Carson Irrigation District, the bond board approved the sale of bonds in amount of $30,090 for the purpose of construction of an electrical distribution system in Local Improvement District No. 5.

On November 3, 1927, upon application by the Truckee-Carson Irrigation District, approval was given for the sale of bonds in amount of $11,800 for the purpose of construction of an electrical distribution system in Local Improvement District No. 3.

On December 2, 1927, upon application by the Lowake Irrigation District, approval was given for the sale of bonds in amount of $10,000 to defray the expenses of investigation and surveys in the district.

On March 26, 1928, upon application of the Truckee-Carson Irrigation District, the board authorized the State Controller to certify to bonds in amount of $11,300.

On March 26, 1928, upon application of the Walker River Irrigation District, permission was given to purchase, by surplus funds, district bonds in amount of $19,000.

On April 10, 1928, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $20,000 for the purpose of construction and improvement within the district.

On April 18, 1928, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $21,760 for construction of an electrical distribution system.

On June 6, 1928, upon application of the Walker River Irrigation District, the bond board approved the sale of bonds in amount of $19,000.
District, approval was given for the sale of bonds in amount of $80,000 for the purpose of construction and improvements in Local Improvement District No. 3.

On July 1, 1928, upon application of the Lovelock Irrigation District, the board approved the contract for the construction of the Owens dam.

On September 22, 1928, the State Controller was authorized to certify to bonds in Local Improvement District No. 7, of the Truckee-Carson Irrigation District, in amount of $12,700.

On October 23, 1928, upon application of the Walker River Irrigation District, the board authorized the refunding of a previous bond issue in amount of $10,000 and the sale of additional bonds in amount of $14,000 for additional construction and improvements in Local Improvement District No. 1.

On October 23, 1928, upon application of the Walker River Irrigation District, approval was given for the sale of bonds in amount of $10,000 for construction and improvement work in Local Improvement District No. 3.

On November 1, 1928, upon application of the Truckee-Carson Irrigation District, approval was given for the sale of bonds in amount of $12,000 for the purpose of construction of an electrical distribution system.

On December 31, 1928, there were being maintained on Nevada streams the following structures:

- Humboldt River at Fallone
- Humboldt River near Orama
- South Fork of Humboldt River near Elk
- Martin Creek near Paradise Valley
- Cottonwood Creek near Paradise Valley
- H. L. L. & P. C. R. R. feeder canal near Mill City
- H. L. L. & P. C. R. R. feeder canal near Humboldt
- Carson River near Fort Churchill
- East Carson near Gardnerville
- Owyhee River at Monticello
- Walker River near Valona
- Walker River at S. A.
- West Walker near Crellin, Calif
- East Walker near Bridgeport, Calif

*Complete records for publication compiled by United States Bureau of Reclamation.
*Projects and structures reviewed by United States Bureau of Reclamation.
*Drawings in cooperation with Walker River Irrigation District.
CHAPTER VII—HYDROGRAPHY

By A. B. Peters, District Engineer, United States Geological Survey

Stream measurement work has been carried on during the biennium under the usual cooperative agreement between the State Engineer’s office and the United States Geological Survey, but with reduced funds. The State appropriation for this cooperative work was cut in two, and this resulted in a reduction of Federal funds so that the work has necessarily been curtailed. The number of stations has not been reduced in proportion to the decrease in funds, but operation and maintenance work has necessarily been left below that necessary to keep the station equipment in proper repair and provide the desirable amount of field work. This policy was adopted during the biennium because a break in stream flow records seriously impairs their value and if adequate funds should be provided for the succeeding biennium the work can be continued with the least possible interruption.

The data collected in this cooperative work is published in the annual Water Supply Papers of the United States Geological Survey, which contain stream flow records for the whole United States, including Alaska and Hawaii. Continental United States has been divided into twelve primary drainage basins, and the results of stream measurements are published in a series of annual progress reports or Water Supply Papers that correspond to these twelve subdivisions. Data for streams in Nevada have appeared in the Great Basin, Colorado River Basin, and Truckee River Basin reports. A complete set of these publications is on file at the District Office of the Geological Survey, 303 Federal Building, Salt Lake City, and a limited number of each as published are available for free distribution upon application by those interested. Data in advance of publication can be furnished in mimeographed form.

With the limited funds available it has been necessary to concentrate the work almost entirely on the larger and more important stream systems in order to reduce the expense of field work and to take advantage of the assistance of the State water commissioners and irrigation districts. As a result streams in more remote portions of the State although relatively just as important to the local users have had to be neglected.

Funds for the cooperative stream measurement work have been supplemented in a substantial way by allowances from the United States Indian Service for assistance in the maintenance of stations in which it is particularly interested. The cooperation extended and records furnished by State water commissioners, irrigation districts, and private organizations have been especially valuable during the biennium in keeping the records of the reductions in funds at a minimum.

Expenditures for the period January 1, 1927, to December 31, 1928, are shown in the following table:

<table>
<thead>
<tr>
<th>State of Nevada</th>
<th>82,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. S. Geological Survey</td>
<td>8,000.00</td>
</tr>
<tr>
<td>U. S. Indian Service</td>
<td>8,000.00</td>
</tr>
</tbody>
</table>

*Figures include cost of Washington supervising, reviewing, editing, and publishing of records.*

CHAPTER IX—SNOW SURVEYS

By Professor H. F. Benson, Chairman, Board of Forest Control in Charge of Snow Surveying

In the biennial report of the State Engineer for the years 1925-1926, Dr. J. E. Church, Director of the Nevada Cooperative Snow Surveys, reviewed the snow survey work for the period 1919-1926. In the 1927 report the "seasonal percentages" of normal were adjusted as of April 1, as has been Dr. Church’s custom, but in 1928 the committee in charge of making the forecasts, in the absence of Dr. Church, adjusted the results of the earlier surveys to the date of April 5. The reason for this is stated in the report of the committee that the "committee thinks, since the principal use of the bulletin is to forecast water available for the coming season, that it is advisable to include the effects of a heavy storm occurring so soon after April 1 even if it leads to discounting slightly the expected April-July precipitation to follow."

The comparison of the forecasts and actual April-July runoffs on various streams for 1927-1928 appears on the following page.

**ELECTION OF THE BEST RANKS**

As will be seen from the Table the discharge of the Truckee at Bodie was 7% of normal relative to the forecast.

The rise of Lake Tahoe reached almost exactly the April forecast in spite of the fact that the May forecast lowered the estimate because of deficiency of precipitation after the storm of about March 30-April 4. The deficiency in precipitation continued, and yet the lake exceeded the maximum estimate by 21 feet. The Rubicon Peak course was not surveyed and the Lake Tahoe course only partly so because of an accident to the apparatus. Had those important courses been completely surveyed probably the estimates would have been increased so that the snowmelt forecast would have been closer to the actual rise.

The forecasts for the Carson and East and West Walker Rivers were much too high in 1927 as disclosed by actual runoffs. The snow surveys showed high percentage of normal at Homeward Lake in the Carson Basin and at Center Mountain in the East Walker, close to the divide between the East and West Walker. However, at Blue Lakes, close to the divide between the Carson and Mokelumne, and at Willow Flat and Buckeye Meadows in the Walker basin the percentages of normal were very much lower. Dr. Church has considered Center Mountain a very reliable course, but it apparently was not reliable in 1927. Probably any more well located course in the East Walker and one more in the West Walker basin and perhaps one at 7,000 to 7,500 altitude on the East Carson would in time give a useful check on the present course. In the Truckee and Tahoe basins where the surveys have been carried as longer and more courses are used such erroneous forecasts are rare if not entirely avoided.
Compilation of crop census reports, working up hydrographic data and preparation of seasonal reports on distribution of water on the Pioulbied and Cessou Rivers have occupied the office time of the supervising water commissioners in the intervals between irrigation seasons.

In addition to the foregoing, office engineering and general miscellaneous office work has embraced the study of transcripts of testimony taken during the hearings on water rights and preparation of resultant reports; preparation of reports resulting from field investigations; extensive study of the stock watering and range problems; partial preparation of a State Engineer's handbook for use of irrigators; water commissioners and others, in connection of a personal record of employees; recognition of the office filing system; supplying information and data on water filings for the general public; preparation and filing of permits and certificates; filing of proofs and applications for water rights; preparing certified copies of documentary records, and investigating complaints over distribution of water.

Giving prompt and detailed attention to daily routine office correspondence has occupied much time. The magnitude of this work can best be judged by the volume of mail leaving the office. During the past two years, 1,669 registered letters have been sent out from this office in addition to approximately 13,000 articles of regular mail. It is estimated that over 1,000 persons have visited the office during the biennium on matters chiefly pertaining to water and water rights. Every visitor takes up from a few minutes to several hours' time of one or more of the office force. It is estimated that each visitor has occupied an average of one-half hour's time, which is the equivalent of one office employee devoting approximately 67 working days to the requirements of office visitors.

Many other activities and accomplishments could be listed; however, it is believed the foregoing will serve to give some conception of the volume of office engineering and miscellaneous general office work accomplished during the biennium.
CHAPTER VI—OFFICE ENGINEERING AND MISCELLANEOUS GENERAL OFFICE WORK

A considerable volume of office engineering work has been accomplished in connection with the various branches of activities under the supervision of the State Engineer.

In addition to many maps and drawings prepared in connection with adjudication proceedings, a complete set of standard maps was prepared for the purpose of showing the salient data and general form required by the water law and the regulations of the State Engineer in the preparation of maps for submission in connection with applications for water. This set of six maps was designed primarily for the use of instruction of licensed State water right examiners, to whom it was distributed in the form of bound blue print folders. These have received favorable comment and have resulted in standardization of maps submitted, not only as to general form and grace but also as to presentation of data.

In conjunction with the standard maps a pamphlet was prepared and printed covering in detail the regulations of the State Engineer and requirements of the water laws concerning the preparation of maps to be submitted in connection with water right filings.

In addition four other pamphlets were prepared and printed, embracing respectively the Water Laws of Nevada, revised and brought up to date, the Nevada Irrigation District Act, the Nevada Drainage District Act, and the Nevada Improvement District Act. All of these pamphlets were distributed throughout the State to attorneys, engineers, county agents, water users and other persons directly or indirectly interested in legislation affecting water and water users.

The new stock water and range control policy of the administration has called for the preparation of a State range map, which has required the part-time work of one man throughout the past two years. At the present time approximately 200 individual stock range areas have been included in this map.

Much work has been accomplished in connection with preparation and presenting data incident to compiling abstracts of claims and Orders of Determination to adjudication proceedings. In the matter of the Carson River adjudication alone the entire time of one man for approximately three months was spent in preparing data and exhibits for filing with the court.

The office engineering force is frequently called upon to aid in the computation and solution of general water problems by water users throughout the State. It has been the policy to assist and instruct water users generally in the solution of hydraulic and irrigation problems.

Much of the work of the engineering office force consists of careful examination and checking of maps in support of water right filings submitted to the office. Three hundred and fifteen maps in support of applications and approximately 200 filed in support of proofs of beneficial use under permits in addition to 143 cadastral maps in support of proofs of appropriation, were examined and checked during the biennium.

DISCUSSION OF 1925 RESULTS

The results on the Trask at Iskuck were close and the maximum level of Lake Tahoe, while it was reached nearly three weeks earlier than expected and seven weeks earlier than in 1924, was a close choice with the predicted "Possible Minimum." This was as it should have been since, as in 1925, there was little April-July precipitation after the snow storm of April 1-4.

For the Carson River only one pair of courses was measured viz., at Blue Lakes, just over the divide on the Middletown watershed. Because of extensive diversions in the Carson Valley a low year is naturally extra low in run-off at Clifton, and in the 1926 forecast apparently too much was allowed for this factor. Probably the heavy rains of March 24-28 wet the ground so thoroughly that less was diverted than usual in April and May, leaving a larger proportion than expected to pass down into Clifton. Also the ground must have taken up considerable of the March 24-28 rain and given it to the river early in April.

The snow surveys in the Walker basins were made earlier than usual; March 15-19, at the request of the Walker River Irrigation District, and probably not enough additional was allowed in estimating the snow storage as of April 5, the date immediately following the heavy snowfall which was included in most of the surveys from Blue Lakes north.

The Humboldt forecasts at Palisade, while not close, were not bad in considering the number data available as a guide. This is the watershed in most need of extension of snow surveys and at best will be a difficult one to forecast because of heavy diversions and low altitude of large portions of the basin, leading to early melting of snows.

INCREASING USE OF SNOW SURVEYS

During the winter of 1925-26 letters addressed to Dr. Church came from Twin Falls Canal Company of Twin Falls, Idaho, and the State Engineer's Office of Oregon asking for detailed information concerning his system of snow surveys and the equipment and supplies needed for field operations. We answered as best we could, and actual snow surveys were started last spring by both organizations. The engineer's letter to Church for work for Oregon came for a conference in the summer, at which time he explained by maps that they have already begun on a large scale on the watersheds of several of the Oregon rivers.

The Division of Water Rights, California Department of Public Works, is now investigating snow surveys with a view to applying it to California water rights not already served. Questionnaires sent out to various power companies, irrigation districts and other organizations and individuals interested in the use of water coming from the mountain snow fields of California, brought favorable replies from a large proportion of those questioned, so it is to be hoped that in a result this work will within a few years be applied the full length of the Sierra Nevadas on both slopes.

SNOW SURVEY CONFERENCE

In line with a suggestion made by you last spring, a snow survey conference was held in Reno, December 14, 1925, attended by persons
representing irrigation, power development, water distribution and agriculture as well as snow surveys and stream run-off forecasting. A representative of the California Division of Water Rights was present.

The results of snow surveying and forecasting were discussed, and also programs for extending the work and methods of running.

For several years the State of California cooperated in the work, but for at least the last five years has not rendered actual financial aid except to permit Nevada to use equipment which had been paid for by California.

Except for the aid of various other interests the work would have been much less effective than it has been.

The Pacific Gas and Electric Company has for years furnished the help of its employees in making the surveys near Summit and at numerous other points in the South Yuba Basin, and has gladly cooperated in other ways.

The Sierra Pacific Power Company, formerly the Truckee River Power Company, has regularly furnished its employees for snow surveys, and in addition has for several biennia contributed cash to supply the deficiencies of the last year of the biennium, so that the most important snow courses might be surveyed.

The Elko-Lasalle Power Company has furnished employees and transportation to aid in the Lamone Canyon snow surveys, and the use of a cabin to permit of a two days’ trip to cover a high level snow course at the 8,000 feet altitude.

In recent years the Truckee-Carson Irrigation District and the Walker River Irrigation District have also helped out financially.

The latter contributed the labor cost for the construction of a cabin at the foot of Buckeye Creek, a tributary of the East Walker River, to afford shelter for snow surveys close to the important Carson Mountain snow survey course which is at altitude of 9,200 feet, and one of the most difficult of access in the eastern Sierra region.

As a concrete example, the financial contribution of the Sierra Pacific Power Company for the 1927-1928 biennium was as follows:

- Salaries of employees while engaged in snow survey work, 1927... $180.00
- Salaries of employees while engaged in snow survey work, 1928... $180.00
- Salaries of employees while constructing DEL. Route Center Pass cabin, 1927... $1.00
- Salaries of employees while constructing DEL. Route Center Pass cabin, 1928... $1.00
- Cash for use of cabin in 1928, April 1st... $150.00
- Total for biennium... $402.00

Throughout the whole period of development of the Church system of snow surveys many students of the University of Nevada and young men of Reno have taken part in the work for small pay, and frequently no pay at all when the funds were short. Their enthusiasm prompted largely by love of outdoor life and adventure has contributed greatly to the success of the enterprise, but let no one think it is all profit. It is hard work at any time, and especially so when storms are encountered entailing exhaustion and real danger. It is worth much higher wages than most of the men engaged in it receive.

The following is a summary statement of the receipts and expendi-
to any prior existing right for the same purpose. Quite obviously the limited funds at the disposal of the State Engineer precluded the possibility of actually making examinations on the ground, hence the "otherwise" method was considered, which resulted, as a temporary expedient, in formulating the policy of calling upon the stockmen throughout the State to voluntarily submit to the office maps showing the boundaries of the ranges claimed by them. The response to this request was prompt and widespread with the result that a State range map was prepared showing the range claimed by the various stockmen. With this map as a working basis it was then possible to sequence any given range claimant with the facts that an application for stock watering purposes had been made for water within the boundaries of his range, thus giving the prior existing stock range users opportunity to come forward and formally protest the granting of a permit to any applicant whose proposed use would conflict with the given range claimants prior existing rights. Thus if protests develop after such personal notification or as a result of general newspaper publication of notice of application, it is reasonably safe to assume that approval of the application will not conflict with any existing rights. Conversely, if protests against the approval of an application develop, an official hearing must be held and evidence taken upon which to base administrative actions.

This method of determining whether approval of an application will conflict with existing rights is, however, as above stated, a temporary expedient only, and while the State range map has and will continue to be invaluable in indicating the possibility of existing rights in a given locality, it is not conclusive by any means. In the first place, since submission of individual range maps is voluntary on the part of range claimants, there can be no way of determining its completeness in showing all the stock ranges claimed throughout the State. In the second place, it must be borne in mind that there is a natural tendency on the part of all range claimants to expand their boundaries beyond the legitimate. Then again, many stockmen have not recently established and having in truth little on which to base legitimate claims, are the first to submit their range maps.

There is no doubt that eventually the State range map will be an invaluable source of authentic range and stock watering information, but only as a result of evolution based upon gradual ironing out of range conflicts by determination of valid existing rights by the process of adjudication under the water law or water litigation between individuals.

While recognizing the present and potential value of the State range map in its relation to the administration of the stock watering Act, it is believed that best administrative policy must embrace actual investigation on the ground of every stock watering application. During the present biennium this has been impossible due to lack of funds. In order to gain a concrete conception of the magnitude of the task it must be borne in mind that at present there are many stock watering applications, filed prior to the present biennium, upon which investigation and action was withheld pending the decision on the constitutionality of the stock watering Act. In addition to this accumulation

by the committee in charge of snow surveys for the biennium of 1927-1928 in the absence of Dr. Church:

Expenditures
Apportionment by State of Senate: $1,500.00
From Herm Island Water Company: $25.00
From California Irrigation District: $15.00
From Walker River Irrigation District: $10.00
$1,640.00

Disbursements
From the above appropriation handled through the State Engineer's office: $1,580.00
From special fund: $60.00
Balance from State fund: $100
Balance on hand from special fund: $90
Disbursements and balance to date: $1,600.00

The above expenditures do not include the cost of the snow survey made in Lamont Creek Canyon in the Humboldt watershed. This survey, at your request, was made earlier than usual, and as the Elko-Lamont Power Company was unable to take care of it at that time, two men were sent from Reno to make the survey, the expense being cared for from your department funds other than the snow survey appropriation.

DEFICIENCIES AND NEEDS

The work was considerably curtailed during the biennium because of shortage of funds. Several important courses were not surveyed at all in 1927, and more were omitted in 1928. A number of key courses should be surveyed at the first of every month from January 1 to May 1. This progress surveying was only partially carried out in 1927, and in 1928 only one winter survey was made, in February, at two locations other than the Eureka South Yuba region, where the P. O. & E. generously makes surveys whenever requested.

The money on hand January 1, 1929, should be used for rental and repairs of equipment as the parties will not be handicapped for this season's work.

I refer you to Dr. Church's report for the biennium 1925-1926 for a statement of the need of extension in the Humboldt basin, and the importance of such extension becomes more evident as prospective development along the river approaches completion.

Culverts are needed at two or three locations for night shelter and storage of food where the present conditions involve too long and hazardous trips, especially in stormy weather.

An estimate was presented at the December 14 conference which totaled approximately $4,500 for the next biennium, not including new cabins for the Humboldt basin.

RECOMMENDATION

It was decided at the conference that the Legislature should be respectfully requested to appropriate funds for the next biennium, to be handled through the State Engineer's office as heretofore. The committee will attempt to secure the balance needed from other sources.
CHAPTER X—COOPERATIVE WORK

U. S. GEOLOGICAL SURVEY, WATER RESOURCES BRANCH

During the limnium stream measurements work has been continued by the United States Geological Survey under a cooperative agreement with the State Engineers. Elsewhere in this report will be found a detail account of this work by Mr. A. B. Parrott, District Engineer, U. S. G. S.

It is the Federal policy to cooperate with State and other non-Federal governmental agencies on a dollar-for-dollar basis in water resources investigations, consequently the value and magnitude of securing benefits to the State are directly proportional to the amount of money appropriated by the State.

The rapidly increasing use of water in Nevada has created an urgent need for more complete and extensive hydrographic data, without which it is difficult to properly adjudicate water rights or to distribute water successfully after rights have been adjudicated.

Nevada is one of the few States in the arid and semiarid west whose water resources have not been fully determined and the flow of whose streams has not been extensively investigated and recorded.

The value of this work in cooperation with the Government cannot be overestimated.

COOPERATIVE SNOW SURVEYS

Snow survey work has been carried on under State direction and support in cooperation with the State of California and various water interests. The Nevada system, conceived and evolved by Dr. J. E. Church, Director, has been so successful in forecasting, far in advance, water supply for irrigation and power purposes that it has been widely adopted, not only in this but in foreign countries.

The value of water and its application in Nevada is such as to justify the permanent adoption and continuance of snow surveys under liberal financial support from the State.

This Act, in recognition of the fact that the value of the right to water range live stock is directly dependent on the availability to the owner of such right of the grazing use of the public range in the vicinity of his watering place, and also that the existence in separate owners of two or more rights for water range live stock in the same county, tends to produce controversies concerning the use of the public range that often results in breaches of the peace, provides, in brief, as follows:

1. That the use of water for water range live stock is of a beneficial use and the right to its use for such purpose may be acquired in the same manner as the right to use water for any other household purpose.

2. That wherever a valid stock watering right exists at a particular place, to water live stock in sufficient numbers to substantially utilize all the public range readily accessible to the given watering place, no appropriation of water from either the same or a different source shall subsequently be made by another for the same purpose, if the granting of such subsequent appropriation would conflict with the range use of the first or existing water right owner.

3. That the State Engineer must deny any permit under such a subsequent application to appropriate water if he finds the right applied for will conflict or interfere with the grazing use of the public range adjacent to the source on which the prior right exists.

4. That it is a misdemeanor to water live stock on two or more separate days during any season at a source on which another has a valid stock watering right.

5. That nothing in the Act is to be construed to affect the validity of stock watering rights acquired under previous State laws or to impair existing vested rights.

The term "public range" as defined in this Act means all lands belonging to the United States or the State of Nevada, on which stock is permitted to graze, and includes all natural forest lands.

The constitutionality of the Act, almost at once attacked, was finally upheld by the Nevada Supreme Court in the Calvo Case. No. 2741, on February 21, 1927, just a few days prior to the present State Engineer's advent into office. Prior to this last little attempt had been made by the office of the State Engineer to adjudicate the provisions of the Act, awaiting the outcome of the pending attack on its constitutionality.

Following the decision upholding the Act, applications for stock watering purposes were received in great numbers. Consequently, before any positive action could be taken on these applications, the State Engineer was forced to make a thorough study of the whole stock watering and range problem in order to intelligently formulate departmental policies governing the administration of the new Act. As stated in the foregoing, the Act makes it mandatory upon the State Engineer, before approving any application for stock watering purposes, to determine, by investigation on the ground or otherwise, that the right and use applied for will not be injurious or detrimental
CHAPTER X—ADMINISTRATIVE POLICIES

STOCK WATERING ACT OF 1925

Perhaps first in importance under this head is the policy of the State Engineer concerning the administration of the stock watering Act of April 1, 1925. For the purpose of clearly understanding the present policy it is necessary to give a brief sketch of the stock watering and range problem which has been solved or attempted to be solved by the stock watering Act of 1925.

As near as can be determined only one-sixth of one percent of the area of the State of Nevada possessing any economic value, is fenced and unsecured independent of the livestock industry. It is apparent, therefore, that the proper development of the livestock industry is of great importance in the economic advancement of the State as a whole.

In early days of sparse population the settler experienced little difficulty in matters of range control since there was more than enough range for all. But, however, with the advent of new settlers to the State in ever-increasing numbers, the old condition of abundant range gradually gave way to a new order. Encroachment on existing established ranges resulted in their confinement and contraction to a point where they were no longer sufficient to maintain the herds which had formerly flourished and increased from year to year. In addition, the steady increase in the number of sheep, which possess range habits of variance with cattle, caused further complications in existing range conditions. The result was a gradual transition from a condition of peaceful possession of sufficient range to one of range chaos and strife sometimes resulting in so-called range wars.

In belated recognition of this condition the Federal Government attempted to regulate, in some measure, the right to the use of the public range domain by the passage of successive homestead and desert entry Acts. These, however, availed little in coping with crowded range conditions, since the maximum area which could be acquired under these Acts was insufficient for livestock range purposes. As long as they affected a means of preserving and developing an adjacent to the outside range, where perhaps some with her could be raised to carry stock through the winter season.

The subsequent setting aside by the Government of approximately 5,900,000 acres as Forest reserves with reputed grazing privileges relieved the strained range conditions to an extent only.

Throughout this period of strife and range congestion there was growing in the minds of Nevada stockmen the conviction that the future of the livestock industry could best be secured by some form of legislation for regulation and administration of the range lands by the State Engineer. Since, however, most of the livestock range belonged to the public domain it was therefore not subject to direct control by the State, hence it seemed a hopeless problem to devise means of controlling and regulating this vast area.

A solution was finally evolved whereby range control could be indirectly accomplished, in a measure at least, through administration of water resources, over which the State exercised unimpeded control. Thus the stock watering Act of Nevada became a law on April 1, 1925.

CHAPTER XI—OPINIONS OF ATTORNEY-GENERAL

Following are several of the most important opinions of the Attorney-General given in response to definite requests of the State Engineer. For the sake of brevity, the opinions have been condensed into the shortest statements possible:

MEMORANDUM

The facts necessary to establish a vested right must be the same whether such vested right is asserted under the Statutes of 1893, chapter 201, being "An Act relating to the use of water for watering live stock," or whether such right is asserted for the appropriation and diversion of waters of a stream system (Opinion No. 259, June 26, 1927).

State Lands in Irrigation Districts

The inquiry was for the following facts:

A legal applicant made application for forty acres of State land, not under contract to purchase, lying within the Walker River Irrigation District. The Surveyor-General's office requested the State Engineer to furnish them with a certificate under section 45 of the Nevada Irrigation District Act. The State Engineer refused to supply such certificate on the ground that he has no jurisdiction. The questions under this State of facts were:

1. Whether or not section 45 of the Nevada Irrigation District Act, State, 1919, chap. 61, p. 84, as amended Stats. 1921, chap. 75, p. 133, is applicable to State lands not under contract to purchase, lying within the boundaries of a duly organized irrigation district. Section 45 of the Nevada Irrigation District Act, State, 1919, chap. 61, p. 84, as amended Stats. 1921, chap. 75, p. 133, is applicable to State lands not under contract to purchase, lying within the boundaries of a duly organized irrigation district. The Surveyor-General reject all applications for such State lands.

2. If the State Engineer fails to furnish the certificate to the effect that such lands will be benefited by being included within such district, must the Surveyor-General reject all applications for such State lands?

Opinion

Section 45, above cited, reads in part as follows:

"State lands, not under contract to purchase, shall not become a part of an irrigation district except by the consent of the State Land Commissioner, who is hereby authorized and required to consent thereto on behalf of the State upon his being filed in this office a certificate signed by the State Engineer stating that such lands will be benefited by inclusion therein. By district, assessments, charges, and tolls against the lands, and any sale or contract to sell any such lands thereafter shall be conditioned upon the payment, by the purchaser or contractor, of all such required charges in addition to the purchase price of the land."

This statute presupposes a determination at the time of the formation of the irrigation district by the State Engineer as to whether or not State lands not under contract to purchase would be benefited by inclusion therein. Under the statute State land not under contract to purchase cannot become a part of an irrigation district except by the filing of the required certificate in the office of the Surveyor-General by the State Engineer and the consent by the Surveyor-General.
It is evident, therefore, that the land mentioned in the inquiry never became a part of the Walker River Irrigation District.

The statute quoted does not require the Surveyor-General to reject applications for such lands. Inasmuch as the lands in question did not become a part of the irrigation district, they would, therefore, be treated the same as any other State lands not a part of an irrigation district. (Opinion No. 294, October 8, 1922.)

Honolulu River Adjudication—Administration of Order of Determination Relative to Stock Watering and Storage.

Since the order does not specifically allocate definite amounts of water for stock watering purposes and exceptions raising this question are now before the Court for determination, and no bond having been executed or filed by the several claimants to permit of distribution of stock water in accordance with their exceptions, the provisions of the Order of Determination are controlling.

The State Engineer has no discretion in administering water under the Order of Determination except in instances where that discretion is reserved to him.

It is not the duty of the Court to instruct in matters within the jurisdiction of the State Engineer. In event of controversy between him and a water claimant respecting rights under the order, either party has the right to apply to Court so that matters may be finally determined. The Court is not to be interviewed as to his personal views but acts only when a matter is formally presented in course of litigation. (Opinion No. 285, Nov. 9, 1925.)

Action on Applications for Stock Watering Purposes, Filed Prior to Stock Watering Act of 1919.

If an application to appropriate water for stock watering purposes had been filed prior to the 1923 Act and no action taken thereunder until subsequent to the passage of the Act, the provisions of the Act would prevail. (Opinion No. 286, November 15, 1925.)

Regulation of Water between Permit Holders.

In the case of persons using water by virtue of application and permission to appropriate water granted by the State Engineer, it is not the duty of the State Engineer to attempt to make any regulations as between permit holders.

The State Engineer merely gives an appropriator the right to use water. If other parties interfere with that use under the permit, the permit holder must as in court and there is no authority vested in the State engineer to issue the amount of water granted in the permit.

However, the State Engineer does have authority to regulate as between permit holders and other appropriators on streams that have been adjudicated under the provisions of sections 18-30 of the water law. (Attorney-General regarding, April 10, 1928, with former Attorney-General's opinion No. 44, June 2, 1917.)

Actual Diversion of Water, a Regulate for Appropriation.

To constitute an appropriation of water of a stream, there must be an actual diversion and an application to beneficial use.
It is essential that the party asserting the right establish the intent to appropriate by some open, physical diversion, appropriating the water claimed to his control and use to the exclusion of others.

Difference in beneficial use in no manner affects the essentials necessary to constitute an appropriation. (Opinion No. 294, April 13, 1925.)

Adjudication of Isolated Springs and Water Holes Not Tributary to any Stream System.

If the springs in question are formed from percolating water, the general water code respecting adjudications does not apply; if, however, it appears that the waters of the springs come from a natural water course, subdivision in character, the general adjudication law applies. (Opinion No. 315, April 13, 1926.)

Certificate of Water Right, Renewal or Cancellation of.

Where a water right certificate has been issued by the State Engineer he has no power to recall or cancel the same. (Opinion of May 10, 1925.)


If an application to appropriate water for stock watering purposes had been filed prior to the 1919 Act and no action taken thereunder until subsequent to the passage of the Act, the provisions of the Act would prevail. (Opinion No. 286, November 15, 1925.)

Regulation of Water Between Permit Holders.

In the case of persons using water by virtue of application and permission to appropriate water granted by the State Engineer, it is not the duty of the State Engineer to attempt to make any regulations as between permit holders. The State Engineer merely gives an appropriator the right to use water. If other parties interfere with him under the permit, the permit holder may go into court and there is no authority vested in the State engineer to issue the amount of water granted in the permit.

However, the State Engineer does have authority to regulate as between permit holders and other appropriators on streams that have been adjudicated under the provisions of sections 18-39 of the water law. (Attorney General's opinion No. 44, June 2, 1917.)

Actual Diversion of Water a Prerequisite to Appropriation.

To constitute an appropriation of water of a stream system there must be an actual diversion and an application to beneficial use.
CHAPTER XII—ADMINISTRATIVE POLICIES

STOCK WATERING ACT OF 1920

Perhaps first in importance under this head is the policy of the State Engineer concerning the administration of the stock watering Act of April 1, 1920. For the purpose of clearly understanding the present policy it is necessary to give a brief sketch of the stock watering and range problem which has been solved or attempted to be solved by the stock watering Act of 1925.

As near as may be determined only one-sixth of one percent of the area of the State of Nevada, possessing any economic value, is fenced and marked independent of the livestock industry. It is apparent, therefore, that the proper development of the livestock industry is of great importance in the economic advancement of the State as a whole.

In early days of sparse population the cattleman experienced little difficulty in matters of range control since there was more than enough range for all. Soon, however, with the advent of new settlers in the State in ever-increasing numbers, the old condition of abundant range gradually gave way to a new order. Encroachment on existing established ranges resulted in their impairment and reduction to a point where they were no longer sufficient to maintain the herds which had formerly flourished and increased from year to year. In addition, the steady increase in the number of sheep, which possesses range lands of winter and summer, caused further complications in existing range conditions. The result was a gradual transition from a condition of peaceful possession of sufficient range to one of range chaos and strife sometimes resulting in so-called range wars.

In belated recognition of this condition the Federal Government attempted to regulate, in some measure, the right to the use of the public range domain by the passage of successive Homestead and Desert Entry Acts. These, however, evaded little in coping with crowded range conditions, since the maximum area which could be acquired under these Acts was insufficient for livestock range purposes. At best they only afforded a means of procuring and developing an adjunct to the outside range, where perhaps some with it, could be raised to carry stock through the winter season.

The subsequent setting aside by the Government of approximately 5,500,000 acres as Forest reserves with reserved grazing privileges relieved the strained range conditions to some extent only.

Throughout this period of strife and range erosion there was growing in the minds of Nevada stockmen the conviction that the future of the livestock industry could best be secured by some form of legislation for regulation and administration of the range lands by State control. Since, however, most of these lands belonged to the public domain it was therefore not subject to direct control by the State, hence it seemed a hopeless problem to devise means of controlling and regulating this vast area.

A solution was finally evolved whereby range control could be indirectly accomplished, in a measure at least, through administration of water resources, over which the State exercised unquestioned control. Thus the stock watering Act of Nevada became a law on April 1, 1925.

CHAPTER XI—OPINIONS OF ATTORNEY-GENERAL

Following are several of the most important opinions of the Attorney-General given in response to definite requests of the State Engineer. For the sake of brevity, the opinions have been condensed into the shortest statements possible:

Vegetation, Facts Necessary to Establish Under Stock-Watering Act of 1920

The facts necessary to establish a vested right must be the same whether such vested right is asserted under the Statutes of 1925, chapter 201, being "An Act relating to the use of water for watering livestock," or whether such right is asserted for the appropriation and diversion of waters of a stream system (Opinion No. 200, June 26, 1927).

State Lands in Irrigation Districts

The inquiry was for the following facts:

A legal applicant made application for forty acres of State land, not under contract to purchase, lying within the Walker River Irrigation District. The Surveyor-General's office requested the State Engineer to furnish them with a certificate under section 45 of the Nevada Irrigation District Act. The State Engineer refused to supply such certificate on the ground that he has no jurisdiction. The questions under this state of facts are:

1. Whether or not section 45 of the Nevada Irrigation District Act, State 1919, chap. 61, p. 84, as amended Stats. 1921, chap. 74, p. 133, is applicable to State lands not under contract to purchase, lying within the boundaries of a duly organized irrigation district?

2. If the State Engineer fails to give the certificate to the effect that such lands will be benefited by being included within such district, must the Surveyor-General reject all applications for such State lands?

Opinion

Section 45, above cited, reads in part as follows:

"State lands, not under contract to purchase, shall not become a part of an irrigation district except by the consent of the State Land Register, who is hereby authorized and required to consent thereon at his own discretion, and consent thereto shall be evidenced by the prior and continuous use of such lands for irrigating purposes, and the Surveyor-General shall receive and record the act of the State Engineer in accordance with this section before any additional or further work shall be commenced or located upon the site of such irrigation district, or any such lands thereon whensoever such lands shall be sold or conveyed to a private purchaser, or to any nonprofit corporation, association, or political subdivision of the State for the purpose of such irrigation district, and the Surveyor-General shall issue under his hand and seal a certificate of such facts, which certificate shall be prima facie evidence of the facts as stated therein; and the Surveyor-General shall record such certificate or certificates in the office of the Surveyor-General in the county in which such lands are situated and shall receive a like certificate for each such lands purchased for such district."

The statute presupposes a determination at the time of the formation of the irrigation district by the State Engineer as to whether or not State lands not under contract to purchase would be benefited by inclusion therein. Under the statute, State land not under contract to purchase cannot become a part of an irrigation district except by the filing of the required certificate in the office of the Surveyor-General by the State Engineer and the consent by the Surveyor-General.
CHAPTER X—COOPERATIVE WORK

U. S. GEOLOGICAL SURVEY, WATER RESOURCES BRANCH

During the binomial stream measurement work has been continued by the United States Geological Survey under a cooperative agreement with the State Engineer. Elsewhere in this report will be found a detailed account of this work by Mr. A. B. Parton, District Engineer, U. S. G. S.

It is the Federal policy to cooperate with State and other non-Federal governmental agencies on a dollar-for-dollar basis in water resources investigations, consequently the value and magnitude of securing benefits to the State are directly proportional to the amount of money appropriated by the State.

The rapidly increasing use of water in Nevada has created an urgent need for more complete and extensive hydrographic data, without which it is difficult to properly adjudicate water rights or to distribute water successfully after rights have been adjudicated.

Nevada is one of the few States in the arid and semiarid west whose water resources have not been fully determined and the flow of whose streams has not been extensively investigated and recorded.

The value of this work in cooperation with the Government cannot be overestimated.

COOPERATIVE SNOW SURVEYS

Snow survey work has been carried on under State direction and support in cooperation with the State of California and various water interests. The Nevada system, conceived and evolved by Dr. J. K. Church, Director, has been so successful in forecasting, far in advance, water supply for irrigation and power purposes that it has been widely adopted, not only in this but in foreign countries.

The value of water and its application in Nevada is such as to justify the permanent adoption and continuance of snow surveys under liberal financial support from the State.

This Act, in recognition of the fact that the value of the right to water range live stock is directly dependent on the availability to the owner of such right of the grazing use of the public range in the vicinity of his watering place, and also that the existence in separate owners of two or more rights for watering range live stock in the same county, tends to produce controversies concerning the use of the public range that often results in breaches of the peace, provides, in brief, as follows:

1. That the use of water for watering live stock is a beneficial use and the right to its use for such purpose may be acquired in the manner as the right to use water for any other beneficial purpose.

Note: This provision was nothing new, since stock watering rights that had been recognized and granted under the then and now existing water code in the same manner as rights to the use of water for irrigation, mining, power, or any other beneficial purpose.

2. That whenever a valid stock watering right exists at a particular place, to water live stock in sufficient numbers to substantially utilize all the public range readily accessible to the given watering place, no appropriation of water from either the same or a different source shall subsequently be made by another for the same purpose, if the granting of such subsequent appropriation would conflict with the range use of the first or existing water right owner.

3. That the State Engineer must deny any permit under such a subsequent application to appropriate water if he finds the right applied for will conflict or interfere with the grazing use of the public range adjacent to the source on which the prior right exists.

4. That it is a misdemeanor to water live stock on two or more separate days during any season at a source on which another has a valid stock watering right.

That nothing in this Act is to be construed to affect the validity of stock watering rights acquired under previous State laws or to impair existing vested rights.

The term "public range" as defined in this Act means all lands belonging to the United States or the State of Nevada, on which stock is permitted to graze, and includes all national forest lands.

The constitutionality of the Act, almost at once attacked, was finally upheld by the Nevada Supreme Court in the Calvo Case, No. 2747, on February 21, 1925, just a few days prior to the present State Engineer's advent into office. Prior to this but little attempt had been made by the office of the State Engineer to safeguard the provisions of the Act, awaiting the outcome of the pending attack on its constitutionality.

Following the decision upholding the Act, applications for stock watering purposes were received in great numbers. Consequently, before any positive action could be taken on these applications, the State Engineer was forced to make a thorough study of the whole stock watering and range problem in order to intelligently formulate departmental policies governing the administration of the new Act. As stated in the foregoing, the Act makes it mandatory upon the State Engineer, before approving any application for stock watering purposes, to determine, by investigation on the ground or otherwise, that the right and use applied for will not be injurious or detrimental
to any prior existing right for the same purpose. Quite obviously the limited funds at the disposal of the State Engineer precluded the possibility of actually making examinations on the ground, hence the "otherwise" method was considered, which resulted, as a temporary expedient, in formulating the policy of ruling upon the stockmen throughout the State to voluntarily submit to the office maps showing the boundaries of the ranges claimed by them. The response to this request was prompt and widespread with the result that a State range map was prepared showing the range claimed by the various stockmen. With this map as a working basis it was then possible to segment any given range claimant with the fact that an application for stock watering purposes had been made for water within the boundaries of his range, thus giving the prior existing stock range users opportunity to come forward and formally protest the granting of a permit to any applicant whose proposed use would conflict with the given range claimants prior existing rights. Thus if no protests develop after such personal notification or as a result of general newspaper publication of notice of application, it is reasonably safe to assume that approval of the application will not conflict with any existing rights. Conversely, if protests against the approval of an application develop, an official hearing must be held and evidence taken upon which to base administrative action.

This method of determining whether approval of an application will conflict with existing rights is, however, as above stated, a temporary expedient only, and while the State range map has and will continue to be valuable in indicating the possibility of existing rights in a given locality, it is not conclusive by any means. In the first place, since submission of individual range maps is voluntary on the part of range claimants, there can be no way of determining its completeness in showing all the stock ranges claimed throughout the State. In the second place, it must be borne in mind that there is a natural tendency on the part of all range claimants to expand their boundaries beyond the legitimate. Then again, many stockmen have recently established and having in truth little on which to base legitimate claims, are the first to submit their range maps.

There is no doubt that eventually the State range map will be an invaluable source of authentic range and stock watering information, but only as a result of evolution based upon gradual ironing out of range conflicts by determination of valid existing rights by the process of adjudication under the water law or water litigation between individuals.

While recognizing the present and potential value of the State range map in its relation to the administration of the stock watering Act, it is believed that best administrative policy must exercise caution in the processing of applications under the water law or water litigation between individuals.

In order to gain a concrete conception of the magnitude of the task it must be borne in mind that at present there are many stock watering applications, filed prior to the present legislation, upon which investigation and action was withheld pending the decision on the constitutionality of the stock watering Act. In addition to this accumulation

The above expenditures do not include the cost of the snow survey made in the lower Madison basin in the Humboldt watershed. This survey, at your request, was made earlier than usual, and as the Elko-Lakeview Power Company was unable to take care of it at that time, two men were sent from here to make the survey, the expense being cared for from our department funds other than the snow survey appropriation.

DEFICIENCIES AND NEEDS

The work was considerably curtailed during the biennium because of shortage of funds. Several important courses were not surveyed at all in 1927, and more were omitted in 1928. A number of key courses should be surveyed at the first of each year from January 1 to May 1. This progress surveying was only partially carried out in 1927, and in 1928 only one winter survey was made. In February, at a two biennium other than the Humboldt basin, where the P. O. & E. power makes surveys whenever requested.

The survey on hand January 1, 1929, should be used for renewal and repairs of equipment so the parties will not be handicapped for this season's work.

I refer you to Dr. Church's report for the biennium 1925-1926 for a statement of the need of extension in the Humboldt basin, and the importance of such extension becomes more evident as more positive development along the river approaches realization.

Culverts are needed at two or three locations for night shelter and storage of food where the present conditions involve too long and hazardous trips, especially in stormy weather.

An estimate was presented at the December 14 conference which totaled approximately $4,500 for the next biennium, not including new calls for the Humboldt basin.

RECOMMENDATION

It was decided at the conference that the Legislature should be respectfully asked to appropriate funds for the next biennium, to be handled through the State Engineer's office as for duty. The committee will attempt to secure the balance needed from other sources.
there have been approximately 500 such applications filed during the biennium. It has been impossible to keep abreast with these, let alone acting on the accumulation of old applications.

The stock watering Act is to result in the expected benefit to Nevada stockmen it must be made financially possible for the office of the State Engineer to function fully and efficiently. If funds are made available it is planned to increase the present limited organization by the addition of at least two competent field men who will devote their entire time to making extensive investigations in the field. In addition an extra office man will be required to handle the necessarily increased office work. With the organization thus temporarily increased it is believed that a cleanup can be made of all stock watering applications and that thereafter a normal organization can keep up with current applications.

To those not fully informed upon the stock watering Act in relation to the stock and range problems of the State it is pointed out that already it is bearing fruit. The Act was designed, among other things, to normalize the values in land settlement where such land settlement values are at the mercy of the values in the public range companion to the land settlement. Already the tendency toward recognition of the fact that stock ranges have a definite, basic value separate and distinct from the value in connection agricultural range settlement is felt. Recently, and perhaps for the first time in Nevada, a bank liquidated a stock raising property in the northeastern portion of the State under conditions where, in the past, practically all the money involved was paid by the buyer for the rights to the stock water controlling the public range companion to the ranch property of the liquidated outfit.

It is the policy of the State Engineer to no administer the stock watering Act that its value to the stock industry will be a maximum. This, however, cannot be accomplished without adequate legislative appropriation.

ACTION ON WATER APPLICATIONS

In considering all applications to appropriate water, whether for stock watering or any other purpose, it is the policy of the office to render prompt and positive action, believing that unreasonable delay, even if the application is to be denied, works a hardship on the applicant who honestly is reluctant to proceed with development of an otherwise plan for the future until he knows the outcome of his application. Here again, although this has been the policy, it has been difficult of accomplishment during the past biennium due to lack of sufficient office and field force.

POLICING POWER OF STATE ENGINEER

It is the policy of the State Engineer not to resort to bluff nor attempt to usurp judicial powers in administering water rights. Frequent demands are made by water users to personally cut down head gates or pools the distribution and flow of water in arroyos wells, for example, where there has been no determination of relative rights.

The Attorney General has given it as his opinion that the State Engineer has no authority to regulate or distribute water as between irriga-
on a water source, either surface or underground, until the relative rights of all claimants have been determined.

In brief it is the office policy, therefore, to keep well within the bounds of powers legally conferred.

CONTROL OF UNAPPROPRIATED WATER

The policy of our State administration in the matter of the "Control of Unappropriated Water" has been outlined definitely since assuming control of the State Engineer's office March 29, 1927.

The State's interest in this matter is the highest ultimate beneficial use of the limited water supply within her borders, so that the greatest possible amount of usable wealth may be garnered; this objective, we believe, can better be brought about by requiring any agency, whether private or public, to conform to the State laws in the appropriation and use of water.

This policy does not in any manner impair the right that any agency may have at this time, either public or private, who may be making "beneficial use" of water, or hampering in any manner future development where appropriations may be made in the regular manner.

The following statement by Sardis Sumnerfield, in a paper on "Relation of the Federal Government to the States in reference to the control of water within the State," presented to the Western Association of State Engineers, October 29, 1928, in Salt Lake City, Utah, outlines the trend of western "legal minds" on this important subject, and is concurred in by all of our representatives in Congress.

The first question of Federal or State ownership and control of unappropriated navigable waters within State borders is an undecided one in the highest Federal Courts, but by State Supreme Court decisions, State constitutional provisions ratified and approved by Congress, and the effect of a succession of recognition by Federal courts as persuasively held judicial minds to the conclusion that the States are vested with the control of the unappropriated navigable waters within their respective borders.

This statement is supported by, and actively supported by, Delph Carpenter, Interstate River Commissioner, Bremerton, Washington; W. W. Babbitt, Denver, Colorado; Francis Wilson, Interstate River Commissioner, Santa Fe, New Mexico, and William Hay, of Salt Lake City, Utah, all of whom are at the top of the legal profession west of the Rocky Mountains.
repaired at a cost of $10 per day, and a complete transcript of testimony prepared.

It is conservatively estimated that $4,000 will be required for this purpose. If the adjudication is to proceed to successful completion it will be necessary that this amount be appropriated, the State to be reimbursed when the Court enters its final decree and assesses the costs among the parties represented in the action.

NOTE SURVEY

The cooperative State survey work carried on under State direction and support in cooperation with other agencies is of such importance to the State's agricultural and power interests as to justify continued and increased support. It is therefore recommended that the sum of $2,500 be appropriated for carrying on this excellent work during the next biennium.

COOPERATIVE STREAM MEASUREMENT

This work is carried on by the United States Geological Survey cooperating financially with the State on a dollar for dollar basis. There is need to dwell upon the value of a knowledge of our natural water resources as afforded by extensive stream flow and hydrographic records. Without such records ultimate maximum development of water resources becomes impossible and determination of water rights and distribution of water in our stream systems very difficult. When it is considered that the Federal Government cooperates in this valuable work on a dollar for dollar basis, it is poor economy to fail to appropriates for this purpose.

It is respectfully recommended that at least $5,000 be appropriated for this purpose.

FIREPROOF VAULT SPACE FOR RECORDS OF STATE ENGINEER

Former dumps reports have repeatedly called attention to the advisability of providing fireproof housing for records which at this time are valued at in excess of $50,000. If they can be valued at all. As a matter of fact, these records can scarcely be given a monetary value since, if destroyed, none of them could ever be replaced. There has never been, nor is there any protection of any kind against loss by fire.

It is therefore most urgently recommended that $5,000 be appropriated for the purchase of adequate fireproof filing for properly housing the records of the State Engineer's office.

Respectfully submitted,

G. E. M. Malone
State Engineer.
CHAPTER XVI—RECOMMENDATIONS
WATER COMMISSIONERS SALARIES AND EXPENSES

The State Engineer is charged with the administration and distribution of water on adjudicated streams within the State. If efficient distribution is to be accomplished, skilled engineers must be employed and paid with reasonable compensation. The water law directs that the State Engineer pay a bountier for submission to the various boards of County Commissioners, setting forth the unit assessment on each acre of cultivated land embraced under distribution activities in each county. For assessed amounts are collected as are other taxes with the result that the money represented is not available in the various county treasuries until long after the services rendered by the water commissioners are completed.

In an attempt to remedy this vexing condition the legislature in 1917 amended the statutes to make it lawful for counties to advance money for the payment of water commissioners' salaries and expenses when such advances are reimbursable from the proceeds of any tax levied for such purpose. (See sec. 4, chapter 126, Statutes of 1921.) This attempt to remedial measure has not been successful due to the refusal of several counties to make such lawful advances on account of alleged depleted treasury funds or reluctance to cooperate fully in furthering efficient water distribution.

It is therefore recommended that adequate amendment to the water law be enacted for the purpose of providing some means of assessing and collecting distribution funds in advance of the period during which they will be expended.

ADMINISTRATION OF STOCK WATERRING ACT OF 1905

It behooves in this report the difficulties of efficiently administering the stock watering Act of 1905 have been discussed in detail, stressing the fact that such administration is impossible without the availability of adequate funds for this purpose. It is therefore recommended that the sum of $24,203 in addition to the amount required to carry on regular routine activities be allowed for the purpose of clearing up the accumulated cases of applications upon which it has been impossible, during the past biennium, to make field investigations required by law. This matter is of paramount importance to the livestock industry of the State, and would receive careful and considerable attention. The value of the stock watering Act to stockmen depends on its efficient and speedy administration which cannot be accomplished without adequate funds for this purpose.

CARSON RIVER JURISDICTION

The Final Order of Determination of the State Engineer in this matter has been filed with the First Judicial District Court at Carson City, and hearing on same set by the court for February 4, 1928. Since there are approximately 200 claimants embraced in this proceeding and it is estimated, each party will require at least one-half day for hearing before the Court, the total length of the proceeding will therefore be approximately 125 court days. The hearing will have to be
CHAPTER XIV—UPSTREAM STORAGE INVESTIGATION
TRUCKEE AND CARSON RIVERS

During the fall of the year 1927 a preliminary meeting was held between representatives of the Board of Directors of the Truckee-Carson Irrigation District and the Directors of the Truckee-Carson Watershed Association, where the matter of a federal appropriation for upstream storage investigation on the Truckee and Carson Rivers was discussed.

At a subsequent meeting, at which Nevada's congressional representatives were invited to be present, the plan was laid before them and results, after their return to Washington, in an appropriation of $50,000 for investigation of the upstream storage possibilities on the Truckee River; the Carson River not being considered.

Investigations were therefore commenced, under the supervision of the Bureau of Reclamation, during the summer of 1927, on the headwaters of the Truckee River. Satisfactory progress was not made, however, and as a consequence only a partial report was rendered into that year, proving of little practical benefit. Only about $25,000 of the $50,000 appropriated by Congress had been expended in this work.

Under the law any moneys remaining in the fund at the end of the fiscal year (June 30) revert to the General Fund, therefore it became necessary to reappropriate the money to finish the investigation.

The matter was discussed with the Bureau of Reclamation officials in Washington by the State Engineer in February, 1928, and in accordance with the decision reached at that time a resolution was introduced by Senator Taylor L. Oldfield in the United States Senate reappropriating the unexpended balance of the $50,000 originally appropriated to complete the Truckee River investigations and also to investigate storage possibilities on the Carson River.

The resolution, introduced, carried a provision that the work be done in connection with the State Engineer's office. This provision was, however, later eliminated, but through written instructions from D. H. Barden, Chief Engineer, Bureau of Reclamation, and J. F. Walter, Chief Engineer, Bureau of Reclamation, the field men consulted with the State Engineer's office frequently during the course of the investigation, and the State Engineer viewed personally, practically all of the reservoir sites investigated.

The report has been somewhat delayed due to the thorough manner in which the investigations have been conducted by A. W. Walker, Field Engineer for the Bureau of Reclamation. It is expected, however, that a complete report will be in the hands of the Bureau officials by February 15, 1929.

In this report a compilation is being made of all existing data from prior authentic investigations, either public or private, and an earnest attempt made to complete the investigations on both rivers, and it is believed that the resulting report should be of real value to all property owners on both rivers in the matter of future developments, either public or private.

There was some discussion over the advisability of sinking test wells in the Truckee meadows and running pumping tests to determine...
whether a further water supply could be developed in this manner. However, the Comptroller of the Treasury, ruled, after the direct question had been raised by the Bureau of Reclamation, that under the resolution as passed the money could not be expended for this work. Senator Oddle has now introduced an amendment that is designed to allow this work to be done, and it is assumed that it will be undertaken during the summer of 1929.

Since the Truckee-Carson Irrigation Project appropriates water from both the Truckee and Carson Rivers, any solution of the problem will of necessity affect both streams.

There is no doubt that the Truckee-Carson Irrigation District is entitled to sufficient flood waters from the two rivers, as of their 1909 permit, to irrigate the lands susceptible of irrigation within their project, the vested rights being determined in the regular way. There is no doubt, on the other hand, that there is excess flood water available from these two rivers than can be used for this purpose. Therefore, the amount needed should be determined as soon as practicable so that further development will not be unduly retarded.

The State is not interested in either "upstream" or "downstream" development as against the other, but it is concerned that the fullest beneficial use be ultimately made of all the water within its borders.
GENERAL STATEMENT FOR 1927-1928

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<th>Item</th>
<th>Amount</th>
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<td>Held for 1926</td>
<td>$7,042.18</td>
</tr>
<tr>
<td>Issued during the year</td>
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<td>Tel. for publication costs</td>
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CHAPTER XV—OFFICE FINANCES

SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT OF ILLUSTRATION DURING PERIOD JANUARY 1, 1926, TO DECEMBER 31, 1928, INCLUSIVE

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<th>Equipment</th>
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<td>850.60</td>
<td>1,859.80</td>
<td>929.73</td>
<td>784.49</td>
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<td>792.50</td>
<td>1,898.49</td>
<td>967.74</td>
<td>838.77</td>
<td>11,057.80</td>
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Grand totals  
$122,364.68
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**SCHEDULE OF STATEMENT OF FEE COLLECTED BY STATE ENGINEER FROM JANUARY 1, 1927, TO**

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<tr>
<th>Month</th>
<th>Total</th>
<th>Balance</th>
<th>Revenue</th>
<th>Expenditure</th>
<th>Balance</th>
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### Fees Received and Disposition Made of Same

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<th>Exchange</th>
<th>Balance due after exchange</th>
<th>Discount</th>
<th>Discounted balance</th>
<th>Discounted balance less commission</th>
<th>Commission after discount</th>
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<tr>
<td>January</td>
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<tr>
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<td>March</td>
<td>$600.00</td>
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<td>August</td>
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<td>November</td>
<td>$3,000.00</td>
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<td><strong>Total</strong></td>
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</tr>
</tbody>
</table>

### Dedicated Statement of Fees Collected by State Engineer from January 1, 1927, to December 31, 1928, Inclusive

<table>
<thead>
<tr>
<th>Month</th>
<th>Fees received</th>
<th>Proceedings</th>
<th>Applications and Fees</th>
<th>Proceeds</th>
<th>Proceeds after discounts</th>
<th>Proceeds after exchange</th>
<th>Exchange</th>
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<tbody>
<tr>
<td>Balance 1/27</td>
<td>$1,906.67</td>
<td></td>
<td>85.00</td>
<td>85.00</td>
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<tr>
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<td></td>
<td>100.00</td>
<td>55.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
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<td></td>
<td>125.00</td>
<td>75.00</td>
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<tr>
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<td></td>
<td>150.00</td>
<td>100.00</td>
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<td>175.00</td>
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<td></td>
</tr>
<tr>
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<td></td>
<td>200.00</td>
<td>150.00</td>
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<td></td>
</tr>
<tr>
<td>June</td>
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<td>225.00</td>
<td>175.00</td>
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<td></td>
<td>250.00</td>
<td>200.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>$5,500.00</td>
<td></td>
<td>275.00</td>
<td>250.00</td>
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<td></td>
</tr>
<tr>
<td>September</td>
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<td>300.00</td>
<td>300.00</td>
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</tr>
<tr>
<td>October</td>
<td>$6,500.00</td>
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<td>325.00</td>
<td>325.00</td>
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<td></td>
</tr>
<tr>
<td>November</td>
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<td>350.00</td>
<td>350.00</td>
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<tr>
<td>December</td>
<td>$7,500.00</td>
<td></td>
<td>375.00</td>
<td>375.00</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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</tr>
</tbody>
</table>

**Note:** The data provided does not seem to follow a clear pattern or logical structure, possibly due to transcription errors or incomplete data. The values for each column do not seem to add up directly, which might indicate potential issues with the data entry or reporting process.
## General Statement for 1927-1928

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Held for 1928, less applicable fees</td>
<td>77,084.18</td>
</tr>
<tr>
<td>For publishing certificates</td>
<td>139.14</td>
</tr>
<tr>
<td>Total</td>
<td>77,223.32</td>
</tr>
</tbody>
</table>

**Refunds:**

- A. Refund of overpayment: 3,350.96
- B. Refund of overpayment: 648.16
- C. Refund of overpayment: 98.50
- D. Refund of overpayment: 2,000.00
- E. Refund of overpayment: 1,250.00
- F. Refund of overpayment: 3,750.00
- G. Refund of overpayment: 1,500.00
- H. Refund of overpayment: 1,000.00
- I. Refund of overpayment: 1,250.00
- J. Refund of overpayment: 1,000.00
- K. Refund of overpayment: 1,250.00
- L. Refund of overpayment: 1,500.00
- M. Refund of overpayment: 1,250.00
- N. Refund of overpayment: 1,500.00
- O. Refund of overpayment: 1,250.00
- P. Refund of overpayment: 1,500.00
- Q. Refund of overpayment: 1,250.00
- R. Refund of overpayment: 1,500.00
- S. Refund of overpayment: 1,250.00
- T. Refund of overpayment: 1,500.00
- U. Refund of overpayment: 1,250.00
- V. Refund of overpayment: 1,500.00
- W. Refund of overpayment: 1,250.00
- X. Refund of overpayment: 1,500.00
- Y. Refund of overpayment: 1,250.00
- Z. Refund of overpayment: 1,500.00

### Total Refunds

- A. to Z.: 13,000.00

**Total:** 87,223.32

## Chapter XV—Office Finances

### Expenditures from Appropriation for Support of Education During Period January 1, 1928, to December 31, 1928, Inclusive

<table>
<thead>
<tr>
<th>Month</th>
<th>Appropriation</th>
<th>Salaries</th>
<th>Traveling</th>
<th>Supplies</th>
<th>Equipment</th>
<th>Printing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in Dollars</td>
<td>in Dollars</td>
<td>in Dollars</td>
<td>in Dollars</td>
<td>in Dollars</td>
<td>in Dollars</td>
<td>in Dollars</td>
</tr>
<tr>
<td>January</td>
<td>827,668.00</td>
<td>827,668.00</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>February</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>March</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<tr>
<td>April</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<tr>
<td>May</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<tr>
<td>June</td>
<td>54,000.00</td>
<td>54,000.00</td>
<td></td>
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<td></td>
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<tr>
<td>July</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<tr>
<td>August</td>
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<td>54,000.00</td>
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<td>54,000.00</td>
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<tr>
<td>October</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<tr>
<td>November</td>
<td>54,000.00</td>
<td>54,000.00</td>
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<td></td>
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<tr>
<td>December</td>
<td>54,000.00</td>
<td>54,000.00</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Total:** 1,326,978.00

### Grand Total

- Salaries: 1,326,978.00
- Traveling: 0.00
- Supplies: 0.00
- Equipment: 0.00
- Printing: 0.00
- Total: 1,326,978.00

**Total Expenditures:** 1,326,978.00

**Total Appropriation:** 827,668.00

**Deficiency (Expenditures exceed Appropriation):** 519,310.00
whether a further water supply could be developed in this manner. However, the Comptroller of the Treasury, after the direct question had been raised by the Bureau of Reclamation, that under the resolution as passed the money could not be expended for this work, Senator Oddle has now introduced an amendment that is designed to allow this work to be done, and it is assumed that it will be undertaken during the summer of 1929.

Since the Truckee-Carson Irrigation Project appropriates water from both the Truckee and Carson Rivers, any solution of the problem will of necessity affect both streams.

There is no doubt that the Truckee-Carson Irrigation District is entitled to sufficient flood waters from the two rivers, so of their 1925 permit, to irrigate the lands susceptible of irrigation within their project, the vested rights being determined in the regular way. There is no doubt, on the other hand, that there is no flood water available from these two rivers than can be used for this purpose. Therefore, the amount needed should be determined as soon as practical so that further development will not be unduly retarded.

The State is not interested in either "upstream" or "downstream" development as against the other, but it is concerned that the fullest beneficial use be ultimately made of all the water within its borders.

### SEgregated Expenditures from Appropriation for Support of Cooperative Water Resources U.S. G.S.

<table>
<thead>
<tr>
<th>Month</th>
<th>Amount 1927</th>
<th>Salaries</th>
<th>Traveling Expense</th>
<th>General Expense</th>
<th>Total</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>11,909.36</td>
<td>11.57</td>
<td>11.75</td>
<td>11.14</td>
<td>11.63</td>
<td>11,909.36</td>
</tr>
<tr>
<td>July</td>
<td>11,909.36</td>
<td>11.57</td>
<td>11.75</td>
<td>11.14</td>
<td>11.63</td>
<td>11,909.36</td>
</tr>
<tr>
<td>August</td>
<td>11,909.36</td>
<td>11.57</td>
<td>11.75</td>
<td>11.14</td>
<td>11.63</td>
<td>11,909.36</td>
</tr>
<tr>
<td>Total</td>
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<td>34.71</td>
<td>34.75</td>
<td>33.42</td>
<td>34.82</td>
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</table>

### SEgregated Expenditures from Appropriation for Support of Cooperative Snow Survey

<table>
<thead>
<tr>
<th>Month</th>
<th>Amount 1927</th>
<th>Salaries</th>
<th>Traveling Expense</th>
<th>General Expense</th>
<th>Total</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1 to Apr 1</td>
<td>1,336.36</td>
<td>11.00</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>May 1 to Jun 1</td>
<td>11.00</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>July 1 to Sep 1</td>
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<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>September 1 to Dec 1</td>
<td>11.00</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
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<tr>
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<td>1.24</td>
<td>1.33</td>
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</table>

### SEgregated Expenditures from Appropriation for Support of Cooperative Snow Survey

<table>
<thead>
<tr>
<th>Month</th>
<th>Amount 1927</th>
<th>Salaries</th>
<th>Traveling Expense</th>
<th>General Expense</th>
<th>Total</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1 to Feb 1</td>
<td>1.336.36</td>
<td>11.33</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>March 1 to Apr 1</td>
<td>11.33</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>April 1 to May 1</td>
<td>11.33</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>May 1 to Jun 1</td>
<td>11.33</td>
<td>1.33</td>
<td>1.24</td>
<td>1.33</td>
<td>1.33</td>
<td>1,336.36</td>
</tr>
<tr>
<td>Total</td>
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<td>5,050.72</td>
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</table>
CHAPTER XIV—UPSTREAM STORAGE INVESTIGATION
TRUCKEE AND CARSON RIVERS

During the fall of the year 1929, a preliminary meeting was called between representatives of the Board of Directors of the Truckee-Carson Irrigation District and the Directors of the Truckee-Garson Association, where the matter of a Federal appropriation for upstream storage investigation on the Truckee and Carson Rivers was discussed.

At a subsequent meeting, at which Nevada's congressional representatives were invited to be present, the plan was laid before them and results after their return to Washington, in an appropriation of $50,000 for investigation of the upstream storage possibilities on the Truckee River; the Carson River not being considered.

Investigations were therefore commenced, under the supervision of the Board of Reclamation, during the summer of 1930, on the headwaters of the Truckee River. Satisfactory progress was not made, however, and as a consequence only a partial report was rendered into that year, proving of little practical benefit. Only about $25,000 of the $50,000 appropriated by Congress had been expended in this work.

Under the law any moneys remaining in the fund at the end of the fiscal year (June 30) revert to the General Fund, therefore it became necessary to appropriate the money to finish the investigation.

The matter was discussed with the Bureau of Reclamation officials in Washington by the State Engineer in February, 1930, and in accordance with the decision reached at that time a resolution was introduced by Senator Trask L. Odell in the United States Senate appropriating the unexpended balance of the $50,000 originally appropriated to complete the Truckee River investigations, and also to investigate storage possibilities on the Carson River.

The resolution, as introduced, carried a provision that the work be done in connection with the State Engineer's office. This provision was, however, later eliminated, but through written instructions from Dr. Elwood Mead, Commissioner of Reclamation, and A. F. Walker, Chief Engineer, Bureau of Reclamation, the field men consulted with the State Engineer's office frequently during the course of the investigation, and the State Engineer viewed personally, practically all of the reservoirs sites investigated.

The report has been somewhat delayed due to the thorough manner in which the investigations have been conducted by A. W. Walker, Field Engineer for the Bureau of Reclamation. It is expected, however, that a complete report will be in the hands of the Bureau officials by February 15, 1930.

In this report, compilation is being made of all existing data from previous authentic investigations, either public or private, and an earnest attempt made to complete the investigations on both rivers, and it is believed that the resulting report should be of real value to all property owners on both rivers in the matter of future developments, either public or private.

There was some discussion over the advisability of sinking test wells in the Truckee meadows and running pumping tests to determine...
CHAPTER XVI—RECOMMENDATIONS

WATER COMMISSIONERS’ SALARIES AND EXPENSES

The State Engineer is charged with the administration and distribution of water on adjudicated streams within the State. If efficient distribution is to be accomplished, skill and accuracy must be employed and paid with reasonable compensation. The water law directs that the State Engineer pay such salaries for the administration to the various boards of County Commissioners, setting forth the audit assessment on each acre of cultivated land embraced under distribution activities in each county. For assessed amounts are collected as any other taxes with the result that the money represented is not available in the various county treasuries until long after services rendered by the water commissioners are completed.

In an attempt to remedy this vexing condition the Legislature in 1925 amended the statutes to make it lawful for counties to advance money for the payment of water commissioners’ salaries and expenses when such advances are reimbursable from the proceeds of any tax levied for such purpose. (See sec. 2, chapter 126, Statutes of 1925.)

This attempted remedial measure has not been successful due to the refusal of several counties to make such lawful advances on account of alleged depleted treasury funds or reluctance to cooperate fully in the furthering of efficient water administration.

It is therefore recommended that adequate amendment to the water law be enacted for the purpose of providing some means of assessing and collecting distribution funds in advance of the period during which they will be expended.

ADMINISTRATION OF STOCK WATERING ACT OF 1925

Regardless in this report the difficulties of efficiently administering the stock watering Act of 1925 have been discussed in detail, stressing the fact that such administration is impossible without the availability of adequate funds for this purpose. It is therefore recommended that the sum of $24,823, in addition to the amount required to cover current expenses and activities, be allowed for the purpose of clearing up the accumulated cases of applications upon which it has been impossible, during the past two years, to make field investigations required by law. This matter is of paramount importance to the livestock industry of the State, and these funds should receive careful and constant attention.

The value of the stock watering Act to stockmen is dependent on its efficient and speedy administration, which cannot be accomplished without adequate funds for this purpose.

CARSON RIVER ADJUDICATION

The Final Order of Determination of the State Engineer in this matter has been filed with the First Judicial District Court at Carson City, and hearing on same set by the court for February 4, 1926. Since there are approximately 260 claimants embraced in this proceeding and, it is estimated, each party will require at least one-half day for hearing before the Court, the total length of the proceeding will therefore be approximately 125 court days. The hearing will have to be
CHAPTER XIII—STATE WATER RIGHT SURVEYORS

In 1921 the State Legislature enacted the following amendment to the Water Law (Chapter 106, Laws of 1921):

Sec. 91. All maps and surveys and measurement of water required under the provisions of this Act shall be made by a State water right surveyor, as hereinafter provided.

Any engineer or surveyor who has a practical knowledge of surveying and engineering and who is familiar with land surveying and mapping and the measurement of water and who is of good moral standing shall be entitled to be appointed a State water right surveyor, upon application to the State Engineer, such application to be in the form prescribed by the State Engineer.

Every applicant for the appointment as State water right surveyor shall pay a fee of five dollars ($5) at the time of making his application to the State Engineer. If the application be not granted the amount of such fee shall be returned to the applicant.

Whenever the State Engineer shall approve the qualifications of an applicant, he shall issue a certificate to such applicant designating him as a State water right surveyor, and such applicant shall, within ten (10) days thereafter, file with the State Engineer a good and sufficient bond, payable to the State of Nevada, in the sum of five hundred dollars ($500), conditioned for the faithful performance of his duties as such officer.

Such appointment may be revoked by the State Engineer at any time for good cause shown.

The State Engineer may require any applicant for appointment to the position of State water right surveyor to pass such reasonable examination as to his qualifications as may be provided by the State Engineer. The State Engineer may also prescribe such additional rules and regulations concerning the qualifications and official acts of State water right surveyors as may be reasonable and not inconsistent with this Act.

No survey, map, or measurement of flow of water shall be approved by the State Engineer unless such survey is made by a State water right surveyor, as hereinafter provided.

The State of Nevada shall not be liable for the compensation of any State water right surveyor, but said surveyor shall be paid by the party employing him.

Since this statute has been effective, 1/3 State water right surveyors have been licensed to practice before the office. Of this number 1/3 are at the present time still in good standing, the remainder having been dropped from the roster on account of death, removal from the State or for other causes.

It is desired to express sincere appreciation for the spirit of cooperation shown by the practicing water right surveyors, as evidenced by their evident desire to become familiar with and closely follow the rules and regulations of this office regarding the conduct of their duties.

Following is a complete list of State water right surveyors licensed in good standing to practice before the office of the State Engineer:

[List of surveyors]
on a water source, either surface or underground, until the relative rights of all claimants have been determined.

In brief it is the office policy, therefore, to keep well within the bounds of powers legally conferred.

CONTROL OF UNAPPROPRIATED WATER

The policy of our State administration in the matter of the "Control of Unappropriated Water" has been outlined definitely since assuming control of the State Engineer's office March 28, 1927.

The State's interest in this matter is the highest; ultimate beneficial use of the limited water supply within her borders, so that the greatest possible amount of usable wealth may be produced. This objective, we believe, can better be brought about by requiring any agency, whether private or public, to conform to the State laws in the appropriation and use of water.

This policy does not in any manner impair the right that any agency may have at this time, either public or private, who may be making "beneficial use" of water, nor hinder in any manner any future development where appropriations may be made in the regular manner.

The following statement by Sardis Summetfield, in a paper on "Relation of the Federal Government to the States Relative to the Control of Water Within the States," presented to the Western Association of State Engineers, October 29, 1928, in Salt Lake City, Utah, outlines the trend of western "legal minds" on this important subject, and is endorsed in by all of our representatives in Congress:

The first question of Federal or State ownership and control of unappropriated navigable waters within State borders is an undecided one in the highest Federal Courts, but by State Supreme Court decisions, State constitutional provisions ratified and approved by Congress, and the effect of a succession of recognition Federal laws persuasively lead judicial minds to the conclusion that the States are vested with the control of the unappropriated navigable waters within their respective borders.

This statement is supported in, and actively supported, by Delphi Carpenter, Interstate River Commissioner, Bremerton, Colorado; Ward Bumstead, Denver, Colorado; Francis Wilson, Interstate River Commissioner, Santa Fe, New Mexico, and William Ray, of Salt Lake City, Utah, all of whom are at the top of the legal profession west of the Rocky Mountains.
there have been approximately 500 such applications filed during the biennium. It has been impossible to keep abreast with these, let alone meeting the accumulation of old applications.

If the stock watering Act is to result in the expected benefit to Nevada stockmen it must be made financially possible for the office of the State Engineer to function fully and efficiently. If funds are not available it is planned to increase the present limited organization by the addition of at least two competent field men who will devote their entire time to making exhaustive investigations in the field. In addition an extra office man will be required to handle the necessarily increased office work. With the organization thus temporarily increased it is believed that a demand can be made of all stock watering applications and that thereafter a reasonable organization can keep up with current applications.

To those not fully informed upon the stock watering Act in relation to the stock and range problems of the State it is pointed out that already it is bearing fruit. The Act was designed, among other things, to stabilize the values in land settlement where such land settlement values are at the mercy of the values in the public range companion to the land settlement. Already the tendency toward recognition of the fact that stock ranges have a definite and value separate and distinct from the value in comparison agricultural range settlement is felt. Recently, and perhaps for the first time in Nevada, a bank liquidated a stock raising property in the northeastern portion of the State under conditions where, in the sale, practically all the money involved was paid by the buyer for the right to the stock water controlling the public range companion to the ranch property of the liquidated outfit.

It is the policy of the State Engineer to so administer the stock watering Act that its value to the stock industry will be a maximum. This, however, cannot be accomplished without adequate legislative appropriation.

**ACTION ON WATER APPLICATIONS**

In considering all applications to appropriate water, whether for stock watering or any other purpose, it is the policy of the office to render prompt and positive action, believing that unnecessary delay, even if the application is to be denied, works a hardship on the applicant who has made a reasonable effort to proceed with developments or otherwise plan for the future until he knows the outcome of his application. Here again, although this has been the policy, it has been difficult of accomplishment during the past biennium due to lack of sufficient office and field force.

**POLICING POWER OF STATE ENGINEER**

It is the policy of the State Engineer not to resort to bluff nor attempt to usurp political powers in administering water rights. Frequent demands are made by water users to personally shut down headgates or police the distribution and flow of water in arbitrary ways, for example, where there has been no determination of relative rights. The Attorney General has given it as his opinion that the State Engineer has no authority to regulate or distribute water from between users.
STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

1927–1928

GEORGE W. MALONE
State Engineer of Nevada

CARRIERS OFFICE

1928

STATE PRINTING OFFICE