

PROPERTY OF
DIVISION OF WATER RESOURCES
BRANCH OFFICE
LAS VEGAS, NEVADA

STATE OF NEVADA

REPORT

OF THE

STATE ENGINEER

For the Period
January 1, 1931, to June 30, 1932, Inclusive

GEORGE W. MALONE
State Engineer of Nevada



CARSON CITY, NEVADA
STATE PRINTING OFFICE - - JOE FARNSWORTH, SUPERINTENDENT
1933

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STATE OF NEVADA

REPORT

STATE ENGINEER



EDWARD W. BAIRD
State Engineer of Nevada



PRINTED BY THE STATE ENGINEER
STATE OF NEVADA
1911

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EXERCISES TO BE DONE

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1. The first exercise is to be done in the morning.

2. The second exercise is to be done in the afternoon.

3. The third exercise is to be done in the evening.

4. The fourth exercise is to be done in the morning.

5. The fifth exercise is to be done in the afternoon.

6. The sixth exercise is to be done in the evening.

7. The seventh exercise is to be done in the morning.

8. The eighth exercise is to be done in the afternoon.

9. The ninth exercise is to be done in the evening.

10. The tenth exercise is to be done in the morning.

11. The eleventh exercise is to be done in the afternoon.

12. The twelfth exercise is to be done in the evening.

13. The thirteenth exercise is to be done in the morning.

14. The fourteenth exercise is to be done in the afternoon.

15. The fifteenth exercise is to be done in the evening.

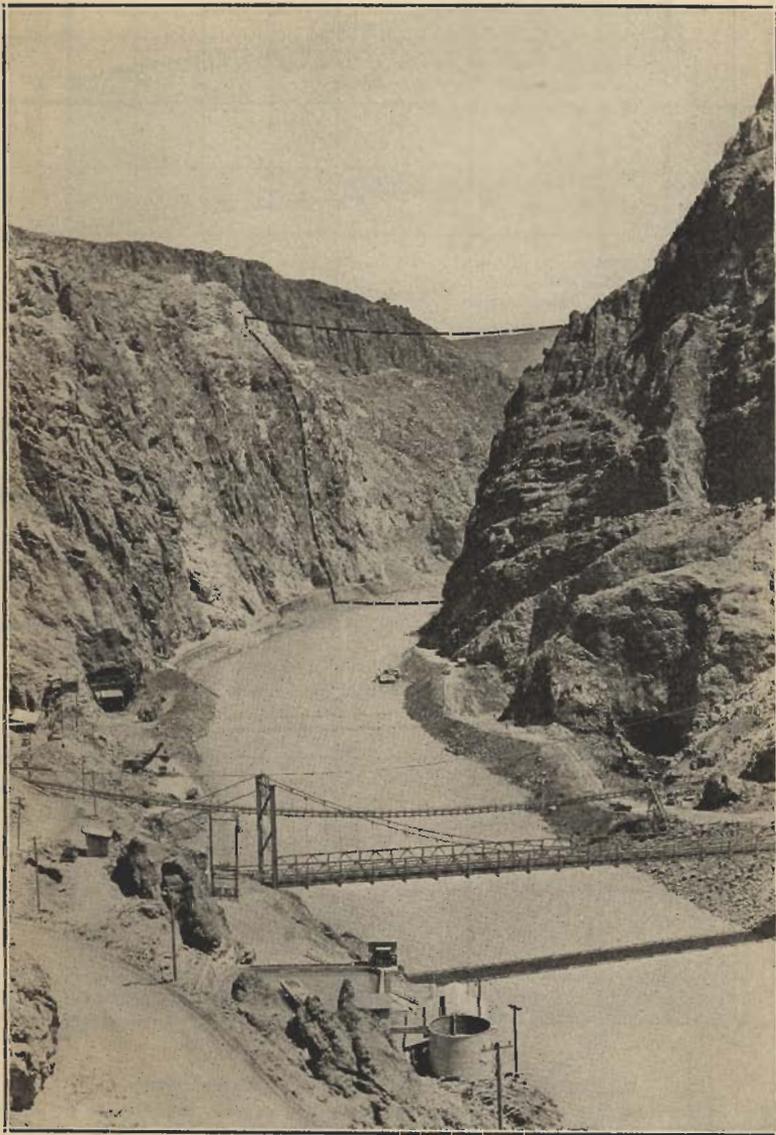
16. The sixteenth exercise is to be done in the morning.

17. The seventeenth exercise is to be done in the afternoon.

18. The eighteenth exercise is to be done in the evening.

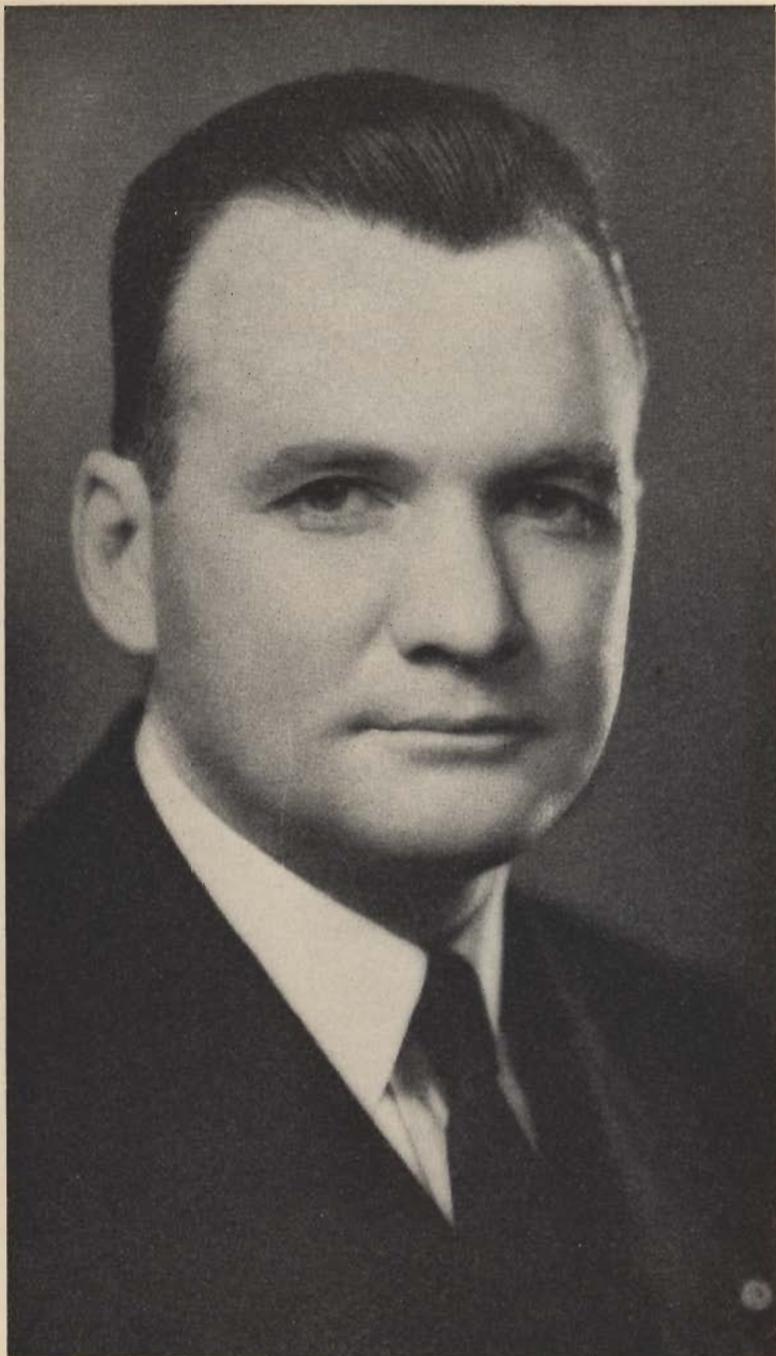
19. The nineteenth exercise is to be done in the morning.

20. The twentieth exercise is to be done in the afternoon.



HOOVER (BOULDER) DAM SITE ON COLORADO RIVER

Located 30 miles southeast of Las Vegas, Nevada. Height of structure above stream bed, 582 feet. Total cost of project, \$165,000,000. United States Reclamation Service Project. Status June 30, 1932. Two tunnels on each side of river, each 50 feet in diameter and 4,000 feet long, through solid rock have been completed.



GEO. W. MALONE, State Engineer of Nevada
Member Public Service Commission, Secretary Colorado River Commission

LETTER OF TRANSMITTAL

STATE OF NEVADA,
OFFICE OF THE STATE ENGINEER,
CARSON CITY, August 1, 1932.

To His Excellency, F. B. BALZAR, Governor, Carson City, Nevada.

SIR: I herewith submit to you my report as State Engineer of the State of Nevada for the period January 1, 1931, to June 30, 1932.

Respectfully submitted,

GEO. W. MALONE,
State Engineer.

STATE ENGINEERS SINCE CREATION OF OFFICE

A. E. CHANDLER.....May 29, 1903, to May 1, 1905
HENRY THURTELL.....May 1, 1905, to May 1, 1907
FRANK R. NICHOLAS.....May 1, 1907, to March 2, 1910
EMMET D. BOYLE.....March 8, 1910, to March 21, 1911
W. M. KEARNEY.....March 21, 1911, to May 15, 1917
J. G. SCRUGHAM.....May 16, 1917, to January 10, 1918
SEYMOUR CASE.....January 25, 1918, to March 28, 1919
J. G. SCRUGHAM.....March 28, 1919, to October 7, 1922
ROBERT A. ALLEN.....October 7, 1922, to March 28, 1927
GEO. W. MALONE.....March 29, 1927—

PERSONNEL

DEPARTMENT OF STATE ENGINEER

Carson City Office

| | |
|-------------------------------------|-------------------------------------|
| GEO. W. MALONE..... | State Engineer |
| H. W. REPPERT..... | Assistant State Engineer |
| O. L. HUSSMAN..... | Deputy State Engineer |
| F. N. DONDERO..... | Office Engineer |
| J. A. MILLAR..... | Field Engineer |
| A. M. QUILL ¹ | Field Engineer |
| A. V. TALLMAN ² | Special Assistant to State Engineer |
| ADA F. POINTER..... | Chief Clerk |
| CHAS. THIEX..... | Clerk |
| ZITA D. MEDER ³ | Stenographer |
| BOBBE DALZELL ⁴ | Stenographer |
| ISADORE S. DAVIE ⁵ | Secretary |

WATER DISTRIBUTION

Humboldt River, 1931⁶

| | |
|--|--------------------------|
| A. V. TALLMAN, Supervising Water Commissioner..... | Entire River |
| PETER KRUMMES, Water Commissioner..... | Lovelock District |
| ROY MEFFLEY, Water Commissioner..... | Lovelock District |
| WM. HOLLAN, Water Commissioner..... | Battle Mountain District |
| FRED BALDINI, Water Commissioner..... | Battle Mountain District |
| ROY WHITACRE, Water Commissioner..... | Elko District |
| W. W. WHITE, Hydrographer..... | Humboldt River |
| C. T. SNOOK, Hydrographer..... | Humboldt River |
| JAMES DOVE, Hydrographer..... | Humboldt River |
| TRUMAN HALL, Hydrographer..... | Humboldt River |
| GEORGE HENNEN, Hydrographer..... | Humboldt River |
| WM. JAUQUIN, Assistant Hydrographer..... | Humboldt River |
| GERALDINE BURNS, Stenographer..... | Winnemucca Office |

Humboldt River, 1932

| | |
|--|--------------------------|
| A. V. TALLMAN, Supervising Water Commissioner..... | Entire River |
| ROY MEFFLEY, Water Commissioner..... | Lovelock District |
| PETER KRUMMES,* Water Commissioner..... | Winnemucca District |
| GEORGE HENNEN, Water Commissioner..... | Battle Mountain District |
| W. W. WHITE, Water Commissioner..... | Elko District |
| MAXWELL THOMPSON, Hydrographer..... | Humboldt River |
| CARL ELGES, Hydrographer..... | Humboldt River |
| WM. JAUQUIN, Assistant Hydrographer..... | Humboldt River |
| GERALDINE BURNS, Stenographer..... | Winnemucca Office |

¹January 1, 1931, to March 31, 1931; September 11, 1931, to March 15, 1932. ²January 1, 1931, to February 19, 1931. ³January 1, 1931, to June 23, 1931. ⁴March 24, 1931, to date. ⁵July 27, 1931, to August 24, 1931; November 9, 1931, to date.

⁶The Humboldt River includes approximately 300,000 acres and 600 water users. The maximum number of men employed at any one time was seven, exclusive of necessary guards employed for short periods only.

*March 1 to May 31. Seven men were the maximum number employed at any one time; five commissioners and two hydrographers.

NOTE—In addition to the State Engineer and his assistant the regular State Engineer's organization includes one deputy, one office, and one field engineer; and chief clerk, clerk, secretary, and one stenographer.

| | |
|---|-----------------------------|
| Little Humboldt River, 1931-1932 | |
| A. M. QULL, Commissioner..... | Entire District |
| White River, 1932 | |
| D. T. NICHOLAS, Commissioner..... | Entire District |
| Tony Creek, 1932 | |
| ERNEST C. WHITCOMB, Commissioner..... | Entire District |
| Muddy River, 1931-1932 | |
| S. D. CONGER, Commissioner..... | Entire District |
| Currant Creek and Duckwater Creek, 1931-1932 | |
| L. A. HARRIS, Commissioner..... | Entire District |
| Pahranagat Lake, 1931-1932 | |
| H. T. McQUISTON, Commissioner..... | Entire District |
| In Cooperation with Department of State Engineer (U. S. Geological Survey, Water Resources Branch) | |
| A. B. PURTON..... | District Engineer in Charge |
| Nevada Cooperative Snow Surveys | |
| J. E. CHURCH, JR..... | In Charge |

**BUREAUS AND COMMISSIONS OF WHICH STATE ENGINEER
IS A MEMBER**

Nevada Colorado River Commission

| | |
|-------------------------------------|-----------|
| HON. F. B. BALZAR, Governor..... | Chairman |
| GEO. W. MALONE, State Engineer..... | Secretary |
| E. W. CLARK..... | Member |

Nevada Public Service Commission

| | |
|-------------------------------------|----------|
| J. F. SHAUGHNESSY..... | Chairman |
| GEO. W. MALONE, State Engineer..... | Member |
| HOYT R. MARTIN..... | Member |

State Irrigation District Bond Commission

| | |
|-------------------------------------|----------|
| HON. F. B. BALZAR, Governor..... | Chairman |
| E. J. SEABORN, Bank Examiner..... | Member |
| GEO. W. MALONE, State Engineer..... | Member |

Bureau of Industry, Agriculture and Irrigation

| | |
|--------------------------------------|----------|
| HON. F. B. BALZAR, Governor..... | Chairman |
| THOS. A. LOTZ, Surveyor General..... | Member |
| GEO. W. MALONE, State Engineer..... | Member |

State Range Commission

| | |
|--|----------|
| HON. F. B. BALZAR, Governor..... | Chairman |
| GEO. W. MALONE, State Engineer..... | Member |
| J. F. SHAUGHNESSY, Tax Commissioner..... | Member |

State Board of Irrigation

| | |
|--------------------------------------|----------|
| HON. F. B. BALZAR, Governor..... | Chairman |
| THOS. A. LOTZ, Surveyor-General..... | Member |
| GRAY WASHBURN, Attorney-General..... | Member |
| GEO. W. MALONE, State Engineer..... | Member |

Advisory Committee to Secretary of Interior (Colorado River)

| | |
|-------------------------------------|--------------|
| GEO. W. MALONE, State Engineer..... | Commissioner |
|-------------------------------------|--------------|

PUBLICATIONS**List of Publications Printed for Distribution by State
Engineer's Office****ADJUDICATION PUBLICATIONS**

Abstract of Claims—

Carson River, 1921.
 Currant Creek, 1919.
 Evans Creek, 1916.
 Humboldt River, 1909.
 Humboldt River, 1912.
 Humboldt River, 1922.
 Little Humboldt River, 1913.*
 Little Humboldt River, 1929.
 Muddy River, 1906.
 Salmon River, 1916.
 Walker River, 1907.*

Preliminary Order of Determination—

Carson River, 1921.*
 Humboldt River, 1922.
 Little Humboldt River, 1929.
 Pahrnagat Lake, 1926.*

Objections to Preliminary Order of Determination—

Humboldt River, 1922.*
 Little Humboldt River, 1930.

Order of Determination—

Carson River, 1927.
 Humboldt River, 1922.
 Muddy River, 1920.
 Pahrnagat Lake, 1930.

Objections to Order of Determination—

Humboldt River, 1923.

Priority Index Chart Humboldt River, 1924.

BIENNIAL REPORTS STATE ENGINEER

1903-1904;* 1905-1906; 1907-1908;* 1909-1910; 1911-1912;*
 1913-1914; 1915-1916; 1917-1918; 1919-1920; 1921-1922; 1923-
 1924; 1925-1926;* 1927-1928; 1929-1930.

MISCELLANEOUS PUBLICATIONS

Cippoletti Weir Discharge Tables.
 Colorado River Compact.
 Humboldt River Distribution, 1930.
 Nevada Drainage District Act.*
 Nevada Improvement District Act.*
 Nevada Irrigation District Act.
 Public Domain Administration.
 Regulations for Preparation of Maps.
 Stock Watering Act.
 Synopsis of Water Law, No. 7.
 Water Laws of Nevada.
 Humboldt River Distribution Report, 1927-1931.

*Supply exhausted.

SUMMARY OF THE WORK OF THE STATE ENGINEER

STATE COMMISSIONS AND BOARDS

The State Engineer's office was created in 1903, at the time of the adoption of the State water law. The Act has been amended from time to time, but it always provides that the holder of that office shall possess "such training in hydraulic and general engineering and such practical skill and experience as shall fit him for the position."

In addition to holding that office, the State Engineer is at this time a member of, and acts as technical adviser to the following commissions and boards:

1. The Public Service Commission.
2. The Colorado River Development Commission.
3. The Colorado River Advisory Board.
4. The Irrigation District Bond Commission.
5. The State Range Commission.
6. The Bureau of Industry, Agriculture and Irrigation.
7. The State Board of Irrigation.

NATIONAL COMMITTEES AND ORGANIZATIONS

1. The President's Committee on the Conservation and Administration of the Public Domain.
2. The Association of Western State Engineers (seventeen western States).
3. The National Reclamation Association (director and member of the Executive Committee).

The membership and work of these commissions are more fully outlined on pages 83-100.

COOPERATIVE WORK

The State Engineer has two cooperative funds for work in connection with stream gaging and stream run-off estimates:

1. The U. S. Geological Survey, Water Resources Branch.
2. The Nevada Cooperative Snow Surveys.

The personnel and work in connection with these cooperative funds are more fully set out on pages 48-53.

STATUS OF ADJUDICATION OF STREAM SYSTEMS

The work of adjudicating the water of the Nevada stream systems has proceeded since the inception of this office, in 1903, to the present time:

| | |
|--|---------|
| 1. Stream systems adjudicated, 1903 to date, and supervised by this office | 20 |
| 2. Acres supervised by this office..... | 375,987 |
| 3. Vested water users under supervised streams..... | 542 |
| 4. Streams in process of adjudication..... | 18 |
| 5. Adjudications initiated since May 29, 1927..... | 9 |
| 6. Adjudications completed since May 29, 1927..... | 7 |
| 7. Adjudications initiated since January 1, 1931..... | 1 |
| 8. Adjudications completed since January 1, 1931..... | 2 |
| 9. Known stream systems on which irrigation is practiced on which no adjudication proceedings have ever been initiated | 220 |

| | |
|---|---------|
| 10. Stream systems adjudicated, but not supervised by this office | 8 |
| 11. Acres adjudicated but not supervised by this office..... | 146,901 |
| 12. Approximate area in process of adjudication not under State Engineer's office | 124,270 |

The status of the adjudication work is more fully set out on pages 26-30.

STATUS OF WATER APPLICATIONS AND PROOFS OF APPROPRIATION

| | |
|---|-------|
| 1. Water applications, 1903 to June 30, 1932..... | 9,605 |
| 2. Water applications acted upon, 1903 to June 30, 1932..... | 8,335 |
| 3. Water applications on which no action has been taken..... | 1,270 |
| 4. Water applications, May 29, 1927, to June 30, 1932..... | 1,544 |
| 5. Proofs of appropriation, 1903 to June 30, 1932..... | 2,265 |
| 6. Proofs of appropriations, March 29, 1927, to June 30, 1932.... | 175 |

The status of the water applications and proofs of appropriation are more fully set out on pages 30, 123 and 128.

SPECIAL WORK

Attention has been called repeatedly to the potential possibilities of the office of the State Engineer as a departmental agency contributing to the permanent economic development of the State through development of the following resources, as outlined on page 18 of the Biennial Report of 1929-1930:

1. Colorado River—
 - a. Revenue in lieu of taxes from this project.
 - b. Power for use in the State.
2. Range Control—
 - a. Range maps.
 - b. State Range Commission.
 - c. The President's Committee on the Conservation and Administration of the Public Domain.
3. Humboldt River—
 - a. Proper records of water distribution.
 - b. Possible storage and river improvement.
4. Truckee and Carson Rivers—
 - a. Completion of the Newlands Project.
 - b. Water storage for Truckee Meadows.
 - c. Water storage for the Upper Carson River.

To these projects have now been added:

5. Working with the Walker River Irrigation District in connection with refinancing arrangements with the bondholders, and efforts to secure Federal financing through Congress. This will entail an engineering and economic survey of this important project.
6. Assisting the Tax Commission and the Attorney-General in preparing a general property valuation for use in connection with the railroad and utilities tax suits, and working with the consulting engineer in preparation of the railroad valuation report to be used in connection with the suits. The consulting engineer has been employed for this particular work by the Public Service Commission at the request of the Tax Commission.

7. Underground water development investigations, with particular reference to the use of power from the Colorado River project for pumping for irrigation, in addition to electro-chemical industrial plants, and mining operations.

The State Administration and our Congressional Delegation have been and will continue working together on the foregoing problems where Congressional action is necessary for their successful conclusion, with the State Engineer acting as technical adviser, furnishing information, arranging briefs, etc., for committees.

The Swing-Johnson Bill, before Congress for several years and passed in December, 1928, as the "Boulder Dam Project Act," was approved December 21, 1928. It provides "revenue in lieu of taxes" and the "withdrawal of power to be used in the State." In the beginning of 1927 the Swing-Johnson Bill did not provide for either of the above named benefits, but our Colorado River Commission after full investigation demanded nine amendments to the bill. Eight of these were accepted, and provided for such revenue and power. The Commission is now working on the utilization of the power when ready for delivery. See page 56, also page 89, 1929-1930 Biennial Report.

The proper range control on our unappropriated and unreserved public lands, consisting of more than 75% of our total area, has been an acute problem for more than thirty years. This office in 1927 set up a system of range maps to determine the locations of the users. The Legislature, in 1929, created the State Range Commission for the purpose of studying the problem. After full investigation our report was submitted to the 1931 Legislature, and it recommended that legislation should be enacted "pointing to ultimate control of the range units by the user or users of such range, as can properly be enforced under the police power of the State." The Range Commission keeps in constant touch with the work in this connection and all proposed national legislation. The State Engineer was appointed a member of a committee by the President, in accordance with an Act of Congress, to study the disposition of the remaining public domain. This Committee reported to the President January 16, 1931. See page 83, also page 107 of 1929-1930 Biennial Report.

The Humboldt River stream system had been in almost continual litigation for more than fifteen years, costing the water users thousands of dollars, when we took over its supervision in 1927. Since that time detailed supervision records have been kept, and early in 1932 a complete report of the records on that stream system for the years 1927-1931, inclusive, was published. Since the report was issued no litigation of any consequence has been initiated. A report on the 1932 distribution will be issued early in 1933, copies of which will be available at this office. See page 35 and also pages 39 and 45 of 1929-1930 Biennial Report.

An investigation of upstream storage possibilities was made by the Bureau of Reclamation in cooperation with this office on the Truckee and Carson Rivers during 1927 and 1928, and a report issued in April, 1929, outlining plan of development. Since that time the Washoe County Conservation District, on the upper Truckee River, and the

Newlands Reclamation Project, on the lower Truckee and Carson Rivers, have had various conferences to determine the relative rights of the areas. When that is accomplished, stabilization of the flow of these rivers should go ahead. See page 110, also page 129 of 1929-1930 Biennial Report.

The work of this office includes working with the water users in the organization of irrigation and conservation districts, and the giving of technical advice in any reorganization that may be necessary. We are prepared and intend to lend every assistance to the Walker River Irrigation District in arriving at a proper engineering and economic set-up in its plan for refinancing, and to assist in securing Congressional assistance in the refinancing plans if that method seems advisable. See page 115, also page 137 of 1929-1930 Biennial Report.

The railroad tax suits have held up a part of the tax payments to the State Treasurer and seriously threaten the tax structure as set up by the State Tax Commission, and the Attorney-General is securing general property valuations in the State for use in the suits. See page 15.

The development of underground water has engaged the attention of the State Engineer's office since its inception, and at various times funds have been set aside by the Legislature for that specific purpose and investigations have been made. It is well known that practically all of the surface supply of water for irrigation has been appropriated for a number of years, and pumping for this purpose has developed slowly. Added incentive for further investigations has been brought about by the possibility of using Hoover (Boulder) Dam power for this purpose in certain areas. See page 102, also page 154 of 1929-1930 Biennial Report.

APPROPRIATION FOR SUPPORT OF THE OFFICE

The appropriation for the support of the State Engineer's office for the biennium July 1, 1931, to June 30, 1933, was \$43,000. This includes all of the work financed by the office except statutory salaries.

It has been possible during the eighteen-month period covered by this report to act on 146 more applications than were filed during that period, thereby reducing the number of pending applications by that amount. For the first time the office has reached the point where a reduction in the more than 1,200 pending applications, which have accumulated over a long period of years, can be made.

It is necessary to give prompt service on applications for irrigation, mining and stockwatering permits, since it is unlawful for an applicant to use the water until the permit is granted, and a permit cannot be granted until the investigation is made in accordance with the State law. Therefore, many contemplated improvements are held in abeyance pending decisions from this office.

The cost of the developments under the total 9,605 applications filed in this office from 1903 to June 30, 1932, can be understood when it is known that the 211 applications for water filed in this office during the eighteen-month period from January 1, 1931, to June 30, 1932, call for an expenditure of \$1,812,000, and that none of the improve-

ments can be made until the applications are acted upon by this office. The actual expenditures for labor and improvements on water appropriations completed during the same eighteen-month period, as evidenced by the proofs filed in this office, are considerably in excess of \$462,000.

It can be seen then that any delay in action upon these applications may be costly to the applicants, but in a period such as this, even necessary work must at times be curtailed. Hence, as noted before, we are submitting a budget for the ensuing biennium which is reduced by ten per cent.

MEASUREMENT OF WATER AND USEFUL EQUIVALENTS

Measurement of Water

Throughout the entire West the term miner's inch has been used up to the present time by the majority of water users in preference to the second foot and the acre foot, which are the legal units in most, if not all, of the western States. The reason for this comes, perhaps, from the fact that the miner's inch was the standard of measurement during the pioneer days of mining and farming in the West, and the people having become used to gaging water in accordance with this term are loath to depart from it.

The term miner's inch, however, is very uncertain unless when used the pressure under which the discharge is delivered is given. The different States have different values for a miner's inch, as the head or pressure is not the same. The legislatures have recognized this uncertainty and have accordingly made the standard of measurement the cubic foot per second, or second foot, and the standard of volume the acre foot.

Useful Equivalents

The following equivalents of the terms second foot, acre foot and miner's inch will serve as a guide where necessary to transpose them:

One acre foot of water is the quantity that will cover an area of one acre one foot deep.

One second foot of water is the quantity that will fill a space of one cubic foot in one second of time.

1 second foot equals 40 miners' inches.

1 second foot equals 7.4805 gallons per second, or 448.83 gallons per minute.

1 acre foot equals 43,560 cubic feet or the volume of water that will cover one acre one foot deep.

1 miner's inch equals 0.186+ gallons per second.

1 miner's inch equals 11.21 gallons per minute.

1 miner's inch equals 672.60 gallons per hour.

1 miner's inch equals 16,142.40 gallons per day of 24 hours.

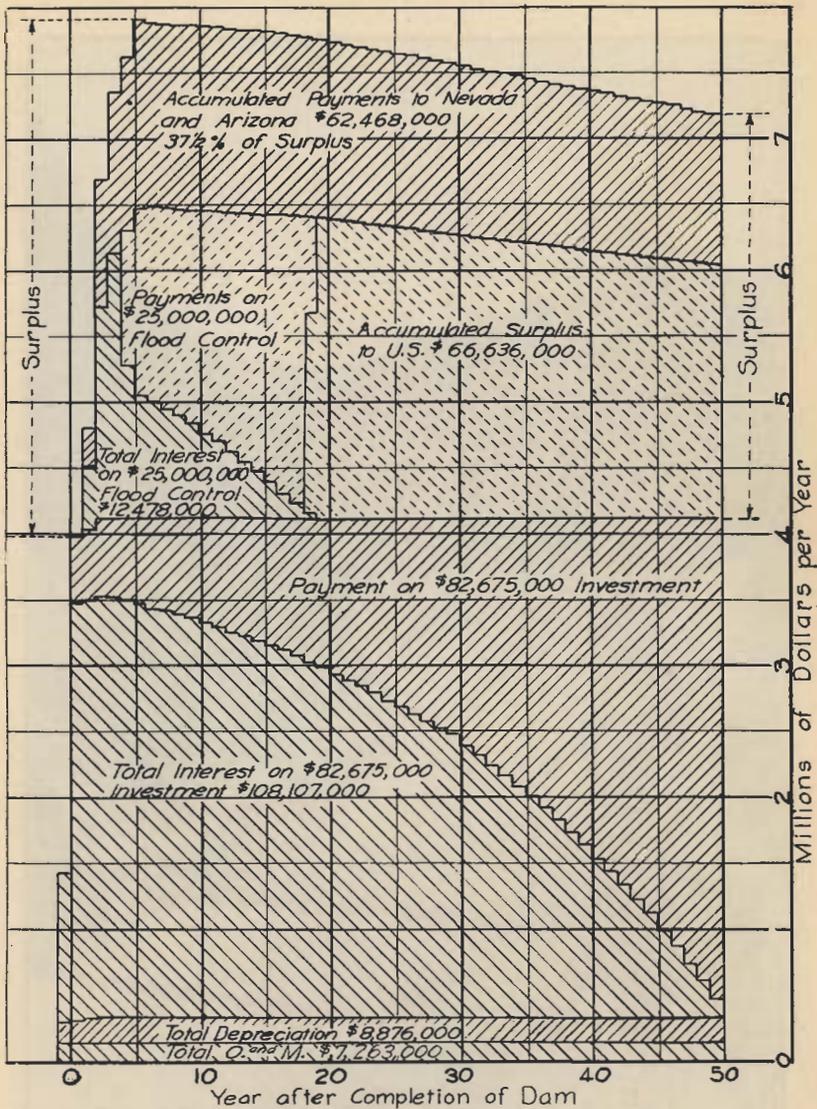
1 miner's inch flowing 20.16 days will cover an acre of land 1 foot deep or it will be the equivalent of 1 acre foot.

1 miner's inch flowing 150 days (5 months of 30 days each) will cover an acre of land 7.4 feet deep.

1 second foot of water flowing 150 days equals 297.06 acre feet or enough water to cover 100 acres of land 2.9706 feet deep.

1 second foot of water flowing 24 hours equals 86,400 cubic feet, or 1.98 acre feet, or approximately 1 acre 2 feet deep.

1 acre foot equals 325,850 gallons.



BOULDER CANYON POWER DEVELOPMENT

Revenue from sale of firm power at 1.63 mills per kw. hour, sale of secondary power at 0.5 mills per kw. hour, and sale of water at 25 cents per acre foot. Firm power defined as 4,330,000,000 kw. hours per year at completion of dam, and decreasing at rate of 8,760,000 kw. hours per year thereafter. Secondary power average taken as 1,550,000,000 kw. hours per year at completion of dam, and decreasing at rate of 8,600,000 kw. hours per year thereafter. Sale of water taken as 640 second feet of water first year and increasing uniformly over a sixteen-year period to 1,500 second feet.—Department of the Interior, Washington, D. C.

BIENNIAL REPORT OF STATE ENGINEER, 1931-1932

CHAPTER I

Introductory and General

Section 1, article 9, of the Constitution of the State of Nevada, as amended (proposed and passed at the thirty-third session of the Legislature, Statutes 1926-1927; agreed to and passed at the thirty-fourth session of the Legislature, Statutes of 1928-1929; and approved and ratified by the people at the general election of 1930), provides: "The fiscal year shall commence on the first day of July of each year."

In conformity with such amendment and the statutory requirements, this report will cover the period from January 1, 1931, to June 30, 1932.

In the biennial report of the State Engineer of Nevada for the period 1929-1930, a brief sketch was given covering the irrigation development in the State, and the evolution and growth of our water law since its inception by the legislative Act of 1903. The entire report was prepared in considerable detail, and not only furnished an historical résumé of the activities of the office from the time of its creation down to the date of that report, but embodied, among other things, discussions on measurement of water, irrigation districts formed in Nevada, Colorado River development, underground water development, and other topics of interest to the water users in general. Owing to the comprehensive nature of the 1929-1930 report, further detailed discussions of the topics contained therein would appear to be needless repetition; consequently the present report will deal only with those matters as would seem to be pertinent in setting forth the accomplishments of this office during the present biennium. Copies of the biennial report of 1929-1930 can be secured at this office upon request.

Four sections of the water law of Nevada were amended by the legislative session of 1931, viz: Sections 34, 35, 52 and 72. The most important of these enactments, in so far as affecting the State Engineer's office is concerned, was the amending of section 52, chapter 106, Statutes of 1921, relating to the appointment of water commissioners and payment of salaries for same. Under the new law, a State revolving fund of \$20,000 was established to be used in paying salaries of water commissioners who are supervising the distribution of water. This fund is under the direct supervision of the Board of Examiners, and all bills in connection with water distribution expense on the various stream systems subject to regulation by the State Engineer must be passed upon by said Board of Examiners before payment is made by the State Controller. The State is reimbursed for any moneys advanced from the fund through collection by the counties wherein assessments have been levied for the current year against lands having water rights subject to regulation by the State Engineer. The procedure has resulted in a practical solution of the former problem with respect to prompt payment of water commissioners' salaries, which results in a more efficient and economical water distribution service.

The irrigation season of 1931 throughout the State was marked by a very unusual water shortage on account of a dearth in precipitation during the winter of 1930 and 1931; while heavy storms in the water sheds of the stream systems during the winter of 1931-1932 brought a normal supply of irrigation water for the 1932 season. The effect of these two unusual years on distribution activities is more fully covered under the heading of "Water Distribution."

The office has put forth an earnest endeavor during the past biennium to promote a more harmonious feeling among the water users of the State by the dissemination of information pertaining to their water rights. As a concrete example, we refer to the Humboldt River report which represents assembled data covering distribution on that stream system for the years 1927-1931, inclusive.

A report will be available shortly after the first of the year, showing the complete record of the distribution of the waters of the Humboldt River for 1932.

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:

1. Water right applications.
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 of conformity with the above grouping. Thus, the Assistant 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 adjudications 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 River; while the State Engineer, in addition to supervising all the above, personally conducts work in connection with his 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 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 stockwatering rights. It therefore logically follows that the interests of the State's 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. See page 15 of 1929-1930 biennial report.

CHAPTER II

Administration, Appeals and Rulings

The year 1931 was characterized by a continuance of subnormal precipitation and extreme shortage in water supply for irrigation and stockwatering 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. This year was prolific with 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 came in from every section of the State, and it was 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 unadjudicated streams, appeals are frequently made for him to act as friend and arbiter to aid in effecting settlements of water controversies on such streams. At the request of the water users, the State Engineer, after extended conferences, was successful in getting many parties to amicably stipulate as to their relative rights. In many cases, there being no other water users on the stream, these stipulations will afford the basis for a speedy adjudication and resulting court decree defining the water rights involved.

In addition to settling controversies on unadjudicated streams, many appeals have been made from decisions of water commissioners on streams, the relative rights 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 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.

During the irrigation season of 1932 there was an ample water supply for practically all sections of the State, and very few new problems were presented to this office for review, except in the early part of the year when, due to the low temperature prevailing in the early part of the season, there was an acute shortage of water for irrigation on the Humboldt River until the first of June.

CHAPTER III

Applications for Water Rights

There has been a noticeable decline in the number of applications filed during the biennium covered by this report when compared with the number filed during the previous one. Such decline, in part, is undoubtedly attributable to a more thorough understanding among water users in general of the policy pursued by this office in passing upon applications to appropriate water; although the present economic situation coupled with the effect of a protracted drouth prior to 1932 has also probably been an influential factor.

In our last biennial report we emphasized the fact that for several years the available office and field force had been unable to keep abreast with current work, and as a consequence there was a large number of applications filed to appropriate public waters that remained unacted upon. The reduction in current work during the past biennium has therefore afforded the opportunity for the office to not only carry on the regular routine activities, but to make some definite progress in cleaning up some of the old work.

During the biennial period 211 applications have been filed. Of this number 20 applications have not as yet been sent to publication, having been returned to the applicants for correction or being held pending the receipt of supporting maps.

During the period from January 1, 1931, to June 30, 1932, definite action of some kind has been taken on 356 applications, representing action on 44 applications filed during the biennial period and 312 applications which were filed prior to January 1, 1931.

Without question, the State of Nevada, since the enactment of the Livestock Watering Act of 1925, has made definite progress in the direction of its range control policy by virtue of valid stockwatering rights. That such rights represent a valuable asset in range control is evidenced by the fact that scarcely any applications to appropriate water for that purpose now reach the stage for action without being the recipient of a formal protest against the granting of a permit thereunder. The filing of these protests, naturally, has a tendency to retard action on applications, since past experience has demonstrated that a field examination on the ground of all applications to appropriate water is indispensable if the State Engineer is to carry into effect a doctrine of protection with respect to prior existing rights. In line with such a policy, the office has, through its field engineers, during the present biennium made field examinations on the ground, and rendered written reports in connection therewith, on approximately 300 applications.

The water law makes it discretionary with the State Engineer regarding the holding of formal hearings on protested applications. The work of the office has therefore been expedited in numerous instances by exercising such discretionary authority, resulting in action on 130 protested applications without resorting to the formality of any hearings. Formal hearings have been conducted in

connection with 29 protested applications, and decisions affecting 27 of these have been rendered.

1. Status of applications filed prior to 1931 (Chap. XVI).
2. Status of appropriations filed during the period January 1, 1931, to June 30, 1932 (Chap. XVII).
3. Certificates issued under permits (Chap. XVIII).

CHAPTER IV

Adjudication of Water Rights

Favorable progress has been made during this last biennium in determining the relative rights of water users diverting water from streams that are in the process of adjudication. This is especially true of the work that was accomplished on the Little Humboldt River, which is one of the major stream systems of the State.

In the last biennial report of the State Engineer (for the years 1929-1930) a complete résumé of proceedings on the stream systems that have been the subject of adjudication is given, and a repetition of such summary is therefore eliminated in this report.

Since January 1, 1931, the work of determining relative rights has progressed on the following streams: Little Humboldt River, Silver Creek, Peavine Creek.

Streams upon which an adjudication has been requested and proceedings initiated since January 1, 1931, are: Piute Creek, Battle Creek, Bartlett Creek, Steptoe Creek.

A résumé is herewith given of the progress made on all the above-named streams:

LITTLE HUMBOLDT RIVER

The Little Humboldt River system derives the major portion of its water supply from the Little Humboldt River proper, Martin Creek and Cottonwood Creek. This river also receives water from several other small tributaries. Approximately 45,900 acres of land are irrigated from these sources. A greater part of this area is wild hay and natural meadow pasture land, and is located in Paradise Valley, 20 to 40 miles north of Winnemucca.

January 18, 1929—Formal notice was served upon the water users of the Little Humboldt River and its tributaries that the State Engineer's Office would proceed with the adjudication of this stream system pursuant to section 14, chapter 253 of the Statutes of 1915. This notice granted the water users a period of 60 days in which to file "additional or supplementary maps, plats, surveys, or evidence, or objections to the admissibility of any evidence hitherto presented and on file in my office." This period was extended from time to time, and on August 1, 1929, was closed. From the data that was on file in this office and with the additional data that was submitted during the period extending from January 18 to August 1, 1929, the abstract of claims was prepared.

October 1, 1929—Abstract of Claims to Waters of the Little Humboldt River and Its Tributaries prepared by the State Engineer and filed in his office at Carson City.

November 1, 1929—The present State Engineer filed in his office the Preliminary Order of Determination of the Little Humboldt River and Its Tributaries in Humboldt and Elko Counties.

January 6, 1930—Preliminary Order of Determination opened for inspection, continuing for a twenty-day period.

January 6 to February 15, 1930—Period allowed for filing Objections to Preliminary Order of Determination.

February 15, 1930—Water users notified as to the date for opening hearing on Objections to the Preliminary Order of Determination.

February 21, 1930—Objections to Preliminary Order of Determination printed and officially filed by the State Engineer in his office.

March 19, 1930—Opening date for hearing Objections to the Preliminary Order of Determination. This hearing was postponed from time to time upon request of the attorneys representing the various water users.

October 1, 1930—Began hearings on objections to the State Engineer's Preliminary Order of Determination. This hearing was completed on December 12, 1930.

March 19, 1931—Order of Determination filed by the State Engineer in his office at Carson City.

April 10, 1931—Order of Determination, together with all evidence, maps and transcripts was filed with the Clerk of the Sixth Judicial District Court at Winnemucca.

September 1, 1931—Hearings commenced before Hon. E. P. Carville on Exceptions to the Order of Determination. This hearing was completed on November 4, 1931.

May 4, 1932—Submitting of briefs, and oral arguments held before the court at Winnemucca.

It is contemplated that the final decree will be issued by the court sometime prior to the beginning of the 1933 irrigation season.

SILVER CREEK

The location of Silver Creek and its tributaries is about 18 miles northerly from Austin in Lander County.

There are three water users on the stream system and the total cultural area irrigated is approximately 312.5 acres.

March 17, 1927—Water users on the stream system petitioned the State Engineer for a determination of the relative rights in and to the waters thereof.

March 7, 1928—Field investigation made by State Engineer and report of same filed in his office.

March 9, 1928—Water users on the stream system waive in writing and request that the State Engineer make an order of determination without the giving, serving or publication of any notices.

December 1, 1931—Order of Determination filed by the State Engineer in his office at Carson City.

March 1, 1932—Order of Determination together with all the original evidence and data as of record in the State Engineer's office were filed with the Clerk of the Third Judicial District Court at Austin, Nevada.

April 18, 1932—Opening date set for hearing exceptions to the State Engineer's Order of Determination before the Hon. Edgar Eather, presiding judge. This hearing was postponed from time to time upon the requests of the Attorney-General, representing the State Engineer's Office, and claimants on the stream system. It is expected the hearings will be held during the fall, giving sufficient time thereafter for the Court to prepare his findings and final decree prior to the 1933 irrigation season.

PEAVINE CREEK

The location of Peavine Creek and its tributaries is about 50 miles north of Tonopah, in Nye County. There are two water users that are directly involved in this adjudication, although there is an additional amount of acreage that derives a partial supply of irrigation water by virtue of water rights, as evidenced by filings in the office of the State Engineer.

February 18, 1928—Petition filed with State Engineer by water users requesting the State to initiate proceedings to determine relative rights.

June 25, 1928—Field investigation completed and report filed by the State Engineer in his office.

August 8, 1928—Notice and order of proceedings to determine water rights published.

September 27, 1929—Notice and order for taking proofs published.

July 1, 1930—Abstract of Claims prepared by State Engineer and filed in his office.

July 5, 1930—Preliminary Order of Determination filed by the State Engineer in his office.

July 7, 1930—Notice and Order setting time and place of inspection of Abstract of Claims and Preliminary Order of Determination.

September 19, 1930—Notice of time and place for hearing Objections and Proof of Service on Claimants. Date of hearing set for December 8, 1930. This hearing was postponed from time to time upon request of the various parties.

January 20, 1931—Hearing on Objections to the State Engineer's Preliminary Order of Determination held at Tonopah before a representative of the State Engineer's Office.

June 28, 1932—Order of Determination filed by State Engineer in his office.

Just as soon as it is practicable to assemble all the evidence, maps, etc., the same, together with the Order of Determination, will be filed with the Clerk of the District Court at Tonopah. Without any unnecessary delays the final adjudication of these water rights should be completed before the beginning of the 1933 irrigation season.

PIUTE CREEK

Piute Creek and its tributaries are located in the western part of Humboldt County, on the west slope of the Black Rock Desert. Sole use of water from this stream for beneficial purposes is made by one individual. Approximately 540 acres of land are irrigated from this source.

December 20, 1929—Petition filed with the State Engineer requesting a determination of the relative rights to the use of the waters of the stream system.

April 6 and 7, 1930—Field investigation made by State Engineer and report of same filed in his office on May 5, 1930.

May 9, 1930—State Engineer makes order granting petition for a determination of the relative rights of the stream system.

April 21, 1931—Waiver of notice submitted requesting State Engineer to make an Order of Determination without the giving, serving or publication of any notices.

June 3, 1931—Proofs of Appropriation filed in the office of the State Engineer.

BATTLE CREEK

Battle Creek and its tributaries are located in the western part of Humboldt County, on the west slope of the Black Rock Desert. Use of water from this stream for beneficial purpose is made by one individual who irrigated approximately 600 acres.

December 20, 1929—Petition filed with the State Engineer requesting a determination of the relative rights to the use of the waters of the stream system.

April 6 and 7, 1930—Field investigation made by State Engineer and report of same filed in his office on May 5, 1930.

May 9, 1930—State Engineer makes order granting petition for a determination of the relative rights of the stream system.

April 21, 1931—Waiver of notice submitted requesting State Engineer to make an Order of Determination without the giving, serving or publication of any notices.

June 3, 1931—Proofs of Appropriation filed in the office of the State Engineer.

BARTLETT CREEK

Bartlett Creek and its tributaries are located in the western part of Humboldt County, on the west slope of the Black Rock Desert. Approximately 225 acres of land are irrigated on this stream system. Like Piute and Battle Creeks, use of water under a vested right is made by one individual.

December 20, 1929—Petition filed with the State Engineer requesting a determination of the relative rights to the use of the waters of the stream system.

April 6 and 7, 1930—Field investigation made by State Engineer and report of same filed in his office on May 5, 1930.

May 9, 1930—State Engineer makes order granting a petition for a determination of the relative rights of the stream system.

May 12, 1931—Waiver of notice submitted requesting State Engineer to make an Order of Determination without the giving, serving or publication of any notices.

June 3, 1931—Proofs of Appropriation filed in the office of the State Engineer.

STEPTOE CREEK

The location of Steptoe Creek and its tributaries is in White Pine County on the west slope of the Schell Creek Range, and the stream proper enters the Steptoe Valley about nine miles southeasterly from Ely. Approximately 1,960 acres of land are irrigated from the stream system.

January 12, 1931—Consolidated Coppermines Corporation of Kimberly, Nevada, owners and operators of the "CCC" Ranch, located on Steptoe Creek, petitioned the State Engineer for a determination of the relative rights to the use of the waters of the stream system.

August 12 and 13, 1931—Field investigation made by State Engineer's Office and report of same filed in this office on December 24, 1931.

August 17, 1931—State Engineer made order granting petition for a determination of the relative rights of the stream system.

January 11, 1932—The State Engineer issued an order initiating proceedings for a determination of the rights involved.

March 21, 1932—Notice and Order for taking proofs published. All known claimants on the stream system were notified that proofs must be filed in the office of the State Engineer, at Carson City, not later than July 16, 1932.

**PROOFS OF APPROPRIATION FILED DURING THE YEARS
1931 AND TO JUNE 30, 1932**

During this period the following proofs of appropriation have been accepted and filed for future use in the determination of relative rights on various sources of water supply within the boundaries of the State. A condensed statement giving the salient data is herewith given in the order of:

1. Proof of Serial Number.
2. Date filed.
3. Name of Claimant.
4. Source of Water Supply.
5. Use Claimed.
6. Purpose of Appropriation.

1931

| | | |
|-----------|--------------|--|
| 02229.... | 1-23-31.... | Frank H. Murphy; Bud Brown Spring; Washoe County; Stockwater. |
| 02230.... | 2- 3-31.... | Town of Hawthorne; Big Squaw Creek and Tributaries; Mineral County; Municipal purposes. |
| 02231.... | 2- 3-31.... | Town of Hawthorne; Water Tunnel and Springs, Tributary of Big Squaw Creek; Mineral County; Municipal purposes. |
| 02232.... | 4-22-31.... | Griswold Henderson Livestock Company; White River Channel and Sink, White Pine County; Stockwater. |
| 02233.... | 4-22-31.... | Griswold Henderson Livestock Company; Steptoe Creek, White Pine County; Stockwater. |
| 02234.... | 4-22-31.... | Griswold Henderson Livestock Company; Willow Creek, Elko County; Stockwater. |
| 02235.... | 5- 2-31.... | Dave L. Barnes; Clover Wash, Lincoln County; Stockwater. |
| 02236.... | 5- 2-31.... | Dave L. Barnes; Clover Wash, Lincoln County; Irrigation and domestic. |
| 02237.... | 6- 3-31.... | W. A. Johnstone; Piute Creek, Humboldt County; Irrigation and Domestic. |
| 02238.... | 6- 3-31.... | W. A. Johnstone; Sheep Springs Creek, Tributary of Piute Creek, Humboldt County; Irrigation and Domestic. |
| 02239.... | 6- 3-31.... | W. A. Johnstone; Battle Creek, Humboldt County; Irrigation and Domestic. |
| 02240.... | 6- 3-31.... | W. A. Johnstone; Bell Morrell Creek, Tributary of Battle Creek, Humboldt County; Irrigation and Domestic. |
| 02241.... | 6- 3-31.... | W. A. Johnstone; Bartlett Creek, Humboldt County; Irrigation and Domestic. |
| 02242.... | 5-29-31.... | W. F. and Letha Cockrell; Wall Creek and Springs, Washoe County; Stockwater. |
| 02243.... | 5-29-31.... | W. F. and Letha Cockrell; Badger Creek and Springs, Washoe County; Stockwater. |
| 02244.... | 5-29-31.... | W. F. and Letha Cockrell; Right Fork and Springs, Washoe County; Stockwater. |
| 02245.... | 6-16-31.... | F. A. Nolan; Wall Creek and Springs, Washoe County; Stockwater. |
| 02246.... | 8-28-31.... | J. L. Hylton; Red Rock Spring No. 5, Elko County; Stockwater. |
| 02247.... | 9- 4-31.... | Bordoli Brothers; Able Springs, Nye County; Stockwater. |
| 02248.... | 9- 4-31.... | Bordoli Brothers; Little Meadow Creek, Nye County; Stockwater. |
| 02249.... | 9- 4-31.... | Bordoli Brothers; Stormy Spring, Nye County; Stockwater. |
| 02250.... | 12-31-31.... | F. J. Powers and Son; Cherry Spring, Washoe County; Stockwater. |
| 02251.... | 12-31-31.... | F. J. Powers and Son; Yellow Rock Spring, Washoe County; Stockwater. |

1932

| | | |
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| 02252.... | 1-12-32.... | E. J. Fee; South Spring, Washoe County; Stockwater. |
| 02253.... | 1-12-32.... | E. J. Fee; Leary Spring, Washoe County; Stockwater. |
| 02254.... | 1-12-32.... | E. J. Fee; Little Ballie Spring, Washoe County; Stockwater. |
| 02255.... | 3-28-32.... | Thousand Creek Land & Livestock Company; Martinez Spring, Humboldt County; Stockwater. |

| | | |
|-----------|-------------|--|
| 02256.... | 3-28-32.... | Thousand Creek Land & Livestock Company; Rock Spring, Humboldt County; Stockwater. |
| 02257.... | 3-28-32.... | Thousand Creek Land & Livestock Company; Smith Lake, Humboldt County; Stockwater. |
| 02258.... | 3-28-32.... | Thousand Creek Land & Livestock Company; Catnip Spring, Washoe County; Stockwater. |
| 02259.... | 3-28-32.... | Thousand Creek Land & Livestock Company; North Lake, Washoe County; Stockwater. |
| 02260.... | 3-28-32.... | Thousand Creek Land & Livestock Company; South Lake, Washoe County; Stockwater. |
| 02261.... | 5- 2-32.... | Martha M. Cook; Tuledad Spring and Creek, Washoe County; Stockwater. |
| 02262.... | 5- 2-32.... | Martha M. Cook; Tuledad Creek and Springs, Washoe County; Stockwater. |
| 02263.... | 5- 2-32.... | Martha M. Cook; Unnamed Lake, Washoe County; Stockwater. |
| 02264.... | 5-16-32.... | D. B. and Irene Williams; Wood Gulch, Elko County; Irrigation and Domestic. |
| 02265.... | 6- 9-32.... | F. J. Powers & Son; Mahogany Creek and Spring, Washoe County; Stockwater. |

There were no certificates issued under proofs of appropriation during this last biennium.

ADJUDICATIONS BY DEPARTMENT OF STATE ENGINEER

The following table shows the status of all the streams in the State that have been or are the subject of adjudication proceedings and given in the order of:

1. Name of Stream System.
2. Date Adjudication Proceedings Initiated.
3. Status Toward Completion, Etc.
4. Remarks.

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|--|
| Baker Creek —1925; To Preliminary Order of Determination. |
| Barber Creek (Douglas County)—1916; January 29, 1919. |
| Bartlett Creek —1930; To Proofs Taken. |
| Battle Creek —1930; To Proofs Taken. |
| Bishop Creek (Elko County)—1910; To Notice of Pendency of Proceedings; Tributary to Humboldt River, included in the adjudication of the Humboldt River Stream System. |
| Carrico Creek —1927; July 9, 1930; Certificates of Appropriation of Water issued by State Engineer to water users. |
| Carson River —1904; November 21, 1928; Order of Determination filed with Clerk of Court. July 1, 1930, Supreme Court of State of Nevada issued writ of prohibition holding in abeyance any effort on part of the State of Nevada to complete adjudication proceedings. Suit now before United States District Court of Nevada. |
| Cherry, Pine and Cottonwood Creeks —1912; 1912; Adjudication in accordance with secs. 14 to 19, inclusive, Statutes of 1907 (see 4685 to 4600, inclusive, Revised Laws 1912) and Certificates issued. |
| Chiatovich Creek —1915. |
| Clear Creek (Pershing County)—1918; November 25, 1919. |
| Clover Valley Creek —1919; To Order Setting Time and Place of Inspection. |
| Crum and Wilson Creeks —1925; May 26, 1928. |
| Currant Creek —1919; April 23, 1921. |
| Deephole Springs, Clear Creek, Squaw Valley Creek, Lost Creek, Grass Valley Creek, Cottonwood Creek, Red Mountain Creek and Hot Springs —1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes 1915. |
| Eden Creek —1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes of 1915. |
| Evans Creek —1916; To Notice of Inspection served on claimants. |
| Franklin River —1927; To investigation of Facts and Conditions; Pending Order Granting Petition. |
| Goose Creek —1916; June 29, 1922. |
| Humboldt River —1913; January 2, 1931, Opinion and Decision of the Court entered and filed; August 23, 1931; Proposed Findings of Fact, Conclusions of Law and Decree filed with the District Court at Winnemucca; December 14-17, 1931; Motions for new trials presented and argued; March 18, 1932; Decision on Motions for new trials filed. |

- Indian or Chiatovich Creek (Esmeralda County)**—1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes 1915.
- Indian or McNett Creek (Esmeralda County)**—1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes 1915.
- K. C. Creek**—1927; March 16, 1929; Suit filed in District Court requesting the Court restrain State Engineer from proceeding with adjudication; Court dissolved injunction and dismissed restraining order; July 10, 1930, Amended Complaint filed requesting restraining order; No action to date by Court on amended restraining order.
- Lehman Creek**—1925; To Proofs taken.
- Little Humboldt River**—1910; September 1, 1931, to November 4, 1931, hearings held on exceptions to the State Engineer's Order of Determination; May 4, 1932, briefs submitted and oral arguments held before the Court.
- Long Spring (White Pine County)**—1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes 1915.
- Muddy River**—1906; March 12, 1920; Referred by Tenth Judicial District Court to State Engineer, 1919 (see section 45, chapter 140, Statutes 1913).
- McNett Creek**—1915.
- Overland Creek**—1919; October 5, 1925.
- Owyhee River**—1913; June 17, 1924; Suit filed in the U. S. District Court of Nevada by W. T. Smith as Receiver for the Union Land and Cattle Company, complainant v. R. M. Woodward et al., for appropriating the waters of Owyhee River belonging to the Union Land and Cattle Company. July 5, 1930; Order made by the U. S. District Court of Nevada making all parties of the Tuscarora branch of the Owyhee River and its tributaries in Nevada, parties defendant in the suit of Ellison Ranching Company, plaintiff, v. R. W. Woodward et al., defendants, successors to W. T. Smith, Receiver of the Union Land and Cattle Company. September 18, 1931; Geo. A. Bartlett appointed Special Master by the U. S. District Court to take evidence and to submit to the court findings and form of proposed decree. Suit is now pending before the Special Master.
- Pahranagat Lake**—1921; Certificates of Proof of Appropriation issued October 14, 1929.
- Peavine Creek**—1928; Hearings of Objections to Preliminary Order of Determination.
- Piute Creek**—1930; To Proofs taken.
- Quinn River**—1907; Adjudication Proceedings initiated and completed before the District Court; Final Decree entered by Court April 9, 1919; A petition for an alternative writ of mandate was filed in the Supreme Court on August 12, 1930, requesting the State Engineer to assume and take control and to regulate the waters of Quinn River; The Supreme Court on July 2, 1931, handed down a decision which failed to sustain the alternative writ and dismissed the proceedings.
- Reese River (Lander County)**—1910; To Notice of Pendency of Proceedings.
- Rice Creek**—1919; June 29, 1922.
- Robison Creek**—1915; To Abstract of Proofs; Adjudication initiated under provision 88a, chapter 253, Statutes 1915.
- Salmon River**—1915; March 1, 3, 1923.
- Siegel Creek**—1918; To Proofs taken.
- Silver Creek**—1928; To Proofs taken.
- Simpson Creek (Eureka County)**—1910; To Notice of Pendency of Proceedings.
- Six Mile Creek**—1919; 1925.
- Spanish Creek (Perry Aiken Creek)**—1915; Decree entered January 22, 1916.
- Steele Creek**—1915; To Notice and Order continuing hearings.
- Steptoe Creek**—1931; To Notice and Order of taking Proofs.
- Thousand Springs Creek**—1928; April 1930; Certificates of Appropriation of Water issued by State Engineer to water users.
- Tony Creek**—1925; August 31, 1929; Final decree rendered by Court.
- Truckee River**—1913; Temporary Order issued by United States Court, February 13, 1926.
- Trout Creek (Elko County)**—1910; To Notice of Pendency of Proceedings; Tributary to Humboldt River now under adjudication as part of Humboldt River Stream System.
- Virgin River**—1921; May 4, 1927.

Walker River—1902; March 3, 1919, Final Decree; July 3, 1924, Bill of Complaint filed by the United States against Walker River Irrigation District restraining the district from obstructing or hindering, etc., the natural flow of 150 cubic feet per second of water to the Walker River Indian Reservation; March 12, 1928, B. F. Curler appointed Special Master by the U. S. District Court of Nevada; December 29, 1930, order of U. S. District Court made and entered accepting resignation of B. F. Curler as Special Master; January 6, 1931, Robert M. Price appointed Special Master to succeed B. F. Curler, resigned; April, 1932, tentative findings made; Final report has not been submitted to the Court.

Weeks (Steel) Creek—1915; To Notice of Inspection served on claimants. Refer to K. C. Creek.

White River—1912; December 4, 1922; Certificates issued under sections 14 to 19, inclusive, Statutes 1907. Case reopened under Statutes 1913. Order of Determination filed with the Court; Hearing held thereon but as yet no final decree rendered.

In addition to the foregoing the following is a partial list of streams in each county of the State on which no statutory adjudication of relative rights has ever been made:

Churchill County

East Gate Creek, Edwards Creek, Cherry Creek, Horse Creek, Headleys Creek, Shoshone Creek.

Clark County

Kyle Canyon Creek, Corn Creek, Indian Springs, Willow Creek, Cold Creek, Las Vegas Wash.

Douglas County

Edgewood Creek, Glenbrook Creek.

Elko County

Mayhugh Creek, Jasper Creek, Dawley Creek, Hawkins Creek, Egan Creek, Chase Creek, Nelson Creek, Dolly Varden Springs, Taylor Creek and Springs (in T. 27 N., R. 62 E.), Taylor Creek and Springs (in T. 28 N., R. 61-62 E.), Taylor Creek and Springs (in T. 29 N., R. 62 E.), Cave Creek, Leach Creek, Wiseman Creek, Winchell Creek, Kelly Creek, Warm Creek, Williams Creek, Stratton Springs, Hardy Creek, Pilot Creek, Phalan Creek.

Eureka County

Cottonwood Creek, Kelly Creek, Ferguson Creek, Pethansen Creek, Roberts Creek, Simpson Creek, Fish Creek, Cedar Creek, Willow Creek, Denay Creek, Henderson Creek, Reynolds Creek, McClosky Creek, Allison Creek, Pine Creek.

Humboldt County

Big Creek, Pass Creek, Boyd Basin Creek (U. S. District Court Decree); Big High Rock Creek, Buffalo Creek, Fall Creek, McConnell Creek, Jakes Creek, Jim Creek, Lee Creek; Leonard Creek (District Court Decree); Long Canyon Creek; Pass Creek, Big Creek and Boyd Basin Creek (U. S. District Court Decree); Santa Rosa Creek; Quinn River (District Court Decree); Soldier Meadow Creek, Wood Canyon Creek, Horse Creek, Thousand Creek, Alder Creek, Knott Creek, Cane Creek, Wilder Creek, Bottle Creek, Happy Creek, Jackson Creek, Trout Creek, Thomas Creek, Cluncey Creek, Water Canyon.

Lander County

Willow Creek, Spanish Creek, Tar Creek, Globe Creek, Crooked Creek, Sheep Creek, Kingston Creek, Murphy Creek, Peterson Creek, Shoshone Creek, Smith Creek, Porter Creek, Wilson Creek, Carsley Creek, Blackbird Canyon, Duck Creek, Woodward Creek, Mill Creek, Birch Creek, Lynch Creek, Frenchman Creek, Gilman Creek, Rook Creek, Santa Fe Creek, Reese Creek, Big Creek, Dry Creek, Blakely Creek, Campbell Creek, Gilbert Creek, Clear Creek, Johnson Creek, Cottonwood Creek, Fish Creek, Lewis Creek, Trout Creek.

Lincoln County

Wilson Spring, Big Springs, Malloy Creek, Cottonwood Creek, Sheep Creek, Cave Creek, North Creek, Meadow Valley, Cherry Creek, Mill Canyon Creek.

Mineral County

Nye Creek.

Nye County

Needles Creek, Grinnell Creek, Pine Creek, Big Creek, Troy Creek, Amargosa River, Reese River, Cloverdale Creek, Hercules Creek, Jefferson Creek, Blue Springs Creek, Wisconsin Creek, Last Chance Creek, Belcher Creek, Broad Creek, Jet Creek, Barker Creek, North Barker Creek, Hot Creek, Snowball Creek, Manhattan Canyon, Moomres Creek, Moorman Channel, Ione Creek, Mosquito Creek, Bull Creek, Big Springs Creek, Cherry Creek, Willow Creek, Little Meadows Creek, Wilson Creek, Stewart Creek, Indian Creek, North and South Twin Creeks, North and South Moore Creeks, Decker Creek, Deckerbob Summit Creek, Ophir Creek, Twin Rovers Creek, Cove Creek, Pablo Creek, Fish Creek, Indian Creek, Carsley Creek, Eden Creek, Itin Canyon, Ash Meadow Spring, Cottonwood Creek, Clear Creek, Shipley Creek, Warm Springs.

Pershing County

Buena Vista Creek, Indian Creek, Golconda Creek, Pleasant Valley Creek, Water Canyon Creek, Coyote Creek, Limerick Canyon Creek, Panther Creek, Cherry Creek, Big Creek, Sonoma Creek, Morning View Canyon Creek, Spring Valley Creek, Rocky Canyon Creek, Lang Syne Canyon Creek, Star Creek.

Storey County

Six Mile Canyon.

Washoe County

Buffalo Creek, Cottonwood Creek, High Rock Creek, Little High Rock Creek, Rye Patch Creek, Tuledad Creek, Washoe Lake and Tributaries, Sand Creek, Fish Creek, Clear Creek, Granite Creek, Poison Creek, Red Mountain Creek, Rock Creek, Wall Canyon Creek, Lost Creek, Catnip Creek.

White Pine County

Bassett Creek, Bastion Creek, Weaver Creek, Snake Creek, Chinn Creek, Muncy Creek, Ellison Creek, Stephens Creek, Silver Creek, Spring Creek, Nigger Creek, Willard Creek.

The number of known unadjudicated streams on which irrigation is practiced is approximately 220. Applications for adjudications are continually received from this list, and the law provides that the State Engineer must take them up in the order in which they are received, and proceed with the adjudication when the work of the office will permit.

CHAPTER V
Water Distribution
HUMBOLDT RIVER

Beginning with the year 1917, the adjudication of the waters of Humboldt River and its tributaries has been a matter of public interest to the people of the State of Nevada.

The area of the watershed of this stream is approximately 14,000 square miles, the head waters rising in the vicinity of Wells, and the surplus waters flowing past the Lovelock Valley are discharged into the Humboldt Sinks. The main channel of the stream is approximately 1,000 miles in length with a difference of elevation of 1,090 feet between Elko and Lovelock.

About 1917, adjudication proceedings were initiated by the State Engineer's office for the purpose of determining the relative rights of some six hundred water users. These proceedings were concluded early in 1932 by the issuance of a final decree by the court. This decree sets forth the year of priority of the various rights as well as classifying the different culture areas, and also establishes a duty of water of three acre feet per acre for harvest crop lands, one and one-half acre feet for meadow pasture lands, and three-fourths of an acre foot per acre for diversified pasture lands.

The river naturally divides itself into two main districts for field work in the matter of distribution. The upper district embraces those lands irrigated from the tributaries and main river situated in Elko County, the lower end of this section being designated by the U. S. G. S. measuring station at Palisade.

The lower river is that part of the main river and its tributaries that lie below Palisade and extends to the Lovelock Valley.

These two main districts are again divided into several smaller districts for distribution purposes only.

Because of the length of the river, the time interval consumed in transporting water from one section to another, the distributing of water to several hundred priorities dating from 1861 to 1921, and numerous other factors it is essential that accurate forecasts be made of the probable run-off from each winter's snowfall in order that priorities entitled to water will receive the quantities which they have been decreed.

A complete report of the activities of the State Engineer's office on this stream would be too voluminous for this biennial report and would, of necessity, be a reprint of a special report that was prepared and issued by this office in March, 1932.

This special report is titled "Humboldt River Distribution and Different Features Affecting These Deliveries for the Years 1927 to 1931, Inclusive." This report contains five chapters which are as follows:

Chapter I—Humboldt River Distribution.

Chapter II—Run-off Measurements of Humboldt Stream System.

Chapter III—Opinion of Attorney-General Re State Engineer's Duties, Bartlett Decree.

Chapter IV—Humboldt River Advisory Board's Findings and Recommendations.

Chapter V—Humboldt Basin Surveys and Meteorological Data.

Chapter VI—Humboldt River Report of the United States Reclamation Service.

This report also includes twenty-two plates and eighteen charts which show the transportation losses and gains in various sections of the river.

A copy of this report, which contains all the pertinent factors relating to work undertaken on the Humboldt River up to and including the year 1931, may be obtained by writing this office.

Season of 1931

The snowfall on the entire watershed of this stream system during the winter of 1930-1931 was the lightest ever recorded, and as a result the run-off during the irrigation season of 1931 was less than 10% of normal. During the period March 1 to July 31, a total flow of 22,000 acre feet passed Palisade, 16,000 acre feet being delivered to priorities up to and including the year 1870. One irrigation was delivered to rights having a priority of 1871.

There is a total of 248,659.76 acre feet decreed to lands that are located between Palisade and Lovelock, so it can readily be seen that only a small portion of the lands in the lower river district were irrigated. The irrigation season ended on June 1 in this district.

Deliveries of water to lands in Elko County did not begin until about May 10, and all of the water available in this district after this time was used in the "Upper District" in order to serve the same priorities as had been served on the "Lower District."

The extreme shortage of water during the irrigation season of 1931 resulted in a material reduction of forage crop production and necessitated the shipping out of this area many thousands of sheep and cattle for winter feeding.

Season of 1932

The entire watershed of the Humboldt Basin was covered with a heavy fall of snow during the winter of 1931-1932. The snow forecast on March 1 indicated that there would be sufficient run-off to fill the priorities up to and including the year 1888. Due to the unusual cold weather experienced in March, April and the first half of May, the spring run-off was delayed to such an extent that on May 20 the outlook was such that there was a doubt as to the possibility of filling the rights having priorities up to the year 1888.

Between May 20 and 25 the rainy season started in the upper section of the river and these rains continued intermittently for a period of three weeks, thus increasing the flow of the river to such an extent that all lands, regardless of priority, were enabled to secure water for irrigation purposes.

The flow of the river at Palisade from March 1 to June 30 was 259,000 acre feet. The largest daily flow recorded at Palisade was 2,600 second feet, Battle Mountain 1,800 second feet, Comas 1,100 second feet, and Lovelock 650 second feet. By July 1 all rights on the entire river were assured of receiving one hundred per cent deliveries of all their rights.

A complete, detailed report of the activities of the State Engineer's office on the Humboldt River during the irrigation year of 1932 will

be compiled during the winter months of 1932-1933 and will be available for distribution by March 1, 1933.

LITTLE HUMBOLDT RIVER

Season of 1931

The distribution of the waters of the Little Humboldt River and its tributaries commenced after the Order of Determination of Relative Rights in and to the Waters of the Little Humboldt River and Its Tributaries in Humboldt and Elko Counties was filed with the Clerk of the Sixth Judicial District Court of the State of Nevada in and for the County of Humboldt on the sixth day of April, 1931.

Owing to the small flow in all the sources, each stream was considered separately, and the earliest priorities only were served.

There was not sufficient water in any of the sources to flow any distance down the valley, and the land located near the upper end of the valley was the only land that could be served.

On May 16 and 17 all dams on the Little Humboldt River were opened and all the flow was given to Abel and Curtner to satisfy their 1864 priority. This action on the part of the water commissioner was strictly in accordance with the Final Order of Determination.

On April 6, 1931, the Ed. Stock Land and Cattle Company filed a motion with the Clerk of the Sixth Judicial District Court of the State of Nevada, in and for the County of Humboldt, for an order staying in part the operation of the Final Order of Determination of the State Engineer of the State of Nevada as it related to their rights.

This motion included all water users on the Little Humboldt River proper, save and except D. W. Cathcart Estate, G. Miller, Jr., A. Hilliard and J. Warren Dutton, who were not served with any notice of application of said order. On May 9, 1931, the court ordered the said Final Order of Determination stayed in so far as it related to or affected the said Ed. Stock Land and Cattle Company, save and except as to the said D. W. Cathcart Estate, G. Miller, Jr., A. Hilliard and J. Warren Dutton.

The subsequent use of water by some of the above-named parties caused the Ed. Stock Land and Cattle Company to file a second motion with the Clerk of the above-named court for an order staying in whole the operation of the said Final Order of Determination, in so far as it affected the right to the use of the waters of the Little Humboldt River proper.

On May 29, 1931, the court ordered the said Final Order of Determination stayed in so far as it related to or affected the said Ed. Stock Land and Cattle Company, as determined in said Final Order of Determination, as to D. W. Cathcart Estate, D. E. Cathcart, Irene Holt, Beryl Kirk, Arlie Mendiola, G. Miller, Jr., A. Hilliard, and J. Warren Dutton.

From May 27 up to August 14, Ed. Stock Land and Cattle Company used practically all the water of the Little Humboldt River, and on the later date they turned most of the water down the channel for about nine days, and Abel and Curtner turned about half the water that reached their headgate in the Lyng Ditch to Mr. Gould

for stock water, a flow of about one-half ($\frac{1}{2}$) c.f.s. reached what is known as Mr. Gould's "Barbed Wire Field" on the 20th.

Seepage causes a heavy loss between the Government gage on Little Humboldt River and the head of Ed. Stock Land and Cattle Company's ditch on this stream, but lower in the valley the transportation loss is small. The waters of Cottonwood Creek and Martin Creek were diverted near the mouths of the respective canyons, and it was impossible to determine the transportation loss in these streams, but it is the opinion of the water commissioners that the heavy transportation losses noted are caused by the many obstructions found in the various channels.

In the large majority of cases where the water is diverted by tight dams, there are no ditches, the water being diverted by overflowing the banks, making it impossible to obtain a record of the quantities.

During the irrigation season, Little Humboldt River proper discharged 2,770 acre feet; Martin Creek, 2,720 acre feet; Cottonwood Creek, 390 acre feet; Mullinax Creek, 130 acre feet; and Colony Creek, 50 acre feet. No records were kept of the flow on the smaller creeks.

Season of 1932

The winter of 1931-1932 was very severe, with an unusual amount of precipitation. The valley which has an elevation of 4,400 feet was covered with snow as late as April 1, and the foothills until the middle of May. A rain and thaw occurred about the middle of March that caused all of the streams to flow at flood stage for a few days, but the water failed to flow any distance in the channels, due to the extreme low water table and the dry condition of the surrounding soil.

Due to the low mountain range surrounding Paradise Valley and the limited area of the watershed of this stream system, any sudden change in temperature causes a corresponding change in the flow of water. During the months of April and May the temperature varied greatly from day to day. One day would be warm only to be followed by several very cold days and nights.

The flow of the Little Humboldt River varied from 69.0 c.f.s. on April 1, to 152.6 c.f.s. on May 24, and 48 c.f.s. on June 30, the total discharge being 18,455 acre feet. The flow of Martin Creek varied from 175 c.f.s. on April 1, to 205.0 c.f.s. on May 21, and 11.0 c.f.s. on June 30, the total discharge being 22,345 acre feet.

The flow of Cottonwood Creek was fairly steady, with a daily average of 20.5 c.f.s., the total discharge being 4,100 acre feet.

The combined discharge of Beef, Colony, Dry, Handy, Indian, Mullinax, Provo, Stone House and Wash O'Neil Creeks amounted to about 10,000 acre feet. The total discharge of the stream system was about 54,900 acre feet.

There are certain sections of nearly every stream channel in this valley that are filled to such an extent with débris that they are partly or completely obliterated, causing an uncontrollable condition which brought about an overirrigation of certain areas in the upper end of the valley, while certain areas in the lower portion received little or no water until late in the season.

DUCKWATER AND CURRANT CREEKS**Duckwater Creek**

Although Duckwater and Currant Creeks are two separate stream systems, the distribution of their waters is conducted by one water commissioner.

Duckwater Creek is located near the northeastern part of Nye County and flows in a southerly direction into Railroad Valley. Approximately 3,000 acres are irrigated along this stream for a distance of twelve miles. A large warm spring rises on the upper ranch and contributes a constant flow of about 12 c.f.s. of water. During the nonirrigating season the flow from the spring is diverted into what is commonly known as the "Big Warm Spring Plateau" where it builds up an underground storage that later has a decided influence on the flow of numerous springs occurring along the creek channel. This storage, combined with a heavy return flow, makes from 36 to 40 cubic feet of water per second available for distribution during the early part of the irrigation season.

The court decree divides the water of this stream into five priorities, which call for a total delivery of 30.7828 c.f.s. As the irrigation season advances the flow of water diminishes, and during the months of July and August the total flow amounts to about 19 c.f.s. By following a system of rotation in the latter part of the irrigation season, the first, second and third priorities have always been served.

A great many factors enter into the distribution of the waters on this stream system. Fluctuations of stream flow due to changes in temperature and heavy rains are frequent; the sudden return of waste water or the cutting off of this supply is no uncommon occurrence, and creates conditions that require constant supervision.

The irrigation season generally commences about April 1 and ends September 30. During the period from March 28 to September 30 of the year 1931, 8,385 acre feet of water was delivered, and during the period from April 8 to June 30 of the year 1932, 4,535 acre feet of water was delivered.

Currant Creek

Currant Creek is located about twelve miles southeasterly from the extreme southerly ranch on Duckwater Creek. It flows in a westerly direction and approximately 600 acres are irrigated along the stream for a distance of about six miles.

The source of water is from springs above the ranches and augmented during the spring months by run-off from the higher reaches of the watershed. During the period of distribution the flow very often attains a volume of 15 c.f.s., and although this quantity does not hold up for any great length of time, 10 c.f.s. of water may continue to flow from one to two months. The springs continue to supply water throughout the irrigating season.

Fluctuations of flow are brought about by marked changes in temperature and heavy rainfall, and call for daily regulatory service.

The irrigation season of 1931 commenced March 24 and ended September 30. During this period 1,488 acre feet of water was delivered. During the early months of the 1932 irrigation season, the run-off was so heavy that the services of a water commissioner were not required until June 1, and from this date to the end of the month 841 acre feet of water was delivered.

WHITE RIVER

White River is located about twenty-four miles southwesterly from Ely, Nevada, and has its origin in the White Pine mountains. The stream is somewhat similar to Currant Creek, inasmuch as some of the flow is derived from seepage springs occurring on the meadows along the stream, which flow is augmented by a run-off from the mountains during the forepart of the irrigation season.

The Order of Determination of the State Engineer in the matter of determination of the relative rights in and to the waters of White River and its tributaries was filed with the Clerk of the Ninth Judicial District Court of the State of Nevada, in and for White Pine County, on or about July 26, 1922. Although a hearing in this matter was held before the court on December 4, 1922, the records do not disclose that a final decree in the adjudication has ever been entered. Consequently, pending a final decree in the matter, the Order of Determination of the State Engineer must be considered as being in full force and effect.

In the past there has been no regular service by a water commissioner on this stream. At intervals the water users have called on the State Engineer's office for a water commissioner's service, and it has been the practice at such times to lend temporarily the services of the Duckwater and Currant Creeks commissioner for making such adjustments in the diversions as found necessary. One trip was made by the commissioner during the irrigation season of 1931, and three trips were required during the early part of the 1932 irrigation season.

In the latter part of May, 1932, the stream was at flood stage, and due to the daily fluctuations in the flow it was found that an equitable distribution of the water was impossible unless a water commissioner made frequent visits to the weirs. Consequently, D. T. Nicholas was regularly appointed a water commissioner for White River, and placed in charge of distribution during what was considered the flood water period. Mr. Nicholas served in this capacity until the latter part of June, 1932, at which time the flow of the stream had diminished to a point where it was no more than sufficient to satisfy the earlier priority rights of the up-stream users.

It is recommended that adequate weirs and gates be installed by the water users of the stream, in order that a more equitable distribution of its waters can be made.

PAHRANAGAT LAKE

A deficiency in the water funds of Lincoln County, contracted during the early years of water distribution in Pahrnagat Lake Valley led some of the water users to request that a water commissioner be appointed for only the low water flow of the season. Consequently a three months' period was decided upon for 1931.

The water law provides for a three-year period, dating from the entry of the court decree, in which any water user may petition the court for a modification of said decree, in so far as it fixes the duty of water. The final decree of the court in the Pahrnagat Lake adjudication was entered on October 14, 1929. Hence, the water

users of this stream system now have until October 14, 1932, in which to apply to the court for any modification in the decree with respect to the amounts of water now allotted to their lands.

The distribution of water in this valley depends not only on the water supply, but upon the effectiveness of the drainage system and the cleanliness of the distribution channels. Due to the fact that weeds and grasses grow so rapidly, sixty days' time will entirely stop the flow of water in most channels. The water users on their own initiative have not properly taken care of this work, thus it was necessary for the water commissioner, in order to secure an equitable distribution of the water, to assist the water users in rehabilitating and reconstructing their distribution and drainage system. Therefore, this fact combined with the idea mentioned before, that is, the necessity for a system to gain the required duty of water measurements before October, 1932, made the 1931 season a very heavy burden on the water users as they were compelled to do all of the work themselves.

The main drainage channel at the lower end of the valley was the first to receive attention. About two hundred acres of water logged land was drained in 1931 by lowering the water level from three to five feet by deepening, widening, and straightening the old water course. This was done at the expense of the Pioche Bank, Inc. They thereby reestablished water rights to some valuable acreage that had become inundated during recent years.

The next problem taken up was to finish draining the three hundred and sixty acres listed in the decree as the Henry Sharp filing and known as the Sharp swamp. The season previous a drainage channel through the center of the swamp had been constructed, five feet wide and from three to ten feet deep. The main body of the swamp land is made up of decayed tules, and as this channel drew the water away, this soft porous material settled, leaving depressions ten feet deep in some places, and many of them a quarter of a mile back from the channel. Consequently, water would seep from the drainage channel through this porous formation into said depression for the reason that the channel was as deep as the valley below would permit, and this seepage will continue two or three years until enough clay washes into the bottom and sides to stop it. Therefore two new ditches were constructed in 1931, one on each side of the valley as high as the above grade would permit. Designed to carry most of the water around the swamp, the Sharp ditch on the west side of the valley as constructed is ten feet wide, average depth three feet, and about two miles long, while the East Sharp ditch has the same length, but three feet wide and two feet deep. To gain a reasonable point for diversion the first quarter of a mile of the East ditch was cut through a ridge ten feet high. Five cement headgates were installed for diversions, drain ditches were cleaned as well as diversion and irrigation ditches. Diversions were regulated in accordance with the court decree except those south of the Sharp swamp which were subject to slight variations because of the erratic flow, as coming through this area about forty-eight per cent of the water was lost.

The construction of the new ditches has almost entirely eliminated this loss, and it is estimated that for an expenditure of less than ten

thousand dollars the present drainage and irrigation system in the Pahranaagat Valley has increased property values one hundred thousand dollars.

The present needs are as follows: Those areas listed in the Final Order of Determination under Alamo Irrigation Company and H. Sharp's filings as swamp are now drained and should be permitted to continue their former use of water. Lateral drains every half mile should be constructed. A main drain eight to ten feet deep through the entire valley should be constructed and maintained. A main drain into Pahranaagat Lake and lateral drains for that area known as the Lincoln Land and Livestock Company's Lower Ranch should be constructed. A drainage channel connecting the Crystal Springs channel with the Hiko area should be built. Highline ditches on each side of the valley through its entire length are a vital need.

Water distribution for the season of 1932 commenced on June 1 and has continued in a satisfactory manner up to the present time.

TONY CREEK

The water supply of this creek during the year 1931 was so low that the services of a water commissioner were dispensed with.

During the year 1932, the water supply was of sufficient volume to satisfy all users on the stream system and only the part-time services of a commissioner were required. The office has met with no success in its efforts to have the water users on this stream agree to installation of some mechanical means for dividing the water in accordance with the priority rights and thus dispensing with the expense of a water commissioner.

MUDDY RIVER

The distribution of water on this stream has been handled in a satisfactory manner by S. D. Conger during the biennial period, and no complaint of any kind has been received from the water users.

SIX MILE CREEK

In the early part of the 1931 irrigation season several complaints were made to the State Engineer regarding the use of water on this stream, and a request was made for the services of a water commissioner. On April 25 a field engineer from the office made an investigation of the water supply on this creek, with both water users present.

On account of the flow in the creek being so low, it was agreed the services of a commissioner would be needless expense.

In June, 1932, a complaint was made relative to the use of water of this creek, but as rains occurred in the vicinity at about that time the complaint was not investigated, and up until June 30 no regulatory service has been required.

Unit Amounts Assessed for Distribution Purposes on Streams Under the Administration of the State Engineer

| Humboldt River— | Unit Assessment | |
|----------------------|-----------------|--------|
| | 1928 | 1929 |
| Elko County..... | 0.0500 | 0.0600 |
| Eureka County..... | 0.0500 | 0.0600 |
| Lander County..... | 0.0500 | 0.0600 |
| Humboldt County..... | 0.0500 | 0.0600 |
| Pershing County..... | 0.0500 | 0.0600 |

UNIT AMOUNTS ASSESSED FOR DISTRIBUTION PURPOSES—*Continued*

| | Unit Assessment | |
|-------------------------|-----------------|--------|
| | 1928 | 1929 |
| Carson River— | | |
| Douglas County— | | |
| East Fork..... | 0.0695 | 0.1475 |
| West Fork..... | 0.1010 | 0.1475 |
| Lyon County— | | |
| Dayton District..... | 0.2605 | 0.1475 |
| Churchill District..... | 0.1645 | 0.1475 |
| Ormsby County..... | 0.2049 | 0.1475 |
| Pahranagat Lake..... | 0.1500 | 0.1500 |
| Muddy River..... | 0.2200 | 0.2200 |
| Six Mile Creek..... | 0.5000 | 0.1500 |
| Tony Creek..... | None | 1.1500 |
| White River..... | 0.3000 | 0.1500 |

NOTE—The cost of supervision on the Truckee River under the Federal Courts is approximately \$11,000 annually on about 96,000 acres. This cost does not include detailed distribution.

CHAPTER VI

Measurement of Water

The 1929-1930 Biennial Report of the State Engineer of Nevada included, in addition to detailed information on construction of weirs, the submerged orifice and Venturi flumes, and the tables for computing the discharge when any of these water measuring devices are used. The subject was broadly covered in that report, copies of which are still available for distribution.

CONSTRUCTION OF WEIRS

The requirements for the proper setting and operating of a two-foot weir box and crest, for example, are:

1. It should be set at the lower end of a long pool sufficiently wide and deep to give an even smooth current, with a velocity of approach of not over 0.5 of a foot per second, which means practically still water.

2. The line of the weir box should be parallel with the direction of flow, that is, the crest is to be at right angles to the direction of the flow.

3. The face of the weir should be perpendicular, that is leaning neither up nor down stream.

4. The crest of the weir should be level, so the water passing over it will be the same depth at all points along the crest.

5. The distance of the crest above the bottom of the pool should be about three times the depth of water flowing over the weir crest, and the sides of the pool should be at a distance from the sides of crest not less than twice the depth of the water passing over the crest.

6. The gage or weir scale may be placed on the upstream face of the weir structure and far enough to one side so that it will be in comparatively still water. It has been found that the setting of the scale at one side of the weir, as shown, gives practically the same result as when it is set in the pool above as is usually directed. It is set with much less trouble, is more permanent and is easier to check.

7. The structure should have the width of the weir crest plainly marked on the upstream face. The metal parts of the weir should be accurately made and should be carefully placed after the weir box and weir board are installed.

8. The crest should be placed high enough so the water will fall practically free below the weir. A submergence or back water condition equal to a depth of about $\frac{1}{16}$ of the depth of the water over the weir or less has very little effect on the weir discharge and may be neglected in ordinary measurements.

9. For accurate measurements the depth over the crest should not be more than one-third of the crest.

10. The depth of water over the crest should not be less than about two inches, as it is difficult to get sufficiently accurate gage readings below this point to give close results. However, a broad crest weir with low gage heights, used where there is little fall, will give more reliable results as a rule than can ordinarily be obtained by the use of an orifice using the same amount of head.

THE SUBMERGED ORIFICE

The structure for the submerged orifice is built the same as for a weir, but instead of placing a weir crest in the front heading, an opening known as an orifice is placed therein.

This opening may be of any required dimensions and of any shape, though for convenience of computation certain standard dimensions are usually selected. The orifice is not used as generally as the weir. This is due to certain inherent disadvantages. First, the orifice structure is such that it gathers trash, which tends to check the flow and hence to destroy the accuracy of the measurement. Second, there is a chance for inaccuracy on low heads, that is, where there is but little difference between the upper and lower gage readings the relative discharge for this small difference is so great that a slight error in reading the gage makes a very great difference in the result of the computed discharge. Third, unless some special provision is made the submerged orifice is not adapted to passing large quantities of water; it will pond the water above the orifice so that damage from overflow is liable to be done to the canal or the heading. In the case of the weir, the proportional discharge is increased as the head increases, and the excess flow is automatically taken care of by passing over the weir.

The coefficient of discharge in the orifice is much more uncertain than in the case of the weir, and is affected by a greater variety of factors that are not so easily regulated. Notwithstanding the above mentioned disadvantages, there are times when it is desirable to use the orifice as a measuring device. This may occur where it is imperative to save head, or hold the water level as high as possible in the canal. In this case it may be necessary to sacrifice accuracy for the sake of saving head. There are times when it is desirable to combine a canal heading with a measuring device, in which case an orifice can well be used, because the heading shuts out the trash and regulates the flow.

Rules Governing the Use of the Orifice

The orifice opening should be regular in shape, and should have sharp edges. The pressure head should be not less than 0.10 of a foot.

The depth of submergence of the orifice should not be less than the height of the orifice, and a submergence of twice the height of the orifice is preferable.

There must be two gages, one of which should be set on the head-wall to one side and below the orifice. These gages should be set with their zero marks at the same elevation. This may be at any desired point, so it will always be covered with water when the orifice is in use.

Where a canal gate or heading is used for an orifice to measure water, the coefficient of discharge must be determined for each different condition, either by measuring the water over a weir or by a current meter measurement, if any degree of accuracy is required. This is because the discharge coefficient changes with the form and kind of orifice and in many cases with the depth of water and the water pressure. For this reason, if good measurements are desired, the standard orifice structure should be used, and the discharges may then be taken from the table for such structures.

Useful equivalents will be found on page 19.

CHAPTER VII

Office Engineering and Miscellaneous Office Work

The work of the office engineering force is varied and embraces every phase of office engineering connected with the initiation, perpetuation and substantiation of water rights. One of the most important duties consists of examination and checking of maps submitted in support of water right applications. During the present period of one and one-half years, 210 of these maps have been checked and filed. In addition, thirty-eight maps in support of proofs of appropriation and approximately fifty maps in support of proofs of beneficial use were checked and filed. The State range map, which was commenced during the year 1927, has had thirty-seven additional stock range areas placed upon it, which are supported by the same number of maps filed by different stockmen in support of their claim to certain range. This brings the total number of range areas on this map up to 262.

There were seventy-two other filings consisting of miscellaneous maps, reporters' transcripts, water supply records, hydrographic curves and tables, court decrees and reports of Humboldt River investigations that were checked and indexed. There were also twenty-four miscellaneous reports and records received which were also indexed and filed.

The office engineering force is called upon to aid in furnishing information relative to the status of applications, permits and even the extent of vested rights, and nearly every day the office is visited by people interested in the appropriation of water, and they are supplied with the desired data, and letters requesting information are answered.

All proofs submitted in connection with permits, proofs of appropriation and protests against the granting of applications are checked before they are filed.

When all the proofs in connection with permits are filed, the office engineering force prepare certificates of water right and submit them to the State Engineer for his approval. There were approximately 170 certificates prepared and issued during the above-named period.

On numerous occasions, office engineers have been called into the field to settle water distribution disputes, arrange satisfactory methods of distribution, employ water commissioners and supervise the work in general throughout the season.

They also prepare the water commissioners' budgets for the stream systems that are regulated under the supervision of the State Engineer and submit them to the different Boards of County Commissioners.

During the year 1931, at the request of the Asylum Commission, a survey was made of a line connecting the Insane Asylum sewer system with the City of Sparks disposal plant. In addition to the survey, an estimate was made as to the amount of material to be moved and the approximate cost of installation.

During certain periods of the day, after the routine work is completed, time is devoted to the preparation of detailed county maps for use in the field. Maps of Churchill, Eureka, Lander and Pershing Counties have been made, and a map of Elko County is well under way.

Many other minor engineering activities are attended to by this force that are too numerous to mention. However, the foregoing will in a measure show the volume of office engineering encountered during the period between January 1, 1931, and June 30, 1932.

Other activities of the office are outlined under Chapter IX, p. 55, and include the work of the State Engineer on the Public Service Commission, the Colorado River Development Commission, The Colorado River Advisory Board, the Irrigation District Bond Commission, the State Range Commission, the Bureau of Industry, Agriculture and Irrigation, State Irrigation Board, and other work.

CHAPTER VIII Cooperative Work

STREAM MEASUREMENT WORK

(In Cooperation with United States Geological Survey)

By A. B. PURTON, *District Engineer, United States Geological Survey*

General stream measurement work has been continued during the biennium by the United States Geological Survey under a standard form of agreement whereby the State and Federal Governments contribute funds on a 50-50 basis.

The data obtained as a result of these cooperative investigations are published in the annual water supply papers of the Geological Survey. The United States has been divided into 12 primary drainage basins and, for convenience, the annual progress reports on stream measurements are published in 14 water supply papers. Each of these papers contains the data for one primary drainage basin, with the exception of the Columbia River Basin, for which the data are published in three water supply papers. Nevada is included in the Great Basin, Colorado River, and Columbia River primary drainage basins. The stream-flow data for this State appear in the water supply papers for these basins.

The variations in the annual flow of Nevada streams are apparent even to the casual observer. Perhaps in no other State do the extremes cover a wider range. The results of stream measurement work provide a reliable and readily available record of these variations. There is gradually being built up a fund of information, increasing in value as the yearly accretions become available, upon which to base current plans for the operation of present developments and studies looking to the economic use of all the water resources.

The longer stream-flow records in connection with the scientific snow surveys are making it possible for engineers to forecast with increasing accuracy and very practical value the probable flow from the more important water sources. As experience develops and the accumulation of data permits increasing accuracy in forecasting, it seems reasonable to expect that this rather recent application of base hydrologic data will aid materially in the satisfactory solution of some complicated problems in water distribution and utilization.

Acknowledgments are due to the water users, particularly in the Walker River and Humboldt River basins, for valuable assistance in maintaining stations in those basins, and to the United States Indian Irrigation Service for financial support and other cooperation. Records for the station on Carson River at Fort Churchill have been furnished by the Newlands Project.

On June 30, 1932, records were being obtained at the stations shown in the following list:

Colorado River Basin

Virgin River at Littlefield, Ariz., 1929-.

Snake River Basin

Salmon Falls Creek near San Jacinto, Nevada, 1909-1916; 1919-.
Owyhee River at Mountain City, Nevada, 1927-.

Great Basin and Minor Basins in Nevada**WALKER LAKE BASIN**

East Walker River near Bridgeport, Calif., 1911-1914; 1921-
 Walker River near Wabuska, Nevada, 1902-1908; 1920-
 Walker River at Schurz, Nevada, 1913-
 West Walker River near Coleville, Calif., 1902-1910; 1915-
 West Walker River near Wellington, Nevada, 1917-

CARSON-HUMBOLDT SINK

Carson River near Fort Churchill, Nevada, 1911-
 Humboldt River at Palisade, Nevada, 1902-1906; 1911-
 Humboldt River near Oreana, Nevada, 1896-1909; 1910-
 South Fork of Humboldt River near Elko, Nevada, 1896-1909;
 1910-
 Martin Creek near Paradise Valley, Nevada, 1922-
 Cottonwood Creek near Paradise Valley, Nevada, 1925-
 H. L. I. L. & P. Co.'s feeder canal—Mill City, Nevada, 1914-
 H. L. I. L. & P. Co.'s outlet canal—Humboldt, Nevada, 1914-

NOTE—Detailed data of run-off measurement of Nevada streams can be found in the State Engineer's 1929-1930 Biennial Report, a copy of which can be secured from this office. The importance of this work cannot be overestimated, and was emphasized by the recent unprecedented dry years, on account of which many estimates for storage were changed. It is impossible to make a dependable forecast of storage possibilities on a stream system without continuous stream-flow records.

SNOW SURVEYS

By H. P. BOARDMAN, *Chairman Forecast Committee,*
Nevada Cooperative Snow Surveys

Snow surveys were conducted in the Central Sierra region on the same watersheds as usual.

1931 Results

The winter of 1930-1931 was extremely low in snowfall, being very similar to 1924 in total content of snow at about April 1. On account of this similarity, the forecasts were made nearly the same as what actually resulted in 1924. The spring and early summer precipitation at Tahoe City was only 26% of normal in 1924, but it was 88% of normal in 1931, with the result that the run-off of streams and rise of Lake Tahoe were somewhat greater than was predicted. This effect of increased spring precipitation was marked on Lake Tahoe which rose $2\frac{3}{8}$ inches more than was predicted, the April-June precipitation at Tahoe City being $2\frac{3}{4}$ inches greater than in 1924.

However, the lake being at elevation 6,223.08, or only one inch above the rim on April 1, and 6,223.59 at the maximum on June 17, it was too low to justify opening the gates. Evaporation rapidly lowered the level after the maximum passed, until the minimum elevation of 6,221.79 was reached December 8. This was $14\frac{1}{2}$ inches below the rim and was the lowest elevation ever reached by the lake since accurate records have been kept.

This explains why, in spite of our good snowfall last winter, we are getting comparatively little help from Tahoe this summer. Two more good seasons before another poor one would bring the lake up to where it would yield enough for late summer irrigation and fall power demands after the Truckee River drops.

The excess of April-July stream run-off over that forecast in 1931 was as follows:

Truckee at Iceland, 4.8% of normal.

Carson at Clifton, 2.3% of normal.

West Walker at Coleville, 3.4% of normal.

East Walker at Bridgeport Dam, 2.7% of normal.

Rise of Tahoe, 11.3% of normal.

Summer 1931

The special appropriation of \$800 "For Traveling and Supplies" to be used before July 1, 1931, covered the purchase of some much needed equipment and the materials and supplies for the construction and outfitting of a new shelter cabin near Hunter Lake, 10 miles southwest of Reno. This cabin, which was constructed by voluntary labor, was needed in connection with the survey of Big Meadows snow course, over the ridge west of the head of Hunter Creek.

During the summer and fall of 1931 several important snow courses on the Truckee, Tahoe and Walker watersheds were inspected by Nevada, with the California snow survey personnel cooperating. These courses were remarked with some slight modifications in location and, where needed, the brush cleared away from the spots where snow samples are taken to facilitate the securing of good clean full depth samples. California shared in the expense of this work.

In November, 1931, at a total cost of about \$270, a badly needed shelter cabin was constructed on Buckeye Creek, a tributary of the East Walker River. California contributed \$200 towards this cost and the Snelson Motor Company of Reno contributed the use of a truck to haul the materials from Reno to the site.

1932 Results

The winter of 1931-1932 started strong, with quite a fall in November and heavy falls in December and January, but there was little snowfall after February 10 in the central Sierra region, and the normal expectation is about one-third of the season's fall after that date.

A few progress snow surveys were made during the winter and complete surveys of all courses were made about April 1.

Truckee River

The general indication of these final snow surveys was a little above normal, but the lowest two of all the well-established courses were Webber Peak and Webber Lake, 82.2% and 90.9% of normal, respectively. These should indicate fairly well the run-off of the Little Truckee, the largest tributary of the Truckee River below Lake Tahoe, so the forecast of the Truckee at Iceland, exclusive of Tahoe contribution, was made 310,000 acre feet or 95.2% of normal.

The total flow at Iceland April 1-June 30 was 260,124 acre feet, and that estimated for July is about 19,000, or a total of 279,100, or nearly 86% of normal.

This discrepancy is partly accounted for by deficiency of spring and summer precipitation, but probably a large factor this year is the ground absorption because of the excessively dry year 1931 following

three other dry years, lowering the water table. Numerous observations last spring indicated that large portions of the early snow melting were going into the ground instead of running into the streams.

If we had definite information every year of the fluctuations of the ground water level at several well-selected locations in each drainage basin it would help the forecast.

Lake Tahoe

The maximum level reached by Tahoe was 6,224.61 July 7 and 8, while the probable maximum predicted was 6,224.75 for July 10, a difference of $1\frac{3}{4}$ inches. The deficiency of April-July precipitation at Tahoe City was 1.27 inches or 29% of the normal, 4.42 inches. It was remarked by many that the early spring melting around the lake was largely going into the ground and the lake was rising much more slowly than was expected.

Carson River

The probable April-July run-off of the Carson River at Clifton was forecast as 100% of normal, or 230,100 acre feet this year.

The actual measured run-off of the Carson River at Clifton for the months of April, May and June, 1932, was 210,536 acre feet, and the present estimated total run-off for the season, including the month of July, is 235,000 acre feet.

West Walker River

Judging from the preliminary reports of the April-June run-off of the West Walker at Coleville and the estimated July run-off, the total for April-July will probably be about 194,000 acre feet, while the forecast was for 200,000, the normal being 191,180 acre feet.

East Walker River

On account of the relatively large quantities of snow caught on high altitude northern and eastern slopes of the Saw Tooth range of mountains west of Bridgeport, the late run-off of the East Walker is larger in proportion than with most of our Sierra Nevada streams, so we are now including August in our forecast.

This year the preliminary data for April-June indicate that the April-August run-off will be between 75,000 and 80,000 acre feet at Bridgeport Dam, including the effect of changes in quantity of storage in the reservoir between April 1 and September 1. The forecast was for 90,000 acre feet.

Humboldt River

Because of the unusual problems connected with forecasting the March-July run-off in the Humboldt Basin and the need of investigation, snow surveying in the Humboldt has been kept distinct from the better organized system conducted in the Sierra Nevada by the Nevada Cooperative Snow Surveys.

This Humboldt work has been under the immediate direction of Dr. J. E. Church, Adviser to the Nevada Cooperative Snow Surveys, and because of lack of appropriation for the work has been financed by the State Engineer from the fund for Humboldt River distribution.

The accuracy of the snow surveys for 1930-1931 and 1931-1932 was very close, despite the extreme differences in the two years. However, this is a case of comparison of other years or careful weighing of doubtful evidence. The great problem is to create a formula by which

the stream flow can be forecasted under all conditions, practically automatically, as in the Sierra Nevada.

Additional snow survey courses have been laid out. The Nevada Bureau of Mines has aided toward organizing a crude zoning system by taking altitude measurements in the course of its investigations. Much success toward discovering a formula has now been attained. A complete discussion of all the problems has been published in "Humboldt River Distribution, 1932." A complete report on the distribution of the water of the Humboldt River for 1932 will be issued by March 1, 1933.

Finances

The following summary of finances is divided into two parts, due to the change in the fiscal year.

The Sierra Pacific Power Company cooperated as usual by furnishing several employees to take part in the snow surveys and inspection trips on company time.

The forecast committee recommends that the usual \$1,500 appropriation be assigned for the next biennium.

Another shelter cabin is needed, but in view of the strained financial conditions its construction can be postponed. The financial statement follows:

SNOW SURVEY, JANUARY 1, 1931-JUNE 30, 1931

Receipts

| | |
|---|-------------------|
| Balance on hand January 1, First National Bank, Reno..... | \$2.65 |
| State Appropriations— | |
| Snow survey salaries..... | 500.00 |
| Traveling and Supplies Snow Surveys..... | 800.00 |
| From State of California cooperation..... | 337.50 |
| Total | \$1,640.15 |

Expenditures

| | |
|--|-------------------|
| Actual Snow Surveys— | |
| Transportation | \$92.06 |
| Meals and lodgings..... | 112.72 |
| Wages | 676.00 |
| | \$880.78 |
| Special Items— | |
| New equipment and supplies..... | \$351.50 |
| Materials and transportation for Hunter Lake cabin..... | 219.13 |
| | 570.63 |
| Miscellaneous and Overhead— | |
| Printing of forecasts..... | \$80.00 |
| Stenography and clerical work..... | 43.40 |
| Stationery, office supplies and miscellaneous..... | 34.88 |
| | 158.28 |
| Total | \$1,609.69 |
| Unused balance of appropriation..... | .86 |
| Balance on hand in First National Bank, Reno, June 30, 1931..... | 29.60 |
| Total | \$1,640.15 |

SNOW SURVEY, JULY 1, 1931-JUNE 30, 1932

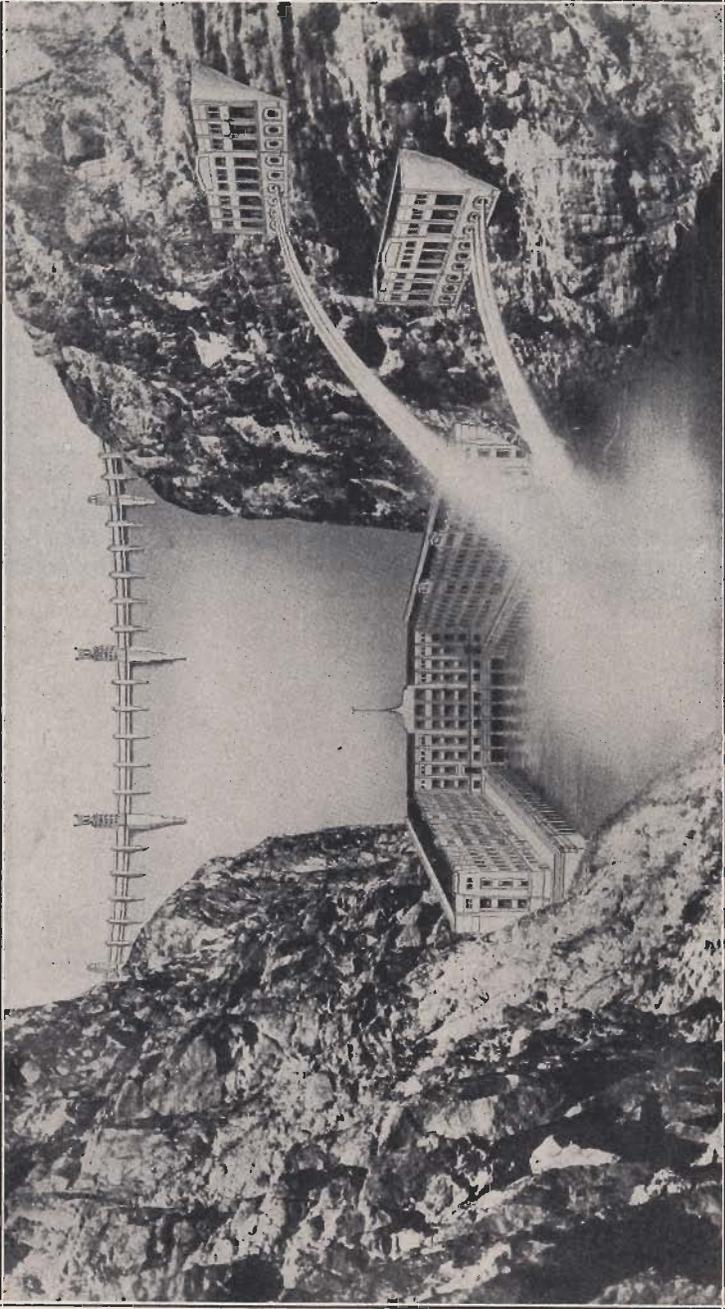
Receipts

| | |
|--|-------------------|
| Cash on hand in First National Bank, Reno, July 1, 1931..... | \$29.60 |
| State appropriation | 1,500.00 |
| From State of California cooperation..... | 823.72 |
| Total | \$2,353.32 |

Expenditures

| | | |
|---|----------|------------|
| Actual Snow Surveys— | | |
| Transportation | \$57.02 | |
| Meals and lodging..... | 175.32 | |
| Wages | 816.50 | |
| | | \$1,048.84 |
| Special Items— | | |
| Inspection trips | \$225.81 | |
| Completing Hunter Lake cabin..... | 23.43 | |
| Buckeye Creek cabin, materials, supplies and transportation | 193.98 | |
| Labor | 79.50 | |
| | | 522.72 |
| Miscellaneous and Overhead— | | |
| Printing forecast, etc..... | \$100.50 | |
| Stenography, clerical work and supervision..... | 200.65 | |
| Stationery, office supplies and miscellaneous..... | 98.44 | |
| | | 399.59 |
| Total expenditures | | \$1,971.15 |
| Balance in State fund..... | | .15 |
| Balance in First National Bank..... | | 382.02 |
| Total | | \$2,353.32 |

A complete outline and explanation of the methods employed in the snow survey work, including the equipment used, is in the Humboldt River Report, issued in the spring of 1932. Copies can be secured from this office.



ARTIST'S CONCEPTION OF HOOVER (BOULDER) DAM AND POWER PLANTS.
United States Reclamation Service Project. Estimated Date of Completion, 1937.

CHAPTER IX
Related Activities of State Engineer
THE PUBLIC SERVICE COMMISSION

The State Engineer was made a member of the Public Service Commission by the Legislature in 1919, and it is provided in section 2 of that Act that:

The Public Service Commission shall consist of three commissioners, one of whom shall be the State Engineer who shall be ex officio commissioner of said commission; the other two commissioners shall be appointed by the Public Service Board which is hereby created to consist of the Governor, Lieutenant Governor and Attorney-General; the terms of the appointive commissioners shall commence on the first Monday in April, 1919; the term of one appointee shall expire on the first Monday in April, 1922, and the term of the second appointee shall expire on the first Monday in April, 1923. Upon the expiration of the terms of said appointive commissioners, their respective successors shall be appointed to hold office for a term of four years after the date of the appointment and until their respective successors are appointed. One of said commissioners shall be generally familiar with the operation of railroads; the third commissioner shall have a general knowledge of fares and freights and tolls and charges levied and collected by public utilities as defined in this Act. The commissioners appointed under this Act shall, within twenty (20) days after their appointment and qualification, meet at the State Capitol and organize and elect one of their number chairman, who shall serve until the second Monday in April, 1921. On the second Monday in April of each odd-numbered year thereafter, the commissioners shall meet at the office of the commission and elect a chairman, who shall serve for two years and until his successor is elected.

The majority of said commissioners shall have full power to act in all matters within their jurisdiction. In the event that two commissioners are disqualified or in the event of two vacancies within the commission, the remaining commissioner shall exercise all the power of the commission. Not more than a majority of all of the commissioners shall be members of the same political party.

This commission has complete jurisdiction over all public utilities located within the State, except the interstate railroads, where limited jurisdiction is had. All other means of transportation, however, come within the scope of this commission's authority.

The growing importance of the power and water companies, the truck and bus companies, and other utilities, makes the commission of major importance in the welfare of the State. The State Engineer conducts a large number of the hearings for this commission which are not held in Carson City.

The long and short haul problem, which fight was started before the Interstate Commerce Commission in 1908 and decided in our favor in

1910, again has been brought to the front by the activities of the railroads, and the importance of the commission in this connection, as well as in other matters of major interest coming under its jurisdiction, cannot be overemphasized.

Property values amounting to millions of dollars are directly dependent upon the rulings of this body to maintain the integrity of the investments, and approximately 75% of the population of our State is directly dependent upon the decisions of the commission to maintain just and fair rates on power, water and transportation facilities.

It can be seen then that no decision of this character can be made without serious consideration and without due regard to the values involved. An unjust decision in fixing rates on a medium sized public utility could very soon cost the people affected by such decision more than is expended in support of the commission for an entire year.

A separate biennial report is issued by the commission, setting forth its activities in detail, and can be secured from this office or by addressing the Public Service Commission.

THE COLORADO RIVER DEVELOPMENT COMMISSION

The membership of the Colorado River Development Commission consists of Governor F. B. Balzar, Chairman; George W. Malone, State Engineer, Secretary; and Ed W. Clark, Member. The State Engineer was made a member of this commission in January, 1927.

Bids for the construction of the dam, power plant, and appurtenant works were opened on March 4, 1931, at the Denver office of the Bureau of Reclamation, and actual work started very soon thereafter.

A maximum number of 3,200 men has been employed on the construction work to date, bringing the population of Boulder City to about 4,000 persons.

There are over 200 trucks, 19 caterpillar tractors, 15 electric shovels, 6 mucking machines, and 4 Plymouth "Diesel" locomotives on the job. The payroll approximates \$500,000 per month. The oil and gas consumption amounts to approximately \$43,000, and truck tires cost \$13,000 monthly.

Construction on the project is approximately one year ahead of schedule. The excavation work on the four fifty foot in diameter tunnels, approximately 4,000 feet through solid rock, is complete, and the water will be diverted in December after the concrete lining is finished. The two coffer dams will be completed in January, and then actual excavation will be started for the foundation of the dam itself. The dam will be arch gravity type—727 feet above bedrock, 582 feet above river bed, length of crest 950 feet, top width 45 feet, base width 650 feet.

The volume of concrete in the dam, and miscellaneous works, will be 4,500,000 cubic yards, requiring 5,500,000 barrels of cement and 19,000,000 pounds of reinforcing steel.

It is estimated now that the dam will be completed early in 1937.

To January 1, 1931, the date of publishing the 1929-1930 Biennial Report of the State Engineer, the activities of the commission were confined almost wholly to securing amendments to the then pending Swing-Johnson Bill for the protection of Nevada's interests, the passage of the bill by Congress, and to working with the Secretary of the Interior,

as provided in the Boulder Dam Project Act, to secure contracts for the sale of power and water, which would provide revenue for Nevada and Arizona, and a proper power withdrawal clause for power to be used in those States. Contracts were secured which permit Arizona and Nevada to withdraw power when and in such amounts as may be needed for use in the States up to 123,000 firm horsepower each, and, according to the Secretary of the Interior, will provide *each State annually the sum of from \$440,000 to \$720,000 in lieu of taxes* after the project is in operation.

The eight amendments secured to the original Swing-Johnson Bill and the benefits to the two States are completely outlined in the 1929-1930 Biennial Report of the State Engineer, pages 89 to 96. Since copies of that report are still available, this report will be confined to the period from January 1, 1931, to June 30, 1932.

Expense of Colorado River Commission, January 1, 1927, to January 1, 1931

| | Appropriation |
|--|--------------------|
| 1927 Legislature, regular session..... | \$4,000.00 |
| 1927 Legislature, special session..... | 15,000.00 |
| 1929 Legislature, regular session..... | 4,113.31 |
| 1929 Legislature, regular session..... | 10,000.00 |
| 1931 Legislature, regular session..... | 9,625.00 |
| Total expended | <u>\$42,738.31</u> |

On January 1, 1931, the Colorado River legislation had become a law, known as the "Boulder Dam Project Act," which provided for revenue and power for the States of Arizona and Nevada as outlined above, and Congress was considering an appropriation to start construction.

Expense of Colorado River Commission, January 1, 1931, to June 30, 1932

| | Appropriation |
|---|---------------|
| 1931 Legislature, January 1-June 30, 1931..... | \$1,000.00 |
| 1931 Legislature, July 1, 1931-June 30, 1932..... | 5,000.00 |

Of the \$1,000 appropriated for the first six months of 1931, or to the beginning of the biennium as provided by law, \$549.83 was expended, and \$450.17 reverted to the State Treasury on June 30, 1931.

Of the \$5,000 appropriated for the biennium from July 1, 1931, to June 30, 1932, \$680.28 was expended from July 1, 1931, to June 30, 1932, or during one-half of the biennium for which it was appropriated, leaving a balance of \$4,319.72; \$3,000 of the \$5,000 appropriation made for the biennium July 1, 1931, to June 30, 1933, will revert to the State Treasury on June 30, 1933.

It will be seen then that only \$2,549.83 of the total of \$6,000 appropriated by the 1931 Legislature has been used, over \$200 of which was used in connection with the Six Companies' tax suit in the Federal Court in San Francisco.

There should be at least \$5,000 appropriated by the 1933 Legislature for the work of this commission during the biennium, July 1, 1933, to June 30, 1935, since it will be necessary to continue the investigations as to the possibility of securing electrochemical and other plants to use the Hoover (Boulder) Dam power when it is available. It is estimated that some of the power will be available in 1936, and that the dam will be completed early in 1937.

Investigations required during the ensuing biennium may include:

1. A more complete investigation of the mineral deposits in the State.
2. A more complete analysis coordinating the cost of such minerals delivered to the plants, with the cost of the power in production.
3. A complete survey of the western markets, including the Orient, to determine the amount of each of the products that will be consumed in that area, including shipping rates to consumers.

It has been estimated that taxable property in the State from electrochemical and other industries may amount to from \$10,000,000 to \$20,000,000.

The necessary investigation will cover a detailed study of the industry, raw materials, markets and transportation costs. Such an investigation is necessarily a highly specialized work and its cost has been estimated at approximately \$10,000. However, if the commission participates in the actual work it may be accomplished for less.

Investigations to Date

An investigation has been conducted by the Nevada State Bureau of Mines, cooperating with this commission, and a bulletin published on the "Mineral Resources of Southern Nevada." This bulletin contains a very complete and comprehensive outline of the kinds, quantities and locations of the minerals in southern Nevada. Since this bulletin was issued a further and more complete investigation has been made by the same bureau, the results of which have been furnished to the commission.

Early in 1932 the commission secured a preliminary report on the possibilities of producing electrochemical products at the dam by the use of power from Hoover (Boulder) Dam, and the Nevada minerals. The report was made by Colin G. Fink, Secretary of the Electrochemical Engineers of America, who is connected with the Columbia University, in New York City. A copy of the Bureau of Mines report on the minerals of Nevada, and an outline of the power set-up by the commission, were furnished to Dr. Fink, who rendered a very satisfactory preliminary report. Dr. Fink's report was incorporated in a report by the State Bureau of Mines, by Jay A. Carpenter and Alfred Merritt Smith. The report outlines the "Possibility of Electrochemical Industries at Hoover Dam," and covers the progress made by the commission in this connection to date.

EXCERPTS FROM REPORT

It is estimated that in six years the construction of Hoover Dam and the power plants will have reached the operating stage, and this vast new source of power will then be continuously available for industry.

The height of the dam will be 582 feet, and the average annual flow of the Colorado River is calculated at approximately 24,000 cubic feet a second. If this full head and average flow can be maintained the year round, the generated power will be about one million horsepower.

The U. S. Reclamation Engineers, taking into consideration the probable range in flow and head, have set the figure for power contracts at 660,000 firm horsepower, or the power that can be assured at all times of the year.

During the months of heavy run-off of water from the Colorado River Basin the power plants should be able to generate the full one million horsepower capacity of the power plants, so we will have 340,000 horsepower excess or secondary power.

The cost of firm power at the switchboard will be very close to 2.15 mills per kwh., equal to \$14.05 per hp. year, and the cost of the secondary or off-peak power will be very close to 0.8 mills per kwh., equal to \$5.22 per hp. year.

There is no place in the country where such cheap power can be obtained today. The electrochemical industry is in a state of flux because the power costs from its old sources have increased so much (to \$30 per hp. year at Niagara) that the industries have had to seek new sources, so they have gone to Canada and Norway and built new plants, because of the steadily advancing price of power here in this country.

Dr. Coling G. Fink, Secretary of the Electrochemical Society, and an accepted authority on matters concerning the electrochemical industry, made the following statement at the hearing on disposal of Boulder Dam power before Secretary Wilbur in Washington, D. C., in November, 1929: "It is my opinion and conviction that the American electrochemical industry will be ready to absorb all of the power developed by the Boulder Canyon project as soon as it is available."

Dr. Fink also stated at the same hearing that "Transmission costs are higher than transportation costs for raw material or finished product."

The foregoing brief outline of the general power set up, coupled with the fact that the Hoover Dam area is one of the richest in the world in raw materials used by the electrochemical industry, insures the creation of an immense electrochemical and electrometallurgical industrial center in southern Nevada.

The utilization of this cheap power in the Hoover Dam area presents the greatest economic opportunity the State of Nevada has ever had, because it is one which will continue for all time, and will bring into valuable use the vast store of mineral substances which have had no economic value on account of the lack of facilities for conversion into more valuable manufactured products.

The benefits to the State will be to create employment for many people, create great additional wealth, and thus lower the tax rate and increase our general prosperity.

The following is a very brief résumé of the more important industries which will be created to use this cheap power, and a brief description of the metallic and nonmetallic resources available in southern Nevada and contiguous territory:

ELECTRIC FURNACE INDUSTRIES

Numerous electric furnace industries are possible. Calcium carbide can be manufactured, for limestone of high purity exists in unlimited quantity near the dam. Although coke will have to be brought in from Utah, the low power rate at the dam will more than offset this expense.

Cheap power may make it possible to calcine this very pure limestone in electric furnaces, obtaining quicklime as one product, carbon dioxide gas as another. Dolomite also occurs in unlimited beds near at hand, to be calcined for various uses, as done there now with oil furnaces. The CO_2 gas would fit into the picture to convert synthetic ammonia to carbonate, which in turn may be elutriated with ground gypsum to form ammonium sulphate fertilizer, and produce hydrated lime as a by-product. Millions of tons of ammonium sulphate are thus manufactured annually in Germany. The unusual combination of great natural resources of raw materials and low priced power makes the economic combinations seem endless.

Ferroalloys of vanadium, molybdenum, manganese, and silicon can be manufactured from ore supplies all within 40 miles of the dam. Tungsten will come from central Nevada. Pig iron can be brought from Utah, or iron for such alloys can be produced from the large deposits in southern California and Nevada.

In San Bernardino County, California, is a splendid deposit of at least 5,000,000 tons of magnetite, on the Union Pacific Railroad at Baxter Siding, only 150 miles by rail from the damsite. In northeastern Riverside County, California, is the great Iron Chief Deposit, conservatively estimated at from 20 to 75 million tons, distant only 200 miles from the dam. To this deposit a 50 mile rail connection with the Santa Fe can be made northerly over easy desert terrain. At Barth, Nevada, near Eureka, is a large deposit of excellent hematite, and in Clark County, near Las Vegas, are found deposits of impure iron ore near the dam. Many other large deposits in the western States can be enumerated.

The sponge iron process has possibilities, in which case Utah would be called on to supply cheap slack coal necessary for reduction, before the electric smelting of the sponge iron. Much work has been done on this process by the U. S. Bureau of Mines. Direct electric smelting of iron ore is also possible. The pioneer plant at Heroult, California, a number of years ago proved electric iron smelting to be practical, and success dependent on costs alone, and that it has a wide new field in the direct production of steel and steel alloys from the ore.

NITRATES AND AMMONIA

Very cheap power and an absence of coal suggests the adoption of some method of nitrogen fixation using only air, water and power, such as the Birkland-Eydes and the Dr. Schönherr's methods in use in Norway by plants consuming 360,000 hp. This electric arc process consumes more power than other methods. The excess of power is converted into heat, a portion of which might be used in other work. The nitric acid so produced has high market value, and nitrate nitrogen is desirable for explosives manufacture, which is a large industry on the Pacific Coast. High power explosives for military protection can be manufactured near the dam, a point remote

from air attack and near the great U. S. munitions storage depot at Hawthorne.

Although the Haber-Bosch ammonia process now is used to produce most of the world's synthetic ammonia, nearly all of the plants consume coke and coal both for power and to produce the gases used. However, in the last few years synthetic ammonia from hydrogen derived by electrolysis of water, and nitrogen obtained from the air, have entered where cheap power is available.

Unlimited water for all factory uses can be obtained from the reservoir, for rates presumably as low as for irrigation below the dam, or from 50¢ to 10¢ per acre foot, especially if the residual water be returned to the river or dam after use.

Tadanac, near Trail, B. C., offers an outstanding example of water electrolysis. It is very interesting to note there the adoption of a cell plant to make hydrogen, and a liquid air unit for nitrogen, used in producing synthetic ammonia by direct combination under pressure with a catalyst. This, too, although the plant is not remote from good sources of Washington coke and coal. Tadanac has long been a great center for lead electrolytic refining, and it was there selective flotation of complex lead-zinc ores made great advance. Now, a \$10,000,000 fertilizer plant is being constructed, consisting of an electrolytic hydrogen unit to produce 3,000,000 cubic feet of hydrogen per day; a liquid-air unit for the production of nitrogen and a synthetic ammonia unit to produce 47 tons of anhydrous ammonia per day. The plant will use power generated by steam from waste heat at a slag retreatment plant.

The plant was made necessary to reduce smelter smoke damage. Part of the SO_2 is converted to sulphuric acid and used in zinc and lead electrolytic refining, in making hydrofluoric acid, in gold-silver refining, and in converting the synthetic ammonia to sulphate.

Thus has low price power and basic materials built up this great group of industries in a location more remote from markets, and having a climate much inferior to Hoover Dam for living, labor and operation conditions.

ELECTROLYSIS

The electrolysis of salt produces sodium hydrate and chlorine, the base and acid for a wide range of chemical uses. Four large salt deposits in Virgin Valley, 50 miles from Hoover Dam, contain at least 25,000,000 tons of rock salt. The greater part of the visible deposit will eventually be submerged by the lake, but before that time arrives undoubtedly new underground extensions of the massive beds will be found and mined. Rock salt, also calcium chloride, occurs in inexhaustible quantities at Bristol Dry Lake, San Bernardino County, 150 miles from Hoover Dam. Great quantities of sodium hydrate might find use in refining the petroleum oils of California. Hydrochloric acid made from the chlorine may

possibly be used in the manufacture of pure iron by electrolysis of a solution of ore in acid. Cheap power would be the key to this method, with the natural resources ready at hand.

METALS

ZINC

For 1930, the U. S. Bureau of Mines reports Arizona, Nevada, New Mexico, Oregon, Washington and Utah as having made a mine production of recoverable zinc of 93,018 short tons. For the same year Colorado and Montana produced 155,718 short tons. Most of the ore was reduced in electrolytic plants in Montana and Idaho, and represents 26.5 per cent of the total United States production.

During the years 1930-1932 the mines of Pioche, Nevada, enormously increased the ore reserves, and now have about 4,000,000 tons of ore blocked out, with the possibility of much more lead-zinc-manganese ore to be developed soon. The mining and reduction of the ore awaits only better prices. With this in sight, probably very soon the far western group of States may produce 50 per cent of all United States zinc.

To provide for this increased production, particularly in Nevada, large concentrating and calcining plants may be built at Pioche, about 150 miles north of the dam. The calcine could be shipped to the dam for electrolytic refining, and the pure metal to Los Angeles or other manufacturing points on the coast for fabrication and export to the Orient. An important by-product of the calcining process is sulphuric acid. About 16 per cent of all the sulphuric acid used in the United States is produced by zinc roasting plants. Probably all of the Pioche acid would be absorbed by industries at the dam, chief of which should be the refining of blister copper.

COPPER

There are western electrolytic copper refineries at Great Falls, Montana, Tacoma, Washington, and a new plant at El Paso, Texas. Dr. Colin G. Fink, Head of Division of Electrochemistry, Columbia University, New York, states that these will not provide for western copper output, but will leave all of Nevada (54,601 tons in 1930) and half of Utah and Arizona, about 500,000 tons in all, to be sent east for refining.

It would appear that for more economical operation a plant should be located at Hoover Dam, which is in the center of the heaviest producing districts, and the refineries there would be at a point on the direct route to the coast. The seaport of Los Angeles would undoubtedly be a good location for such a plant, but power cost would be higher there than at the dam-site. The dam-site would also have advantages as a general western distribution point for refined copper, with outlet for oriental export through Los Angeles. Finished copper products could best be manufactured in Los Angeles, where labor, the highest cost in such work, would be substantially lower.

ALUMINUM

Dr. Fink points out that all aluminum used in the western half of the United States is subject to an expensive cross-haul, hauxite from Arkansas going east for reduction and then west again as metal. Six million pounds per year is shipped to the Orient, in addition to large amounts used in the western States. It would appear that the Aluminum Company of America, which controls this great industry, would effect economy by establishing a plant at the damsite.

A deposit of pure alunite is being developed at Sulphur, Humboldt County, Nevada; Marysvale, Utah, is also a source of this aluminum-potash mineral. There are other localities in Nevada and Utah which may be able to supply some of this ore. A commercial process for recovering both aluminum and potash from alunite should not be difficult to work out, given cheap power and abundant water.

MANGANESE

There are various deposits of manganese ore in the western States. In Nevada, at Golconda and Ely, small tonnages of high grade ore are produced. At both Las Vegas and Pioche are very large bedded deposits.

The probable tonnage of manganese ore, associated with zinc and lead in the Pioche district, now amounts to about 4,000,000 tons. Possibly two or three times as much will eventually be developed. The Combined Metals Company at Pioche is perfecting a commercial process for the separation of manganese, which can probably be carried out most advantageously at the damsite, where, in any case, the next steps of making ferromanganese for use in chemical industries would be carried out.

Only 10 miles northwest of Hoover Dam is another large bedded deposit of manganese ore, which Geologists Hewett and Webber of the U. S. Geol. Survey estimate to contain at least 500,000 tons, possibly 1,000,000 tons.

As manganese ore imports in 1930 were 585,568 long tons, and domestic production of all classes, including 708,000 tons of manganiferous iron ore was only 845,000 tons, the need of cheap domestic manganese is seen.

Ferromanganese can be cheaply made in electric furnaces at the damsite, and thus be ready for market at exceedingly low cost for the ores.

TUNGSTEN

Nevada and California together produce most of the tungsten consumed in the United States. In Nevada, deposits occur at Osceola, Sodaville, Ellsworth, Mt. Montgomery, Eagleville, Lovelock, and Mill City. The largest western production is made at Mill City, Nevada, and Atolia, California, which, together, produce about 80 per cent of all used in the United States. (In 1930, 702 tons, 60% WO_3 , were produced.)

A portion of Nevada's production of 64 per cent of the total, which is now shipped to Niagara Falls for reduction, could be converted to ferrotungsten at the dam for western and Oriental consumption at a great saving.

ADDITIONAL MINERALS AND METALS NEAR HOOVER DAM

ALUM

Three miles east of Boulder City is a large deposit of iron alum, traversed both by the highway and the railroad.

BORAX

Exceedingly large borate deposits (colemanite) are located in White Basin and Callville Wash, respectively 30 and 20 miles north of Hoover Dam. They are estimated to contain a minimum of 3,000,000 tons.

BRUCITE

A very large deposit of brucite, pure $Mg(OH)_2$, lies in Nye County, Nevada, 200 miles northwest of Boulder City. More than 1,000,000 tons have been developed by drilling, as well as a big tonnage of crystalline magnesite.

GYPSUM

Clark County, Nevada, contains at least 28,000,000 tons of high-grade gypsum ready for quarrying, and possible resources of several times that much. The developed gypsum could supply the entire Pacific Coast market for 50 years, and all of it is within 50 miles of Hoover Dam. Possibilities for the manufacture of sulphuric acid by processes being developed in Germany exist, while the conversion of ammonia to sulphate by gypsum is a well-established method.

CLAYS

Bentonite is mined in large amount at Ash Meadows, Nye County. There are deposits at Silver Peak, in Esmeralda County, and Sodaville, Mineral County. Undeveloped deposits occur in several districts in Clark and Nye Counties near the dam.

Kaolin has been shipped for 10 years to Los Angeles from a large deposit 150 miles north of Boulder City and on the Union Pacific Railroad.

Diatomite occurs in large deposits in Esmeralda and Nye Counties, comparatively near the dam, and in unlimited quantities in several other Nevada districts.

FELDSPAR

Six miles east of Nipton, a station on the U. P. R. R., about 60 miles from Boulder City, is a substantial deposit of potash feldspar.

FLUORSPAR

The Daisy mine of the Continental Fluorspar Company has been increasingly productive for 10 years, located only 150 miles northwest of Boulder City. Another large deposit within range is at Mt. Montgomery, Mineral County, Nevada.

LIMESTONE

Limestone of 97 per cent CaCO_3 purity occurs in unlimited quantities 25 miles west of Hoover Dam. The pure beds are hundreds of feet thick, and extend for miles. Its high purity and the coherent quality of its calcine have caused it to supplant all other limestones in the large and exacting industry of sugar refining in Southern California. Two large lime companies operate in this area.

MAGNESITE

Vast massive beds of magnesite occur near St. Thomas near the shore line of the future reservoir. The principal deposit is 3 miles long and 300 feet thick. Much of it is impure, but it contains strata from 10 to 20 feet thick of excellent quality.

SILICA

Clark County contains four very large bedded deposits of silica sand, one of which can produce unlimited tonnages of high purity and permissible low iron content. It seems strange that good silica sand, not common on the Pacific Coast, should be found in great quantity near Hoover Dam. The feasibility of a silica glass industry is suggested, made possible by low cost operation electric furnaces.

VANADIUM AND MOLYBDENUM

Vanadium in the form of descloizite and cuprodescloizite (lead-zinc vanadate, or copper-lead-zinc vanadate) occurs in several mines in the southwest part of Goodsprings Mining District, 40 miles from the damsite. Heretofore this ore, which might be developed in considerable tonnage, has had no value, due to its difficult metallurgy and the great distance from chemical plants equipped to treat it on a commercial scale.

Another mine in the Goodsprings District is now shipping small amounts of lead molybdate to eastern markets.

The establishment of a great electrochemical center, with ferroalloy furnaces, at the very door of these small mines should lead to their development.

SODIUM SULPHATE

A deposit of glauberite, anhydrous sodium-calcium sulphate, containing between 2,000,000 and 4,000,000 tons, lies on what will be the western shore of the reservoir, $4\frac{1}{2}$ miles southwest of St. Thomas. Although the deposit will be eventually flooded by the slowly rising waters of the lake, it can probably be mined for 10 years or more before water will seriously interfere with the work, and, as is the case with the adjoining large Big Cliff salt deposit, underground extensions may be found that will not be affected by the lake. The glauberite is readily decomposed by water, forming sodium sulphate and calcium sulphate. Surely here is a field for the chemical engineer.

SULPHUR

Sulphur deposits occur 17 miles south of Goldfield in Nye County, and about 200 miles from the dam. Great deposits, mined sporadically from pioneer days, lie at Sulphur, Humboldt County, Nevada.

A very large pyrite deposit occurs in Mojave County, Arizona, less than 100 miles from the dam. Heavy sulphide ores containing nickel, copper, gold and platinum, occur near Bunkerville, Nevada. An almost unlimited potential source of sulphur from the zinc-lead mines of Pioche nearby, has been already described.

The unlimited salt and silica have been described, and a number of metals, to which we must add gold, silver, mercury, platinum, cobalt and bismuth, all of which are found in Nevada and California near the damsite.

Great economies to the mining industry seem possible by establishing reduction plants and refineries at this source of cheap electric energy.

The State of Nevada stands ready to assist the pioneer plants in this work. The concerted action of mining and metallurgical engineers, electrochemists and capitalists will bring about a great era of western prosperity through new industries.

An investigation has been conducted during the past year by the Bureau of Reclamation, in cooperation with the commission, for feasible irrigation projects in Nevada, as provided by the Boulder Dam Project Act. The investigation has not been completed as yet, but it has been estimated that considerable acreage can be irrigated by gravity, and pumping from the reservoir.

Power for use in pumping underground water for irrigation will justify further investigation, and is covered elsewhere in this report.

Documents by this Commission

"Senate Document No. 186." (200 pages, 60 cuts and illustrations.)

"Presenting the Facts." (Before Senate Committee, January 20, 1928.)

"Transcript of Testimony." (Before Senate Committee, January 20, 1928.)

"The Colorado River Development Commission." (Included in the 1929-1930 Biennial Report of the State Engineer.)

Colorado River Development Commission Act

(As amended March 26, 1927)

SEC. 7. The duties of said commission shall be to collect and arrange all data and information connected with the Colorado River and tributaries which may affect or be of interest to the State of Nevada; to present the same to the Governor for his information; to represent the State of Nevada in such interstate or other conferences or conventions as may be called for the consideration of the development of reclamation projects connected with the Colorado River or its tributaries; for the consideration of Federal and State rights and procedure relating thereto; to tender the friendly cooperation of the State of Nevada to such

constructive enterprises as look to the conservation of the waters of the Colorado River and its tributaries and the development of power thereon; to negotiate with the representatives of other States and the United States, in endeavoring to equitably settle and define the rights of the States and the United States in the waters of the Colorado River and its tributaries; to make and enter into agreements, compacts or treaties between the State of Nevada and the States of Arizona, California, Colorado, New Mexico, Utah and Wyoming, either jointly or severally, which said agreements, compacts or treaties shall not become binding upon the State of Nevada until ratified by the Legislature and approved by the Governor of said State; to report to the Governor such measures for legislative action as may be deemed necessary to secure to the people of Nevada all possible benefits from such enterprises. Said commission is hereby empowered to receive and hold in trust for the State of Nevada all water and/or water rights, hydroelectric power and/or hydroelectric power rights and all other rights interests or benefits in and to the waters of the Colorado River now held by or which may hereafter accrue to the State of Nevada under and by virtue of any Act of Congress of the United States or any compact or treaty between States to which the State of Nevada may become a party; *provided*, that all rights of appropriation and use of water of said Colorado River belonging to the State of Nevada for the irrigation of lands, domestic use and mining within said State are hereby excepted from the provisions of this Act.

Said commission shall hold and administer all rights and benefits mentioned in this Act for the State of Nevada, and is hereby empowered to lease, sublease, let, sublet, contract or sell the same in whole or in part on such terms as said commission shall determine; and shall collect and receive all revenues thereby created or derived therefrom which shall become due and owing to the State of Nevada under any such lease, contract, or sale; *provided*, that any such lease, sublease, contract or sale shall not become binding upon the State of Nevada until ratified by the Legislature and approved by the Governor of said State.

Said commission shall deposit all moneys received or collected by it under the provisions of this Act with the State Treasurer in a fund to be called the "Colorado River Fund." The State Treasurer is hereby directed to receive and hold such funds, and he shall, on the first day of January and the first day of July of each year, transfer the money in said Colorado River Fund to the General Fund of the State.

All members of said Colorado River Commission shall give bond to the State of Nevada for the faithful performance of their duties in such sums as the Governor shall from time to time direct. The premiums on said bonds shall be paid out of any fund appropriated for the support of said commission.

THE COLORADO RIVER ADVISORY BOARD

This board was created by the Legislature in 1929 to conform to the provision of section 16 of the Boulder Dam Project Act which provides:

In furtherance of any comprehensive plan formulated hereafter for the control, improvement, and utilization of the resources of the Colorado River system and to the end that the

project authorized by this Act may constitute and be administered as a unit in such control, improvement and utilization, any commission or commissioner duly authorized under the laws of any ratifying State in that behalf shall have the right to act in an advisory capacity to and in cooperation with the Secretary of the Interior in the exercise of any authority under the provisions of sections 4, 5, and 14 of this Act, and shall have at all times access to records of all Federal agencies empowered to act under said sections, and shall be entitled to have copies of said records on request.

The 1929 Act of the Nevada Legislature, conforming to the above, provides:

SECTION 1. The Governor of the State of Nevada is hereby authorized and empowered to appoint some proper person as a commissioner of the State of Nevada to act in behalf of the State of Nevada in an advisory capacity to and in cooperation with the Secretary of the Interior in the exercise of any authority under the provisions of sections 4, 5, and 14 of said Act.

As a member of that board the State Engineer did cooperate with the Secretary of the Interior in obtaining the ratification of the seven-State compact by six States of the Basin, as provided in section 4 of the Act; and in negotiations looking to a three-State compact, under certain specified conditions; and to securing contracts for power and water, insuring the repayment to the Federal Government, over a fifty-year period, of the amounts to be expended; and in relation to revenue to the States of Arizona and Nevada.

The State Engineer is now cooperating with the Secretary under section 14 of the Boulder Dam Project Act, as provided in section 16, by inspecting the work under way on the project at this time on an average of once per month, and assisting in coordinating the actions of State and Federal Governments relative to the construction work.

Section 14 provides that: This Act shall be deemed a supplement to the reclamation law, which said reclamation law shall govern the construction, operation, and management of the works herein authorized, except as otherwise herein provided.

The seven-State agreement was ratified by six States, as required by the Act, and contracts were secured for power and water to insure the repayment to the Government of the funds advanced. The work of construction on Hoover Dam is proceeding in a satisfactory manner. They are at least one year ahead of the schedule in the work. The dam will be completed early in 1937.

The importance of this board cannot be overemphasized when it is realized that the price finally set for power per kwh. and water per acre foot, according to the Secretary of the Interior, will return to our State from \$440,000 to \$720,000 per year, and that some of the power will be available in 1936. The regular readjustment period on the sale price of the power is every ten years, but can be brought up at an earlier period, therefore it must be watched carefully by this board and the Colorado River Development Commission to insure Nevada a fair return "in lieu of taxes" on the project itself.

A more complete report on this project will be found under the heading "Colorado River Development Commission."

STATE IRRIGATION DISTRICT BOND COMMISSION

The Legislature set up the Irrigation District Bond Commission in 1921, and provided that the State Engineer should be the engineer member of the commission, and further provided in the Act that:

SEC. 9. All necessary expenses incurred in making the investigation and report in this Act provided for shall be paid as the commission may require by the irrigation district whose property has been investigated and reported on by the said commission; *provided*, that the benefit of any services that may have been performed and any data that may have been obtained by any member of said commission or any other public official, in pursuance of the requirements of any law other than this Act, shall be available for the use of the commission herein provided for without charge to the district whose affairs are under investigation.

Bonds Certified Legal Investments for Trust Funds, Etc.

SEC. 10. All bonds certified in accordance with the terms of this Act shall be legal investments for all trust funds, and for the funds of all insurance companies, banks, both commercial and savings, and trust companies, and whenever any money or funds may, by law now or hereafter enacted, be invested in bonds of cities, counties, school districts, or municipalities in the State of Nevada, such money or funds may be invested in the said bonds of irrigation districts, and whenever bonds of cities, counties, school districts, or municipalities may by any law now or hereafter enacted be used as security for the performance of any act, bonds of irrigation districts under the limitations in this Act provided may be so used.

The theory under which this commission was created is commendable, since it attempts to set up a commission to scrutinize public bond issues in order to furnish protection to both the organization and the investor.

In actual practice, however, the law is faulty, for the following reasons:

1. After the proposed bond issue has been investigated by the commission and the security for such issue is found sufficient and a favorable report made, the commission has no authority to follow through and require the money to be properly expended, or to require periodical reports to determine if this is being done.

2. When a State commission approves a bond issue, it is very liable to give the impression that the State guarantees the payment of such bonds.

The first fault could and should be corrected to give the Bond Commission authority to require monthly reports of expenditures of money on construction work that has had the approval of such commission, and the commission should be empowered to estop any misuse of such

funds; further, the district should be required to submit to the commission for its approval any change that may be made in the plans as the work progresses.

The second fault can only be corrected by the State becoming actually responsible for the payment of such bonds upon the approval of the commission, which does not seem feasible at this time, or by stamping across the face of each bond a statement to the effect that the State is not responsible for payment.

It has been suggested that the State Engineer, as a member of this commission, be required, upon the invitation of a majority of the Board of Directors of any district, or a certain number of water users under such district, to come in for consultation as to procedure.

This would seem a reasonable safeguard with reference to the integrity of the bonds of such district, but it would also seem to be an encroachment upon the proper field of engineers in private practice, in that it would be comparable to requiring the Attorney-General to give legal advice to private districts.

During the period from January 1, 1931, to June 30, 1932, the State Irrigation District Bond Commission met and acted upon the following applications:

March 13, 1931—Application of Walker River Irrigation District for approval of refunding plan and matters relating thereto. Refunding plan submitted by said district was approved, and a refunding bond issue authorized in a sum equal to the face value of the outstanding and unredeemed bonds.

May 11, 1931—Application of Washoe County Water Conservation District of Nevada for permission to borrow money. Issuance of warrants bearing six per cent interest, redeemable within one year, and not to exceed \$12,000, was approved.

September 21, 1931—Application of Walker River Irrigation District for the approval of the issuance of refunding bonds of said district, and matters relating thereto. Approval granted to sell or exchange fifty-six \$1,000 bonds, maturing January 1, 1941, and sixty-five \$1,000 bonds, maturing January 1, 1942. Issuance of bonds authorized to refund a like amount due January 1, 1932 and 1933.

Application of Local Improvement District No. 1, Walker River Irrigation District, for approval of an exchange of long term bonds for bonds outstanding, due July 1, 1932. Issuance of \$3,000 of bonds of Local Improvement District No. 1 of Walker River Irrigation District in exchange for a like sum due July 1, 1932, was approved.

Application of Local Improvement District No. 4 of Walker River Irrigation District, for the approval of an exchange of long term bonds for bonds outstanding, due July 1, 1931, and January 1 and July 1, 1932. Issuance of \$5,500 of bonds of Local Improvement District No. 4 of Walker River Irrigation District in exchange for a like sum due July 1, 1932, was approved.

March 28, 1932—Application of Pershing County Water Conservation District for approval to issue and sell \$30,000 of bonds at rate of six per cent interest. Sale of bonds not to exceed \$30,000, with interest rate at six per cent, approved.

April 13, 1932—Application of Pershing County Water Conservation District for consent of the commission to issue warrants in the

sum of \$26,850, bearing interest at the rate of six per cent per annum, to mature not later than January 1, 1942, approved by commission.

June 7, 1932—Application of Walker River Irrigation District for approval and authority to incur an indebtedness in the sum of \$8,000, with authority to issue warrants bearing interest at the rate of six per cent per annum. The Walker River Irrigation District was empowered to incur an indebtedness of \$8,000, and to issue warrants in the aggregate sum of \$8,000, bearing interest at the rate of six per cent per annum.

THE STATE RANGE COMMISSION

The proper control and utilization of the public lands within our State have been problems of major importance for at least thirty years, or since the number of live stock on the open range reached the point where all of the available feed thereon was completely utilized.

PUBLIC DOMAIN AREAS

| | Forest Reserves | Area | Unreserved public land | Unsurveyed |
|-----------------|--------------------|------------|---------------------------|------------|
| Arizona..... | 11,466,626 | 72,838,400 | 16,911,367 | 7,846,000 |
| California..... | 19,026,819 | 99,898,880 | 20,209,421 | 5,749,684 |
| Colorado..... | 13,309,549 | 66,341,120 | 8,218,875 | 1,136,694 |
| Idaho..... | 19,300,773 | 53,346,560 | 10,734,420 | 1,882,805 |
| Montana..... | 16,170,658 | 93,296,640 | 6,900,144 | 78,320 |
| Nevada..... | 4,978,198 | 70,285,440 | 53,410,938 | 21,915,318 |
| New Mexico..... | 8,491,831 | 78,401,920 | 16,282,582 | 1,164,627 |
| Oregon..... | 13,297,838 | 61,188,480 | 13,227,141 | 92,411 |
| Utah..... | 7,475,762 | 52,597,760 | 25,147,867 | 11,955,734 |
| Washington..... | 9,598,372 | 42,775,040 | 951,903 | 14,202 |
| Wyoming..... | 8,460,755 | 62,460,160 | 17,035,537 | 617,501 |

The Legislature created what is known as the "State Range Commission" in 1929 for the purpose of determining and reporting to the 1931 Legislature the "principles, laws or policies that should apply to the grazing user of the natural range forage resources of the publicly owned lands within Nevada * * * that should prevail for the best public interest." The State Engineer was made a member of that body by law. The report of this commission, dated March 4, 1931, to the Legislature of the State of Nevada follows:

THE COMMISSION

HON. F. B. BALZAR, GOVERNOR, *Chairman*,

HON. J. F. SHAUGHNESSY, *Secretary*.

HON. GEO. W. MALONE, State Engineer, *Member*.

CONCLUSIONS

1. That the highest development of the livestock industry of the State is dependent upon the proper use of the public lands for grazing purposes.

2. That such proper use is only possible to the extent that a user or users can be assured of the benefits from his or their particular range.

3. That the present economic set-up, including existing equities and investments, must not be disturbed.

4. That future prospecting and mining, and water development for irrigation purposes must not be disturbed.

5. That any method of range unit control must provide like protection to all rightful users, regardless of the size of such units.

6. That the taxable value of the outlying ranches used for livestock purposes is directly dependent upon the range units.

7. That if protection is afforded such range units, agreements will be made, in the case of more than one user entitled to the same range, and that the result will be the building up of the range values in accordance with good practice.

8. That if encroachments upon the legitimate user or users are prevented, than further improvements will be made upon the ranges, particularly the development of water for stockwatering purposes upon the winter ranges, where large investments for this purpose are necessary.

9. That if a method can be found for the protection of range units by legislative action, allowing the economic trends of the industry to develop, it would be unsound to invite supervision of the ranges by either the Federal Government or State, necessitating large expenditures by these agencies and a corresponding tax upon the livestock industry.

RECOMMENDATIONS

That the present Legislature should enact such legislation pointing to ultimate control of range units by the user or users of such range as can properly be enforced under the "police powers" of the State.

It would then follow that if Congress acts favorably on the Public Domain Committee report to the President in the matter of Federal recognition of the State's method of control of the range, the State Legislature could then properly exercise such control, beyond the "police powers" of the State, to regulate the movement of live stock on the public domain.

REPORT

Report to the Legislature of the State of Nevada, March 4, 1931, pursuant to an Act passed on March 26, 1929, creating the State Range Commission for the purpose of investigating range conditions. Section 2 of the Act follows:

Sec. 2. It shall be the duty of the commission to conduct a study and investigation to determine the principles, laws or policies that should apply to the grazing use of the natural range forage resource of the publicly owned lands within Nevada; for the purpose of facilitating that relationship between that resource and the economic structure of Nevada, and particularly its proper contribution to the revenues thereof, that should prevail for the best public interest, as well as to make public from time to time its findings, and to foster and promote such steps as in its judgment are required for the best public interests in this connection.

Organizations appearing before the Commission during the hearings held include the following:

- U. S. Forest Service.
- Agricultural Extension Service.
- Nevada Land and Livestock Association.
- Mine Operators' Association of Nevada.
- Bureau of Mines.
- Bankers' Association of Nevada.
- Nevada Taxpayers' Association.

Southern Pacific Company.
Western Pacific Railroad Company.
Los Angeles & Salt Lake Railway Company.
Chambers of Commerce of various towns.
Other civic organizations.

These organizations were practically unanimous in declaring that some form of range unit control is necessary, the Forest Service indicating that if turned over to them, they would immediately devise some method of allocating it to individuals.

BASIS OF POLICY

It is concluded, however, that any method adopted must provide a system or policy that will, over a period of years, develop along the following general lines:

1. That the maximum taxable property and business revenues may be developed in the State through this natural resource, pending the time that the public lands may be taken up under the regular land or mining laws, with due regard to the expense and efficiency of such system.

2. That due to the requirements of the industry upon these lands of little value, requiring as they do in most cases balanced winter, summer, spring and fall ranges and ranch units, these economic units developed over a long period of years must not be upset, and that any method adopted must encourage development along the natural trends of the industry.

3. That prospecting and mining for minerals, nonmetallic products and other resources, or legitimate homesteading of lands where water may be developed, either surface or underground, for irrigation purposes must not be interfered with in any manner.

4. That any method adopted must provide the same protection for all livestock units, regardless of the size of such units.

There are approximately 55,000,000 acres of unreserved, unappropriated public domain in Nevada, in addition to approximately 5,000,000 acres within the Forest Reserve boundaries and of the unreserved area, Government reports show that an average of 40 acres for a sheep unit and 140 acres for a cow unit are required for grazing purposes. The low feed value of these areas creates a unique condition on the Nevada public domain that must be met.

The maximum of taxable property and business revenues can only be developed through the natural conditions surrounding the industry. It has been demonstrated in this State that a livestock unit must consist of a balanced summer, winter, fall and spring range. The winter range may consist all or in part of ranching property where sufficient feed can be raised to take care of the stock through the winter season. These ranches must be balanced against the range units.

The value of the outlying ranches, where transportation conditions make it infeasible to raise agricultural products for the market, is dependent upon the range units. It is well known that the taxable value of the ranches is directly dependent upon the value of such range unit, and that when any of the range is lost, the carrying capacity of the unit is decreased without a decrease in the investment, the value of the whole unit thus being impaired.

The present economic set-up has been brought about through development over a long period of years, and the heavy general losses incident to any sudden change are to be avoided.

The development of the industry for more than fifty years has followed natural economic trends and shaped itself to the natural conditions encountered, and this must be recognized in any system that may be adopted.

The mining industry is very well satisfied with the present condition, and is one of the principal industries of the State, and any system adopted must not interfere in any manner with prospecting or mining development; or legitimate homesteading of such lands where either underground or surface water can be developed in sufficient quantities for irrigation purposes. Therefore, any system adopted along the lines of providing control of the use of such lands for grazing purposes should be such that it can be supplanted by more valuable uses, such as mining or irrigation.

The livestock industry, following its natural economic trends, has developed various sized units, from a few head of stock up to several thousand sheep or cattle in one unit, dependent upon the number of topographic and economic conditions. Any method adopted must take this situation into account.

EVIDENCE CONSIDERED

All of this evidence has been carefully considered, together with the experience of the various State departments having to do with range management, in order to arrive at a proper policy with reference to the use of the public lands of the State.

RANGE POLICY

The first use made of the public lands for the ranging of live stock was begun more than sixty years ago, and at that time no particular system of acquiring either the lands or the control of their use was available, and none was needed, since there was enough range for all purposes; but as time went on and greater numbers of live stock were brought into the country, it became increasingly evident that some control was necessary for the established user. This was attempted in various ways by the users of the range in accordance with existing laws, which were improved or added to from time to time, but in general hinged around two methods:

1. Acquiring ownership of all of the available land or enough thereof to control strategic points, so that any other user, to make efficient use of the range, must become a trespasser, with the usual penalty.

2. Owning or controlling the use of all of the available water for livestock purposes.

Acquiring ownership of land did not prove successful for two reasons. In the first instance the land laws were not sufficiently broad to allow land to be acquired in all of the necessary points, and in the second place too large an investment was required. The feed value of the average public land was in no way commensurate with the cost of such land, and the taxes were too great to be supported by the livestock industry if all or any great amount of the land to be used for grazing purposes had to be owned.

Controlling the use of all of the available water was not feasible for the reason that on the majority of the lands there was enough water to

take care of considerably more live stock than the range could support, therefore rights could be acquired on the same watering hole or spring by different livestock organizations, and this could be continued even after there was no available range, and therefore led to overgrazing and range fights.

THE STOCKWATERING ACT

This condition caused the livestock industry to cast about for ways and means to better control range units, and in 1925 led to the enactment of what is known as the Nevada Stockwatering Act, which provides in general that the amount of feed available is the criterion for the granting of further stockwatering rights instead of the amount of water, and makes it mandatory for the State Engineer to discontinue granting of further stockwatering rights when all of the available feed is being utilized from the subsisting rights, regardless of the amount of unappropriated water that might be available, and further provides a penalty for watering more than fifty head of live stock more than once a season at or within three miles of such subsisting right without the right so to do.

ALL RANGE UTILIZED

It is well known that all of the range has been utilized in Nevada for at least twenty-five years, and for that length of time any new stock that have been brought into the State have merely displaced, on an average, a like number that were already here and have not, therefore, increased the taxable wealth of the State. The Stockwatering Act, however, made it possible to prevent a continuation of this practice in the case of all ranges where grazing requires the use of watering places.

PROTECTION POLICY AND RANGE MAPS

Early in 1927 the State Engineer's office announced a policy of protection for the user or users of any range to the extent that they would be notified directly when new applications were made for stockwatering rights within the limits of the range claimed by them, so that protests might be filed by them; and, also, that in the hearing of such protests the burden of proof was on the new applicant to show that there was range in that area not being utilized from subsisting rights. This policy is still in effect and, together with a system of range maps covering most of the State, has gone a long way toward stabilizing range values.

RIGHT TO THE USE OF RANGE

It is evident that where such large areas are required to support livestock units some method must be found that will eventually lead to a control of the range use in such manner that it is not necessary for the users to make large investments in lands of little value in order that the highest beneficial use of these values may be secured. This has led to a very careful investigation and study to determine whether or not it is possible to provide a system whereby control of the use of the range may be acquired in the same manner as the right to the use of water, retaining the control just so long as it is put to beneficial use, and could be lost by nonuse the same as the right to the use of water.

CONTROL NECESSARY

From the evidence gathered at the various hearings of the commission from widely varied interests, and from experience gained through long association with the industry, it is practically a unanimous conclusion that some form of control must be exercised and that range

units must be controlled and their use limited to certain users so that there is no incentive to overgraze the lands, but that on the other hand the range values will be built up and developed in accordance with good range practice for the benefit of the industry, the State and the Nation.

METHODS OF CONTROL

There are several methods by which such control can be obtained, which warrant consideration on their merits as to their efficiency and economy of operation in the management of these lands of little value, until such time as they may be taken up under the regular land or mining laws:

1. Private ownership.
2. Leasing system.
3. Federal supervision.

4. Range unit control through State legislation along the lines of the Stockwatering Act to establish control over range units, without supervision by any agency.

Private ownership would be the ideal system if the lands had sufficient value and earning power to justify such ownership. In the first place, however, it appears that to bring about such ownership it would be necessary to reorganize the entire tax structure of the State so that lands could be assessed at a very low value, instead of a minimum of \$1.25 per acre as exists at this time, and also that it would be almost, if not entirely, impossible to set a price on such lands low enough that the livestock industry could stand the extra investment. Further, some of the public lands have very great mineral value, far in excess of their value for grazing purposes, and it seemed questionable whether *large areas of such low grazing value should be allowed to pass into private ownership for that purpose alone*, with the danger that prospecting for minerals might be retarded and, even when such minerals were found, the owners of the property might prevent development or make it so expensive that the incentive therefor would be impaired.

The leasing system seemed to provide a logical method to determine who would be entitled to the use of the grazing areas. However, that also seems to be inadvisable, since any leasing system must be predicated on the value of the lands for grazing purposes, and it would seem that on lands of so little value it might provide an extra load that might become very burdensome. Leasing would also require some kind of supervision, and it seems doubtful whether the earnings from such system would pay the supervision costs.

Federal supervision along the lines the Forest Reserve now follows is a very efficient method. Some of the objectionable practices now followed could probably be ironed out and made entirely satisfactory, except that the fees charged must again be on a basis of what the feed is worth, and the grazing values are so small that it is difficult to fix a price low enough not to be burdensome. Further, such charges rarely cover the cost of supervision, so that the Government, then, is subjected to a continued expense beyond the return, and the stockmen are subjected to a continued charge which they are little able to bear at this time in addition to the necessary expenses already incident to their industry.

It has never been the policy of the Government to charge for the grazing use of the unreserved public domain, even through the middle west, but the practice has been to get it taken up for private use.

PUBLIC DOMAIN POLICY

The Government's policy for more than one hundred years, relative to the public domain, has been to meet the situation with proper land and mining laws, so that patents may issue when the land is valuable enough for either agriculture or mining purposes to make it desirable, allowing the public use of such land and necessary regulation by the State until it has been taken up under the regular land or mining laws, or been reserved for some specific purpose.

The policy of range unit control through State legislation along the lines of the Stockwatering Act to establish private control over range units, without supervision by any public agency or making necessary ownership of the land, seems to be the most feasible method, if it can be properly worked out so that the range users may have controlled use of the public lands for grazing purposes until such time as the land may be taken up for mining, homesteading, or other legitimate purposes. Under such a plan the users would only be putting out such expense as considered necessary by them, and providing ways and means of regulating the movement of live stock to make the most of the existing possibilities.

STOCK WATER RIGHTS

Control in the use of the range through stockwater rights, as provided in the stockwatering law, may now be held in either of two ways:

1. Vested stockwatering rights.
2. Stockwatering permits from the State.

It is concluded by the commission that it would be unwise to initiate any legislation that would upset the established situation of range control as established in this connection, and which has received the approval of our State Supreme Court.

SUPERVISION NOT NEEDED

It is thought that it would not be necessary or advisable to project legislation beyond providing a method of establishing range control in the user or users of such range. This would protect such user or users from encroachment by others upon their range units without the need for supervision by any agency, and give them the opportunity to work out their own range problems in accordance with the most feasible method of range development possible in our circumstances.

RANGE AGREEMENTS OR DISTRICTS

It is not the fact that a range user must deal with other legitimate users of such range units or make arrangements to cooperate with such users that makes our range livestock industry uncertain—it is the fact that after adjustments have been settled, as between the rightful users, and agreements can be made or grazing districts formed between users to prevent overgrazing, an entirely new user may come in under certain conditions, upset the arrangement and cause improper use of such range, forcing the legitimate users to overgraze the range

to gain any use for themselves. Range agreements between users are therefore rendered useless until some form of legislation can be had to prevent their subsequent upsetting.

PROPERTY INVESTMENTS

Property investments are the important thing in the State. Therefore, any legislation pointing toward range unit control by the users should take into account and encourage property investment.

WATER DEVELOPMENT

If control can be had over individual range units, it is believed that investments will be made on the range, especially in water development on the winter ranges, thereby causing a more efficient use of that area with a subsequent increase in the total range values of the State.

The 1931 Legislature, after considering the report of the commission, passed what has since become known as the 1931 Range Act, which conforms to the recommendation of the commission that: "Legislation should be enacted pointing to ultimate control of range units by the user or users of such range as can properly be enforced under the 'police powers' of the State."

Section one of the Act provides:

SECTION 1. It shall be unlawful to graze live stock on any part of the unreserved and unappropriated public lands of the United States in the State of Nevada, when such grazing will or does prevent, restrict or interfere with the customary use of such land for grazing live stock by any person who, by himself or his grantors or predecessors, shall have become established, either exclusively or in common with others, in the grazing use of such lands by operation of law or under and in accordance with the customs of the graziers of the region involved; *provided*, that this Act shall not prohibit the grazing on any part of such public lands of live stock owned, kept or used for work or milking purposes by any ranch owner or bona fide settler, for his domestic use, as distinguished from commercial use, nor prohibit the grazing of any live stock necessary for and used in connection with any mining or construction work or other lawful work of similar character. Customary or established use as graziers, otherwise than under the operation of law, as herein used, shall be deemed to include the continuous, open, notorious, peaceable and public use of such range seasonally for a period of five years or longer immediately prior to the approval of this Act by the person or his grantors and/or predecessors in interest except in cases where initiated without protest or conflict to prior use or occupancy thereof. It is further provided that any change in such customary use so established shall not be made hereafter so as to prevent, restrict or interfere with the customary or established use of any other person or persons.

A penalty is provided for violation of this Act.

This Act has since been held constitutional by the Fourth Judicial District Court in a well-written decision by Hon. L. O. Hawkins, in which he says in part:

The Legislature when enacting the 1931 grazing law no doubt had in mind the decisions of our Supreme Court upon the Acts of 1919 (as well as the 1925 Stock Grazing Law). And by the passage of such measure exercised its police powers to preserve the peace upon the public domain within its borders, hoping thereby to bring stability to a great industry of our people. Their efforts should not be set at naught, unless it clearly appears they exceeded their constitutional authority, or that the Act is clearly in conflict with Federal laws upon the same matter.

As hereinbefore stated, every legislative Act is presumed to be constitutional and within legislative powers. That presumption should be allowed full weight in considering the constitutionality of the Act now before the court, for we all know and realize the magnitude of the evil sought to be created by the passage of that Act. In addition to the hundreds of breaches of the peace committed because of controversies over range rights on the public domain, some of which have caused loss of human lives, and many prosperous ranch holdings have been rendered almost valueless by unrestricted grazing upon the nearby public domain; which deplorable state of affairs will continue if the Act is held void, and most of which, if not all, will be avoided in the future by sustaining and enforcing the said law.

There is no doubt that if the lands in question belong to the State the Legislature could pass the Grazing Act of 1931, and although it is not the owner thereof, the people of this State, as well as those of our neighboring States, are entitled to protection in their use and enjoyment of the grasses growing upon those lands. The Federal Government has not yet seen fit to exercise any control over such lands, thereby assuring to said users peace and protection. Congress not having so acted, it seems to me not only the right but the duty of the States to regulate, and in proper cases prohibit, the use of such lands to the end they may be of the greatest benefit to the most people possible; ever having in mind the supreme duty of the State to preserve the peace within its borders.

Believing the Act constitutional, as being a reasonable exercise of the police powers of the State, that it creates no right in or grants no privilege to those individuals coming within the definition of "established graziers," that provision IV of the Act grants unto plaintiff the right to injunctive relief, and that the complaint states facts sufficient to constitute a cause of action against defendant, it is ordered that the demurrer of defendant be, and the same is, overruled.

The 1931 Range Act, in the opinion of livestock men familiar with its operation, dovetails with the 1925 Nevada Stockwater Act in that it provides for the control of the range by the "customary users" where ownership of the right to use the water for stockwatering purposes does not furnish such control. There is very little, if any, water available on the winter ranges. Snow is utilized as a substitute, and there is no provision for acquiring rights to its use.

In 1925 the Nevada Stockwater Act was passed, and sections 2 and 3 of this Act provide that:

SEC. 2. Whenever one or more persons shall have a subsisting right to water range live stock at a particular place, and in sufficient numbers to utilize substantially all that portion of the public range readily available to livestock watering at that place, no appropriation of water from either the same or a different source shall subsequently be made by another for the purpose of watering range live stock in such numbers, and in such proximity to the watering place first mentioned, as to enable the proposed appropriator to deprive the owner or owners of the existing water right of the grazing use of said portion of the public range, or to substantially interfere with or impair the value of such grazing use and of such water right.

SEC. 3. Before approving any application for the right to use water for watering live stock, the State Engineer shall determine, by examination on the ground or otherwise, that the right and use applied for will not contravene the policy of section 2 of this Act. If he shall determine that the right applied for will contravene such policy, he must reject the application. If the water applied for shall be along the course of or in the immediate vicinity of an established or customary driving route for moving live stock from one range to another, the State Engineer may reject the application even if no previous right shall exist for any portion of such water, if he shall determine that such water will best subserve the public interests by being reserved for the watering of live stock while so being driven along such customary driving route.

A penalty is provided for violation of this Act.

The Supreme Court of Nevada has held this Act constitutional.

The "Range Act," the "Stockwatering Act" and the work of this office, in connection with range control, are aimed at control of the range by the "customary users" without additional expense to the State, the Federal Government, or the users of such range.

The Colorado law goes much further and provides for adjudication of the range, first as between sheep and cattle, and second in designating the number of either kind of live stock that any one user may have on any range used in common. Legislation of this character may very well form another step in our progress in range control when our Legislature may judge that we are ready for it. This may be done in the same manner as our water adjudications are now handled, through the State Engineer's office, at a minimum of expense, and the decisions made subject to appeal to the District Court for review, as in the case of applications for permit to appropriate water.

The State Engineer, acting also as a member of the State Range Commission, has assisted in organizing several "Range Districts," as suggested in the report of the Range Commission to the 1931 Legislature, which are located for the most part in the "winter range" in the southeastern part of the State where water does not control the range and where they must rely in a large measure on the 1931 Act.

H. R. 11816, known as the "Colton Bill," provides that the Secretary of the Interior shall take over at his discretion any or all of the unreserved and unappropriated lands, provide for their supervision, and charge what he considers the feed is worth for range purposes under leases. This bill was introduced by Hon. Don Colton, Congressman from Utah.

The State Engineer appeared before the Public Lands Committee in Washington, D. C., May 17, 1932, and testified in regard to Nevada's position on any national legislation relative to control of the public domain, and later submitted a brief, which is included in the published "Hearings" (on page 32) on H. R. 11816, May 3 to June 2, 1932.

The conclusions and recommendations made to the Committee on Public Lands at that time follow:

CONCLUSIONS

1. That of the 180,000,000 acres of unappropriated unreserved public domain in the eleven western States, 55,000,000 acres or 30 per cent, are included in Nevada; and that of the 52,000,000 acres of the remaining unsurveyed territory in this area, 22,000,000 acres, or 42 per cent, are located within Nevada; and that 90 per cent of the area of the State is drained into lakes and "sinks" located entirely within the State.

2. That Nevada, being the sixth largest State in the Union (70,000,000 acres), has less population (91,000) and the least taxable property (\$208,000,000) of any State.

3. That due to such widely varied conditions, from absolutely barren areas in the "Great American Desert" through Nevada to the "Short Grass Country" in States of greater rainfall, with elevations ranging from below sea level to more than 10,000 feet above, with climate ranging from fifty degrees below zero in winter to one hundred and thirty degrees above in summer in different areas, that no one method of "range control" will fit all conditions, making it absolutely essential to follow long adopted policies in local areas.

4. That some regulation is both necessary and desirable.

5. That such regulation can be brought about by "operation of law" protecting the "customary user," through the policy adopted by the Nevada statutes, without additional expense to the Government, and very little to the range user, and that any system adopted must *recognize agreements made in associations or districts composed of actual users of such range lands.*

6. That the long established policy of the Government in relation to the public lands should be continued, passing the lands into the hands of the legitimate users of such lands, on the payment of nominal filing fees.

7. That on lands such as those included in the Nevada area, where Government records show that it requires 140 acres to support a "cow unit" one year, and 40 acres for a "sheep unit," any charge made comparable with the value of the feed upon such lands would not pay for its supervision.

8. That adequate watershed protection will be had when the "customary user" of the range is allowed to protect such range by "operation of law," and can build up and protect his range in accordance

with good practice. Where the range is protected the watershed protection is automatically taken care of.

9. That the Stockgrazing Act, allowing the location of 640 acres where no water is found, should be repealed, since that amount of acreage is of no practical value, and only allows unscrupulous individuals to locate such homesteads inside of range units already established and built up, thereby forcing the "customary user" to buy the homesteads.

10. That principles and policies of "range control" adopted by law, by any State, *regulating the movement of live stock upon the public lands for the protection by law of the users of such lands must be recognized*, then such laws are not discriminatory between the States, thereby recognizing associations or districts made up of owners of established "units," operating at no expense to the Government and very little to themselves. *It is concluded that any method setting up a new system of charges in this connection at this time would be unwise.*

RECOMMENDATIONS

1. That any public land legislation passed by the Congress of the United States should recognize policies and methods adopted by State law *regulating the movement of live stock on the public domain that are not discriminatory between the States.*

2. That the operation of any method inaugurated by the Congress, providing for supervision of such public lands, should be made optional *with the State involved or with associations or districts made up of the "established users" of such range lands.*

BUREAU OF INDUSTRY, AGRICULTURE AND IRRIGATION

This commission was created by the Legislature in 1911, and the Act, amended in 1915, provides that:

SEC. 2. The selection, management, and disposal of said land shall be vested in a commission consisting of the Governor, the State Engineer, and the Surveyor-General, and which, for the purpose of this Act, shall be known as the Commission of Industry, Agriculture and Irrigation, and the Surveyor-General is hereby designated as State Register of Lands under the Carey Act.

It will be seen then that the work of this commission is confined to operations under the "Carey Act," which has been inactive in this State for some years. Therefore, our commission has not been active. However, there has been a considerable number of inquiries received relative to the Carey Act during the past biennium, showing a revived interest in this particular method of reclaiming lands.

Only one project, located in Elko County, was ever perfected in Nevada under this Act. This project is reviewed by the Surveyor-General on page 39 of his last biennial report.

THE STATE BOARD OF IRRIGATION

The State Board of Irrigation was created by the Legislature in 1901, and later amended in section 88c of the 1913 Water Law, which provides that the State Engineer shall be a member, and secretary, of the board. The original Act provides that:

SEC. 2. A State Board of Irrigation is hereby created, to consist of the Governor, the Surveyor-General and the Attorney-General of the State of Nevada, who shall direct the expenditure of the money appropriated by section 1 of this Act (section 1 made an appropriation for the measurement of streams and survey of sites for storage reservoirs during the years 1901 and 1902), upon plans approved by said board, which the representatives of the United States Geological Survey in charge of hydrography, and of the United States Department of Agriculture in charge of irrigation investigation shall supply.

The work of this board originally contemplated the survey of reservoir sites in addition to cooperation with the Federal Government in the measurement of water on the stream systems of the State.

The principal work of this board, for the past fifteen years at least, has been cooperative stream gaging with the United States Geological Survey on the more important stream systems of the State, and the recorded measurements are invaluable in estimating water available for storage and other purposes.

It has been amply demonstrated during the past ten years, which included the dryest cycle of record, that the work must be continued so that any changes in the trend of stream flow may be available if future computations to determine available water for storage purposes, or to determine amounts of water available for irrigation, are to be of value.

A complete report on the cooperative work of this board will be found on page 48. Two thousand dollars was the amount provided by the 1931 Legislature for the biennium.

A number of times since the creation of this office, funds have been appropriated for the investigation of future development possibilities, under various committees such as this board, the Bureau of Industry, Agriculture and Irrigation, for engineering experimentation, etc. The value of this work cannot be doubted, and as the office has become experienced and informed in regard to the matter the work has, of course, improved accordingly.

This is a particularly opportune time to continue investigation work, and this office has continued the storage and river improvement work, with particular reference to the Truckee, Carson and Humboldt Rivers, in cooperation with the Bureau of Reclamation, Department of the Interior, Washington, D. C. A special fund is needed, however, to continue underground water investigations since, with the advent of Hoover (Boulder) Dam power, possibilities for such development are very materially increased. At least \$5,000 should be appropriated for this work.

THE COMMITTEE ON CONSERVATION AND ADMINISTRATION OF THE PUBLIC DOMAIN

(Appointed by the President)

The Committee on the Conservation and Administration of the Public Domain, appointed by President Hoover in 1929, has completed its report. This report has been submitted to the President, and recognizes that the Legislatures of the public land States may be better able

to deal with the important matter of range control than an outside agency, choosing the method best suited to their particular area, considering its topographic and economic features.

The personnel was listed and the work of this committee completely outlined on page 100 of the 1929-1930 biennial report of this office. They are as follows:

Ex Officio Members

Ray Lyman Wilbur, Secretary of the Interior.
Arthur M. Hyde, Secretary of Agriculture.

Members

James R. Garfield, Former Secretary of the Interior, Chairman.
H. O. Bursum, New Mexico.
I. M. Brandjord, Land Commissioner, Montana.
Gardner Cowles, Newspaper Publisher, Iowa.
James P. Goodrich, Former Governor of Indiana.
Col. W. B. Greeley, Former Head of the Forest Service, Colorado.
Perry W. Jenkins, Land Commissioner, Wyoming.
Rudolph Kuchler, Land Commissioner, Arizona.
George Horace Lorimer, Publisher Saturday Evening Post.
George W. Malone, State Engineer, Nevada.
Elwood Mead, Commissioner of Reclamation, Washington, D. C.
Charles J. Moynihan, Colorado.
I. H. Nash, Land Commissioner, Idaho.
William Peterson, Agricultural College, Utah.
Mary Roberts Rinehart, Writer, Washington, D. C.
Huntley N. Spaulding, Former Governor of Massachusetts.
R. K. Tiffany, Washington.
Wallace Townsend, Arkansas.
E. C. Van Petten, Oregon.
Francis C. Wilson, New Mexico.
Hugh A. Brown, Executive Secretary, Department of the Interior, Washington, D. C.

Problems

1. Administration of the Public Domain—
 - a. State ownership.
 - b. Continued Federal ownership.
 1. Supervision under Federal Bureau.
 2. Under State laws.
2. The future reclamation policy.
3. Federal aid for road construction.
4. Completion of the public land surveys.
5. Oil, gas and coal development policy.
6. Development of metalliferous minerals.
7. Reclassification of forest reserve areas.
8. Recommendation to prevent overlapping of Federal Bureau authority.
9. Watershed protection.
10. Administration of Forest Reserve grazing areas.
11. Water control.

The administration of the public domain has been one of the pertinent problems before our Government from the beginning, starting

with a resolution in 1780 providing for the care of the unappropriated lands that might come into the possession of the United States.

Past and Present Policies

During the early days the public lands were considered as a source of revenue, and settlement of these areas was not encouraged.

It was soon realized, however, that progress could only be made by encouraging settlement of the land, and the general trend of congressional action began to encourage private ownership. This led to the Preemption Act in 1841, giving the right to purchase such land based upon settlement.

Homestead Laws

The first homestead law was passed in 1862, definitely establishing the policy of passing the public lands into private ownership at a minimum cost to the settler, regardless of the value of such lands. During the period from 1862 to 1900 most of that great area from Ohio to the Rocky Mountains, containing some of the richest farm land in the United States, passed into the hands of the settler for a nominal filing fee to cover the cost of the transfer, no charge being made for the land, the only requirement being that the settler make his home on such land and farm it.

As the land settlement began to reach the semiarid and arid sections west of the Mississippi River and beyond the Rocky Mountains it was found that 160 acres was not enough land to support a family. This condition led to the passage in 1909 of the Enlarged Homestead Act and later, in 1916, the Stock Raising Act, all calculated to provide the settler with enough land to supply his family. It was soon apparent that even with these later Acts, which in all provided that one man might acquire approximately 1,000 acres of land, it was not sufficient in the arid sections; therefore the land could not be settled. Abundant evidence can be found of the failure of all homestead laws in the arid sections by the abandoned homesteads through that area.

At the present time practically all of the land of any value is in Government or State forest reserves, or parks, or has been withdrawn from entry for some specific purpose, or has passed into private ownership. Therefore the problem now confronts us, just what are we to do with these remaining lands of little per acre value? Shall we revert to the original policy of 1780 of considering them a source of revenue to the States and Nation, or shall we try to continue the policy of passing them into the hands of actual settlers at the least possible cost? If they are to be passed into the hands of the settlers a complete reorganization of the land laws will be necessary.

Grazing Areas

The chief value of these lands, in fact the only value they possess at this time, except where minerals are found, is for grazing purposes and they are being completely utilized for that purpose at this time.

The reason for the small value attaching to these lands is, of course, primarily the lack of rainfall; wherever the precipitation reaches as much as twelve to fifteen inches per year there is no problem, because dry farming can be practiced on suitable areas and abundant grazing values are available on the remainder; but when the rainfall is only

from three to six inches annually, no farming of any kind is possible and large areas are necessary to support live stock; in fact, Government reports show that the remaining unreserved public lands in Nevada require on an average of 140 acres to support one cow unit and approximately 40 acres for a sheep unit. It can be readily seen that an enormous acreage is necessary for the support of a family, since the original 160 acres allowed under the old homestead laws would support only a little more than one cow unit. There is the problem.

It will be seen that for the support of a family an enormous acreage of this range is necessary and to set up what is known as an economic unit of 250 to 500 cattle or 1,500 to 2,000 sheep an area of 30,000 to 70,000 acres would be necessary, and this would correspond to the original 160 acres of land in the more productive areas. Any reorganization of the land laws that might be attempted to permit private ownership must of necessity be flexible enough to cover the highly variable conditions found in these States.

Development Policy

The west and the east hold in general two diametrically opposed ideas as to the undeveloped resources of the west; the west believes that the resources contained within a State, subject to proper reserves, should be developed in an orderly manner and considered as an asset of that State, while a large part of the east believes that the undeveloped public domain in the western States should be considered as an asset to the National Government, belonging to all of the people, and should be preserved for that purpose the same as any other investment. Little conception is had of the magnitude of the development problem of the arid sections.

Irrigation Development

| States | Individuals | Irrigation Districts | Government | All others | Total |
|-------------------|-------------|----------------------|------------|------------|------------|
| Arizona..... | 80,511 | 300 | 257,547 | 129,207 | 467,565 |
| California..... | 1,502,870 | 577,188 | 37,319 | 2,101,638 | 4,219,040 |
| Colorado..... | 1,014,412 | 248,409 | 75,411 | 2,010,153 | 3,348,385 |
| Idaho..... | 513,350 | 359,995 | 290,534 | 1,328,927 | 2,488,806 |
| Kansas..... | 14,546 | ..... | ..... | 32,766 | 47,312 |
| Montana..... | 976,615 | 35,153 | 187,178 | 482,783 | 1,681,729 |
| Nebraska..... | 68,140 | 206,206 | 87,558 | 80,786 | 442,690 |
| Nevada..... | 355,901 | 80,000 | 49,645 | 30,901 | 516,447 |
| New Mexico..... | 151,351 | 15,008 | 86,750 | 285,268 | 538,377 |
| North Dakota..... | 300,306 | ..... | 8,766 | ..... | 12,072 |
| Oklahoma..... | 969 | ..... | ..... | 2,000 | 2,969 |
| Oregon..... | 590,626 | 92,081 | 58,981 | 224,474 | 986,162 |
| South Dakota..... | 31,664 | ..... | 56,658 | 12,360 | 100,682 |
| Texas..... | 110,680 | 88,571 | 20,284 | 366,585 | 586,120 |
| Utah..... | 160,887 | 21,143 | 54,555 | 1,129,066 | 1,371,651 |
| Washington..... | 142,215 | 79,918 | 192,379 | 115,387 | 529,899 |
| Wyoming..... | 724,620 | 22,935 | 75,555 | 364,872 | 1,207,982 |
| Totals..... | 6,448,663 | 1,822,887 | 1,539,120 | 8,437,218 | 18,547,888 |

These figures were compiled in 1920, and there has been very little change since that time.

Reclamation Development

The major development in the arid section is irrigation, and the area affected can be roughly designated by the area west of the line drawn north and south through central Kansas, which includes approximately all of the arid and semiarid region, and includes approximately

45 per cent of the entire area; about 20 per cent of the population and approximately 5 per cent of the cultivated area of the United States.

The entire irrigated area is approximately 18,500,000 acres, of which approximately 35 per cent has been brought under irrigation by individuals; 10.5 per cent by irrigation districts; 8.5 per cent by the Federal Government, and 46 per cent by all other agencies, including operation under the Carey Act.

Present Policy

The present policy of the Government in the management of the public domain includes close supervision of the forest reserves, parks, and Indian reservations, the supervision of livestock grazing within these areas, and the leasing of certain areas for mineral development. The unreserved unappropriated public domain is not supervised in any manner by any Government agency.

Western States Development

It is not generally realized by people of the midwest and eastern States just how small our western development really is in comparison to the total development of the United States, or the obstacles that must be surmounted for further development.

Nevada, for example, has a total area of 70,285,440 acres, of which less than 500,000 acres are actually under cultivation, or approximately three-quarters of one per cent (.75%). The total irrigated acreage in the seventeen western States is approximately 18,500,000 acres, which is, in itself, insignificant compared to the estimated total of 400,000,000 cultivated acres in the United States. Approximately 1,500,000 acres of the 18,500,000 have been brought under cultivation on the Government reclamation projects.

Our policy with respect to utilization is outlined in detail under "The State Range Commission," on page 71, but in general our policy with respect to national legislation has been to have it so drawn that our State laws in this connection would be recognized when they were not discriminatory between the States, and that such legislation would not be operative except by the request of the State involved or the actual users of such range, feeling that we would be amply protected in that event, and at the same time would not be preventing other States from securing such supervision as they might desire.

A detailed report was rendered to the President in January, 1931, containing much important data. Copies of this report are available in this office. The special recommendations follow:

Special Recommendations

1. That Congress pass an Act granting to the respective public land States all the unreserved, unappropriated public domain within their respective boundaries, conditioned, however, that in order to make the grant effective, the States desirous of accepting it shall so signify by act of legislation. A copy of the accepting Act, signed by the Governor and attested by the great seal of the accepting State, when transmitted to the President of the United States, shall operate as an application for the clear listing of the lands granted, and the proceedings thereon shall follow under the direction of the Secretary of the Interior, as in the case of selections heretofore made by public land States under State land grants.

2. That for States not accepting the grant, Congress shall include in the Act a provision that *upon the application of the State Land Commission, or State Land Commissioner, as the case may be, authorized thereto by the State Legislature, the President should, by Executive Order, designate the unreserved, unappropriated public domain in such State as a national range.* (Federal supervision upon application by State.)

Existing laws and appropriations pertaining to the national forests should be extended to national ranges in so far as applicable, including grazing research and range improvements, and disposition of receipts, homestead provisions, and the prospecting for and utilization of minerals.

National ranges should include public lands withdrawn for mineral or other purposes when the use of the land for grazing is not inconsistent with the purpose of the withdrawal.

3. In the same Act of Congress it should be provided that *in the absence of legislation by any State within 10 years thereafter dealing with the control and administration of the unreserved, unappropriated public domain*, the President, by Executive Order, may establish, when authorized by Congress, a national range in such State, comprised of all such public domain, including lands withdrawn for mineral or other purposes whose use for grazing is not inconsistent with the purpose of the withdrawal. (In absence of State legislation national ranges may be established.)

4. Areas of unreserved and unappropriated public domain granted to the States shall be clear listed by the Department of the Interior in accordance with established procedure as to mineral or nonmineral character. In the case of lands classified as nonmineral in character, those passed to the States should be in fee simple, *and pending the transfer of lands to the States the Federal Government should recognize, in so far as possible, any method inaugurated by the States to regulate the movement of live stock on such lands, to prevent overgrazing, that is not discriminatory between the States.* (State's method of range regulation to be recognized.)

In the case of lands classified as mineral in character, title to the State should be in fee simple, except for the reservation in the United States of specified mineral or minerals found by the Interior Department to be present in the land at the time of clear listing, and with reservation in the United States, its permittees, lessees, or grantees, of the right to enter upon the lands, to prospect for, mine, and remove such minerals.

5. There should be temporarily excepted from the grant the areas shown on map No. 1, submitted to this committee by the Forest Service, entitled "Areas proposed by Forest Service as additions to existing national forests or for establishment as new national forests." In order to determine what, if any, areas should be taken from or added to the national forests, a board should be created for each State composed of *five members, one designated by the President of the United States, one by the Secretary of the Interior, one by the Secretary of Agriculture, and two by the State.* The power and duty of such boards shall be: (1) *To decide what, if any, lands within such proposed areas shall be added to the national forests;* (2) *to decide what, if any, areas within existing national forests shall be restored to the public domain;*

(3) *additions to national forests should be limited to areas chiefly valuable for forest purposes, except upon request of the State involved;*
(4) the board shall endeavor to correct and round out the boundaries of national forests by the consolidation of areas wherever practicable;
(5) the board shall report its findings from time to time to the Secretary of the Interior, and complete its findings within one year from appointment of the board. (Criterion—Chiefly valuable for forest purposes.)

The committee recommends the use of map No. 1 merely as a basis for consideration of the board, not as an expression of opinion or suggestion that those areas be added to the national forests.

The committee believes that this method of procedure will expedite clear listing of the remaining lands.

Whatever areas are not included within a national forest as a result of the decision of the board shall then pass to any accepting State to be clear listed in the same manner as the general grant.

The board herein created shall be organized upon the passage of the Act, and any State may elect to defer acceptance of the grant in paragraph 1 until the determination of the board has been made.

6. The board should also be authorized to select additional reservations important for national defense, for reclamation purposes and reservoir sites, for national parks and monuments, and for migratory bird refuges, and to recommend that they be set aside for the purposes indicated, and be excluded from lands granted to any accepting State, and such recommendation, when received by the Secretary of the Interior, shall have the effect of excluding such areas from the grant; provided, however, that the recommendations shall be filed with the Secretary of the Interior prior to the clear listing to the State of any of the land which might be so reserved.

If a majority of the board, or in the case of national defense and/or for reservoir sites on interstate streams, two members thereof request that a definite area for the purposes stated in the preceding paragraph be excluded from the clear listing of any tract for further study to be given the subject, then the Secretary of the Interior shall exclude such definite areas from the clear listed lands.

This board shall also have the power and it shall be its duty to make recommendations to the Secretary of the Interior for the elimination of lands from existing reservations, withdrawals, and classifications when such action is deemed proper by the board.

7. Areas restored to the unreserved and unappropriated public domain through the cancellation of any rights or claims or release of withdrawals should be subject to adjudication and clear listing or reservation, as herein provided.

8. The Secretary of the department having jurisdiction over any of the lands classified and disposed of as herein provided and remaining in public ownership *should be authorized to exchange any of such lands with States or private owners for other lands of equal value with a view to consolidating ownership* for more effective utilization and administration. *In the making of such exchanges, long-standing priority of use of grazing areas should be given due consideration and no exchanges completed until after full hearing has been accorded.* Similar authority should be extended by an enabling Act to the States as

to any public lands granted thereby, and also as to any lands granted to the State by previous enabling or other Acts.

9. In order to bring about the consolidation of existing State holdings within the States not accepting the general grant, so that administration and control may be more efficiently exercised, the State should be authorized, in the discretion of the Secretary of the department having jurisdiction thereover, to select any isolated area not in excess of four sections of the unreserved, unappropriated public domain, such as consolidated with near-by areas of State-owned lands would effect the purpose mentioned; and upon clear listing of such selections, title should then pass to the State as in the case of other State land grants. (Established use recognized.)

10. The Secretary of the Interior should be authorized to clear list areas previously withdrawn for the protection of stockwatering places and areas withdrawn for stock driveways upon a showing by the State that they are no longer required.

11. As to all grants provided for in the Act, the land should pass to the States impressed with a trust for administration and rehabilitation of the public domain and for public institutions, and with such restrictions as Congress might deem appropriate.

The following general restrictions are deemed desirable:

(a) The lands passing to the several States under the provisions of this proposal *shall be subject to lease, sale, or other disposition as the State Legislature may determine*; provided, however, that all sales of such lands shall be made only at public auction after previous advertising and with reservation of subsurface minerals. (Legislature to determine disposition of land.)

(b) None of such lands, nor any estate or interest therein, shall ever be sold or leased except in pursuance of general laws providing for such disposition.

(c) All proceeds arising from the sale or other permanent disposition of the lands and every part thereof shall be placed in a permanent fund to be safely invested and to be guaranteed by the State against diversion or loss.

12. *The present conservative policy of reclamation development should be continued. Under it, construction expenditures each year are restricted to the payments from settlers and the income from other sources provided for in the law. If payments are not made, works will not be built. This makes of reclamation a sound business policy and is a strong influence toward maintaining the integrity of the contracts. (Reclamation to be continued.)*

Where projects require a larger investment than can be met from the reclamation fund, they should be dealt with by Congress in special Acts similar in character to the Boulder Canyon Project Act. (Special projects.)

We recommend that, in the undertaking of any project, there should be no interference with the laws of the State relating to the appropriation, control, or distribution of the water or with vested rights secured thereunder.

Past experience, coupled with the urgent need of additional funds for accelerating and continuing construction work on irrigation projects, points conclusively to the desirability of adopting a definite policy

relative to hydroelectric development, under which the power receipts should be used; first, to repay the cost of the power plant and appurtenant works; second, the cost of the reservoir and dam which regulates the delivery of water to the plant; and after that, all net revenues should be credited to the reclamation revolving fund.

The policy should be continued of having a central organization to design and build works, but to transfer these works to the control and management of the water users as soon as the projects are settled and developed.

13. We approve and adopt from the Report of the Committee of the Irrigation Division of the American Society of Civil Engineers made October 4, 1928, the following:

The conservation of the water in the rivers and lakes of the country should be under public control, and in order to lay a proper foundation for the making of comprehensive plans the Federal and State governments should gather data, compile statistics, and conduct studies necessary to determine the feasibility of projects.

The regulation of the flow of streams for the prevention of floods and for the best possible utilization of the waters should be undertaken by the States, or jointly by the United States and the States under such suitable forms of cooperation as may be appropriate under the constitutional authority now delegated to each. They should prepare and adopt comprehensive plans for such regulation and should bear an equitable portion of the cost of water storage and flood control work when the economic aspects after full investigations are found to be favorable, and the remainder of the cost should be allocated to flood control, irrigation, power development, municipal water supply, and other purposes.

Where protection against flood waters results from the regulation of stream flow by means of reservoirs or otherwise, the proportion of the cost of the flood control work not assumed by the Federal or State government should be assessed against the lands and other properties which receive benefit therefrom.

14. Whatever be the method adopted for the use and disposition of the public domain, any final administrative act must be based upon a survey of the areas involved. *It is therefore recommended that the Congress be asked to provide appropriations sufficient to enable the General Land Office to proceed immediately with the survey of the remaining unsurveyed areas.*

15. In the administration of the public domain as a national range it is recommended that consideration be given to those methods which will perpetuate the best interests of the livestock industry, including long-time permits for grazing and developing watering holes to permit the complete use of the range. The program should include consideration of a year-round permit system allocated so as to make the best use of the entire grazing areas of the State.

Careful consideration should be given to those areas vital for both grazing and watershed protection, to the end that both interests receive constructive administration.

16. *That the present ratio of participation by the Federal Government in the construction of Federal aid highways be continued for a period of ten years.*

17. *The location and protection of stock driveways should be given immediate consideration. Pending the determination of the extent to which they should be transferred to the States accepting the grant, cooperative action between the Federal Government, the States, and the stockraisers' associations as to use, location, and policing should be entered into where possible. Interstate driveways should be retained in the Federal Government and held subject to use determined by interstate agreements.*

18. *We adhere to the principle that in all matters clearly involving the interest of two or more States, but not that of the other States of the Union, all questions arising therefrom should be settled by agreement and compact so far as possible and not by Federal intervention, save an appeal to the courts where necessary. This principle has proved very effective recently, and should be more frequently resorted to in the future.*

19. *It is the conclusion of the committee that as to agricultural and grazing lands, private ownership, except as to such areas as may be advisable or necessary for public use, should be the objective in the final use and disposition of the public domain.*

20. *In order to provide for a more effective administration of the public domain, and the various reservations and areas now under the control of the Federal Government, and to promote the conservation of natural resources, it is recommended that the Congress be asked to authorize the President to consolidate and coordinate the executive and administrative bureaus, agencies, and offices created for or concerned with the administration of the laws relating to the use and disposition of the public domain, the administration of the national reservations, and the conservation of natural resources.*

National Range Legislation

The above recommendations were embodied in H. R. 5840, known as the "Garfield Bill," introduced in Congress December 15, 1931. A bill also dealing with the disposal of the public domain, H. R. 11816, known as the "Colton Bill," was introduced May 3, 1932, which provided that the Secretary of the Interior should take over and supervise at his discretion all of the public lands, charging what he considered the feed to be worth for such supervision.

The State Engineer and the State Range Commission made it a particular point to emphasize the necessity of inclusion in any national legislation the two provisions as outlined under the report of the State Range Commission:

1. *That any public land legislation passed by the Congress of the United States should recognize policies and methods adopted by State law, regulating the movement of live stock on the public domain, that are not discriminatory between the States.*

2. *That the operation of any method inaugurated by the Congress, providing for supervision of such public lands, should be made optional with the State involved or with associations or districts made up of the "established users" of such range lands.*

It is felt that with the recommendations made in the report to Congress and the President, relative to our particular problem, that even if no direct action is taken by Congress we are in much better position than ever before, since a national committee has indorsed our principle of operation.

THE ASSOCIATION OF WESTERN STATE ENGINEERS

The Association of Western State Engineers was organized in 1927 in order that the seventeen western arid and semiarid States might cooperate with a beter understanding of their common problems. The following are lists of the States included in the membership of the organization, and the persons representing the various States:

| States | | |
|------------|--------------|------------|
| Nevada | Arizona | Montana |
| Texas | North Dakota | Nebraska |
| Washington | South Dakota | New Mexico |
| Utah | Idaho | Oklahoma |
| California | Kansas | Oregon |
| Colorado | | Wyoming |

Members (1932)

Officers—

President, George M. Bacon.
 Vice President, George S. Knapp.
 Executive Committee, George M. Bacon, George S. Knapp, Edward Hyatt.

Members—

Frank P. Trott, Phœnix, Arizona.
 Edward Hyatt, Sacramento, California.
 M. C. Hinderlider, Denver, Colorado.
 R. W. Faris, Boise, Idaho.
 George S. Knapp, Topeka, Kansas.
 J. S. James, Helena, Montana.
 R. H. Willis, Bridgeport, Nebraska.
 George W. Malone, Carson City, Nevada.
 George M. Neel, Santa Fe, New Mexico.
 Robert E. Kennedy, Bismarck, North Dakota.
 T. C. Harhill, Wagoner, Oklahoma.
 Charles E. Stricklin, Salem, Oregon.
 John Berg, Pierre, South Dakota.
 John A. Norris, Austin, Texas.
 George M. Bacon, Salt Lake City, Utah.
 Charles J. Bartholet, Olympia, Washington.
 John A. Whiting, Cheyenne, Wyoming.

Purpose

The "Association of Western State Engineers," comprising the seventeen arid or semiarid States, has been organized and is now operating along the lines laid down in its constitution, viz:

1. To formulate broad principles, applicable to all of these States for the use, control and regulation of the waters thereof.
2. To assist one another in the solution of individual problems through the exchange of ideas and experiences.

3. To cooperate in making common cause for the preservation to the States of their inherent sovereign right to use, control and distribute the waters thereof, and to facilitate the adjustment of interstate problems.
4. To help stabilize the commercial phases of the use of water by encouraging the perfecting of the laws relating thereto, and by other proper means.
5. To circulate among members such information as may be helpful in the discharge of their official duties.

It is recognized that the limit of a State's water supply is the "limit of that State's development." Therefore, the objective of the arid States is to adopt such laws, principles and policies as to bring about the highest development possible under prevailing conditions.

The program of the last general conference, held in Sacramento, California, October 28-30, 1931, follows:

Federal and State Policies with Respect to Control of Water—

An Historical Résumé and Present Status of Conflicts between Federal and State Jurisdiction, by Sidney T. Harding.

Policies with Respect to Reservoirs—

Federal Viewpoint, by Dr. Elwood Mead.

State Viewpoint, by George M. Bacon.

Discussion.

Policies with Respect to Navigation and Flood Control—

Federal Viewpoint, by Lieut. Col. Thomas M. Robins.

State Viewpoint, by George S. Knapp.

Discussion of Improvement of Laws and Financial Stability of Irrigation Districts (Dick Bill, Smith Bill, etc.).

Forethought in Planning the Development of Water Resources—

The State Water Plan of California, by A. D. Edmonston.

Penalties of Lack of Forethought and Uncoordinated Effort, by M. C. Hinderlider.

Federal Facilities Available to Assist in Evolution and Development of Plans.

Conservation and Administration of Public Domain—

Report of the Work of the Federal Committee, by George W. Malone.

Discussion.

General Discussion of Matters of Common Interest—

Federal Bill for Relief of Drainage and Irrigation Districts (Dick Bill, Smith Bill, etc.), by R. W. Faris.

Laws Relating to Underground Water, by George M. Neel.

Fees in Connection with Applications to Appropriate, Adjudications and Stream Administration, by Chas. E. Stricklin.

Report of Committee on General Relations with the U. S. Geological Survey.

Advances in Improvement of U. S. Weather Bureau Meteorological Service.

Law and Procedure in Connection with Unusual Appropriations, by H. W. Reppert.

The Present Status of Registration of Engineers, by R. J. Tipton.

The State Engineer of Nevada called the original meeting in Denver, Colorado, in 1927, was responsible for the organization of the

Association, and was elected its president for the years 1928-1929. M. C. Hinderlider, State Engineer of Colorado, was president in 1930; Edward Hyatt, State Engineer of California, in 1931, and George Bacon, State Engineer of Utah, in 1932. Annual conferences were held in Salt Lake City, Utah, in 1928; Reno, Nevada, in 1929; Denver, Colorado, in 1930, and Sacramento, California, in 1931.

Copies of the proceedings of these conferences can be seen in the State Engineer's office.

THE NATIONAL RECLAMATION ASSOCIATION

(Included in printed report by request)

A meeting of men prominent in irrigation and reclamation affairs in the United States was called for December 5 in Salt Lake City, Utah, by Governor George H. Dern of Utah, to precede the Western Governors' Conference, on December 6 and 7, of which he was acting president.

The purpose of the meeting preceding the annual Governors' Conference was to outline a definite program relative to reclamation and irrigation development which subsequently could be adopted by the Governors' Conference and made a part of their program.

The necessity of such a program and its importance to our own State is quickly recognized. Following is a list of prominent men invited to attend the meeting, together with the letter to them by Governor F. B. Balzar, which outlines the serious problem confronting the western States:

CARSON CITY, NEVADA, November 30, 1932.

- Honorable P. A. McCarran, Senator Elect, Reno.
- Honorable James G. Scrugham, Congressman Elect, Reno.
- Mr. Geo. W. Malone, State Engineer, Carson City.
- Mr. Henry Rives, Secretary Mine Operators' Association, Reno.
- Mr. R. C. Stitser, Editor Review-Miner, Lovelock.
- Mr. E. M. Steninger, Editor Elko Free Press, Elko.
- Mr. J. I. Wilson, President Walker River Irrigation District, Yerington.
- Mr. W. A. Harmon, President Newlands Reclamation Project, Fallon.
- Mr. H. F. Dangberg, President Irrigation District No. 1, Carson Valley Unit, Minden.
- Mr. C. W. Mapes, President Washoe County Conservation District, Reno.
- Mr. A. L. Jones, Secretary-Treasurer Muddy Valley Irrigation Company, Overton.
- Mr. Graham Sanford, Editor Reno Evening Gazette, Reno.
- Mr. Ross McKechnie, Editor Nevada State Journal, Reno.
- Mr. A. E. Cahlan, Editor Review-Journal, Las Vegas.
- Mr. Charles P. Squires, Editor Las Vegas Age, Las Vegas.
- Mr. E. H. Walker, Secretary Reno Chamber of Commerce, Reno.
- Mr. Charlie Jones, President Water-Users Association, Lovelock District, Lovelock.
- Mr. Phil M. Tobin, President Water-Users Association, Winnemucca District, Winnemucca.
- Capt. E. R. Marvel, President Water-Users Association, Battle Mountain District, Battle Mountain.

Mr. George Ogilvie, President Water-Users Association, Elko District, Lamoille.

GENTLEMEN: A session of the Western States Governors' Conference will be held in Salt Lake City, December 6 and 7, and this will be preceded on December 5 by a Reclamation Conference.

The importance of these two conferences will become apparent when it is considered that the Government policy relative to reclamation in the west promises to be seriously threatened in the coming Congress, due to opposition developed throughout the east and middle west on the theory that there is already too much land under cultivation at this time, and that further aid to Government reclamation projects should be discontinued.

To offset this propaganda and to make possible continued assistance to the western States by the Bureau of Reclamation, it is imperatively necessary that the western States decide upon a definite policy to be followed, and unite in taking any required action before congressional committees to offset the work being done against western reclamation.

In addressing you several gentlemen, it is my thought that as many as possible from the State of Nevada should arrange to attend this conference, in view of your vital interest in the work of the reclamation service, and other subjects to be discussed thereat, affecting our State.

It is to be regretted that the State has no funds from which the expenses of your trip can be paid, but I hope, nevertheless, that you may find it possible to attend, and will appreciate your advising me if you find it possible to make the trip.

With my personal well wishes, I am

Very truly yours,

F. B. BALZAR, *Governor.*

The following is a list of men attending the conference:

ARIZONA

Amos A. Betts, Phoenix.
G. E. P. Smith, University of Arizona.
Thomas Maddock, Phoenix.

CALIFORNIA

R. E. Caldwell, Los Angeles.
A. M. Barton, Sacramento.
C. B. Hutchinson, University of California.
A. B. Tarpey, Fresno.
Edward Hyatt, Sacramento.
Frank Adams, University of California.
Charles L. Childers, El Centro.

COLORADO

E. B. Debler, Denver.
W. H. Olin, D. & R. G. W. R., Denver.

IDAHO

Joseph Anderson, St. Anthony.
Jeffries.
Lew W. Davis, St. Anthony.
T. C. Coffin, Pocatello.
Nate Block, Pocatello.
L. F. Parsons, Boise.
R. E. Shepherd, Jerome.

W. H. Robinson, Caldwell.
 R. B. Satterday, Caldwell.
 Earl Q. Marsing, Marsing.
 G. W. Grege, Kuma.
 John W. Hart, Rigby.
 Thomas Heath, Preston.
 Ben Ross, Governor, Boise.
 N. W. Sharp, Fisher.
 R. W. Faris, Boise.
 John T. Fisher, St. Anthony.
 Joel L. Priest, Boise.
 Roy S. White, New Plymouth.

ILLINOIS

R. W. Reynolds, Chicago.

MINNESOTA

John W. Haw, Northern Pacific Railway Co., St. Paul.

MONTANA

J. Sklower, Malta.
 Wm. E. Davison.
 John R. Lovelace, Bozeman.
 John E. Dawson, Great Falls.
 Augustus Vaux, Sidney.
 Sam Stephenson, Great Falls.
 L. A. Campbell, Missoula.
 B. C. Lillis, Billings.
 J. S. James, Helena.

NEBRASKA

R. A. Smith, Omaha.

NEVADA

Fred B. Balzar, Governor, Carson City.
 George W. Malone, Carson City.
 George W. Friedhoff, Yerington.

NEW MEXICO

N. B. Phillips, Las Cruces.

OREGON

Marshall N. Dana, Portland.
 W. L. Powers, Corvallis.
 Robert E. Smith, Portland.
 W. G. Ide, Portland.
 Charles E. Stricklin, Salem.
 Frank Morgan, Nyssa.
 E. C. Van Petten, Ontario.
 Kenneth Miller, Portland.

TEXAS

Roland Harwell, El Paso.

UTAH

George H. Dern, Governor, Salt Lake.
 E. O. Larson, Salt Lake.
 George C. Southerland.
 Edward B. Jones, Lehi.
 J. Will Robinson.
 A. H. Evans, Lehi.
 Myrth Johnson, Payson.
 Henry H. Blood, Salt Lake.
 Kenneth Berg, Payson.
 Eli F. Taylor, Salt Lake.

J. A. Hale, Salt Lake.
 Ora Bundy, Ogden.
 R. B. Ketchum, University of Utah.
 D. A. Lyon, University of Utah.
 Raymond J. Ashton, Salt Lake.
 Walter H. Trask, Jr., Salt Lake.
 Charles F. Barrett, Salt Lake.
 L. B. Hampton, Salt Lake.
 A. F. Doremus, Tooele.
 William R. Wallace, Salt Lake.
 Glen E. Davis, Santaquin.
 A. R. Creer, Spanish Fork.
 William Peterson, U. A. C., Logan.
 S. M. Nielsen, Mt. Pleasant.
 Frank Francis, Ogden.
 George M. Bacon, Salt Lake.
 A. P. Bigelow, Ogden.
 J. W. Gillman, Provo.
 R. A. Hart, Salt Lake.
 Ralf R. Woolley, Salt Lake.

WASHINGTON

Joseph Jacobs, Seattle.
 Roy R. Gill, Spokane.
 Fred W. Graham, Seattle.
 J. L. Lytel, Seattle.
 E. F. Blaine, Grandview.
 A. E. Larson, Yakima.
 C. C. McCormick, Spokane.
 W. P. Stapleton, Seattle.

WYOMING

John A. Whiting, Cheyenne.
 B. B. Morton, Cheyenne.
 Charles B. Stafford, Cheyenne.
 A. M. Clark, Governor, Cheyenne.
 Perry W. Jenkins, Big Piney.
 Dr. A. G. Crane.

At the conference December 5, during which a general discussion of the entire situation was had, it was decided that some well-defined and directed organization must be formed, with specific authority to speak for the entire arid sections of the United States in the matter of the future reclamation and irrigation policy. After committees had been appointed and their recommendations submitted the following constitution was adopted:

CONSTITUTION

NATIONAL RECLAMATION ASSOCIATION

NAME OF ASSOCIATION

1. The name of this association shall be the National Reclamation Association.

PURPOSE

2. The purpose of the association shall be to promote the cause of reclamation by irrigation and to exert its efforts for the continuation of the services of the Federal Bureau of Reclamation and to cooperate with and assist it in bringing about the speedy completion of various Federal reclamation projects and to promote the adoption of such legislation affecting reclamation as shall meet the approval of its Board of Directors.

MEMBERSHIP

3. Memberships shall be composed of the Governors, State Water Engineers or Commissioners, United States Senators and Representatives in Congress of

the member States, also of individuals and organizations including State Reclamation Associations, Irrigation Districts, Water Users' Associations, Chambers of Commerce, Commercial Clubs, Farm Organizations, Civic Clubs, Labor Groups, companies and corporations, and all civic associations having a membership of 25 or more members which are interested in the development of the various States by irrigation.

BOARD OF DIRECTORS

4. The governing body of this association shall be a Board of Directors consisting of one director from each State in which there is located a Federal irrigation project; said directors shall be elected at the annual meeting upon nomination by the delegates from the respective States.

MEETINGS

5. The annual meeting of the association shall be held on the second Tuesday of October of each year, at a place to be selected at the preceding annual meeting or by the Board of Directors, in the event the preceding annual meeting shall fail to act. The annual meeting shall be by convention made up of delegates from the various States in which there is located a Federal irrigation project; each State shall be entitled to not more than ten voting delegates. Delegates to any meeting shall be appointed by the Governors of the member States from a list of nominees submitted by the members of the association in the respective State, and presented to the Governor by the Director for that State, and in the event of failure of the Governor to so appoint not less than ten days prior to the meeting, selections shall be made from the list of nominees by the Director of that State.

SPECIAL MEETINGS

6. Special meetings may be called by the President from time to time or by a majority of the Board of Directors, at such time and place as shall be designated by them, upon giving not less than fifteen days' notice to the membership.

OFFICERS

7. The officers shall be a president, a first vice president, a second vice president, a secretary, a treasurer, an executive committee, consisting of five members, of which the president shall be ex officio a member, and a secretary-manager. All officers shall be chosen by a majority vote of the Board of Directors. Those officers shall hold office for one year and until their successors are duly elected and qualified, and shall perform the usual and customary duties of their respective offices.

Secretary-Manager. The duties of the secretary-manager shall be prescribed by the Board of Directors and he shall be responsible to the Board of Directors, and shall make reports to the president from time to time, as the president may request.

Bonds. It shall be the duty of the Board of Directors to require the treasurer, or any other officer handling funds of the association, to file with the president a bond conditioned upon the faithful performance of his office, said bond to be in such sum as the Board of Directors may prescribe.

FINANCES

8. Funds for the activities of the association shall be provided by contributions solicited by the officers and by the members, and there shall also be a membership fee of one dollar per annum for individual members, and five dollars per annum for organizations having a membership of less than one hundred persons, and ten dollars per annum for organizations having a membership of more than one hundred persons.

AMENDMENTS

9. Amendments to the constitution may be made at any regular or special meeting by the affirmative vote of at least one-half of the member States, each State having one vote.

BY-LAWS

10. The directors may adopt such by-laws as may from time to time be deemed necessary for the control and government of the association.

RULES OF ORDER

11. Roberts Rules of Order shall govern all annual meetings, and all business and special meetings of the association.

Following the adoption of the constitution, the officers, executive committee, and directors were elected. They are as follows:

OFFICERS

Dana, Marshall, President, c/o The Journal, Portland, Ore.
 Stephenson, Sam, First Vice President, Great Falls, Montana.
 Wallace, Wm. R., Second Vice President, Newhouse Building, Salt Lake City, Utah.
 Larson, A. E., Treasurer, Yakima, Washington.
 Miller, Kenneth, Secretary, S. P. & S. Ry. Co., Portland, Ore.

EXECUTIVE COMMITTEE

Tarpey, Arthur B., Fresno, California.
 Stephenson, Sam, Great Falls, Montana.
 Malone, George W., Carson City, Nevada.
 Wallace, Wm. R., Newhouse Building, Salt Lake City, Utah.
 Jenkins, Perry, Big Piney, Wyoming.

DIRECTORS

Maddock, Thos. B., 306 E. McDowell, Phoenix, Ariz.
 Tarpay, Arthur B., Fresno, California.
 Debler, A. B., 421 Customs House, Denver, Colo.
 Sharp, N. V., Route 2, Fisher, Ida.
 Stephenson, Sam, Great Falls, Montana.
 Smith, R. A., 1416 Dodge Street, Omaha, Nebr. (Union Pacific).
 Malone, George W., Carson City, Nevada.
 Phillips, N. B., Las Cruces, N. M.
 Dana, Marshall N., c/o The Journal, Portland, Ore.
 Harwell, Roland, 363 Myrtle Avenue, El Paso, Tex.
 Wallace, Wm. R., Newhouse Building, Salt Lake City, Utah.
 Larson, A. E., Yakima, Wash.
 Jenkins, Perry, Big Piney, Wyo.

The entire program as outlined above was subsequently adopted by the Governors' Conference on December 6 and 7, and made a part of its program.

The president of the association, Mr. Marshall N. Dana, will appear before congressional committees and otherwise represent the association, calling on the various members for such assistance as he may need.

It is recommended, in view of the importance of this work to our State, that whatever is determined to be our part of the expense in this connection be appropriated by the Legislature.

FUTURE DEVELOPMENT IN NEVADA

The statement is often made that Nevada is a State of small resources, indicating that it has about reached its ultimate maximum development.

We are familiar with mining development and what can happen under favorable conditions brought about by a "bonanza strike," hence there is a tendency to wait for something spectacular to happen. However, it has been brought home to us that a State depending upon mining development alone, cannot continually prosper. It must develop other resources less spectacular, but which will hold our people when the mines are on the decline.

Other developments are slower and attract less attention, hence a more sustained effort is required to bring them to successful conclusions.

The following is a partial list of possible developments, which should be realized in the not-too-distant future, not including the mining of precious metals and like activities. Most of these prospective developments are more fully outlined elsewhere in this report:

1. Truckee River

A cooperative investigation conducted by the Federal Government with this office in 1927-1928 showed that upstream storage on this river was not only feasible but desirable in order to round out the water supply on the Newlands Project and to stabilize the water supply on the Truckee Meadows. This would materially increase the taxable value in these two areas.

2. Carson River

A cooperative investigation was carried on by the Federal Government with this office on the Carson River in 1928, and we are convinced that the rights of the Newlands Project can be entirely safeguarded by upstream storage on the Truckee and Carson Rivers, and that the water supply on the Carson Valley lands can also be stabilized to a large extent. If this can be brought about, the taxable value of the Carson Valley lands will be materially increased.

3. Humboldt River

A cooperative investigation is now being carried on by the Federal Government with this office to determine feasible river improvement and storage sites. It is believed that the water supply on a substantial amount of the lands on this stream system can be stabilized, thereby creating a large amount of taxable wealth.

4. Walker River

The Walker River Irrigation District is at this time in financial difficulties, but will be refinanced and pay out. This district needs more storage, and further units can be constructed on the West Walker River, and on the East Walker River, when they are required. This project eventually will be rounded out and will materially increase the taxable values of the State.

5. Muddy River

Upstream storage possibilities on this river were investigated in cooperation with this office in 1928, the project being temporarily abandoned when it was decided to build Hoover Dam twenty-five feet higher, thereby backing the water farther up Muddy River and covering more land. This project will be feasible, however, on a smaller scale, when Hoover Dam is completed, and no doubt will be constructed, thus increasing the taxable values on that stream system.

6. Colorado River

A. Power—

By the aid of cheap power from Hoover Dam and the close proximity of the metallic and nonmetallic deposits in southern Nevada it is believed that many products can be manufactured. It is estimated that from \$10,000,000 to \$20,000,000 of new taxable property may be created in that manner. See Colorado River Development Commission, page 56.

B. Irrigation—

It is estimated that there is a considerable acreage to be developed by gravity from Colorado River water, and a much larger acreage upon which water can be pumped directly from the reservoir by the aid of the cheap power. This acreage is being determined at this time by the Federal Government under the terms of the Boulder Dam Project Act.

C. Revenue—

Revenue in lieu of taxes must be continually safeguarded now that it has been secured, otherwise the sale price might be adjusted so there would be no returns to the State.

7. Owyhee River and Virgin River

Unfortunately there is very little land in Nevada under a suitable damsite on the Owyhee River. A dam covering the lands on this river, however, would be located in Nevada. A dam was recently constructed in Utah on the Virgin River, covering some lands in Nevada, but it failed during excessive high water last year. A project there may be feasible. It has not been investigated by this office.

8. Range Control

By providing proper control of the range by the customary users, without additional expense, it is estimated that the carrying capacity of the range may be increased from 15% to 30%. This would materially increase the taxable wealth of the State. See page 71.

9. Underground Water

By the aid of cheap power from Hoover Dam, underground water can be pumped for irrigation and other purposes wherever the power load can be developed to justify taking the power into the district. See pages 119 and 122.

The position is often taken by the people in different parts of the State that they are not interested in developments not immediately affecting their districts, but all of these developments should be considered from the standpoint of the State as a whole, as well as affecting particular sections, because any increase in the actual wealth of the State reduces the burden carried by other properties.

Remarks

We have not materially increased our taxable wealth for a considerable time. Raising valuations is not increasing values. Rather it has the opposite effect and, in the opinion of a large number of well-informed men in this State, the future welfare of our people depends upon developing our natural resources so that our population and wealth may be increased and that the burden on existing property values may be correspondingly decreased.

Considerable propaganda is being circulated at this time to the effect that there should be no new developments until such time as the actual need is felt for increased production. It is well known that it requires from six to fifteen years to finance and complete a new project, and during that time a complete cycle of high and low prices may pass.

The irrigation projects mentioned above are merely stabilizing water supply on lands now under cultivation, where people already have their homes and investments, and bring very little if any new lands under cultivation.

THE OFFICE OF THE STATE ENGINEER

The office of the State Engineer was created in 1903 by the State Legislature to provide an economical way of recording and determining water rights, and to provide a central point for records of water rights which would be readily accessible to the public, so that the extent of such rights on any stream system might easily be ascertained.

The Legislature provided, in setting up the office, that a right to the use of water could only be acquired by application to the office of the State Engineer, and a definite method of procedure was established to determine whether a permit should be granted, the decision of the office being subject to appeal to the District Court by either the applicants or protestants. It was specified that any right to the use of water initiated prior to the creation of the State Engineer's office was to be known as a vested right; that the State Engineer could not impair a vested right, but definite machinery was set up by which the office could determine the extent of such right.

This procedure is called adjudicating the water rights and provides for definite advertising periods, methods of securing necessary information, hearings, objections, preliminary and final orders of determination, and filing with the court, which in turn hears objections. The whole process is outlined and set up so that all of the data and information can be collected in an informal manner at a minimum of expense before the court is called upon to act, and experience has proven it to be the most economical and feasible process known. Since there are still more than two hundred streams in the State to be adjudicated the importance of the work can readily be understood. The work of the office also includes the regulation of the water on adjudicated streams upon the request of one or more of the users on such stream systems. There is no method of regulating the water on streams until the adjudication proceedings have been finished, filed with the court, and the extent of the vested rights have been determined.

The work of the State Engineer affects directly or indirectly approximately 95% of the people of the State, and every decision deals directly with property rights. Therefore, intimate knowledge of the matter under consideration is required, and this involves almost innumerable hearings, investigations and reports.

The scope of the work of the State Engineer has been steadily enlarged to include many other duties in addition to passing on applications to appropriate water and adjudicating vested rights. Work in connection with range control and the duties of the Public Service Commission is particularly important. Additional information in regard to these subjects will be found on page 55.

CHAPTER X

Supreme Court Decisions Relating to State Engineer's Office

No. 2915

STATE EX REL. HINCKLEY v. SIXTH JUDICIAL DISTRICT COURT IN AND FOR HUMBOLDT COUNTY, ET AL.

(Decision filed July 3, 1931)

Appeal from Sixth Judicial District Court, Humboldt County; Frank T. Dunn, judge presiding.

Original proceeding in certiorari by the State, on the relation of Grayson Hinckley, to review an order of the Sixth Judicial Court in and for Humboldt County and the Honorable Frank T. Dunn, presiding judge thereof, adjudging relator guilty of contempt of court. Judgment affirmed in part and in part annulled.

By the Court, COLEMAN, C. J.:

This is an original proceeding in certiorari to review an order adjudging relator guilty of contempt of court for violating an Order of Determination in the Matter of the Determination of the Relative Rights of the Appropriators of the Waters of the Humboldt River Stream System, made pursuant to the water law of the State, Stats. 1913, p. 192, as amended. See N. C. L. sec. 7890, et seq.

* * * * *

Upon the filing of the complaint aforesaid, an order directing the defendants to show cause why they should not be punished for contempt of court was entered.

In due time the defendants appeared and demurred to the complaint. The demurrer having been overruled, the defendants filed a joint answer to the complaint, in which they denied that they had committed any act constituting contempt and affirmatively alleged matters which will be hereafter referred to.

The ditch in which is the spillway mentioned has its headgate something over one and one-half miles above the spillway, and it is contended by relator, among other things, that between the headgate and the spillway a portion of the water which was in the ditch found its way therein at a point about one-third of the distance between the headgate and the spillway, because of the fact that the river is higher at that point than is the ditch. It is also a fact that the relator removed or caused to be removed a portion of the obstruction placed in the headgate to enable a portion of the water of the stream to flow into the ditch, after the office had undertaken to close such headgate and posted a notice thereon to that effect, though the complaint in the contempt proceedings does not so charge. * * *

* * * * *

The water thus flowing into the ditch was a portion of the water of the stream system. Under a long line of decisions in this and other western States no title can be acquired to the public waters of the State by capture or otherwise, but only a usufructuary right can be obtained therein. If there were any foundation for the contention as to "captured" water, all that a man has to do in certain situations, to get more water than he is legally entitled to use, is to blast down a

side of the mountain at a precipitous point into the river bed, which might require weeks to remove, and thus "capture" the entire flow of the river for the irrigating season. The statute makes it the duty of the State Engineer, and the water commissioner working in pursuance of his order, to distribute the waters of the stream system, and it makes no exceptions in favor of any one or of any condition which may exist or be produced to defeat the purpose of the law.

* * * * *

The judgment assessing the fine is valid, but that portion of it directing that the relator be incarcerated until the fine is paid is void. So much of the judgment as imposes a jail sentence is hereby annulled.

It is ordered that the proceeding as to the fine be and remain in full force and effect.

No. 2957

ELLISON RANCHING COMPANY *v.* BARTLETT
(Decision filed October 2, 1931)

By the Court, COLEMAN, C. J.:

This is an original proceeding in prohibition to arrest proceedings before the respondent.

It grows out of the proceedings instituted many years ago to have adjudicated the relative rights of the water users of the Humboldt River stream system.

Pursuant to preliminary steps theretofore taken, the State Engineer, on January 17, 1923, filed in said matter his Order of Determination with the Clerk of the District Court of the Sixth Judicial District of Nevada, in and for Humboldt County. Thereafter certain water users along said stream system filed their objections and exceptions to said Order of Determination; among them was this petitioner. In due time the matter came on for hearing upon said objections and exceptions before the Honorable George A. Bartlett, then a duly elected, qualified, and acting District Judge in the State of Nevada. Final hearing having been had in said matter, said Bartlett, as District Judge, on December 31, 1930, filed with the said Clerk his opinion and decision in said matter, wherein, among other things, he ordered:

Except where specifically in this decision otherwise ordered, the Order of Determination made, filed and caused to be entered of record in the office of the State Engineer on the 29th day of September, 1922, by James G. Scrugham, State Engineer, and thereafter filed on the 17th day of January, 1923, in the Sixth Judicial District Court of the State of Nevada, in and for the County of Humboldt, is affirmed.

Findings will be prepared in accordance with this decision.

Let judgment be entered herein accordingly.

The term of office of respondent, as District Judge, terminated on January 5, 1931.

At the late session of our Legislature, section 9036, Compiled Laws of Nevada, was so amended as to authorize a retiring District Judge to make and enter findings of fact and decree in a case in which he had, while in office, rendered a decision, within twelve months after the termination of his term of office, instead of within sixty days as theretofore provided.

The relator contends that the decision rendered by Judge Bartlett

on December 31, 1930, is so indefinite that findings and decree cannot be based upon it, and that to enable the respondent to enter such findings and decree it will be necessary that he exercise judicial powers, which he cannot now do.

It is also contended that the Act is prospective and not retrospective, and hence does not empower the respondent to act.

Other contentions are also based upon the allegations of the petition. The respondent and some of the interested water users answered and also moved to quash.

We think the motion to quash should be sustained.

In determining this matter it is not our intention to pass upon the legal points urged by petitioner and the other party who has appeared in support of the petition.

* * * * *

Waiving aside other objections that are made to the issuance of the writ, we are convinced that sound judicial discretion and the furtherance of justice demands that these proceedings be dismissed and that the complaining parties be left to pursue their legal remedy.

REPORTER'S NOTE: The Supreme Court of the United States on January 25, 1932, entered the following per curiam opinion in the case of Ellison Ranching Co. v. Bartlett, No. 522, October term, 1931:

"The appeal herein is dismissed for the reason that the judgment of the State court is based upon a non-Federal ground adequate to support it." * * *

For other opinions see page 113, 1929-1930 Biennial Report.

CHAPTER XI

Opinions of the Attorney-General

Following are the opinions of the Attorney-General rendered to the State Engineer during the present biennium in response to definite requests. For the sake of brevity, the opinions have been condensed into brief statements.

1. Opinion No. 12, March 10, 1931. Regarding distribution of the waters of the Humboldt River under terms of decision rendered December, 31, 1930:

Until further order of the Court or until the entry of the Decree, the distribution of the waters of the Humboldt River Stream System should be in accordance with the Order of Determination.

2. Opinion of Deputy Attorney-General, letter of March 26, 1931. Water assessment of the Humboldt-Lovelock Irrigation and L. P. Company, Lovelock, Nevada:

The State Engineer should not assess the Humboldt-Lovelock Irrigation and L. P. Company unless the waters of the reservoir are distributed under the provision of section 77 of the water code.

3. Opinion No. 56, September 10, 1931. Use of adjudication emergency revolving fund approved March 25, 1929:

The emergency fund of the 1927 Act is to be used in all cases of litigations concerning the water rights wherein the State is a party, and that so long as any money is in this fund the revolving fund of 1929 cannot be used for this purpose; however, if the adjudication emergency fund is exhausted and litigation is going on in the courts, then in order to take care of stenographic work, court reporting, and other incidental expenses, the revolving fund of 1929 may be used.

4. Opinion No. 68, January 26, 1932. Findings of fact, conclusions of law and decree filed October 20, 1930, as related to the alleged districting of the Humboldt River stream system to the law of priorities, and as related to the beginning of the irrigation season:

The findings of fact, conclusions of law and decree in the above matter does not disregard or abrogate or even attempt to disregard or abrogate the law of priority as it relates to the rights of the water users. It attempts to provide a method of rotation in the use of the waters of the stream system as between the Elko District or that district above Palisade, Nevada, on the Humboldt River, and Lovelock District or that district below Palisade.

In regard to the date of the beginning of the irrigation season, the State Engineer is the sole judge, so long as his discretion in this matter is reasonable and not arbitrary. The action of the State Engineer in this regard, as in all other particulars provided for in the decree, is under the supervision of the court.

5. Opinion No. 69, February 2, 1932. Jurisdiction of State Engineer to hear and determine protested applications for permission to appropriate waters previously determined by the court, regardless of the erroneous location of the source:

The State Engineer is bound by the Judgment and Decree of the Court and is therefore without power or jurisdiction to modify or

change the Decree. His duties are limited to granting a permit to use the unappropriated water. The error in the description of the location of the source is for the Court to correct upon its own motion or upon application of the parties.

6. Opinion No. 74, April 1, 1932. Definite time notices of applications for permission to appropriate water must be published, and period of time in which protests are filed:

Statute requiring publication of notice once a week for a given number of weeks is complied with when the required number of publications have been made. Notice must contain the dates of the first and last publications, otherwise legal notice is not given.

The period within which to file a formal protest begins from date of the last publication notice and runs for thirty days.

7. Opinion, letter of April 6, 1932. Assessment of permitted rights in connection with distribution of water:

It is the duty of the State Engineer to include in the budget for the expense of water distribution the areas in their entirety upon which a permit to appropriate water has been granted.

For further opinions see page 121, 1929-1930 Biennial Report.

CHAPTER XII

State Water Right Surveyors of Nevada

Following is a complete list of State Water Right Surveyors licensed and in good standing to practice before the office of the State Engineer, as provided by law:

NEVADA

- Alamo—W. F. Thorne.
Battle Mountain—O. P. Adams.
Beatty—Chas. G. Walker.
Carson City—H. M. Payne.
E. H. Sweetland.
Robert A. Allen.
W. T. Holcomb.
Albert Quill.
Elko—W. H. Settelmeyer.
R. A. Kinne.
Chas. F. DeArmond.
Ely—F. W. Millard.
R. P. Arnold.
C. R. Townsend.
Geo. T. Saxton.
Neil A. McGill.
Enreka—L. A. Harris.
Fallon—C. C. Allen.
L. W. Crehore.
Hugh M. Wilson.
E. P. Osgood.
Fernley—W. A. Pray.
Gardnerville—O. L. Hussman.
S. Krummes.
Gerlach—Mont E. Hutchison.
Goldfield—Ed. S. Giles.
Las Vegas—J. F. Hesse.
J. T. McWilliams.
Hugh A. Shamberger.
Arthur R. Thompson.
C. D. Baker.
Lovelock—John A. Runner.
Mina—L. B. Spencer.
Minden—J. A. Millar.
Mount Montgomery—S. T. McElroy.
Palisade—W. S. Raine.
Paradise Valley—F. B. Stewart.
Pioche—Frank Walker.
Reno—L. H. Taylor.
C. V. Taylor.
Parker Liddell.
D. H. Updike.
Thos. R. King.
John V. Mueller.
Morgan G. Huntington.
Milton A. Pray.
Carl Stoddard.
Sparks—C. C. Taylor.
Sprucemont—J. L. Vandiver.
Tonopah—W. A. Ray.
D. S. Johnson.
John C. Rodder.
C. A. Liddell.
H. F. Bruce.

Tuscarora—Chester L. Woodward.

John W. King.

Walter S. Craven.

Winnemucca—F. R. O'Leary.

Winthrop W. Fisk.

H. H. Sheldon.

Yerington—S. M. Gregory.

CALIFORNIA

Berkeley—R. E. Tilden, 2829 Benvenue Avenue.

Ventura—Robert B. Swadener, 1994 Chennel Drive.

San Francisco—H. M. McClymonds, 64 Pine Street.

J. W. Williams, 983 Mills Building.

Canby—A. M. Green.

Sacramento—G. F. Engle, 1857 44th Street.

IDAHO

Twin Falls—Harold M. Merritt, Bank & Trust Building.

OREGON

Burns—Mott V. Dodge.

UTAH

St. George—Leo A. Snow.

Garrison—G. S. Quate.

Ogden—H. B. Way, Care of Utah Construction Company.

Louis H. Boukol, Care of Southern Pacific Company.

Salt Lake City—Norman Blye, 503 Scott Building.

E. A. Vail, Box 895.

CHAPTER XIII

Upstream Storage Investigations

The unusually low run-off of several of the larger streams in the State during the past several years has been responsible for a great deal of activity on the part of the irrigation interests toward the development of storage facilities. Studies that had been made of feasible storage sites brought forth the fact that it would be necessary to enlist the aid of Federal agencies in any future construction work, as the cost of these various projects would be so great that it would be imperative that the water user be granted a long period of time in which to repay these costs, as well as a low rate of interest on advanced moneys.

The State Engineer worked with the Congressional representatives of the State and others during the past biennium to interest the United States Reclamation Service in our need for storage facilities on several of our streams. As a result of these efforts Commissioner of Reclamation, Dr. Elwood Mead, sent to the State of Nevada an engineer for the purpose of personally surveying the possible reservoir sites on the Humboldt River, with the idea in mind that if these storage sites are feasible the aid of the United States Reclamation Service might be secured to carry on any suggested program.

HUMBOLDT RIVER

The Bureau of Reclamation, under the U. S. Department of the Interior, Washington, D. C., made an incomplete, preliminary investigation on the Humboldt River at the time of the original Lahontan project investigation, but for some reason abandoned it. Since 1927 the State Engineer, in cooperation with our Congressional representatives, has endeavored to secure further Federal investigations on this stream system in order to determine feasible storage and river improvement possibilities. The Bureau of Reclamation had always insisted upon a fifty-fifty basis of financial cooperation by the State, which proportion of the funds the State was unable to furnish. The bureau estimated that it would require from \$15,000 to \$20,000 to complete the work.

In March, 1932, the Humboldt River Report was published, and included detailed data on distribution and suggestions for river improvement based on actual surveys made by this office. When the report was submitted to the bureau, Dr. Elwood Mead, Commissioner of Reclamation, advised that our work would constitute Nevada's contribution to the surveys, and ordered that the work be started. The correspondence follows:

WASHINGTON, D. C., March 1, 1932.

HON. TASKER L. ODDIE, *United States Senate.*

MY DEAR SENATOR ODDIE: On February 12 you wrote me relative to examination and survey to determine the feasibility of irrigation development in the Humboldt River watershed, to which I replied on February 20 that the irrigation situation in the Humboldt Valley is such as to warrant further investigation, and that this should be conducted under a *cooperative agreement with the State*, in accordance with the present policy of the Department, *which requires contribution by the State, Irrigation Districts, Chambers of Commerce and other*

local interests. I also advised that I was writing to State Engineer Malone to ascertain what arrangements have been made regarding contributions by local authorities to the expense of this survey.

I now have a reply from Mr. Malone, dated February 25, a copy of which I am enclosing, in which he states that inasmuch as you are handling the matter in Congress, he is waiting to hear from you before he makes any arrangements in the State, in order that there may be a coordination of your action, and his efforts in the State would supplement yours in Washington. I should like to have your views in this matter.

Very truly yours,

ELWOOD MEAD, *Commissioner.*

CARSON CITY, NEVADA, March 11, 1932.

DR. ELWOOD MEAD, *Bureau of Reclamation, Washington, D. C.*

DEAR DR. MEAD: I have forwarded you, under separate cover, three copies of our Humboldt River Report for your files. This work took more time than we had previously anticipated, due to the complicated water studies involved, but I believe that it will furnish you a good foundation for your work on the river.

Most of the controversial issues on the river have been automatically answered by a study of the results of the daily reports of water distribution over the five-year period, and practically all of the questions that have been the subject of protracted court litigation are covered in detail. It is hoped that this report will preclude any further political discussion on this stream and confine the distribution there to accepted methods of procedure.

I shall appreciate receiving your comments when you have had time to study the report. With best regards, I am

Sincerely yours,

GEORGE W. MALONE.

WASHINGTON, D. C., March 21, 1932.

MR. GEO. W. MALONE, *State Engineer, Carson City, Nevada.*

DEAR MR. MALONE: In connection with the bureau's examination and survey of the feasibility of irrigation development in the Humboldt River watershed, Nevada's contribution to the cost of this work has been under consideration, and it has been suggested by Senator Oddie that your report on the subject, recently received, be considered the State's contribution. I referred the matter to Chief Engineer Walter and this morning have a reply as follows:

Re let seventeenth Humboldt River investigations. Arrangement proposed satisfactory if State will continue to carry on needed stream measurement work and collect other needed data with its employees and University personnel to extent practicable without enlargement of organizations as their part of the cooperative investigation.

Will you kindly advise whether it will be possible for the State to continue the stream measurement work and assist in the collection of data with your present personnel, and the aid of the University staff.

Very truly yours,

ELWOOD MEAD, *Commissioner.*

WASHINGTON, D. C., March 23, 1932.

MR. GEO. W. MALONE, *State Engineer, Carson City, Nevada.*

MY DEAR MR. MALONE: I received your letter of March 11 transmitting three copies of your Humboldt River Report which shows that you and your organization are making some very valuable studies of conditions in the Humboldt Valley, and the results thus far obtained fully justify the expenditures that have been made and should make it clear to every citizen of Nevada that the work should be continued. The report has been printed in a particularly attractive manner and reflects credit on the ability of the State Printing Office to turn out an excellent job. I have handed your report to Mr. Sanford who has submitted the following comments:

The report of the State Engineer of Nevada on the Humboldt River and the different features affecting water deliveries for the past five years is a particularly valuable compilation of facts that will serve as a basis for working out a comprehensive plan for developing the limited supply of water in the river and its application to beneficial use on the irrigable lands in the valley.

The tabulation and hydrographs that have been prepared give some rather startling information relative to losses in the lower sections of the river, and emphasize the necessity of improving physical conditions along the stream so that these losses may be reduced to a minimum. The report suggests several methods of accomplishing this, and it is now directly up to the ranch owners along the river to see that authority is granted so as to accomplish the desired results. The work that has thus far been accomplished shows very clearly the necessity of having the control of a stream like the Humboldt placed in the hands of men who, by education, training and experience, are qualified to do the work in a thorough and efficient manner.

The important matter to be determined in the Humboldt Valley investigations is how much water can be stored, particularly at the lower end of the stream where, because of a longer growing season, more valuable crops can be produced. The discharge records show there have been a number of years when considerable quantities of water could have been stored, but with intervening periods of some shortages which would have been particularly serious during the recent dry spell. The data already assembled will be very useful in outlining plans for eliminating unnecessary waste. In order to accomplish this, it is clear that the obstructions that have been placed across the stream must be removed so that the water can flow down the channel in the shortest practicable time. Consideration must be given to changing the diversion point of existing canals so that water can be diverted without maintaining a high water surface in the river. The problem of passing water around or through the Argenta Swamp must be solved, as there is now a very heavy waste at this section. The value and efficiency of the Pitt-Taylor reservoir should be determined and, if a better plan can be worked out of storing the water decreed to this reservoir, it should be done.

The work that has been done by the State Engineer is a long step along the road that must be traveled in working out a comprehensive plan for the most efficient utilization of the Humboldt River. There is much important work remaining to be done that must receive the attention of local authorities and land owners in the valley, so that every possible acre foot of waste may be eliminated. The construction of storage works on this stream is highly desirable, but whatever decision may be reached will not give 100 per cent perfection. The report of the State Engineer will be very helpful in working out a practical solution of the storage problem on the Humboldt River.

Copies of your report have been forwarded to the office of the Chief Engineer at Denver, and arrangements will be made in the immediate future to assign one of our engineers to assist your organization in continuing the Humboldt investigations.

Very truly yours,

ELWOOD MEAD, *Commissioner*.

CARSON CITY, NEVADA, March 28, 1932.

DR. ELWOOD MEAD, *Commissioner, Bureau of Reclamation, Washington, D. C.*

DEAR DOCTOR MEAD: I have your letter of March 21 and I appreciate the manner in which this matter has been brought to a successful conclusion, and I want to assure you again that this office is *entirely at your service in any way we can assist you in your work in the Humboldt River Basin.*

I am herewith enclosing a copy of my letter to Senator Oddie in that connection.

I know that I can speak for the University staff—that they will continue their cooperation with us in any manner that will promote a full investigation and report of the storage and river improvement possibilities on the Humboldt River.

We shall consider the matter settled then in accordance with the suggestions contained in your letter. Could you give me an idea as to the approximate date the work can be started? The weather is good now, and the field work could be started whenever it is possible for you to send men out here.

With best regards, I am

Sincerely yours,

GEORGE W. MALONE.

WASHINGTON, D. C., April 2, 1932.

MR. GEO. W. MALONE, *State Engineer, Carson City, Nevada.*

DEAR MR. MALONE: Referring to my letter to you of March 21, relative to continuation by the State of Nevada on needed stream measurement work and the collection of other needed data with your present personnel and that of the University in connection with the cooperative investigation to be made on the Humboldt River watershed, I now have your reply of March 28, stating that the cooperation as set up in my letter will be given.

I will be at our Denver office April 14, and for a few days following, and will discuss with Chief Engineer Walter the assignment of Engineer Foster to these investigations. I will communicate with you after conferring with Mr. Walter as to when actual assignment of Mr. Foster will be made.

Sincerely yours,

ELWOOD MEAD, *Commissioner.*

Mr. L. J. Foster, United States Reclamation Service Engineer, came to the Humboldt River on May 1, 1932, and up to the present time is visiting every section of this stream in order to familiarize himself with every phase of reclamation need of this stream system. The Reclamation Service report of this work will probably be available early in 1933.

TRUCKEE RIVER

Since the last report of this office the problems of securing a final decree establishing the relative rights to the waters of the Truckee River system and construction of upstream storage and pondage have been diligently prosecuted by the three major interests, namely, the Sierra Pacific Power Company, the Truckee-Carson Irrigation District, and the Washoe County Water Conservation District.

The engineering and legal staffs of the three interests have made several intensive and detailed water supply and legal studies, the results of which have been incorporated in various forms for a proposed stipulation for incorporation in a final decree. Much progress has been made in the elimination of conflicting claims through cooperative plans for storage on the Little Truckee River, pondage on the main Truckee, provision for the maintenance of specific rates of flow in the river, and the division or allocation of such flows between the various parties.

Federal funds, without interest, are needed for the construction of the upstream storage and other works. However, all attempts to secure such funds during the past two years have brought nothing but refusal of the Department of the Interior to recommend the bills and rejection of same by Congress. Department of the Interior representatives have stated, and it is apparent, that Congress feels that funds shall not be advanced by the Government until such time as the conflicting interests on the Truckee River and Lake Tahoe have reached an agreement.

While no agreement entirely satisfactory to all parties has been reached, this goal is in sight; and it is reasonable to expect that a stipulated final decree on the Truckee River system will be obtained within the coming two years.

The investigations for upstream storage possibilities on the Truckee and Carson Rivers were made by the Bureau of Reclamation in cooperation with this office during the years 1927 and 1928.

CHAPTER XIV

Irrigation Districts and Canal Companies

To date, five irrigation districts have been organized under the provisions of the Nevada Irrigation District Act. These are the Walker River Irrigation District, embracing lands on east and west forks of the Walker River; Truckee-Carson Irrigation District, embracing lands included in Newlands Reclamation Project; Washoe County Conservation District, embracing lands irrigated from the Truckee River and its Tributaries; Irrigation District Number One, Carson Valley Unit, Truckee-Carson Project, embracing lands upon the upper reaches of the Carson River; and the Pershing County Water Conservation District (formerly Lovelock Irrigation District), embracing lands watered from the Humboldt River in Pershing County, Nevada.

During the biennial period there has been very little activity in connection with irrigation districts in Nevada, with no material change in the status of existing districts.

Judgment and Decree of Confirmation No. 35027 was entered July 11, 1931, in Department No. 2, Second Judicial District Court of Nevada, in and for Washoe County, approving and confirming the organization of the Washoe County Conservation District.

Comprehensive information and data on irrigation districts and canal companies in Nevada was given in the 1929-1930 Biennial Report of this office, copies of same still being available for distribution.

Name and address of irrigation districts and major canal companies in Nevada:

Walker River Irrigation District—

K. P. Kafoury, Secretary.
Yerington, Nevada.

Truckee-Carson Irrigation District—

D. S. Stuver, Project Manager.
Fallon, Nevada.

Washoe County Conservation District—

Thos. R. King, Engineer.
Reno, Nevada.

Irrigation District Number One, Carson Valley Unit, Truckee-Carson Project—

H. F. Dangberg, President.
Minden, Nevada.

Pershing County Water Conservation District (formerly Lovelock Irrigation District)—

A. Jahn, President.
Lovelock, Nevada.

Humboldt, Lovelock, Irrigation Light and Power Company—

Geo. C. Stokes, President.
Lovelock, Nevada.

Preston Irrigation Company—

Hyrum Whitlock, Secretary.
Preston, Nevada.

- Alamo Irrigation Canal Company—
Alamo, Nevada.
- Lund Irrigation and Water Company—
Lund, Nevada.
- Muddy Valley Irrigation Company—
A. L. Jones, Secretary, Treasurer.
Overton, Nevada,

CHAPTER XV

Underground Water

The underground waters of Nevada, except flood water which may hereafter be stored by construction of expensive reservoirs, now form practically our only potential future supply.

The major development of our underground resources has centered mainly around the artesian areas, for the reason that, except under the most favorable conditions, it must still be considered economically infeasible to pump water for the production of crops as commonly grown in this State, except where Hoover (Boulder) Dam power may be made available. At the present time much of the development by pumping water from wells has been for the purpose of augmenting the late seasonal supply from surface streams or for watering live stock grazing the forage in valleys that are devoid of any natural watering holes.

The present water law, in its general provisions, makes underground water subject to appropriation by the same procedure as waters of any other source.

In conformity with the statutes, it has been the practice of State Engineers to accept and file applications for permission to appropriate waters from an underground supply, to approve same where no prior rights are affected, and to issue a final certificate of water right upon proof submitted by the permittee that the water has been placed to beneficial use. There is nothing, however, in the statutes that vests the State Engineer with control and supervision over the use of such water after the right to its use has been granted. Although it can hardly be said that any serious difficulties have been encountered as the result of this situation, it is believed that as more extensive development of our underground waters takes place, some form of remedial legislation will make itself manifest. Obviously, unless such legislation is enacted, the value of existing rights will sooner or later be severely jeopardized by a condition wherein the draft from a ground water supply, as the result of drilling new wells, will exceed the replenishment. Some provision should also be made, if rights to the use of underground water are to be administered in an efficient and intelligent manner, for a thorough study of certain areas, leading to a reasonable quantitative determination of the annual replenishment and the available supply.

The filing of applications for all wells to be used for irrigation should be required.

ENGINEERING EXPERIMENTATION

(Taken from the State Engineer's Biennial Report for 1917-1918)

In the general appropriation bill for the years 1917 and 1918, \$5,000 was appropriated for engineering experimentation under direction of the State Engineer.

An Act of March 11, 1915, provided for the establishment of a Department of Engineering Experimentation at the State University. The Act states that said department "shall devote its efforts to the aiding of settlers, farmers, and other persons desiring to develop, or who

have already developed, the underground waters of the State of Nevada." The sum of \$5,000 was appropriated for the work.

When a like fund under the same designation was attached to the State Engineer's appropriations by the Legislature of 1917, it was no doubt intended that the money should be expended for the purposes defined in the Act of March 11, 1915.

Following is a list of the valleys traversed in making the preliminary survey of underground water conditions. More detailed information regarding the various localities can be found in the complete report of Mr. MacFarland, filed in this office.

Valleys along the following river systems and their tributaries: Humboldt, Carson, Truckee, Walker, Muddy, and Virgin, and also:

Clover Valley in Elko County.
 Ruby Valley in Elko County
 Long Valley in Elko County.
 Antelope Valley in Elko County.
 Huntington Valley in Elko and White Pine Counties.
 Diamond Valley in Elko and Eureka Counties.
 Gibson Valley in White Pine County.
 Newark Valley in White Pine County.
 Long Valley in White Pine County.
 White Sage Valley in White Pine County.
 Spring Valley in White Pine County.
 Snake Valley in White Pine County.
 Butte Valley in White Pine County.
 Antelope Valley in White Pine County.
 Steptoe Valley in White Pine and Elko Counties.
 White River Valley in White Pine and Nye Counties.
 Railroad Valley in Nye County.
 Hot Creek Valley in Nye County.
 Fish Spring Valley in Nye County.
 Ralston Valley in Nye County.
 Ione Valley in Nye County.
 Cactus Flat in Nye County.
 Reveille Valley in Nye County.
 Kawich Valley in Nye County.
 Emigrant Valley in Nye County.
 Amargosa Desert in Nye County.
 Gold Flat in Nye County.
 Ash Meadows in Nye County.
 Pahrnmp Valley in Nye County.
 Springdale Valley in Nye County.
 Big Smoky Valley in Nye and Lander Counties.
 Little Smoky Valley in Nye and Eureka Counties.
 Monitor Valley in Nye and Lander Counties.
 Reese River Valley in Lander County.
 Gran Valley in Lander County.
 Smith Creek Valley in Lander County.
 Antelope Valley in Lander County.
 Kobeh Valley in Eureka County.
 Dry Valley in Eureka County.
 Crescent Valley in Eureka and Lander Counties.
 Duck or Lake Valley in Lincoln County.
 Pahrnagat Valley in Lincoln County.
 Meadow Valley in Lincoln County.
 Desert Valley in Lincoln County (western part).
 Desert Valley in Lincoln County (northern part).
 Coal Valley in Lincoln County.
 Pahroc Valley in Lincoln County.
 Garden Valley in Lincoln and Nye Counties.
 Penoger Valley in Lincoln and Nye Counties.

Las Vegas Valley in Clark County.
Indian Springs Valley in Clark County.
Edwards Creek Valley in Churchill County.
Fish Lake Valley in Esmeralda County.
Clayton Valley in Esmeralda County.
Lake Valley in Mineral County.
Whisky Flat in Mineral County.
Soda Spring Valley in Mineral County.
Duck Flat in Washoe County.
Long Valley in Washoe County.
Smoke Creek Desert in Washoe County.
Hualipi Valley in Washoe County.

The importance of this work is being emphasized at this time on account of the probable irrigation development in certain parts of the State in connection with the use of Hoover (Boulder) Dam power in mining and industrial development. There should be a special appropriation for the continuation of this important work.

**RULINGS OF THE STATE ENGINEER WITH RESPECT TO
UNDERGROUND WATER**

(Adopted in 1911)

The following rulings of this office, approved by the State Board of Irrigation, as applying to general applications to appropriate the underground public waters of the State, and by the State Commission of Industry, Agriculture and Irrigation, as applying to like applications for the reclamation of Carey Act lands, shall be hereafter in force:

RULE 1. In all applications to appropriate the underground public waters of the State, the State Engineer will assume the existence of such waters by virtue of the application and such examination as he may make, but the quantity thereof, subject to appropriation, being invisible and incapable of measurement, will not be definitely declared or stated in any approval of the application. The applicant may apply for as many second-feet flow from such underground watercourse or lake as he may be able to put to beneficial use, and each second foot flow, or fraction thereof, which he may demonstrate from time to time upon the surface, by means of artesian wells or pumped wells tapping the supply, will be deemed a perfected unit of the application. Upon satisfactory proof of the measurement of the flow of such perfected unit, together with proof of beneficial use, the State Engineer will issue the applicant a certificate therefor, under the provisions of section 29 of the Act approved February 26, 1907; and from time to time as such units are perfected and proof of beneficial use made, the State Engineer will issue such certificates, and the priority of all such water right units of the application shall date uniformly from the filing of the application in the State Engineer's office. The State Engineer, in approving an application to appropriate such underground waters, will reserve to his office full authority to determine when the unappropriated waters of such underground watercourse or lake are exhausted, and on notification thereof to the applicant, the several perfected units of irrigation works, on the date such notification takes effect, will be deemed to comprise the complete perfected application, and all further authority of the applicant to appropriate water from such underground natural watercourse or lake, by virtue of such application, shall terminate.

RULE 2. Where more than one application is approved to appropriate the waters of a common underground natural watercourse or lake, the notification by the State Engineer that the unappropriated waters thereof are exhausted will be served upon each of such appropriators and shall take effect simultaneously, whereupon the priority of the perfected water rights of each applicant shall be in the order of the filing of the respective applications in the State Engineer's office.

RULE 3. The State Engineer, from such determinations as may be made by measurements of the flow of artesian or pumped wells, withdrawing water from a common underground watercourse or lake, and from all other information as seems to him pertinent, will estimate the quantity of water that may be annually withdrawn therefrom, without diminishing the quantity available for succeeding seasons; and where in his opinion the annual supply is adequate for all existing or for additional wells, a junior applicant will not be enjoined from the enjoyment of the flow of his wells, in the first instance, or from sinking additional wells, in the second instance, even though the same may diminish the natural flow of the wells of a senior applicant; for the reason that a diminution of the natural flow of a senior artesian well must be expected as additional wells are sunk, even prior to the time of the actual appropriation of all the available waters of such underground watercourse or lake—the State assuming, as a matter of public policy, to insure the largest beneficial use of the natural supply, that the burden is upon the owner of the artesian well, ultimately, to protect its flow by means of some artificial lift.

RULE 4. The approval by the State Engineer of any application to appropriate the underground waters of the State shall contain a stipulation that all bored or driven wells must be encased with such kind and quality of pipe, and to such relative depth in each well, as he may require, in order to conserve the underground supply from waste due to run-off or leakage through any intervening sand or gravel stratum between the source of the underground supply and the surface, as well as to enable such wells to be capped during the irrigation season.

Underground Water Regulation

The increasing importance of underground water for irrigation in the seventeen western arid and semiarid States has led to much study and discussion of this subject.

The States of California and New Mexico have led the western States in this field, due to the fact that the climate allows more intensive farming.

A study of the laws and court decisions in the western States discloses the fact that there are three methods of dealing with the subject. They are:

1. Appropriation.
2. Overlying lands.
3. Correlative rights.

The "appropriation" method is the same as for surface water, and the right to its use is in accordance with priority of filing in the State Engineer's office, and in such amounts as proof of beneficial use can be made on.

The "overlying lands" method provides for the right to irrigate the

lands from which the water is pumped in such amounts as proof of beneficial use can be made for. If the water supply is insufficient for all of the lands, investments can be rendered useless by overdevelopment.

The "correlative rights" method corresponds to the riparian method as to surface water, which means that there is no priority of use and any one at any time has the right to pump water from his own land to irrigate it. Under this system investments can be rendered valueless by overdevelopment and there is apparently no recourse.

The conclusions reached by this office after several years of study and observation of methods and results are:

1. That the appropriation theory is the proper method for our State, providing for the use of underground water in the same manner as for the surface waters of the State.

2. That application to the State Engineer's office for permits to appropriate such water should be required by law, together with proofs of beneficial use, the same as for the surface waters.

3. That there should be no restriction on the number of permits issued in any basin, but when the water table is lowered by excessive use to such an extent that damage is caused, that the right to the use of such water should be according to priority, and that when such damage is caused, any water user can appeal to the State Engineer to make such investigation as may be necessary to determine the extent of the water supply and to establish the priority that can be served for that year, such decision to be subject to appeal to the District Court, as in the case of decisions relative to applications for permits to appropriate water.

A special report on this important subject will be issued by this office within a few months.

The Carey Act

The Act of Congress known as the "Carey Act" set up a definite method for the development of desert lands and provided roughly that each State should select 1,000,000 acres of the unappropriated and unreserved public lands to be reclaimed, except Nevada, which was allowed 2,000,000 acres.

The State Commission of Industry, Agriculture and Irrigation was created to supervise the work.

This law was set up as an inducement to private capital to develop water supplies for arid lands, and numerous attempts were made in that direction. However, as only one project, located at Metropolis in Elko County, was ever completed under this Act, it was not considered particularly successful in this State. With the advent of cheap power from Hoover (Boulder) Dam in 1937, it is possible that under the provisions of this Act further development may be brought about.

The Pittman Act

The "Pittman Act" provides that any person, or group of persons, may file on four sections (2,560 acres) of land, and confers an exclusive right to "explore" that area for water for irrigation purposes. A period of two years is allowed during which time sufficient water must be developed to irrigate properly 20 acres of such land, and such irrigation must have actually been done and a crop raised thereon. Title,

then, can be secured to one section (640 acres) of the land included in the original filing and the remaining three sections must be relinquished.

Considerable activity occurred as a result of this Act during the years immediately following its passage, but relatively small amounts of land actually passed to patent, principally due to the expense in connection with the underground water development. It is thought that the availability of power from Hoover (Boulder) Dam may bring about a revival of interest in this Act. It would appear that it is the most feasible method so far suggested in dealing with the matter.

The radius of the territory which will feel the influence of the power from Hoover Dam in water development will depend entirely upon the load that can be developed in certain areas in connection with mining and other industries.

CHAPTER XVI

Status of Applications Filed During the Period from January 1, 1931, to June 30, 1932

STATUS OF APPLICATIONS FILED DURING THE BIENNIUM 1931-1932

Following is a condensed statement giving the salient data in connection with applications filed during the period from January 1, 1931, to June 30, 1932, in the order of:

1. Application Serial Number.
2. Date of Filing.
3. Name of Applicant.
4. Source of Water Supply.
5. Purpose of Appropriation.
6. Action on Application.
7. Status of Permits as of June 30, 1932.

1931

| | | |
|----------|-------------|--|
| 9395.... | 1- 2-31.... | Chango & Aldax; Unnamed Spring; Stockwatering and domestic; Canceled September 22, 1931. |
| 9396.... | 1- 8-31.... | T. J. Harper, Trustee; Spring in Tehama Canyon; Mining and milling; Denied January 27, 1932. |
| 9397.... | 1- 8-31.... | A. C. Florio; Vanover Spring; Stockwatering; No action. |
| 9398.... | 1- 8-31.... | A. C. Florio; Cow Well; Stockwatering; No action. |
| 9399.... | 1- 8-31.... | A. C. Florio; Home Spring; Irrigation and domestic; No action. |
| 9400.... | 1- 9-31.... | Kent Land & Livestock; Hard Time Spring; Stockwatering and domestic; Approved July 8, 1932. G. S. |
| 9401.... | 1-14-31.... | Ramon Intamussu; Shanks Spring; Stockwatering and domestic*; No action. |
| 9402.... | 1-19-31.... | P. H. Anderson; Olson Spring; Stockwatering; Canceled September 20, 1931. |
| 9403.... | 1-19-31.... | P. H. Anderson; Mule Canyon Spring; Stockwatering; Canceled September 20, 1931. |
| 9404.... | 1-22-31.... | Ed. P. Graham; Watson Spring; Irrigation and domestic*; Approved February 23, 1932. G. S. |
| 9405.... | 1-23-31.... | Walker River Irrigation District; West Walker River and Tributaries; Irrigation and domestic; No action. |
| 9406.... | 1-27-31.... | Laura Gentry; Virgin River; Irrigation; Withdrawn February 20, 1931. |
| 9407.... | 1-30-31.... | Nevada-Massachusetts Company, Inc.; Spearmint Canyon; Mining, milling and domestic; Canceled October 26, 1931. |
| 9408.... | 1-30-31.... | A. C. Florio; Corner Spring; Stockwatering and domestic*; No action. |
| 9409.... | 2- 5-31.... | Pete Laca; Antelope Spring; Stockwatering*; No action. |
| 9410.... | 2-14-31.... | F. & N. Land & Livestock Company; Robinson Lake; Irrigation; Canceled September 21, 1931. |
| 9411.... | 2-18-31.... | A. C. Florio; Cow Well No. 2; Stockwatering and domestic*; No action. |
| 9412.... | 2-21-31.... | E. A. Ludwick and James J. Garnier; Scossa Well; Mining and domestic*; No action. |
| 9413.... | 2-21-31.... | E. A. Ludwick and James J. Garnier; Ludwick Well; Mining and domestic; Canceled November 23, 1931. |
| 9414.... | 2-22-31.... | Bonifacio Malaxechevarria; Butter Milk Creek; Irrigation and domestic*; No action. |
| 9415.... | 2-23-31.... | Battista Vener; Cottonwood Canyon; Irrigation*; No action. |
| 9416.... | 2-26-31.... | Grey Eagle Mining Co.; Yallobouchie Springs; Mining, milling and domestic; Approved December 16, 1931. G. S. |
| 9417.... | 2-26-31.... | Grey Eagle Mining Co.; Stonehouse Springs; Mining, milling and domestic; Approved December 16, 1931. G. S. |
| 9418.... | 2-26-31.... | Grey Eagle Mining Co.; Algonquin Springs; Mining, milling and domestic; Approved December 16, 1931. G. S. |
| 9419.... | 2-26-31.... | Grey Eagle Mining Co.; Opher Spring; Mining, milling and domestic; Approved December 16, 1931. G. S. |
| 9420.... | 3- 4-31.... | A. C. Florio; Butte Station Spring; Stockwatering and domestic*; No action. |
| 9421.... | 3- 4-31.... | A. C. Florio; Moody Spring; Stockwatering and domestic*; No action. |
| 9422.... | 3- 4-31.... | A. C. Florio; Mahogany Spring; Stockwatering and domestic*; No action. |
| 9423.... | 3- 4-31.... | A. C. Florio; Portuguese Spring; Stockwatering and domestic; No action. |
| 9424.... | 3- 4-31.... | A. C. Florio; McClure Spring; Stockwatering and domestic*; No action. |

*Protested application. G. S. Good standing.

- 9425.... 3- 4-31....A. C. Florio; Sand Spring; Stockwatering and domestic*; No action.
- 9426.... 3- 4-31....A. C. Florio; Big Louis Spring; Stockwatering and domestic*; No action.
- 9427.... 3- 4-31....A. C. Florio; Cook Tank Spring; Stockwatering and domestic*; No action.
- 9428.... 3-17-31....Rubert R. Spencer; Horse Creek; Irrigation and domestic*; No action.
- 9429.... 3-18-31....Bradley Mining Company; Canyon Creek; Mining, milling and domestic; No action.
- 9430.... 3-18-31....A. G. McBride; McBride Long Valley Well; Stockwatering and domestic; No action.
- 9431.... 3-23-31....R. E. Hartsif; Pidgeon Springs; Irrigation and domestic*; No action.
- 9432.... 3-28-31....Fernando Segura; Segura No. 11 Spring and Creek; Stockwatering and domestic; No action.
- 9433.... 4-30-31....Fernando Segura; Segura No. 12 Spring and Creek; Stockwatering and domestic; No action.
- 9434.... 4- 4-31....South Creek Live Stock Company; Underground Water; Stockwatering; Canceled November 3, 1931.
- 9435.... 4- 6-31....George Eldridge; Eldridge Well No. 2; Stockwatering; Approved May 13, 1932. G. S.
- 9436.... 4- 7-31....M. H. Phelps; Warm Springs; Mining, milling and domestic; Canceled December 10, 1931.
- 9437.... 4-13-31....William G. Remaley; Bellville Mine Overflow and Telephone Canyon Springs; Mining and domestic*; No action.
- 9438.... 4-20-31....Mary C. G. Jewett; Mormon Green Springs No. 2; Irrigation and domestic; No action.
- 9439.... 4-20-31....W. A. Condiff; Meadow Valley Wash; Irrigation and domestic; Canceled November 3, 1931.
- 9440.... 4-23-31....A. C. Florio; Garden Spring; Stockwatering and domestic*; No action.
- 9441.... 4-23-31....A. C. Florio; Call Spring; Stockwatering and domestic*; No action.
- 9442.... 4-23-31....A. C. Florio; Mt. Hope Spring; Stockwatering and domestic*; No action.
- 9443.... 4-24-31....Smith Creek Livestock Company; Underground Water; Stockwatering; Withdrawn October 16, 1931.
- 9444.... 4-25-31....Geo. W. Freidhoff; East Walker River; Irrigation and domestic*; No action.
- 9445.... 4-26-31....Ernest C. Whitcomb; Peterman Canyon; Irrigation and domestic; No action.
- 9446.... 4-28-31....City of Elko; Underground Water; City water supply; No action.
- 9447.... 4-28-31....Leo L. Davis; Waste Water; Irrigation and domestic; Withdrawn August 14, 1931.
- 9448.... 4-30-31....L. B. Tudor and Roy Clark; Ibox Spring; Mining and domestic; Canceled November 3, 1931.
- 9449.... 4-30-31....E. C. Murphy; Murphy Well No. 3; Stockwatering and domestic; Approved October 20, 1931. G. S.
- 9450.... 4-30-31....E. C. Murphy; Murphy Well No. 2; Stockwatering and domestic; Approved October 20, 1931. G. S.
- 9451.... 4-30-31....Marcos Legarra; Underground Water; Stockwatering; Canceled November 3, 1931.
- 9452.... 4-30-31....Fernando Segura; Underground Water; Stockwatering and domestic*; No action.
- 9453.... 5- 2-31....Dave L. Barnes; Clover Wash; Stockwatering*; No action.
- 9454.... 5- 4-31....Las Vegas Home Building Investment Company, Ltd.; Artesian Well; Irrigation and domestic; No action.
- 9455.... 5- 8-31....Daniel B. Clark; Steptoe Well; Stockwatering; No action.
- 9456.... 5-11-31....Alma Woods; Dry Lake; Stockwatering; No action.
- 9457.... 5-11-31....Horace F. Wilson; Pine Creek; Irrigation and domestic; No action.
- 9458.... 5-18-31....F. M. Fulstone, Inc.; Unnamed Spring; Mining, milling and domestic; No action.
- 9459.... 5-19-31....The Cardinal Mining Co., Ltd.; Cinnebar Spring; Mining and domestic; Canceled November 3, 1931.
- 9460.... 5-20-31....Moore Sheep Co.; Moore Well No. 3; Stockwatering; Canceled November 3, 1931.
- 9461.... 5-22-31....Calvin B. Beach; Muddy River Tributary (Bloedel Spring); Irrigation and domestic; No action.
- 9462.... 5-22-31....Smith, Peterson & Co.; Underground Water; Industrial; No action.
- 9463.... 5-25-31....O. D. Iveson; Nigger Creek; Irrigation and domestic*; No action.
- 9464.... 5-27-31....John Canson; Underground; Domestic and bathing; No action.
- 9465.... 6- 2-31....United Cattle & Packing Co.; Little Meadows Creek; Stockwatering and domestic*; No action.
- 9466.... 6- 5-31....Vivian J. Frei; Meadow Valley Wash; Irrigation; No action.
- 9467.... 6- 5-31....Beverly Hills Development, Ltd.; Artesian Well; Irrigation and domestic; Approved April 20, 1932. G. S.
- 9468.... 6- 6-31....W. D. and M. C. Caton and J. E. Malloy; Big Antelope Spring; Stockwatering and domestic*; No action.
- 9469.... 6- 6-31....W. D. and M. E. Caton and J. E. Malloy; Little Antelope Spring; Stockwatering and domestic*; No action.
- 9470.... 6- 7-31....F. A. Allen; Cabin Spring; Stockwatering; Canceled June 7, 1932.

*Protested application. G. S. Good standing.

- 9471.... 6- 8-31....Boulder Dam Townsite Company; Artesian Well; Irrigation and domestic; No action.
- 9472.... 6- 8-31....Winnemucca State Bank & Trust Co.; Underground Waters; Irrigation and domestic*; No action.
- 9473.... 6- 9-31....Ray W. LaForce and Jesse M. Short; Revue Springs; Mining, milling and domestic*; No action.
- 9474.... 6-10-31....J. E. Malloy; Garden Spring; Stockwatering and domestic*; No action.
- 9475.... 6-10-31....J. E. Malloy; Murphy Spring; Stockwatering and domestic*; No action.
- 9476.... 6-11-31....Herman Hildebrandt; Well at Spring in Troy Canyon; Mining, milling and domestic; No action.
- 9477.... 6-11-31....Herman Hildebrandt; Spring in South American Canyon; Mining, milling and domestic; No action.
- 9478.... 6-11-31....Herman Hildebrandt; Spring in South Troy Canyon; Mining, milling and domestic; No action.
- 9479.... 6-12-31....Henry Hagar; Hagar Well No. 1; Stockwatering; Canceled June 7, 1932.
- 9480.... 6-12-31....Henry Hagar; Hagar Well No. 3; Stockwatering; Canceled June 7, 1932.
- 9481.... 6-12-31....Henry Hagar; Hagar Well No. 2; Stockwatering; Canceled June 7, 1932.
- 9482.... 6-18-31....John Uhalde; Willow Spring; Stockwatering and domestic; Canceled June 27, 1932.
- 9483.... 6-19-31....Leon Acorda; Acorda Well No. 3; Stockwatering; No action.
- 9484.... 6-19-31....Alex Duferrena; Cherry Creek; Stockwatering*; No action.
- 9485.... 6-20-31....E. J. Fee; Big Spring; Stockwatering*; No action.
- 9486.... 6-24-31....Theodore Belzarena Co.; East Fork of Cove Creek; Stockwatering*; No action.
- 9487.... 6-24-31....Theodore Belzarena Co.; Wood Canyon; Stockwatering*; No action.
- 9488.... 6-24-31....Theodore Belzarena Co.; South Fork Little Alder Creek; Stockwatering*; No action.
- 9489.... 6-24-31....Theodore Belzarena Co.; Quaking Asp Creek; Stockwatering*; No action.
- 9490.... 6-25-31....William Gardner; Pine Spring; Stockwatering; No action.
- 9491.... 6-27-31....J. H. Causten; Unnamed Spring; Mining, milling and domestic*; Approved January 18, 1932. G. S.
- 9492.... 6-29-31....Wm. J. Walker; Watson Springs; Irrigation and domestic*; Approved February 23, 1932. G. S.
- 9493.... 6-29-31....John G. Taylor; Humboldt River; Irrigation and stockwatering; No action.
- 9494.... 7- 3-31....Gartiez Bros.; Bilk Creek; Stockwatering; No action.
- 9495.... 7- 7-31....E. P. Walker; McCarthy Springs; Mining, milling and domestic*; No action.
- 9496.... 7- 9-31....A. G. McBride; Coal Valley Well No. 1; Stockwatering*; No action.
- 9497.... 7-10-31....Josie Pearl; Cove Canyon; Mining and domestic; No action.
- 9498.... 7-10-31....Francis M. Linn; Artesian Well; Irrigation and domestic; No action.
- 9499.... 7-13-31....Geo. M. and Thos. Hay; Artesian Well; Stockwatering and domestic; Canceled June 7, 1932.
- 9500.... 7-15-31....Erwin W. Hesselgesser; Flag Spring Creek; Irrigation and domestic; No action.
- 9501.... 7-17-31....J. H. Carter Estate Co.; Carter Well; Stockwatering and domestic*; No action.
- 9502.... 7-20-31....Consolidated Coppermines Corporation; Steptoe Creek; Mining, milling and domestic; No action.
- 9503.... 7-21-31....Geo. H. Copley; Quaken Asp Springs; Mining, milling and domestic*; No action.
- 9504.... 7-25-31....A. C. Florio; Coyote Spring; Stockwatering and domestic*; No action.
- 9505.... 7-27-31....A. G. McBride; Coal Valley Well No. 2; Stockwatering and domestic*; No action.
- 9506.... 7-27-31....A. G. McBride; Coal Valley Well No. 3; Stockwatering and domestic*; No action.
- 9507.... 7-27-31....A. G. McBride; Coal Valley Well No. 4; Stockwatering and domestic*; No action.
- 9508.... 7-29-31....J. E. Mattison; Springs; Mining; Withdrawn February 6, 1932.
- 9509.... 7-30-31....Ramon Intamussu; Big Creek; Stockwatering*; No action.
- 9510.... 7-30-31....Ramon Intamussu; Big Creek; Stockwatering*; No action.
- 9511.... 7-30-31....Ramon Intamussu; Bottle Creek; Stockwatering*; No action.
- 9512.... 7-30-31....Ramon Intamussu; South Fork of Bottle Creek; Stockwatering*; No action.
- 9513.... 7-30-31....Ramon Intamussu; Bottle Creek; Stockwatering*; No action.
- 9514.... 7-30-31....Ramon Intamussu; Bottle Creek; Stockwatering*; No action.
- 9515.... 8- 2-31....Geo. Arnot; Shoshone Creek and a Well; Mining and domestic; Withdrawn June 27, 1932.
- 9516.... 8- 3-31....Ferdinand M. Ferguson, M. D.; Underground; Irrigation and domestic; No action.
- 9517.... 8- 8-31....John Uhalde; Underground Water; Stockwatering and domestic; Canceled June 27, 1932.
- 9518.... 8- 8-31....John Uhalde; Underground Water; Stockwatering and domestic; No action.

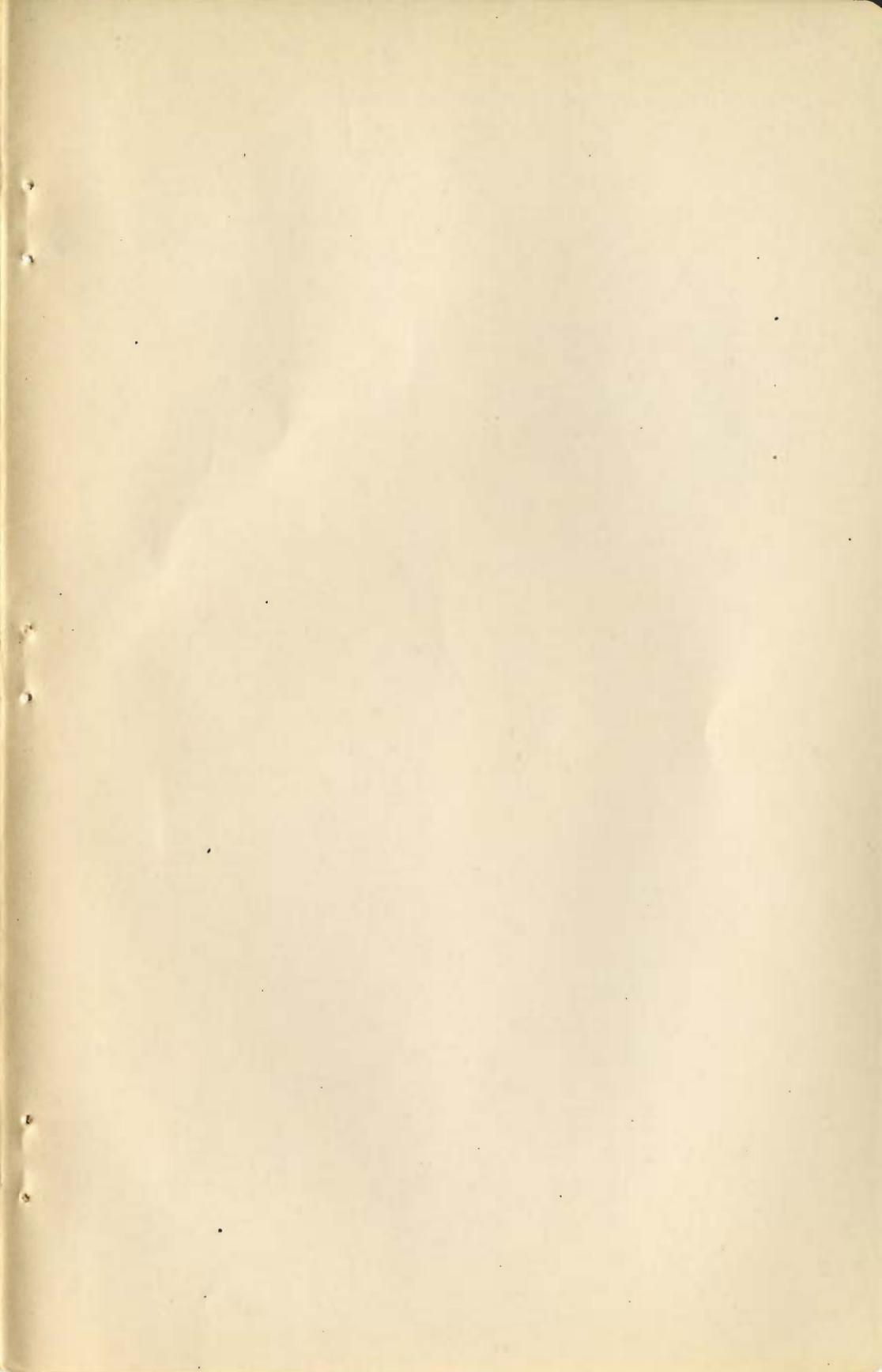
*Protested application. G. S. Good standing.

- 9519.... 8- 8-31....John Uhalde; Underground Water; Stockwatering and domestic; No action.
- 9520.... 8-28-31....Walter F. McLallen; Artesian Well; Irrigation and domestic; No action.
- 9521.... 8-29-31....Board of County Commissioners, Town of Battle Mountain; Underground Water; Municipal; No action.
- 9522.... 9- 1-31....Thos. L. Williams; Artesian Wells; Irrigation and domestic; No action.
- 9523.... 9- 2-31....J. E. Renfro and May Renfro; Renfro's Spring; General traveling public and domestic; Approved January 25, 1932. G. S.
- 9524.... 9- 4-31....Bordoli Bros.; Twin Springs Slough; Stockwatering; No action.
- 9525.... 9-14-31....Julia Russell; Artesian Basin; Irrigation and domestic; No action.
- 9526.... 9-17-31....Joe Castillo; Shell Creek; Stockwatering; No action.
- 9527.... 9-20-31....Theodore Belzarena Co.; Bell Spring; Stockwatering*; No action.
- 9528.... 9-21-31....May Renfro; Willow Creek; Irrigation and domestic; Approved January 25, 1932. G. S.
- 9529.... 9-22-31....E. M. Dawes; Dawes Well; Mining, milling and domestic*; No action.
- 9530.... 9-23-31....Joe Olaechea; Olaechea Well No. 1; Stockwatering and domestic; Withdrawn March 14, 1932.
- 9531.... 9-23-31....C. R. Moorman; Divide Well; Stockwatering*; No action.
- 9532.... 9-25-31....Pete Itcaina; Deep Well; Stockwatering*; No action.
- 9533.... 9-26-31....E. C. Johnson; Big Pole Spring; Stockwatering*; No action.
- 9534.... 9-28-31....Fritz Walti; Valley Spring; Stockwatering and domestic; No action.
- 9535....10- 1-31....Lena Harkey Scott; Willow Spring; Stockwatering; No action.
- 9536....10- 1-31....Gartiez Bros.; Summit Spring; Stockwatering*; No action.
- 9537....10- 4-31....Theodore Belzarena Co.; Gravel Spring; Stockwatering*; No action.
- 9538....10- 8-31....John Uhalde; Uhalde Well No. 2; Stockwatering and domestic*; No action.
- 9539....10-10-31....Forest Service, Dixie National Forest, U. S. Department of Agriculture; South Fork of Deer Creek; Domestic and culinary; Approved June 17, 1932. G. S.
- 9540....10-13-31....C. H. Taylor; Taylor Spring No. 1; Stockwatering and domestic; No action.
- 9541....10-17-31....Willis Carol Green; Indian Creek; Irrigation and domestic; No action.
- 9542....10-18-31....Earl Higgins; Artesian Wells; Irrigation and domestic; No action.
- 9543....10-20-31....Bentura Bengocheas; Old Corral Spring; Stockwatering*; No action.
- 9544....10-20-31....Bentura Bengocheas; Little Creek Spring; Stockwatering*; No action.
- 9545....10-20-31....Raimundo Erquiaga; Skull Creek Spring; Stockwatering*; No action.
- 9546....10-20-31....Raimundo Erquiaga; Top Spring; Stockwatering*; No action.
- 9547....10-20-31....Raimundo Erquiaga; Mud Spring; Stockwatering*; No action.
- 9548....10-20-31....Raimundo Erquiaga; Nine Mile Summit Spring; Stockwatering*; No action.
- 9549....10-20-31....Mrs. J. Micheo; Lookout Springs; Irrigation and domestic*; No action.
- 9550....10-24-31....G. D. and R. O. Bliss; The Eden Valley Well; Stockwatering; No action.
- 9551....10-27-31....U. S. Forest Service; Unnamed Spring; Irrigation and domestic; No action.
- 9552....10-29-31....A. C. Florio; McBride Spring; Stockwatering and domestic; No action.
- 9553....11- 2-31....Nevada-Massachusetts Co.; Spearmint Canyon and Springs; Mining, milling and domestic; No action.
- 9554....11- 3-31....Javier Goyeneche; Goyeneche Well; Stockwatering*; No action.
- 9555....11-13-31....A. Afranchino; Afranchino Spring; Irrigation and domestic; Approved June 17, 1932. G. S.
- 9556....11-16-31....Hylton Sheep Co.; Burnt Station Well; Stockwatering; No action.
- 9557....11-19-31....James Wilker and Associates, E. A. Scott, T. S. Dalton, and J. M. Dalton; Underground Source; Mining, milling and domestic; No action.
- 9558....11-20-31....John Magnuson & Sons; Valley Well; Stockwatering; No action.
- 9559....11-25-31....Mrs. O. C. Stewart; Unnamed Spring; Stockwatering; No action.
- 9560....11-27-31....B. A. Ercanbrack; Buckskin Well; Stockwatering; Canceled June 27, 1932.
- 9561....11-27-31....Bertrand Paris; Underground Water; Stockwatering and domestic; No action.
- 9562....11-27-31....Bertrand Paris; Underground Water; Stockwatering and domestic; No action.
- 9563....12- 9-31....Henry B. Stephens; East Fork of Snow Creek; Irrigation and domestic; No action.
- 9564....12-13-31....E. J. Fee; Holy Lake; Irrigation; No action.
- 9565....12-14-31....Hafen Frei Brothers; Meadow Valley Wash; Stockwatering; No action.
- 9566....12-14-31....Hafen Frei Brothers; Meadow Valley Wash; Stockwatering; No action.
- 9567....12-14-31....Hafen Frei Brothers; Meadow Valley Wash; Stockwatering; No action.

*Protested application. G. S. Good standing.

- 9568....12-14-31....Hafen Frei Brothers; Meadow Valley Wash; Stockwatering; No action.
- 9569....12-24-31....Hugh Dolan; Wells in the Indian Creek Basin; Placer mining; No action.
- 9570....12-30-31....City of Fallon; Underground Water; Municipal and domestic; No action.
- 9571.... 1-30-32....Thos. J. Salter; Muddy River; Placer mining; No action.
- 9572.... 2- 3-32....Charles Labbe; Unnamed Spring; Mining, milling and domestic; No action.
- 9573.... 2- 3-32....Charles Labbe; Unnamed Spring; Mining, milling and domestic; No action.
- 9574.... 3-18-32....G. Edgar Nesbitt; White River Dry Wash and Tributaries; Stockwatering; No action.
- 9575.... 3-12-32....Preston Irrigation Company; Jakes Wash Reservoir; Irrigation; No action.
- 9576.... 3-23-32....D. V. Romeos; Kid Spring; Stockwatering; No action.
- 9577.... 3-23-32....D. V. Romeos; Goat Spring; Stockwatering; No action.
- 9578.... 3-25-32....Wm. G. McLoskey; Unnamed Springs; Irrigation and domestic; No action.
- 9579.... 3-25-32....Harry L. Wilson; Cherry Springs; Irrigation and domestic; No action.
- 9580.... 3-28-32....Alex Duferrena; Rock Spring; Stockwatering; No action.
- 9581.... 4- 1-32....Eek & Duval; Middle Spring; Stockwatering; No action.
- 9582.... 4- 2-32....Wichman Brothers; Parale Spring; Stockwatering; No action.
- 9583.... 4- 2-32....Wichman Brothers; Twin Springs; Stockwatering; No action.
- 9584.... 4- 6-32....Eek & Duval; Stone Wall Spring; Stockwatering; No action.
- 9585.... 4- 6-32....Howard E. Shove and Earl Hagey; Springs and Flood Water; Mining; No action.
- 9586.... 4- 9-32....L. F. Birdno; Troy Creek; Mining and domestic; No action.
- 9587.... 4-13-32....Thousand Creek Livestock Co.; Martinez Spring; Stockwatering*; No action.
- 9588.... 4-14-32....A. B. Gardner; Oneota Reservoir; Stockwatering; No action.
- 9589.... 4-18-32....W. F. Mendes; Wild Horse Spring; Stockwatering and domestic; No action.
- 9590.... 5- 7-32....Rose Georgetta; Dry Wash; Stockwatering; No action.
- 9591.... 5-28-32....Lola Heckethorn and J. P. Johansen; Big Spring; Irrigation; No action.
- 9592.... 5-31-32....Theodore and Pauline Youngs; Cherry Creek; Irrigation and domestic; No action.
- 9593.... 6- 1-32....Earl L. Johnson; Easterly Silver Hill Spring; Stockwatering; No action.
- 9594.... 6- 1-32....Earl L. Johnson; Westerly Fondaway Canyon Spring; Stockwatering; No action.
- 9595.... 6- 2-32....E. S. Mendive; Duck Creek; Mining; No action.
- 9596.... 6- 7-32....Elizabeth McNamara; Graham or Carroll Springs; Mining, milling and domestic; No action.
- 9597.... 6-13-32....Washoe County Title Guaranty Co.; Francis Well; Stockwatering and domestic; No action.
- 9598.... 6-17-32....Tuscarora Consolidated Goldfields, Inc.; Ford Spring; Mining and domestic; No action.
- 9599.... 6-17-32....Tuscarora Consolidated Goldfields, Inc.; Summit Spring; Mining and domestic; No action.
- 9600.... 6-17-32....Tuscarora Consolidated Goldfields, Inc.; Upper Ford Spring; Mining and domestic; No action.
- 9601.... 6-17-32....City of Las Vegas; Artesian Well; Municipal and domestic; No action.
- 9602.... 6-17-32....City of Las Vegas; Artesian Well; Irrigation and domestic; No action.
- 9603.... 6-23-32....Richard P. Landis; Spring; Mining; No action.
- 9604.... 6-25-32....Gartiez Bros.; East Fork Bilk Creek; Stockwatering; No action.
- 9605.... 6-29-32....G. B. Austin; Underground Water; Mining and domestic; No action.

*Protested application. G. S. Good standing.



CHAPTER XVII

Status of Applications Filed Prior to 1931

STATUS OF APPLICATIONS FILED PRIOR TO JANUARY 1, 1931, UPON WHICH ACTION HAS BEEN TAKEN DURING THE YEARS 1931-1932

Following is a condensed statement giving the salient data in connection with applications filed prior to January 1, 1931, upon which action has been taken during the years 1931 and 1932, in the order of:

1. Application Serial Number.
2. Date of Filing.
3. Name of Applicant.
4. Source of Water Supply.
5. Purpose of Appropriation.
6. Action on Application.
7. Status of Permits as of June 30, 1932.

1932

| | | |
|------|----------|---|
| 4069 | 7-21-16 | Nick Bielick; Siegel Creek; Irrigation and domestic*; Denied July 21, 1931. |
| 4627 | 10-10-17 | Glenn Moore; Quaker Springs, North Group; Irrigation and domestic*; Approved June 12, 1931. G. S. |
| 4626 | 10-10-17 | Glenn Moore; Quaker Springs, South Group; Irrigation and domestic*; Withdrawn April 27, 1931. |
| 4664 | 10-29-17 | Owyhee Land & Livestock Co.; North Fork of Deep Creek; Irrigation and domestic; Approved April 15, 1931. G. S. |
| 4685 | 11- 8-17 | Gil Prida; Garden Canyon Creek; Stockwatering; Approved February 6, 1932. G. S. |
| 4686 | 11- 8-17 | Bertrand Irigoin; Panther Creek; Irrigation and domestic; Approved January 18, 1932. G. S. |
| 4687 | 11- 8-17 | Bertrand Irigoin; Branch of Panther Creek; Irrigation and domestic; Approved January 18, 1932. G. S. |
| 4772 | 12-12-17 | J. F. Foremaster; Grove Spring No. 1; Stockwatering and domestic; Denied August 7, 1931. |
| 4773 | 12-12-17 | J. F. Foremaster; Grove Springs No. 2; Stockwatering and domestic; Denied August 7, 1931. |
| 4931 | 2-30-18 | John C. Crain; Squaw Valley Creek; Irrigation, stock and domestic*; Denied January 6, 1932. |
| 4933 | 2-23-18 | Jacob W. Reed; West Fork of Deep Creek; Irrigation and domestic; Approved April 15, 1931. G. S. |
| 4934 | 2-23-18 | Robert A. Thorley; Unnamed Spring; Stockwatering and domestic; Denied August 24, 1931. |
| 5030 | 4-26-18 | James L. Richards; Garden Canyon; Irrigation, stock and domestic; Withdrawn October 7, 1931. |
| 5046 | 5- 2-18 | A. Campbell, U. W. Harwood; Pole Canyon; Mining, milling and domestic*; Withdrawn April 20, 1932. |
| 5084 | 5-24-18 | Seth Baldwin; Deep Creek; Irrigation; Approved May 14, 1932. G. S. |
| 5096 | 6- 8-18 | C. F. Campbell and U. W. Harwood; Unnamed Canyon; Mining, milling and domestic; Withdrawn April 20, 1932. |
| 5157 | 7-17-18 | J. L. and H. L. Sharp, Warren Cutler and E. P. Higbee; Big Spring No. 2; Stockwatering and irrigation; Denied March 21, 1932. |
| 5209 | 8-20-18 | Roy L. Primeaux; Bluebell Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5210 | 8-20-18 | Roy L. Primeaux; Lone Choke Cherry Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5211 | 8-20-18 | Roy L. Primeaux; Morris Basin Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5212 | 8-20-18 | Roy L. Primeaux; Mud Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5213 | 8-20-18 | Roy L. Primeaux; Elizabeth Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5214 | 8-20-18 | Roy L. Primeaux; Hillside Spring; Stockwatering; Withdrawn July 23, 1931. |
| 5217 | 8-20-18 | Russell T. Hazzard; Hazzard Springs; Irrigation and domestic; Denied March 21, 1932. |
| 5268 | 10- 1-18 | C. E. Franklin; Mud Creek; Irrigation and domestic*; Approved December 2, 1931. G. S. |
| 5380 | 2- 1-19 | Nevada Fire Insurance Co.; Rogers Spring; Irrigation and domestic; Approved April 22, 1931. G. S. |
| 5430 | 3-20-19 | Preston Irrigation Co.; Jakes Valley Wash; Irrigation; Approved May 14, 1931. G. S. |

*Protested application. G. S. Good standing.

- 5431.... 3-20-19....Preston Irrigation Co.; Black Jack Wash; Irrigation; Approved May 13, 1931. G. S.
- 5437.... 4- 1-19....Benoit Lohidoy et al.; North Fork of Cottonwood Creek; Stockwatering; Denied January 6, 1932.
- 5465.... 4-26-19....Grover C. Shank; Trout Creek; Irrigation and stockwatering; Denied February 25, 1932.
- 5497.... 5-13-19....Clayton C. Belcher; Warm Creek; Irrigation, stockwatering and domestic; Approved April 9, 1931. G. S.
- 5514.... 5-22-19....Eugene Cluff Chicken Creek; Irrigation and domestic; Approved April 9, 1931. G. S.
- 5517.... 5-27-19....Grover Maxwell; Eagle Creek; Irrigation and domestic; Denied February 25, 1931.
- 5614.... 7-17-19....Wm. B. Parsons; Wilson Creek; Irrigation and domestic*; Denied July 23, 1931.
- 5622.... 7-17-19....Juan E. Yrazoqui; Choke Cherry Spring; Stockwatering and domestic*; Denied July 23, 1931.
- 5666.... 8-13-19....John E. Wamboldt; Edwards Spring; Irrigation and domestic; Denied August 24, 1931.
- 5772.... 9-27-19....Juan E. Yrazoqui; Bluebell Spring; Stockwatering*; Denied July 23, 1931.
- 5773.... 9-27-19....Juan E. Yrazoqui; Rock Spring; Stockwatering*; Denied July 23, 1931.
- 5774.... 9-27-19....Juan E. Yrazoqui; Summit Spring; Stockwatering*; Denied July 23, 1931.
- 5797....10- 7-19....Josephine Lauceria; Paradise Canyon Spring; Mining and domestic; Approved November 5, 1931. G. S.
- 5829....11- 1-19....John W. Tuck; Stanley B. Springs; Stockwatering; Denied July 20, 1931.
- 5839....11- 5-19....Sheehan and Farrell; Underground Water; Irrigation and stockwatering; Denied February 6, 1932.
- 5840....11- 5-19....Sheehan & Farrell; Underground Water; Irrigation and stock; Denied February 6, 1932.
- 5842....11- 6-19....Newton Hibbs; Underground Water; Irrigation and stock; Withdrawn October 7, 1931.
- 5867....11-19-19....Newton Hibbs; Underground Water; Irrigation and stock; Withdrawn October 7, 1931.
- 5949.... 1-14-20....Melvern W. Jones; Sand Creek; Irrigation and stockwatering*; Approved April 1, 1932. G. S.
- 5961.... 1-28-20....Sheehan & Farrell; Spaulding Creek; Irrigation and stockwatering; Denied February 6, 1932.
- 6045.... 4- 3-20....Ashdown Gold Mines Co.; Big Creek and Tribes; Power and domestic; Denied July 30, 1931.
- 6133.... 5-21-20....Earl Allen Woodward; Pass Creek; Irrigation and domestic*; Denied September 17, 1931.
- 6149.... 6- 4-20....John L. Sevy; Logan Creek; Mining and domestic*; Denied August 7, 1931.
- 6234.... 8-12-20....Pine Forest Mining Co.; Dyke Hot Spring; Mining, milling and domestic*; Denied September 28, 1931.
- 6237.... 8-16-20....D. A. Johnson; Dyke Gulch; Mining and domestic; Denied September 15, 1931.
- 6363....12-23-20....Carl E. Foremaster; Bill Lamb Spring; Irrigation and domestic*; Withdrawn January 16, 1931.
- 6404.... 2-21-21....Elton Cooley; Upper Spring Gulch; Irrigation and domestic*; Denied August 24, 1931.
- 6406.... 2-24-21....Nevada Fire Insurance Co.; Blue Point Springs; Irrigation and stockwatering; Approved April 22, 1931. G. S.
- 6430.... 3- 3-21....H. Van den Heuval; Willow Creek; Power and irrigation; Approved June 15, 1931. G. S.
- 6538.... 8-11-21....John E. Royce; Cherry Springs; Irrigation and domestic*; Denied July 30, 1931.
- 6582....11- 2-21....D. D. Sabala; Sabala No. 6 Spring; Stockwatering*; Denied July 30, 1931.
- 6591....11-25-21....Chas. Culverwell; Mountain Spring; Stockwatering and domestic; Denied July 16, 1931.
- 6679.... 5-19-22....Sharp Land & Cattle Co.; Cottonwood Creek; Stockwatering and irrigation; Approved May 4, 1931. G. S.
- 6685.... 5-29-22....C. I. Burt; Matteucci Springs; Irrigation and domestic*; Denied February 10, 1931.
- 6713.... 7-11-22....D. D. Sabala; Badger Springs; Stockwatering and irrigation*; Denied December 28, 1931.
- 6722.... 7-24-22....D. D. Sabala; Badger No. 1 Springs; Stockwatering and irrigation*; Denied July 30, 1931.
- 6728.... 8- 3-22....Frank Walker and L. L. Bert; Clover Wash; Domestic*; Withdrawn January 16, 1931.
- 6747.... 8-25-22....Great Western Gypsum Co.; Mateucci Spring; Mining, milling and domestic*; Denied February 10, 1931.
- 6824....11-14-22....H. Van den Heuval; Willow Creek Spring; Irrigation*; Approved June 15, 1931. G. S.
- 6843....12-29-22....Elida Read; Spring Creek; Irrigation and domestic*; Denied September 28, 1931.
- 6870.... 3- 7-23....Henry Engle; Leaches Hot Springs; Irrigation and domestic; Denied March 21, 1932.
- 6974.... 9-17-23....Mary C. Hill; Denio Creek; Irrigation*; Denied September 28, 1931.

*Protested application. G. S. Good standing.

- 6985....10- 8-23....Augustus Frederick Richan; Six Mile Spring; Irrigation and domestic*; Denied February 11, 1931.
- 6991....10-18-23....Jess E. Metherd; Bull Camp Creek; Irrigation*; Approved September 26, 1931. G. S.
- 7062.... 3-13-24....R. B. Stewart; Pompernickle Spring and Creek; Irrigation and domestic; Approved April 12, 1931. G. S.
- 7064.... 3-19-24....Nevada Lead Co.; Fairview Wash; Mining, milling and domestic; Approved May 7, 1931. G. S.
- 7082.... 4-11-24....John B. Pescio; Kingsley Springs; Stockwatering; Denied July 16, 1931.
- 7194.... 8-13-24....John Urrizaga; Cattle Camp Creek; Irrigation and domestic*; Approved June 15, 1931. G. S.
- 7205.... 9- 3-24....John W. Salls; Circle Creek; Irrigation and domestic; Denied July 30, 1931.
- 7231....10-23-24....Eloise Bunker; Meadow Valley Wash; Irrigation and domestic*; Approved October 20, 1931. G. S.
- 7234....10-27-24....State Fish and Game Commission; Lehman Creek; Fish propagation, irrigation and domestic; Withdrawn September 15, 1931.
- 7261....12- 2-24....A. H. Koenig; Idaho Canyon Creek; Irrigation and domestic; Denied March 21, 1932.
- 7296.... 1-30-25....Benjamin B. Gardner; Big Springs; Irrigation and domestic; Approved August 4, 1931. G. S.
- 7320.... 3- 5-25....Grass Valley Land and Livestock Co.; Leaches Hot Springs; Irrigation and stockwatering; Denied February 6, 1932.
- 7341.... 4-25-25....Rudolph Merchun; Clay Springs; Stockwatering; Denied August 24, 1931.
- 7348.... 5- 1-25....Jose Iragui; Aspin Spring; Stockwatering*; Denied February 6, 1932.
- 7352.... 5- 1-25....Jose Iragui; Crutcher Springs; Stockwatering*; Denied February 6, 1932.
- 7378.... 5-21-25....Edgar H. Venerable; McCoy Creek; Power and domestic; Denied May 29, 1931.
- 7399.... 6-15-25....D. States; Pedriola Creek; Irrigation*; Denied July 16, 1931.
- 7562....11- 1-25....James Brown; Miguel Creek; Irrigation and domestic*; Denied February 6, 1932.
- 7619.... 1-14-26....E. B. Salinas; Springs in North Branch Sacramento Canyon; Stockwatering*; Withdrawn November 6, 1931.
- 7702.... 4- 9-26....John Mentaberry; Washburn Creek; Irrigation, stockwatering and domestic; Approved January 6, 1932. G. S.
- 7735.... 4-30-26....Muncy Lead Silver Mining Co.; Muncy Creek; Mining and domestic*; Denied August 24, 1931.
- 7749.... 5-12-26....Nevada Fire Insurance Co.; Rio Virgin River; Irrigation and domestic*; Withdrawn April 13, 1931.
- 7767.... 6- 1-26....Alma Woods; Alma Woods Spring No. 2; Stockwatering*; Approved August 4, 1931. G. S.
- 7773.... 6- 3-26....Tonopah Belmont Development Co.; Belmont Spring No. 1; Mining, milling and domestic; Withdrawn April 5, 1932.
- 7807.... 7- 1-26....Frank T. Smith; Shermantown Springs Nos. 1 to 8, inclusive; Mining and domestic; Withdrawn January 26, 1931.
- 7815.... 7- 7-26....Frank T. A. Smith; Lebeau Creek; Mining and domestic; Withdrawn January 26, 1931.
- 7849.... 8-18-26....National Consolidated Mining Co.; North Fork Twelve Mile Creek; Mining and domestic; Approved February 2, 1932. G. S.
- 7894.... 9-20-26....Mike Sala; Well No. 2; Stockwatering; Denied July 16, 1931.
- 7895.... 9-20-26....Mike Sala; Well No. 1; Stockwatering; Denied July 16, 1931.
- 7907....10-15-26....Mrs. Lena Harkey Scott; Section 4 Spring; Stockwatering; Approved February 6, 1932. G. S.
- 7916....10-24-26....Earl Murrish; Murrish Spring; Stockwatering and domestic; Denied August 24, 1931.
- 7919....11- 3-26....T. J. Cummins Estate; Warm Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7920....11- 3-26....T. J. Cummins Estate; Section 8 Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7921....11- 3-26....T. J. Cummins Estate; Section 16 Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7922....11- 3-26....T. J. Cummins Estate; Cacklebur Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7923....11- 3-26....T. J. Cummins Estate; Willow Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7924....11- 3-26....T. J. Cummins Estate; Section 21 Spring; Stockwatering and domestic; Denied April 30, 1931.
- 7925....11- 3-26....T. J. Cummins Estate; Section 9 Spring; Stockwatering and domestic*; Denied April 30, 1931.
- 7940....11-24-25....Carson and Tahoe Lumber and Fluming Co.; South Zephyr Creek; Irrigation and domestic; Approved January 21, 1931. G. S.
- 7947....12-11-26....F. J. Powers and Son; Powers Spring; Stockwatering; Denied March 31, 1932.
- 7948....12-11-26....Marco Moretti and B. F. Roberts; Sherman Creek; Mining, milling and domestic; Denied October 27, 1931.
- 7959....12-30-26....Axel Bellander; Sidehill Spring; Stockwatering and camp use; Approved September 12, 1931. G. S.
- 7961.... 1- 5-27....Champion Sillimanite, Inc.; Sillimanite Spring; Mining, milling and domestic; Approved January 6, 1932. G. S.

*Protested application. G. S. Good standing.

- 8004.... 2-11-27....Clarence A. Lewis, Alvin G. Anderson; The Muddy River; Power; Denied July 30, 1931.
- 8016.... 2-25-27....B. S. Robinson; Kiger Spring; Stockwatering; Denied January 22, 1931.
- 8017.... 2-25-27....B. S. Robinson; Rock Springs; Stockwatering; Denied January 22, 1931.
- 8088.... 4- 5-27....D. D. Sabala; Corral Spring; Stockwatering and domestic; Denied July 30, 1931.
- 8114.... 4-28-27....Randall Sage; Fulgham Spring; Stockwatering; Approved January 6, 1932. G. S.
- 8127.... 5- 6-27....A. N. Norcutt & Sons; Buckbrush Spring; Stockwatering*; Approved March 5, 1932. G. S.
- 8128.... 5- 6-27....A. N. Norcutt & Sons; Long Canyon Spring; Stockwatering*; Approved March 5, 1932. G. S.
- 8141.... 5-24-27....A. N. Norcutt & Sons; High Rock Spring; Stockwatering*; Approved March 5, 1932. G. S.
- 8142.... 5-24-27....A. N. Norcutt & Sons; North Branch Spring; Stockwatering and domestic*; Approved March 5, 1932. G. S.
- 8144.... 5-29-27....Agustus F. Richan; Crain Slough; Irrigation and stockwatering; Denied February 11, 1931.
- 8152.... 6- 5-27....Mattl Capelli; New York Canyon; Stockwatering*; Denied September 17, 1931.
- 8159.... 6- 9-27....James Allen Woodward; North Fork Pass Creek; Irrigation*; Withdrawn June 15, 1931.
- 8173.... 6-15-27....Boulder Canyon Airways, Inc.; Underground Water; Irrigation and domestic; Approved April 9, 1931. G. S.
- 8190.... 6-21-27....William Hendrix; Quaking Asp Spring; Stockwatering; Denied May 23, 1931.
- 8204.... 6-29-27....B. F. Roberts and Moritti; Township Creek; Mining, milling and domestic; Approved April 9, 1931.
- 8226.... 7-12-27....Alex Duferrena; North Fork of Sagehen Creek; Stockwatering*; Denied August 10, 1931.
- 8227.... 7-12-27....Alex Duferrena; Mud Creek; Stockwatering*; Approved September 25, 1931. G. S.
- 8241.... 7-19-27....Williams Estate Co.; Cottonwood Spring; Stockwatering and domestic; Approved June 15, 1931. G. S.
- 8245.... 7-20-27....Griswold Henderson Livestock Co.; Eagle Rock Spring; Stockwatering; Approved April 29, 1931. G. S.
- 8246.... 7-20-27....Griswold Henderson Livestock Co.; Unnamed Spring; Stockwatering; Approved April 29, 1931. G. S.
- 8247.... 7-22-27....Williams Estate Co.; Skull Spring; Stockwatering; Approved June 15, 1931. G. S.
- 8249.... 7-22-27....Williams Estate Co.; Double Mountain Spring; Stockwatering and domestic; Approved June 15, 1931. G. S.
- 8257.... 8- 4-27....Charles P. Squires and Roy W. Martin; Little Falls; Domestic and power*; Approved June 1, 1931. G. S.
- 8263.... 8- 5-27....E. W. Griffith; Rainbow Creek; Irrigation and domestic; Approved June 1, 1931. G. S.
- 8305.... 8-24-27....Fernando Goicoechea; Unnamed Spring; Stockwatering and domestic; Approved August 24, 1931. G. S.
- 8306.... 8-29-27....Preston Irrigation Co.; Preston Big Spring Channel; Stockwatering*; Approved February 26, 1932. G. S.
- 8307.... 8-29-27....Preston Irrigation Co.; Jakes Wash Reservoir; Stockwatering*; Approved February 26, 1932. G. S.
- 8314.... 9- 5-27....William Hendrix; Chokecherry Spring; Stockwatering*; Denied May 23, 1931.
- 8315.... 9- 5-27....William Hendrix; Rock Spring; Stockwatering; Withdrawn April 28, 1931.
- 8323.... 9-16-27....Snow Creek Livestock Co.; East Spring; Stockwatering; Withdrawn November 30, 1931.
- 8327.... 9-29-27....Carson and Tahoe Lumber and Fluming Co.; Unnamed Spring; Irrigation and domestic; Approved January 21, 1931. G. S.
- 8362....10-26-27....Ernest Want; Sacramento Spring; Stockwatering*; Denied August 24, 1931.
- 8363....10-26-27....Clarks Valley Land & Sheep Co.; Wild Cat Spring; Stockwatering*; Approved February 9, 1932. G. S.
- 8364....10-26-27....Clarks Valley Land & Sheep Co.; Deer Spring; Stockwatering; Approved February 9, 1932. G. S.
- 8365....10-26-27....Clarks Valley Land & Sheep Co.; Horse Canyon Springs and Creek; Stockwatering*; Approved February 9, 1932. G. S.
- 8366....10-26-27....Clarks Valley Land & Sheep Co.; Rattlesnake Spring; Stockwatering; Approved February 9, 1932. G. S.
- 8367....10-26-27....Clarks Valley Land & Sheep Co.; Hole in the Ground Creek; Stockwatering; Approved February 9, 1932. G. S.
- 8368....10-26-27....Clarks Valley Land & Sheep Co.; Wild Cat Canyon Spring; Stockwatering*; Approved February 9, 1932. G. S.
- 8369....10-26-27....Clarks Valley Land & Sheep Co.; Stone Corral Canyon Spring; Stockwatering*; Approved February 9, 1932. G. S.
- 8371....10-26-27....Clarks Valley Land & Sheep Co.; Cow Spring; Stockwatering*; Approved February 9, 1932. G. S.
- 8372....10-26-27....Clarks Valley Land & Sheep Co.; Buffalo Creek; Stockwatering*; Approved February 9, 1932. G. S.
- 8382....11-11-27....Mattl Capelli; Sentinel Peak Spring; Stockwatering*; Denied September 17, 1931.

*Protested application. G. S. Good standing.

- 8383.....11-11-27.....A. L. DeLong; Lone Tree Spring; Stockwatering*; Denied September 17, 1931.
- 8399.....11-28-27.....Roy Suttle; Unnamed Spring No. 2; Stockwatering*; Denied July 30, 1931.
- 8400.....11-28-27.....Roy Suttle; Unnamed Spring No. 1; Stockwatering*; Denied July 30, 1931.
- 8414.....12-29-27.....Clarks Valley Land & Sheep Co.; Fish Spring; Stockwatering; Approved February 9, 1932. G. S.
- 8428..... 1- 7-28.....The Adams McGill Co., Inc.; Bradley Well; Stockwatering*; Withdrawn January 24, 1932.
- 8480..... 3-15-28.....The Adams McGill Co., Inc.; Giroux Wash Reservoir No. 3; Stockwatering*; Approved February 2, 1932. G. S.
- 8481..... 3-15-28.....The Adams McGill Co., Inc.; Giroux Wash Reservoir No. 1; Stockwatering*; Approved February 2, 1932. G. S.
- 8482..... 3-15-28.....The Adams McGill Co., Inc.; Giroux Wash Reservoir No. 2; Stockwatering*; Approved February 2, 1932. G. S.
- 8491..... 3-28-28.....J. W. Read; Wolf Creek; Irrigation; Approved May 14, 1931. G. S.
- 8495..... 4- 3-28.....Snow Creek Livestock Co.; Butte Spring; Stockwatering*; Approved December 3, 1931. G. S.
- 8512..... 4-21-28.....John Urrazaga; Upper Cattle Camp Spring; Irrigation*; Withdrawn April 28, 1931.
- 8513..... 4-21-28.....John Urrazaga; Lower Cattle Camp Spring; Irrigation*; Withdrawn April 28, 1931.
- 8552..... 6- 2-28.....J. P. Clough; Buckhorn Springs; Mining and domestic*; Approved March 25, 1931.
- 8559..... 6- 7-28.....L. E. McCulley; Coyote Springs and Creek; Irrigation and domestic*; Denied May 28, 1932.
- 8578..... 6-20-28.....Gaston Uhalde; Meadow Seep Spring; Stockwatering and domestic*; Denied January 27, 1932.
- 8580..... 6-20-28.....William Hendrix; Summit Spring; Stockwatering and domestic*; Denied May 23, 1931.
- 8581..... 6-20-28.....Gaston Uhalde; Deer Track Spring; Stockwatering and domestic*; Denied August 7, 1931.
- 8582..... 6-20-28.....Gaston Uhalde; Cold Spring; Stockwatering and domestic; Denied August 7, 1931.
- 8595..... 6-25-28.....John Uhalde; Cabin Spring; Stockwatering and domestic; Approved December 3, 1931. G. S.
- 8632..... 7-19-28.....R. A. Yelland; Coyote Well; Stockwatering; Approved September 2, 1931. G. S.
- 8638..... 7-26-28.....William Hendrix; Rock Spring; Stockwatering and domestic*; Denied May 23, 1931.
- 8642..... 7-30-28.....R. C. Bauermeister; Lincoln Creek; Mining and domestic; Denied June 5, 1931.
- 8659..... 8-13-28.....Malcolm McLeish; Read Springs; Mining and domestic*; Approved April 9, 1931. G. S.
- 8688..... 9- 6-28.....E. W. Griffith; Mary Jane Spring; Stockwatering and domestic; Approved February 10, 1931. G. S.
- 8694..... 9-14-28.....Kent Land & Livestock Co.; East Lee Spring; Stockwatering; Approved March 24, 1932. G. S.
- 8695..... 9-14-28.....Kent Land & Livestock Co.; North Lee Spring; Stockwatering; Approved March 24, 1932. G. S.
- 8696..... 9-14-28.....Kent Land & Livestock Co.; Long Canyon Spring; Stockwatering; Approved March 24, 1932. G. S.
- 8715.....10- 7-28.....Wm. G. Lamb; Big Springs; Irrigation and Stockwatering; Approved August 24, 1931. G. S.
- 8716.....10-10-28.....St. Lawrence Mines Co.; Lincoln Canyon Springs; Mining and domestic*; Denied August 7, 1931.
- 8717.....10-10-28.....St. Lawrence Mines Co.; Lincoln Canyon Springs; Power and domestic*; Denied August 7, 1931.
- 8737.....10-26-28.....R. T. Evans; Unnamed Spring; Stockwatering; Approved September 12, 1931. G. S.
- 8743.....11- 9-28.....W. M. Kearney; Unnamed Spring or Creek; Stockwatering and domestic*; Denied May 19, 1932.
- 8750.....11- 9-28.....W. M. Kearney; Unnamed Spring or Creek; Stockwatering and domestic*; Denied May 19, 1932.
- 8778.....12-15-28.....Bordoli Brothers; Big Creek; Stockwatering*; Approved July 8, 1931. G. S.
- 8779.....12-15-28.....Bordoli Brothers; Grease Wood Spring; Stockwatering; Approved July 8, 1931. G. S.
- 8780.....12-15-28.....Bordoli Brothers; Water Canyon; Stockwatering; Approved July 8, 1931. G. S.
- 8832..... 2-17-29.....Gaston Uhalde and Wm. Hendrix; Nuggett Spring; Stockwatering and domestic*; Withdrawn November 5, 1931.
- 8850..... 3-26-29.....Walker River Irrigation District; West Walker River; Irrigation, stockwatering and domestic; Canceled January 19, 1931.
- 8874..... 4-20-29.....R. B. Jepsen; Underground; Municipal; Approved January 21, 1931. G. S.
- 8928..... 5-31-29.....Harvey L. Titus; Warm Spring; Irrigation and domestic*; Denied February 25, 1932.
- 8961..... 6-19-29.....N. M. Fothergill; Underground Water; Irrigation; Approved March 7, 1931. G. S.
- 8968..... 6-25-29.....Julius N. Van Meter; Pine Spring; Irrigation and domestic; Withdrawn October 17, 1931.

*Protested application. G. S. Good standing.

- 8976.... 6-30-29....W. H. Gilmer & Son; Unnamed Spring; Stockwatering; Approved May 15, 1931. G. S.
- 8996.... 7-21-29....Frank B. Smith; Glider Spring; Stockwatering and domestic*; Denied August 24, 1931.
- 9014.... 8-13-29....Elizabeth L. Kellum; McFaul Creek and Tributaries; Irrigation and domestic; Approved August 4, 1931. G. S.
- 9015.... 8-14-29....Julius N. Van Meter; Willow Spring; Irrigation and domestic*; Withdrawn October 17, 1931.
- 9035.... 8-16-29....Mort Hulery; Champion Creek; Irrigation; Approved April 9, 1931. G. S.
- 9049.... 9- 7-29....William J. England; Willard Creek; Mining and domestic*; Denied July 22, 1931.
- 9050.... 9- 7-29....William J. England; Shingle Creek; Mining and domestic*; Denied July 22, 1931.
- 9051.... 9-12-29....Edward Austin, Jr.; Austin Well; Stockwatering; Approved September 2, 1931. G. S.
- 9056.... 9-18-29....Abel & Curtner Livestock Co.; Mahogany Spring; Stockwatering*; Approved June 2, 1932. G. S.
- 9057.... 9-18-29....Abel & Curtner Livestock Co.; Rock Spring; Stockwatering; Approved August 4, 1931. G. S.
- 9063....10- 1-29....F. J. Powers & Son; Yellow Hills Creek; Stockwatering; Approved April 7, 1932. G. S.
- 9065....10- 1-29....F. J. Powers & Son; Yellow Rock Creek; Stockwatering*; Approved April 7, 1932. G. S.
- 9067....10- 3-29....H. C. Purdy and A. J. Nelson; Underground Water; Stockwatering; Denied August 13, 1931.
- 9069....10- 4-29....Frank Yrazoqui; Underground Water; Stockwatering*; Denied November 25, 1931.
- 9070....10- 4-29....Frank Yrazoqui; Underground Water; Stockwatering*; Denied November 25, 1931.
- 9071....10- 4-29....Frank Yrazoqui; Underground Water; Stockwatering*; Denied June 17, 1931.
- 9072....10- 4-29....Frank Yrazoqui; Underground Water; Stockwatering*; Denied November 25, 1931.
- 9073....10- 7-29....Central Pacific Railway Co.; Garden Spring; Railroad and domestic; Approved May 28, 1931. G. S.
- 9084....10- 9-29....Frank M. Owens; Circle Creek; Irrigation and domestic; Denied December 17, 1931.
- 9086....10-11-29....R. E. Griffith; Maze Spring; Irrigation and domestic; Approved February 10, 1931. G. S.
- 9089....10-16-29....Frank B. Smith; Smith Well; Stockwatering and domestic*; Denied August 24, 1931.
- 9090....10-16-29....Frank Yrazoqui; Yrazoqui Well No. 5; Stockwatering*; Denied November 25, 1931.
- 9095....10-26-29....Palma Bros.; Maybe Well; Stockwatering*; Approved April 9, 1931. G. S.
- 9096....10-26-29....Palma Bros.; Big Pump Well; Stockwatering*; Approved April 9, 1931. G. S.
- 9103....10-28-29....S. O. Cressler Estate; Catnip Creek and Tributaries; Stockwatering and domestic; Approved March 15, 1932. G. S.
- 9104....10-28-29....S. O. Cressler Estate; Fish Creek and Tributaries; Stockwatering and domestic*; Approved March 15, 1932. G. S.
- 9153....11-19-29....F. E. Bush and F. H. Murphy; Cottonwood Creek and Springs; Stockwatering and domestic*; Approved June 18, 1931. G. S.
- 9154....11-19-29....F. E. Bush and F. H. Murphy; White Rock Spring and Creek; Stockwatering and domestic; Approved June 18, 1931. G. S.
- 9155....11-19-29....F. E. Bush and F. H. Murphy; Cove Creek and Springs; Stockwatering and domestic; Approved June 18, 1931. G. S.
- 9156....11-19-29....F. E. Bush and F. H. Murphy; Knott Creek and Springs; Stockwatering and domestic; Approved June 18, 1931. G. S.
- 9157....11-19-29....F. E. Bush and F. H. Murphy; Corral Creek and Springs; Stockwatering and domestic*; Approved June 18, 1931. G. S.
- 9158....11-19-29....F. E. Bush and F. H. Murphy; Pass Spring and Creek; Stockwatering and domestic*; Approved June 18, 1931. G. S.
- 9159....11-19-29....F. E. Bush and F. H. Murphy; Willow Springs and Creek; Stockwatering and domestic*; Approved June 18, 1931. G. S.
- 9160....11-19-29....F. E. Bush and F. H. Murphy; Pole Creek and Springs; Stockwatering and domestic; Approved November 30, 1931. G. S.
- 9161....11-19-29....F. E. Bush and F. H. Murphy; Sheep Spring and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9162....11-19-29....F. E. Bush and F. H. Murphy; Crane Creek and Springs; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9163....11-19-29....F. E. Bush and F. H. Murphy; Canyon Spring and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9164....11-19-29....F. E. Bush and F. H. Murphy; Idaho Canyon Springs and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9165....11-19-29....F. E. Bush and F. H. Murphy; Summit Spring and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9166....11-19-29....F. E. Bush and F. H. Murphy; Alkali Springs and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9167....11-19-29....F. E. Bush and F. H. Murphy; Indian Spring; Stockwatering and domestic*; Approved November 30, 1931. G. S.

*Protested application. G. S. Good standing.

- 9168....11-19-29....F. E. Bush and F. H. Murphy; West Spring and Creek; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9170....11-23-29....F. E. Bush and F. H. Murphy; Little Rock Spring; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9171....11-23-29....F. E. Bush and F. H. Murphy; Idaho Canyon Spring No. 1; Stockwatering and domestic*; Approved November 30, 1931. G. S.
- 9180....12- 6-29....J. E. Marble; Union Spring No. 6; Stockwatering; Approved February 23, 1932. G. S.
- 9182....12-12-29....Leo F. and Geo. M. Streeter; Unnamed Springs and Seepage; Fish culture*; Approved May 25, 1931. G. S.
- 9199.... 1-10-30....Handley Brothers; Valley Well; Stockwatering and domestic; Approved November 10, 1931. G. S.
- 9203.... 1-14-30....E. D. Farnham; Hot Springs and Tributaries; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9204.... 1-14-30....E. D. Farnham; South Branch Spring Creek and Tributaries; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9205.... 1-14-30....E. D. Farnham; North Fork Big Creek and Tributaries; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9206.... 1-14-30....E. D. Farnham; Middle Fork Big Creek and Springs and Tributaries; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9222.... 2- 7-30....John I. Guthrie; Little Mud Springs; Irrigation and domestic; Approved October 20, 1931. G. S.
- 9234.... 4- 9-30....C. H. Baker and B. J. Sears; Unnamed Spring; Mining and domestic; Approved March 26, 1932. G. S.
- 9239.... 4-14-30....Mrs. Helen Sutherland Wengert; Artesian Wells; Irrigation and domestic; Approved February 10, 1931. G. S.
- 9240.... 4-15-30....Willard H. George; Sandstone Springs Nos. 1 and 2; Irrigation and domestic; Approved January 31, 1931. G. S.
- 9242.... 4-18-30....Mammoth Quicksilver Mining Co.; Easter Spring; Mining, milling and domestic; Approved October 31, 1931. G. S.
- 9243.... 4-20-30....Bell Telephone Co. of Nevada; Artesian Wells; Irrigation and domestic; Approved February 11, 1931. G. S.
- 9244.... 4-22-30....Fritz Schacht; Underground; Irrigation and domestic; Approved October 20, 1931. G. S.
- 9246.... 4-23-30....E. T. Smith; Jack Springs; Irrigation and domestic; Approved March 21, 1931. G. S.
- 9248.... 4-25-30....Clcl E. Georgetta; Spring Creek; Stockwatering and domestic; Approved March 20, 1931. G. S.
- 9249.... 4-25-30....Clcl E. Georgetta; Spring Creek; Stockwatering and domestic; Approved March 20, 1931. G. S.
- 9260.... 5-22-30....Pueblo Mountain Mining Co.; Yellow Stone Spring; Mining; Denied October 29, 1931.
- 9264.... 5-24-30....Nevada Consolidated Mining Co.; Underground; Milling and domestic; Approved April 16, 1931. G. S.
- 9265.... 5-24-30....Nevada Consolidated Mining Co.; Underground; Irrigation; Approved April 16, 1931. G. S.
- 9271.... 6- 9-30....H. E. Springer; Granite Spring; Mining and domestic; Approved July 14, 1931. G. S.
- 9274.... 6-20-30....Nelson E. Noon; LaMadre Spring; Irrigation and domestic; Approved January 29, 1931. G. S.
- 9275.... 6-21-30....M. H. Wallace and Elmer Seevere; Davenport Canyon; Mining; Canceled September 22, 1931.
- 9278.... 6-26-30....Basque Mining & Milling Co.; Cherry Springs; Mining and domestic; Approved June 22, 1931. G. S.
- 9279.... 6-26-30....Basque Mining & Milling Co.; Basque Spring; Mining and domestic; Approved June 22, 1931. G. S.
- 9290.... 6-28-30....E. Edwards and Harry Parker; Lee Canyon; Mining and domestic*; Denied January 7, 1931.
- 9291.... 7- 7-30....Golden Eagle Mining & Milling Co.; Lebeau Creek; Mining, milling and domestic*; Approved June 10, 1931. G. S.
- 9292.... 7-10-30....A. G. Burns and W. S. Thompson; Unnamed Spring; Salt refining and domestic; Canceled September 23, 1931.
- 9293.... 7-10-30....Consolidated Copper Mines Corp.; Steptoe Creek; Mining, milling and domestic; Approved July 14, 1931. G. S.
- 9294.... 7-11-30....Peter Etchart; Cane Springs; Stockwatering; Approved June 15, 1931. G. S.
- 9295.... 7-11-30....Peter Etchart; Etchart Springs; Stockwatering*; Approved June 15, 1931. G. S.
- 9297.... 7-15-30....H. E. Springer; Barrel Spring; Mining, milling and domestic; Approved July 14, 1931. G. S.
- 9299.... 7-19-30....Pete Itcaina; South Well; Stockwatering; Approved May 15, 1931. G. S.
- 9300.... 7-19-30....Pete Itcaina; White Horse Well; Stockwatering; Approved April 9, 1931. G. S.
- 9301.... 7-19-30....Pete Itcaina; Spruce Well; Stockwatering; Approved April 9, 1931. G. S.
- 9302.... 7-19-30....Pete Itcaina; Mizpah Well; Stockwatering; Approved April 9, 1931. G. S.
- 9303.... 7-19-30....Pete Itcaina; North Well; Stockwatering; Approved April 9, 1931. G. S.
- 9306.... 7-23-30....Thos. Wilson; Timber Hill Wash; Mining and domestic; Canceled September 22, 1931.

*Protested application. G. S. Good standing.

- 9309.... 7-26-30....J. B. Sorhouet; Well; Stockwatering and domestic; Canceled July 12, 1931.
- 9310.... 8- 5-30....Garat & Company; Peaks Creek; Irrigation, stockwatering and domestic; Canceled July 18, 1931.
- 9316.... 8-18-30....Willard H. George; Surface; Stockwatering; Canceled January 31, 1931.
- 9317.... 8-18-30....Willard H. George; Surface; Stockwatering; Canceled January 31, 1931.
- 9319.... 8-20-30....W. D. Spencer; Artesian Well; Irrigation and domestic; Canceled October 20, 1931.
- 9321.... 8-23-30....Halley D. Buzick; South Fork Spring; Irrigation and domestic; Withdrawn May 7, 1931.
- 9323.... 8-25-30....Boulder Dam Townsite Co.; Artesian Well; Irrigation and domestic; Approved January 29, 1931. G. S.
- 9326.... 9- 2-30....Smiley Brothers; Smiley Well; Stockwatering and domestic; Canceled July 12, 1931.
- 9327.... 9- 2-30....Benton V. Smith; Surprise Spring; Camp and domestic*; Approved December 17, 1931. G. S.
- 9328.... 9- 5-30....Longstreet Gold Mining & Milling Co.; Unknown Spring; Mining, milling and domestic; Canceled July 12, 1931.
- 9329.... 9- 8-30....Mose Butti; Butti Well; Irrigation; Approved May 28, 1931. G. S.
- 9343.... 9-29-30....Mrs. Zoe Birnie; Meadow Valley Wash; Irrigation and domestic; Approved April 17, 1931. G. S.
- 9344.... 9-30-30....F. A. Pecetti and Cazaza Estate; Thomas Creek and Tributaries; Power; Approved August 24, 1931. G. S.
- 9346....10- 4-30....F. E. Bush and F. H. Murphy; Bell Spring and Creek; Stockwatering and domestic*; Approved May 30, 1931. G. S.
- 9349....10-12-30....The F. W. Noble and Smith Sheep Co.; Ruby Valley Well No. 2; Stockwatering; Withdrawn August 14, 1931.
- 9352....10-17-30....Department of Highways; Wood Spring; Highway maintenance and domestic*; Withdrawn August 27, 1931.
- 9356....10-23-30....Rubert R. Spencer; Horse Creek; Irrigation and domestic; Canceled March 4, 1931.
- 9358....10-26-30....George Weilmunster; Cold Spring Slide Creek; Irrigation and domestic; Approved May 9, 1932. G. S.
- 9359....10-27-30....C. G. Sevier; Holy Lake Creek and Tributaries; Irrigation and domestic; Approved February 23, 1932. G. S.
- 9361....10-29-30....E. D. Farnham; North Fork Spring Creek; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9362....10-29-30....E. D. Farnham; Horse Springs; Stockwatering and domestic; Approved September 19, 1931. G. S.
- 9364....11- 3-30....John and Antone Rodriques; Ragsdale Spring; Irrigation and domestic*; Denied February 6, 1932.
- 9365....11- 3-30....Lyle J. Beeney and Chas. Lunceford; Horse Creek Spring; Stockwatering and domestic; Canceled September 21, 1931.
- 9366....11- 4-30....Ohio Mines Corporation; Underground Seepage; Mining, milling and domestic; Approved December 2, 1931. G. S.
- 9372....11-11-30....F. J. Powers & Son; Powers Spring; Stockwatering; Withdrawn February 2, 1931.
- 9373....11-11-30....Smith Creek Livestock Co.; Underground Water; Stockwatering; Canceled September 21, 1931.
- 9374....11-16-30....Everett Gallop, Powers Brothers and Ernest J. Fee; Snow Creek; Irrigation; Approved June 8, 1931. G. S.
- 9375....11-20-30....Clyde E. Franklin; Summit Springs; Stockwatering; Denied August 7, 1931.
- 9376....11-20-30....Clyde E. Franklin; Little Sage Hen Springs; Stockwatering; Approved December 2, 1931. G. S.
- 9377....11-20-30....John Zaharis; Unnamed Spring; Stockwatering; Canceled September 22, 1931.
- 9387....11-29-30....United States Brucite Corp.; Mining and domestic; Underground; Withdrawn January 24, 1931.
- 9388....12- 4-30....Carlo and Luigi Arobio; Humboldt River; Irrigation*; Approved May 16, 1931. G. S.
- 9392....12-14-30....Theodore Belzarena & Co.; Gravel Springs and Creek; Stockwatering; Canceled September 24, 1931.
- 9394....12-23-30....Theodore Belzarena & Co.; Idaho Canyon Spring No. 1; Stockwatering; Withdrawn June 19, 1931.

*Protested application. G. S. Good standing.

CHAPTER XVIII

Certificates Issued Under Permits, 1931-1932

Following is a condensed statement giving the salient data in connection with Certificates Issued Under Permits during the biennium 1931-1932, in the order of:

1. Certificate Number.
2. Book Number.
3. Permit Number.
4. Name of Applicant.
5. Source of Water Supply.
6. Purpose of Appropriation.
7. Amount of water in cubic feet per second, unless otherwise noted.
8. Date of Certificate Issued.

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|------|---|------|---|--------|---------|
| 1661 | 6 | 3139 | Mrs. Alice Carter; Unnamed Spring (Carter Spring); Stockwatering | 0.003 | 2- 5-31 |
| 1662 | 6 | 8023 | Roger Brothers; Willow Spring; Stockwatering and domestic | 0.02 | 2- 5-31 |
| 1663 | 6 | 9075 | J. P. Saffores; Indian Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1664 | 6 | 9076 | J. P. Saffores; Mud Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1665 | 6 | 9077 | J. P. Saffores; Willow Springs; Stockwatering | 0.019 | 5- 7-31 |
| 1666 | 6 | 9078 | J. P. Saffores; Little Willow Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1667 | 6 | 9079 | J. P. Saffores; Little Cottonwood Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1668 | 6 | 9080 | J. P. Saffores; Mountview Creek; Stockwatering | 0.019 | 5- 7-31 |
| 1669 | 6 | 9081 | J. P. Saffores; Big Rock Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1670 | 6 | 9082 | J. P. Saffores; Hayes Spring; Stockwatering | 0.019 | 5- 7-31 |
| 1671 | 6 | 9172 | J. P. Saffores; Ant Spring; Stockwatering | 0.009 | 5- 7-31 |
| 1672 | 6 | 9173 | J. P. Saffores; Finley Spring No. 4; Stockwatering | 0.009 | 5- 7-31 |
| 1673 | 6 | 9174 | J. P. Saffores; Finley Spring No. 3; Stockwatering | 0.016 | 5- 7-31 |
| 1674 | 6 | 8833 | Kent Land & Livestock Company; Willow Spring; Stockwatering and domestic | 0.016 | 5- 7-31 |
| 1675 | 6 | 8834 | Kent Land & Livestock Company; Freeman Creek and Canyon; Stockwatering and domestic | 0.028 | 5- 7-31 |
| 1676 | 6 | 8873 | Kent Land & Livestock Company; Jobs Basin Spring; Stockwatering and domestic | 0.028 | 5- 7-31 |
| 1677 | 6 | 8896 | Kent Land & Livestock Company; Box Canyon Spring; Stockwatering and domestic | 0.028 | 5- 7-31 |
| 1678 | 6 | 8897 | Kent Land & Livestock Company; Buck Brush Spring; Stockwatering and domestic | 0.015 | 5- 7-31 |
| 1679 | 6 | 8984 | Kent Land & Livestock Company; Deep Canyon Spring; Stockwatering and domestic | 0.016 | 5- 7-31 |
| 1680 | 6 | 6969 | Pacific Fruit Express Company; Humboldt River; Production of natural ice | 6.57 | 5- 7-31 |
| 1681 | 6 | 7598 | C. C. Everett, P. G. Lofthouse and R. J. Lofthouse; Bobs Canyon Spring; Stockwatering | 0.003 | 5- 7-31 |
| 1682 | 6 | 7599 | C. C. Everett, P. G. Lofthouse and R. J. Lofthouse; Deer Lodge Spring; Stockwatering | 0.003 | 5-7-31 |
| 1683 | 6 | 7600 | C. C. Everett, P. G. Lofthouse and R. J. Lofthouse; Granite Canyon Spring; Stockwatering | 0.003 | 5- 7-31 |
| 1684 | 6 | 7601 | C. C. Everett, P. G. Lofthouse and R. J. Lofthouse; Eagle Springs; Stockwatering | 0.003 | 5- 7-31 |
| 1685 | 6 | 4919 | Mrs. W. O. Ferguson; Unnamed Creek and Springs (Ferguson Springs); Irrigation and domestic | 0.546 | 5-13-31 |
| 1686 | 6 | 7386 | Department of Highways, State of Nevada; Little Six Mile Creek Spring; Highway maintenance and general domestic | 0.25 | 5-13-31 |
| 1687 | 6 | 5942 | Mrs. Pearl Huston; Meadow Valley Wash; Irrigation | 0.3752 | 5-15-31 |

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| 1688 | 6 | 8492 | W. C. Pitt Company; Logan Springs; Stockwatering and domestic. | 0.003 | 5-18-31 |
| 1689 | 6 | 7726 | John M. Taylor and William H. Taylor; Bridge Stream; Irrigation | 0.3364 | 5-22-31 |
| 1690 | 6 | 8320 | Donly Gray; Shallow Well or Spring; Stockwatering and domestic. | 0.001 | 5-22-31 |
| 1691 | 6 | 7596 | Alma Woods; Paroni Spring; Stockwatering. | 0.009 | 5-25-31 |
| 1692 | 6 | 8411 | The Adams McGill Company; Copper Flat Well; Stockwatering. | 0.047 | 5-25-31 |
| 1693 | 6 | 8067 | C. R. Moorman; Wild Horse Spring; Stockwatering | 0.003 | 5-26-31 |
| 1694 | 6 | 8068 | C. R. Moorman; Halsteads Creek; Stockwatering | 0.0078 | 5-26-31 |
| 1695 | 6 | 8069 | C. R. Moorman; School House Spring; Stockwatering | 0.0078 | 5-28-31 |
| 1696 | 6 | 8070 | C. R. Moorman; Ledge Springs; Stockwatering | 0.0078 | 5-26-31 |
| 1697 | 6 | 7334 | Paul Hours; Green Spring; Stockwatering. | 0.0029 | 6- 1-31 |
| 1698 | 6 | 8569 | Ely Water Company; Touer Spring; Stockwatering | 0.0219 | 6- 1-31 |
| 1699 | 6 | 8570 | Ely Water Company; Warm Springs; Stockwatering | 0.0219 | 6- 1-31 |
| 1700 | 6 | 8921 | James Ryan and John H. Conaway; Abandoned spring; Stockwatering and domestic | 0.0016 | 6- 1-31 |
| 1701 | 6 | 7458 | Alma Woods; Lost Spring; Stockwatering. | 0.0047 | 6- 1-31 |
| 1702 | 6 | 7414 | Myrtle and Louis H. Danberg; Unnamed Spring (Danberg Spring); Stockwatering | 0.003 | 6- 2-31 |
| 1703 | 6 | 7413 | Myrtle and Louis H. Danberg; Box Canyon Spring; Stockwatering. | 0.003 | 6- 2-31 |
| 1704 | 6 | 7019 | Vicente Juaristi; Juaristi Well; Stockwatering | 0.03 | 6- 3-31 |
| 1705 | 6 | 7927 | Vicente Juaristi; Dry Lake Well No. 1; Stockwatering and domestic. | 0.05 | 6- 3-31 |
| 1706 | 6 | 7928 | Vicente Juaristi; Dry Lake Well No. 2; Stockwatering and domestic. | 0.03 | 6- 3-31 |
| 1707 | 6 | 9253 | E. G. Schmiedell; Poett Spring; Fire protection and domestic. | 0.01114 | 6- 3-31 |
| 1708 | 6 | 8585 | Bertrand Paris; Paris Spring No. 2; Stockwatering | 0.03 | 6- 8-31 |
| 1709 | 6 | 8592 | Bertrand Paris; Pine Spring; Stockwatering. | 0.03 | 6- 8-31 |
| 1710 | 6 | 8594 | Bertrand Paris; Willow Spring; Stockwatering | 0.03 | 6- 8-31 |
| 1711 | 6 | 8584 | Bertrand Paris; Paris Spring No. 3; Stockwatering | 0.03 | 6-12-31 |
| 1712 | 6 | 8586 | Bertrand Paris; Paris Spring No. 4; Stockwatering | 0.03 | 6-12-31 |
| 1713 | 6 | 8587 | Bertrand Paris; Paris Spring No. 5; Stockwatering | 0.03 | 6-12-31 |
| 1714 | 6 | 8588 | Bertrand Paris; Paris Spring No. 1; Stockwatering | 0.03 | 6-12-31 |
| 1715 | 6 | 8593 | Bertrand Paris; High Rock Spring; Stockwatering | 0.03 | 6-12-31 |
| 1716 | 6 | 8606 | Bertrand Paris; Paris Spring No. 6; Stockwatering | 0.03 | 6-12-31 |
| 1717 | 6 | 8704 | Bertrand Paris; Underground Water (Paris Well); Stockwatering. | 0.025 | 6-12-31 |
| 1718 | 6 | 7137 | Geo. Itzania; Itzania Spring; Stockwatering. | 0.0044 | 8-27-31 |
| 1719 | 6 | 8123 | D. McCuiston; Shell Creek; Irrigation and domestic | 0.378 | 8-27-31 |
| 1720 | 6 | 8542 | R. A. Yelland; Yelland Well; Stockwatering. | 0.025 | 8-27-31 |
| 1721 | 6 | 4351 | Marl A. Page; Iron Spring; Stockwatering. | 0.008 | 11-30-31 |
| 1722 | 6 | 7300 | Joe Bird; Natural Channel; Irrigation. | 0.12 | 11-30-31 |
| 1723 | 6 | 7425 | Flora Dean Hobart; Rim Rock Spring; Stockwatering | 0.03 | 11-30-31 |
| 1724 | 6 | 7434 | Flora Dean Hobart; Rim Rock Spring; Stockwatering | 0.053 | 11-30-31 |
| 1725 | 6 | 7436 | Flora Dean Hobart; Unnamed Spring; Stockwatering | 0.034 | 11-30-31 |
| 1726 | 6 | 7464 | Flora Dean Hobart; Dean Spring No. 1; Stockwatering | 0.05 | 11-30-31 |
| 1727 | 6 | 7465 | Flora Dean Hobart; Dean Spring No. 2; Stockwatering | 0.05 | 11-30-31 |
| 1728 | 6 | 7466 | Flora Dean Hobart; Dean Spring No. 3; Stockwatering | 0.05 | 11-30-31 |
| 1729 | 6 | 7492 | Flora Dean Hobart; Willow Creek Spring; Stockwatering | 0.05 | 11-30-31 |
| 1730 | 6 | 7503 | Flora Dean Hobart; Big Field Spring No. 1; Stockwatering | 0.034 | 11-30-31 |
| 1731 | 6 | 7504 | Flora Dean Hobart; Big Field Spring No. 2; Stockwatering | 0.0375 | 11-30-31 |
| 1732 | 6 | 7505 | Flora Dean Hobart; Buck Horn Spring; Stockwatering | 0.05 | 11-30-31 |

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| 1733 | 6 | 7506 | Flora Dean Hobart; Buckhorn Spring No. 1; Stockwatering | 0.05 | 11-30-31 |
| 1734 | 6 | 7862 | Capital City Bank; Underground Water (Deep Well) Irrigation | 1.60 | 11-30-31 |
| 1735 | 6 | 8571 | Handley Brothers; Stonehouse Springs; Stockwatering | 0.017 | 2- 4-32 |
| 1736 | 6 | 7517 | Fritz Walti; Hiller Spring No. 2; Stockwatering | 0.0115 | 2-11-32 |
| 1737 | 6 | 7518 | Fritz Walti; Hiller Spring No. 1; Stockwatering | 0.0115 | 2-11-32 |
| 1738 | 6 | 7519 | Fritz Walti; Moonshine Spring; Stockwatering | 0.0115 | 2-11-32 |
| 1739 | 6 | 7520 | Fritz Walti; Potato Spring No. 1; Stockwatering | 0.0115 | 2-11-32 |
| 1740 | 6 | 7521 | Fritz Walti; Cottonwood Spring; Stockwatering | 0.0115 | 2-11-32 |
| 1741 | 6 | 7523 | Fritz Walti; Flat Spring; Stockwatering | 0.0115 | 2-11-32 |
| 1742 | 6 | 7524 | Fritz Walti; Potato Spring No. 2; Stockwatering | 0.0115 | 2-11-32 |
| 1743 | 6 | 7525 | Fritz Walti; Red Mountain Spring; Stockwatering | 0.0115 | 2-11-32 |
| 1744 | 6 | 7526 | Fritz Walti; Sheep Corral Springs; Stockwatering | 0.0115 | 2-11-32 |
| 1745 | 6 | 8577 | J. F. Poore; Post Canyon Creek; Stockwatering | 0.01 | 2-15-32 |
| 1746 | 6 | 8598 | Donelly Land & Livestock Company; Buck Spring; Stockwatering | 0.03 | 2-15-32 |
| 1747 | 6 | 8600 | Donelly Land & Livestock Company; Donelly Spring; Stockwatering | 0.03 | 2-15-32 |
| 1748 | 6 | 8601 | Donelly Land & Livestock Company; Box Spring; Stockwatering | 0.03 | 2-15-32 |
| 1749 | 6 | 7302 | E. M. Dawes; Underground Flow of Westgate Canyon; Mining and domestic | 0.000232 | 2-19-32 |
| 1750 | 6 | 8444 | Mrs. Effie M. Jamie; Blue Point Spring; Stockwatering | 0.00156 | 2-19-32 |
| 1751 | 6 | 8459 | Mrs. Effie M. Jamie; Whiskey Springs; Stockwatering | 0.00156 | 2-19-32 |
| 1752 | 6 | 8739 | E. J. Fee; Baker Creek; Stockwatering | 0.022 | 2-23-32 |
| 1753 | 6 | 7415 | Myrtle and Louis H. Danberg; Deep Canyon Spring; Stockwatering | 0.003 | 2-23-32 |
| 1754 | 6 | 8819 | Los Angeles & Salt Lake Railroad Company; Upper Cottonwood Spring; Railroad and domestic | 0.0557 | 2-23-32 |
| 1755 | 6 | 9248 | Clel E. Georgetta; Spring Creek; Stockwatering | 0.039 | 2-23-32 |
| 1756 | 6 | 8871 | Rose Georgetta; Battle Spring No. 2; Stockwatering | 0.037 | 2-23-32 |
| 1757 | 6 | 8872 | Rose Georgetta; Battle Spring No. 1; Stockwatering | 0.037 | 2-23-32 |
| 1758 | 6 | 6589 | Board of Fish and Game Commissioners of Nevada; Sproule Creek; Fish hatchery purposes | 1.50 | 2-29-32 |
| 1759 | 6 | 4462 | James Ryan one-half interest, J. H. and Emma Conway one-half interest; Delamar Flat Reservoir; Stockwatering | 0.025 | 2-29-32 |
| 1760 | 6 | 7595 | William Gansberg; Gansberg Spring; Irrigation and domestic | 1.57 | 2-29-32 |
| 1761 | 6 | 4291 | James F. and Doyle C. Robison; Willard Creek; Irrigation and domestic | 0.3182 | 3- 3-32 |
| 1762 | 6 | 6831 | Anna Vega; Clear Creek; Irrigation | 0.154 | 3- 4-32 |
| 1763 | 6 | 7860 | E. A. Settlemeyer; Unnamed Spring; Stockwatering | 0.0219 | 3- 4-32 |
| 1764 | 6 | 8361 | Emil Baumann; Rye Patch Spring; Stockwatering | 0.019 | 3- 4-32 |
| 1765 | 6 | 8105 | E. A. Settlemeyer; Unnamed Spring; Settlemeyer Springs; Stockwatering | 0.0219 | 3- 4-32 |
| 1766 | 6 | 7931 | J. C. Potts; Potts Well; Stockwatering | 0.026 | 3- 5-32 |
| 1767 | 6 | 3358 | Central Pacific Railway Company; Santa Clara and Tehama Creeks; Irrigation | 1.175 | 3- 5-32 |
| 1768 | 6 | 8934 | Central Pacific Railway Company; Parson Springs; General railroad and domestic | 0.15 | 3- 5-32 |
| 1769 | 6 | 8935 | Central Pacific Railway Company; Killian Springs; General railroad and domestic | 0.05 | 3- 5-32 |
| 1770 | 6 | 9073 | Central Pacific Railway Company; Garden Springs; General railroad and domestic | 0.02 | 3- 5-32 |
| 1771 | 6 | 9074 | Central Pacific Railway Company; Killian Spring; General railroad and domestic | 0.02 | 3- 5-32 |
| 1772 | 6 | 6167 | Claud V. Meecham; Lexington Creek; Irrigation | 0.185 | 3- 5-32 |
| 1773 | 6 | 5513 | Alaska Improvement Company; Rip Van Winkle Spring; Mining, milling and domestic | 0.10 | 3- 8-32 |
| 1774 | 6 | 2764 | William A. Vance; Bothwick Creek; Irrigation | 0.589 | 3-14-32 |

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| 1775 | 6 | 8827 | John Canson; Well No. 1 and Well No. 2; Bathing and domestic | 0.19 | 3-14-32 |
| 1776 | 6 | 9297 | United States Brucite Corporation; Barrel Spring; Mining and domestic | 0.02 | 3-14-32 |
| 1777 | 6 | 4124 | Fernando Segura; Upper Davis Spring; Stockwatering and domestic | 0.0156 | 3-16-32 |
| 1778 | 6 | 4125 | Fernando Segura; Lower Davis Spring; Stockwatering and domestic | 0.0156 | 3-16-32 |
| 1779 | 6 | 4126 | Fernando Segura; Kinkead Springs; Stockwatering and domestic | 0.0156 | 3-16-32 |
| 1780 | 6 | 4127 | Fernando Segura; Number Four Spring; Stockwatering | 0.006 | 3-16-32 |
| 1781 | 6 | 7123 | St. John Laborde and Michel Cadet; Copartners; Fileria Stream; Irrigation | 0.074 | 3-21-32 |
| 1782 | 6 | 7124 | St. John Laborde and Michel Cadet; Stone House Creek; Irrigation | 0.421 | 3-21-32 |
| 1783 | 6 | 7139 | St. John Laborde and Michel Cadet; Carico Creek; Irrigation | 1.515 | 3-21-32 |
| 1784 | 6 | 7140 | St. John Laborde and Michel Cadet; Carico Creek; Irrigation | 2.858 | 3-21-32 |
| 1785 | 6 | 7232 | St. John Laborde and Michel Cadet; Elephant Head Spring; Stockwatering | 0.022 | 3-21-32 |
| 1786 | 6 | 7233 | St. John Laborde and Michel Cadet; Willow Creek; Stockwatering | 0.022 | 3-21-32 |
| 1787 | 6 | 7460 | St. John Laborde and Michel Cadet; Underground Source (Wholey Well No. 2); Stockwatering | 0.009 | 3-21-32 |
| 1788 | 6 | 7367 | St. John Laborde and Michel Cadet; Underground Source (Wholey's Well); Stockwatering | 0.022 | 3-21-32 |
| 1789 | 6 | 7477 | St. John Laborde and Michel Cadet; Stone Cabin Spring; Stockwatering | 0.009 | 3-21-32 |
| 1790 | 6 | 6488 | Edward Weiss and J. F. Vogel; Donelly Creek; Irrigation | 331.24 a. f. | 3-31-32 |
| 1791 | 6 | 8421 | George H. Sharp; Mud Spring; Stockwatering | 0.0039 | 3-31-32 |
| 1792 | 6 | 8422 | George H. Sharp; Blind Spring; Stockwatering | 0.0039 | 3-31-32 |
| 1793 | 6 | 8423 | George H. Sharp; Artesian Well; Stockwatering | 0.0039 | 3-31-32 |
| 1794 | 6 | 8424 | George H. Sharp; Irwin Canyon Spring; Stockwatering | 0.005 | 3-31-32 |
| 1795 | 6 | 7992 | Isaac M. Springer, Jr.; Hot Spring; Domestic and service station | 0.05 | 4- 5-32 |
| 1796 | 6 | 9083 | City of Lovelock; Underground Source (Well); Municipal domestic use | 1.34 | 4- 5-32 |
| 1797 | 6 | 7426 | B. H. Robison; Flat Spring; Stockwatering | 0.016 | 4-13-32 |
| 1798 | 6 | 7286 | B. H. Robison; Upper Stockade Spring; Stockwatering | 0.0125 | 4-13-32 |
| 1799 | 6 | 7262 | B. H. Robison; Kinsley Spring; Stockwatering | 0.0094 | 4-13-32 |
| 1800 | 6 | 2040 | Ugo Giorgi and Guillo Giorgi; East Walker River; Irrigation and domestic | 0.79 | 4-13-32 |
| 1801 | 6 | 2040 | Isabel Foster Bernard; East Walker River; Irrigation and domestic | 1.5656 | 4-13-32 |
| 1802 | 6 | 2040 | Joseph Traille; East Walker River; Irrigation and domestic | 1.3056 | 4-13-32 |
| 1803 | 6 | 2040 | D. J. Kennahan; East Walker River; Irrigation and domestic | 0.707 | 4-13-32 |
| 1804 | 6 | 2040 | Leslie A. L. Green; East Walker River; Irrigation and domestic | 0.727 | 4-13-32 |
| 1805 | 6 | 9449 | E. C. Murphy; Murphy Well No. 3; Stockwatering | 0.023 | 4-18-32 |
| 1806 | 6 | 9450 | E. C. Murphy; Murphy Well No. 2; Stockwatering | 0.023 | 4-18-32 |
| 1807 | 6 | 1774 | William C. Anderson; Carson River; Irrigation | 0.50 | 4-18-32 |
| 1808 | 6 | 3207 | William C. Anderson; Carson River; Irrigation and domestic | 0.1424 | 4-18-32 |
| 1809 | 6 | 7189 | Roberts Mining & Milling Company; Mill Creek; Mining, milling and domestic | 0.184 | 4-18-32 |
| 1810 | 6 | 5890 | John Uhalde; Thirty Mile Spring; Irrigation and domestic | 0.28 | 4-27-32 |
| 1811 | 6 | 4756 | Frank E. Bell; Storey Spring; Stockwatering | 0.025 | 4-27-32 |
| 1812 | 6 | 4452 | H. F. Dangberg Land and Livestock Company; Wild Horse Springs; Stockwatering | 0.025 | 4-27-32 |
| 1813 | 6 | 8301 | Handley Brothers; Pump Well (Underground); Stockwatering | 0.039 | 4-27-32 |
| 1814 | 6 | 7036 | George B. Williams; East Gate Creek and Tributaries; Irrigation | 0.94 | 5-13-32 |
| 1815 | 6 | 7037 | George B. Williams; Willow Creek; Irrigation | 0.94 | 5-13-32 |

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| 1816 | 6 | 8059 | Fred J. Hess; Lower Cottonwood Spring; Stockwatering | 0.025 | 5-13-32 |
| 1817 | 6 | 8059 | Ellison Ranching Company; Lower Cottonwood Spring; Stockwatering | 0.025 | 5-13-32 |
| 1818 | 6 | 8060 | Fred J. Hess; Hess Spring; Stockwatering | 0.025 | 5-13-32 |
| 1819 | 6 | 8060 | Ellison Ranching Company; Hess Spring; Stockwatering | 0.025 | 5-13-32 |
| 1820 | 6 | 7461 | St. John Laborde and Michel Cadet; Wholey Well No. 3 (underground); Stockwatering and domestic | 0.0125 | 5-21-32 |
| 1821 | 6 | 4283 | Jose F. Triguero; Brooks Spring; Irrigation and domestic | 1.64 | 6-16-32 |
| 1822 | 6 | 9062 | Bertrand Paris; Rye Grass Well; Stockwatering | 0.0375 | 6-16-32 |
| 1823 | 6 | 5385 | John P. Buzanes; Gold Hill Springs; Stockwatering | 0.00125 | 6-16-32 |
| 1824 | 6 | 3969 | James F. Robison and Doyle C. Robison; Rock Spring; Stockwatering | 0.025 | 6-16-32 |
| 1825 | 6 | 9203 | E. D. Farnham; Hot Springs; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1826 | 6 | 9204 | E. D. Farnham; South Branch Spring Creek; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1827 | 6 | 9205 | E. D. Farnham; North Fork Big Creek; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1828 | 6 | 9206 | E. D. Farnham; Middle Fork Big Creek; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1829 | 6 | 9361 | E. D. Farnham; North Fork Spring Creek; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1830 | 6 | 9362 | E. D. Farnham; Horse Springs; Stockwatering and domestic | 0.06 | 6-14-32 |
| 1831 | 6 | 9008 | Central Pacific Railway Company; Star Canyon Creek; General railroad and domestic | 1.00 | 6-16-32 |
| 1832 | 6 | 9061 | Central Pacific Railway Company; Star Canyon Creek; General railroad and domestic | 1.00 | 6-16-32 |

CHAPTER XIX—OFFICE FINANCES
SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT OF IRRIGATION DURING PERIOD JANUARY 1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE

| Month 1931 | Appropriation by Legislature | Salaries | Traveling | Supplies | Equipment | Miscellaneous | Totals | Balance |
|------------------------------|---------------------------------|-------------|------------|------------|------------|---------------|-------------|-------------|
| January..... | \$10,750.00 | \$1,225.00 | \$62.30 | \$59.11 | \$45.50 | \$156.78 | \$1,548.69 | |
| February..... | | 1,015.00 | 154.37 | 54.12 | ..... | 167.46 | 1,390.95 | |
| March..... | | 1,072.25 | 152.10 | 158.70 | 37.25 | 263.97 | 1,684.27 | |
| April..... | | 1,021.10 | 221.35 | 93.14 | 1,977.40 | 216.31 | 3,529.30 | |
| May..... | | 1,065.75 | 226.12 | 36.00 | 5.50 | 163.85 | 1,497.22 | |
| June..... | | 990.00 | 74.11 | ..... | ..... | 34.60 | 1,098.71 | |
| Totals June 30, 1931..... | | \$6,389.10 | \$890.35 | \$401.07 | \$2,065.65 | \$1,002.97 | \$10,749.14 | *\$0.86 |
| <i>1931</i> | | | | | | | | |
| July..... | \$43,000.00 | \$977.50 | \$304.23 | \$137.95 | \$147.90 | \$55.64 | \$1,623.22 | |
| August..... | | 1,460.00 | 205.86 | 83.70 | 378.05 | 71.09 | 1,898.70 | |
| September..... | | 1,174.38 | 139.68 | 61.26 | 29.76 | 116.64 | 1,521.72 | |
| October..... | | 1,107.50 | 506.60 | 76.94 | ..... | 66.33 | 1,757.37 | |
| November..... | | 1,225.26 | 428.95 | 53.45 | 108.82 | 67.21 | 1,883.69 | |
| December..... | | 1,207.50 | 242.08 | 133.62 | 117.03 | 131.53 | 1,831.76 | |
| <i>1932</i> | | | | | | | | |
| January..... | | 1,200.00 | 536.81 | 108.43 | 226.90 | 99.28 | 2,171.42 | |
| February..... | | 1,200.00 | 70.21 | 56.90 | 9.00 | 90.73 | 1,426.84 | |
| March..... | | 1,100.00 | 118.06 | 41.06 | 46.48 | 53.49 | 1,359.09 | |
| April..... | | 1,000.00 | 219.75 | 84.32 | 98.89 | 98.89 | 1,483.81 | |
| May..... | | 1,000.00 | 359.83 | 41.04 | 195.65 | 148.88 | 1,745.40 | |
| June..... | | 1,000.00 | 116.81 | 213.83 | 1,182.70 | 43.55 | 2,556.89 | |
| Totals to June 30, 1932..... | | \$13,352.14 | \$3,248.87 | \$1,089.38 | \$2,526.61 | \$1,043.26 | \$21,260.26 | \$21,739.74 |

*Reverted June 30, 1931.

REPORT OF STATE ENGINEER

FEEES RECEIVED AND DISPOSITION MADE OF SAME, JANUARY 1, 1931, TO JUNE 30, 1932, INCLUSIVE

| Month 1931 | Fees received | Deposited with State Treasurer | Paid for publications | Refunds on canceled applications | Recording certificates and transfers | Blue prints | Excess collections | Balance held for recording |
|-----------------------|------------------|--------------------------------------|--------------------------|--|--|-------------|-----------------------|----------------------------------|
| Balance, 1930* | \$10,607.66 | | | | | | | |
| January..... | 449.00 | \$243.00 | \$262.50 | \$25.00 | ..... | \$1.00 | \$20.00 | \$9,255.16 |
| February..... | 389.00 | 227.50 | 112.50 | 25.00 | ..... | 1.00 | 3.00 | 9,275.16 |
| March..... | 673.20 | 446.10 | 25.00 | 12.50 | ..... | 24.10 | 28.00 | 9,275.16 |
| April..... | 766.50 | 534.50 | 137.50 | ..... | ..... | 2.00 | 5.00 | 9,275.16 |
| May..... | 639.50 | 422.00 | 62.50 | 12.50 | ..... | 1.00 | 4.00 | 9,325.16 |
| June..... | 1,079.00 | 616.50 | 150.00 | 12.50 | ..... | 3.00 | 7.00 | 9,415.16 |
| Totals..... | \$14,603.86 | \$2,489.60 | \$750.00 | \$37.50 | ..... | \$32.10 | \$67.00 | \$9,415.16 |
| 1931 | | | | | | | | |
| Balance June 30, 1931 | \$11,177.66 | | | | | | | |
| July..... | 732.00 | \$461.50 | \$312.50 | \$50.00 | ..... | \$2.00 | \$6.00 | \$9,415.16 |
| August..... | 291.50 | 203.50 | 400.00 | 25.00 | ..... | .50 | ..... | 9,415.16 |
| September..... | 478.00 | 267.50 | 262.50 | 150.00 | ..... | 6.00 | 32.00 | 9,425.16 |
| October..... | 517.00 | 277.75 | 112.50 | 25.00 | ..... | 3.75 | 10.50 | 9,425.16 |
| November..... | 523.50 | 337.75 | 237.50 | 87.50 | ..... | 5.75 | 5.00 | 9,455.16 |
| December..... | 319.50 | 207.75 | 225.00 | ..... | ..... | 3.75 | 7.00 | 9,455.16 |
| 1932 | | | | | | | | |
| January..... | 214.00 | 149.50 | 75.00 | 12.50 | ..... | 2.50 | 42.00 | 9,475.16 |
| February..... | 485.00 | 412.00 | 37.50 | 25.00 | \$26.00 | 1.50 | 1.00 | 9,475.16 |
| March..... | 425.00 | 209.00 | 112.50 | 12.50 | 29.00 | 3.50 | 5.00 | 9,565.16 |
| April..... | 285.00 | 161.50 | 137.50 | ..... | 24.00 | 3.50 | ..... | 9,565.16 |
| May..... | 205.00 | 108.50 | 50.00 | ..... | 7.00 | 3.00 | 1.00 | 9,605.16 |
| June..... | 394.25 | 207.62 | 37.50 | 112.50 | 12.00 | 4.13 | 5.00 | 9,615.16 |
| Totals..... | \$16,047.41 | \$3,023.87 | \$2,000.00 | \$500.00 | †\$98.00 | \$39.88 | \$114.50 | \$9,615.16 |

*Publications, \$1,362.50; recording, \$9,245.16. †Balance held for recording, \$6.

REPORT OF STATE ENGINEER

SEGREGATED STATEMENT OF FEES COLLECTED BY STATE ENGINEER FROM JANUARY 1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE

| Month | Fees received | Proof of appropriation | ---APPLICATIONS--- Publications | Issuing and recording permits | Proof completion of work | Proof of benefit | Protests | Clerical | Blue prints | Excess collections |
|-----------------------|---------------|------------------------|------------------------------------|-------------------------------|--------------------------|------------------|----------|----------|-------------|--------------------|
| 1931 | | | | | | | | | | |
| January | \$443.00 | \$10.00 | \$175.00 | \$95.00 | \$4.00 | \$5.00 | \$17.00 | \$13.00 | \$2.00 | \$20.00 |
| February | 389.00 | 20.00 | 137.50 | 50.00 | 17.00 | 10.00 | 7.00 | 51.00 | 2.00 | 3.00 |
| March | 673.20 | ..... | 175.00 | 183.00 | 18.00 | 16.00 | 5.00 | 78.00 | 48.20 | 28.00 |
| April | 766.50 | ..... | 225.00 | 207.50 | 63.00 | 17.00 | 5.00 | 66.00 | 4.00 | 5.00 |
| May | 639.50 | 50.00 | 162.50 | 161.50 | 55.00 | 27.00 | 2.00 | 56.50 | 2.00 | 4.00 |
| June | 1,079.00 | 90.00 | 362.50 | 321.50 | 7.00 | 15.00 | 3.00 | 24.50 | 6.00 | 7.00 |
| Totals, June 30, 1931 | \$3,996.20 | \$170.00 | \$1,237.50 | \$1,018.00 | \$164.00 | \$105.00 | \$39.00 | \$289.00 | \$64.20 | \$67.00 |
| 1932 | | | | | | | | | | |
| July | \$732.00 | ..... | \$262.50 | \$230.00 | \$6.00 | \$7.00 | \$18.00 | \$29.00 | \$4.00 | \$6.00 |
| August | 291.50 | ..... | 87.50 | 88.50 | 4.00 | 5.00 | 17.00 | 19.00 | 1.00 | ..... |
| September | 478.00 | \$10.00 | 162.50 | 123.00 | 7.00 | 6.00 | 7.00 | 15.00 | 12.00 | 32.00 |
| October | 517.00 | ..... | 225.00 | 95.00 | 4.00 | 7.00 | 18.00 | 14.00 | 7.50 | 10.50 |
| November | 523.50 | 30.00 | 125.00 | 200.00 | 10.00 | 5.00 | 16.00 | 33.00 | 11.50 | 5.00 |
| December | 319.50 | ..... | 100.00 | 80.00 | 6.00 | 5.00 | 12.00 | 34.00 | 7.50 | 8.00 |
| January | 214.00 | 20.00 | ..... | 80.00 | 3.00 | 14.00 | 2.00 | 42.00 | 5.00 | 42.00 |
| February | 485.00 | ..... | 37.50 | 355.00 | 1.00 | 5.00 | 1.00 | 25.00 | 3.00 | 34.00 |
| March | 425.00 | 90.00 | 87.50 | 115.00 | 4.00 | 6.00 | 2.00 | 24.00 | 7.00 | 35.00 |
| April | 285.00 | ..... | 100.00 | 40.00 | 8.00 | 11.00 | ..... | 18.00 | 7.00 | 20.00 |
| May | 205.00 | 40.00 | 37.50 | 40.00 | 3.00 | 1.00 | ..... | 37.00 | 6.00 | 16.00 |
| June | 394.25 | 10.00 | 162.50 | 50.00 | 4.00 | 4.00 | 2.00 | 37.00 | 8.25 | 10.00 |
| Totals, June 30, 1932 | \$4,869.75 | \$200.00 | \$1,387.50 | \$1,496.50 | \$60.00 | \$85.00 | \$95.00 | \$327.00 | \$79.75 | \$218.50 |

GENERAL STATEMENT OF STATE ENGINEER'S OFFICE SHOWING RECEIPTS AND DISBURSEMENTS FOR PERIOD JANUARY 1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE

| <i>Receipts</i> | | <i>Disbursements</i> | |
|---|-------------|--|-------------|
| Held for 1930— | | Deposited with State Treasurer January 1 to June 30, 1931..... | \$2,489.60 |
| Publications | \$1,362.50 | Paid publications January 1 to June 30, 1931..... | 750.00 |
| Recording | 3,245.16 | Paid refunds on canceled applications January 1 to June 30, 1931 | 87.50 |
| Total held for 1930..... | \$10,607.66 | Paid blue prints January 1 to June 30, 1931..... | 33.10 |
| Fees Collected— | | Paid excess collections January 1 to June 30, 1931..... | 67.00 |
| January 1, 1931, to June 30, 1931..... | \$3,996.20 | Deposited with State Treasurer July 1, 1931, to June 30, 1932..... | 3,023.87 |
| July 1, 1931, to June 30, 1932..... | 4,869.75 | Paid publications July 1, 1931, to June 30, 1932..... | 2,000.00 |
| Credits for checks canceled and returned..... | 332.05 | Paid refunds July 1, 1931, to June 30, 1932..... | 500.00 |
| Total for period January 1, 1931, to June 30, 1932..... | \$9,198.00 | Paid recording certificates July 1, 1931, to June 30, 1932..... | |
| | | Held | \$6.00 |
| | | Paid | 98.00 |
| | | Paid blue prints..... | 104.00 |
| | | Paid excess collections..... | 39.88 |
| | | Balance Held— | 114.50 |
| | | For publications | \$650.00 |
| | | For recording | 9,615.16 |
| | | Credits from unclaimed checks..... | 332.05 |
| | | | 10,597.21 |
| Total collections | \$19,805.66 | Total held and disbursed January 1, 1931, to June 30, 1932.. | \$19,805.66 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT
OF COOPERATIVE WATER RESOURCES U. S. G. S., JANUARY 1,
1931, TO JUNE 30, 1931, BOTH DATES INCLUSIVE**

Segregated Expenditures from Appropriation for Salaries of Gage Observers

| | |
|------------------------------|----------|
| Appropriation..... | \$225.00 |
| Salaries gage observers..... | 217.00 |
| | <hr/> |
| Balance reverted..... | \$8.00 |

Special Stream Measurement Fund

| | |
|----------------------------------|----------|
| Appropriation..... | \$400.00 |
| Stream measurement salaries..... | \$373.33 |
| Field expenses..... | 26.67 |
| | <hr/> |
| | \$400.00 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION OF COOPERATIVE
WATER RESOURCES U. S. G. S., JULY 1, 1931, TO JUNE 30, 1932**

| | |
|------------------------------------|------------|
| Appropriation | \$2,000.00 |
| Salaries, stream measurements..... | \$521.03 |
| Field expense | 49.79 |
| Salaries, gage observers..... | 324.50 |
| General expense | 16.00 |
| | <hr/> |
| | 911.32 |
| Balance, July 1, 1932..... | \$1,088.68 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT
OF COOPERATIVE SNOW SURVEY, JANUARY 1, 1931, TO JUNE 30,
1931, BOTH DATES INCLUSIVE**

Salaries Snow Survey

1931

| | |
|---------------------|----------|
| Appropriation | \$500.00 |
| Salaries | \$500.00 |
| | <hr/> |
| Total | \$500.00 |

Traveling and Expenses Snow Survey

1931

| | |
|------------------------|----------|
| Appropriation | \$800.00 |
| Travel expense | \$68.26 |
| General expense | 650.88 |
| Printing | 80.00 |
| | <hr/> |
| | 799.14 |
| Balance reverted | \$0.86 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT
OF COOPERATIVE SNOW SURVEY, JULY 1, 1931, TO JUNE 30, 1932,
BOTH DATES INCLUSIVE**

| | |
|------------------------|------------|
| Appropriation | \$1,500.00 |
| Traveling | \$277.45 |
| Salaries | 892.66 |
| General expense | 329.74 |
| | <hr/> |
| | 1,499.85 |
| Balance reverted | \$0.15 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT
OF COLORADO RIVER COMMISSION, JANUARY 1, 1931, TO JUNE 30,
1932, BOTH DATES INCLUSIVE**

| <i>1931</i> | |
|------------------------------|--------------|
| Appropriation | \$1,000.00 |
| Express and auto..... | \$7.38 |
| Train and airplane..... | 179.70 |
| Subsistence | 172.60 |
| Telegraph and telephone..... | 86.20 |
| Office supplies | 15.00 |
| Stenographer and taxi..... | 88.45 |
| | <hr/> 549.33 |
| Balance reverted | \$450.67 |

| <i>1931-1932</i> | |
|--|--------------|
| Appropriation | \$5,000.00 |
| Salaries, commissioners and engineers..... | \$125.00 |
| Express and auto..... | 47.94 |
| Train and airplane..... | 138.86 |
| Subsistence | 108.70 |
| Telegraph and telephone..... | 164.48 |
| Office supplies | 1.80 |
| Stenographer and taxi..... | 2.00 |
| Equipment, office rent and maps..... | 91.50 |
| | <hr/> 680.28 |
| Balance, June 30, 1932..... | \$4,319.72 |

**SEGREGATION STATEMENT OF THE LITTLE HUMBOLDT APPROPRIA-
TION, JANUARY 1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE**

| | |
|------------------------------|----------------|
| Appropriation | \$3,000.00 |
| Typing and stenographer..... | \$2,238.19 |
| Certified copies | 3.70 |
| Publications | 105.58 |
| | <hr/> 2,347.47 |
| Balance June 30, 1932..... | \$652.53 |

**SEGREGATED EXPENDITURES FROM APPROPRIATION FOR SUPPORT
OF NEVADA STATE RANGE COMMISSION DURING PERIOD JAN-
UARY 1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE.**

| <i>1931</i> | |
|------------------------|--------------|
| Appropriation | \$400.00 |
| Auto and train..... | \$100.20 |
| Meals | 87.70 |
| Telephone | 62.35 |
| Stenographer | 84.75 |
| Telegraph | 25.60 |
| Supplies | 18.25 |
| Express | 1.00 |
| | <hr/> 379.85 |
| Balance reverted | \$20.15 |

| <i>1931-1932</i> | |
|-----------------------------|--------------|
| Appropriation | \$2,000.00 |
| Reports | \$75.00 |
| Telephone | 4.02 |
| Telegraph | 49.72 |
| | <hr/> 128.74 |
| Balance, June 30, 1932..... | \$1,871.26 |

**SEGREGATED EXPENDITURES, CURRANT AND DUCKWATER DISTRI-
BUTION, APRIL 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE**

| Month | Salaries, commissioners | Auto requirements | Supplies | Industrial insurance | Total |
|-------------------|----------------------------|----------------------|----------|-------------------------|------------|
| <i>1931</i> | | | | | |
| April..... | \$270.00 | \$54.50 | \$9.80 | ..... | \$334.30 |
| May..... | 279.00 | 53.85 | ..... | \$5.11 | 337.96 |
| June..... | 261.00 | 43.45 | ..... | 1.96 | 306.41 |
| July..... | 279.00 | 62.70 | ..... | 2.09 | 343.79 |
| August..... | 279.00 | 44.50 | ..... | 2.09 | 325.59 |
| September..... | 270.00 | 63.60 | ..... | 2.03 | 335.63 |
| Totals..... | \$1,638.00 | \$322.60 | \$9.80 | \$13.28 | \$1,983.68 |
| <i>1932</i> | | | | | |
| March..... | ..... | ..... | ..... | \$0.64 | \$0.64 |
| April..... | \$118.80 | \$15.25 | ..... | 1.01 | 135.06 |
| May..... | 167.59 | 23.75 | ..... | 1.38 | 192.72 |
| June..... | 243.00 | 20.50 | ..... | 2.07 | 265.57 |
| Totals..... | \$529.39 | \$59.50 | ..... | \$5.10 | \$593.99 |
| Grand totals..... | 2,167.39 | 382.10 | \$9.80 | 18.38 | 2,577.67 |

REPORT OF STATE ENGINEER

HUMBOLDT RIVER DISTRIBUTION, SEGREGATED EXPENDITURES, PERIOD APRIL 1, 1931, TO JUNE 30, 1932, AS STATE ENGINEER'S OFFICE RECORDS

| Month | Salaries | Mileage | Auto expense | Miscellaneous expenses | Industrial insurance | Telegraph and telephone | Snow survey expense | Totals |
|-------------------|------------|------------|--------------|------------------------|----------------------|-------------------------|---------------------|-------------|
| <i>1931</i> | | | | | | | | |
| April..... | \$1,636.50 | \$383.49 | \$118.70 | \$101.27 | ..... | \$4.43 | ..... | \$2,143.39 |
| May..... | 2,731.00 | 302.96 | 383.95 | 27.14 | \$30.80 | \$95.20 | ..... | 3,571.05 |
| June..... | 1,794.85 | 206.44 | 267.01 | 5.11 | 12.72 | 107.62 | ..... | 2,393.75 |
| July..... | 1,083.46 | 189.35 | 187.73 | 17.90 | 7.88 | 23.55 | ..... | 1,509.87 |
| August..... | 753.00 | 212.11 | 1.90 | 7.93 | 5.46 | 5.60 | ..... | 986.00 |
| September..... | 510.00 | 68.34 | 47.92 | 14.35 | 3.83 | ..... | ..... | 648.29 |
| October..... | 429.35 | 216.11 | 7.97 | 25.00 | 3.21 | ..... | ..... | 681.64 |
| November..... | 315.00 | 105.18 | ..... | 53.08 | 2.36 | ..... | ..... | 475.62 |
| December..... | 461.00 | 83.85 | ..... | 68.20 | 3.22 | 33.18 | ..... | 652.45 |
| Totals..... | \$9,613.16 | \$1,767.83 | \$1,015.18 | \$319.98 | \$69.48 | \$276.43 | ..... | \$13,062.06 |
| <i>1932</i> | | | | | | | | |
| January..... | \$375.00 | \$57.75 | ..... | \$245.94 | ..... | \$19.50 | ..... | \$698.19 |
| February..... | 310.00 | 119.88 | ..... | ..... | \$2.33 | 47.55 | ..... | 554.49 |
| March..... | 745.00 | 138.48 | ..... | 1,063.73 | 13.63 | 29.43 | \$467.35 | 2,494.62 |
| April..... | 1,190.60 | 260.30 | \$37.00 | 50.67 | 18.93 | 40.90 | 68.50 | 1,951.97 |
| May..... | 1,620.07 | 317.25 | 357.14 | 291.28 | 14.29 | 51.77 | ..... | 2,651.80 |
| June..... | 1,536.11 | 163.99 | 334.79 | 42.03 | 13.39 | 63.83 | ..... | 2,159.14 |
| Totals..... | \$5,776.78 | \$1,062.65 | \$1,051.00 | \$1,768.38 | \$62.57 | \$252.98 | \$535.85 | \$10,510.21 |
| Grand totals..... | 15,389.94 | 2,830.48 | 2,066.18 | 2,088.36 | 132.05 | 529.41 | 535.85 | 23,572.27 |

**LITTLE HUMBOLDT DISTRIBUTION, SEGREGATED EXPENSES FOR
PERIOD 1931 AND 1932, JANUARY, 1931, TO JUNE 30, 1932**

| Month 1931 | Salary, commissioner | Mileage | Miscellaneous expenses | Industrial insurance | Snow survey | Totals |
|------------------------|-------------------------|-----------------|---------------------------|-------------------------|-----------------|-------------------|
| April | \$300.00 | \$90.00 | \$29.30 | ----- | ----- | \$419.30 |
| May | 310.00 | 69.40 | ----- | \$4.68 | ----- | 384.08 |
| June | 300.00 | 82.80 | 8.02 | ----- | ----- | 390.82 |
| July | 310.00 | 76.00 | ----- | 2.32 | ----- | 388.32 |
| August | 310.00 | 49.50 | ----- | 2.33 | ----- | 361.83 |
| September | 66.67 | ----- | ----- | .50 | ----- | 67.17 |
| Totals | \$1,596.67 | \$367.70 | \$37.32 | \$9.83 | ----- | \$2,011.52 |
| <i>1932</i> | | | | | | |
| February | ----- | ----- | ----- | ----- | \$30.84 | \$30.84 |
| March | \$160.00 | \$17.20 | \$0.44 | \$5.61 | 77.16 | 260.41 |
| April | 300.00 | 76.20 | ----- | 2.55 | ----- | 378.75 |
| May | 310.00 | 71.00 | ----- | 2.64 | ----- | 386.12 |
| June | 300.00 | 65.00 | ----- | 2.55 | 2.48 | 367.55 |
| Totals | \$1,070.00 | \$229.40 | \$0.44 | \$13.25 | \$110.48 | \$1,423.67 |
| Grand totals... | 2,666.67 | 597.10 | 37.76 | 23.18 | 110.48 | 3,435.19 |

**SEGREGATED EXPENDITURES, MUDDY RIVER DISTRIBUTION, APRIL
1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE**

| Month 1931 | Salary, commissioner | Industrial insurance | Totals |
|---------------------------|-------------------------|-------------------------|-----------------|
| April | \$80.00 | \$0.60 | \$80.60 |
| May | 80.00 | .60 | 80.60 |
| June | 80.00 | .60 | 80.60 |
| July | 80.00 | .60 | 80.60 |
| August | 80.00 | .60 | 80.60 |
| September | 50.00 | .38 | 50.38 |
| October | 20.00 | .15 | 20.15 |
| November | 20.00 | .15 | 20.15 |
| December | 20.00 | .15 | 20.15 |
| Totals | \$510.00 | \$3.83 | \$513.83 |
| <i>1932</i> | | | |
| January | \$20.00 | \$0.15 | \$20.15 |
| March | ----- | 1.02 | 1.02 |
| April | 36.00 | .33 | 36.33 |
| May | 49.00 | .42 | 49.42 |
| June | 85.00 | .72 | 85.72 |
| Totals | \$190.00 | \$2.64 | \$192.64 |
| Grand totals | 700.00 | 6.47 | 706.47 |

**PAHRANAGAT LAKE DISTRIBUTION, SEGREGATED EXPENSES, APRIL
1, 1931, TO JUNE 30, 1932, BOTH DATES INCLUSIVE**

| Month 1931 | Commissioner's salary | Auto expense | Industrial insurance | Totals |
|---------------------------|--------------------------|-----------------|-------------------------|-----------------|
| June | \$270.00 | \$11.20 | \$1.93 | \$283.13 |
| July | 279.00 | 12.45 | 2.09 | 293.54 |
| August | 279.00 | 11.45 | 2.10 | 292.55 |
| September | 75.00 | 5.10 | .56 | 80.66 |
| Totals | \$903.00 | \$40.20 | \$6.68 | \$949.88 |
| <i>1932</i> | | | | |
| March | ----- | ----- | \$0.99 | \$0.99 |
| June | \$135.00 | \$5.10 | 1.15 | 141.25 |
| Totals | \$135.00 | \$5.10 | \$2.14 | \$142.24 |
| Grand totals | 1,038.00 | 45.30 | 8.82 | 1,092.12 |

SIX MILE CREEK DISTRIBUTION, SEGREGATED EXPENDITURES,
PERIOD MAY, 1931, TO JUNE 30, 1932

Salaries..... \$12.50

TONY CREEK DISTRIBUTION, SEGREGATED EXPENDITURES,
MARCH, 1932, TO JUNE 30, 1932

| Month | Commissioner's salary | Travel | Industrial insurance | Total |
|--------------|-----------------------|--------|----------------------|---------|
| March | | \$9.23 | ..... | \$9.23 |
| May | \$48.00 | ..... | \$0.41 | 48.41 |
| June | 20.00 | ..... | .17 | 20.17 |
| Totals | \$68.00 | \$9.23 | \$0.58 | \$77.81 |

WHITE RIVER DISTRIBUTION, SEGREGATED EXPENDITURES,
JUNE 1, 1931, TO JUNE 30, 1932

| Month | Commissioner's salary | Auto expense | Total |
|---------------------|-----------------------|--------------|---------|
| June 1931 | \$9.00 | \$4.50 | \$13.50 |
| April 1932 | 9.00 | 3.90 | 12.90 |
| May | 9.00 | 4.00 | 13.00 |
| Totals | \$27.00 | \$12.40 | \$39.40 |

CHAPTER XX
Recommendations
REMARKS

Under existing conditions there are no vital recommendations to be made for legislation affecting the work of this department. It is, however, deemed advisable to call attention to some slight amendments which should be made and to stress the importance of some of the work now being carried on by or through the department.

One of the most important services the State Engineer can render to water users in connection with the administration and distribution of water on adjudicated streams is the determination of the duty of water for their lands. Section 36a, chapter 106, Statutes of 1921, provides as follows:

The decree entered by the court, as provided by section 36 of this Act, shall be final and shall be conclusive upon all persons and rights lawfully embraced within the adjudication; *provided, however,* that the State Engineer, or any party or adjudicated claimant upon any stream or stream system affected by such decree, may, at any time within three years from the entry thereof, apply to the court for a modification of said decree, in so far only as said decree fixed the duty of water, and upon the hearing of such motion the court may modify such decree, increasing or decreasing the duty of water consistent with good husbandry and consistent with the principle that actual and beneficial use shall be the measure and limit of the right. Notice of application shall be given as in civil cases.

Due to the uncertainties of water supply in our streams and the varying factors from year to year that influence the consumptive use of water on various classes of lands, it is practically impossible in most instances to arrive at the proper duty of water within a three-year period following the entry of the decree on an adjudicated stream.

In the 1929-1930 biennial report, mention was made of the number of old applications pending in this office for action. In explanation of this condition attention is called to the fact that these applications represent filings on streams or water holes scattered throughout the entire State. In numerous instances valuable property rights are involved, so that definite action on an application can be taken only after an extensive investigation regarding the circumstances surrounding the appropriation has been made. This necessarily means delay with added expense. By grouping the applications in districts and concentrating efforts accordingly, the office during the biennial period has made substantial progress in cleaning up some of this old work. There were over 1,500 applications pending without action at the beginning of the biennial period; the number has now been reduced to less than 1,300. This reduction has been accomplished in addition to keeping the current work up to date. The importance of bringing this work up to date is obvious when it is considered that each of the now pending applications represents contemplated developments

within the boundaries of the State, with possible expenditures ranging from a few dollars to several hundred thousand dollars. The combined estimated cost of improvements furnished by applicants in connection with 211 applications filed during the biennial period alone amount to \$1,812,000, and the actual expenditures for labor and improvements on water appropriations completed in this period, as evidenced by proofs filed with this office, is considerable in excess of \$462,000.

The Nevada system of snow surveys, conceived and evolved by Dr. Church of our State University, has been so successful in forecasting far in advance water supply for irrigation and power purposes that it has received world-wide recognition. The power companies were early to foresee the advantages of snow surveys, since it allowed them to arrange in advance for their anticipated requirements. Water users in general, by availing themselves of the information furnished as the result of snow survey forecasts, can adjust their ranching operations so that only those crops will be planted that will mature with the available water supply, thus saving both labor and expense.

The forecast run-off of our streams is proving of inestimable value to the water users in general, as evidenced by the fact that a great number of voluntary contributions are being made for carrying on this important work. The value of snow surveys can not be overestimated, and should continue to receive liberal financial support from the State.

Cooperative stream measurement work is carried on by the United States Geological Survey cooperating with the State on a dollar-for-dollar basis. The ultimate maximum development of our water resources and determination of water rights depends primarily upon accurate records of stream flow.

It would not seem amiss at this time to direct attention to the fact that the Federal Government in carrying on this cooperative work on a dollar-for-dollar basis gives the State credit for a portion of the work performed by its commissioners in distributing water on adjudicated streams.

If this work is to be continued in an efficient manner, no further reductions in appropriations for the cooperative work should be made.

Attention is again called to the advisability of providing fireproof housing for the records of this office. In the event that a fireproof vault for all of these records cannot be provided, there should at least be a fireproof safe for the book records and also for some 10,000 maps.

At the present time there is no protection of any kind against loss of these records by fire.

RECOMMENDATIONS

We therefore respectfully recommend:

1. That section 36a be amended so as to provide for a period of at least five years following the entry of the court decree within which to make a study of the water duty requirements and for petitioning the court for a modification of said decree with respect thereto.

2. That sufficient funds be appropriated by the next Legislature to continue successfully to carry on the work of bringing up to date some 1,300 water applications, in the interests of irrigation and range

control. (The appropriation covers the expenses of the State Engineer on all commissions of which he is a member except the Public Service Commission, the Colorado River Development Commission, and the State Range Commission; \$1,000 of the appropriation for the biennium 1931-1933 will not be expended and will revert to the State Treasury.)

3. That funds be appropriated for continued snow survey forecasts, and that the appropriation for the biennium 1933-1935 be in the sum of \$1,500, as the work cannot be conducted at less expense. (The funds appropriated by the State are matched by those of the irrigation districts and the Sierra Pacific Power Company to carry on the work in the Sierra watershed. The scope of the work has been materially broadened, without additional expense to this State, by the participation of the California State Snow Survey in the same. Snow survey work in the Big Humboldt and Little Humboldt Basins has been carried on by the Snow Survey Committee with the assistance of water commissioners employed by this office on those streams.)

4. That cooperative stream measurement work be continued with the United States Geological Survey, and that the appropriation for the biennium 1933-1935 be in the sum of \$2,000, as the work cannot be conducted at less expense. (In addition to matching State funds on a 50-50 basis, the U. S. G. S. allowed for work performed by the State Engineer's office and water commissioners, for the period July 1, 1930, to July 30, 1931, \$150; and for the period July 1, 1931, to June 30, 1932, \$500. Total Federal expenditures for cooperative stream measurement work, January 1, 1931, to June 30, 1931, \$818.51; and total Federal expenditures July 1, 1931, to June 30, 1932, \$1,749.84, including \$250 special fund for Owyhee River stream.)

5. That sufficient money be appropriated for the purchase of adequate fire-proof files for properly housing the records of the State Engineer's office. (Records without such protection in this office could not be replaced at any price, and are estimated to have cost approximately \$1,000,000.)

6. That the water law be so amended that the filing of applications for all wells to be used for irrigation purposes shall be required.

7. That the State Range Commission be allowed, for the biennium of 1933-1935, the customary \$2,000, to be used if and when necessary. (This fund has no connection with the State Engineer's appropriation; \$1,000 out of the \$2,000 appropriated for this biennium will not be used, and will revert to the State Treasury on June 30, 1933.)

8. That the Colorado River Development Commission be allowed, for the biennium of 1933-1935, the customary \$5,000, to be used if and when necessary. (This fund has no connection with the State Engineer's appropriation; \$3,000 of the \$5,000 appropriated for use during this biennium will not be used, and will revert to the State Treasury on June 30, 1933.)

9. That the Bond Commission Act, approved February 26, 1921, be so amended that the powers of the Irrigation District Bond Commission shall be enlarged and its authority extended to require semiannual reports to be submitted to the commission on each bond issue which has received the stamp of its approval; that such reports show the financial status of the irrigation district; that such reports cover

any new work or proposed changes in the work from the plans contemplated at the time of the original bond issue, and that the commission's approval be required before the adoption of the proposed changes.

10. That the sum of \$5,000 be appropriated as a special fund to be expended in underground water investigations under the direction of the State Engineer and the State Board of Irrigation. (It is possible to secure a like amount from the United States Geological Survey, under a cooperative agreement, to be expended within the State during the ensuing biennium. The importance of this work cannot be overemphasized at this time, due to the possible use of Hoover Dam power in this connection in creating new taxable wealth.)

Respectfully submitted,

GEO. W. MALONE,
State Engineer.

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