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

STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

For the Period
July 1, 1946, to June 30, 1948, Inclusive

ALFRED MERRITT SMITH
State Engineer of Nevada

CARSON CITY, NEVADA
STATE PRINTING OFFICE - - JACK McCARTHY, SUPERINTENDENT
1948

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1[20]

STATE ENGINEER

OF THE

BIENNIAL REPORT

STATE OF NEVADA

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LETTER OF TRANSMITTAL

STATE OF NEVADA,
OFFICE OF STATE ENGINEER,
CARSON CITY, July 15, 1948.

To His Excellency, HONORABLE VAIL PITTMAN, *Governor of Nevada, Carson City, Nevada.*

SIR: In compliance with the provisions of section 14, chapter 140, Nevada Statutes 1913, and section 1, chapter 171, Nevada Statutes 1931, I have the honor to transmit herewith the Biennial Report of the State Engineer for the period ending June 30, 1948.

The report of the Colorado River Commission for the biennium is included herein as an appendix.

Respectfully submitted,
ALFRED MERRITT SMITH,
State Engineer.

STATE ENGINEERS SINCE CREATION OF OFFICE

A. E. CHANDLER.....May 29, 1903, to May 1, 1905
HENRY THURTEL.....May 1, 1905, to May 1, 1907
FRANK R. NICHOLAS.....May 1, 1907, to March 3, 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, to May 28, 1935
ALFRED MERRITT SMITH:.....May 28, 1935—

OFFICIAL ROSTER DEPARTMENT OF STATE ENGINEER

OFFICE PERSONNEL

Carson City, Nevada

July 1, 1946, to June 30, 1948

ALFRED MERRITT SMITH	State Engineer
HUGH A. SHAMBERGER	Assistant State Engineer
EDMUND MUTH	Deputy State Engineer
F. N. DONDERO	Office Engineer
J. A. MILLAR[1]	Office Engineer
C. E. THIEX	Chief Clerk
ALTA THIEX	Stenographer
VALENCIA E. SCOTT[2]	Secretary
ELDEANE MURPHY	Extra Clerical
SHIRLEY HINES[3]	Secretary
HELEN OXOBY[4]	Stenographer

WATER DISTRIBUTION PERSONNEL

Las Vegas and Pahrump Artesian Basins

HARRY E. JAMESON	Commissioner, 1946–1948

Humboldt River, 1946

J. A. MILLAR, Supervising Water Commissioner	Entire River
ALBERT M. QUILL, Water Commissioner	Star Valley, North Fork, and Lamoille
JERRY WIGNAL, Hydrographer	Lovelock

Humboldt River, 1947

CHESTER WOOD, Supervising Commissioner	Entire River
GEORGE HENNEN, Assistant Supervising Commissioner	Entire River
NELLO AIAZZI, Water Commissioner	South Fork, Lamoille
WARREN CLEMENS, Water Commissioner	Starr Valley, Deeth
MYRON CLARK, Water Commissioner	Battle Mountain
PETE ANKER, Water Commissioner	Lovelock
JERRY WIGNAL, Hydrographer	Lovelock
WILLIAM HOOD, Water Commissioner	Little Humboldt, Winnemucca

Humboldt River, 1948

GEORGE HENNEN, Supervising Commissioner	Entire River
NELLO AIAZZI, Assistant Supervising Commissioner	Entire River
WILLIAM HOLT, Water Commissioner	Little Humboldt
SIMON ALCORTA, Water Commissioner	Lovelock
JERRY WIGNALL, Water Commissioner	Lovelock
STEVE CUSTER, Hydrographer	Lovelock
WARREN CLEMENS, Water Commissioner	Starr Valley, Deeth
GEORGE MOSLEY, Water Commissioner	Lamoille, South Fork
RUTH GUSTAFSON, Stenographer	Elko Office

Duckwater and Currant Creeks, 1946–1948

W. E. HAWKINS, Water Commissioner	Entire District

[1]October 1, 1946, to date.
[2]Resigned May 31, 1947.
[3]May 24, 1947, to date.
[4]April 5, 1948, to date, Colorado River Commission.

Muddy River, 1946–1948

CLARENCE A. LEWIS, Water Commissioner.....Entire District

Pahranagat Lake, 1946

ALDEN STEWART, Water Commissioner.....Entire District

Pahranagat Lake, 1947

GILBERT STEWART, Water Commissioner.....Entire District

Pahranagat Lake, 1948

GUY JACKA, Water Commissioner.....Entire District

Baker and Lehman Creeks, 1946–1948

DON BECK,[5] Water Commissioner.....Entire District

[5]Died June, 1948.

SUMMARY OF THE WORK OF THE STATE ENGINEER

STATE COMMISSIONS AND BOARDS

The State Engineer upon taking office automatically becomes a member of the following Commissions:

1. The Nevada Public Service Commission.
2. The Nevada State Irrigation District Bond Commission.
3. The State Range Commission.
4. The Nevada State Planning Board.

By gubernatorial appointment the present State Engineer is also a member of the following:

5. The Colorado River Commission of Nevada.
6. State Board of Registered Professional Engineers.

RECLAMATION ORGANIZATIONS

1. The Association of Western State Engineers (seventeen western States).
2. The National Reclamation Association.
3. National Water Conservation Conference.
4. Colorado River Water Users Association.
5. National Rivers and Harbors Congress.

STATUS OF ADJUDICATION OF STREAM SYSTEMS

The work of adjudicating the waters 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	39
2. Acres under adjudicated streams	389,199
3. Vested water users under adjudicated streams	621
4. Adjudicated stream systems supervised by this office during the past biennium	8
5. Adjudicated stream systems not supervised by this office during the past biennium	32
6. Streams in process of adjudication	22
7. Adjudications completed during past biennium	4
8. Stream systems on which decrees have been entered by civil suit not under supervision of this office	10
9. Stream systems adjudicated by United States District Court	4
10. Stream systems under process of adjudication by United States District Court	1

STATUS OF WATER APPLICATIONS AND PROOFS OF APPROPRIATION

1. Water applications filed 1903 to June 30, 1948	12,519
2. Water applications acted upon, 1903 to June 30, 1948	11,889
3. Water applications on which no action has been taken	630
4. Water applications acted on, July 1, 1946, to June 30, 1948	688
5. Water applications filed, July 1, 1946, to June 30, 1948	895

6. Proofs of commencement of work filed, July 1, 1946, to June 30, 1948 349
7. Proofs of completion of work filed, July 1, 1946, to June 30, 1948 290
8. Proofs of beneficial use filed, July 1, 1946, to June 30, 1948.. 203
9. Protests filed against the granting of applications, July 1, 1946, to June 30, 1948 338
10. Certificates of appropriation issued under permitted water rights, July 1, 1946, to June 30, 1948 188
11. Proofs of appropriation filed, 1903 to June 30, 1948 2,350
12. Proofs of appropriation filed, July 1, 1946, to June 30, 1948.. 19

COOPERATIVE WORK

The State Engineer also carries on cooperative work in stream gaging, snow survey, and ground-water studies through three State appropriations. The cooperating agencies are:

The Water Resources Branch of the United States Geological Survey.

The Nevada Cooperative Snow Surveys.

The stream gaging and ground-water study programs are carried by the United States Geological Survey under two separate cooperative programs.

The activities of the State Engineer are related under their proper headings elsewhere.

PUBLIC SERVICE COMMISSION

The Nevada Public Service Commission is composed of the following members:

George Allard, Chairman, Carson City.

Charles V. Williams, Yerington.

Alfred Merritt Smith, Carson City.

Lee S. Scott, Secretary, Carson City.

The work of this commission is published by the chairman in a biennial report. During the past biennium many hearings have been held in various parts of the State on matters concerning the rate schedules of public utilities, rail and motor carriers, complaints as to public service, and requests for certificates of convenience and necessity for the operation of public utilities.

THE STATE IRRIGATION DISTRICT BOND COMMISSION

The State Irrigation District Bond Commission was created by an Act of the Legislature approved February 26, 1921, being sections 8217–8228 Nevada Compiled Laws 1929. The commission consists of the following members:

Vail Pittman, Governor of Nevada.

Grant L. Robison, Bank Examiner.

Alfred Merritt Smith, State Engineer.

It is the duty of the commission to pass upon the eligibility of bonds of irrigation districts as legal investment within Nevada.

THE STATE RANGE COMMISSION

This commission consists of the following members:

Vail Pittman, Governor of Nevada.

George Allard, Chairman, Public Service Commission.
Alfred Merritt Smith, State Engineer.

The 1929 Legislature created the "State Range Commission" for the purpose of determining the principles, laws, or policies that should apply to the grazing use of the natural range forage resources of publicly owned lands within Nevada.

The work of this commission has been dormant, since the major part of the range area in Nevada has come under the supervision of the Taylor Grazing Division of the Department of the Interior. It should be noted, however, that in the areas not within Division of Grazing Districts the State Engineer bases decisions and makes rulings on water filings according to the Nevada Stockwatering Act of 1925.

BIENNIAL REPORT OF STATE ENGINEER, 1946-1948

ACKNOWLEDGMENTS AND RECOMMENDATIONS

ACKNOWLEDGMENTS

This report, covering the seventh two-year period of service by my associates and myself in the department of the State Engineer, will in part show the tremendous increase in work in the department during the past biennium. This can best be realized when attention is called to the fact that the work involved in handling applications to appropriate water now occupies at least 60 percent of our time. During the period covered by this report there were 895 applications filed to appropriate water as compared with 487 during the biennium 1944–1946, which is an increase of 83 percent. The increase during the 1946–1948 biennium over the biennium 1942–1944 was 205 percent. In addition to this many other new activities were carried on as described in this report during the 1946–1948 biennium, inclusive of the cooperative ground water study, the Quinn River Investigation, the Lake Tahoe Water Study, the handling of Well Driller's logs, the organization of the Humboldt River Advisory Board, the Nevada Power Market Survey, and the Clear Creek Reservoir study. Therefore, I wish especially to praise the splendid and unstinted service rendered by my staff.

Acknowledgments and sincere thanks are extended to the following agencies with which we have worked so closely during the past two years:

Soil Conservation Service.
U. S. Extension Service.
Nevada State Experiment Station.
Farmer's Home Administration.
United States Geological Survey.
United States Indian Service.
United States Weather Bureau.
Bureau of Land Management.
United States Forest Service.
U. S. Bureau of Reclamation.
U. S. Army Engineering Office.
Federal Power Commission.
Nevada State Farm Bureau.

May I again repeat a statement I have often made before which is that the services and efficiency of the department are in no small measure due to the help of State officers in other departments. These officers with whom we are in contact almost daily and whose work is often related to our own, have always given us their full cooperation. Governor Vail Pittman, Attorney General Alan Bible and his able assistants, Wm. T. Mathews, George P. Annand, and Homer Mooney, have all been of great assistance to me and my staff, and I take this means of publically thanking them.

I wish also to extend my sincere thanks to our representatives in

Congress, Senator Pat McCarran, Senator George Malone, and Congressman Charles Russell, who have never failed to lend aid and council when called upon. I also thank the many other State and county officers throughout our State who have rendered valuable service to our department.

RECOMMENDATIONS

1. *Additional Personnel.* Due to the great increase of work in the Department, it is recommended that the Legislature appropriate funds sufficient to enable the State Engineer to employ the services of one additional engineer and one additional stenographer.

2. *Cooperative Ground-Water Program.* Due to the great increase in the use of ground water I recommend that the Legislature appropriate the same amount of money as was appropriated in 1947, *i.e.* $40,000 to carry this program forward.

3. *Cooperative Stream Measurement Program.* There are now 61 stream gaging stations being operated for Nevada under this program. Of this number, 16 were added during the biennium period 1946–1948. Due to the increased cost of operation and maintenance of the station, it is recommended that the Legislature increase the State appropriation from the 1947 appropriation of $9,000 to $14,000.

4. *Cooperative Snow Survey Program.* During the biennium a cooperative agreement was entered into between the Soil Conservation Service, the Experiment Station, and the office of State Engineer relative to snow survey work and irrigation studies. In addition to the snow survey work, studies have been started on evapo-transpiration losses. To carry this work forward, and in addition due to higher costs, it is recommended that the Legislature increase the appropriation for the biennium to at least $6,000.

ALFRED MERRITT SMITH,
State Engineer.

CHAPTER I

Introductory and General

In the preparation of this report the following objectives have been kept in mind:

First—An accounting by the State Engineer to the Governor, the State Legislature and the taxpayers of his stewardship of the department for the biennial period.

Second—To benefit the water users or any persons interested in water rights by presenting in a condensed and concise form all data that have been recorded in connection with water rights during the two-year period.

Third—To familiarize water users and the public with the various duties and activities of the State Engineer's office.

Fourth—To perpetuate for future reference and historical use a résumé of numerous activities of the department that may not be permanently recorded in any other manner.

The office of the State Engineer was created by Legislative Act in 1903, primarily for the purpose of providing a statutory method for the determination and regulation of existing water rights. In 1905 the Legislature provided a statutory method by which future water rights could be acquired and perfected by application to the State Engineer for permission to appropriate and apply water to beneficial use.

The original water law has been amended several times since its passage as a result of needs made evident by its application. The result has been that our water law is now admirably adopted to conditions in Nevada. The 1936–1938 Biennial Report of the State Engineer contains a summary of the various changes in the water law dating back to the earliest Act pertaining to diversion of water in 1866.

The activities of the State Engineer's office may be divided into the following activities:

1. Water right applications which include the filing of applications, publication, investigations, hearings, action in either approving or denying same. (See chap. III.)
2. Adjudication of vested water rights. (See chap. IV.)
3. Distribution of water on adjudicated stream systems. (See chap. V.)
4. Ground-water program in cooperation with the United States Geological Survey and the administration of the ground water law. (See chap. VI.)
5. Stream measurement program in cooperation with the United States Geological Survey. (See chap. VII.)
6. Well Driller's licensing program. (See chap. X.)
7. Miscellaneous office activities.

In addition, the State Engineer is the member of several State and Reclamation Boards which takes up a great deal of his time. These are listed on page 9.

During the biennium covered by this report, there has been a great increase in both the office and field work. This is due in part to the fact that more applications to appropriate water were received than in any similar period in the history of the office. The 895 applications filed exceeded the 806 applications filed during the period July 1, 1926, to July 1, 1928 by 89 applications. Other factors were the increasing activity brought about by the ground-water program, the Nevada Power Survey, and the Lake Tahoe study, and increased work on water distribution problems. A great deal of time is taken up with examining all new applications and checking and filing maps submitted in support thereof. With respect to this work, the aim of this office has been to eliminate all errors before filing and publishing the notices of proposed appropriations. All proofs of commencement of work and completion of work, and proofs of application of water to beneficial use, together with the maps in support thereof, are carefully examined for errors before filing. Proofs of appropriation of water and supporting maps covering vested water rights or rights initiated prior to March 1, 1905, are also given careful study before filing as a part of our routine office work in order to expedite the work of preparing data for adjudication proceedings.

Issuance of certificates of appropriation of water under both permits and decreed rights under statutory adjudication has occupied considerable time. In connection with this work it must be borne in mind that the certificate of appropriation of water is the final step in a perfected water right and, therefore, it is of vital importance that no errors exist, and for this reason they are examined at least three times before they are sent to the County Recorder in the county where the appropriation exists for recording.

Budgets covering the costs of water distribution prepared and submitted to the county clerks are a part of our annual work.

Many deeds affecting the transfer of water rights of record are carefully examined in order to ascertain that there is no missing link in the chain of title from the owner of record to the new owner. In other words, the succession of title to the water right of record must be strictly adhered to so as to keep in close contact with the new owners, especially in cases of rights covering pending applications and permits where the attention of the holder of such application and permit is required to keep it in good standing, and also for the purpose of enabling this office to issue the certificate of appropriation of the perfected right to the legal owner or owners of record. In cases where the State Engineer's file numbers are omitted in the deeds, but the description of the land and appurtenances are given, much time is devoted in searching through the records to determine with certainty that none of the water rights covered by such deeds are omitted.

Adjudication proceedings were completed on the following four streams during the period covered by this report: Kalamazoo Creek, Jumbo Creek, Rodeo Creek, and Warm and Big Springs. Pertinent information concerning these proceedings is given in chapter IV.

In July of 1947 the office revised and published the Nevada Water Law. This publication is available upon request. Chapter XI sets forth briefly the changes in the water law made by the 1945 and 1947 Legislatures.

Many field investigations and hearings were held in connection with applications to appropriate water. Numerous complex water commissioner problems arise every year relative to the distribution of water, which occupy our immediate attention and time. In certain cases charts and tables relative to the division and allotment of water have been prepared for the water commissioners to facilitate the work. A great deal of office and field work has been devoted to straightening out the many complex details associated with distribution problems. Deputy State Engineer Edmund Muth is in charge of water distribution problems.

Assistance was given to the Water Resources Branch of the United States Geological Survey by making measurements of the flows of the Carson River at the Carson City gaging station. Frequent checks and adjustments are made on the Carson City water stage recording gage.

There has been a notable increase in the submitted number of documents in connection with applications as shown by the filing of 349 proofs of commencement of work, 290 affidavits of completion of work, 203 proofs of water to beneficial use, 338 protests to the granting of applications. There were 188 certificates of appropriation issued under permits to appropriate water. There were 500 blueprints of maps of record in this office made available on request for which the sum of $661 was received for this service. In addition there were 1,592 other documents filed during this biennium.

A summary of some of the documents filed during this biennium as against the 1944–1946 biennium is herewith given:

	1944–1946	1946–1948
Applications filed	487	895
Proofs of Appropriation filed	4	20
Proofs of Commencement filed	241	349
Proofs of Completion filed	175	290
Proofs of Beneficial Use filed	154	203
Protests filed	101	338

Prompt and cordial attention has been accorded to the many visitors on matters chiefly pertaining to water engineering, and to matters pertaining to this State. In many instances the entire day was devoted to these visitors. The daily routine office correspondence, official notices, and clerical work also required our attention.

CHAPTER II

State Water Right Surveyors of Nevada

Following is a complete list of licensed State Water Right Surveyors authorized to practice before the Office of the State Engineer during the past biennium:

NEVADA

Battle Mountain—James R. Wilson.
Beatty—Charles G. Walker.
Caliente—Wayne Cox.
Carson City—
John B. Chattin.
Wayne McLeod.
Harry E. MacNelly.
Robert W. Wickenden.
Robert A. Allen.
W. T. Holcomb.
Albert Quill.
Lawrence G. Chambers.
Jack A. Parvin.
Elko—
W. H. Settelmeyer.
R. A. Kinne.
John W. King.
W. S. Raine.
Ely—
F. W. Millard.
Robert W. Millard.
John Victor Caselli.
Eureka—
M. M. Harcourt.
Floyd Sadler.
Nye Tognoni.
Thomas M. Cahill.
Fallon—
L. W. Crehore.
Hugh M. Wilson.
E. P. Osgood.
J. C. Coniff.
Fernley—W. A. Pray.
Gardnerville—O. L. Hussman.
Goldfield—
Ed. S. Giles.
William H. Hisle.
Henderson—
Ernest H. Clary.
F. W. Thorne.
Las Vegas—
C. D. Baker.
Jack Asher.
William Clark.
Harlan Brown.
Chas. L. Knaus.
Van O. Eastland.
Frank D. Rathbun.
Frank D. Rathbun, Jr.
George W. Von Tobel.
Sherman Mason.
Lovelock—
Robert S. Leighton.
J. H. Causten.
Peter F. Anker.
Manhattan—Arthur E. Smith.
Mina—L. B. Spencer.
Minden—J. A. Millar.
Mountain City—Edward C. Stephens.
Montello—John D. Smith.
Paradise Valley—F. B. Stewart.
Pioche—Frank Walker.
Reno—
R. W. Prince.
John E. Curran.
L. H. Taylor.
C. V. Taylor.
D. H. Updike.
Thos. R. King.
John V. Mueller.
M. A. Pray.
Starr McW. Hill, Jr.
Carl Stoddard.
Harold L. Layman.
David Mitchell.
Geo. W. Malone.
William J. Moran.
C. J. Preece.
C. C. Taylor.
John D. Franklin.
A. E. Holgate.
A. C. Bruhns.
Fred W. Clayton.
Round Mountain—J. W. E. Taylor.
Sparks—
James N. Nelson.
Robert F. Guinn.
Sulphur—J. G. Huntington.
Sprucement—J. L. Vandiver.
Tonopah—
D. S. Johnson.
C. A. Liddell.
Tuscarora—Chester L. Woodward.
Virginia City—
Walter G. Reid.
Howard W. Squires.
Winnemucca—
W. A. Wentz.
H. H. Sheldon.
A. V. Tallman.
Yerington—Claude E. Hunter.

CALIFORNIA

Alturas—
W. J. Archer, P. O. Box 167.
Benton—Joseph Markert.
Berkeley—
R. E. Tilden, 2829 Benvenue Ave.
Sacramento—
G. F. Engle, 1857 Forty-fourth St.
San Francisco—
T. L. Phillips, Chief Engineer,
W. P. R. R. Co., Mills Bldg.

OREGON

Burns—Mott V. Dodge.
Portland—Harry D. Willis, Room 714, Wheatherly Bldg.

UTAH

Ogden—Louis H. Boukol,
Care Southern Pacific Co.
K. W. Kennedy, 1544 27th St.
B. Russell Lyon,
Forest Service Bldg.
Salt Lake City—
Norman Blye, 503 Scott Bldg.
C. R. Hagen, 218 Felt Bldg.
St. George—Leo A. Snow, Snow Bldg.

In an opinion from the Attorney General's office dated November 3, 1947, we were advised that following the enactment of 1947 amendments to the registered professional Act of 1919, as amended in 1937, that surveyors, in order to qualify for State Water Right Surveyors, would have to first qualify as registered professional land surveyors.

In August of 1947 a letter was sent to all State Water Right Surveyors regarding certain requirements pertaining to the preparation of supporting maps, which is as follows:

OFFICE OF STATE ENGINEER
CARSON CITY, NEVADA

To State Water Right Surveyors of the State of Nevada—

In addition to the requirements, and to emphasize certain other items contained in our pamphlet entitled "Regulations Concerning Preparation of Maps for Submission to the State Engineer Under Applications to Appropriate Water and Proof of Appropriation" we deem it advisable to require the following:

1. Maps must be accurate and complete in all respects in order to eliminate uncertainties. Careless surveys and poor maps have caused appropriators of water undue trouble and expense.

2. The point of diversion of water is of vital importance, upon the location of which depends the question of interference with other rights. Map must show the location of the points of diversion by accurate course and distance ties to an *authentic* section or quarter section corner, if within six miles of the government land survey as well as by 40-acre legal subdivision, the boundaries of which must appear on the map accurately plotted in relation to all other data appearing thereon. If on unsurveyed land, in addition to the tie, the 40-acre tract must be shown by extending the lines of the nearest township or surveyed territory. If there is no government corner within six miles, the point of diversion must be tied to some definite and fixed monument or object acceptable to the State Engineer.

3. Ties to off-set section or one-quarter section corners on township lines must also show the nearest corner of the adjoining township

together with the off-set distance. Lots within a lotted section in which are the location of the point of diversion and place of use of water, whether for irrigation or other purposes, must be shown and designated.

4. Map must show all sections cornering at intersections.

5. Map must contain a full description of the corner to which the tie is made, especially if metal or monument, etc., *together with all markings thereon.*

6. On any line on which a bearing is shown there must be a statement as to the method of obtaining such bearing, *i.e.* (a) compass bearing, (b) solar or polaris observation, or (c) by turning an angle off of a line of known bearing. If (c) method is used the source of the known bearing should be given. If by (a) compass bearing, the magnetic declination used should be given.

7. The appropriation must be from a natural source of water supply or channel, such as a river, creek, spring, lake, underground, etc. In all cases the source must be shown and designated on the map. If from a natural water course the channel must be shown at least 500 feet on each side of the point of diversion. The channel from a spring if such exists must be shown, if not then the direction of the drainage. The shores of large lakes or bodies of water must be shown for at least 500 feet on each side of the point of diversion. If water is to be diverted from a well the source must be given as an "underground source." The name of the well can be given in parenthesis.

8. Description of works or proposed works of diversion must be given on the map.

9. The map must show the place of use of water by means of the government land survey, the exterior boundaries of which must be shown, and may be indicated by means of heavy dash lines. The proposed place of use whether for irrigation or other purposes must be indicated, such as lands proposed to be irrigated, proposed place of use, etc.

10. Maps to accompany applications to change the point of diversion or manner and place of use of water must show:

a. In case of change of point of diversion, the locations of existing point of diversion and the proposed point of diversion, must be shown in the same manner as hereinabove described.

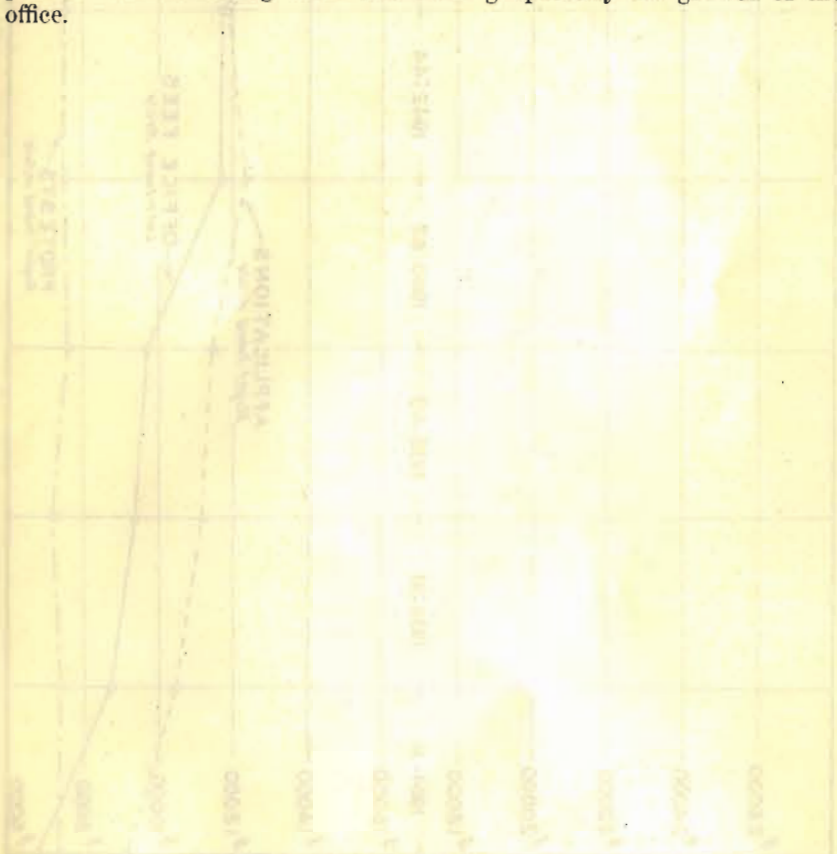
b. In case of change of place and manner of use, the location of the existing place of use together with the location of the point of diversion of water must be shown. In case of irrigated land the acres by means of the 40-acre legal subdivision, from which it is proposed to sever the water, must be shown on the map.

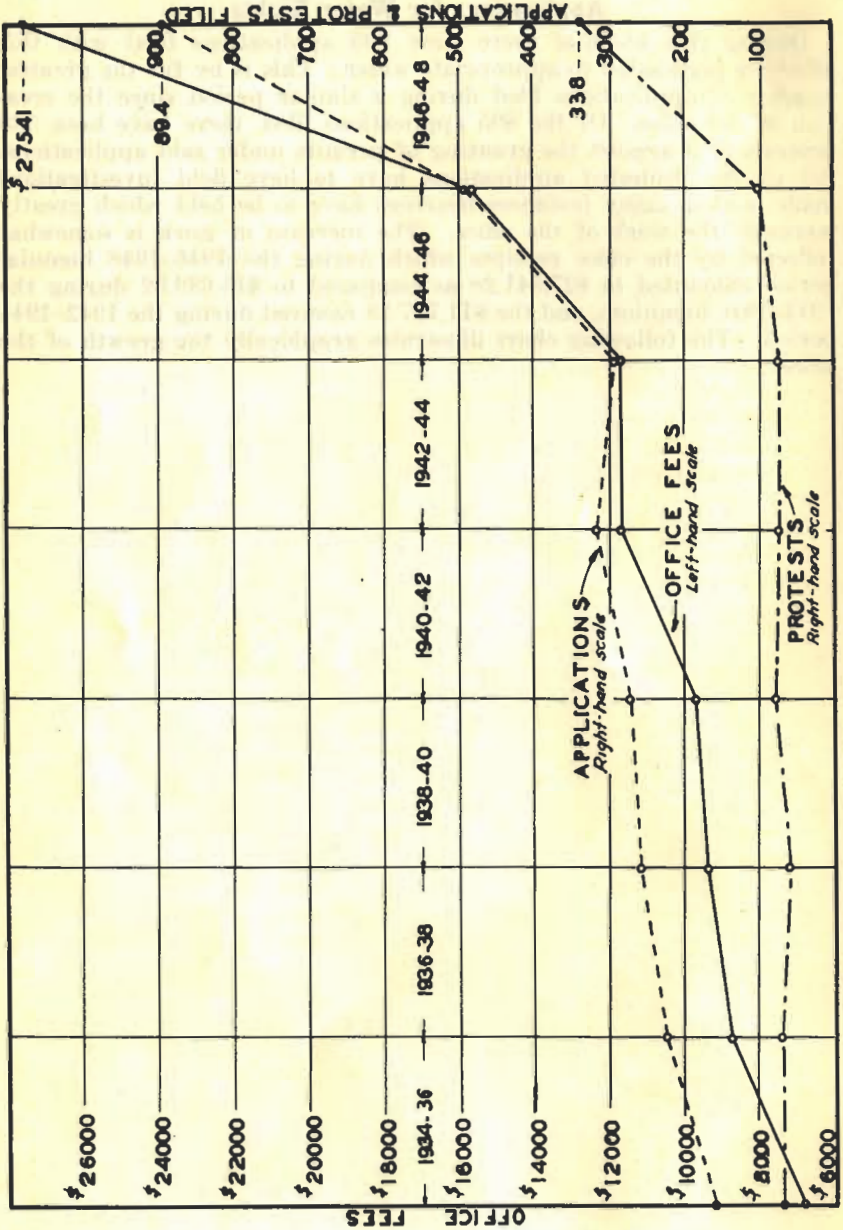
Should any condition arise whereby the State Water Right Surveyor feels that a modification of any of the above regulations would be warranted he is privileged to write to the State Engineer giving full facts, and if the State Engineer feels that the request is justifiable he can authorize such modification.

CHAPTER III

Applications for Water Rights

During this biennial there were 895 applications filed with this office for permission to appropriate water. This is by far the greatest number of applications filed during a similar period since the creation of the office. Of the 895 applications filed, there have been 338 protests filed against the granting of permits under said applications. All of the protested applications have to have field investigations made, and in many instances hearings have to be held which greatly increases the work of the office. The increase in work is somewhat reflected by the office receipts which during the 1946–1948 biennial period amounted to $27,541.28 as compared to $15,689.02 during the 1944–1946 biennium, and the $11,727.55 received during the 1942–1944 period. The following chart illustrates graphically the growth of the office.





Plat showing increase in applications to appropriate water, protests, and office fees for past seven bienniums.

The great increase in the number of applications filed is due to the development of ground water for irrigation and stockwatering purposes. Out of the 895 applications filed, 438 were to appropriate ground water. There were 230 applications filed to appropriate ground water for irrigation purposes alone, which indicates the trend towards the development of ground water for irrigation purposes. The following tabulation shows the manner of use of water applied for during the past five biennial periods:

MANNER OF USE COMPARISON

	1946–1948	1944–1946	1942–1944	1940–1942	1938–1940
Irrigation	328	159	96	101	73
Mining and milling	56	28	26	75	130
Stockwatering	329	179	104	46	40
Domestic	54	13	7	21	10
To change point of diversion	43	27	26	11	9
Municipal	5	10	9	8	2
Power	8	1	.....	6	6
Fish rearing	8	5			
Manufacturing	5	1	3	3	
Quasi-municipal	57	61	19	37	
Railroad	....	2	1	4	
Bathing	1	.....	1	2	
Gravel and sand washing	1	.....	1		
Recreational	....	1	.....	4	2
Total	895	487	293	318	272

Definite action has been taken on 688 applications during this biennium. This represents action on 387 applications filed prior to July 1, 1946, and 301 filed during this biennium period.

Pertinent information regarding water applications filed in this office since its creation will be found on page 9. The status of applications filed and certificates issued will be found as follows:

1. Status of applications filed during the biennium 1946–1948, chapter XVII.
2. Status of applications filed prior to July 1, 1946, upon which action has been taken during the past biennium, chapter XVIII.
3. Certificates issued under permits during the 1946–1948 biennium, chapter XIX.

CHAPTER IV

Adjudication of Water Rights

Section 1, chapter 4, Statutes of 1903, provided a law creating the office of State Engineer and furnished a method for the determination of the relative rights in and to waters already appropriated. Several amendments were subsequently made, with the result that our water law is now admirably adapted to conditions in Nevada, and has been declared constitutional in its entirety by decisions rendered by the Supreme Court of Nevada.

Amendatory Acts were passed during the 1907 and 1909 sessions of the Legislature. In 1913 a new water law was enacted and the old water law in its entirety was repealed. The new law was approved on March 22, 1913. Under this Act the water law was greatly broadened, both as to the adjudication procedure on the determination of vested rights and the appropriation of water procedure on the determination of vested rights, and the appropriation of water procedure by application to the State Engineer. Subsequent amendments to the laws relating to the adjudication procedure were enacted in the following sessions of the Legislature, viz, 1915, 1917, 1919, 1921, 1925, 1927, 1931, 1933, and 1937. A brief description of these various amendments may be found in chapter 6 of the 1936–1938 Biennial Report, wherein a summary of the laws enacted by the Nevada Legislature relating to water and the office of the State Engineer is given. The statutory procedure to determine the relative rights in and to the waters of a stream system under a claim of vested right is set forth in sections 18 to 58 of the water law. A summary of this procedure may be found on page 59 of the 1947 compiled water laws of Nevada, which is available upon request.

PROOFS OF APPROPRIATION FILED DURING THE YEARS OF THE PRESENT BIENNIUM

During this period the following proofs of appropriation, which are claims of vested water rights, have been filed for future use in the determination of the relative rights and also to make of record such claims. A condensed statement giving the salient data is herewith given in the order of:

1. Proof serial number.
2. Date filed.
3. Name of claimant.
4. Source of water supply.
5. Location by county.
6. Use claimed.

02332 2– 6–46 George Eldridge; Kalamazoo Creek; White Pine County; Irrigation.

02333 7–29–46 James E. Stead; Home Ranch Creek; Washoe County; Irrigation, stockwater, and domestic.

02334 7–29–46 Wm. M. Stead; Hay Canyon Creek; Washoe County; Irrigation, stockwater, and domestic.

02335 7–29–46 Wm. M. Stead; Wilcox Creek; Washoe County; Irrigation, stockwater, and domestic.

02336 11– 6–46 Ira G. Blundell; Rodeo Creek; Washoe County; Irrigation, stockwater, and domestic.

02337 1–21–47 Roy A. Judd; Jumbo Creek; Washoe County; Irrigation and domestic.

02338 1-21-47 John D. Callaghan; Charlie Creek Tributary to Woodward Creek; Lander County; Stockwater.
02339 1-21-47 John D. Callaghan; Charlie Canyon Spring Tributary to Woodward Creek; Lander County; Stockwater.
02340 2-10-47 H. N. Sharp; Troy Canyon Wash; Nye County; Stockwater.
02341 2-10-47 H. N. Sharp; Big Creek; Nye County; Stockwater.
02342 7- 3-47 Laura Gentry; Gann Spring; Clark County; Stockwater.
02343 7- 3-47 Laura Gentry; Liston Spring; Clark County; Stockwater.
02344 7- 3-47 Laura Gentry; Pearson Spring; Clark County; Stockwater.
02345 7- 3-47 Laura Gentry; Perkins Spring; Clark County; Stockwater.
02346 7- 3-47 Laura Gentry; Quail Spring; Clark County; Stockwater.
02347 7- 3-47 Laura Gentry; Rattlesnake Spring; Clark County; Stockwater.
02348 7- 3-47 Laura Gentry; Redrock Spring No. 1; Clark County; Stockwater.
02349 7- 3-47 Laura Gentry; Redrock Spring No. 3; Clark County; Stockwater.
02350 9- 8-47 Chas. Culverwell; Nelson Well Spring; Lincoln County; Stockwater.
02351 9- 8-47 Chas. Culverwell; Mule Spring; Lincoln County; Stockwater.

ADJUDICATIONS IN PROCESS AND COMPLETED DURING THE PRESENT BIENNIUM

KALAMAZOO CREEK

Kalamazoo Creek is located on the easterly slope of Shell Creek Range in White Pine County, in and about Township 20 N., Range 66 E., M. D. M. There are two claimants to the waters of this source, namely, B. H. Robison and George H. Eldridge.

January 4, 1940 and January 31, 1940—Petitions requesting the determination of the relative rights filed in office of State Engineer.

December 1, 1939—Report of investigation of the stream system.

June 14, 1940—State Engineer entered order granting the petition.

April 28, 1945—Waiver of Notice, etc., pursuant to section 36 to chapter 106, Statutes of 1921, signed.

June 20, 1947—Abstract of Claim filed in office of State Engineer.

November 4, 1947—Order of Determination filed in office of State Engineer. Harvest lands 232.46.

JUMBO CREEK

Jumbo Creek originates in the mountains easterly from Washoe Lake, in and about Township 16 N., R. 20 E., M. D. M. There is only one claimant, namely, Roy A. Judd. Petition requesting determination of relative rights in and to waters of Jumbo Creek filed in office of State Engineer. The report of the investigation of the stream system filed in office of State Engineer.

August 12, 1946—State Engineer entered order granting the petition.

February 26, 1947—Order of Determination filed.

September 26, 1947—Decree filed. 66.27 acres of cultural acreage.

RODEO CREEK

Rodeo Creek is located westerly from the southern end of Pyramid Lake in Washoe County, on the easterly slope of Pah Rah Range of Mountains, and flow in a northerly direction towards Pyramid Lake. There is one claimant, namely, Ira G. Blundell.

September 23, 1946—Petition requesting determination of relative rights in and to the water of Rodeo Creek filed in office of State Engineer.

February 20, 1947—The report of investigation of the stream system filed in office of State Engineer.

June 10, 1948—Order of Determination filed. 58.36 acres of cultural land.

WARM SPRINGS AND BIG SPRINGS

Warm Springs and Big Springs are located on the westerly slope of Hat Mountain, and on the easterly side of Surprise Valley, in northern Washoe County, and being about in Township 40 and 41 N., Range 18 E., M. D. M. There is one claimant, namely, R. M. Miller.

October 16, 1947—Petition requesting determination of relative rights in and to the waters of said stream system filed in office of State Engineer.

November 22, 1947—Reporting of investigation of the stream system filed.

June 10, 1948—Order of Determination filed. 102.86 acres of cultural land.

CHAPTER V

Water Distribution

HUMBOLDT WATER DISTRIBUTION DISTRICT

Season 1946—J. A. Millar, Supervising Water Commissioner.
Season 1947—Chester Wood, Supervising Water Commissioner.
Season 1948—George Hennen, Supervising Water Commissioner.

Advisory Board Members, 1948

A. V. Tallman, Winnemucca, Chairman.
Warren Monroe, Elko.
George Ogilvie, Elko.
Rene Lemaire, Battle Mountain.
Elmer Hill, Battle Mountain.
Jack Kerns, Winnemucca.
Clarence Sommer, Lovelock.
Victor Arobio, Lovelock.
Robert Leighton, Lovelock.

On January 7, 1947, the Humboldt Water Distribution District was created by an order of the State Engineer. This district embraces all of Humboldt, Pershing, and Elko Counties, and those portions of Lander and Eureka Counties lying north of the township line between townships 24 and 25 north. The following stream systems in this district have been adjudicated and the distribution of their waters is under the supervision of the State Engineer:

Humboldt River, Little Humboldt River, Quinn River, Salmon River, Tony Creek, Clear Creek, Thousand Springs Creek, Rice Creek, Piute Creek, Battle Creek, Bartlett Creek, Cane Spring Creek, Six Mile Creek, Crum and Wilson Creek.

Several of the smaller streams do not, at present, require any supervision by the State Engineer.

The Humboldt Water Distribution District was created for the purpose of giving better service to the water users in the area within the district. A district office was set up in Elko, Nevada. In the near future a complete set of records will be on file in this office.

The Elko office is under the supervision of a water commissioner who is permanently stationed in Elko. This will provide year around service to the water users. (See chap. XIII for Advisory Board report.)

Humboldt River Distribution System—July 1 to September 30, 1946

Personnel

J. A. MILLAR, Supervising Water Commissioner.....Entire River
ALBERT M. QUILL, Water Commissioner....Starr Valley, North Fork, Lamoille, Valley
JERRY WIGNALL, Hydrographer.....Lovelock

The July run-off from the Elko District fell off quite rapidly during July, resulting in a flow at Palisade of 7,395 acre-feet as compared to the June run-off of 29,270 acre-feet. The mean flow during July at

Palisade was 239 acre-feet. During August and September the mean flow was 52.5 and 33.4 acre-feet, respectively. The total flow at Palisade for the water season of October 1, 1945, to September 30, 1946 was 387,900 acre-feet.

Humboldt Water Distribution District—January 1 to December 31, 1947

Personnel

CHESTER WOOD, Supervising Commissioner.....Entire River
GEORGE HENNEN, Assistant Supervising Commissioner.....Entire River
NELLO AIAZZI, Water Commissioner.....South Fork, Lamoille
WARREN CLEMENS, Water Commissioner.....Starr Valley, Deeth
MYRON CLARK, Water Commissioner.....Battle Mountain
PETE ANKER, Water Commissioner.....Lovelock
JERRY WIGNALL, Hydrographer.....Lovelock
WILLIAM HOOD, Water Commissioner.....Little Humboldt, Winnemucca

During the 1947 irrigation season the flow of the streams within the area of the Humboldt Water Distribution District was below normal. Rains in late May and early June were of particular benefit to the wild hay meadows in Elko County. Most ranches received sufficient water to grow a hay crop which was only slightly below average in quantity, but better than average in quality.

A great deal of work was done in preparing priority charts on the Humboldt River. These charts will be printed after the final check on their accuracy has been made.

Humboldt Water Distribution District—January 1 to July 1, 1948

Personnel

GEORGE HENNEN, Supervising Commissioner.....Entire River
NELLO AIAZZI, Assistant Supervising Commissioner.....Entire River
WILLIAM HOLT, Water Commissioner.....Little Humboldt
SIMON ALCORTA, Water Commissioner.....Quinn River
JERRY WIGNALL, Water Commissioner.....Lovelock
STEVE CUSTER, Hydrographer.....Lovelock
WARREN CLEMENS, Water Commissioner.....Starr Valley, Deeth
GEORGE MOSLEY, Water Commissioner.....Lamoille, South Fork
RUTH GUSTAFSON, Clerk-Stenographer.....Elko Office

On March 10, 1948, the Sixth Judicial District Court entered an order directing the State Engineer to distribute the waters of the Quinn River and its tributaries in Humboldt County, Nevada. (See chapter XII.) This stream system is within the area designated as the Humboldt Water Distribution District.

The winter of 1947–1948 was cold with little storm; late spring rains prevented one of the worst droughts of record. Most ranches received enough water to produce a fair hay crop. Lack of early water and a late growing season were the principal factors contributing to the short crop.

Summary—January 1, 1947, to July 1, 1948

The low water years of 1947 and 1948 show definitely the need for channel improvement on all the streams within the Humboldt District. These years have also emphasized the need for some satisfactory method of beaver control.

The first 18 months of operation of the Humboldt Water Distribution District has, we feel, definitely shown beneficial results in the handling of water within the district area.

Two seasons of study of distribution problems under low water conditions has been made on the areas of the Humboldt River below Palisade. Within the next year the State Engineer will be in a position to make definite recommendations on distribution matters on the lower sections of the river.

Information is being gathered and compiled on all the streams within the district as fast as time and personnel limitations will allow. From time to time as the studies progress, the State Engineer will present his analysis of the conditions and recommendations for improvement to those water users immediately concerned.

PAHRANAGAT LAKES DISTRIBUTION

July 1, 1946, to June 30, 1948

AIDEN STEWART—Season 1946.
GILBERT STEWART—Season 1947.
GUY JACKA—Season 1948.

The biennial period July 1, 1946, to June 30, 1948 has been a period of improvement of water distribution facilities and betterment of conditions in general in the area served by the waters of Ash Springs.

A new irrigation company known as the Ash Springs Irrigation Company was organized to handle the water of Ash Springs below the so-called "Middle Ranch." Only two users of water from Ash Springs are now not members of an irrigation company. Since the formation of this company many of the small vexing problems which confronted the water commissioner and State Engineer have been eliminated. The rotation schedule adopted by the company has improved the water use and bettered the irrigation conditions for all the members of the company.

The directors of the Ash Springs and Alamo Irrigation Companies have tentatively agreed on a method of maintaining and cleaning ditches that are jointly used. It is hoped that a signed agreement can soon be executed.

The Alamo Irrigation Company has completed a fine piece of work in concrete lining all their main ditches. This work will save a large quantity of water and will be of great benefit to the members of the company.

Under the supervision of the State Engineer six Parshall flumes were installed near the diversion points in the main irrigation ditches. During the present irrigation season, four meter gates are to be installed on the high line canal. These measuring devices will make a more equitable distribution of the water possible.

The water users under Hiko Springs have been discussing the formation of an irrigation company and are considering the lining of their main irrigation ditch.

DUCKWATER CREEK

WM. HAWKINS—Seasons 1946, 1947, 1948.

Many improvements have been made on Duckwater Creek during the past biennium.

The U. S. Indian Service has installed meter gates at all their diversion points, constructed new ditches, cleaned channel, reinforced the dikes on the "lakes" and built a diversion structure at the Big Warm Springs. The work done by the Indian Service has been very beneficial to all the water users on Duckwater Creek.

Parshall flumes have been installed at the diversion points of the other water users.

A new "tail ditch" was constructed by the lowest water users on the system and a regulatory diversion dam was placed in the flood channel under the supervision of the State Engineer. This dam will divert the water into the new "tail ditch."

The work done at Duckwater has greatly improved the water use and irrigation practices in the valley.

It is a recommendation of the State Engineer that diversion structures and headgates be installed as soon as it is practical.

BAKER–LEHMAN CREEK

DON BECK—Seasons 1946, 1947, 1948.

Some improvement of the Baker-Lehman Creek distribution system has been made through constructing some new ditches and installing regulatory headgates.

A weir should be installed immediately at the point where the lateral ditches divert from the main ditch.

In cooperation with the County Commissioners of White Pine County, and the U. S. Geological Survey, Surface Water Division, the State Engineer has installed a gaging station on Baker Creek and one on Lehman Creek. The immediate purpose of these stations is to determine the feasibility of constructing a hydroelectric plant at Baker, Nevada, to produce electricity under a rural electrification program.

CHAPTER VI

Summary of Ground-Water Studies by the U. S. Geological Survey, Division of Ground Water

By THOMAS W. ROBINSON, District Engineer, G. W.

During the biennium beginning July 1, 1946, the cooperative study of the ground-water resources of Nevada, begun in July 1944, has been continued without let-up. During this period some phase of ground water has received attention in nearly every part of the State. In connection with the ground-water studies the Ground Water Division has consulted, or cooperated with, most of the State and Federal agencies concerned with the development and use of water in the State. Broadly speaking, the ground-water studies may be grouped into three general phases, although the work is all closely related. There are: (1) Detailed studies of ground-water conditions, in areas or valleys selected by the State Engineer. Such studies are quantitative in nature, and involve an estimate of the quantity of ground water that may be developed by the drilling of wells, for irrigation or other uses. (2) Reconnaissance studies of selected valleys to evaluate the possibilities for future ground-water development. These studies are not quantitative, but are made only for the purpose of determining whether the conditions for the development of ground water are generally favorable or unfavorable. (3) Ground-water information furnished by special request. This phase of the work ranges from inquiries by individuals such as farmers and ranchers concerning the drilling or development of a well for water, to requests from State and Federal agencies for information concerning the development of a ground-water supply for a specific purpose or in a particular area.

Detailed studies have been made in 10 areas or valleys, and reports based on these studies have been or are in the process of publication by the State Engineer. In some of the reports more than one area or valley have been combined in order to simplify publication. The reports published, or in the process of publication or preparation, since the present program was begun in 1944 are listed below:

Progress Report on the Ground-Water Resources of Las Vegas Artesian Basin (Mimeographed) 1945.

*Water Resources Bulletin No. 2. Ground Water in Lovelock Valley, Nevada, 1946.

Water Resources Bulletin No. 3. Water Levels and Artesian Pressure in Wells in Las Vegas Valley and in Other Valleys in Nevada, 1913–1945, 1947.

Water Resources Bulletin No. 4. Well Data in Las Vegas and Indian Spring Valleys, Nevada, 1947.

†Water Resources Bulletin No. 5. Geology and Water Resources of Las Vegas, Pahrump, and Indian Spring Valleys, Clark and Nye Counties, Nevada.

Water Resources Bulletin No. 6. Ground Water in Las Vegas, Pahrump, and Indian Spring Valleys, Nevada (A summary) 1947.

*Out of print. †In press.

Water Resources Bulletin No. 7. Geology and Ground Water in the Meadow Valley Wash Drainage Area, Nevada, Above the Vicinity of Caliente, 1948.

‡Water Resources Bulletin No. 8. Ground Water in White River Valley, Nevada.

‡Water Resources Bulletin No. 9. Geology and Ground Water in Grass Valley, and Adjacent Parts of Humboldt River Valley, Nevada.

‡Water Resources Bulletin No. 10. Ground Water in Paradise Valley, Nevada.

‡Water Resources Bulletin No. 11. Ground Water in Diamond and Newark Valleys, Nevada.

Ground Water in the Vicinity of Elko, Nevada (Mimeographed) 1947.

Detailed studies will be continued in selected valleys as rapidly as the demand for this type of study warrants. Such studies are under way at present in Smith Valley in Lyon County, and Truckee Meadows in Washoe County. The study in Smith Valley will be completed early in the coming biennium. The reports based on detailed studies give information on the estimated quantity of ground water that may be developed annually without exceeding the safe yield, quality of the water, characteristics of the water-bearing beds, probable depth to which wells must be drilled to obtain water, depth to the water level, and the approximate area where the pumping lift will not be excessive.

Reconnaissance studies have been completed, or are in progress, in 16 valleys. These valleys are listed below by counties. Some of the valleys lie in two or more counties, but are listed for the county in which the major part of the valley lies:

Churchill, Edwards Valley; Douglas, Carson Valley; Elko, Goshute Valley; Esmeralda, Fish Lake Valley; Eureka, Crescent; Humboldt, Quinn River; Lander, Lower Reese River, including Argenta Swamp, Upper Reese River; Lincoln, Penoyer Valley; Mineral, Whiskey Flat, Teels Marsh; Nye, Hot Creek Valley, Reveille Valley; Ormsby, Eagle Valley; Pershing, Buena Vista Valley; Washoe, Spanish Springs, Warm Springs.

For the present it is planned that only memorandum reports will be prepared for these valleys, or other valleys in which similar studies are made. These reports will be filed with the State Engineer and the Geological Survey. They will give general information on the ground water of the valley, such as favorable or unfavorable conditions, depth to water level, information on existing wells, and recommendations for future study. Those valleys which appear to have definite ground-water possibilities will be studied in detail at some future date. From the studies already made, it is known that in some of these valleys the prospects are good for developing ground-water supplies, whereas in others the prospects are poor. It is planned to cover in this manner all the major valleys in the State not covered by detailed studies.

The following valleys have been tentatively selected for reconnaissance studies in the near future:

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‡In preparation.

Churchill, Dixie Valley; Elko, Ruby Valley, Clover Valley, Independence Valley; Lincoln, Pahranagat; Lyon, Mason Valley; Mineral, Gabbs Valley; Nye, Big Smoky Valley; Washoe, Long Valley, Smoke Creek, Washoe Valley; White Pine, Steptoe Valley, Spring Valley.

The amount of information dealing with ground water furnished to individuals or State and Federal agencies upon inquiry or special request has been continually increasing. Several hundred such requests were received and answered during the present biennium. In most cases the requests were answered from data already in the files, but in some instances requests from State and Federal agencies required field trips to the area in question. Generally the information was supplied in the course of an interview, or by letter. In some cases a short memorandum was prepared. The requests for ground-water information are many and varied. A few examples will illustrate: water supply for goats, other livestock, fish propagation, irrigation, recreational areas, highway maintenance stations, air conditioning, heating purposes (thermal waters), mining purposes, municipal water supply, and for sanitariums and medicinal use.

Some of the State and Federal agencies that have requested information on ground water are: State of Nevada, Department of Highways, water supply for proposed or existing stations; State of Nevada, Fish and Game Commission, water for propagation of fish; State of Nevada, Penitentiary, water for irrigation; State of Nevada, Board of Health, contamination of well water; Nevada Cooperative Snow Surveys, stage of ground-water levels to assist in forecasting runoff; U. S. Forest Service, water supply for Nevada Beach recreational area at Lake Tahoe, water supply for warehouse; and Farmers Home Administration, water supplies for irrigation.

In addition to these phases of ground-water work, the Division of Ground Water participated in conferences with State and Federal agencies dealing with the water resources of the State in planning and solving water problems. Two conferences of the subcommittee on Hydrologic Data, one at San Francisco, California, and the other at Salt Lake City, Utah, were attended, where problems relating to the long-range planning for the collection of basic hydrologic data were considered, and recommendations made for the type of instrumentation needed. These activities will be continued in the future.

In the course of the cooperative studies the Division of Ground Water has received a great deal of assistance from State and Federal agencies in one form or another that has been quite helpful in the studies. For this assistance grateful acknowledgment is made to the Soil Conservation Service, Department of Agriculture, for maps, soil classification, and basic data; to the Forest Service of the same department for maps; to the Bureau of Land Management, Department of the Interior, for maps and well data; to the Experiment Station, University of Nevada, for soil classification and water analysis; to the State Board of Health for water analysis; to the Nevada Cooperative Snow Survey for snowfall data; to the State of Nevada, Department of Highways, for maps and map data, and to the State Engineer for basic hydrologic data.

CHAPTER VII

Cooperative Stream Measurement Work in Nevada

By L. R. SAWYER, *Engineer-in-Charge, Surface Water Division, Water Resources Branch, United States Geological Survey.*

The importance of water to the economy of the State of Nevada cannot be too strongly emphasized. The development and use of all other resources is directly affected and often limited by the available water supply. A careful analysis of the fundamental uses of water will lead to the conclusion that water is our most valuable mineral. It is essential for domestic, agricultural, power development, and manufacturing uses, and to life itself. The dollar value of water is very high when it is considered that it is a basic and fundamental need for irrigation and power projects, municipal and industrial supplies, livestock, mining, recreation, and many other activities on which the State of Nevada depends.

The importance and value of this material resource make it imperative that a reliable and intensive investigation be continued to determine the available supply and distribution, in order that the ultimate development of the State may proceed on a wise and efficient basis. The Congress of the United States has recognized the Federal responsibility for developing the water resources of the country by appropriating funds for cooperative investigations with the States and other political subdivisions since 1905. These Federal funds for stream gaging are available only for cooperative work requested by State and local interests. It is important, therefore, that the present and future needs of the State and local interests for water resources information be given careful consideration in planning and financing this work.

Stream gaging is fundamentally the work of collecting basic data relative to water supplies; however, it is very closely connected with the investigation of ground-water resources as covered in chapter VI of this report. The two programs are closely coordinated, since surface water records are used to determine the recharge to ground-water reservoirs, and ground-water supplies are available for supplementing surface runoff.

For the period covered by this report there has been an increasing demand for additional water resources information, particularly by the Army Engineers in the investigation of desirable flood control projects, and by the Bureau of Reclamation in plans for additional irrigation developments. The cooperative stream gaging program, financed by funds made available by the State Legislature, local water users, and the Geological Survey, was entirely inadequate to satisfy current requests. The Army Engineers, therefore, made available supplemental funds for the installation and operation of three gaging stations in the Truckee and Walker River Basins, and the Bureau of Reclamation allotted funds for the installation and operation for one year of eight gaging stations in the Carson and Little Truckee River Basins. The State of California has made available $1,000 to assist in the continued operation of the new gaging stations installed in that

State in the Carson and Little Truckee River Basins. With the total funds made available by the State, local water users, and Federal agencies, 16 gaging stations were constructed during this biennium, locations of which are given on page 37.

Continuous type water-stage recorders were installed at all of these gaging stations. Seven of these instruments are housed in galvanized corrugated metal pipe gage-house structures, and the remaining nine in timber structures, either because the sites were inaccessible except by pack train, or because the expected period of operation of the station did not warrant the more permanent type of installation, or both. Gaging cableways for making highwater discharge measurements were constructed at 11 of the stations. This is an excellent improvement in the Nevada stream gaging program, but current requests of those agencies planning the present and future development of the State's water resources are not fully satisfied. Several new stations are particularly needed in the Truckee River Basin.

The gaging stations operated in and for the State of Nevada are listed below. Locations and descriptions of these stations are given in the report of the State Engineer for the biennium 1944–1946, except for stations installed during this biennium, which are described on page 37 of this report.

SALMON FALLS CREEK BASIN

Salmon Falls Creek near San Jacinto.

OWYHEE RIVER BASIN

Wild Horse Reservoir near Gold Creek.
Owyhee River near Gold Creek.
Owyhee River at Mountain City.
Owyhee River near Owyhee.

HUMBOLDT RIVER BASIN

Humboldt River near Elko.
Humboldt River near Carlin.
Humboldt River at Palisade.
Humboldt River near Argenta.
Humboldt River at Battle Mountain.
Humboldt River at Comus.
*Humboldt River near Rose Creek.
Humboldt River near Imlay.
Rye Patch Reservoir near Rye Patch.
Humboldt River near Rye Patch.
Marys River below Hot Springs Creek near Deeth.
Lamoille Creek near Lamoille.
North Fork Humboldt River at Devils Gate near Halleck.
South Fork Humboldt River near Lee.
South Fork Humboldt River near Elko.
Pine Creek near Palisade.
Rock Creek near Battle Mountain.
Little Humboldt River near Paradise Valley.

*Gaging stations established during the biennium.

Little Humboldt River at Chimney dam site near Paradise Valley.
Martin Creek near Paradise Valley.
Cottonwood Creek near Paradise Valley.
Humboldt-Lovelock Irrigation Light & Power Company's Feeder Canal near Imlay.

PYRAMID AND WINNEMUCCA LAKES BASIN

Pyramid Lake near Nixon.
Truckee River at Tahoe, California.
Truckee River near Truckee, California.
Truckee River at Farad, California.
*Truckee River at Reno.
Donner Creek near Truckee, California.
*Little Truckee River near Hobart Mills, California.
*Franktown Creek at Franktown.

CARSON RIVER BASIN

*East Fork Carson River near Markleeville, California.
East Fork Carson River near Gardnerville.
Carson River near Carson City.
Carson River near Fort Churchill.
*Silver King Creek near Coleville, California.
*Wolf Creek near Markleeville, California.
*Silver Creek near Markleeville, California.
*Markleeville Creek near Markleeville, California.
*Pleasant Valley Creek near Markleeville, California.
*West Fork Carson River above Woodfords, California.
West Fork Carson River at Woodfords, California.
*Clear Creek near Carson City.

WALKER LAKE BASIN

Walker Lake near Hawthorne.
Bridgeport Reservoir near Bridgeport, California.
East Walker River near Bridgeport, California.
*East Walker River near Yerington.
West Walker River below East Fork, near Coleville, California.
*West Walker River near Hudson.
East Fork West Walker River near Bridgeport, California.
Topaz Reservoir near Topaz, California.

VIRGIN RIVER BASIN

Virgin River at Littlefield, Arizona.
Meadow Valley Wash near Panaca.

COLORADO RIVER MAIN STEM

Lake Mead at Hoover Dam.
Colorado River below Boulder Dam.

MINOR BASINS

*Baker Creek near Baker.
*Lehman Creek near Baker.

*Gaging stations established during the biennium.

Forty-six of these gaging stations are financed by State-Federal cooperative funds, and seven by Federal noncooperative funds. The gaging station on Salmon Falls Creek near San Jacinto is operated under the supervision of T. R. Newell, District Engineer for the U. S. Geological Survey in Boise, Idaho, and is operated in cooperation with the Salmon River Canal Co., Ltd., of Twin Falls, Idaho. The two gaging stations on the Colorado River are operated under a cooperative agreement between the Bureau of Reclamation and the U. S. Geological Survey office at Tucson, Arizona, in charge of District Engineer John Gardiner. The gaging station on the Virgin River at Littlefield, Arizona, is also under the supervision of Mr. Gardiner. Records for gaging stations Nos. 2, 4, and 6 in the Pyramid and Winnemucca Lakes Basin are furnished by Walter Bell, Federal Court Watermaster. Records for Carson River at Fort Churchill are furnished by the Newlands Project.

Location and Descripiton of Gaging Stations Established During the Biennium, 1946–1948

HUMBOLDT RIVER BASIN

Humboldt River near Rose Creek

Location—Water-stage recorder, lat. 40° 52′, long. 118° 00′, in NW¼ sec. 36, T. 35 N., R. 35 E., 5½ miles southwest of Rose Creek and 15½ miles southwest of Winnemucca.

Remarks—Many diversions for irrigation above station. Established April 23, 1948.

PYRAMID AND WINNEMUCCA LAKES BASIN

Truckee River at Reno

Location—Water-stage recorder, lat. 39° 32′, long. 119° 47′, in sec. 12, T. 19 N., R. 19 E., half a mile east of Reno.

Records available—January 1947 to September 1947.

Remarks—Records collected in 1908–1919 equivalent during high water periods, but may differ materially during periods of low flow.

Little Truckee River near Hobart Mills, California

Location—Water-stage recorder, lat. 39° 30′, long. 120° 16′, in sec. 14, T. 19 N., R. 15 E., half a mile upstream from Independence Creek and 7½ miles northwest of Hobart Mills.

Records available—December 1946 to September 1947.

Remarks—Records collected 1909–1910 at station near Truckee not equivalent.

One transmountain diversion above station to Sierra Valley.

Franktown Creek at Franktown

Location—Water-stage recorder, lat. 39° 16′, long. 119° 51′, in sec. 9, T. 16 N., R. 19 E., half a mile west of Franktown and 3 miles upstream from Washoe Lake.

Remarks—Established April 18, 1948.

CARSON RIVER BASIN

East Fork Carson River above Soda Springs Ranger Station near Markleeville, California

Location—Water-stage recorder, lat. 38° 31′, long. 119° 41′, in

NW¼ sec. 33, T. 8 N., R. 21 E., 1½ miles above Soda Springs ranger station and 16 miles south of Markleeville, California.

Records available—September 1946 to September 1947.

Remarks—Records collected at station near Markleeville during 1910–1931 are not equivalent.

Silver King Creek near Coleville, California

Location—Water-stage recorder, lat. 38° 31′, long. 119° 36′, in SW¼ sec. 30, T. 8 N., R. 22 E., 5 miles above mouth and 7 miles southwest of Coleville.

Records available—September 1946 to September 1947.

Wolf Creek near Markleeville, California

Location—Water-stage recorder, lat. 38° 31′ 30″, long. 119° 43′ 30″, in SE¼ sec. 24, T. 8 N., R. 20 E., 6½ miles above mouth and 12 miles south of Markleeville, California.

Records available—September 1946 to September 1947.

Silver Creek below Pennsylvania Creek near Markleeville, California

Location—Water-stage recorder, lat. 38° 36′, long. 119° 47′, in NE¼ sec. 28, T. 9 N., R. 20 E., 300 feet downstream from Pennsylvania Creek, 4 miles above mouth, and 6 miles south of Markleeville.

Records available—December 1946 to September 1947.

Remarks—Records probably not equivalent to those collected at station near Markleeville 1910–1912.

Markleeville Creek above Grover Hot Springs near Markleeville, California

Location—Water-stage recorder, lat. 38° 42′, long. 119° 51′, in SE¼ NE¼ sec. 23, T. 10 N., R. 19 E., ½ mile upstream from Buck Creek, 4 miles upstream from mouth, and 4 miles west of Markleeville.

Records available—October 1946 to September 1947.

Remarks—Records will not be equivalent to those collected at Markleeville 1910–1931, or above Markleeville 1911–1930.

Pleasant Valley Creek above Raymond Canyon Creek near Markleeville, California

Location—Water-stage recorder, lat. 38° 39′, long. 119° 50′, in SE¼ sec. 12, T. 9 N., R. 19 E., 1¼ miles upstream from Raymond Canyon Creek, 4½ miles above mouth, and 5 miles southwest of Markleeville, California.

Records available—October 1946 to September 1947.

Remarks—Records will not be equivalent to those collected at station near Markleeville 1910–1912.

West Fork Carson River above Woodfords, California

Location—Water-stage recorder, lat. 38° 46′ 32″, long. 119° 53′ 50″, in NW¼ sec. 31, T. 11 N., R. 19 E., one mile above Horsethief Canyon, 1¼ miles below Willow Creek, and 4 miles west of Woodfords.

Records available—December 1946 to September 1947.

Remarks—This gaging station is about 3 miles upstream from station at Woodfords and records are not expected to be equivalent at all times.

Clear Creek near Carson City

Location—Water-stage recorder, lat. 39° 07′, long. 119° 49′, in sec.

1, T. 14 N., R. 19 E., 3 miles upstream from Carson River, and 4 miles southwest of Carson City.

Remarks—Established March 2, 1948.

WALKER LAKE BASIN

East Walker River near Yerington

Location—Water-stage recorder, lat. 38° 48′, long. 119° 03′, in sec. 14, T. 11 N., R. 26 E., 13½ miles southeast of Yerington.

Records available—October 1902 to July 1908 (gage heights only); January to September 1947.

Remarks—Flow affected by Bridgeport Reservoir. Diversions above station for irrigation.

West Walker River near Hudson

Location—Water-stage recorder, lat. 38° 49′, long. 119° 14′, in sec. 18, T. 11 N., R. 25 E., half a mile upstream from Wilson Canyon and 4 miles southeast of Hudson.

Records available—May 1921 to March 1925, January to September 1947.

Remarks—Flow affected by Topaz Reservoir and diversions above station.

MINOR BASINS

Baker Creek at the Narrows near Baker

Location—Water-stage recorder, lat. 38° 59′, long. 114° 13′, in sec. 22, T. 13 N., R. 69 E., one-half mile downstream from Pole Canyon, 1 mile downstream from the Narrows, and 4¾ miles southwest of Baker.

Remarks—Established December 13, 1947. Records at this site will not be equivalent to those obtained in 1913–1915 at former site three-quarters of a mile downstream because of probable channel losses between the two locations.

Lehman Creek near Baker

Location—Water-stage recorder, lat. 39° 01′, long. 114° 13′, in sec. 10, T. 13 N., R. 69 E., 4¾ miles west of Baker.

Remarks—Station established December 14, 1947.

Surface water supplies for the biennium covered by this report varied from good to fair. Records for the key gaging station on the Humboldt River at Palisade show that the discharge for the water years ending September 30, 1946, and 1947, was 188 percent and 85 percent, respectively, of the 39-year normal. Runoff from the West Walker River, draining from the Sierra Nevada Mountains, was 111 percent and 77 percent of its 37-year normal for the same periods. The large yearly variations in stream flow shown by these comparisons emphasize the necessity of recording runoff information over a long period of time if reliable plans are to be made for the complete development of this resource.

A suboffice of the Surface Water Distribution of the Geological Survey was established in Carson City in August 1946, in order to carry on the cooperative stream gaging program more intensively, and to make records more readily available to State officials and citizens using them.

The detailed information collected as a result of these cooperative investigations are published in the annual water-supply papers of the

Geological Survey. The published reports are avaliable for consultation at the State Engineer's Office, the State Library, and the Geological Survey suboffice at Carson City, and also at several district offices of the Survey, in addition to many educational institutions and public libraries scattered throughout the States. Current data in advance of publication and information for previous years can be furnished in blueprint form on application to the Engineer-in-Charge, P. O. Box 327, Carson City, Nevada.

CHAPTER VIII

Nevada Cooperative Snow Surveys, 1946–1948

By CLYDE E. HOUSTON, *Irrigation Engineer Division of Irrigation, Soil Conservation Service, U. S. D. A.*

Most of the past fall and winter the time of this office was spent in compiling past snow survey data for inclusion in a summary for the period 1910 through 1948. The summary will be completed and mailed to water users and interested parties during the next biennium.

Snowfall in Nevada and the eastern Sierra in California was at an all time low prior to March 1, 1948. Reservoir storage was also extremely short. As a result, conservation measures were taken to prepare for an extremely short irrigation season water supply. Storms throughout the higher elevations during March and April alleviated the immediate shortages of this year's supplies but, to date, reservoir shortages are the outlook for next season.

During the 1948 snow survey season 100 men traveled about 1,000 miles on snowshoes or skis to obtain the 3,000 measurements required on the 100 snow courses in Nevada and the Eastern Sierra in California.

Snow Survey—Streamflow forecasts were issued for three additional gaging points during the past spring. These were: Carson River near Carson City, Nevada, West Carson River at Woodfords, California, East Carson River near Gardnerville, Nevada. This brings to thirteen the total number of forecasting points in Nevada.

Three informal forecast committees met at Minden, Fallon, and Yerington, Nevada, early in April of this year. The meetings were attended by representatives of irrigation farmers, irrigation districts, and Federal and State agencies. The purpose of the meeting was to pool all available hydrologic information and determine irrigation season water supplies for the coming season. The meetings were quite successful and it was the unanimous opinion of those in attendance that such meetings should be held every year. Plans for next year call for expansion of these forecast meetings to about three communities along the Humboldt River.

CHAPTER IX

Inspection and Surveys of Lands Suitable for Irrigation by Pumping

By HOWARD G. MASON, *Agricultural Experiment Station, University of Nevada*

This activity was undertaken near the end of the biennium, following several conferences between representatives of the State Engineer's office, the Water Resources Branch of the U. S. Geological Survey, the Soil Conservation Service U. S. D. A., and the Nevada Agricultural Experiment Station of the University of Nevada. The work by the Experiment Station is being carried on under a formal project, approved by the Office of Experiment Stations, entitled: "An Inventory of Lands Suitable for Irrigation by Pumping."

The purpose of these studies is two-fold. They are intended first, to aid in determining the priority of detailed water investigations for different areas. They are also intended to delineate the approximate areas of agricultural land located over potential ground-water supplies. The procedure in making these investigations so far has been to make a quick visit to areas under consideration to determine whether or not they appear worthy of further study at an early date.

If the area has rather limited possibilities it is given a low priority and set aside for further study after more promising ones have been taken care of. Where there is a relative abundance of land found to be susceptible to development, the practice has been to proceed with a reconnaissance type of land classification as soon as possible after the area estimated to be underlaid with a potential ground-water supply has been determined.

The land classification is based upon any available technical information gathered by other agencies and by field examination. The field work includes observations of soil texture and profile, native vegetation, and alkali conditions. Three classes of land are delineated as accurately as possible by reconnaissance methods and the availability of ground control. Class 1 land is that which is considered definitely suitable for development with a pumped supply of irrigation water. Class II land is on the borderline, or consists of a mixture of suitable and unsuitable land difficult to separate by the survey methods used. Class III lands are considered to be definitely unsuitable for development by pumping.

Work on this project to date consists of a completed report on Grass Valley, in Humboldt and Pershing Counties; completion of field work of a land classification of White River Valley in White Pine and northeastern Nye County; and inspection trips to Diamond Valley, Railroad Valley, Hot Creek Valley, and Penoyer Valley.

CHAPTER X

Well Drillers

The 1947 Legislature added a new section to the underground water law (Sec. 7A, chap. 178, Stats. 1947), providing for the licensing of well drillers subsequent to July 1, 1947. During this biennium, well drillers were licensed, which we believe included all active well drillers operating within the State. The name of the well drillers licensed up to July 1, 1948, their license number and address are herewith given.

Lic. No.	Name	Address
1	J. J. Barry	Fallon, Nevada
2	J. C. Faretto & Son	Reno, Nevada
3	Mel Meyer Well Drilling Co.	Reno, Nevada
4	Louis Clarkson	Elko, Nevada
5	Fred E. Hummel	Paradise Valley, Nevada
6	Jesse J. Harrison	Carson City, Nevada
7	O. G. Hairgrove	Las Vegas, Nevada
8	Roscoe Moss Company	Los Angeles 33, California
9	John Frewalt	Las Vegas, Nevada
10	Harvey Meyer	Carson City, Nevada
11	R. L. Norris & Son	Reno, Nevada
12	Cecil R. Hill	Ely, Nevada
13	Claude R. Keener	Winnemucca, Nevada
14	J. D. Hill Drilling Co.	Ely, Nevada
15	Warren W. Overholser	Winnemucca, Nevada
16	C. J. Brackney	Fallon, Nevada
17	Canemona Drilling Co.	Las Vegas, Nevada
18	Henry L. Nelson	Lovelock, Nevada
19	B. G. Arnall	Las Vegas, Nevada
20	Wm. L. Helm	Las Vegas, Nevada
21	E. W. Brockman & Son	Corona, California
22	Earl Miller	Caliente, Nevada
23	Dennis Smith	Ely, Nevada
24	F. C. Ferguson	Tonopah, Nevada
25	C. O. Keaster	Carson City, Nevada
26	Geo. Dalton	Fallon, Nevada
27	Wm. Emory Rhoads	Pittman, Nevada
28	J. B. Reynolds	Fallon, Nevada
29	John Champion	Reno, Nevada
30	Free Brothers	Pioche, Nevada
31	Rodgers & Smith	Las Vegas, Nevada
32	Ed Frevert	Gardnerville, Nevada
33	Don Crawford	Vya, Nevada
34	A. G. Klinger	Boulder City, Nevada
35	Joseph E. Metz	North Las Vegas, Nevada
36	Harry C. House	Cedar City, Utah
37	Louis R. Simmons	Gerlach, Nevada
38	A. L. Simpson	Las Vegas, Nevada
39	Prince W. McIntyre	Arden, Nevada
40	Tom Miller	Pittman, Nevada
41	Isbell Construction Co.	Reno, Nevada
42	Al Godfrey	Long Beach, California
43	Harry Wilson and Preston Bradshaw	Cedar City, Utah
44	Harden & Company	Boise, Idaho
45	S. R. McKinney	Las Vegas, Nevada
46	Elwood B. Smith	Carson City, Nevada
47	Stanley Ford	Pahrump, Nevada
48	Karl Ward Berg	Round Mountain, Nevada
49	Edward E. Hana	Reno, Nevada

Lic. No.	Name	Address
50	Western Drilling Co.	Wellington, Nevada
51	C. C. Scott	Beaumont, California
52	Monk Electric & Plumbing	Lovelock, Nevada
53	M. F. Smith	Las Vegas, Nevada
54	Wm. Anderson	Carson City, Nevada
55	Scott Brothers	Bakersfield, California
56	William S. Wright	Cartago, California
57	Allen Brothers	Smith, Nevada
58	Frank N. Quinn	Cedar City, Utah
59	Martin H. Bertolino	Manhattan, Nevada
60	Arthur T. Warnken	Denio, Oregon
61	Delbert Bowermon	Reno, Nevada
62	A. E. Hosack & Son	Nampa, Idaho

The well drillers have cooperated quite well under this program by submitting to the State Engineer logs of wells drilled by them. One of the provisions under this licensing section is that the drillers must submit logs of wells drilled within thirty days following the completion of the well. The importance of this can be realized when we consider that 542 logs were made of record in the office of State Engineer during this biennium. Without such a law, very few of these logs would have been furnished with the result that information of great value would have been lost. As soon as time permits, the locations of wells as shown on the log forms will be indexed on township cards.

Well drillers' licenses must be renewed on July 1, 1948 and each year thereafter. A tabulation of licensed well drillers will be available on request.

RULES AND REGULATIONS FOR DRILLING WELLS

STATUTORY REQUIREMENTS

The State law requires that every person, firm, copartnership, association, or corporation before engaging in the drilling of water wells after July 1, 1947, for compensation or otherwise, upon land other than his own, must make application and obtain a well driller's license from the State Engineer. Applications for well driller's license shall be made on forms prescribed by the State Engineer. All licenses expire on the 30th day of June following the issuance thereof and are not transferable.

Licenses may be revoked by the State Engineer if it appears after an investigation and hearing that the well driller has failed to comply with the law and the rules and regulations. Any well driller as defined in the Act who drills a well in violation of the rules and regulations and the State law, shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than $50 nor more than $500 or by imprisonment in the county jail, not exceeding six months, or by both such fine and imprisonment.

It is mandatory that the well driller keep a log of the depth, thickness and character of the different strata penetrated and the location of water-bearing strata together with other data set forth in sec. 7A of the underground water law. The log must be signed by the driller and forwarded to the State Engineer within thirty days following the completion of each well.

FEES

The fee for issuing a well driller's license is $5. The fee for the renewal of the license is $2 for each year.

DEFINITIONS

The definitions of the words and phrases used in the law and rules and regulations are as follows:

"Person," means any firm, partnership, association, company or corporation, municipal corporation, power district, political subdivisions of this or any State or United States government agency.

"Aquifer," means a geological formation or structure that transmits water.

"Well," an artificial excavation put down by any method for the purpose of withdrawing water from the underground reservoir.

"Artesian Well," means a well tapping an aquifer underlying an impervious material in which the static water level in said well stands above where it is first encountered in said aquifer.

"Waste," means permitting an artesian well to discharge water unnecessarily above or below the surface of the ground so that the waters thereof are lost for beneficial use, or conveying water from a well by means of canal, ditch or pipeline whereby the loss of water in transit is more than 20 percent of the amount of water discharged from said well, or in any event when over 20 percent of the water discharged from a well is lost from beneficial use.

"Well Driller," means any person, firm, copartnership, association or corporation, who shall drill a well or wells for compensation or otherwise, upon land other than his own.

"General Water Law," means the statutory water laws of 1913, and all amendments thereto.

RULES AND REGULATIONS

[The section referred to relates to the 1939 underground water law as amended in 1943 and 1947.]

1. It is the purpose and intent of these rules and regulations:

(a) To obtain complete logs of all wells drilled, bored, jetted or otherwise, in Nevada.

(b) To prevent over-appropriation of water.

(c) To prevent pollution and contamination of underground water.

(d) To insure the construction and repair of wells in such manner that the flow, if any, can be completely controlled.

(e) To prevent waste of water from wells at the ground surface, and from one aquifer to another under the ground.

(f) To prevent undue interference with existing water rights.

2. The well driller's name and address, in legible letters together with a license plate issued by the State Engineer, shall be conspicuously displayed on the drilling rig or rigs operated or owned by the well driller. The license plate shall be provided by the State Engineer for each rig operated by the well driller. If the well driller operates more than one rig his license shall cover all of the rigs and each rig will bear the same license number. In other words, if a licensed well driller hires an operator for one of his rigs, the operator will not be required to obtain a license to drill.

3. In any proven artesian basin or any basin or subbasin designated by the State Engineer as provided for in sec. 4, before a person shall be permitted to sink a well for water, and before performing any work in connection with the sinking of said well, he must first make application for, and obtain from the State Engineer, a permit to appropriate such water in accordance with the general water law.

Therefore, in such a designated area, the well driller shall not commence any work in connection with the drilling of a well until the person for whom the well is to be drilled can produce a permit from the State Engineer to appropriate water at a point at which the well is to be drilled. To date, July 1, 1947, only two areas have been designated, re the Las Vegas Artesian Basin and the Pahrump Artesian Basin. As other areas are designated, the State Engineer will advise the well drillers.

4. In basins or subbasins which have not been designated by the State Engineer, or which are not proven artesian basins, no application or permit to appropriate water is necessary until after the well is sunk and a water supply has been thereby developed. Before any legal diversion of water can be made for said well, the appropriator must make application to the State Engineer and obtain a permit to appropriate water. (Sec. 6.) In such areas the well driller can proceed to drill without the owner of the property having a permit to appropriate water, but in all cases the well driller must furnish a well log on the prescribed form to the State Engineer.

5. No application for a permit to appropriate water for domestic purposes is necessary where the draught does not exceed two gallons per minute and the water so developed is not from an artesian well in a designated basin. In all cases, the well driller shall furnish logs of such wells.

6. Wells drilled into or through artesian aquifers or through material which will cave must be cased with sound casing material.

7. In artesian wells that are not gravel packed there must be a satisfactory seal between the outside of the casing and the confining material so as to prevent upward leakage. In artesian wells the perforations must not extend above the confining material so that there will be no leakage from inside the casing when the well is shut off.

8. In a gravel packed well penetrating an artesian aquifer, the gravel must not be placed above the confining strata. Above the gravel the well must be cemented in order to prevent escape of water up the outside of the casing when the valve is closed.

9. Wherever a well flows naturally upon completion, the well driller shall, prior to moving his rig from the well, install an effective shut-off valve of a type approved by the State Engineer.

10. All wells which are to be used for domestic purposes, shall be constructed as to prevent contamination or pollution.

11. The well driller shall keep a log of each well, making current records as drilling progresses. The log shall contain the following:

(a) Location of well in reference to *legal sub-divisions*, if possible, or in reference to some landmark, such as roads, towns, etc.

(b) The kind and nature of material in each stratum passed through or penetrated; each change of formation with at least one entry for each ten foot vertical interval.

(c) Size and depth of well and location of water bearing aquifers.

(d) A complete casing record, including size and number of perforations in casing.

(e) Date commenced and completed; name of well driller and driller's license number.

(f) If well flows naturally, the flow in cubic feet per second or gallons per minute and the shut-in pressure in pounds per square inch, and if nonflowing, the static water level below the land surface or other permanent reference point.

(g) If a pump test is made by the driller, a complete report of such test shall be included on the log form.

(h) Other information if and as requested by the State Engineer.

12. The State Engineer, upon investigation and after a hearing held upon at least fifteen days notice sent by registered mail to a licensed well driller, may revoke the well driller's license if he finds that said well driller has:

(a) Intentionally made a material misstatement of facts in his application for a license, or

(b) Intentionally made a material misstatement of facts in a well driller's log and report, or

(c) Been found to be incompetent as a well driller, or

(d) Willfully violated any of the prescribed rules and regulations, or

(e) Failed to submit a log and report of wells drilled, in accordance with the rules and regulations.

13. The State Engineer may, upon investigation and hearing, refuse to issue a permit to an applicant if it appears (1) that he has not had sufficient training or experience to qualify him as a well driller, (2) that he is incompetent, (3) that he has theretofore intentionally violated the law relating to well drilling, or (4) that he has theretofore intentionally made a material misstatement of fact in an application for a well driller's license.

14. After one year following the date of revocation of his license, a well driller may make application for a new license.

15. The State Engineer may, upon good cause shown, waive any of the foregoing rules and regulations, provided the waiver is in writing and briefly states the reason for the action taken.

16. Lack of knowledge of the law, or the rules and regulations relating to well drilling shall not constitute an excuse for violation thereof.

17. These rules and regulations are subject to change from time to time, but any such change is not binding upon the well driller until he has been notified in writing of such change.

CHAPTER XI

New Laws Affecting Water

This chapter will deal briefly with legislation passed by the 1945 and 1947 sessions of the State Legislature pertaining to water and which comes under the administration of the State Engineer.

A. DUTY OF WATER UNDER PERMITTED RIGHTS

Sec. 11, chap. 140, Stats. 1913 (As amended, chap. 56, 1945)

Under this section, as amended, the amount of water hereafter appropriated is limited to such water as shall reasonably be required for the beneficial use to be served. Heretofore the amount was limited to one one-hundredth of one cubic foot per second for each acre of land irrigated. Under the now existing law, the State Engineer in determining the amount of water to be granted in a permit to appropriate water shall take into consideration the irrigation requirements in the section of the State in which the appropriation is to be made. This section also was amended to exclude reservoir evaporation losses in determining the acre-footage to be granted in a permit.

B. WATER DISTRIBUTION UNDER CIVIL ACTION DECREES

Sec. 46½, chap. 159, Stats. 1947

This is a new section. Prior to the enactment of a State water law, under which a statutory method was provided for the adjudication of water rights, the District Courts of the State adjudicated water rights on many of our smaller streams under civil actions. Heretofore, the State Engineer had no authority to exercise any jurisdiction over such rights (Pacific Livestock Co. v. Malone, 54 Nevada). Section 46½ provides a method whereby such rights may be placed under the jurisdiction of the State Engineer, the same as water rights established by a statutory adjudication, if the District Court determines that the administration of such water rights by the State Engineer would be to the best interests of the water users.

During the spring of 1948 the waters of Quinn River and tributaries in Humboldt County were brought under the supervision of the State Engineer under the provisions of this section. A report on the procedure followed may be found in chapter XII.

C. WATER COMMISSIONER'S SALARIES

Sec. 52, chap. 209, Stats. 1931 (As amended chap. 159, 1947)

The salary of water commissioners was set at not to exceed ten dollars per day and necessary travel expenses, and fixing the salary of water commissioners in a supervisory capacity as not to exceed forty-five hundred dollars per annum and necessary travel expenses. The 1945 Legislature increased the salary of water commissioners from five dollars per day to seven dollars and fifty cents, and supervisory commissioners from ten dollars per day to twelve dollars per day.

D. WATER DISTRICTS—ADVISORY BOARDS

Sec. 53, chap. 140, Stats. 1913 (As amended chap. 159, 1947)

This section as originally enacted provided that the State Engineer

shall divide the State into water districts when the necessity exists. The 1947 Legislature added a provision that upon creation of a water district, the State Engineer may appoint an advisory board of representative citizens within the district to assist him in formulating plans and projects for the conservation of the water resources and the use thereof in such district. It was provided that the per diem and necessary travel and subsistence expenses of the appointive members of such board shall be paid from the water distribution fund and such expenses shall not exceed eight hundred dollars per year.

In conformity with this section, the State Engineer appointed the members of the Humboldt River Advisory Board on March 13, 1948, and the first meeting of the Board was held in Winnemucca on April 23, 1948. Further details relative to this Board are contained in chapter XIII.

E. COSTS OF GUARDS EMPLOYED BY STATE ENGINEER

Sec. 55A, chap. 109, Stats. 1933 (As amended, chap. 56, 1945)

An error was apparently made when this section was enacted in 1933. It provided that the costs of guards, employed by the State Engineer to prevent unlawful diversions, shall be assessed against the lands having water rights under said ditch and shall be collected as provided in sec. 77, chap. 253, Stats. 1915. The 1945 amendment provided that the charges be collected as provided in sec. 77, chap. 140, Stats. 1913.

F. PAYMENT FOR HEADGATES INSTALLED BY STATE ENGINEER

Sec. 56, chap. 140, Stats. 1913 (As amended, chap. 159, 1947)

This section provides for the installation of headgates and measuring devices when found necessary by the State Engineer. The 1947 amendment added a provision that upon the refusal of a person to install a headgate, measuring device or flume, as provided for in said section, the State Engineer may install such headgate, measuring device or flume, as the case may be, and in the first instance pay the actual cost of such installation from the water distribution fund as provided for in sec. 52 of the water law, and thereafter present such bill to the County Commissioners of the county where the charges were incurred. The commissioners shall thereafter present the bill to the person liable therefor under this section and if such person does not pay the charge within thirty days, the charge and costs shall become a lien upon the lands and property of the person liable for payment of the bill, and shall be assessed as delinquent taxes against said lands and property until collected.

G. TIME WITHIN WHICH TO TAKE ACTION ON WATER APPLICATIONS

Sec. 63, chap. 140, Stats. of 1913 (As amended, chap. 251, 1947)

This section pertains to action by the State Engineer on applications to appropriate water. The amendment provides that the State Engineer shall take action on such application within one year from the final date for filing protests; *provided,* that in the case of a protested application, action can be postponed by the State Engineer upon written authority to do so by both protestant and applicant, and *further provided,* that in areas where water supply studies are being

made or where court actions are pending, the State Engineer may withhold action until such time as it is determined there is unappropriated water, or the court action becomes final.

H. CONTROL OF WATER RIGHTS GRANTED UNDER PERMITS

Sec. 72A, chap. 106, Stats. 1921 (As amended, chap. 159, 1947)

There was added to this section a provision to the effect that the State Engineer may regulate and control any permitted right to water on a stream that has not been adjudicated, to the same extent and in the same manner as if it had been adjudicated pursuant to the water law.

I. UNDERGROUND WATER—FEE FOR ISSUING PERMIT

Sec. 73, chap. 106, Stats. 1921 (As amended, chap. 159, 1947)

The change in this section is the elimination of the provision that the fee for issuing a permit for irrigation purposes shall not apply to permits for underground waters. Before this amendment was made, fees for permits to appropriate underground water for irrigation purposes were based on the number of cubic feet per second of water applied for. As the section now reads, such fees are based on the number of acres irrigated. However, the minimum fee of ten dollars still applies.

J. PROCEEDINGS IN DISTRICT COURT—STATE ENGINEER DEEMED PARTY IN INTEREST

Sec. 75½, chap. 159, Stats. 1947

This is a new section which provides that when the State Engineer brings any proceedings into a District Court, either of a civil or criminal nature, concerning the administration and for the enforcement of the provisions of a decree, wherein the validity of the decree or any of its provisions has been drawn into question and the decision or judgment of the said court is that the said decree is invalid and/or void, the State Engineer shall be deemed to be a party in interest with the right to take an appeal from such decision or judgment to the Supreme Court.

UNDERGROUND WATER LAW

During the 1947 session of the Legislature, practically all of the sections of the underground water law were amended and some new sections added. The State Engineer's interpretation of this law will be found in chapter XIV.

CHAPTER XII

Quinn River Investigation

The water rights of the Quinn River Stream System were established by decree in the case of the Pacific Livestock Company v. Ellison Ranch Company, et al., Suit No. 1596, Second Judicial District Court (now Sixth Judicial District Court) in and for the County of Humboldt, on April 9, 1919. Certain rights in Oregon were not considered due to lack of jurisdiction, and the right of the United States Government for the use of water on McDermitt Indian Reservation in Nevada was not fixed or determined.

In 1930 the Pacific Livestock Company petitioned the then State Engineer, George Malone, to take charge of the distribution of the waters of the Quinn River Stream System pursuant to the decree of the said Humboldt County District Court. The State Engineer refused to divide and distribute such waters, as the decree in question does not constitute a statutory adjudication pursuant to the 1913 water law, as amended, and therefore the State Engineer is without jurisdiction.

The Pacific Livestock Company brought proceeding in mandamus against George W. Malone, State Engineer, in the District Court in and for the County of Humboldt. The State Engineer demurred to the petition and was sustained, and the proceedings were dismissed. The matter was taken to the Supreme Court of Nevada and is reported in 53 Nevada Reports on page 118. The Supreme Court sustained the demurrer and stated that the State Engineer was not concerned with the enforcement of a decree which is not a statutory adjudication, but is an adjudication of water rights in an equity action.

The 1947 Legislature, realizing that there were many instances other than Quinn River where the water rights had been determined by court action in a manner than otherwise provided for in the water law, and that provisions should be made whereby such rights could be administrated by the State Engineer, and that such administration would be to the best interests of the water users, enacted into law a new section, *i. e.*, section 46½, chapter 159, Statutes of 1947, which reads as follows:

> SEC. 46½. On any stream on which the water rights have been determined, as between all persons who claim the right to use the waters of such stream, by any district court in the state in a manner than otherwise provided for in sections 18 to 51, inclusive, of this act, and where one or more of the users of such determined rights desire the state engineer to take charge of the diversions and distributions of such rights in conformity to the decree of the court, they may petition the district court which issued such decree requesting such administration. Following such petition, the district court may direct the state engineer to make a hydrographic survey of such stream system and to render a written report, together with such maps and other necessary data as will enable the said court to determine whether or not administration of such water right by the state engineer would be to the best

interests of the water users. In the event that the said district court determines the matter affirmatively, the said court shall by its order duly entered, direct the state engineer to distribute such waters in accordance with the decree, and from and after the filing of such order in the district court the distribution of water shall be under the supervision and control of the district court, as set forth in section 36½ of the above-entitled act, and the owners of all such decreed rights shall be subject to all of the provisions of the above-entitled act relating thereto, including the assessment of cost for the administration of such rights.

The cost of making the survey and map by the state engineer as herein provided for shall be paid from the hydrographic fund as provided for in section 46 of the above-entitled act.

Pursuant to such Act on October 8, 1947, the Ellison Ranching Company, through their attorney, J. D. Skeen, filed a petition in the Sixth Judicial Court, in and for the County of Humboldt, petitioning the said Court to direct the State Engineer to make a hydrographic survey of Quinn River System and to render a written report such as would enable the Court to determine whether or not the administration of said water right by the State Engineer would be to the best interest of the water users, and that following receipt of such report if the Court determines that such administration would be for the best interest of the water users, for the Court to direct the State Engineer to take jurisdiction and to distribute such waters in accordance with the decree.

On October 8, 1947, Honorable Merwyn H. Brown, District Judge of the Sixth Judicial District Court, ordered the State Engineer to make a hydrographic survey of the Quinn River System and to render a report.

Pursuant to such Order, the State Engineer proceeded to make such hydrographic investigation, and on March 6, 1948, issued the following report:

HYDROGRAPHIC REPORT ON QUINN RIVER AND ITS TRIBUTARIES

By ALFRED MERRITT SMITH, *State Engineer.*

(Report issued pursuant to sec. 46½, chap. 159, Stats. 1947)

Quinn River Valley is located in Humboldt County, Nevada, and Malheur County, Oregon.

The Quinn River flows from north to south along the west side of the valley. At the south end of the valley the Quinn River flows northwest into Kings River Valley and thence into the Black Rock Desert.

The tributary streams making up the Quinn River System beginning at the south and listing them in a clockwise direction are Trout or Crowley Creek, Washburn Creek, McDermitt Creek, Quinn River or "The Slough," East Fork Quinn River or "Quinn River," Eight Mile Creek, Twelve Mile Creek, Canyon Creek, Pole Creek, Flat Creek, and Happy Creek.

Between Flat Creek and Happy Creek are a number of streams which rise in the Santa Rosa Mountains and flow westward into the

Quinn River Valley. Because of a low natural barrier along the center of the valley these streams do not flow into the Quinn River.

WATER RIGHTS

The water rights of the Quinn River Stream System are decreed in the case of the Pacific Livestock Company v. Ellison Ranching Company, et al., Suit No. 1596, Second Judicial District Court (now Sixth Judicial Court), in and for the County of Humboldt. Because of a lack of jurisdiction, some rights in Oregon were not considered and the right of the United States Government for the use of water on McDermitt Indian Reservation in Nevada was not fixed or determined.

On March 10, 1938 the United States Government filed application 10,343 to change the point of diversion and place of use of the waters of the Quinn River that were decreed to the Pacific Livestock Company for use on their "Hog John" and "Quinn River Crossing" ranches. The new place of use is the former J. D. Minor or "Giacumetto" ranch. A permit to make the change was granted by the State Engineer and the permit has now been perfected. A copy of this permit together with other pertinent information is attached to this report as an exhibit.

An agreement has been entered into between Sullivan-Mullaney, McCulloch and the United States Government and their successors whereby they divide the waters of McDermitt Creek that they are jointly entitled to use. The division of the water is one-fourth each to Sullivan-Mullaney and the United States Government and one-half to McCulloch. A copy of this agreement is attached as an exhibit.

OWNERSHIP

Since the entry of the decree there have been many changes in ownership of the ranches and the water decreed to them within the Quinn River System. Those holding water rights at this date are as follows:

Present owner—Henry McCleary Timber Company.

1. All the rights of Lizzie J. Anderson Dunn except the rights decreed to the Upper and Lower Flat Creek Ranches.

Present owner—Santa Rosa Land & Livestock Co.

1. The rights of Lizzie J. Anderson Dunn to the Upper and Lower Flat Creek Ranches.

Present owner—United States Government.

1. All the rights of Jerry and Margaret Hearn.
2. All the rights of J. B. Crandall.
3. All the rights of J. D. Minor.
4. All the rights of the Pacific Livestock Company, except the right decreed to the Coburn Ranch.

(Rights 3 and 4 are subject to agreement.)

Present owner—Bessie L., Lyle Calayde L., and Melba Ellison.

1. All the rights of the Ellison Ranching Company except the right decreed to the "Magor Field."

Present owner—Clayton E. Gunn.

1. All the rights of Milpitas Land & Livestock Co.
2. All the rights of Abel & Curtner Livestock Company.

(These rights are subject to agreement.)

Present owner—Sullivan-McCormick (Mullaney).

1. Decreed to Adelaide Mullaney Sullivan and Regina Mullaney. (This right is subject to agreement.)

Present owner—Clyde Franklin.

1. All the rights of Mathew and Katherine Danglemair.

Present owner—John Marcuerquiaga.

1. All the rights of Juan M. Legarza.

Present owner—Henry and Candida Marcuerquiaga.

1. All the rights of Guadalupe Hurtado.

2. The right of the Ellison Ranch Company decreed to the "Magor Field."

Present owner—William and Mabel DeLong.

1. All the rights of A. L. and W. M. DeLong and Elizabeth Floyd.

Present owner—I. W. Minor, et al.

1. All the rights of W. H. and Pheloma M. Minor, Quinn River Ranch.

Present owner—John Mentaberry.

1. All the rights of W. H. and Pheloma M. Minor, Washburn Creek property.

Present owner—Unknown.

1. The right of the Pacific Livestock Company decreed to the "Coburn Ranch." The points of diversion, and the place of use of this water is in Oregon. It is understood that the present owner of this property is a resident of Oregon. The entire property is outside the jurisdiction of the State Engineer.

STREAM CHANNEL CONDITIONS

Field investigations were made by representatives of the State Engineer's office on November 5 to 7, 1947, inclusive, on January 26 to February 2, 1948, inclusive, and on February 16 to 18, 1948, inclusive.

A base map was prepared from original township maps, highway department maps, and the individual property maps that had been used and filed in Case 1596 (Pacific Livestock Co. v. Ellison Ranching Company, et al.) This compiled map and the original property maps were used in making the field investigations.

The investigations were made to determine the condition of the stream channels and the irrigation practice on the individual ranches.

Quinn River (Including the Slough)

North of the confluence of the "East Fork Quinn River" with the Quinn River Channel, the Quinn River is designated on the maps submitted as exhibits in Case 1,596 as "The Slough." The Court, however, decreed rights from this channel and designated the source as Quinn River. In this report, the Quinn River Channel is considered as the channel which extends north into Oregon and enters Nevada about a mile west of the town of McDermitt.

The Quinn River Channel is a large meandering water course that originates in Oregon and has no "live source" of water at its head. Except for a short distance on the "Ellison Ranch," the channel is large and free from natural obstructions. Two or three beaver dams were noted at the lower end of the "Hearn Ranch" (Indian Service).

Tight dams on the "Hurtardo Ranch" (Marcuerquiaga) have caused the channel in this area to become choked with tule.

In general, the channel conditions are excellent and the channel will convey all the water decreed with a minimum amount of loss.

Crowley or Trout Creek

There is now no apparent channel of Crowley Creek across the Ellison Ranch. No water from Crowley Creek will reach the Quinn River except in years of excessively high run-off.

Washburn Creek

Where Washburn Creek enters the valley, the channel is somewhat constricted and in times of high water will flow into several flood channels which carry the water toward McDermitt Creek.

For the most part, that portion of the channel observed was in excellent shape.

McDermitt Creek

The township maps of townships 47 north, ranges 37 and 38 east, show the channels of McDermitt Creek. The same channels are shown on the maps submitted in Case 1,596 and are designated as the Sullivan Ranch Channel, Hat Field Channel, and J. D. Minor Ranch Channel.

The Sullivan Ranch and Hat Field channels are used as irrigation ditches and cannot be used to convey McDermitt Creek water to the Quinn River.

The J. D. Minor Ranch Channel, now called the "Indian Ditch" is a large open channel until it enters the west property line of the Indian Service "Giacumetto Ranch." From this point, for a distance of about one mile, the channel is used as an irrigation ditch. Just west of the ranch buildings on this property the channel again opens into a large water course and enters the Quinn River on the north side of the "English Property."

The "Hat Field" channel and the "J. D. Minor Ranch" channel come together west of the west property line of the "Giacumetto Ranch," and from that point there is only one channel of McDermitt Creek.

At present there is a division box in McDermitt Creek where it enters Quinn River Valley that divides all the water of McDermitt Creek. This division throws three-quarters of McDermitt Creek north into the Hat Field and Sullivan Ranch channels, and allows one-quarter of the flow to go down the J. D. Minor Ranch channel.

Under the existing arrangement, only waste water from the fields ever enters the Quinn River from McDermitt Creek.

East Fork Quinn River

This is a large open channel that reaches Quinn River without obstruction.

Eight Mile, Twelve Mile, Pole and Canyon Creeks

These streams, flowing from east to west are intercepted by old channels or sloughs flowing from north to south and paralleling the Quinn River which is the most westerly water course. These sloughs enter the Quinn River at the south end of the Henry McCleary Timber Company's "Hoppin Ranch."

As these sloughs are used as irrigation ditches, only waste water from the fields will enter the Quinn River.

Flat Creek

The present channel of Flat Creek, in places, does not correspond with the location shown on old surveys.

The channel is in good shape except for a short distance on the east side of the "Lower Flat Creek Ranch."

Happy Creek

No survey was made of Happy Creek as it enters the Quinn River below all other present diversion.

WATER USERS

Crowley or Trout Creek

The Ellison property uses all the water of Crowley Creek that reaches the head of the "Crowley Creek Ranch." Only waste water reaches Quinn River.

Washburn Creek

The Mentaberry Ranches are small and are along the creek. All the water that is needed is used on the ranches and the remainder, if any, flows into Quinn River.

McDermitt Creek

All the water flowing in McDermitt Creek is divided between the Clayton E. Gunn, Sullivan, McCormick, and Indian Service ranches. The division is one-quarter each to the Sullivan-McCormick and Indian Service, and one-half to the Gunn property. Several hundred acres of land without a water right are irrigated on the Gunn ranch. Only waste water reaches Quinn River.

East Fork Quinn River

All diversions from this stream are onto Indian lands. The diversions are all regulatory.

The "English Ranch," which is without a decreed water right, is irrigated from a lateral that diverts water from one of the Indian Service ditches.

Eight Mile, Twelve Mile, Pole and Canyon Creeks

All the water from these streams that reaches the Henry McCleary Timber Company lands will divert into the irrigation system. Only waste water will reach Quinn River.

The Flat Creek ranch diverts water from Pole Creek to the Upper Flat Creek ranch under a permitted right.

Flat Creek

The waters of Flat Creek are used on the Upper Flat Creek ranch. Any water in excess of that used on the Upper ranch is conveyed by the Flat Creek channel and used on the Lower Flat Creek ranch. Only waste water from the Lower Flat Creek ranch reaches Quinn River.

Quinn River

The "Minor Ranch" is the most northerly ranch taking water from Quinn River. The only source of water for the ranch is waste water from McDermitt Creek that drains into the channel. This ranch has three rock, dirt and debris dams in the channel. Only the lower two dams will divert water except in years of exceptionally heavy flow.

There are no headgates in the ditches. Any water reaching these diversions will divert onto the fields. About 80 acres of land without a water right is being irrigated on this property; however, some of the fields having water rights are apparently not being irrigated.

There is no diversion from the Quinn River onto the Indian properties or the English property.

The next diversion to the south is onto the Henry McCleary Timber Company's holdings. This ranch has two diversions from Quinn River.

The first diversion is at the south end of the Indian "Hearn Ranch." This diversion is a large ditch, shown on maps as "New Ditch," which diverts directly from the river. There is now no headgate in this ditch, although there are remnants of such a structure. Any water in Quinn River will now divide at this point with a large portion of the water going onto the McCleary Ranch.

The second diversion is about one-half mile below the first diversion. At this point a solid earth dam has been placed in the river. All the water diverts into the ditch. However, the ditch has broken and there is a return channel to the river. The break in the ditch has been stopped by a rock and brush dam. Under the present circumstances, no water will return to the channel except during high water. Any water remaining in the channel at the first diversion is all diverted at this point. There is the remnant of a headgate at this point. The only water available for lower users is the water that returns to the river at the south boundary of this property.

The lower Flat Creek Ranch has no diversion from the Quinn River.

On the Ellison Ranch, the diversions are by flooding, ditches, and sloughs. There are no headgates in any ditches and any water reaching the ranch will divert from the channel onto the fields. In some places the channel is practically obliterated and the water floods over the banks. Only waste water from the fields returns to the Quinn River and is available for use on the lower ranches.

The Henry Marcuerquiaga property consists of the "Magor Field" and the "Hurtado Ranch." The "Magor Field" has one diversion point with a ditch taking out on either side of the river. The diversion dam is rock and brush with a regulatory wooden box in the center. There are no headgates in the ditches. On the day of the investigation of this property, all the boards were in the box and hay and manure had been placed in front of the structure to prevent any leakage. All the water in Quinn River would divert onto the fields at this point.

The "Hurtado Ranch" is irrigated by a series of old rock and brush dams and new concrete regulatory dams which force the water into ditches and sloughs and flood the banks. The channel is in poor condition through this ranch due to the many obstructions. All the dams were in on the day of the examination and all the water of Quinn River would be diverted. Only waste water off the fields would be available for the lower users.

The John Marcuerquiaga property, formerly the "Lagarza Ranch," has a control structure in the river. On the day of the investigation, the river was stopped at this point by boards in the dam and with hay and manure thrown in front of the boards to stop leakage. There are no headgates in the ditches and all the water of Quinn River would be

diverted onto the fields. Only waste water off the fields would be available for the lower ranch.

The Clyde Franklin "Sod House" Ranch is now the lowest water user on the stream system. The channel from the Lagarza Ranch to the Sod House Ranch is satisfactory. No investigation of the Sod House Ranch was made.

CONCLUSION

In view of the conditions found to exist at the time of the field investigations, this office has arrived at the following conclusions:

1. There is apparently no attempt made by any water used on the stream system to abide by the terms or priorities fixed in the "Quinn River Decree."

2. There is a need for supervised regulation of the use of the waters of the Quinn River System, if the provisions of the Quinn River Decree are to be carried out.

RECOMMENDATIONS

1. At all points where water is diverted into sloughs or ditches, regulatory headgates should be placed in the ditches to control the amount of water diverted.

2. Some type of measuring device should be constructed in the ditches wherever it is practical.

3. Stream gaging stations at three points should be maintained by the water users in cooperation with the State of Nevada and the U. S. Geological Survey.

SUGGESTIONS

If the Court, in its judgment, should order the State Engineer to distribute the waters of Quinn River, it will be necessary for the Court to provide a method of collecting the proportionate share of the distribution costs from the Sullivan-McCormick nee Mullaney ranch in Oregon.

The Indian Service has indicated to the State Engineer that they will pay their proportionate share in the same manner they pay for water regulation on other projects.

ALFRED MERRITT SMITH,
State Engineer.

Dated this 6th day of March, 1948.

On March 10, 1948, the Honorable Merwyn H. Brown, District Judge, Sixth Judicial District Court, issued the following order:

> The above-entitled matter, having been heretofore set for hearing, upon the petition of Bessie Ellison, Lyle Ellison, Claude L. Ellison and Melba Ellison, successors in interest of the Ellison Ranching Company, and notice of said hearing having been given by publication therein in the Humboldt Star, a newspaper published at Winnemucca, Nevada, as directed by the court, proof of which has been made and filed herein, J. D. Skeen, appearing as attorney for the said petitioners, Edmund Muth, deputy state engineer, appearing for the state engineer, and C. J. Preece appearing for the superintendent of the Carson Indian Agency, and the state engineer

of the State of Nevada having made and filed his report, pursuant to the order of this court made and entered on the 8th day of October, 1947, directing the state engineer to make a hydrographic survey of the Quinn River System, and the court having considered the said report and being sufficiently advised in the premises,

It is ordered,

1. That the conclusions of the State Engineer in the said report be and they are hereby approved and adopted.

2. That the administration of the water rights in and of the waters of the Quinn River System, by the State Engineer for the State of Nevada, will be for the best interests of all of the said water users.

3. That the said State Engineer be and he is hereby directed to distribute the waters of Quinn River in accordance with the decree made and entered in the above-entitled suit, on the 9th day of April, 1919, under the supervision and control of the above-entitled court and subject to all of the provisions of section 36½ of chapter 159 of Nevada Compiled Laws of 1929, and the owners of all of such decreed rights shall be subject to the provisions of said Act, including assessment of costs for the administration of such rights.

(Signed) MERWYN H. BROWN,
Judge.

Dated this 10th day of March, 1948.

The actual cost of making the hydrographic survey which amounted to $347.90 was paid out of the hydrographic fund as set up under section 46, chapter 140, Statutes of 1913. In conformity with the Court Order of March 10, 1948, this charge was assessed against the property having water rights from Quinn River, and when collected will replenish the above-mentioned hydrographic fund.

In addition, and in conformity with said Court Order, a budget was prepared in the amount of $2,377.52 to pay for the salary of a Water Commissioner for the 1948 season, together with the costs attached for the purchase and installation of three recording water gages.

The Quinn River Stream System lies within the Humboldt Water Distribution District and therefore the distribution of water of Quinn River comes under the general supervision of the Supervisory Commissioner of the Humboldt River. Distribution of the waters of Quinn River by the State Engineer was commenced on April 1, 1948.

CHAPTER XIII

Humboldt River Advisory Board

PERSONNEL

A. V. Tallman, Chairman, Winnemucca, Nevada.
Warren Monroe, Secretary, Elko, Nevada.
George Ogilvie, Elko, Nevada.
R. W. Lemaire, Battle Mountain, Nevada.
Elmer Hill, Battle Mountain, Nevada.
Jack Kearns, Winnemucca, Nevada.
Clarence Sommer, Lovelock, Nevada.
Victor Arobio, Lovelock, Nevada.
Robert Leighton, Lovelock, Nevada.

In August 1945 a meeting was held in Elko under the auspices of the Elko Chamber of Commerce to discuss Humboldt River problems. A complete report of this meeting may be found in chapter X of the 1944–1946 Biennial Report of the State Engineer. At this meeting, which was attended by representative water users from the four main districts, *i. e.,* Lovelock, Winnemucca, Battle Mountain, and Elko, as well as representatives from Federal and State agencies concerned with water problems on the Humboldt River, it was decided to set up a Humboldt River Board with two representatives from each district, to be selected by the respective districts. The board was set up and during 1946 two meetings were held. It was the suggestion of the board to amend the water law so that the board would have official status and also provide for necessary per diem and traveling expenses.

Accordingly, such an amendment to section 53, chapter 140, Statutes of 1913, was introduced in the 1947 Legislature and subsequently enacted into law. This amendment provides that upon creation of a water district, the State Engineer may appoint an advisory board of representative citizens within the districts to assist him in formulating plans and projects for the conservation of the water resources and the use of water within such district; also, provisions were made for per diem and necessary travel expense for the members of such board.

On March 13, 1948, Alfred Merritt Smith, State Engineer, appointed the members of the Humboldt River Advisory Board and called upon the members to hold their first meeting at the Humboldt Hotel in Winnemucca on April 23, 1948.

The meeting of April 23d was attended by all members of the board excepting Robert Leighton of Lovelock. In addition, Alfred Merritt Smith, State Engineer; Hugh A. Shamberger, Assistant State Engineer; Edmund Muth, Deputy State Engineer, and George Hennen, Supervising Water Commissioner, were in attendance.

Among various topics of discussion at the meeting in Winnemucca were stream improvement, including upstream storage, improved beaver control, and continuation of underground water studies.

A resolution was passed by the board directing the State Engineer to immediately contact army engineers and urge them to make a comprehensive survey on the Humboldt River at the earliest possible date

with a view of supplying information urgently needed for best methods of controlling damaging floods on the stream.

A committee to make a study of the beaver situation on the river in conjunction with other State agencies was appointed, consisting of Arobio of Lovelock; Hill of Battle Mountain, and Ogilvie of Elko.

Present methods of beaver control provided by law give the State Engineer no authority to interfere when beaver dams are resulting in diversion of stream flow. Removal of beaver from a stream rests entirely upon the choice of the land owner and where they are found on privately owned land, neither the State Engineer nor the State Fish and Game Commission can remove them unless they have the consent of the land owner.

Considerable discussion took place at the meeting regarding preservation of Humboldt River adjudication records which are now on file in Winnemucca court records.

Maps, transcribed testimony, and various documents and matters of evidence pertaining to the adjudication matter compose one of the most voluminous records ever filed in any Nevada court case and require vast storage facilities.

Subsequent to the meeting and during the late spring and summer of 1948, the U. S. Army Engineers have been working on a flood control program on the Humboldt River and will prepare a detailed survey report to be released in about November of 1948. It is the plan of Colonel Joseph S. Gorlinski, District Engineer, Corps of Engineers, to hold a public hearing on the principal features of the contemplated improvements during August of 1948.

CHAPTER XIV

Rules and Regulations

STATE ENGINEER'S INTERPRETATION OF CERTAIN ASPECTS OF THE GROUND WATER LAW

[Chap. 178, Stats. of 1939, as amended by chap. 43, Stats. of 1947]

Section 1 provides that all underground water belongs to the public, and subject to all existing rights are subject to appropriation for beneficial use *only under the laws* of the State relating to the appropriation and use of water *and not otherwise.* The procedure then to appropriate underground water is the same as for the appropriation of surface water and is set out in sections 59 to 74 of the General Water Law 1939 Act.

It is also provided that the State Engineer can make such rules and regulations within the terms of this Act as may be necessary for the proper execution of the provisions of the 1939 Act. The following interpretations are in accordance with this provision.

Section 2 defines the following words: "person," "aquifer," "artesian well," "waste," "well driller," and "general water law."

Section 3. The purpose of this section was and is to make it unnecessary for a person to go to the expense of making an application to appropriate water for purely domestic purposes. In section 4 provision is made for the designation of areas within which the State Engineer has jurisdiction over the distribution of ground water and in section 9 it is provided that in such areas the State Engineer may compel the owner of a well who is using water therefrom without a legal right to cease such use until he has complied with the laws pertaining to the appropriation of water. The provisions of section 9 would not apply to domestic wells as provided for in section 3.

However, once an area is designated as provided for in section 4 and the domestic wells would encounter artesian water then before any deep drilling was done for such domestic water a permit to appropriate water would have to be obtained. The reason for this is that it would give the State Engineer better control over the drilling operation in an effort to prevent faulty wells which could well cause excessive waste. In any such designated area the State Engineer shall declare his policy regarding domestic wells.

In a designated area where the well wouldn't encounter artesian water domestic wells as described in section 3 could be drilled without obtaining a permit to appropriate water.

The owner of a domestic well tapping artesian water that was drilled subsequent to March 25 (1939), (See sec. 9B) would acquire no legal water right unless he complied with laws relating to the appropriation of water; however, he does have the legal right of usage pending the determination of the right to appropriate according to law. On the other hand the owner of a domestic well drilled prior to March 22, 1913, in the case of an artesian well, and prior to March 25, 1939, if the well tapped percolating water, would have a vested water right as described in section 9B.

The term "domestic use" as herein applied, extends to culinary and household purposes, the watering of a family garden, lawn, and the watering of domestic animals such as milk cows, horses, etc.

The State Engineer construes the term "two gallons per minute" to mean that the owner can use a quantity of water equal to 2,880 gallons every 24 hours (1,440 minutes in each 24 hours), not necessarily in a continuous flow, but rather when the water is needed during the 24-hour period.

Section 4 provides a method for the designation of a basin and supervision of underground water development.

The petition can be signed by anyone having a permit to appropriate underground water, or by anyone who can substantiate a vested right as defined in section 9B.

Supervision such as regulatory measures cannot be exercised on wells having vested rights unless such vested rights have been adjudicated nor on wells coming under the provisions of section 3, except as to controlling waste. In other words, should it become necessary to restrict withdrawals of water due to over depletion such restrive measures cannot be taken against unadjudicated vested rights, unless water from such wells is being wasted.

Section 5 provides for the employment of a well supervisor, payment of salary, etc., and is self-explanatory.

Section 6. The first part of this section provides that every person desiring to drill a well in any *proven artesian basin* or any designated basin as provided for in section 4, shall first make application to and obtain a permit to appropriate such water.

The question here is what is the definition of a "proven artesian basin." It might be said that any basin where a few artesian wells exist could be said to be a proven artesian basin. If so, before any wells could be drilled, a person would have to obtain a permit to appropriate water—a matter that takes a minimum of two and one-half months following the filing of the application and supporting map. Where such restriction is not necessary it would tend to impede development.

The interpretation of the State Engineer is that in order for an artesian basin to come under this category, *i. e.*, requiring a permit to appropriate water prior to drilling without being designated pursuant to section 4, it will be necessary for the State Engineer to make an order declaring such area a "proven artesian basin," and specifically stating in such order that permits to appropriate must be obtained prior to drilling. Such order to be published in a newspaper of general circulation in the county within which the basin is located, and further all licensed well drillers shall be advised of the order. In such areas the State Engineer would not have any administrative powers over the distribution of water as outlined in section 4 until the area was designated.

It would appear that the main objective of such procedure would be to afford the State Engineer the opportunity to keep track of well-drilling operations, or to prevent drilling until such time as the State Engineer determined that there was unappropriated water.

The balance of the section is to the effect that in undesignated areas,

which have not been declared proven artesian basins as heretofore outlined, a person may have a well drilled prior to obtaining a permit to appropritae. However, before any legal diversion of water can be made a permit to appropriate water must be obtained.

The question of legal diversion as herein used and the necessity thereof merits discussion. In an undesignated area if a person has a well and uses the water therefrom without obtaining a permit to appropriate water, or without having a vested right as described in section 9B, and providing the well is not a domestic well under the provisions of section 3, such use would be an illegal use. There is little the State Engineer could do to restrict this use until such time as the area is designated whereupon the owner could be forced to either obtain a permit or to discontinue using the water as provided for in section 9. Under such a condition owners of legal water rights in the area who are affected by such illegal use could petition the State Engineer to proceed under the provisions of section 8 if the illegal use was from a flowing artesian well or under the provisions of section 4 to designate the area.

Section 7A provides for the licensing of well drillers, the keeping of a log, and submission of such log to the office of State Engineer within thirty days following completing of well.

Section 8. This section provides a method whereby the State Engineer can control waste of water from an artesian well located anywhere within the State, regardless of whether it is located within a designated area or not. The procedure to be followed is for the State Engineer to notify the owner of such well which is wasting water by registered mail to abate or at least to take proper steps to abate such waste within fifteen days from the date of the letter. If the owner fails to do this the State Engineer is impowered to take such steps as is necessary to stop the waste. The cost of such repair is first paid by the State Engineer from the Water Distribution Fund as provided for in section 5, but becomes a lien on the property of the well owner following the filing of a statement of costs, within thirty days after completing the repair, with the County Recorder. Such lien may be enforced in the same manner as provided by law for the enforcement of mechanics' liens.

Section 9 clearly sets forth the only method whereby a legal right to appropriate water can be obtained from wells not having a vested right as defined in section 9B. Such method is by complying with the provisions of the general water law pertaining to the appropriation of water, *i. e.*, by making application to appropriate. This indicates that the owners of wells excepted under section 3 would not have gained a legal appropriation in the sense of a water right but would have a perpetual right to use such water without unnecessary interference.

The section further provides that following a designation of the area as provided for in section 4 anyone using water, other than provided for in section 3, without the right to use such water either under a vested right or a permitted right, must, following notice by the State Engineer, either proceed with acquiring a permit or else cease using water therefrom. If such owner refuses to cease using water from such well and fails to initiate proceedings to secure a permit he shall be deemed guilty of a misdemeanor.

Section 9A. The first paragraph of this section is positive. Any underground water right, under whatever claim of right and no matter when established may be lost by five successive years of nonbeneficial use. This applies only to the extent of the nonuse. In other words if a person had acquired a water right for 3 c.f.s. of water and failed to use 1 c.f.s. during any five successive years he would lose the right of use for the 1 c.f.s. of water which would revert to the public or to junior appropriators. If such right was an undetermined right, *i. e.*—vested rights that had not been determined by an adjudication procedure, the loss would be by forfeiture. If the right was a determined right, *i. e.*, a vested right determined by adjudication or a perfected permitted right as evidenced by a certificate of appropriation, the loss would be by abandonment.

In the case of a unperfected permitted right (undetermined right) the five-year nonuse period can only start on or subsequent to the original time set when the permit was issued within which water is to be placed to beneficial use. Therefore extensions of time as provided for in the general water law (sec. 69, chap. 140, Stats. 1913) as applied to underground water cannot cover a period longer than five years subsequent to the original date set in the permit within which to place water to beneficial use.

The right to use underground water, no matter under what claim of title, may be lost by abandonment. In determining abandonment the intent to abandon by the owner of the well must be clearly evident. There is no time element involved in abandonment.

In either the case of forfeiture or abandonment the owner of the right affected must be notified by registered mail and may appeal the ruling of the State Engineer in the manner provided in section 75, chap. 75, Statutes of 1915 of the general water law. If such appeal is not taken within the time provided for in said section the ruling of the State Engineer becomes final.

It is evident from the language of section 3 that underground water used only for domestic purposes and where the draught does not exceed 2 gallons per minute would not be subject to the above forfeiture or abandonment provisions.

Section 9B provides that existing water rights to the use of underground water are recognized. This means water rights that have been established prior to 1947 whether by the application and permit procedure or by having acquired a vested right.

The section defines vested underground water rights and differentiates between two classes of water, *i.e.*—(1) water from an artesian well or from a definable aquifer, and (2) percolating water the course and boundaries of which are incapable of determination. To acquire a vested right under the first classification it must have been developed and used prior to March 22, 1913, and to acquire a vested right under the second classification the development and use must have been prior to March 25, 1939.

The matter of the determination of whether water is in a definable aquifer or whether it is percolating water, the course and boundaries of which are incapable of determination, is left to the State Engineer to determine the criterion to be used in determining if the well under question is tapping water from definable aquifer is if in the judgment

of the State Engineer the aquifer is within a contracted and bounded channel such as would be evident in a buried channel. When the facts are not clear the State Engineer will assume that the water comes under the classification of "percolating water the course and boundaries of which are incapable of determination."

The section further provides for the adjudication of vested underground water rights. Following a petition from a claimant of vested water rights to adjudicate such rights and if the State Engineer finds justification for such procedure he proceeds to designate the area pursuant to section 4 of this Act. The procedure is then the same as set forth in the general water law (Secs. 18 to 36). In such designation the area designated can include all claimed underground water rights in any one drainage basin. The definition of "drainage basin" as used herein is interpreted to mean "ground water" drainage basin.

Section 10. Several provisions are set forth in this section and will be discussed in the order that they appear.

First, it provides that the State Engineer shall prescribe all necessary rules and regulations within the terms of this Act for administration purposes. The interpretations, rules and regulations herein set forth are prepared in conformity to this provision.

It is provided that the State Engineer may require certain information from all holders of permits and claimants of vested rights including water usage and acreage water is placed on.

That the State Engineer can conduct pumping tests to determine if over-pumping is indicated and other hydrologic properties.

That the State Engineer shall determine if there is unappropriated water in the area and shall issue permits only if he finds that there is unappropriated water available.

It is provided that in each permit issued the right of the permittee shall be limited to a fixed quantity of water which may be obtained with a pumping limit which is not in excess of the maximum lift found feasible by the State Engineer at the time of the granting of the permit. As this is interpreted by the State Engineer it was not the intention in granting a permit to set by reference a maximum lift as found to be reasonable by the State Engineer, but rather to designate specifically a quantity of water to be diverted from the well which the State Engineer feels can be obtained within a feasible or reasonable lift based on the known hydrologic factors. It is only when continued over-pumping occurs that the water table lowers beyond natural recovery. The Act is definite in that the State Engineer is to restrict over-pumping. This can be done if the safe yield of the ground-water basin has been determined and the area has been designated pursuant to section 4 of this Act. It is clear that if over-depletion is prevented that the lowering of the ground-water table would not ordinarily be unreasonable. However, it is apparent that in certain instances continued development of ground water in an area which is not over-depleted might cause the ground-water level to drop below a level from which it is not economical to pump any longer for certain crops grown in the area, even though the safe yield had not been reached. It will be the policy of the State Engineer to restrict further diversions when (1) the safe yield has been reached, and (2) when the water table has reached such a level

that the pumping lift approaches the maximum economical limit, whichever comes first.

It further provides that a right to appropriate ground water doesn't guarantee the permittee the right to have the water level in his well maintained at any level higher than is necessary for a reasonable pumping lift. This means that such permittee has no regress if other permits are granted in the area even though further appropriations under such permits cause the water level to drop, just so the lowering is not unreasonable. In determining the reasonable pumping lift one of the major items to consider is whether or not the lift is economical.

Provision is made for the State Engineer to hold a hearing to determine whether the water supply in any area is adequate for the needs of all permittees and vested right claimants. By virtue of the groundwater studies being carried on under the cooperative program between the United States Geological Survey and the office of State Engineer this information will in most cases be available prior to any great development. If the determination is negative then withdrawals are to be restricted according to priority. Of course under such conditions and to exercise such control the basin must be designated in accordance to section 4.

In any designated basin the State Engineer may restrict drilling in any particular portion of an area if he determines that such additional wells would cause undue interference with existing wells. Therefore, such provision would give the State Engineer the right to deny a permit on the grounds that should water be diverted at such proposed point of diversion there would be undue interference on an existing water right. Should the State Engineer make a general order restricting further drilling in a portion of a designated area, such order is subject to be reviewed by the District Court pursuant to section 75 of the General Water Law.

The continuance of free flow conditions or the maintenance of water levels in artesian wells is not to be protected in the provisions of a permit even though subsequent development causes a lowering of the pressure head and which may cause the free flow to cease. The only questions to be determined are (1) is there unappropriated water, and (2)will the resulting pumping level be feasible. If so, further permits can be granted.

Section 11 provides that the State Engineer, his assistants or authorized agents, may enter any premise where a well covered by this Act is located.

Section 12 describes a misdemeanor and sets forth the penalty, therefor.

Section 13 provides that each section of the Act is an independent section, and the holding of any section as unconstitutional shall not affect the other sections.

Section 14 repeals certain Acts in conflict.

RULES AND REGULATIONS PERTAINING TO PROTESTS AND HEARINGS ON APPLICATIONS TO APPROPRIATE WATER

The section of the water law which provides a method in which protests may be filed against the granting of an application to appropriate water is as follows:

Section 62, chapter 140, Statutes of 1913, sec. 7947, N. C. L. 1929. Any person interested may, within (30) days from the date of last publication of said notice of application, file with the state engineer a written protest against the granting of said application, setting forth with reasonable certainty the grounds of such protest, which shall be verified by the affidavit of the protestant, his agent or attorney. On receipt of a protest, as hereinbefore provided, it shall be the duty of the state engineer to advise the applicant whose application has been protested of the fact that said protest has been filed with him, which advice shall be sent by registered mail. The state engineer shall duly consider the said protest, and may, in his discretion, hold hearings and require the filing of such evidence as he may deem necessary to a full understanding of the rights involved; *provided, however,* that no hearing thereon shall be had except after due notice by registered mail to both the applicant and protestant, which notice shall give the time and place at which the said hearing is to be held, which notice shall be mailed at least fifteen days prior to the date set for said hearing. Said hearings shall be conducted under such rules and regulations as the state engineer may make, which he is hereby empowered to make for the proper and orderly exercise of the powers conferred herein.

1. NOTICE OF APPLICATION

Notice of an application to appropriate water shall be published in a newspaper of general circulation in the county in which the source of water sought to be appropriated is located, once a week for five consecutive weeks. A formal protest must be made between the dates of the first publication and within thirty days following the final publication.

2. FORMAL PROTEST

Following receipt of a formal protest, and as soon as possible thereafter, the State Engineer shall duly consider same, and may, *at his own discretion,* hold a hearing in order that a full understanding of the rights involved may be obtained. The usual procedure is to first conduct a field investigation. Both applicant and protestant are invited to accompany the investigating engineer. Oftentimes the differences can be resolved during such investigation. If not, and the State Engineer feels that he has sufficient information on which to issue a ruling he proceeds with the ruling. In many instances, however, the State Engineer needs additional evidence, such as the testimony of witnesses, and in such cases he notifies both applicant and protestant by registered mail that a hearing will be held at a certain time and place. Such notice must be mailed at least fifteen days prior to the date set for the hearing.

3. EXCEPTION TO RULING OF STATE ENGINEER

Either party to the action feeling himself aggrieved by the ruling of the State Engineer may have such ruling and order reviewed by the

district court having jurisdiction as provided for in section 75, chapter 253, Statutes of 1915, sec. 7961 N. C. L. 1929.

In his action on any application to appropriate water, whether protested or not, the State Engineer shall use extreme caution so as not to jeopardize any existing rights. In all permits granted to appropriate water, the provisions "subject to existing rights on the source" is included.

4. PROTEST FORM

The State Engineer has prepared a form upon which to submit protests and the use of this form is recommended. These forms are furnished free upon request. *Protests must be submitted in duplicate accompanied by the statutory filing fee of $1.* One copy is filed and the other copy is forwarded to the applicant.

A person desiring to protest an application should use the prepared forms, but it is not mandatory. A form can be prepared by the person making the protest, but it must be along the lines of the prepared form as outlined below, and *must be submitted in duplicate.* The form of the protest is as follows:

In the Office of the State Engineer of the State of Nevada

In the Matter of Application Number.....
Filed by.....
On.....19....., to appropriate } Protest of.....
the waters of.....

Comes now.....
Whose post-office address is.....
whose occupation is....., and protests the granting of application number....., filed on ....., 19....., by.....to appropriate the waters of....., situated in.....
County, State of Nevada, for the following reasons and on the following grounds, to wit:

.....
.....
.....
.....

WHEREFORE, protestant prays that the application be.....
.....

(Denied or issued subject to prior rights, as the case may be)

and that the use of water herein claimed by protestant be confirmed and then an order be entered establishing said right and for such other relief as the State Engineer deems just and proper.

.....
Protestant.

STATE OF NEVADA, }
COUNTY OF..... } ss.

....., being first duly sworn, deposes and says, that he has read the foregoing protest and knows the contents thereof and that the same is true of his own knowledge,

except as to the matters which are therein stated on information and belief, and as to those matters he believes it to be true.

.....

Subscribed and sworn to before me this.....day of....., 19.....

.....

Notary Public.

5. ANSWERS TO PROTEST

It is not necessary for the applicant to answer a protest. If he desires to make an answer he may do so and it will be accepted and filed *providing the answer is in duplicate and is accompanied by the statutory fee of $1 for filing.*

6. WITHDRAWAL OF PROTEST

Subsequent to the filing of a protest, the protestant may, if he desires, withdraw the protest by filing with the State Engineer a notice in writing that the protest is thereby withdrawn, and thereafter the State Engineer may proceed in his processing of the application in the same manner as if no protest had been filed in the first instance.

The applicant and protestant may enter into an agreement regarding the use of the water applied for and set forth such agreement in a stipulation signed by the parties, which when filed in the office of State Engineer, will have the effect of withdrawing the protest. The permit to appropriate water may thereupon be issued subject to the conditions of the stipulation. The State Engineer is not a party to such agreement and the acceptance of such stipulation will not have the effect of establishing a water right not theretofore acquired pursuant to law.

7. HEARINGS

When an application to appropriate water is protested in due form in accordance with the requirements of section 62, chapter 140, Statutes of 1913, sec. 7947 N. C. L. 1929, a hearing will be held thereon unless the protests are withdrawn or unless the State Engineer in his discretion feels that he has sufficient information relative to the rights involved upon which to base a ruling. The State Engineer will give due consideration to the wishes of the parties involved in the proceeding in deciding whether or not a formal hearing is necessary.

The various steps involved are as follows:

(a) Notice of hearing, setting time and place to be sent to both the applicant and the protestant by registered mail at least fifteen (15) days prior to date of hearing.

(b) Upon request of either applicant or protestant and for good cause shown, the date set for the hearing may be continued over. A request to have the date of hearing changed must be made to the State Engineer at least three days prior to the set date in order that the other party or parties may be advised. In all cases, such request may be granted or denied at the discretion of the State Engineer.

(c) It is optional with each party whether or not he shall be represented by counsel. In the event that either applicant or protestant is

represented by counsel, service of notice or other papers pertaining to the issue upon such counsel shall be sufficient.

(d) The order of proceeding to take testimony at a hearing shall be as follows except as otherwise provided herein: The protestant to an application shall be considered as the plaintiff and will be requested to first present his evidence as to why the application should not be granted. In other words, the protestant is the complaining party and in order to put the right of the applicant at issue, the protestant must first present his evidence as to why such application should not be granted. The exception to the above procedure is when applicant and protestant or their respective counsel voluntarily agree to change the procedure, *i.e.*, the applicant to first present his evidence as to why the application should be granted.

(e) The witnesses will be examined orally by and before the State Engineer. Hearings will be conducted in such manner as the State Engineer deems most suitable to the particular case and technical rules of evidence need not be applied. The general procedure will be as follows:

Upon the opening of the hearing and following the statement of the matter to be heard, the State Engineer will inquire whether applicant and protestant and/or protestants are represented by counsel. The State Engineer will then obtain from the parties a list of their witnesses, and will proceed by first calling upon the protestant to submit his evidence. The State Engineer will first administer the oath to the witness and then proceed with his interrogation, following which counsel for protestant is privileged to question his witness along lines pertinent to the matter at hand. Counsel for applicant, or if applicant is not represented by counsel, the applicant himself is privileged to cross examine the witness. The procedure will continue in the examination of the witnesses for the protestant. The procedure will be similar when the applicant presents his case.

(f) In the event that either party at a hearing shall pursue a line of interrogation of a witness that is clearly irrelevant, incompetent, or immaterial, the State Engineer may forthwith stop such interrogation.

8. DEPOSITIONS

(a) The deposition of a witness for use in a hearing or an application to appropriate water pending before the State Engineer may, after the issue is joined, be taken in compliance with a stipulation between the parties concerned or an order of the State Engineer.

(b) In the event the deposition is to be taken by an order of the State Engineer, the parties concerned shall be notified at least fifteen days prior to the date set, such notice setting forth the name or names of the parties to be questioned, the time and place and the subject matter or matters concerning which the witness or witnesses will be expected to testify.

9. STATE ENGINEER MAY MAKE INVESTIGATIONS

The State Engineer will make such investigations as may be necessary for the purpose of securing information needed in connection with determining the issues involved. A hearing before the State Engineer

as described in Rule 7 heretofore outlined, is one of the recourses that may be taken to obtain such information but may be supplemented by information obtained from other sources.

10. BRIEFS

Prior to the closing of the hearing and upon request of both applicant and protestant, the State Engineer may agree to the presentation of briefs. The order of presenting briefs and the time periods shall be determined by the State Engineer following consultation with counsel.

11. REPORTING OF PROCEEDING AND TRANSCRIPT

The State Engineer shall require a deposit of five dollars ($5) per day, or fraction thereof, from each party while engaged in taking evidence on said application. Should there be any balance left after paying for the reporting, such balance will be credited on cost of transcribing the testimony.

At all formal hearings the record of the proceedings shall be taken down by a reporter, or in the absence of a reporter by someone designated by the State Engineer.

12. INFORMAL HEARINGS

The State Engineer may, if he desires, in order to get additional information, hold an informal hearing on an application to which no protest was filed. The rules heretofore set forth on formal hearings do not necessarily apply to informal hearings.

13. STATE ENGINEER

The wording "State Engineer" as used herein means the State Engineer of Nevada, and any of his officially designated assistants.

CHAPTER XV

State Board of Registered Professional Engineers

By STANLEY G. PALMER, *Secretary.*

The Engineer's Registration Law, as passed in 1919, and amended in 1935, and again in 1947, defines the practice of professional engineering in the following terms: "The practice of professional engineering within the meaning and intent of this act includes any professional service such as surveying, consultation, investigation, evaluation, planning, and design, or responsible supervision of construction or operation in connection with any public or private utilities, structures, building, machines, equipment, processes, works, or projects, wherein the public welfare or the safeguarding of life, health, or property is concerned or involved, when such professional services require the application of engineering principles and data."

The registration board appointed by the Governor consists at the present time of the following members:

A. M. Smith, Chairman, State Engineer, Carson City, appointed first in July, 1939.

S. G. Palmer, Secretary, Dean of College of Engineering, University of Nevada, Reno, appointed first in July, 1941.

A. J. Shaver, Resident Engineer, Colorado River Commission, Las Vegas, appointed first in July, 1939.

W. H. Settelmeyer, Elko County Surveyor, Elko, appointed first in July, 1939.

H. D. Mills, Assistant State Highway Engineer, Carson City, appointed first in July, 1941.

During the period from July 1, 1946, through June 30, 1948, 108 applications were approved of the 164 received, 35 were withdrawn, rejected, or dropped for failure of applicant to appear for examination, and 21 are pending. Sixteen of the licensed engineers have died; 32 dropped for nonpayment of renewal fees or resignation, and five who were dropped for nonpayment of renewal fees have been reinstated.

At the present time there are a total of 464 Registered Engineers and Land Surveyors. Of these 253 are Nevada residents and 211 reside in other States.

The division of classifications is as follows: Architects, 19; Chemical, 15; Civil, 199; Electrical, 38; Geological, 17; Highway, 23; Land Surveyors, 166; Mechanical, 65; Mining, 132; Structural, 23; Miscellaneous, 28.

The distribution of Registered Engineers and Land Surveyors residing in Nevada is as follows:

Churchill County—Fallon	4
Clark County—Las Vegas, Overton, Boulder City, Henderson	61
Douglas County—Gardnerville, Minden	2
Elko County—Elko	5
Esmeralda County—Goldfield	2
Eureka County—Eureka	2
Humboldt County—Winnemucca, Sulphur	7
Lander County	0
Lincoln County—Pioche, Bristol Silver, Panaca	5
Lyon County—Wellington, Yerington	5
Mineral County—Hawthorne, Mina	2
Nye County—Tonopah, Gabbs	8
Ormsby County—Carson City	34
Pershing County—Imlay, Lovelock	2
Storey County—Fernley, Virginia City	5
Washoe County—Reno, Sparks	92
White Pine County—Ruth, Kimberly, McGill, Ely	17
Total	253

The Engineer's Registration Law requires that the financial report be made by the calendar year. Therefore, the one that follows is from January 1, 1946, through December 31, 1947.

FINANCIAL REPORT

January 1, 1946, Through December 31, 1947

Bank balance, January 1, 1946		$1,726.21
RECEIPTS		
Fees and bond interest, Jan. 1–Dec. 31, 1946	$2,182.50	
Fees and bond interest, Jan. 1–Dec. 31, 1947	2,069.85	
		4,252.35
Total (receipts plus bank balance)		$5,978.56
DISBURSEMENTS		
Telephone calls	$41.45	
Office equipment	170.34	
Typewriter rental	49.50	
Office supplies	52.40	
Dues to National Council of State Boards of Engineering Examiners	75.00	
Stationery and printing	313.05	
Postage	281.76	
Salaries—Secretary, stenographic help	1,044.50	
Travel and per diem of board members for meetings	992.01	
Convention (National Council) secretary's trip	350.00	
Miscellaneous	20.00	
Refunds	144.00	
Checks returned	37.50	
Total disbursements		3,571.51
Total (receipts plus bank balance) less disbursements		$2,407.05
Bank balance, December 31, 1947		2,407.05

TOTAL ASSETS

Bank balance, December 31, 1947	$2,407.05
United States bonds	2,000.00
	$4,407.05

Until 1947 there was no specific Act relating to land surveyors. Such an Act was passed by the 1947 Legislature. This requires that any professional, practicing land surveyor in Nevada must be registered as a land surveyor, even though he holds other registration as a professional engineer. The law provides for the giving of the additional classification of land surveyor to those registered professional engineers in Nevada who applied for such classification not later than 30 days after notification by the board, and, in any event, not later than 90 days after the passage and approval of the Act. All others were required to take a written examination. At the present time there are 166 licensed land surveyors in the State of Nevada. Each County Recorder has been furnished with a list of the licensed land surveyors and with a supplementary list whenever additional surveyors are granted registration.

The amended law also requires that every applicant for registration as a professional engineer appear before the board for examination. The examination may be written or oral as determined by the board on the basis of applicant's education and experience.

CHAPTER XVI

Irrigation Districts and Companies

IRRIGATION DISTRICTS

Walker River Irrigation District; Pershing County Conservation District; Truckee-Carson Irrigation District, and Washoe County Water Conservation District.

IRRIGATION COMPANIES

Muddy River Irrigation Company; Preston Irrigation Company; Lund Irrigation Company; Bunkerville Irrigation Company; Mesquite Irrigation Company; Alamo Irrigation Company; Panaca Irrigation Company; Pacific Reclamation Company; Franktown Creek Irrigation Company, and Ash Springs Irrigation Company.

WALKER RIVER IRRIGATION DISTRICT

Officers—Wilbur Seyden, President; M. Dellamonica, Vice President; John H. Wichman, Treasurer; C. O. Gelmstedt, Secretary-Manager; Richard Day, Gus Williams, Directors; W. M. Kearney, Attorney.

Office at Yerington, Nevada.

Organized April 14, 1919.

Walker River Irrigation District comprises all the irrigable lands of the east, west and main Walker Rivers in the State of Nevada, with the exception of the Walker River Indian Reservation. These rivers have their source in the eastern slopes of the Sierra Nevada Mountains, drawing from a watershed of some 3,000 square miles. The total area of the district is 260,000 acres, of which 160,000 acres are irrigable. At the present time, 128,450 acres are held under private ownership of which 79,175 acres have water rights. The irrigated area is approximately 53,000 acres.

The outstanding bonded indebtedness of this district is now $264,000. These bonds carry an interest rate of 4 percent per annum and are all held by the Reconstruction Finance Corporation. They are scheduled to be redeemed over the period between now and the year 1965.

During the past two years, the activities of this district have consisted chiefly of operation and maintenance. However, notable improvements in the distribution and drainage systems are now under consideration.

A complete description of the operation and status of this district may be found in the 1934–1936 Biennial Report of the State Engineer.

PERSHING COUNTY CONSERVATION DISTRICT

Officers—Ruth C. Ruddell, President; Edward Garaventa, Vice President; Henry Anderson, Treasurer; John E. Holmstrom, Lester Hanson, Lester Munk, L. Arobio, Fred Nordman, Directors; Robert S. Leighton, Secretary-Manager; Jerry E. Wignall, Watermaster; Sanford A. Bunce, Attorney; Mrs. Alice Custer, Office Clerk.

Office at Lovelock, Nevada.

Organized February 1926.

This district has about 30,000 acres of irrigable lands within its

boundaries. Of this amount, 21,096 acres have decreed water rights. In the Lovelock Valley only about 11,600 acres of land having decreed rights are not included in the district. During the latter part of 1936 the Rye Patch Dam was completed on the Humboldt River. This structure is located about 23 miles northeast of Lovelock, and was built by the Bureau of Reclamation under a repayment contract dated October 1, 1934, with the Pershing County Water Conservation District. The history and description of this project was fully described by L. J. Foster, Construction Engineer, in an article appearing in the 1934–1936 Biennial Report.

The repayment contract mentioned above between the Bureau and the District provides that the total cost of the project shall be returned to the United States in 40 annual payments over a period of 40 years without interest charges. If the annual payments are not made when due, such payments carry a 6 percent interest charge.

The project consists of two salient features, namely, the construction of Rye Patch dam and the purchase of water rights and the making of river channel improvements in the Battle Mountain area. These features are discussed in the 1936–1938 Biennial Report.

TRUCKEE-CARSON IRRIGATION DISTRICT

Officers—Geo. G. Miller, President; J. C. Mall, Vice President; H. W. Emery, Secretary-Treasurer; W. A. Harmon, John Konda, Marvin Weishaupt, Donald Streiff, Mario Peraldo, Directors; Phil W. Hiibel, Project Superintendent; Andrew L. Haight, Attorney.

Office at Fallon, Nevada.

Organized November 25, 1918.

The Newlands Project, located in western Nevada, embraces lands mainly in Churchill and Lyon Counties. This project was the first of the numerous Federal projects to be investigated, and upon which construction work was commenced by the United States Reclamation Service under the Act of Congress, approved June 17, 1902, commonly known as the Reclamation Act. Actual construction work was commenced during September 1903, and water was delivered to project lands from the new system of works during 1905. The project was operated and maintained by the United States Bureau of Reclamation until December 31, 1926, on which date control was transferred to the Truckee-Carson Irrigation District under a contract dated December 18, 1926. The irrigation district was organized on November 25, 1918, under the laws of the State of Nevada.

WASHOE COUNTY WATER CONSERVATION DISTRICT

Officers—Edward M. Peckham, President; Robert J. Flick, Vice President; E. S. Yoakam, Secretary; Ernest Capurro, Treasurer; Ernest Kleppe, Carl Stoddard, C. J. Gault, Directors; Chester C. Taylor, Engineer-Manager; Charles M. Merrill, Attorney.

Office at 29 East First Street, Reno, Nevada.

Organized June 1929.

The Washoe County Water Conservation District was organized in pursuance of the provisions of that certain Act of the Legislature of the State of Nevada, known as the Nevada Irrigation District Act, on June 21, 1929, in Reno, Nevada.

Investigations were immediately started as to securing supplemental water for district members by virtue of upstream storage. On June 13, 1935, an agreement known as the Truckee River Agreement was approved by the United States Secretary of the Interior, this agreement being among five parties, namely, the United States of America, the Truckee-Carson Irrigation District, the Washoe County Water Conservation District, the Sierra Pacific Power Company, and other users of the waters of the Truckee River. Whereupon Boca Reservoir was constructed by the Bureau of Reclamation, at the mouth of the Little Truckee River. The capacity of the reservoir is 42,000 acre-feet and was constructed at a cost of $1,000,000, one-half of said cost to be paid back by Washoe County and the other half to be paid by the Conservation District over a repayment contract period with the Government of 40 years.

Inasmuch as distribution is handled by the Federal Water Master, most work entailed by the district are administrative and the operation and maintenance of Boca Reservoir. Flood control and storage along with regulation of the Truckee River flow are prime factors which are decided upon by this district in conjunction with other signatories of the Truckee River Agreement.

Boca Dam has proved to be a big factor in flood control on the Truckee River for amounts running from 90,000 acre-feet to 130,000 acre-feet per year are regulated and controlled through its needle valves.

MUDDY VALLEY IRRIGATION COMPANY

Officers—C. A. Lewis, President; Mads Jorgenson, Vice President; Durrell Evans, Secretary-Treasurer; Edwin Marshall, Louis Adams, Glenn Lee, Directors.

Office at Overton, Nevada.

PRESTON IRRIGATION COMPANY

Officers—J. R. Bradley, President; Wesley Reid, Vice President; Charles Funk, Secretary; Lowell Peterson, Clifford Peacock, Directors.

Office at Preston, Nevada.

Organized March 24, 1911.

LUND IRRIGATION COMPANY

Officers—Arthur Carter, President; George Fawcett, Vice President; Leland Hendrix, Secretary; Milton Gardner, Vance McKenzie, Directors.

Office at Lund, Nevada.

Organized 1907.

BUNKERVILLE IRRIGATION COMPANY

Officers—Ferlin Hunt, President; George Huntsman, Vice President; Merle Wittwer, Secretary-Treasurer.

Office at Bunkerville, Nevada.

Organized June 25, 1925.

MESQUITE IRRIGATION COMPANY

Officers—Dee Hughes, President; Luther Hafen, Vice President;

John Alfred Tobler, Secretary-Treasurer; Iren Tobler, Director; Max Hafen, Resident Agent.

Office at Mesquite, Nevada.

Organized June 8, 1925.

ALAMO IRRIGATION COMPANY

Officers—John P. Wright, President; Max Ercanbrack, Vice President; Dan Steward, Secretary-Treasurer; Roland Cox, Harvey Frehner, Directors.

Office at Alamo, Nevada.

Organized 1922.

PANACA IRRIGATION COMPANY

Officers—Job F. Hall, President; M. L. Wadsworth, Vice President; Francis C. Lee, Secretary-Treasurer; Charles H. Hansen, Allen Findley, Members.

Office at Panaca, Nevada.

PACIFIC RECLAMATION COMPANY

Officers—Ensign Hill, President; Wayne Bake, Vice President; Lawrence Bohne, Secretary-Treasurer; Clifford Hepworth, Watermaster.

Office at Metropolis, Nevada.

FRANKTOWN CREEK IRRIGATION COMPANY

Officers—Alvin Cliff, President; William Pedroli, Vice President; Henry Heidenreich, Secretary-Treasurer; George Leonard, John Jackson, Fred Cliff, R. F. I. Raymond, Directors; M. A. Diskin, Attorney.

Office at First National Bank Building, Reno, Nevada.

Organized 1947.

ASH SPRINGS IRRIGATION COMPANY

Officers—Gardner Chism, President; Edwin Higbee, Vice President; Leonard Wadsworth, Secretary-Treasurer; Lorin Bunker, Cyril Holaday, Directors.

Office at Alamo, Nevada.

Organized 1947.

CHAPTER XVII

Status of Applications Filed During the Period from July 1, 1946, to June 30, 1948

Following is a condensed statement giving the salient data in connection with applications filed during the period from July 1, 1946, to June 30, 1948, 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, 1948.

11625 7- 1-46 Floyd R. Lamb and Carlton P. Lamb; Black Rock Spring; Stockwatering and domestic;* Approved August 21, 1947, for 0.0063 c.f.s. G. S.

11626 7- 1-46 Floyd R. Lamb and Carlton P. Lamb; Unnamed Drainage Basin through Antelope Reservoir; Stockwatering and domestic;* Approved August 21, 1947, for sufficient water to water 200 head of cattle. G. S.

11627 7- 1-46 E. B. and Margie Grubb; Underground (Las Vegas Artesian Basin); Domestic; Approved October 16, 1946, for 0.2 c.f.s. G. S.

11628 7- 1-46 E. B. Grubb, et al.; waste water; Irrigation;* Approved April 28, 1947, for 0.6 c.f.s. G. S.

11629 7- 5-46 Miller Haynes Smith, Inc.; Underground (Las Vegas Artesian Basin); Manufacturing and domestic; Approved January 6, 1947, for 1.0 c.f.s. G. S.

11630 7- 5-46 Howard Bruce Wilbourn; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 3, 1947, for 1.0 c.f.s. G. S.

11631 7-10-46 C. J. and E. M. Lyons; Underground; Irrigation, domestic, and fire protection; Approved November 6, 1946, for 0.25 c.f.s. G. S.

11632 7-10-46 John F. Perkins and John G. Perkins; Seepage water; Irrigation; Approved June 2, 1947, for 2.0 c.f.s. G. S.

11633 7-11-46 Murray Wollman and Nate Mack; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved November 22, 1946, for 0.4 c.f.s. G. S.

11634 7-11-46 Murray Wollman and Nate Mack; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved November 22, 1946, for 0.4 c.f.s. G. S.

11635 7-15-46 H. J. W. Elges, Ervin Elges and Charles S. Foster; Unnamed Spring (Elges Spring); Domestic; No action.

11636 7-17-46 L. A. Woitishek; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved November 15, 1946, for 0.5 c.f.s. G. S.

11637 7-20-46 I. S. Kiehm; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.

11638 7-22-46 R. E. Harris; North Spring; Stockwatering; Approved December 18, 1946, for 0.003 c.f.s. G. S.

11639 7-23-46 Bonanza Lodge, Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved December 30, 1946, for 1.0 c.f.s. G. S.

11640 7-23-46 Sunrise Acres Water Association, Inc.; Underground (Las Vegas Artesian Basin); Municipal; Approved December 18, 1946, for 0.3 c.f.s. G. S.

11641 7-26-46 United States of America, Fish and Wild Life Service; Lamb Spring; Wild life watering purposes; Approved March 4, 1947, for 0.001 c.f.s. G. S.

11642 7-26-46 United States of America, Fish and Wild Life Service; Quartz Spring; Wild life watering purposes; Approved March 4, 1947, for 0.001 c.f.s. G. S.

11643 7-26-46 United States of America, Fish and Wild Life Service; Sheep Spring; Wild life watering purposes; Approved March 4, 1947, for 0.001 c.f.s. G. S.

11644 7-26-46 United States of America, Fish and Wild Life Service; Bootleg Spring; Wild life watering purposes;* Approved March 4, 1947, for 0.001 c.f.s. G. S.

*Protested application. G. S. Good standing.

11645.... 7–26–46....United States of America, Fish and Wild Life Service; Perkins Spring; Wild Life watering purposes; Approved March 4, 1947, for 0.001 c.f.s. G. S.

11646.... 7–26–46....United States of America, Fish and Wild Life Service; Deadman Springs; Wild life watering purposes; Approved March 4, 1947, for 0.002 c.f.s. G. S.

11647.... 7–26–46....United States of America, Fish and Wild Life Service; Wagon Spring; Wild life watering purposes; Approved March 4, 1947, for 0.001 c.f.s. G. S.

11648.... 7–26–46....Lee S. Smith; Cottonwood Creek; Irrigation; Withdrawn by applicant November 1, 1946.

11649.... 7–26–46....Merrill H. Gubler; Sheep Ranch Springs; Irrigation and domestic; Approved November 22, 1946, for 4.0 c.f.s. G. S.

11650.... 7–26–46....Wm. M. Stead; Cottonwood Creek; Irrigation and domestic; Approved November 15, 1946, for 500 a. f. G. S.

11651.... 7–27–46....Wm. M. Stead; Wilcox Creek Storage Reservoir; Irrigation and domestic; Approved November 15, 1946, for 500 a.f. G. S.

11652.... 7–27–46....Wm. M. Stead; Hay Canyon Creek Storage Reservoir; Irrigation and domestic; Approved November 15, 1946, for 500 a.f. G. S.

11653.... 7–27–46....James E. Stead; Aspen Creek Storage Reservoir; Irrigation and domestic; Approved November 15, 1946, for 500 a.f. G. S.

11654.... 7–27–46....James E. Stead; Twin Springs Creek Reservoir; Irrigation and domestic; Approved November 15, 1946, for 500 a.f. G. S.

11655.... 7–30–46....J. Cutten; Intermountain Mine; Irrigation, domestic, mill. No action.

11656.... 7–30–46....Leroy L. Smallwood; Carson River; Irrigation and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.

11657.... 8– 1–46....John Sutherland; Underground; Irrigation and domestic; Approved February 28, 1947, for 0.3 c.f.s. G. S.

11658.... 8– 3–46....John M. Beville and Helen Beville; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 29, 1946, for 0.3 c.f.s. G. S.

11659.... 8– 8–46....J. E. and C. R. Cavanaugh; Underground; Stockwatering;* Approved June 14, 1947, for 0.02 c.f.s. G. S.

11660.... 8– 9–46....Carlton P. Lamb and Floyd R. Lamb; Kihibab Spring; Stockwatering and domestic;* Approved August 21, 1947, for 0.0063 c.f.s. G. S.

11661.... 8–12–46....A. Marney; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 22, 1946, for 0.6 c.f.s. G. S.

11662.... 8–12–46....William F. May, Joseph H. Sandahl, William E. Daugherty, Sophie Moore, Clarence E. Lane and Floyd J. Behmer; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 11, 1947, for 0.175 c.f.s. G. S.

11663.... 8–12–46....W. J. Thomas; Underground; Irrigation and domestic; Approved September 24, 1947, for 2.0 c.f.s. G. S.

11664.... 8–12–46....Nevada Scheelite, Inc.; Underground; Mining, milling, and domestic; Approved December 9, 1946, for 0.25 c.f.s. G. S.

11665.... 8–13–46....Merrill M. Gubler; Green Springs; Irrigation and domestic; Approved November 22, 1946, for 1.6 c.f.s. G. S.

11666.... 8–16–46....F. Lorin Bunker; Grapevine Spring; Stockwatering and domestic;* No action.

11667.... 8–17–46....Marie Streshley, Edith Givens, and W. L. Petersen; Old Rock Cabin Spring; Stockwatering and domestic;* Approved March 26, 1947, for 0.047 c.f.s. G. S.

11668.... 8–19–46....Floyd R. Lamb and Carlton P. Lamb; Pony Spring; Stockwatering and domestic;* Approved August 21, 1947, for 0.0063 c.f.s. G. S.

11669.... 8–19–46....Floyd R. Lamb and Carlton P. Lamb; Lambs Pond; Stockwatering and domestic;* Approved August 21, 1947, for sufficient water to water 200 head of cattle. G. S.

11670.... 8–19–46....Cavanaugh Brothers; Underground; Stockwatering;* Approved June 14, 1947, for 0.02 c.f.s. G. S.

11671.... 8–19–46....Dr. J. N. Hartsock; Underground; Municipal and quasi-municipal; approved March 24, 1947, for 1.0 c.f.s. G. S.

11672.... 8–22–46....Kenneth F. Johnson; Logan Shoals Creek No. 2; Quasi-municipal; No action.

11673.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Irrigation and domestic; Approved December 5, 1946, for 3.0 c.f.s. G. S.

11674.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Stockwatering;* No action.

11675.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Stockwatering;* No action.

11676.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Stockwatering; Approved March 20, 1947, for .007 c.f.s. G. S.

11677.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Stockwatering; Approved March 7, 1947, for 0.007 c.f.s. G. S.

11678.... 8–24–46....Natalie F. Cornell and H. D. Cornell; Underground (Pahrump Artesian Basin); Stockwatering;* Approved March 7, 1947, for 0.007 c.f.s. G. S.

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*Protested application. G. S. Good standing.

11679.... 8–30–46....Wm. R. Weaver; Natural Spring; Stockwatering and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11680.... 8–30–46....J. O. Eads and Marian A. Eads; Natural Spring; Stockwatering and domestic; Approved November 14, 1947, for 0.002 c.f.s. G. S.
11681.... 8–30–46....J. O. Eads and Marian A. Eads; Natural Spring; Stockwatering and domestic; Withdrawn by applicant April 28, 1947.
11682.... 9– 4–46....Robinson Neeman; Unnamed Seeps; Quasi-municipal;* No action.
11683.... 9– 5–46....W. J. Hefler and J. B. O'Day; China Spring; Mining, milling, and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11684.... 9– 9–46....John and Alice Ross; Unnamed Spring and seepage; Quasi-municipal;* No action.
11685.... 9–11–46....Albert Jensen and M. E. Ray; Lime Creek; Power for mining and milling ore;* No action.
11686.... 9–12–46....D. J. White; Natural Spring; Stockwatering and domestic; Approved June 14, 1947, for 0.0023 c.f.s. G. S.
11687.... 9–14–46....H. R. Humphrey, E. J. Shirley, and Stanley Chiatovich; Underground; Stockwatering;* No action.
11688.... 9–14–46....H. R. Humphrey, E. J. Shirley, and Stanley Chiatovich; Underground; Stockwatering;* No action.
11689.... 9–14–46....H. R. Humphrey, E. J. Shirley, and Stanley Chiatovich; Underground; Stockwatering;* No action.
11690.... 9–16–46....Robert W. Harris and Merrill H. Peterson; Teepe Seep; Domestic and irrigation; Approved August 14, 1947, for 0.75 c.f.s. G. S.
11691.... 9–17–46....One Eleven Bar Cattle Co.; Dry Channel; Stockwatering;* No action.
11692.... 9–17–46....One Eleven Bar Cattle Co.; Dry Channel and Drainage; Stockwatering; Approved March 24, 1947, for 0.008 c.f.s. G. S.
11693.... 9–17–46....One Eleven Bar Cattle Co.; Dry Wash; Stockwatering and domestic;* Approved March 24, 1947, for 0.008 c.f.s. G. S.
11694.... 9–17–46....One Eleven Bar Cattle Co.; Underground; Stockwatering; Approved February 17, 1947, for 0.008 c.f.s. G. S.
11695.... 9–17–46....One Eleven Bar Cattle Co.; Underground; Stockwatering; Approved February 17, 1947, for 0.008 c.f.s. G. S.
11696.... 9–18–46....Jessie F. and Alexander Boyle; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 3, 1947, for 0.13 c.f.s. G. S.
11697.... 9–25–46....Pete Moore; Cranes Canyon Creek and tributaries; Irrigation and domestic;* No action.
11698.... 9–27–46....Ruth Botsford; Buck Creek and Senobia Creek; Irrigation; Approved February 10, 1947, for 2.0 c.f.s. G. S.
11699....10– 4–46....Bertrand Arambel; Underground; Stockwatering;* No action.
11700....10– 4–46....Bertrand Arambel; Underground; Stockwatering;* No action.
11701....10– 5–46....Fallini Brothers (E. W., Joe B., and R. A. Fallini); Twin Springs Wash; Stockwatering; Approved December 9, 1947, for 0.032 c.f.s. G. S.
11702....10– 5–46....V. E. Greenwald; Underground; Stockwatering; Approved September 17, 1947, for 0.005 c.f.s. G. S.
11703....10– 5–46....V. E. Greenwald; Timber Mountain Spring; Stockwatering; Approved September 17, 1947, for 0.005 c.f.s. G. S.
11704....10– 5–46....V. E. Greenwald; Underground; Stockwatering; Approved September 17, 1947, for 0.005 c.f.s. G. S.
11705....10– 5–46....David C. Bullock and Warren H. Bullock; (Tunnel No.1 and Tunnel No. 3); To change point of diversion and place of use; Stockwatering and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11706....10–10–46....Elda A., John T., and William Orr Gilcrease; Underground (Las Vegas Artesian Basin); To change point of diversion and place of use; Irrigation and domestic; Approved February 11, 1947, for 2.0 c.f.s. G. S.
11707....10–10–46....Elda A., John T., and William Orr Gilcrease; Underground (Las Vegas Artesian Basin); To change point of diversion and place of use; Irrigation and domestic; Approved February 11, 1947, for 2.0 c.f.s. G. S.
11708....10–10–46....E. L. Cord; Underground; Stockwatering; Approved March 11, 1947, for 0.0156 c.f.s. G. S.
11709....10–11–46....L. A. Woitishek; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved February 24, 1947, for 0.4 c.f.s. G. S.
11710....10–24–46....Ethyle A. Harrison; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved January 31, 1947, for 0.4 c.f.s. G. S.
11711....10–29–46....Eastland Heights Water Company; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved March 26, 1947, for 0.30 c.f.s. G. S.
11712....10–29–46....W. L. Petersen; Upper Smoky Valley Channel; Irrigation; Approved June 23, 1947, for 1.6 c.f.s. G. S.
11713....10–30–46....Constant Minerals Seperation Process, Inc.; Underground; Placer mining; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11714....11– 2–46....Bartholomae Corporation; Duckwater Creek; To change point of diversion and place of use; Irrigation; Approved February 19, 1947, for 1.19 c.f.s. G. S.

*Protested application. G. S. Good standing.

11715—11– 4–46—Charles J. McComb and Martha W. McComb; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 28, 1947, for 1.0 c.f.s. G. S.
11716—11– 6–46—T. A. Wells; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 4, 1947, for 0.3 c.f.s. G. S.
11717—11–12–46—Vernon S. Caples; Unnamed Spring; Domestic and medicinal; Approved April 8, 1947, for 0.10 c.f.s. Withdrawn by applicant October 20, 1947.
11718—11–14–46—Erastus L. Jones; Six Mile Spring; Stockwatering and domestic; Approved July 28, 1947, for 0.0125 c.f.s. G. S.
11719—11–16–46—W. L. and Beatrice M. Helm; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 11, 1947, for 0.5 c.f.s. G. S.
11720—11–18–46—Fay Bresnan; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved February 14, 1947, for 0.07 c.f.s. G. S.
11721—11–18–46—Emil Heineke; Wild Horse Spring; Mining, milling, and domestic; Approved November 14, 1947, for 1.0 c.f.s. G. S.
11722—11–20–46—William H. Barry; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 24, 1947, for 0.3 c.f.s. G. S.
11723—11–22–46—Christian P. Edwards; Underground; Irrigation and domestic; Approved September 17, 1947, for 1.2 c.f.s. G. S.
11724—11–25–46—Lory M. or Myrtle Joy Free; Underground; Irrigation; Approved March 20, 1947, for 1.61 c.f.s. G. S.
11725—11–26–46—Cyril O. Bastain; Flood waters; Stockwatering; Cancelled April 25, 1947, because of failure to refile corrected application within statutory time.
11726—11–26–46—The Rohr Company; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 25, 1947, for 0.4 c.f.s. G. S.
11727—11–26–46—The Rohr Company; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 25, 1947, for 0.4 c.f.s. G. S.
11728—11–29–46—A. J. Buyan; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved March 25, 1947, for 0.03 c.f.s. G. S.
11729—11–29–46—T. A. McCall; Big Spring; Irrigation and domestic;* No action.
11730—11–29–46—Vail Pittman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 28, 1947, for 0.5 c.f.s. G. S.
11731—12– 2–46—Harnedy and Dane; Underground; Irrigation and domestic; Approved May 19, 1947, for 0.04 c.f.s. G. S.
11732—12– 7–46—James A. Daniels; Minnesota Spring; Stockwatering; No action.
11733—12– 7–46—James A. Daniels; Unnamed Spring; Stockwatering; No action.
11734—12–16–46—Olive Craig; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 7, 1947, for 2.0 c.f.s. G. S.
11735—12–16–46—Dr. H. E. McKay and Celia McKay; Underground; Bathing and domestic; Withdrawn by applicant April 19, 1947.
11736—12–17–46—Louis Peterson; Diamond Spring; Domestic;* No action.
11737—12–17–46—Louis Peterson; Arrow Spring; Domestic;* No action.
11738—12–18–46—Eastland Water Co., Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved April 3, 1947, for 1.0 c.f.s. G. S.
11739—12–23–46—J. H. Cornell; Underground; Stockwatering;* No action.
11740— 1– 6–47—Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
11741— 1– 6–47—Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
11742— 1– 6–47—Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; Approved April 13, 1948, for 3.0 c.f.s. G. S.
11743— 1– 6–47—Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
11744— 1–10–47—William B. Mainor; Waste water; Irrigation; Approved May 19, 1947, for 0.80 c.f.s. G. S.
11745— 1–10–47—Roland H. Wiley; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 21, 1947, for 0.05 c.f.s. G. S.
11746— 1–10–47—Herman J. Hoffman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved May 10, 1947, for 1.0 c.f.s. G. S.
11747— 1–10–47—Herman J. Hoffman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved May 10, 1947, for 1.0 c.f.s. G. S.
11748— 1–10–47—E. Edwards; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved May 10, 1947, for 0.07 c.f.s. Poor standing.
11749— 1–10–47—Clark Barton and Harold Henry; Freeman Creek; Irrigation; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11750— 1–10–47—Clark Barton and Harold Henry; Box Canyon Creek; Irrigation; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.
11751— 1–13–47—Petan Company; Circle and/or Duck Creek; Irrigation; Approved August 14, 1947, for 1,500 a.f. G. S.

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*Protested application. G. S. Good standing.

11752.... 1-14-47....Dudley H. Fay; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved May 19, 1947, for 0.2 c.f.s. G. S.

11753.... 1-15-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini); Twin Springs Wash; Stockwatering; Approved September 17, 1947, for 0.032 c.f.s. G. S.

11754.... 1-15-47....Nathan Realty Company; Underground; Cooling air conditioners; Approved April 28, 1947, for 0.25 c.f.s. G. S.

11755.... 1-15-47....Nathan Realty Company; Underground; Drinking water; Approved April 28, 1947, for 0.001 c.f.s. G. S.

11756.... 1-17-47....Eureka Corporation, Ltd.; Underground; Mining, milling, and domestic; Approved October 18, 1947, for 3.0 c.f.s. G. S.

11757.... 1-22-47....B. E. Smith; Waste water; Irrigation; Approved July 1, 1947, for 0.05 c.f.s. G. S.

11758.... 1-22-47....R. E. Warburton and M. L. Warburton; Cold Spring; Stockwatering;* No action.

11759.... 1-23-47....Less Lytle, Freel Lytle, and Mrs. P. H. Devlin; Rose Valley Creek; Irrigation and domestic;* Approved May 12, 1948, for 3.5 c.f.s. G. S.

11760.... 1-23-47....John G. Barkley; White Rock Creek; Irrigation and domestic; Cancelled June 10, 1947, because of failure to refile corrected application within statutory time.

11761.... 1-24-47....Jos. Irving; Underground (Las Vegas Artesian Basin); Domestic and manufacturing; Approved June 14, 1947, for 0.1 c.f.s. G. S.

11762.... 1-26-47....Kauffman & Jensen, Inc.; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved June 2, 1947, for 0.4 c.f.s. G. S.

11763.... 2- 1-47....O. G. Hairgrove and A. F. Buck; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved May 19, 1947, for 0.05 c.f.s. G. S.

11764.... 2- 3-47....Howard Parish; Underground; Stockwatering and domestic; Approved April 11, 1947, for 0.0016 c.f.s. G. S.

11765.... 2- 4-47....James M. Daniels; Underground; Stockwatering;* No action.

11766.... 2- 6-47....William J. Stinson; Omco Spring; Stockwatering; No action.

11767.... 2- 6-47....William J. Stinson; Wild Rose Spring; Stockwatering; No action.

11768.... 2- 6-47....W. L. Fisk; Shady Run Canyon Springs; Domestic and Stockwatering;* No action.

11769.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; Willow Springs; Stockwatering;* No action.

11770.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; Silver Hill Canyon Creek; Stockwatering;* No action.

11771.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; I.X.L. Canyon Creek; Stockwatering;* No action.

11772.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; Alameda Canyon Spring; Stockwatering;* No action.

11773.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; The Rocks Spring; Stockwatering;* No action.

11774.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; Wood Canyon Spring; Stockwatering;* No action.

11775.... 2-10-47....Fallon Ice & Cold Storage Co., Inc.; White Rock Creek; Stockwatering; No action.

11776.... 2-10-47....Fallon Ice & Cold Storage Co., Inc., and Nate Merritt, Jr.; Hare Canyon; Stockwatering;* No action.

11777.... 2-10-47....Fallon Ice & Cold Storage Co., Inc.; Gold Creek; Stockwatering; No action.

11778.... 2-13-47....B. A. Saltzman; Underground (Las Vegas Artesian Basin); General hotel supply and domestic; Approved June 2, 1947, for 0.1 c.f.s. G. S.

11779.... 2-15-47....Arthur M. Perkins and LaPrele Perkins; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved May 26, 1947, for 0.22 c.f.s. G. S.

11780.... 2-15-47....Comet Coaltion Mines Co.; Underground; Mining, milling, and domestic; Approved July 15, 1947, for 2.0 c.f.s. G. S.

11781.... 2-18-47....Harvey S. Hale; Cow Creek; Irrigation;* No action.

11782.... 2-21-47....Mountain View Ranch; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 17, 1947, for 0.50 c.f.s. G. S.

11783.... 2-21-47....Mountain View Ranch; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 17, 1947, for 0.50 c.f.s. G. S.

11784.... 2-21-47....W. N. Hinson; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved June 2, 1947, for 0.25 c.f.s. G. S.

11785.... 2-21-47....H. C. Harris and Naomi M. Harris; Surface water from Las Vegas Wash; Irrigation; Approved August 20, 1947, for 0.25 c.f.s. G. S.

11786.... 2-24-47....Ethyle A. Harrison; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved July 15, 1947, for 0.10 c.f.s. G. S.

11787.... 2-24-47....H. N. Sharp; Goat Ranch Springs; To change point of diversion and place of use; Stockwatering and domestic;* Denied April 26, 1948, on the grounds of a misdescription of the location of the point of diversion and places of use as described in said application.

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*Protested application. G. S. Good standing.

11788 — 2-24-47 — C. F. Gartside; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved May 19, 1947, for 0.1 c.f.s. G. S.

11789 — 2-26-47 — Wayne L. Jenison and Bernice Jenison; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved June 23, 1947, for 0.10 c.f.s. G. S.

11790 — 3- 3-47 — Alma Woods; Surface flow from Monitor Valley; Stockwatering; Approved June 14, 1947, for 0.01 c.f.s. G. S.

11791 — 3- 5-47 — John P. Ames and Dorotha Ames; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved June 14, 1947, for 0.05 c.f.s. G. S.

11792 — 3- 5-47 — Floyd Burnett; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 5, 1947, for 0.25 c.f.s. G. S.

11793 — 3- 5-47 — Kent Land & Livestock Co.; Underground; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11794 — 3- 5-47 — Kent Land & Livestock Co., and Ira H. Kent; Underground; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11795 — 3- 5-47 — Kent Land & Livestock Co., and Ira H. Kent; Underground; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11796 — 3- 5-47 — Kent Land & Livestock Co.; West Lee Canon Spring; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11797 — 3- 5-47 — Kent Land & Livestock Co.; Underground; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11798 — 3- 5-47 — Kent Land & Livestock Co.; Side Hill Springs; Stockwatering and domestic; Approved October 28, 1947, for 0.03 c.f.s. G. S.

11799 — 3- 6-47 — Mato Kusick; Horseshutem Spring; Irrigation and domestic; Approved September 4, 1947, for 0.10 c.f.s. G. S.

11800 — 3- 7-47 — C. L. Hennon; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 15, 1947, for 0.8 c.f.s. G. S.

11801 — 3-11-47 — J. M. Raycraft; Underground; Irrigation; Approved August 22, 1947, for 3.0 c.f.s. G. S.

11802 — 3-11-47 — Sierra Pacific Power Company; Truckee River; To change the point of diversion, place and manner of use; Municipal and domestic; Approved June 1, 1948, for 2.38 c.f.s. G. S.

11803 — 3-12-47 — Shimayo Nagamatsu and Yoshiko Nagamatsu; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 5, 1947, for 1.0 c.f.s. G. S.

11804 — 3-12-47 — R. A. Yelland; Slough; Irrigation and domestic; Cancelled October 20, 1947, because of failure to refile corrected application within statutory time.

11805 — 3-14-47 — Marion Mahlon Green; Ferguson Spring; Stockwatering and domestic; Approved February 5, 1948, for 0.033 c.f.s. G. S.

11806 — 3-17-47 — Charles A. McKay; Underground; Irrigation;* Withdrawn by applicant April 2, 1948.

11807 — 3-17-47 — David M. Aitken; Underground; Irrigation and domestic; Approved January 7, 1948, for 0.10 c.f.s. G. S.

11808 — 3-17-47 — Charles and Elizabeth Hammond; Quail Seeps; Stockwatering and domestic; Approved September 26, 1947, for 0.0016 c.f.s. G. S.

11809 — 3-18-47 — Emma L. Oeder; Underground; Irrigation and domestic; Approved December 22, 1947, for 1.0 c.f.s. G. S.

11810 — 3-25-47 — V. E. Greenwald; Wagon Spring; Stockwatering; Approved September 17, 1947, for 0.005 c.f.s. G. S.

11811 — 3-25-47 — W. H. Thomas; Crane Creek; Placer mining and domestic; No action.

11812 — 3-25-47 — Dr. H. E. Jacobsen, S.M.; Allen Springs; Medicinal; Approved August 20, 1947, for 0.20 c.f.s. G. S.

11813 — 3-26-47 — Harold Allison; Barrel Spring; Stockwatering; Withdrawn by applicant September 26, 1947.

11814 — 3-31-47 — Frank E. and Olga Gowen; Laverne and Della Bork, and George B. and Jane G. Maxey; Underground; Domestic and irrigation; Approved July 15, 1947, for 0.4 c.f.s. G. S.

11815 — 4- 4-47 — Peter Piccoli and Toni Bruno; Waste water; Irrigation; Approved July 28, 1947, for 1.0 c.f.s. G. S.

11816 — 4- 4-47 — Fish & Wildlife Service; Willow Spring Creek; Fish cultural and domestic; Approved September 24, 1947, for 4.0 c.f.s. G. S.

11817 — 4- 4-47 — Fallon Ice and Cold Storage Co., Inc., and Nate Merritt, Jr.; Jobes Canyon; Stockwatering;* No action.

11818 — 4- 9-47 — Levi H. Irvin and Clara Irvin; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 22, 1947, for 0.1 c.f.s. G. S.

11819 — 4- 9-47 — John M. Starner; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 15, 1947, for 0.40 c.f.s. G. S.

11820 — 4-10-47 — Rubert R. Spencer; Spire Canyon Spring; Stockwatering;* No action.

11821 — 4-10-47 — Rubert R. Spencer; Pine Gulch Spring; Stockwatering;* No action.

11822 — 4-10-47 — Howard Turley; Crehore Basin Spring; Stockwatering;* No action.

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*Protested application. G. S. Good standing.

11823.... 4–10–47....Ray Van Horn; Underground; Irrigation; No action.
11824.... 4–11–47....Lawrence L. Warden and Lubertha Warden; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 5, 1947, for 0.25 c.f.s. G. S.
11825.... 4–11–47....Matley Brothers; Matley Creek; Irrigation and domestic; Approved December 11, 1947, for 2,000 a.f. G. S.
11826.... 4–11–47....Matley Brothers; Dry Valley Creek; Irrigation and domestic; No action.
11827.... 4–11–47....Matley Brothers; Dry Valley Creek; Irrigation and domestic; Approved December 11, 1947, for 1,000 a.f. G. S.
11828.... 4–11–47....Freda Carlson; Big Spring; Irrigation and domestic; Cancelled because of failure to submit supporting map. February 17, 1948.
11829.... 4–12–47....Old English Gold Corporation; Troy Creek; Power and domestic; Approved August 5, 1947, for 1.0 c.f.s. G. S.
11830.... 4–15–47....R. D. Gard; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 28, 1947, for 0.10 c.f.s. G. S.
11831.... 4–16–47....John H. Sexsmith; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 5, 1947, for 0.40 c.f.s. G. S.
11832.... 4–16–47....W. E. Norris; Dunn Glenn Creek; Irrigation and domestic; No action.
11833.... 4–17–47....James M. Staley; Bell Springs; Irrigation and domestic; Approved February 5, 1948, for 0.60 c.f.s. G. S.
11834.... 4–24–47....Edward L. Ouimet and Effie B. Ouimet; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 24, 1947, for 0.03 c.f.s. G. S.
11835.... 4–25–47....Alma Woods; Willow Creek; Stockwatering; Approved October 23, 1947, for 0.01 c.f.s. G. S.
11836.... 4–25–47....Alma Woods; Underground; Stockwatering;* Approved October 24, 1947, for 0.01 c.f.s. G. S.
11837.... 4–30–47....Joseph E. Metz and Josephine Metz; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 2, 1947, for 0.03 c.f.s. G. S.
11838.... 4–30–47....Vernon Young; Cow Camp Spring; Stockwatering; No action.
11839.... 4–30–47....Vernon Young; Rye Patch Spring; Stockwatering; No action.
11840.... 5– 1–47....R. A. Coffman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 20, 1947, for 0.25 c.f.s. G. S.
11841.... 5– 1–47....Mike Leatherwood; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 18, 1947, for 0.05 c.f.s. G. S.
11842.... 5– 2–47....Norman and Lester Shurtliff; Underground; To change the point of diversion and place of use; Irrigation; Approved November 18, 1947, for 3.0 c.f.s. G. S.
11843.... 5– 2–47....Freeman Ranch; Fondaway Canyon Spring; Stockwatering; No action.
11844.... 5– 2–47....Freeman Ranch; Tule Canyon Spring; Stockwatering; No action.
11845.... 5– 5–47....Loretta J. Hardy; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved September 4, 1947, for 0.05 c.f.s. G. S.
11846.... 5– 6–47....A. J. Blackley; Red Spring; Stockwatering; Approved October 18, 1947, for 0.007 c.f.s. G. S.
11847.... 5–10–47....Sierra Pacific Power Company; Truckee River; To change the point of diversion, place and manner of use; Municipal and domestic; Approved August 5, 1947, for 1.75 c.f.s. G. S.
11848.... 5–15–47....Ira Carter; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 18, 1947, for 0.25 c.f.s. G. S.
11849.... 5–15–47....Ira Carter; Duck Creek; Irrigation and domestic; Approved October 18, 1947, for 0.8 c.f.s. G. S.
11850.... 5–17–47....Charles W. Williams; Ute Springs; Domestic and irrigation; Approved December 2, 1947, for 1.0 c.f.s. G. S.
11851.... 5–17–47....Fish and Wildlife Service; Cold Creek; Fish culture and domestic;* No action.
11852.... 5–19–47....Wilbur Clark; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 18, 1947, for 0.5 c.f.s. G. S.
11853.... 5–21–47....H. F. Dangberg Land & Livestock Company; Underground; Irrigation and domestic; Approved September 10, 1947, for 6.69 c.f.s. G. S.
11854.... 5–22–47....Matley Brothers; Sugar Cane Springs; Irrigation; Approved December 11, 1947, for 6.00 c.f.s. G. S.
11855.... 5–23–47....Zephyr Cove Water Company; Lake Tahoe; Municipal and domestic; No action.
11856.... 5–28–47....Arthur Clarence Wiley; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved September 24, 1947, for 0.4 c.f.s. G. S.
11857.... 5–29–47....Van Horn and Stringfellow; Underground; To change the point of diversion and place of use; Irrigation; Approved October 24, 1947, for 3.0 c.f.s. G. S.
11858.... 5–29–47....Van Horn and Stringfellow; Underground; Irrigation; No action.
11859.... 5–29–47....Van Horn and Stringfellow; Underground; Irrigation; No action.

*Protested application. G. S. Good standing.

11860.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini); Underground; Stockwatering; Approved December 2, 1947, for 0.032 c.f.s. G. S.
11861.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini); Underground; Stockwatering; Approved December 2, 1947, for 0.032 c.f.s. G. S.
11862.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini) and Constant Vener; Underground; Stockwatering; Approved December 2, 1947, for 0.032 c.f.s. G. S.
11863.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini), and Constant Vener; George's Water Creek; Stockwatering; Approved December 2, 1947, for 0.032 c.f.s. G. S.
11864.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini), and Constant Vener; Underground; Stockwatering; No action.
11865.... 5-29-47....Fallini Brothers (E. W., Joe B., and R. A. Fallini), and Constant Vener; Kawich Valley Wash; Stockwatering;* No action.
11866.... 5-31-47....W. E. and Ruth a Saylor; Underground (Las Vegas Artesian Basin); Irrigation; Approved August 30, 1947, for 0.50 c.f.s. G. S.
11867.... 6- 2-47....M. A. Morley; Unnamed Spring; Mining and domestic;* No action.
11868.... 6- 4-47....A. C. Florio; Caribou Canyon Creek; Irrigation and domestic; Cancelled November 22, 1947, because of failure to refile corrected application within statutory time.
11869.... 6- 4-47....A. C. Florio; Caribou Canyon Creek; Stockwatering; Cancelled November 22, 1947, because of failure to refile corrected application within statutory time.
11870.... 6- 9-47....Kenneth F. Johnson; Underground; Quasi-municipal and domestic; No action.
11871.... 6- 9-47....Kenneth F. Johnson; Underground; Quasi-municipal and domestic; No action.
11872.... 6-11-47....Buffalo Valley Mines Company; Mill Creek; Mining, milling, and domestic; Approved October 30, 1947, for 1.0 c.f.s. G. S.
11873.... 6-13-47....Mrs. J. M. Butler; Underground; Stockwatering; No action.
11874.... 6-13-47....Smith-Petersen & Co.; Underground; Industrial, washing sand and gravel; Approved February 10, 1948, for 1.5 c.f.s. G. S.
11875.... 6-13-47....Constant Minerals Separation Process, Inc.; Underground; Placer mining and domestic; No action.
11876.... 6-16-47....James O. Greenan; Underground; Placer mining (dredging) and domestic; Approved December 11, 1947, for 3.5 c.f.s. G. S.
11877.... 6-18-47....McNeil Housing Company; Underground (Las Vegas Arteslan Basin); To change the point of diversion; Quasi-municipal and domestic; No action.
11878.... 6-18-47....Monitor Land & Livestock Co.; Stoneberger Creek; Irrigation and domestic; Approved May 12, 1948, for 5,000 a.f. G. S.
11879.... 6-20-47....Vicinti Jauristi; Unnamed Spring; Stockwatering;* No action.
11880.... 6-20-47....Vicinti Jauristi; Unnamed Spring; Stockwatering;* No action.
11881.... 6-20-47....Security Industrial Corporation; Little Juanita Spring; Mining and domestic; Approved October 30, 1947, for 1.0 c.f.s. G. S.
11882.... 6-20-47....J. A. Hail; Underground; Stockwatering and domestic; Approved October 30, 1947, for 0.025 c.f.s. G. S.
11883.... 6-24-47....Edwin S. Giles; Underground; Mining and milling; Approved April 19, 1948, for 1.0 c.f.s. G. S.
11884.... 6-25-47....Harold J. and Dorothy V. Fish; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved September 24, 1947, for 0.05 c.f.s. G. S.
11885.... 6-25-47....Walter Corkins; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved November 14, 1947, for 0.10 c.f.s. G. S.
11886.... 6-26-47....Laura Gentry (McGonigle and Gentry); Hartman's Tank; Stockwatering; Approved September 24, 1947, for 0.001 c.f.s. G. S.
11887.... 6-30-47....Francis R. Heher; Waste water; Irrigation and domestic; Approved December 2, 1947, for 0.80 c.f.s. G. S.
11888.... 7- 1-47....The Glenbrook Company; Lake Tahoe; Domestic; No action.
11889.... 7- 1-47....The Glenbrook Company; Lake Tahoe; Irrigation; No action
11890.... 7- 1-47....The Glenbrook Company; Lake Tahoe; Domestic; No action.
11891.... 7- 1-47....Mary C. Derby; Lake Tahoe; Domestic; No action.
11892.... 7- 1-47....Henry S. Russell and Caroline T. Russell; Lake Tahoe; Domestic; No action.
11893.... 7- 1-47....Ralph D. Brooks and Grace S. Brooks; Lake Tahoe; Domestic; No action.
11894.... 7- 1-47....J. R. Hooker; Lake Tahoe; Domestic; No action.
11895.... 7- 1-47....Maryly Krusi Taylor; Lake Tahoe; Domestic; No action.
11896.... 7- 1-47....Julius Bergen and Mary W. Bergen; Lake Tahoe; Domestic; No action.
11897.... 7- 1-47....James G. Noyes and Winifred T. Noyes; Lake Tahoe; Domestic; No action.
11898.... 7- 1-47....Maryly Krusi Taylor; Lake Tahoe; Domestic; No action.
11899.... 7- 1-47....J. E. Cook; Lake Tahoe; Domestic; No action.
11900.... 7- 1-47....Gwendolen Browne; Lake Tahoe; Domestic; No action.
11901.... 7- 1-47....H. R. Jepsen and Charlotte Jepsen; Lake Tahoe; Domestic; No action.
11902.... 7- 1-47....Edward S. Clark and Elizabeth C. Clark; Lake Tahoe; Domestic; No action.

*Protested application. G. S. Good standing.

11903 7- 1-47 Rebecca G. Soule and Ada G. Fraser: Lake Tahoe; Domestic; No action.
11904 7- 1-47 Amy Requie Russell; Lake Tahoe; Domestic; No action.
11905 7- 2-47 Josephine B. Dewey; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 24, 1947, for 0.05 c.f.s. G. S.
11906 7- 7-47 B. & L. Ranch; Underground; Irrigation;* No action.
11907 7- 7-47 Peter B. Cook, Jr.; Lake Tahoe; Domestic; No action.
11908 7- 8-47 Ida B. Pittman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
11909 7-10-47 Freda Westmoreland Heisler; Middle Indian Spring; Domestic; Approved December 26, 1947, for 0.10 c.f.s. G. S.
11910 7-10-47 A. J. Blackley; Willow Spring; Stockwatering; No action.
11911 7-10-47 A. J. Blackley; Sage Hen Spring; Stockwatering; No action.
11912 7-14-47 R. H. Bergstrom; Lake Tahoe; Domestic; No action.
11913 7-16-47 W. O. Brown; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 14, 1947, for 0.10 c.f.s. G. S.
11914 7-16-47 Graham R. Sirwell; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved December 9, 1947, for 0.15 c.f.s. G. S.
11915 7-17-47 Fallini Brothers (E. W., Joe B., and R. A. Fallini); Flood waters; Stockwatering; Approved December 2, 1947, for 0.033 c.f.s. G. S.
11916 7-17-47 St. Elmo Mining Co., Inc.; Cornwall Springs; Mining, milling, and domestic; Cancelled February 1, 1948, because of failure to refile corrected application within statutory time.
11917 7-18-47 Town of Gardnerville; Underground; Municipal and domestic; Approved March 15, 1948, for 5.0 c.f.s.
11918 7-18-47 C. C. Perrin; Burke Channel and its tributaries; Irrigation and domestic;* No action.
11919 7-21-47 Denzil D. McKinney; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 2, 1947, for 0.20 c.f.s. G. S.
11920 7-23-47 E. J. Shirley, Stanley Chiatovich and H. R. Humphrey; Barney Spring; Stockwatering; Cancelled January 3, 1948, because of failure to refile corrected application within statutory time.
11921 7-23-47 E. J. Shirley, Stanley Chiatovich and H. R. Humphrey; Mud Springs; Stockwatering; Cancelled January 3, 1948, because of failure to refile corrected application within statutory time.
11922 7-23-47 E. J. Shirley, Stanley Chiatovich and H. R. Humphrey; Inman Spring; Stockwatering; Cancelled January 3, 1948, because of failure to refile corrected application within statutory time.
11923 7-23-47 E. J. Shirley, Stanley Chiatovich and H. R. Humphrey; Coyote Spring; Stockwatering;* No action.
11924 7-23-47 E. J. Shirley, Stanley Chiatovich and H. R. Humphrey; Cave Spring; Stockwatering; Cancelled January 3, 1948, because of failure to refile corrected application within statutory time.
11925 7-23-47 The Glenbrook Company; Lake Tahoe; Domestic; No action.
11926 7-24-47 Madison Locke and H. L. Titus; Underground; Stockwatering;* No action.
11927 7-24-47 Madison Locke and H. L. Titus; Underground; Stockwatering;* No action.
11928 7-24-47 Madison Locke and H. L. Titus; Burnt Cabin Spring; Stockwatering;* No action.
11929 7-24-47 Madison Locke and H. L. Titus; Red Spring; Stockwatering;* No action.
11930 7-24-47 Madison Locke and H. L. Titus; Limestone Spring; Stockwatering;* No action.
11931 7-24-47 Madison Locke and H. L. Titus; Stingler Spring; Stockwatering;* No action.
11932 7-24-47 Madison Locke and H. L. Titus; Bassit Spring; Stockwatering;* No action.
11933 7-24-47 Madison Locke and H. L. Titus; Sand Springs Valley Wash (Narrows Catch Basin); Stockwatering;* No action.
11934 7-24-47 Madison Locke and H. L. Titus; Sand Springs Valley Wash (Lava Bed Catch Basin); Stockwatering;* No action.
11935 7-24-47 Madison Locke and H. L. Titus; Sand Springs Valley Wash (Logan Catch Basin); Stockwatering;* No action.
11936 7-24-47 Madison Locke and H. L. Titus; Sand Springs Valley Wash (Needles Catch Basin); Stockwatering;* No action.
11937 7-24-47 Madison Locke and H. L. Titus; Sand Springs Valley Wash; Stockwatering;* No action.
11938 7-24-47 Madison Locke and H. L. Titus; Tank Springs; Stockwatering;* No action.
11939 7-25-47 Re Organized Silver King Divide Mining Co.; Underground; Milling, mining, and domestic; Approved June 1, 1948, for 0.2 c.f.s. G. S.
11940 7-28-47 August Bunkowski; Drainage water; Irrigation and domestic;* No action.
11941 7-29-47 F. H. Baker; Underground; Irrigation and domestic; Approved November 14, 1947, for 0.103 c.f.s. G. S.
11942 7-30-47 Fred H. Callihan, Jr.; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 21, 1947, for 0.25 c.f.s. G. S.

*Protested application. G. S. Good standing.

11943.... 7–30–47....Gordon G. Hair; Underground; To change the point of diversion; Irrigation and domestic; No action.
11944.... 8– 1–47....Re Organized Silver King Divide Mining Co.; Underground; Milling, mining, and domestic; Approved June 1, 1948, for 0.2 c.f.s. G. S.
11945.... 8– 2–47....Sierra Pacific Power Company; Truckee River; To change the point of diversion; place and manner of use; Municipal and domestic; Approved February 16, 1948, for 1.441 c.f.s. G. S.
11946.... 8– 4–47....C. R. Moorman; Illipah Creek; To change the points of diversion; and place of use; Irrigation; Approved February 10, 1948, for 5/12 of the total flow of Illipah Creek. G. S.
11947.... 8– 4–47....C. R. Moorman; Illipah Creek; To change the point of diversion and place of use; Irrigation; Approved February 10, 1948, for one-third of the total flow of Illipah Creek. G. S.
11948.... 8– 4–47....H. M. Rich; Lake Tahoe; Domestic; No action.
11949.... 8– 4–47....William Waller Hawkins; Lake Tahoe; Domestic; No action.
11950.... 8– 4–47....Margaret C. Hawkins; Lake Tahoe; Domestic; No action.
11951.... 8– 6–47....August Bunkowski; Bunkowski Drainage Canal; Irrigation;* No action.
11952.... 8– 7–47....Charles W. Goodrich; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 19, 1948, for 0.6 c.f.s. G. S.
11953.... 8–11–47....Lewis Jones; Iceberg Springs; Culinary and domestic; Approved April 13, 1948, for 0.025 c.f.s. G. S.
11954.... 8–11–47....The St. Lawrence Mining Company; Unnamed Spring; Milling and domestic; No action.
11955.... 8–11–47....B. & L. Ranch; Truckee River; To change the point of diversion and place of use; Irrigation, domestic, and stockwatering;* No action.
11956.... 8–11–47....B. & L. Ranch; Truckee River; To change the point of diversion and place of use; Irrigation, domestic, and stockwatering;* No action.
11957.... 8–11–47....B. & L. Ranch; Steamboat Creek; To change the point of diversion and place of use; Irrigation and domestic;* No action.
11958.... 8–11–47....B. & L. Ranch; Truckee River; To change the point of diversion and place of use; Irrigation, domestic and stockwatering;* No action.
11959.... 8–13–47....Kenneth Amundson and Margaret Amundson; Lake Tahoe; Domestic; No action.
11960.... 8–13–47....A. R. Ruppert; Underground; Irrigation; Approved April 29, 1948, for 5.0 c.f.s. G. S.
11961.... 8–13–47....A. R. Ruppert; Underground; Irrigation; No action.
11962.... 8–13–47....Gerald D. Musser, Frank G. Snow, and Marvin Ray; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 2, 1947, for 0.10 c.f.s. G. S.
11963.... 8–14–47....G. I. Dumond & Co.; Toe Jam Canyon Creek; Mining and domestic; No action.
11964.... 8–14–47....D. V. Romeos; Billy Goat Spring; Stockwatering; No action.
11965.... 8–14–47....A. J. Blackley; Pinchot Spring; Stockwatering; No action.
11966.... 8–14–47....A. J. Blackley; Gap Spring; Stockwatering; No action.
11967.... 8–15–47....Louis Bartlett; Unnamed spring; Quasi-municipal and domestic;* No action.
11968.... 8–18–47....Clyde F. Mathews; Underground; Irrigation; Approved May 12, 1948, for 2.0 c.f.s. G. S.
11969.... 8–19–47....Lyle L. Frey; Charters Spring; Irrigation; No action.
11970.... 8–19–47....Fred J. DeLongchamps; Underground; Mining, milling, and domestic; Approved February 24, 1948, for 1.0 c.f.s. G. S.
11971.... 8–20–47....C. W. and Elyse E. Piper; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved November 14, 1947, for 0.05 c.f.s. G. S.
11972.... 8–22–47....Wayne Whitehead; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved November 14, 1947, for 0.12 c.f.s. G. S.
11973.... 8–22–47....Kenneth Lee; Underground; Irrigation and domestic; Approved January 8, 1948, for 3.0 c.f.s. G. S.
11974.... 8–22–47....Kenneth Lee; Underground; Irrigation and domestic; Approved January 8, 1948, for 1.0 c.f.s. G. S.
11975.... 8–22–47....Kenneth Lee; Underground; Irrigation and domestic; Approved January 8, 1948, for 1.0 c.f.s. G. S.
11976.... 8–22–47....Alice A. Hagarty; Lake Tahoe; Domestic; No action.
11977.... 8–26–47....Madison Locke and H. L. Titus; Shale Spring; Stockwatering;* No action.
11978.... 8–26–47....Robert J. Agee; North Fork of Salmon River; Irrigation;* No action.
11979.... 8–26–47....Robert J. Agee; Salmon River; Irrigation;* No action.
11980.... 8–26–47....Walter M. Gilmer; Sun Creek tributary; Irrigation;* No action.
11981.... 8–26–47....Walter M. Gilmer; Sun Creek; Irrigation;* No action.
11982.... 8–26–47....Walter M. Gilmer; Camp Creek; Irrigation;* No action.
11983.... 8–26–47....Walter M. Gilmer; Sun Creek; Irrigation; No action.
11984.... 8–26–47....Esther Teressa Boles; Cottonwood Creek; Irrigation;* No action.
11985.... 8–26–47....Esther Teressa Boles; Cottonwood Creek; Irrigation;* No action.
11986.... 8–26–47....Esther Teressa Boles; Cottonwood Creek; Irrigation;* No action.
11987.... 8–26–47....Albert H. Agee, O. F. Boles, and H. V. Agee; Salmon River; Irrigation; No action.
11988.... 8–26–47....Albert H. Agee; Dry Creek; Irrigation; No action.

*Protested application. G. S. Good standing.

11989.... 8-26-47.... James and Ida Compston; Minnehaha Spring; Stockwatering; Approved February 19, 1948, for 0.0165 c.f.s. G. S.
11990.... 8-26-47.... James and Ida Compston; Sheep Corral Springs; Stockwatering; Approved February 19, 1948, for 0.0165 c.f.s. G. S.
11991.... 8-28-47.... Black Bird Gold Mine, Inc.; Underground; Domestic and commercial use; Approved January 20, 1948, for 0.25 c.f.s. G. S.
11992.... 9- 1-47.... Elbert B. Edwards; Underground; Irrigation; Approved December 22, 1947, for 1.0 c.f.s. G. S.
11993.... 9- 1-47.... Mt. Wheeler Ranch; Underground; Irrigation; No action.
11994.... 9- 1-47.... Mt. Wheeler Ranch; Underground; Irrigation; No action
11995.... 9- 1-47.... Mt. Wheeler Ranch; Underground; Irrigation; No action
11996.... 9- 3-47.... James and Ida Compston; Deep Spring; Stockwatering; Approved February 19, 1948, for 0.0165 c.f.s. G. S.
11997.... 9- 3-47.... James and Ida Compston; China Spring; Stockwatering; Approved February 19, 1948, for 0.0165 c.f.s. G. S.
11998.... 9- 4-47.... Castle Mountain Mining Co.; Underground; Mining and milling; Approved June 1, 1948, for 2.0 c.f.s. G. S.
11999.... 9- 4-47.... Castle Mountain Mining, Inc.; Marshal Canyon Creek; Mining and milling; Approved June 1, 1948, for 2.0 c.f.s. G.S.
12000.... 9- 4-47.... M. H. Donald; Underground; Placer mining and domestic; Approved December 26, 1947, for 5.0 c.f.s. G. S.
12001.... 9- 6-47.... James O. Greenan; Willow Creek; To change the point of diversion; Placer mining (dredging) and domestic; Withdrawn by applicant November 8, 1947.
12002.... 9- 6-47.... Mrs. H. H. Heisler; Middle Indian Spring; Domestic and irrigation; Withdrawn by applicant December 1, 1947.
12003.... 9-10-47.... S. H. Manor; Jackson Spring; Stockwatering; Approved April 29, 1948, for 0.003 c.f.s. G. S.
12004.... 9-10-47.... S. H. Manor; Underground; Stockwatering; Approved April 29, 1948, for 0.003 c.f.s. G. S.
12005.... 9-10-47.... R. H. and Mary C. Burney; Lower Icehouse Spring; Stockwatering and domestic;* No action.
12006.... 9-10-47.... R. H. and Mary C. Burney; Upper Icehouse Spring; Stockwatering and domestic;* No action.
12007.... 9-15-47.... Freda Westmoreland Heisler; Upper Indian Spring; Domestic; Approved December 26, 1947, for 0.10 c.f.s. G. S.
12008.... 9-18-47.... E. T. Nollner; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 22, 1947, for 0.20 c.f.s. G. S.
12009.... 9-22-47.... Ransom V. Middaugh and Mary A. Middaugh; Underground; Irrigation and domestic; Approved June 1, 1948, for 2.0 c.f.s. G. S.
12010.... 9-22-47.... George S. Reed; Underground; Irrigation and domestic; No action.
12011.... 9-22-47.... George S. Reed; Underground; Irrigation and domestic; No action.
12012.... 9-22-47.... George S. Reed; Underground; Irrigation and domestic; Withdrawn by applicant March 1, 1948.
12013.... 9-22-47.... George S. Reed; Underground; Irrigation and domestic; Withdrawn by applicant March 1, 1948.
12014.... 9-23-47.... Roy A. Brown; Underground; Stockwatering;* No action.
12015.... 9-24-47.... A. C. Marshall; Orahana Spring; Stockwatering; No action.
12016.... 9-24-47.... A. C. Marshall; Cow Wells Spring; Stockwatering; No action.
12017.... 9-24-47.... A. C. Marshall; Underground; Stockwatering; No action.
12018.... 9-24-47.... A. C. Marshall; Underground; Stockwatering; No action.
12019.... 9-24-47.... A. C. Marshall; McCullough Spring; Stockwatering; No action.
12020.... 9-24-47.... A. C. Marshall; Underground; Stockwatering; No action
12021.... 9-24-47.... A. C. Marshall; Underground; Stockwatering; No action.
12022.... 9-24-47.... A. C. Marshall; Hyland Spring; Stockwatering; No action.
12023.... 9-25-47.... Associated Amusements Company; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved February 5, 1948, for 0.25 c.f.s. G. S.
12024.... 9-25-47.... United States of America, U. S. Forest Service; Lake Tahoe; Recreational and domestic; No action.
12025.... 9-25-47.... J. M. Smoot; Underground; Quasi-municipal and domestic; Approved February 5, 1948, for 0.4 c.f.s. G. S.
12026.... 9-25-47.... H. F. Dangberg Land & Livestock Company; Underground; Irrigation; Approved January 22, 1948, for 6.0 c.f.s. G. S.
12027.... 9-26-47.... Marie Anderson; Brown Station Spring; Stockwatering; Approved March 8, 1948, for 0.016 c.f.s. G. S.
12028.... 9-26-47.... Town of Minden; Underground; Municipal and domestic; Approved February 5, 1948, for 4.0 c.f.s. G. S.
12029.... 9-30-47.... Clara Corporation; Underground; Irrigation; No action.
12030.... 10- 1-47.... Abe P. and Linnea C. Miller; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved January 21, 1948, for 0.15 c.f.s. G. S.
12031.... 10- 1-47.... Jack and Virginia Barrett; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved January 31, 1948, for 0.05 c.f.s. G. S.
12032.... 10- 6-47.... S. H. Manor; Underground; Stockwatering; Approved April 29, 1948, for 0.003 c.f.s. G. S.
12033.... 10- 8-47.... Hugh H. Hunt; Lovelock drainage ditch; Irrigation and stockwatering; No action.

*Protested application. G. S. Good standing.

12034—10- 9-47—Harlan Brown and Ruth V. Brown; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 26, 1948, for 0.03 c.f.s. G. S.
12035—10- 9-47—James E. Brandon and Virginia A. Brandon; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 24, 1948, for 0.03 c.f.s. G. S.
12036—10- 9-47—Glen L. Churchill; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 5, 1948, for 0.12 c.f.s. G. S.
12037—10-11-47—Constant Vener; Willow Springs; Stockwatering; Approved January 20, 1948, for 0.0035 c.f.s. G. S.
12038—10-11-47—Constant Vener; Mule Shoe Spring; Stockwatering; Approved January 20, 1948, for 0.0035 c.f.s. G. S.
12039—10-11-47—Constant Vener; Cave Spring; Stockwatering; Approved January 20, 1948, for 0.0035 c.f.s. G. S.
12040—10-13-47—Alma Woods; Willow Creek; Irrigation; Approved February 13, 1948, for 2.0 c.f.s. G. S.
12041—10-13-47—Samuel Angus; Underground (Las Vegas Artesian Basin); Domestic and irrigation; Approved June 11, 1948, for 2.0 c.f.s. G. S.
12042—10-13-47—Samuel Angus; Underground (Las Vegas Artesian Basin); Domestic and irrigation; Approved June 11, 1948, for 2.0 c.f.s. G. S.
12043—10-14-47—Floyd R. Lamb and Carlton P. Lamb; Gold Spring; Stockwatering;* No action.
12044—10-14-47—Floyd R. Lamb and Carlton P. Lamb; Horse Spring; Stockwatering;* No action.
12045—10-14-47—W. R. Campbell; Underground; Domestic; No action.
12046—10-14-47—Louise Morrison; Mason Spring; Irrigation and domestic;* No action.
12047—10-14-47—John L. and Marion E. Harvey; Lake Tahoe; Domestic; No action.
12048—10-14-47—James Daniels; Cottonwood Spring; Stockwatering and domestic;* No action.
12049—10-14-47—James Daniels; Jeff Davis Spring; Stockwatering and domestic;* No action.
12050—10-15-47—A. C. Marshall; McClanahan Spring; Stockwatering; No action.
12051—10-15-47—A. C. Marshall; North Crescent Spring; Stockwatering; No action.
12052—10-17-47—Homer Black; Mohawk Canyon; Mining, milling, and domestic; No action.
12053—10-18-47—Glenn E. Womble and Ann E. Womble; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12054—10-20-47—G. F. Barkley, Jr.; Milton Canon Creek; Irrigation and domestic; No action.
12055—10-20-47—Constant Minerals Separation Process, Inc.; Rabbit Hole Springs; Mining, milling, and domestic; No action.
12056—10-20-47—H. Foster and Mary Wright Bain; Unnamed Spring; Irrigation and domestic; No action.
12057—10-22-47—Alma Woods; Reynolds Creek; Stockwatering;* No action.
12058—10-22-47—Alma Woods; Kelley Creek; Stockwatering;* No action.
12059—10-22-47—J. J. Ballard and Roy Persson; White's Creek; Irrigation;* No action.
12060—10-24-47—Vera E. Reed; Underground; Irrigation and domestic; No action.
12061—10-24-47—Vera E. Reed; Underground; Irrigation and domestic; No action.
12062—10-25-47—Constant Vener; Underground; Stockwatering;* No action.
12063—10-25-47—Constant Vener; Underground; Stockwatering;* No action.
12064—10-25-47—A. R. Tobey; Underground; Irrigation; Approved February 10, 1948, for 1.0 c.f.s. G. S.
12065—10-20-47—Bert M. Willey and Helen Willey; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 19, 1948, for 0.2 c.f.s. G. S.
12066—11- 1-47—W. W. Whitaker; Underground; Stockwatering; No action.
12067—11- 1-47—W. W. Whitaker; Underground; Stockwatering; No action.
12068—11- 3-47—R. B. Stewart; Greggs Canyon; To change the point of diversion; Irrigation; No action.
12069—11- 5-47—Lloyd Jones; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 13, 1948, for 0.4 c.f.s. G. S.
12070—11- 5-47—W. W. Birdzell; Underground; Irrigation and domestic; Approved April 13, 1948, for 2.0 c.f.s. G. S.
12071—11-10-47—Royal Leavitt; Virgin River; Irrigation and domestic; No action.
12072—11-14-47—Bess Westmoreland; Small Spring; Domestic; No action.
12073—11-14-47—The Ohio Mines Corporation; Cartier Spring; Mining, milling, and domestic; No action.
12074—11-14-47—Joe Capurro; Fulton Spring; Stockwatering and domestic; No action.
12075—11-15-47—Robert Calvin Gibson and Renee Gibson; Underground; Domestic and irrigation;* Approved February 24, 1948, for 1.0 c.f.s. G. S.
12076—11-15-47—M. E. Grout; Tamarisk Spring; Stockwatering;* No action.
12077—11-15-47—M. E. Grout; Underground; Stockwatering;* No action.
12078—11-15-47—M. E. Grout; Underground; Stockwatering;* No action.

*Protested application. G. S. Good standing.

12079—11-15-47—Wm. Fred Moon and Hattie G. Moon; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 19, 1948.
12080—11-15-47—Nora Rappaport; Underground; Quasi-municipal and domestic; Approved February 19, 1948, for 0.05 c.f.s. G. S.
12081—11-15-47—George Whittell; Zephyr and North Zephyr Cove Creeks and tributaries; Irrigation nad domestic; No action.
12082—11-15-47—George Whittell; South Fork of Zephyr Cove Creek and tributaries; Quasi-municipal; No action.
12083—11-15-47—George Whittell; Unnamed Springs and tributaries; Domestic; No action.
12084—11-15-47—George Whittell; Marlette Creek, Main North Fork and tributaries; Irrigation and domestic; No action.
12085—11-15-47—George Whittell; Marlette Creek, North Fork and Springs; Power and domestic; No action.
12086—11-15-47—George Whittell; Marlette Creek and tributaries; Power and domestic; No action.
12087—11-15-47—George Whittell; South Fork of Marlette Creek and tributaries; Power and domestic; No action.
12088—11-15-47—George Whittell; Fifth Creek and tributaries; Quasi-municipal and domestic; No action.
12089—11-15-47—George Whittell; Fourth Creek and tributaries; Quasi-municipal and domestic; No action.
12090—11-15-47—George Whittell; Sixth Creek and tributaries; Quasi-municipal and domestic; No action.
12091—11-15-47—George Whittell; Third Creek and tributaries; Quasi-municipal and domestic; No action.
12092—11-15-47—George Whittell; First Creek and tributaries; Quasi-municipal and domestic; No action.
12093—11-17-47—White Eagle Mining Company; Liberty Spring; Mining, milling, and domestic; Withdrawn by applicant November 25, 1947.
12094—11-17-47—White Eagle Mining Company; Unnamed Creek; Mining, milling, and domestic; Withdrawn by applicant November 25, 1947.
12095—11-17-47—Vestal Sprague, Lawrence Olson, and Richard C. Lofthus; China Spring; Mining, milling, and domestic; Withdrawn by applicant November 25, 1947.
12096—11-17-47—Elmer G. Jones; Steamboat Creek and Boynton Slough; Irrigation; No action.
12097—11-17-47—Carl S. Myers; Old Roman Spring; Stockwatering; No action.
12098—11-17-47—Carl S. Myers; Battle Ax Spring; Stockwatering; No action.
12099—11-17-47—Carl S. Myers; Rattlesnake Spring; Stockwatering; No action.
12100—11-19-47—Nevada Scheelite Inc.; Underground; Mining and milling; Approved April 29, 1948, for 0.5 c.f.s. G. S.
12101—11-19-47—Nevada Scheelite Inc.; Underground; Mining and milling; Approved April 29, 1948, for 0.5 c.f.s. G. S.
12102—11-19-47—Albert Romeo; Romeo Basin; Stockwatering;* No action.
12103—11-19-47—George Whittell; Second Creek and tributaries; Quasi-municipal and domestic; No action.
12104—11-19-47—Roy A. Brown; Underground; Irrigation and domestic; No action.
12105—11-20-47—Allison Smith; Underground; To change the manner and place of use of a portion of water under permit No. 10822; Stockwatering and domestic;* No action.
12106—11-20-47—Gabbs Valley Cattle Co.; Underground; Stockwatering and domestic;* No action.
12107—11-20-47—Gabbs Valley Cattle Co.; Paradise Springs; Stockwatering and domestic;* No action.
12108—11-20-47—Gabbs Valley Cattle Co.; Willow Springs; Stockwatering and domestic;* No action.
12109—11-21-47—Gordon M. Reid; Underground; Irrigation; No action.
12110—11-21-47—Seymour B. Rodgers, Dewey Alley, and Hugh Cost; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved February 19, 1948, for 0.1 c.f.s. G. S.
12111—11-24-47—Joseph V. and Anneta Snyder; Lake Tahoe; Domestic; No action.
12112—11-24-47—Charles H. Beckerman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 2, 1948, for 0.2 c.f.s. G. S.
12113—11-24-47—Charles H. Beckerman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 2, 1948, for 0.2 c.f.s. G. S.
12114—11-25-47—C. H. Baker and Arthur L. Baker; Dun Glen Creek; Mining and domestic; No action.
12115—11-29-47—James O. Greenan; Willow Creek; Placer Mining and domestic; No action.
12116—11-29-47—Roy Visbeek; Underground; Domestic and stockwatering;* No action.
12117—11-29-47—Roy Visbeek; Underground; Domestic and stockwatering;* No action.
12118—11-29-47—Richard R. Haman and Freeman E. Fairfield; Clouds; Irrigation; No action.
12119—12- 2-47—Gabbs Valley Cattle Co.; Obrien Springs; Stockwatering and domestic;* No action.
12120—12- 2-47—Gabbs Valley Cattle Co.; Pactola Springs; Stockwatering and domestic;* No action.

*Protested application. G. S. Good standing.

12121—12– 4–27—Thomas Buckley; Underground; Irrigation; No action.
12122—12– 4–47—W. J. Ford; Coyote Spring; Stockwatering;* No action.
12123—12– 5–47—W. E. Fitzgerald; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved May 12, 1948, for 0.2 c.f.s. G. S.
12124—12– 8–47—E. G. and Buelah A. Salyer; Underground; Stockwatering; No action.
12125—12–10–47—Basil Brewer and George A. Riley; Underground; Stockwatering; No action.
12126—12–10–47—C. G. Petrie and Clem Malone; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved March 15, 1948, for 0.50 c.f.s. G. S.
12127—12–11–47—Jesse Coleman Harris; Rio Virgin; Irrigation; No action.
12128—12–12–47—Angela Besso, Frank Besso, Emery Besso, and Carrie Besso; Truckee River; To change the point of diversion; Irrigation and domestic; No action.
12129—12–13–47—Darrough Brothers; Cove Creek; Irrigation and domestic; Approved April 29, 1948, for 7.2 c.f.s. G. S.
12130—12–16–47—Otto Curnow; Underground; Irrigation and domestic; No action.
12131—12–18–47—Ruth Cutten; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 13, 1948, for 1.0 c.f.s. G. S.
12132—12–19–47—Theodore R. Wall; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved May 12, 1948, for 1.0 c.f.s. G. S.
12133—12–19–47—Vern R. Parman and Ralph G. Parman; Underground; Irrigation and domestic; No action.
12134—12–19–47—Vern R. Parman and Ralph G. Parman; Underground; Irrigation and domestic; No action.
12135—12–20–47—J. R. Lewis; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved April 13, 1948, for 0.4 c.f.s. G. S.
12136—12–20–47—Malcolm E. Bean; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved April 13, 1948, for 0.05 c.f.s. G. S.
12137—12–22–47—Robert L. and Nellie J. Abbott; Rio Virgin; Irrigation and domestic; No action.
12138—12–22–47—Roy A. Brown; Underground; Stockwatering; No action.
12139—12–22–47—Roy A. Brown; Underground; Stockwatering; No action.
12140—12–22–47—Roy A. Brown; Underground; Stockwatering; No action.
12141—12–26–47—Clark County; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved March 31, 1948, for 0.25 c.f.s. G. S.
12142—12–26–47—Frank Millsap; Unnamed Spring; Irrigation and domestic; No action.
12143—12–27–47—Fallini Brothers (E. W., Joe B., and R. A. Fallini), and Constant Vener; Underground; To change the point of diversion and place of use; Stockwatering; No action.
12144—12–29–47—R. E. McCulley; Hidden Spring; Stockwatering and domestic; No action.
12145—12–29–47—R. E. McCulley; Rock Spring; Stockwatering and domestic;* No action.
12146—12–29–47—R. E. McCulley; Lost Spring; Stockwatering and domestic; No action.
12147—12–29–47—R. E. McCulley and Vesta McCulley; McCulley Spring; Stockwatering and domestic; No action.
12148—12–29–47—R. E. McCulley and Vesta McCulley; Martinson Spring No. 1; Stockwatering and domestic; No action.
12149—12–29–47—R. E. McCulley and Vesta McCulley; Martinson Spring No. 2; Stockwatering and domestic; No action.
12150— 1– 2–48—Mildred D. Wall; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12151— 1– 5–48—Wendell L. Leavitt; Rio Virgin; Irrigation; No action.
12152— 1– 6–48—T. A. McCall; White Mound Springs; Stockwatering and domestic;* No action.
12153— 1– 6–48—T. A. McCall; Underground (Arrastra Artesian Well); Stockwatering and domestic; No action.
12154— 1– 6–48—T. A. McCall; Underground; Stockwatering and domestic; No action.
12155— 1– 7–48—Desert Water Association; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved April 29, 1948, for 0.25 c.f.s. G. S.
12156— 1– 7–48—State of Nevada, Fish and Game Commission; Underground; Fish Propagation and domestic; No action.
12157— 1– 8–48—Washoe County; Spring No. 1; Fish culture and domestic; No action.
12158— 1– 8–48—Washoe County; Spring No. 2; Fish culture and domestic; No action.
12159— 1– 8–48—Washoe County; Spring No. 3; Fish culture and domestic; No action.
12160— 1– 8–48—Washoe County; Galena Creek; Fish culture; No action.
12161— 1– 8–48—W. F. Sauer; Unnamed Spring; Domestic;* No action.
12162— 1–13–48—Jerry R. Jacobs; Cottonwood Spring; Irrigation and domestic; Approved June 1, 1948, for 0.15 c.f.s. G. S.
12163— 1–13–48—Lewis F. Blann; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved May 12, 1948, for 0.1 c.f.s. G. S.
12164— 1–14–48—Clark Barton and A. E. Yost; Box Canyon Creek; Irrigation and domestic; No action.

*Protested application. G. S. Good standing.

12165 1-14-48 Clark Barton and A. E. Yost; Freeman Creek; Irrigation and domestic; No action.
12166 1-15-48 J. Karr; Choke Cherry Spring; Stockwatering; Withdrawn by applicant June 8, 1948.
12167 1-15-48 J. Karr; Mud Springs; Stockwatering and domestic; Withdrawn by applicant June 8, 1948.
12168 1-15-48 J. Karr; Morgan Spring; Stockwatering and domestic; No action.
12169 1-15-48 J. Karr; Summit Springs; Stockwatering and domestic; No action.
12170 1-16-48 Bartholomae Corporation; Underground; Irrigation and domestic;* No action.
12171 1-16-48 Bartholomae Corporation; Underground; Stockwatering and domestic;* No action.
12172 1-16-48 Bartholomae Corporation; Underground; Irrigation and domestic; No action.
12173 1-16-48 Bartholomae Corporation; Underground; Stockwatering;* No action.
12174 1-16-48 Bartholomae Corporation; Underground; Stockwatering;* No action.
12175 1-16-48 Bartholomae Corporation; Underground; Stockwatering;* No action.
12176 1-16-48 Bartholomae Corporation; Klobe Hot Springs Channel; Stockwatering;* No action.
12177 1-16-48 Bartholomae Corporation; Faulkner Creek Channel; Div. No. 1; Stockwatering;* No action.
12178 1-16-48 Bartholomae Corporation; Faulkner Creek Channel; Diversion No. 2; Stockwatering;* No action.
12179 1-16-48 Bartholomae Corporation; Daggett Creek; Stockwatering;* No action.
12180 1-16-48 Bartholomae Corporation; Dagget Creek; Stockwatering;* No action.
12181 1-16-48 Bartholomae Corporation; Dagget Creek; Stockwatering;* No action.
12182 1-16-48 Bartholomae Corporation; Allison Creek Diversion No. 1; Stockwatering;* No action.
12183 1-16-48 Bartholomae Corporation; Allison Creek Diversion No. 2; Stockwatering;* No action.
12184 1-16-48 Bartholomae Corporation; Sullivan Creek; Stockwatering;* No action.
12185 1-16-48 Bartholomae Corporation; Cockalorum Channel Diversion No. 1; Stockwatering;* No action.
12186 1-16-48 Bartholomae Corporation; Cockalorum Channel Diversion No. 2; Stockwatering;* No action.
12187 1-16-48 Bartholomae Corporation; Cockalorum Channel Diversion No. 3; Stockwatering;* No action.
12188 1-16-48 Bartholomae Corporation; Cockalorum and Fish Creek Valley Channels, Diversion No. 4; Stockwatering;* No action.
12189 1-16-48 Bartholomae Corporation; Fish Creek Valley Channel Diversion No. 5; Stockwatering;* No action.
12190 1-16-48 Bartholomoe Corporation; Fish Creek Valley Channel Diversion No. 6; Stockwatering;* No action.
12191 1-16-48 Bartholomae Corporation; Fish Creek Valley Channel Diversion No. 7; Stockwatering;* No action.
12192 1-16-48 Bartholomae Corporation; Fish Creek Valley Channel Diversion No. 8; Stockwatering;* No action.
12193 1-16-48 Bartholomae Corporation; Nine Mile Canyon Channel; and Antelope Valley Channel Diversion No. 1; Stockwatering;* No action.
12194 1-16-48 Bartholomae Corporation; Antelope Valley Channel Diversion No. 2; Stockwatering;* No action.
12195 1-16-48 Bartholomae Corporation; Antelope Valley Channel Diversion No. 3; Stockwatering;* No action.
12196 1-16-48 Bartholomae Corporation; Antelope Valley Channel Diversion No. 4; Stockwatering;* No action.
12197 1-16-48 Bartholomae Corporation; Antelope Valley Channel Diversion No. 5; Stockwatering;* No action.
12198 1-16-48 Bartholomae Corporation; Antelope Valley Channel Diversion No. 6; Stockwatering;* No action.
12199 1-16-48 Bartholomae Corporation; Fish Creek Well Canyon Channel Diversion No. 1; Stockwatering;* No action.
12200 1-16-48 Bartholomae Corporation; Fish Creek Well Canyon Channel Diversion No. 2; Stockwatering;* No action.
12201 1-16-48 Bartholomae Corporation; Fish Creek Well Canyon Channel Diversion No. 3; Stockwatering;* No action.
12202 1-16-48 Bartholomae Corporation; Fish Creek Well Canyon Channel Diversion No. 4; Stockwatering;* No action.
12203 1-16-48 Bartholomae Corporation; Fenstermaker Channel Diversion No. 1; Stockwatering;* No action.
12204 1-16-48 Bartholomae Corporation; Fenstermaker Channel Diversion No. 2; Stockwatering;* No action.
12205 1-16-48 Bartholomae Corporation; Fenstermaker Channel Diversion No. 3; Stockwatering;* No action.
12206 1-16-48 Bartholomae Corporation; Fenstermaker Channel Diversion No. 4; Stockwatering;* No action.

*Protested application. G. S. Good standing.

12207.... 1-16-48....Bartholomae Corporation; Fenstermaker Channel Diversion No. 5; Stockwatering;* No action.
12208.... 1-16-48....Bartholomae Corporation; Cedar Creek Channel Diversion No. 1; Stockwatering;* No action.
12209.... 1-16-48....Bartholomae Corporation; Cedar Creek Channel Diversion No. 2; Stockwatering;* No action.
12210.... 1-16-48....Bartholomae Corporation; Cedar Creek Channel Diversion No. 3; Stockwatering;* No action.
12211.... 1-16-48....Bartholomae Corporation; Antelope Meadow Channel Diversion No. 1; Stockwatering;* No action.
12212.... 1-16-48....Bartholomae Corporation; Antelope Meadow Channel Diversion No. 2; Stockwatering;* No action.
12213.... 1-16-48....Bartholomae Corporation; Fish Creek Channel; Stockwatering;* No action.
12214.... 1-17-48....John S. Field; Underground; Irrigation and domestic; Approved June 11, 1948, for 0.025 c.f.s. G. S.
12215.... 1-19-48....A. Nuti; Underground; Irrigation and domestic; No action.
12216.... 1-19-48....Ralph Windsor; Unnamed Spring; Irrigation; No action.
12217.... 1-19-48....Ralph Windsor; Roger Spring; Irrigation; No action.
12218.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12219.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12220.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12221.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12222.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12223.... 1-19-48....J. E. Stead and Marian M. Stead; Underground; Irrigation and domestic; No action.
12224.... 1-19-48....J. E. Stead and Marian M. Stead; Haden Spring; Irrigation and domestic; No action.
12225.... 1-21-48....A. J. Frade; Underground; Irrigation and domestic; No action.
12226.... 1-21-48....Henry S. Heidenreich; South Fork of Jumbo Canyon; Irrigation and domestic; No action.
12227.... 1-22-48....Elda A., John T., and William Orr Gilcrease; Underground (Las Vegas Artesian Basin); To change the point of diversion and place of use; Irrigation and domestic; Approved May 3, 1948, for 2.5 c.f.s. G. S.
12228.... 1-22-48....Frank W. and L. T. Bledsoe, Paul P. and Maria C. Kuvelis, and Ross R. and Ora O. Stine; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved June 1, 1948, for 0.1 c.f.s. G. S.
12229.... 1-23-48....John Tisdale; Rio Virgin; Irrigation and domestic; No action.
12230.... 1-23-48....The U. C. Land & Cattle Co.; Underground; Stockwatering; No action.
12231.... 1-23-48....The U. C. Land & Cattle Co.; Underground; Irrigation and domestic; No action.
12232.... 1-23-48....The U. C. Land & Cattle Co.; Underground; Irrigation and domestic; No action.
12233.... 1-23-48....The U. C. Land & Cattle Co.; Underground; Stockwatering; No action.
12234.... 1-25-48....John H. Blandford and Ida P. Blandford; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved June 1, 1948, for 0.03 c.f.s. G. S.
12235.... 1-26-48....James R. Clark; Robinson Creek and tributaries; Irrigation and domestic; No aciton.
12236.... 1-26-48....James R. Clark; Jim Bob Creek and tributaries; Irrigation and domestic; No action.
12237.... 1-26-48....John Jay Casey; Underground; Irrigation and domestic; No action.
12238.... 1-27-48....Muller Bros.; Farrington Spring; Stockwatering; No action.
12239.... 1-27-48....Mat Knecht; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved May 12, 1948, for 0.1 c.f.s. G. S.
12240.... 1-27-48....Martin C. Duffy; Underground; Mining, milling, and domestic; Approved June 1, 1948, for 1.0 c.f.s. G. S.
12241.... 1-29-48....St. Elmo Mining Co., Inc.; Cornwall Springs; Mining, milling, and domestic; No action.
12242.... 1-29-48....H. E. Rowntree; Underground; Irrigation and domestic; No action.
12243.... 1-30-48....W. J. Ford; Underground; Stockwatering and domestic;* No action.
12244.... 2- 4-48....Dale B. Perkins and G. M. Perkins; Underground; Irrigation; No action.
12245.... 2- 5-48....W. S. Watkins & Son; Underground; Industrial and domestic; Approved June 11, 1948, for 1.0 c.f.s. G. S.
12246.... 2- 6-48....Frank Thorley; Bob Hamilton Spring; Stockwatering; No action.
12247.... 2- 6-48....Frank Thorley; Rock Corral Spring; Stockwatering; No action.
12248.... 2- 9-48....J. R. Berns, Underground; Irrigation and domestic; No aciton.
12249.... 2- 9-48....Lester C. Mathews; Underground; Irrigation; No action.
12250.... 2-10-48....The U. C. Land & Cattle Co.; Underground; Domestic and stock-watering; No action.
12251.... 2-10-48....The U. C. Land & Cattle Co.; Underground; Domestic and stock-watering; No action.

*Protested application. G. S. Good standing.

12252 2-10-48 The U. C. Land & Cattle Co.; Underground; Domestic and stockwatering; No action.
12253 2-10-48 The U. C. Land & Cattle Co.; Underground; Domestic and stockwatering; No action.
12254 2-11-48 Ida E. Allen; Underground; Fish propagation and domestic; No action.
12255 2-11-48 Ida E. Allen; Underground; Stockwatering; No action.
12256 2-11-48 Melvin A. Robison and Melbourne A. Robison; Shingle Creek; Irrigation; No action.
12257 2-11-48 Frank Alexis; Underground; Stockwatering;* No action.
12258 2-11-48 Reorganized Silver King Divide Mining Co.; Gilbert's Creek; Mining and milling; No action.
12259 2-13-48 August Bunkowski; Bunkowski Drainage Canal; Irrigation;* No action.
12260 2-13-48 August Bunkowski; Bunkowski Drainage Canal; Irrigation;* No action.
12261 2-13-48 August Bunkowski; Bunkowski Drainage Canal; Irrigation;* No action.
12262 2-13-48 August Bunkowski; Underground; Stockwatering and domestic; No action.
12263 2-13-48 August Bunkowski; Underground; Stockwatering and domestic; No action.
12264 2-13-48 August Bunkowski; Underground; Stockwatering and domestic; No action.
12265 2-13-48 August Bunkowski; Underground; Stockwatering and domestic; No action.
12266 2-17-48 William F. Merchant; Underground; Irrigation and domestic; Approved June 11, 1948, for 0.6 c.f.s. G. S.
12267 2-17-48 William F. Merchant; Underground; Irrigation and domestic; Approved June 11, 1948, for 0.6 c.f.s. G. S.
12268 2-18-48 Orville C. Finley; Underground; Irrigation and domestic; No action.
12269 2-19-48 Norman D. Brown; Underground; Stockwatering; No action.
12270 2-19-48 Norman D. Brown; Underground; Stockwatering; No action.
12271 2-19-48 Norman D. Brown; Underground; Stockwatering; No action.
12272 2-19-48 Norman D. Brown; Underground; Stockwatering; No action.
12273 2-19-48 Norman D. Brown; Underground; Stockwatering and domestic; No action.
12274 2-21-48 Darrel R. Rytting; Unnamed Spring; Domestic; No action.
12275 2-24-48 F. M. Fulstone, Inc.; Underground; Irrigation and domestic; No action.
12276 2-24-48 F. M. Fulstone, Inc.; Underground; Irrigation and domestic; No action.
12277 2-24-48 F. M. Fulstone, Inc.; Underground; Irrigation and domestic; No action.
12278 2-24-48 F. M. Fulstone, Inc.; Underground; Irrigation and domestic; No action.
12279 2-25-48 Ora and Mildred S. Crawford; Underground; Quasi-municipal and domestic; No action.
12280 2-26-48 Plymouth Land and Stock Co.; Underground; Stockwatering and dipping; No action.
12281 2-26-48 Dugan S. and Mina S. Albright; Underground; Domestic and garden irrigation; No action.
12282 2-26-48 Jay Robb; Underground; Irrigation and domestic;* No action.
12283 2-27-48 Harvey S. Hale; Cow Creek; Irrigation; No action.
12284 2-28-48 Merrill H. Peterson; Ash Spring; Domestic and stockwatering; No action.
12285 3- 1-48 Roy Persson; Underground; Irrigation and domestic; No action.
12286 3- 1-48 William Robert Rogers; Underground; Irrigation and domestic; No action.
12287 3- 1-48 William Robert Rogers; Underground; Irrigation and domestic; No action.
12288 3- 1-48 William Robert Rogers; Underground; Irrigation and domestic; No action.
12289 3- 1-48 Tarr Land Company; Underground; Irrigation and domestic; No action.
12290 3- 1-48 Tarr Land Company; Underground; Irrigation and domestic; No action.
12291 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12292 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12293 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12294 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12295 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12296 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12297 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12298 3- 1-48 Paradise Valley Corporation; Underground; Irrigation and domestic; No action.

*Protested application. G. S. Good standing.

12299.... 3- 1-48....Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12300.... 3- 1-48....Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12301.... 3- 1-48....Maggie M. Wilkerson; Underground; Stockwatering and domestic; No action.
12302.... 3- 2-48....H. W. Parker; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12303.... 3- 3-48....E. J. and Anita Leveille; Underground; Stockwatering and domestic; No action.
12304.... 3- 3-48....G. C. Smith; Underground; Stockwatering and domestic; No action.
12305.... 3- 3-48....G. C. Smith; Underground; Stockwatering and domestic; No action.
12306.... 3- 3-48....Beatrice E. Hinds; Underground; Irrigation and domestic; No action.
12307.... 3- 3-48....Charles Groso; Underground; Stockwatering; No action.
12308.... 3- 3-48....Charles Groso; Underground; Domestic; No action.
12309.... 3- 3-48....Amos and Ettore Mencarini; Underground; Stockwatering and domestic; No action.
12310.... 3- 3-48....Helen Gubler; Meadow Valley Wash; Irrigation and domestic;* No action.
12311.... 3- 5-48....Harold's Club, Inc.; Underground; Air conditioning and general; No action.
12312.... 3- 5-48....Louise M. Kuser; Underground; domestic; No action.
12313.... 3- 8-48....H. L. Gepford; Underground; Irrigation and domestic; No action.
12314.... 3- 8-48....Cowles Brothers; Cottonwood Spring; Stockwatering and domestic; No action.
12315.... 3- 8-48....Cowles Brothers; North Cottonwood Spring; Stockwatering and domestic; No action.
12316.... 3-10-48....John W. Kelley and Bette C. Kelley; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; No action.
12317.... 3-10-48....John W. Kelley and Bette C. Kelley; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; No action.
12318.... 3-10-48....John W. Kelley and Bette C. Kelley; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; No action.
12319.... 3-10-48....Merrill H. Peterson; Chalk Spring; Domestic and Stockwatering; No action.
12320.... 3-12-48....United States of America, Forest Service; Dishrag Spring; To change the manner and place of use; Stockwatering; No action.
12321.... 3-12-48....G. C. McVicar; Underground; Irrigation; No action.
12322.... 3-12-48....G. C. McVicar; Underground; Irrigation; No action.
12323.... 3-12-48....G. C. McVicar; Underground; Domestic; No action.
12324.... 3-12-48....G. C. McVicar; Underground; Stockwatering and domestic; No action.
12325.... 3-12-48....G. C. McVicar; Underground; Domestic; No action.
12326.... 3-13-48....Nevada Chemical Company; Underground; Milling; No action.
12327.... 3-13-48....Nevada Chemical Company; Underground; Milling; No action.
12328.... 3-13-48....Nevada Chemical Company; Underground; Milling; No action.
12329.... 3-13-48....Nevada Chemical Company; Underground; Milling; No action.
12330.... 3-13-48....Louis Damonte; Truckee River; To change the place of use; Irrigation and domestic; No action.
12331.... 3-13-48....Joe Capurro; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12332.... 3-13-48....Louis Damonte; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; Withdrawn by applicant June 15, 1948.
12333.... 3-13-48....Joseph N. Filipelli; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; Withdrawn by applicant June 15, 1948.
12334.... 3-13-48....Wm. C. Avansino; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12335.... 3-13-48....H. E. Cafferata and John Granata; Truckee River; To change the place of use and point of diversion; Irrigation and domestic; No action.
12336.... 3-13-48....Frank Margrave; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12337.... 3-13-48....Frank DeLucchi; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12338.... 3-13-48....M. E. Cafferata; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12339.... 3-15-48....A. J. Schmid; Underground; Irrigation and domestic; No action.
12340.... 3-15-48....C. G. Wines; Underground; Irrigation and domestic; No action.
12341.... 3-15-48....Timothy Linscott; Underground; Stockwatering and Domestic; No action.
12342.... 3-15-48....F. W. Settelmeyer; Underground; Stockwatering and domestic; No action.
12343.... 3-15-48....C. F. Chidwick; Underground; Irrigation and domestic; No action.
12344.... 3-15-48....Lester M. Farias; Underground; Stockwatering and domestic; No action.
12345.... 3-15-48....Mrs. C. A. McVicar; Underground; Stockwatering and domestic; No action.

*Protested application. G. S. Good standing.

12346 — 3-15-48 — Mrs. C. A. McVicar; Underground; Stockwatering and domestic; No action.
12347 — 3-16-48 — S. V. Seddon; Underground; Stockwatering and domestic; No action.
12348 — 3-16-48 — S. V. Seddon; Underground; Stockwatering; No action.
12349 — 3-16-48 — Elizabeth Martin; Copenhagen Creek; Stockwatering; No action.
12350 — 3-17-48 — S. H. Manor; Underground; Stockwatering; No action.
12351 — 3-17-48 — S. H. Manor; Underground; Stockwatering; No action.
12352 — 3-17-48 — Mabel Batjer; Underground; Domestic; No action.
12353 — 3-17-48 — George Leonard; Underground; Irrigation; No action.
12354 — 3-20-48 — Fern L. Talcott; Underground; Irrigation and domestic; No action.
12355 — 3-23-48 — William M. Turner; Underground; Irrigation and domestic; No action.
12356 — 3-23-48 — Armando A. Francisco; Underground; Stockwatering;* No action.
12357 — 3-23-48 — Wells Power Company; Boulder Creek; Power generation; No action.
12358 — 3-23-48 — Wells Power Company; West Fork of Boulder Creek; Power generation; No action.
12359 — 3-23-48 — Wells Power Company; East Fork of Boulder Creek; Power generation; No action.
12360 — 3-25-48 — James M. Daniels; Dixon Spring; Stockwatering; No action.
12361 — 3-25-48 — James M. Daniels; Underground; Stockwatering; No action.
12362 — 3-25-48 — James M. Daniels; Stonewall Spring; Stockwatering; No action.
12363 — 3-25-48 — James M. Daniels; Underground; Stockwatering; No action.
12364 — 3-25-48 — James M. Daniels; Underground; Stockwatering; No action.
12365 — 3-25-48 — James M. Daniels; Gold Reef Spring; Stockwatering; No action.
12366 — 3-25-48 — J. B. Reynolds; Underground; Irrigation and domestic; No action.
12367 — 3-25-48 — J. B. Reynolds; Underground; Irrigation and domestic; No action.
12368 — 3-25-48 — J. B. Reynolds; Underground; Irrigation and domestic; No action.
12369 — 3-25-48 — J. B. Reynolds; Underground; Irrigation and domestic; No action.
12370 — 3-25-48 — The Roman Catholic Bishop of Reno; Underground; Irrigation, domestic, and fire protection; No action.
12371 — 3-25-48 — Central Mercantile; Underground; Domestic and commercial; No action.
12372 — 3-25-48 — Annie Fulstone; Underground; Irrigation; No action.
12373 — 3-25-48 — Frank B. Mann; Underground; Stockwatering and domestic; No action.
12374 — 3-25-48 — Bruno Fenili; Underground; Irrigation and domestic; No action.
12375 — 3-25-48 — Walter R. Schwake; Underground; Stockwatering and domestic; No action.
12376 — 3-25-48 — Andrew C. Sayre; Underground; Stockwatering and domestic; No action.
12377 — 3-25-48 — Andrew C. Sayre; Underground; Stockwatering; No action.
12378 — 3-25-48 — John H. Wichman; Underground; Stockwatering and domestic; No action.
12379 — 3-25-48 — Wines Bros.; Underground; Domestic and commercial; No action.
12380 — 3-25-48 — Warren Simpson; Underground; Stockwatering and domestic; No action.
12381 — 3-25-48 — Warren Simpson; Underground; Stockwatering; No action.
12382 — 3-26-48 — Emory Garrett; Mud Springs; Stockwatering; No action.
12383 — 3-26-48 — Emory Garrett; Old Sawmill Spring; Stockwatering; No action.
12384 — 3-26-48 — Carlton O. and W. E. Rouse; Seepage water; Irrigation; No action.
12385 — 3-26-48 — W. J. Stinson; Tuffly Spring; Irrigation and domestic; No action.
12386 — 3-26-48 — Marion R. McCann; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12387 — 3-29-48 — Dan J. Ronnow; Underground; Irrigation and domestic; No action.
12388 — 3-29-48 — C. D., D. L., and G. G. Stewart; Tunnel Spring No. 1; To change the place and manner of use; Stockwatering and domestic; No action.
12389 — 3-31-48 — Wilbur and Carl O. Rouse; Underground; Irrigation and domestic; No action.
12390 — 4- 1-48 — James H. Davis and W. B. McKnight; Docking Corrals Springs; Stockwatering and domestic; No action.
12391 — 4- 1-48 — James H. Davis and W. B. McKnight; Wagon Tire Springs; Stockwatering and domestic; No action.
12392 — 4- 1-48 — James H. Davis and W. B. McKnight; Unnamed Spring; Stockwatering and domestic; No action.
12393 — 4- 3-48 — A. D. Drumm, Jr.; Underground; Stockwatering and domestic;* No action.
12394 — 4- 3-48 — A. D. Drumm, Jr.; Underground; Stockwatering and domestic;* No action.
12395 — 4- 3-48 — J. Everett Clark, Allice B. Clark, William Everst Clark and John Everett Clark, Jr.; Underground; Quasi-municipal and domestic; No action.
12396 — 4- 3-48 — Lee E. Pitts; Unnamed Seep; Mining and milling; No action.

*Protested application. G. S. Good standing.

12397.... 4– 3–48....Congress Mining Company; Horseshutem Spring; Mining, milling and domestic; No action.
12398.... 4– 7–48....James T. McKay; Underground; Stockwatering and domestic; No action.
12399.... 4– 7–48....James T. McKay; Underground; Domestic; No action.
12400.... 4– 7–48....E. R. Larson and M. B. Larson; Underground; Mining; No action.
12401.... 4– 7–48....Louis G. Scatena; Underground; Irrigation and domestic; No action.
12402.... 4– 8–48....Cleo H. Bullard and Pauline M. Bullard; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; No action.
12403.... 4– 9–48....A. C. Dinsmore, J. L. McCoy, and Lyle Donohue; Little Log Spring; Mining and milling; No action.
12404.... 4– 9–48....A. C. Dinsmore, and John L. McCoy; Pigeon Spring; Mining and milling; No action.
12405.... 4–10–48....A. L. Varnes and T. C. Barber; Underground; Irrigation and domestic; No action.
12406.... 4–10–48....Eugene Besswanger; Underground; Irrigation and domestic; No action.
12407.... 4–10–48....Henry McCleary Timber Company; Unnamed stream; Irrigation and domestic; No action.
12408.... 4–10–48....E. L. Cord; Piper Spring; Stockwatering; No action.
12409.... 4–12–48....Palace Club; Underground; Domestic air conditioning; No action.
12410.... 4–12–48....John F. and Bernice E. Kincaid; Main Cottonwood Creek Spring; Stockwatering; No action.
12411.... 4–12–48....Albert H. Agee; Willow or Dry Creek; Irrigation; No action.
12412.... 4–12–48....Albert H. Agee; Salmon River; Irrigation; No action.
12413.... 4–14–48....E. L. Cord; East Ice House Spring; Stockwatering;* No action.
12414.... 4–17–48....James M. Daniels; Underground; Stockwatering; No action.
12415.... 4–17–48....Gallio Brothers; Underground; Irrigation and domestic; No action.
12416.... 4–17–48....Mrs. Leland Clair Easley; Main Cottonwood Creek Spring and tributaries to Cottonwood Channel; Irrigation and domestic; No. action.
12417.... 4–17–48....Alice Cardelli; Carson River; To change the point of diversion; Irrigation and domestic; No action.
12418.... 4–19–48....Fred L. Cole, Elcey Cole Williams, Florence Livingston, as executrix of the Estate of Florence L. Kirchen, deceased; Manhattan Gulch; Placer mining; No action.
12419.... 4–19–48....Fred L. Cole, Elcey Cole Williams; Florence Livingston, as executrix of the Estate of Florence L. Kirchen, deceased; Manhattan Gulch; Placer mining; No action.
12420.... 4–19–48....Fred L. Cole, Elcey Cole Williams; Florence Livingston, as executrix of the Estate of Florence L. Kirchen, deceased; Underground; Placer mining; No action.
12421.... 4–19–48....Fred L. Cole, Elcey Cole Williams, Florence Livingston, as executrix of the Estate of Florence L. Kirchen, deceased; Underground; Placer mining and domestic; No action.
12422.... 4–26–48....Vern R. Parman and Ralph G. Parman; Unnamed spring; Irrigation and domestic; No action.
12423.... 4–26–48....Vern R. Parman and Ralph G. Parman; Underground; Irrigation and domestic; No action.
12424.... 4–28–48....Meadows Water and Land Co., Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal; No action.
12425.... 4–29–48....A. W. and Hildreth Hannefield; Waste water; Irrigation; No action.
12426.... 5– 1–48....Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
12427.... 5– 1–48....Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
12428.... 5– 1–48....Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
12429.... 5– 1–48....Norman Shurtliff and Lester Shurtliff; Underground; Irrigation and domestic; No action.
12430.... 5– 1–48....Elizabeth Martin and Fernando Segura; Underground; Stockwatering; No action.
12431.... 5– 3–48....William J. Stinson; Lou Spring; Stockwatering; No action.
12432.... 5– 3–48....William J. Stinson; Simon Spring; Stockwatering; No action
12433.... 5– 3–48....William J. Stinson; Granite Springs; Stockwatering; No action.
12434.... 5– 4–48....Orville C. Finley; Schultz Spring; Irrigation and domestic; No action.
12435.... 5– 5–48....Jay Mathews and Sam Mathews; Underground; Irrigation; No action.
12436.... 5– 7–48....Chester Barton; Underground; Irrigation and domestic; No action.
12437.... 5– 8–48....E. J. Shirley, S. M. Chiatovich, and H. R. Humphrey; Inman Spring; Stockwatering and domestic; No action.
12438.... 5– 8–48....E. J. Shirley, S. M. Chiatovich and H. R. Humphrey; Barney Spring; Mining, stockwatering and domestic; No action.
12439.... 5– 8–48....Louise Semenza; Underground; Air conditioning and domestic; No action.

*Protested application. G. S. Good standing.

12440 — 5-11-48 — A. C. Sayre, Cora Sayre, and Andrew and Melvin Sayre; West Fork of Walker River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12441 — 5-12-48 — Round Mountain Gold Dredging Corporation; Underground; Mining, milling, and domestic; No action.
12442 — 5-12-48 — Round Mountain Gold Dredging Corporation; Underground Mining, milling, and domestic; No action.
12443 — 5-12-48 — Round Mountain Gold Dredging Corporation; Underground Mining, milling, and domestic; No action.
12444 — 5-12-48 — Round Mountain Gold Dredging Corporation; Underground Mining, milling, and domestic; No action.
12445 — 5-12-48 — Round Mountain Gold Dredging Corporation; Underground Mining, milling, and domestic; No action.
12446 — 5-13-48 — Constant Vener; Keystone Spring; Stockwatering; No action.
12447 — 5-13-48 — Constant Vener; Underground; Stockwatering; No action.
12448 — 5-17-48 — Jean A. Prentiss; Underground; Irrigation and domestic; No action.
12449 — 5-18-48 — A. C. Florio; Underground; Stockwatering and domestic; No action.
12450 — 5-18-48 — A. C. Florio; Underground; Irrigation and domestic; No action.
12451 — 5-19-48 — James M. Daniels; Valcalda Spring; Stockwatering and domestic; No action.
12452 — 5-19-48 — A. E. Hosack; Underground; Irrigation and domestic; No action.
12453 — 5-19-48 — A. E. Hosack; Underground; Irrigation and domestic; No action.
12454 — 5-19-48 — A. E. Hosack; Underground; Irrigation and domestic; No action.
12455 — 5-19-48 — A. E. Hosack; Underground; Irrigation and domestic; No action.
12456 — 5-19-48 — A. E. Hosack; Underground; Irrigation and domestic; No action.
12457 — 5-20-48 — C. D. Long; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12458 — 5-20-48 — Lawrence W. Perkins; Underground; Irrigation and domestic; No action.
12459 — 5-20-48 — Lawrence W. Perkins; Underground; Irrigation; No action.
12460 — 5-20-48 — Las Vegas Land and Water Company; Underground (Las Vegas Artesian Basin); Irrigation; No action.
12461 — 5-21-48 — Rudolph Schwartz; Underground; Irrigation and domestic; No action.
12462 — 5-24-48 — F. E. Hesselgesser, Jack B. Smith, and Erwin Hesselgesser; Underground; Irrigation and domestic; No action.
12463 — 5-24-48 — Myrl Y. Farnsworth; Underground; Irrigation and domestic; No action.
12464 — 5-24-48 — Myrl Y. Farnsworth; Underground; Irrigation and domestic; No action.
12465 — 5-25-48 — S. H. Hunewill & Co.; Underground; Stockwatering and domestic; No action.
12466 — 5-25-48 — S. H. Hunewill & Co.; Underground; Stockwatering and domestic; No action.
12467 — 5-27-48 — Minerva Scheelite Mining Company; Underground; Mining, milling, and domestic; No action.
12468 — 5-27-48 — William J. Stinson; Petrified Spring; Stockwatering; No action.
12469 — 5-27-48 — William J. Stinson; Iron Tank Spring; Stockwatering; No action.
12470 — 5-28-48 — B. R. and Barbara Russell; Underground; Irrigation and domestic; No action.
12471 — 6- 2-48 — Harrison Grove; Boyd Creek; Irrigation and domestic; No action.
12472 — 6- 2-48 — Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12473 — 6- 2-48 — Paradise Valley Corporation; Underground; Irrigation and domestic; No action.
12474 — 6- 2-48 — Lahontan Placers; Underground; Placer mining and domestic.
12475 — 6- 2-48 — Lewis E. Ball and/or Mable June Ball; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12476 — 6- 2-48 — John Benard and Ruth Wentz; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12477 — 6- 3-48 — Elizalde & Co., Ltd.; Amargosa River; Irrigation and domestic; No action.
12478 — 6- 4-48 — John F. and Bernice E. Kincaid; Wild Indian Spring; Stockwatering; No action.
12479 — 6- 4-48 — John F. and Bernice E. Kincaid; North Cottonwood Spring; Stockwatering; No action.
12480 — 6- 4-48 — John F. and Bernice E. Kincaid; Center Cottonwood Spring; Stockwatering; No action.
12481 — 6- 4-48 — John F. and Bernice E. Kincaid; South Cottonwood Spring; Stockwatering; No action.
12482 — 6- 4-48 — John F. and Bernice E. Kincaid; West Fork Indian Creek Spring; Stockwatering; No action.
12483 — 6- 5-48 — W. T. Stewart; Underground; Stockwatering; No action.
12484 — 6- 5-48 — El Rancho Amigo; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12485 — 6- 5-48 — El Rancho Amigo; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12486 — 6- 5-48 — El Rancho Amigo; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12487 — 6- 8-48 — Joe Filippini; Underground; Irrigation and domestic; No action.

*Protested application. G. S. Good standing.

12488 6-10-48 Arthur E. Gray and Agnes Leinsteiner; Amargosa Hot Springs; To change the point of diversion and place of use; Irrigation and domestic; No action.
12489 6-10-48 Arthur E. Gray and Agnes Leinsteiner; Underground; Irrigation, domestic, and bathing; No action.
12490 6-10-48 Mark M. Butler; Lynn Creek; Placer mining; No action.
12491 6-10-48 D. G. Lorenzi; Underground (Las Vegas Artesian Basin); Quasi-municipal; No action.
12492 6-10-48 Wayne Gardner and Cannon Gardner; Underground; Irrigation; No action.
12493 6-10-48 Ernest H. Gubler; Underground; Irrigation; No action.
12494 6-10-48 Joe Capurro; Truckee River; To change the point of diversion and place of use; Irrigation and domestic; No action.
12495 6-10-48 Joe Capurro; Truckee River; To change the place of use; Irrigation; No action.
12496 6-10-48 Joe Capurro; Truckee River; To change the point of diversion and place of use; Irrigation; No action.
12497 6-10-48 Joe Capurro; Truckee River; To change the point of diversion and place of use; Irrigation; No action.
12498 6-11-48 Henry Seeman; Waste water; Irrigation; No action.
12499 6-14-48 Lund Irrigation Company; Waste water; Irrigation and domestic; No action.
12500 6-15-48 K. W. Raymond; Underground; Irrigation and domestic; No action.
12501 6-15-48 Bernice H. Raymond; Underground; Irrigation and domestic; No action.
12502 6-15-48 Ada H. Jefferson; Underground; Irrigation and domestic; No action.
12503 6-15-48 Louis Perozzi; Underground (Las Vegas Artesian Basin); To change the manner of use; Irrigation and domestic; No action.
12504 6-16-48 Henry K. Sakai; Underground (Las Vegas Artesian Basin); Irrigation and domestic; No action.
12505 6-16-48 Emma G. Rogers and Harry E. Rogers; Underground; Stockwatering; No action.
12506 6-16-48 Emma G. Rogers and Harry E. Rogers; Underground; Stockwatering; No action.
12507 6-18-48 Hugh C. Crutchfield; Underground; Irrigation and domestic; No action.
12508 6-18-48 Hugh C. Crutchfield; Underground; Irrigation and domestic; No action.
12509 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Wolf Hole Spring; Stockwatering; No action.
12510 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Red Rock Spring; Stockwatering; No action.
12511 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Pine Spring; Stockwatering; No action.
12512 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Rye Grass Spring; Stockwatering; No action.
12513 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Canyon Spring; Stockwatering; No action.
12514 6-18-48 Byron A. Ercanbrack, Lowell M. Ercanbrack, and Max W. Ercanbrack; Mustang Reservoir; Stockwatering; No action.
12515 6-23-48 Marvin B. and Lucy K. Humphrey; Lake Tahoe; Domestic; No action.
12516 6-25-48 J. H. Gates, E. J. Kearns, Lewis E. Walton, Grace Hayes, and Bill Doches; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; No action.
12517 6-28-48 Clair Whipple; White River and Hot Creek Channel; Irrigation; No action.
12518 6-28-48 Nevin Munson; White River; Irrigation; No action.
12519 6-29-48 Security Industrial Corporation; Juanita Big Spring; Ore milling and domestic; No action.

*Protested application. G. S. Good standing.

CHAPTER XVIII

Status of Applications Filed Prior to July 1, 1946

Following is a condensed statement giving the salient data in connection with applications filed prior to July 1, 1946, upon which action has been taken during the present biennium, 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, 1946.

2227 10- 7-11 Archie R. Clayton; Peterson Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

2228 10- 7-11 Archie P. Clayton; Pratt Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

*2322 1-22-12 J. E. Akin and Mattie Akin; Unnamed spring; Irrigation and domestic; Cancelled May 27, 1942, because of failure of applicant to comply with the provisions of permit.

*2344 2-19-12 Chas. W. Clubine; Sherman Creek; Irrigation and domestic; Cancelled August 10, 1944, because of failure of applicant to comply with provisions of permit.

2593 12-28-12 Diana Murphy Hill; North Fork of Humboldt River; Domestic and irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2594 12-28-12 Diana Murphy Hill; North Fork of Humboldt River; Domestic and irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2595 12-28-12 Diana Murphy Hill; Foreman Creek; Domestic and irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2596 12-28-12 Diana Murphy Hill; Foreman Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2597 12-28-12 Diana Murphy Hill; North Fork of Humboldt River; Domestic and irrigation; Denied December 16, 1946, on the ground that there is no unappropriated water during the irrigation season.

2601 1- 3-13 Diana Murphy Hill; North Fork of Humboldt River; Domestic and irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2602 1- 3-13 Diana Murphy Hill; Main Foreman Creek; Irrigation and domestic; Denied December 16, 1946, on the ground that there is no unappropriated water during the irrigation season.

2603 1- 3-13 Diana Murphy Hill; Dry Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

2702 5- 2-13 D. R. Corbett; Kitridge Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3034 7-10-14 Elko Water & Light Corporation; Kitridge Creek or Canon and tributaries; domestic and town supply purposes; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3202 12- 9-14 C. R. Fuller; Ten Mile Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

*3255 1-27-15 Elenor Miriam Langwith (Assigned to Margaret Angea Langwith); Humboldt River; Irrigation; Cancelled February 1, 1945, because of failure of applicant to comply with the provisions of permit.

3305 3-16-15 Neil N. Gergen; Mitchell Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

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*Omitted in previous Biennial Reports.

3389 5-10-15 Manuel Erro and Miguel Murillo; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3518 7-20-15 Geo. Hennen; Dry Creek; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water in the source.

3519 7-20-15 Alex B. Carden; Dry Creek; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water in the source.

*3681 11- 6-15 Sylvain Siard, (Assigned to Blanche Siard); Unnamed spring; Irrigation and domestic; Cancelled January 1, 1938, because of failure of applicant to comply with provisions of permit.

*3712 11-23-15 Blanche Siard; Unnamed spring; Irrigation and domestic; Cancelled January 1, 1938, because of failure of applicant to comply with provisions of permit.

3805 2-19-16 Jay H. Clemons; Taber Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3829 3-13-16 Louis B. Hamre; Lamoille Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3843 3-23-16 John W. Puett; Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

*3867 4- 6-16 Baker Livestock Company (Assigned to Earl Edgar and Dolores Edgar); Cal Young Canyon; Irrigation; Cancelled June 17, 1936, because of failure of applicant to comply with provisions of permit.

*3938 4-26-16 John C. Visby (Assigned to Phebe Giroux); McAfee Creek; Irrigation and domestic; Withdrawn March 2, 1937.

3966 5- 9-16 Frank C. Strange (Assigned to William Becker); Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3972 5-12-16 Joe H. Persons; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3975 5-15-16 M. J. Rand; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

3976 5-15-16 Jas. Paxman; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4005 6- 6-16 F. G., L. Z. Elliott, and J. Ravella; Seitz or Rabbit Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4012 6-12-16 Gemma Deni; Humboldt River; Irrigation; Denied May 1, 1947, on the grounds that there is no unappropriated water in the source.

4027 6-19-16 Addiline T. Bellinger; South Fork of Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

4140 9- 8-16 D. E. Jones; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4175 10- 6-16 P. E. Pollard and Paul C. Winter; (Assigned to Carroll Henderson and Frank C. Strange); Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4191 10-18-16 J. E. Williams and F. A. Travis; (Assigned to Production Credit Corp. of Berkeley, Calif.); South Fork of Humboldt River; Irrigation and domestic; Denied May 1, 1947, on the grounds that there is no unappropriated water in the source.

4192 10-18-16 J. E. Williams and F. A. Travis; South Fork of Humboldt River; Irrigation and domestic; Denied May 1, 1947, on the grounds that there is no unappropriated water in the source.

4278 1-11-17 P. J. Ogilvie; South Fork of Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

4354 3-12-17 Earl R. Green; Soldier Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4355 3-15-17 Domingo Oruesagasti; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4371 3-23-17 Harry W. Sommer; Humboldt River; Irrigation and domestic; Denied September 15, 1947, on the grounds that there is no unappropriated water in the source.

4396 4-14-17 Mamie Winstead and Henry Peterson; South Fork of Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

4408 4-24-17 Eugene L. Dutertre; Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

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*Omitted in previous Biennial Reports.

4437 .. 5–16–17.. William A. Brown, Jr.; Berger Canyon; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

4459.... 6– 1–17.. Eugene C. Brown; South Fork of Humboldt River; Irrigation and domestic; Denied May 1, 1947, on the grounds that there is no unappropriated water in the source.

4481.... 6–27–17.. Lee Hoagland; Flood and surplus waters of Soldier Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4489.... 7– 5–17.. John B. McKee; Rattlesnake Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4497.... 7–11–17.. David Dotta and B. Guerena; Flood and surplus waters of Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4534.... 7–30–17.. John L. Armistead; Welsh Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4535.... 7–30–17.. Armond T. Rose; Reed Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4757 .. 12– 5–17.. Ernest F. Schmidt; Lamoille Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4759.... 12– 5–17.. Simon C. Cassidy; Perl Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4796 .. 12–19–17.. Zernie Linebarger; Maggie Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

4797.... 12–20–17.. C. W. Mitchell; Cottonwood Creek; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water in the source.

4837.... 1–10–18.. Geo. W. Goodfellow; Hot Creek; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

4844.... 1–12–18.. John G. Taylor (Assigned to Pacific States Savings and Loan Co.); Humboldt River; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

4921.... 2–18–18.. Ben Butler (Assigned to G. W. Thiriot); Crystal Spring; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

5009.... 4–16–18.. Thomas S. Park; Dorsey Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water in the source.

5044.... 5– 1–18.. George Arthur; Dwyer's Springs; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

5048.... 5– 3–18.. Parley E. Hatch; Herder Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

5058.... 5– 7–18.. Grace Irene Riddell; Ackler Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

5059.... 5– 8–18.. James M. Riddell; Ackler Creek; Irrigation and stockwatering; Denied on the grounds that there is no unappropriated water during the irrigation season.

5060.... 5– 9–18.. Grock Bros. (Assigned to First National Bank of Elko); Starr Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5241.... 9– 9–18.. Frank S. Connors and Terrence Connors; Tributaries of South Fork of Humboldt River; Mining, milling, and manufacturing; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5242.... 9–11–18.. Cora J. Byers; Gray's Lake; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5243.... 9–11–18.. Mary A. Goodale; Gray's Lake; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5298.... 10–19–18.. Royal M. Stewart; Mary's River; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5302.... 10–26–18.. Oliver Riffe; Eyroz Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water in the source.

5388.... 2–13–19.. Jay H. Clemons; Mary's River; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5403.... 3– 5–19.. Gabriel Rossi; Rabbit Creek; Irrigation, domestic, and stockwatering; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5406.... 3–10–19.. Pete Salicchi (Assigned to Johana Eisenberg); Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5442 4- 7-19 A. G. Birch; Kleckner Creek; Electric power and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5539 6-14-19 Griswold-Henderson Livestock Co.; Hot Springs; Irrigation, domestic, and stockwatering; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

5634 7-23-19 Lynn Big Six Mining Company; Unnamed spring; Mining, milling, and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

5680 8-20-19 J. L. and H. L. Sharp; Ash Spring Creek; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

5695 8-28-19 L. S. Weathers; Boulder Creek; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

6087 5- 4-20 Ethel Gulley; Wild Cat Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6090 5- 5-20 Malatios Papapavlos; Lamoille Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6131 5-18-20 Devereaux Goodale; Stevens Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6148 6- 3-20 Herbert Henry Landers; McClellans Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6324 11-17-20 Harry K. Brown and G. L. Chism; Ash Spring Creek; Irrigation and stock; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6457 5-12-21 Charles H. Fox; Boulder Creek; Irrigation; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

6467 5-23-21 Ralph A. Drown; Lee Creek; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6482 6- 4-21 Edward Goodale; Boulder Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

6577 10-15-21 Leroy E. Nelms and J. C. Walthers; Soldier Creek; Irrigation, stockwatering, and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6590 11-15-21 G. E. Truett; Forney Creek; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6650 3-13-22 John W. Richard; Ash Spring Creek; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6651 3-13-22 A. J. Richard; Ash Spring Creek; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6658 3-31-22 Chas. C. Drown and Arthur Drown; South Fork of Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6659 3-31-22 Drown Brothers; South Fork of Humboldt River; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6673 5- 3-22 H. A. Agee (Assigned to Federal Land Bank of Berkeley); Hall Canyon Creek; Irrigation and stockwatering; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

6698 6-15-22 Estate of Thomas Kearns (Assigned to Kearns Corp.); McAfee Creek; Irrigation; Denied June 1, 1948, on the grounds that that there is no unappropriated water in the source.

6699 6-15-22 Estate of Thomas Kearns (Assigned to Kearns Corp.); Walker Creek and Springs; Irrigation; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6719 7-17-22 George L. Sanford (Assigned to George Whittell); Zephyr and North Zephyr Cove Creek; Irrigation, stock, and domestic; Cancelled December 3, 1946, because of failure to comply with provisions of the permit.

6791 10-11-22 Estate of Thomas Kearns (Assigned to Kearns Corp.); McAfee Creek; Irrigation and domestic; Denied June 1, 1948, on the grounds that there is no unappropriated water in the source.

6826 11-20-22 J. M. McNamara; Dixie Creek; Irrigation and domestic; Denied December 16, 1946, on the grounds that there is no unappropriated water during the irrigation season.

7051 2-16-24 C. Ballenger (Assigned to T. A. McCall); Big Spring; Irrigation and domestic; Withdrawn by applicant March 25, 1947.

7104 4-28-24 Dudley F. Wilson; Kelly Creek; Irrigation; Approved January 6, 1947, for 1.2 c.f.s. G. S.

7638 2- 9-26 Minnie Mae Wholey (Assigned to Ed. Filippini); Underground; Irrigation, stockwatering, and domestic; Withdrawn by applicant July 27, 1948.

G. S. Good standing.

7663 3–14–26 Gardner Ranch Company; Crystal Springs; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

7670 3–22–26 G. Edgar Nesbitt; Hiko Spring; Irrigation and domestic; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

7765 5–28–26 Myrtle O. Bell; Bell Spring; Irrigation; Cancelled August 29, 1947, because of failure of applicant to comply with the provisions of the permit under application 8313.

8655 8– 9–28 James Castles; Hiko Spring; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

8687 9– 6–28 J. P. Wright; Hiko Spring; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

8702 9–20–28 G. Edgar Nesbitt; Hiko Springs; Irrigation; Denied April 1, 1947, on the grounds that there is no unappropriated water in the source.

8762 11–11–28 M. J. Hough; Rose Spring; Mining, milling, and domestic; Cancelled October 10, 1947, because of failure of applicant to comply with the provisions of permit.

8811 1–14–29 W. M. Kearney (Assigned to Carrara Portland Cement Co.); Amargosa River; Irrigation and domestic; Cancelled August 19, 1947, because of failure of applicant to comply with provisions of permit.

8966 *–23–29 Wm. Jacoby (Assigned to John E. Smith); Jacoby Spring; Stockwatering and domestic; Approved August 13, 1946, for 0.10 c.f.s. G. S.

9324 8–27–30 Carson and Tahoe Lumber and Fluming Company (Assigned to George Whittell); South Fork of Zephyr Cove Creek; Irrigation and domestic; Cancelled December 3, 1946, because of failure to comply with provisions of permit.

9378 11–21–30 Hazel Green (Assigned to Merrill H. and Wenona B. Gubler); Sheep Creek; Irrigation; Approved November 22, 1946, for 0.8 c.f.s. G. S.

9774 7–13–34 M. H. Donald; Underground; Placer mining; Denied January 6, 1947, on the grounds that after due notice by registered mail, applicant failed to submit statutory permit fee.

9831 1–19–35 Don F. Anhder; Ash Spring Creek; Power; Denied April 1, 1947, on the grounds that the granting of same would be detrimental to public interests.

9885 8– 2–35 Blanche Dennison; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Cancelled August 1, 1947, because of failure of applicant to comply with provisions of permit.

9903 10– 5–35 George F. Elder; Underground; Irrigation and domestic; Cancelled August 2, 1946, because of failure of applicant to comply with provisions of permit.

9904 10–14–35 Comstock Gold Mines, Inc.; Underground; Mining, milling, and domestic; Denied December 6, 1946, for the reason that registered notice could not be delivered indicating that applicant has moved away and is no longer interested in application.

9991 6– 6–36 Comstock Gold Mines, Inc.; Unnamed Canyon Creek and Springs; Mining, milling, and domestic; Denied December 6, 1946, for the reason that registered notice could not be delivered indicating that applicant had apparentiy moved away and is no longer interested in application.

9993 6–27–36 Richard Kirman (Assigned to George Whittell); Unnamed spring; Irrigation, domestic, and fire protection; Cancelled December 3, 1946, because of failure to comply with provisions of permit.

10163 9– 7–37 George Whittell; Marlette Creek; Power and domestic; Cancelled December 3, 1946, because of faiiure of applicant to comply with provisions of permit.

10166 9–10–37 George Whittell; South Fork of Marlette Creek; Power and domestic; Cancelled December 3, 1946, because of failure of applicant to comply with provisions of permit.

*10240 4–14–38 Anna Savery; Springs and Creek; Irrigation and domestic; Cancelled June 1, 1947, because of failure of applicant to comply with provisions of permit.

10298 9–28–33 E. B. Salinas; Sacramento Creek; Irrigation and domestic; Cancelled March 1, 1948, because of failure of applicant to comply with provisions of permit.

10372 5–29–39 Little Gem Mining Company; Indian Creek; Mining, milling and domestic; Denied April 19, 1948, on the grounds that after due notice by registered mail, it has been taken as conclusive evidence that applicant is no longer interested in said application.

10397 7–14–39 Copper Canyon Mining Company; Underground; Mining, milling, and domestic; Withdrawn by applicant May 27, 1947.

10425 9–20–39 Henry E. Heidenreich; South Fork of Jumbo Canyon; Irrigation and domestic; Cancelled January 1, 1948, because of failure of applicant to comply with the provisions of permit.

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*Omitted in previous Biennial Report.

10488 4- 8-40 J. F. Featherstone; Trenton Creek; Milling and mining; Denied August 29, 1947, on the grounds that after notice by registered mail it is apparent that applicant is no longer interested in this application.

10503 5-13-40 E. A. Clark; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Cancelled July 4, 1946, because of failure of applicant to comply with provisions of permit.

10543 8- 1-40 Anna Savery; Underground; Domestic and commercial; Cancelled July 4, 1947, because of failure of applicant to comply with provisions of permit.

10546 8- 6-40 Star Tungsten Mines; Harrison Pass Creek; Mining, milling, and domestic; Denied August 29, 1947, on the grounds that after notice by registered mail it is apparent that applicant is no longer interested in said permit.

10567 10-14-40 Allie B. Adams; Eight Mile Spring; Domestic and stockwatering; Denied September 22, 1947, on the grounds that the waters of Eight Mile Spring are fully appropriated under application 10088.

10610 1-13-41 Anna Savery; Unnamed Creek and Springs; Irrigation and domestic; Cancelled June 1, 1947, because of failure of applicant to comply with provisions of permit.

10620 2-14-41 Press Duffin, Jr., Underground water; Irrigation and domestic; Cancelled August 1, 1947, because of failure of applicant to comply with provisions of permit.

*10634 3-11-41 Martin E. Lugea; Gold Ace Spring; Mining and domestic; Withdrawn by applicant March 25, 1946.

10658 5- 5-41 Star Tungsten Mine; Lime Kiln Canyon; Mining; Denied August 29, 1947, on the grounds that after notice by registered mail it is apparent that applicant is not interested in said application.

10683 6-26-41 Earl B. Crouch; Victorine Creek; Mining and milling; Approved August 20, 1946, for 1.0 c.f.s. G. S.

10684 6-26-41 Earl B. Crouch; Victorine Creek; Power and domestic; Approved August 20, 1946, for 1.0 c.f.s. G. S.

10685 6-26-41 Earl B. Crouch; Big Smoky Creek; Power; Approved August 20, 1946, for 16.0 c.f.s.

10704 7-30-41 Samuel J. Lawson; Paradise Valley Artesian Basin; Irrigation and domestic; Cancelled October 1, 1946, because of failure of applicant to comply with provisions of permit.

10705 7-30-41 Dalton H. Buck; Paradise Valley Artesian Basin; Irrigation and domestic; Cancelled July 6, 1946, because of failure of applicant to comply with provisions of permit.

10716 8-22-41 Allye Lawson and Virginia Lawson; Paradise Valley Artesian Basin; Irrigation and domestic; Cancelled October 1, 1946, because of failure of applicant to comply with provisions of permit.

10750 10-24-41 Florence Lawson; Paradise Valley Artesian Basin; Irrigation and domestic; Cancelled July 6, 1946, because of failure of applicant to comply with provisions of permit.

10751 10-24-41 M. M. Sweeney; Paradise Valley Artesian Basin; Irrigation and domestic; Cancelled July 6, 1946, because of failure of applicant to comply with provisions of permit.

10780 1-29-42 George and Mary Hunstman; Virgin River; Irrigation; Cancelled February 6, 1948, because of failure of applicant to comply with the provisions of permit.

10783 2-13-42 J. A. and Pearl Prichard; Flood and winter waters of Robinson Canyon; Irrigation; Withdrawn by applicant February 23, 1947.

10793 3-13-42 Durrell Adams and Kay Bunker; Virgin River; Irrigation; Cancelled August 12, 1946, because of failure of applicant to comply with provisions of permit.

10804 4- 6-42 Leslie Blackburn; Deserted well (Underground); Stockwatering and domestic; Denied April 9, 1948, on the grounds that if said application were granted it would conflict with existing rights.

10809 4-11-42 George Eldridge; Spring Valley Wash flood water; Irrigation: Withdrawn by applicant August 1, 1947.

10811 4-13-42 Joe Erquiaga; Continental Lake; Irrigation; Cancelled October 28, 1946, because of failure of applicant to comply with provisions of permit.

10834 6-11-42 Security Industrial Corporation; Juiata Spring; Milling and domestic; Withdrawn by applicant September 15, 1947.

10890 10-29-42 Leonard E. Billman; Underground; Quasi-municipal and domestic; Cancelled December 9, 1946, because of failure of applicant to comply with provisions of permit.

10920 2- 3-43 George Eldridge; Mike Spring; Irrigation and domestic; Withdrawn by applicant August 1, 1947.

10989 8-26-43 Joe Gruden; Snake Creek; Placer mining; Cancelled October 1, 1946, because of failure of applicant to comply with provisions of permit.

11022 10-29-43 George Eldridge; Underground; Stockwatering; Approved June 2, 1947, for 0.038 c.f.s. G. S.

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*Omitted in previous Biennial Report. G. S.—Good standing.

11034—12– 3–43—Molybdenum Products Co.; Underground; Mining, crushing, processing and domestic; Cancelled September 25, 1947, because of failure of applicant to comply with provisions of permit.

11035—12– 6–43—Joe Eldridge; Partridge Spring; Stockwatering; Approved September 13, 1946, for 0.003 c.f.s. G. S.

11043—12–30–43—E. A. Clark; Underground (Las Vegas Artesian Basin); Milling and domestic; Denied April 21, 1948, on the grounds that applicant failed to submit permit fee.

*11046—1–10–44—Max Hafen, John Jensen, and Lee Hardy; Hen Spring; Stockwatering; Withdrawn by applicant June 16, 1947.

11081— 3– 9–44—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; Approved April 7, 1947, for 0.016 c.f.s. G. S.

11083— 3– 9–44—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; Approved April 7, 1947, for 0.016 c.f.s. G. S.

11083— 3– 9–44—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; Approved April 7, 1947, for 0.016 c.f.s. G. S.

11088— 3–17–44—R. J. Kelly and V. E. Greenwald; Lower Indian Spring; Stockwatering; Approved April 7, 1947, for 0.016 c.f.s. G. S.

11090— 3–17–44—R. J. Kelly and V. E. Greenwald (Assigned to E. P. Porter); Speci Spring; Stockwatering; Withdrawn by applicant March 18, 1947.

11106— 4–15–44—Nick P. Megas; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Denied April 25, 1947, on the grounds that applicant is being served with water from the Las Vegas Land and Water Company.

11152— 8– 8–44—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; (Assigned to E. P. Porter); Withdrawn by applicant March 18, 1947.

11153— 8– 8–44—R. J. Kelly and V. E. Greenwald (Assigned to E. P. Porter; Mud Spring; Stockwatering; Withdrawn by applicant March 18, 1947.

11154— 8– 8–44—R. J. Kelly and V. E. Greenwald (Assigned to E. P. Porter); Underground; Stockwatering; Withdrawn by applicant March 18, 1947.

11164— 9– 6–44—S. J. Anderson and Elmer H. Peterson; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Denied April 25, 1947, on the grounds that applicants are being served with water from the Las Vegas Land and Water Company.

11185—10–11–44—Ray Van Horn (Assigned to C. E. Van Horn and J. L. Stringfellow); Underground; Irrigation; Approved October 23, 1947, for 3.0 c.f.s. G. S.

11194—11– 4–44—Hotel Securities Co. El Rancho Vegas; (Application to change place of use; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Withdrawn by applicant March 1, 1948.

11195—11– 4–44—Hotel Securities Co. El Rancho Vegas; (Application to change place of use; Underground (Las Vegas Artesian Basin); Quasi-municipal; Withdrawn by applicant March 1, 1948.

11199—11–10–44—Sheldon W. Lamb; Antelope Spring; Stockwatering and domestic; Approved December 26, 1947, for .0031 c.f.s. G. S.

11205—11–15–44—Benjamin F. Casey; Jack Ass Spring; Stockwatering and domestic; Cancelled April 8, 1948, because of failure of applicant to comply with provisions of permit.

11207—11–18–44—Wm. Clark; Underground; Domestic and Quasi-municipal; Cancelled November 15, 1947, because of failure of applicant to comply with provisions of permit.

11212—12– 4–44—Basil Brewer and George A. Riley; Underground; Stockwatering; Denied October 27, 1945, on the grounds that the use of said water and the appurtenant range would interfere with prior rights.

11213—12–11–44—Basil Brewer and George A. Riley; Bar 99 Spring; Stockwatering; Denied October 7, 1947, on the grounds that the use of said water and the appurtenant range would interfere with prior rights.

11215—12–11–44—Harry Mack, Nate Mack and Murray Wollman (Assigned to Pacific States Theaters, Gene Pace and Bee Dragani); (Application to change point of diversion); Underground; Las Vegas Artesian Basin; Irrigation and domestic; Cancelled January 1, 1948, because of failure of applicants to comply with provisions of permit.

11224—12–27–44—Circle L Ranch; Unnamed Spring (Ivan Spring); Stockwatering; Denied October 27, 1947, on the grounds that the approval of this application would disturb the general range use and would be detrimental to public interests.

11227— 1– 6–45—Harry Mack, Nate Mack, and Murray Wollman (Assigned to Pacific States Theaters, Inc., (Gene Pace and Bee Dragani); Underground; Las Vegas Artesian Basin; Quasi-municipal and domestic; Cancelled January 9, 1948, because of failure of applicant to comply with provisions of permit.

11229— 1– 8–45—M. L. Miller; Miller Spring; Stockwatering; Denied May 28, 1947, on the grounds that the granting of this application would be detrimental to public welfare.

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*Omitted in previous Biennial Reports.

11230 1- 8-45 M. L. Miller; Bostwick Creek; Stockwatering; Denied May 28, 1947, on the grounds that the granting of this application would be detrimental to public welfare.

11234 1-16-45 Ewald F. Winkelman and Edgar N. Palen; Seepage water; Irrigation; Cancelled December 4, 1946, because of failure to refile corrected application within the statutory time.

11235 1-25-45 Hyrum T. Church and A. E. Littleton; Seepe Spring; Stockwatering; Denied April 9, 1948, on the grounds that the granting thereof would conflict with existing rights.

11236 1-25-45 J. H. Frasher; Underground; Mining and domestic; Approved September 6, 1946, for 1.0 c.f.s. G. S.

11248 2-24-45 James D. McPherson; Colorado River; Mining and milling, and domestic; Withdrawn by applicant May 12, 1947.

11254 3-29-45 Combined Metals Reduction Co.; (Application to change place of use); Underground; Mining, milling, and domestic; Withdrawn by applicant March 24, 1947.

11258 4- 1-45 Basil Brewer and George A. Riley; Underground; Stockwatering and domestic; Denied October 27, 1947, on the grounds that the granting of same would contravene the provisions of section 2 of the 1945 Stockwatering Act.

11265 4- 6-45 Basil Brewer and George A. Riley; (Application to change point of diversion and place of use); Underground; Stockwatering; Denied October 27, 1947, on the grounds that the use of water and appurtenant range would interfere with prior rights.

11266 4- 6-45 Basil Brewer and George A. Riley; (Application to change point of diversion and place of use); Bar 99 Spring; Stockwatering; Denied October 27, 1947, on the grounds that approval thereof would disturb the general range use.

11268 4-18-45 H. F. Dangberg Land & Livestock Co.; Underground; Stockwatering and domestic; Approved November 13, 1946, for 0.05 c.f.s. G. S.

11269 4-18-45 H. F. Dangberg Land & Livestock Co.; Underground; Stockwatering and domestic; Approved November 13, 1946, for 0.05 c.f.s. G. S.

11270 4-18-45 H. F. Dangberg Land & Livestock Co.; Underground; Stockwatering and domestic; Approved November 13, 1946, for 0.05 c.f.s.

11274 4-27-45 J. M. Prunty; Virgin River; Irrigation; Approved May 26, 1947, for 9.0 c.f.s. G. S.

11279 5- 5-45 Ira H. Kent; Underground; Stockwatering and domestic; Approved December 30, 1946, for 0.0047 c.f.s. G. S.

11286 5-14-45 A. A. Daniels and J. M. Daniels; Underground; Stockwatering; Approved August 6, 1947, for 0.0031 c.f.s. G. S.

11289 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11290 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11291 5-19-46 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11292 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11293 5-19-45 McCullough Tool Company; Underground; Stockwatering; Denied May 28, 1947, on the grounds that the granting thereof might impair existing rights.

11294 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11295 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11296 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11297 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Denied May 28, 1947, on the grounds that the granting thereof might impair existing rights.

11298 5-19-45 McCullough Tool Co.; Underground; Stockwatering; Approved November 1, 1946, for 0.006 c.f.s. G. S.

11310 6- 8-45 Dave L. Barnes; Underground; Stockwatering; Denied April 9, 1948, on the grounds that the granting thereof would be detrimental to public welfare.

11311 6- 9-45 E. A. Henriod; Underground; Stockwatering; Approved September 6, 1946, for 0.022 c.f.s. G. S.

11313 6-16-45 E. A. Henriod; Moonshine Springs; Stockwatering; Approved September 6, 1946, for 0.022 c.f.s. G. S.

11315 6-16-45 Sunrise Acres Water Assn., Inc.; (Application to change manner of use); Underground (Las Vegas Artesian Basin); Municipal; Withdrawn by applicant April 19, 1947.

11328 7-12-45 R. J. Kaltenborn and Jerome Mack; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved June 1, 1948, for 0.1 c.f.s. G. S.

11329 7-12-45 Ira Blundell; Unnamed Spring; Stockwatering; Approved September 13, 1945, for 0.01 c.f.s. G. S.

11331 7-16-45 One Eleven Bar Cattle Company; Underground; Stockwatering and domestic; Withdrawn by applicant July 18, 1946.

G. S. Good standing.

11350 8-11-45 James E. Doutre; Siegel Creek; Stockwatering; Denied April 9, 1948, on the grounds that the approval thereof would be detrimental to existing rights.

11351 8-11-45 James E. Doutre; Kilsey Spring No. 2; Stockwatering; Denied April 9, 1948, on the grounds that the approval thereof would be detrimental to existing rights.

11352 8-11-45 James E. Doutre; Kilsey Spring No. 1; Stockwatering; Denied April 9, 1948, on the grounds that the approval thereof would be detrimental to existing rights.

11354 8-11-45 E. A. Henriod and James E. Doutre; Underground; Stockwatering; Approved September 6, 1946, for 0.047 c.f.s. G. S.

11355 8-11-45 Eugene A. Henriod; Underground; Stockwatering; Approved June 2, 1947, for 0.004 c.f.s. G. S.

11369 9- 4-45 Marguerite D. Quinby; Underground; Mining and domestic, and milling; Approved September 14, 1946, for 2.0 c.f.s. G. S.

11375 9-24-45 Texas A. McCall (Assigned to Ash Meadows, Inc.); Fairbanks Spring; Mining, milling, and domestic; Approved June 14, 1947, for 2.0 c.f.s. G. S.

11376 9-24-45 Texas A. McCall (Assigned to Ash Meadows, Inc.); Fairbanks Spring; Irrigation and domestic; Approved June 14, 1947, for 10.0 c.f.s. G. S.

11384 10-11-45 Roy L. Wilbur; Deep or Big Spring; Irrigation and domestic; Approved November 7, 1946, for 1.6 c.f.s. G. S.

11389 10-15-45 B. F. Porter Estate, a Corporation; Underground; Stockwatering; Approved September 20, 1946, for 0.016 c.f.s. G. S.

11390 10-15-45 B. F. Porter Estate; Crowbar Spring; Stockwatering; Approved September 20, 1946, for 0.016 c.f.s. G. S.

11391 10-15-45 B. F. Porter Estate; Chipmunk Spring; Stockwatering; Approved September 20, 1946, for 0.016 c.f.s. G. S.

11392 10-15-45 B. F. Porter Estate; Johnstone Spring; Stockwatering; Approved September 20, 1946, for 0.01 c.f.s. G. S.

11393 10-15-45 B. F. Porter Estate; Whiterock Spring; Stockwatering; Approved September 20, 1946, for 0.016 c.f.s. G. S.

11394 10-15-45 B. F. Porter Estate; Pinto Mountain Spring; Stockwatering; Approved September 20, 1946, for 0.03 c.f.s. G. S.

11395 10-15-45 B. F. Porter Estate; Bartlett Peak Spring; Stockwatering; Approved November 21, 1947, for 0.03 c.f.s. G. S.

11396 10-15-45 B. F. Porter Estate; Troughs Spring; Stockwatering; Approved September 20, 1946, for 0.013 c.f.s. G. S.

11398 10-15-45 B. F. Porter Estate; Battle Creek Spring; Stockwatering; Approved September 20, 1946, for 0.023 c.f.s. G. S.

11399 10-15-45 B. F. Porter Estate; Lower Pigeon Spring; Stockwatering; Approved September 20, 1946, for 0.003 c.f.s. G. S.

11400 10-15-45 B. F. Porter Estate; Mahogany Spring; Stockwatering; Approved September 20, 1946, for 0.01 c.f.s. G. S.

11405 10-24-45 Charlie and Elizabeth Hammond; Hiko Spring; Stockwatering and domestic; Approved September 6, 1946, for 0.002 c.f.s. G. S.

11406 10-24-45 Charlie and Elizabeth Hammond; Willow Spring; Stockwatering and domestic; Approved September 6, 1946, for 0.002 c.f.s. G. S.

11407 10-24-45 Charlie and Elizabeth Hammond; Sacatone Spring; Stockwatering and domestic; Approved September 6, 1946, for 0.002 c.f.s. G. S.

11408 10-24-45 Charlie and Elizabeth Hammond; Dripping Spring; Stockwatering and domestic; Approved September 6, 1946, for 0.002 c.f.s. G. S.

11413 11- 1-45 Harry Mack (Assigned one-quarter interest to Arthur and Helen M. Dial, and one-quarter interest to Maybelle Davis); Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved December 9, 1946, for 0.1 c.f.s. G. S.

11415 11- 1-45 Steve Brown; Mason Springs; Domestic and stockwatering; Approved September 24, 1946, for 0.003 c.f.s. G. S.

11418 11- 3-45 M. B. Bates and J. H. Sewell; Underground; Stockwatering; Withdrawn by applicant November 18, 1947.

11425 11-15-45 Ransom and Mary Middaugh; Underground; Irrigation and domestic; Approved October 19, 1946, for 7.0 c.f.s. G. S.

11426 11-15-45 Rosegold Placers, Inc.; Underground; Placer mining and domestic; Approved May 10, 1947, for 3.0 c.f.s. G. S.

11427 11-16-45 D. L. Stewart; Stewart Spring; Stockwatering and domestic; Approved September 24, 1946, for 0.003 c.f.s. G. S.

11428 11-16-45 C. A. Morehouse and Gertrude Morehouse (Assigned to Benny Binion and Teddy Jane Binion); Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved July 15, 1947, for 0.08 c.f.s. G. S.

11439 11-29-45 W. J. Stinson; Underground; Stockwatering; Approved August 15, 1946, for 0.031 c.f.s. G. S.

11440 11-29-45 W. J. Stinson; Underground; Stockwatering; Approved August 15, 1946, for 0.031 c.f.s. G. S.

11441 11-30-45 Carson Indian Agency; Underground; Irrigation; Approved February 14, 1947, for 4.0 c.f.s. G. S.

11442 12- 3-45 City of Wells; Underground; Municipal purposes; Approved September 20, 1946, for 1.3 c.f.s.

G. S. Good standing.

11443—12– 6–45—Walter Dewey Parker; Buffalo Slough; Irrigation and domestic; Approved December 5, 1946, for 2000 acre-feet per annum. G. S.

11444—12– 6–45—Diamond S. Ranch; Pole Creek; Irrigation; Approved October 2, 1946, for 1000 acre-feet per annum. G. S.

11445—12– 6–45—Diamond S. Ranch; Pole Creek; Irrigation; Cancelled September 14, 1946, for failure to refile corrected application.

11450—12–20–45—Dan Filippini; Duff Creek; Irrigation; Approved August 15, 1946, for 2.0 c.f.s. G. S.

11451—12–20–45—Dan Filippini; Little Cottonwood Creek; Irrigation and stockwatering; Approved July 10, 1946, for 4.2 c.f.s. G. S.

11452—12–20–45—C. A. Roberts and Rachel C. Roberts; Lower Ranch Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11453—12–20–45—C. A. and Rachel Roberts; South Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11454—12–20–45—C. A. and Rachel Roberts; Cane Springs; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11455—12–20–45—C. A. and Rachel Roberts; Galvanized Tank Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11456—12–20–45—C. A. and Rachel Roberts; Sheep Springs; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11457—12–20–45—C. A. and Rachel Roberts; Clay Bank Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11458—12–20–45—C. A. and Rachel Roberts; East Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11459—12–20–45—C. A. and Rachel Roberts; Rock Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11460—12–20–45—C. A. and Rachel Roberts; Bootlegger Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11461—12–20–45—C. A. and Rachel Roberts; West Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s.

11462—12–20–45—C. A. and Rachel Roberts; Big Timber Spring; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11463—12–20–45—C. A. and Rachel Roberts; Big Timber Spring (Upper Diversion); Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11464—12–20–45—C. A. and Rachel Roberts; Center Springs; Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s. G. S.

11465—12–20–45—C. A. and Rachel Roberts; Cejter Spring (Upper Diversion); Stockwatering and domestic; Approved July 6, 1946, for 0.0046 c.f.s.

11466—12–21–45—Fallini Brothers; Underground; Stockwatering; Approved July 9, 1948, for .03 c.f.s. G. S.

11468—12–21–45—Ross F. Steele; Troy Creek; Power and domestic; Approved October 16, 1946, for 1.0 c.f.s. G. S.

11469—12–21–45—Yomba Shoshone Tribe; Underground; Stockwatering; Approved October 29, 1946, for 0.016 c.f.s. G. S.

11471—12–26–45—C. J. Gaspari; Underground; Stockwatering; Approved April 24, 1946, for 0.0031 c.f.s. G. S.

11473—12–26–45—Smith Gold Placers Inc.; Underground; Placer mining; Approved July 9, 1946, for 2.0 c.f.s.

11475—1– 2–46—R. H. Conklin; Breakaheart Ranch; Underground; Stockwatering and domestic; Approved August 13, 1946, for 0.010 c.f.s. G. S.

11478—1– 9–46—Floyd Lamb and J. W. Richard; Tributaries to Pahranagat Lake; Irrigation; Approved July 17, 1946, for 2.224 acre-feet. G. S.

11482—1–10–46—Mark G. Bradshaw; Tognoni Spring; Mining and milling; Approved April 13, 1948, for 1.0 c.f.s. G. S.

11483—1–10–46—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; Approved April 7, 1947, for 0.009 c.f.s. G. S.

11484—1–10–46—R. J. Kelly and V. E. Greenwald; Underground; Stockwatering; Approved April 7, 1947, for 0.009 c.f.s. G. S.

11486—1–14–46—E. L. Cord; (Application to change point of diversion); Trail Creek; Irrigation; Approved September 13, 1946, for 1.6 c.f.s. G. S.

11489—1–16–46—South Side Irrigating Canal Co.; (Application to change point of diversion); Truckee River; Irrigation; Approved April 3, 1948, for 31.46 c.f.s. G. S.

11491—1–21–46—Helena T. Crutchfield; Jones Creek; Irrigation and domestic; Approved July 9, 1946, for 2.016 c.f.s. G. S.

11492—1–30–46—J. P. Gibbons; Underground; Quasi-municipal; Withdrawn by applicant April 1, 1948.

11493—1–30–46—Charlie and Elizabeth Hammond; Natural Springs, Discovery Spring; Stockwatering and domestic; Approved September 6, 1946, for 0.007 c.f.s. G. S.

11498—2– 6–46—Wilbur Clark; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved July 9, 1946, for 0.2 c.f.s. G. S.

11499—2– 7–46—The Nunn Company; Underground; Milling and domestic; Approved July 9, 1946, for 1.11 c.f.s. G. S.

G. S. Good standing.

11500 2-13-46 Ebbie H. Davis; Underground; (Las Vegas Artesian Basin); Stockwatering and domestic; Approved July 17, 1946, for 0.05 c.f.s. G. S.

11501 2-18-46 V. L. Robinson, Lawrence and Ainsley Sharp, Ernest, Joe and Edwin Higbee; Underground; Stockwatering and domestic; Withdrawn by applicant March 11, 1948.

11502 2-27-46 D. V. Romeos; Goat Spring; Stockwatering; Approved April 28, 1947, for 0.007 c.f.s. G. S.

11503 2-27-46 Nate Mack; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Cancelled April 16, 1947, because of failure of applicant to comply with provisions of permit.

11504 2-26-46 Eldred Lemul Leavitt; Virgin River; Irrigation; Approved October 2, 1946, for 0.6 c.f.s. G. S.

11505 3- 1-46 Nevada Minerals Company; Underground; Mining, milling, and domestic; Approved October 2, 1946, for 1.0 c.f.s. G. S.

11506 3- 1-46 V. E. Greenwald; Underground; Stockwatering; Cancelled September 14, 1946, because of failure to refile corrected application within the statutory time.

11507 3- 1-46 V. E. Greenwald; Underground; Stockwatering; Cancelled September 14, 1946, because of failure to refile corrected application within the statutory time.

11508 3- 1-46 Charles J. McGill; White's Canyon Creek; Irrigation and domestic; Approved July 9, 1946, for 0.4 c.f.s. G. S.

11510 3- 5-46 Kenneth C. and Zelda Lawrence; Underground; Irrigation and domestic; Approved October 28, 1946, for 0.03 c.f.s. G. S.

11511 3- 8-46 Frank J. Seibert; Las Vegas Creek; Irrigation and domestic; Approved April 11, 1947, for 0.4 c.f.s. G. S.

11512 3-14-46 Mrs. Evelyn S. Potter; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 7, 1946, for 0.125 c.f.s. G. S.

11513 3-16-46 Parley E. Harris, II; (Assigned an undivided one-half interest to Parley Estes Harris); Rio Virgin; Irrigation; Approved December 11, 1946, for 2.14 c.f.s. G. S.

11514 3-20-46 Ebbie H. Davis; Underground; Stockwatering and domestic; Approved December 5, 1946, for 0.015 c.f.s. G. S.

11515 3-20-46 Ebbie H. Davis; Underground; Stockwatering and domestic; Approved October 1, 1946, for 0.014 c.f.s. G. S.

11516 3-20-46 Ebbie H. Davis; Underground; Stockwatering and domestic; Approved December 5, 1946, for 0.015 c.f.s. G. S.

11517 3-20-46 Ebbie H. Davis; Underground; Stockwatering and domestic; Approved October 1, 1946, for 0.014 c.f.s. G. S.

11522 3-25-46 Leland M. and Lillian L. Woods; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved July 9, 1946, for 0.5 c.f.s.

11523 3-25-46 J. B. and Katie L. Reynolds; Dixie Valley Creek; Irrigation and domestic; Approved May 12, 1948, for 10 c.f.s. G. S.

11524 3-25-46 Joaquin Arbonies; Gold Ace Spring; Irrigation and domestic; Approved June 2, 1947, for 0.5 c.f.s. G. S.

11525 3-26-46 D. L. Stewart; Jump Up Spring; Stockwatering; Approved November 7, 1946, for 0.003 c.f.s. G. S.

11526 3-27-46 Cyril O. Bastian; Flood waters; Stockwatering; Cancelled September 14, 1946, because of failure to refile corrected application within statutory time.

11527 3-28-46 J. H. Gates; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved July 17, 1946, for 0.08 c.f.s.

11528 3-28-46 V. E. Greenwald; Timber Mountain Spring; Stockwatering; Cancelled September 14, 1946, because of failure of applicant to refile corrected application within statutory time.

11529 3-28-46 V. E. Greenwald; Wagon Springs; Stockwatering; Cancelled December 4, 1946, because of failure of applicant to refile corrected application within statutory time.

11530 3-29-46 L. H. Dickens; Arrow Spring; Mining and domestic; Cancelled September 14, 1946, because of failure to refile corrected application within statutory time.

11531 3-29-46 Mrs. Bernice Sullivan Holmstrom, Mrs. Adeline Minor, and Mrs. Minnie Heidenreich; Unnamed Spring and Creek; Irrigation and domestic; Approved July 21, 1946, for 1.0 c.f.s. G.S.

11532 3-30-46 Milton Holmes (Assigned to Jerry Giesler); Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved September 18, 1946, for 0.5 c.f.s. G. S.

11533 4- 4-46 George H. and Mary McKaig; Underground; Irrigation and domestic; Approved October 28, 1946, for 1.00 c.f.s. G. S.

11541 4- 5-46 Richard Henry and Nora A. Sheehy; Unnamed Spring; Irrigation and domestic; Withdrawn by applicant September 14, 1946.

11542 4- 6-46 Hazel June Warner; Underground water; Quasi-municipal; Approved October 28, 1946, for 0.2 c.f.s. G. S.

11543 4- 6-46 The Francis Corporation; Underground; Quasi-municipal; Approved October 28, 1946, for 0.5 c.f.s. G. S.

11544 4- 8-46 L. H. Dickens; Diamond Spring; Mining and domestic; Cancelled December 4, 1946, for failure to refile corrected application within statutory time.

11545 4- 9-46 Sheldon Lamb; Big Creek; Irrigation; Approved June 1, 1948, for 7.0 c.f.s. G. S.

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*Protested application. G. S. Good standing.

11547.... 4– 9–46....Storm Cloud Mining Co.; Storm Cloud Spring; Mining, milling, and domestic; Cancelled October 10, 1947, because of failure of applicant to comply with provisions of permit.
11548.... 4–13–46....Carl C. Kingsbury; Underground; Irrigation and domestic; Approved October 15, 1946, for 0.28 c.f.s. G. S.
11549.... 4–16–46....Vegas Heights Community; Underground (Las Vegas Artesian Basin); Municipal; Approved August 7, 1946, for 1.0 c.f.s. G. S.
11550.... 4–22–46....Frank E. and Olga Gowen; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 12, 1946, for 1.0 c.f.s.
11551.... 4–22–26....Vegas Heights Community; Underground (Las Vegas Artesian Basin); Municipal; Approved August 20, 1946, for 1.0 c.f.s.
11552.... 4–22–46....Bertrom and Barbara Russell; Underground; Irrigation and domestic; Approved October 28, 1946, for 0.5 c.f.s. G. S.
11554.... 4–25–26....Richard Stadelman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 7, 1946, for 0.3 c.f.s. G. S.
11555.... 4–25–26....T. A. Wells; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 21, 1946, for 0.1 c.f.s. G.S.
11556.... 4–25–46....T. A. Wells; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved July 21, 1946, for 0.3 c.f.s. G.S.
11558.... 4–27–46....Walter Hughes and R. F. Harmer; Underground; Irrigation; Approved April 28, 1947, for 2.0 c.f.s. G. S.
11559.... 4–27–46....Murray Wollman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 7, 1946, for 0.1 c.f.s. G.S.
11560.... 4–27–46....Murray Wollman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 7, 1946, for 0.1 c.f.s. G. S.
11561.... 4–27–46....Dr. E. A. Vincent; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved August 7, 1946, for 0.1 c.f.s. G. S.
11562.... 4–29–46....C. E. Smoke; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved September 13, 1946, for 0.4 c.f.s. G. S.
11563.... 4–29–46....Lloyd E. Devore; Mandalay Springs; Irrigation and domestic; Approved October 2, 1946, for 2.0 c.f.s. G.S.
11564.... 4–29–46....Leon and Marie Grivel; Underground; Irrigation and domestic; Cancelled August 1, 1947, because of failure of applicant to comply with provisions of permit.
11564.... 4–30–46....Mrs. Berenice Sullivan Holmstrom, Mrs. Adeline Minor, and Mrs. Minnie Heidenreich; Underground; Domestic and commercial; Approved July 21, 1946, for 0.5 c.f.s. G. S.
11566.... 5– 1–46....F. M. Fulstone, Inc.; Underground; Irrigation and domestic; Cancelled December 4, 1946, because of failure to refile corrected application within statutory time.
11567.... 5– 1–46....Thomas E. Sharp (Application to change point of diversion); Irrigation and domestic; Underground (Las Vegas Artesian Basin); Approved July 17, 1946, for 0.3 c.f.s. G. S.
11568.... 5– 3–46....Sheldon Lamb; Underground; Stockwatering; Denied April 26, 1948, on the grounds that the granting thereof would be detrimental to public interests.
11569.... 5– 4–46....Frank Harrington; Squaw Creek; Irrigation and domestic; Approved July 21, 1947, for 2.4 c.f.s. G. S.
11570.... 5– 6–46....Frank W. Fulstone, T. W. Salchenberger, and S. A. Kenoyer; Underground; Irrigation and domestic; Approved September 6, 1946, for 9.6 c.f.s. G. S.
11571.... 5– 6–46....Mrs. Marie Streshley, Mrs. Edith Givens, and W. L. Peterson; Underground; Stockwatering and domestic; Approved March 26, 1947, for 0.047 c.f.s.
11573.... 5– 9–46....Storm Cloud Mining Co.; Storm Cloud Willow Spring; Mining, milling, and domestic; Cancelled October 10, 1947, because of failure of applicant to comply with provisions of permit.
11574.... 5–13–46....Sigurd Folwick; Buser Creek; Irrigation; Approved October 3, 1946, for 1.0 c.f.s. G. S.
11575.... 5–13–16....William Hendrix; Nugget Spring; Stockwatering and domestic; Denied May 28, 1947, on the grounds that to approve same would be detrimental to public welfare.
11576.... 5–13–46....M. P. Depaoli; Fort Defence Creek; Irrigation and domestic; Cancelled December 4, 1946, because of failure to refile corrected application within statutory time.
11577.... 5–16–46....William Albert Johnson; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 16, 1946, for 0.05 c.f.s. G. S.
11578.... 5–16–46....P. J. Goumond; (Application to change point of diversion and place of use); Underground; Irrigation and domestic; Approved September 24, 1946, for 3.8 c.f.s. G. S.
11579.... 5–26–46....Gregson Bautzer (Assigned to Nevada Project Corp.); Underground (Las Vegas Artesian Basin); General hotel supply and domestic; Approved September 13, 1946, for 0.35 c.f.s. G. S.
11580.... 5–23–46....Gladys L. Splane; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved August 21, 1946, for 1.0 c.f.s. G. S.

G. S. Good standing.

11581.... 5–24–46....Caliente Public Utilities; Underground; Domestic; Approved September 13, 1946, for 1.0 c.f.s. G. S.

11582.... 5–24–46....Caliente Public Utilities; Underground; Domestic; Approved September 13, 1946, for 1.5 c.f.s. G. S.

11583.... 5–25–46....Mrs. Berenice Sullivan Holmstrom, Mrs. Adeline Minor, and Mrs. Minnie E. Heidenreich; Unnamed Creek; Irrigation and domestic; Approved September 13, 1946, for 0.5 c.f.s. G. S.

11584.... 5–27–46....Emil Pahor; Underground (Las Vegas Artesian Basin); Irrigation and domestic; October 28, 1946, for 0.58 c.f.s. G. S.

11585.... 6– 1–46....H. S. Staley; Fairbanks Spring; Irrigation and domestic; Approved June 23, 1947, for 0.80 c.f.s. G. S.

11586.... 6– 1–46....F. M. Cook and Harry C. Mudge; West Spring; Mining, milling, and domestic; Denied December 6, 1946, for the reason that after registered notice it is apparent that applicant is no longer interested in application.

11587.... 6– 1–46....F. M. Cook, Harry C. Mudge; North Summit Springs; Mining, milling, and domestic; Denied December 6, 1946, for the reason that after registered notice it is apparent that applicant is no longer interested in application.

11588.... 6– 3–46....A. L. Arnold; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 1, 1946, for 0.20 c.f.s. G. S.

11589.... 6– 3–46....Dan Filippini; Sod House Creek; Irrigation; Approved February 24, 1947, for 1.2 c.f.s. G. S.

11590.... 6– 5–46....Glenn D. Hurt; Underground; Irrigation and domestic; Approved November 7, 1946, for 3.0 c.f.s. G. S.

11591.... 6– 6–46....Opaco Lumber & Realty Co.; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 18, 1946, for 0.8 c.f.s. G. S.

11593.... 6–10–46....James R. and John G. Murdock; Kelley Creek; Irrigation and domestic; Approved January 6, 1947, for 1.6 c.f.s. G.S.

11594.... 6–10–46....Oly T. Edgell; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 18, 1946, for 0.2 c.f.s. G. S.

11595.... 6–10–46....A. F. Winter (Assigned to M. D. Close, Sr.); Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved September 18, 1946, for 0.25 c.f.s. G. S.

11596.... 6–10–46....E. E. Kaltenborn and Moe Taub; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved December 18, 1946, for 0.1 c.f.s. G. S.

11597.... 6–10–46....R. J. Kaltenborn; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved December 18, 1946, for 0.4 c.f.s. G. S.

11598.... 6–10–46....Harry Mack; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 15, 1946, for 0.2 c.f.s. G. S.

11599.... 6–10–46....Murray Wollman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 15, 1946, for 0.2 c.f.s. G. S.

11600.... 6–10–46....Murray Wollman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 15, 1940, for 0.2 c.f.s. G. S.

11601.... 6–10–46....Murray Wollman; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved October 15, 1946, for 0.2 c.f.s. G. S.

11602.... 6–12–46....S. H. Manor; Frazier Spring; Stockwatering; Denied August 11, 1947, on the grounds that the approval of same would contravene policy of the 1925 Stockwatering Act.

11603.... 6–12–46....S. H. Manor; Little Willow Springs; Stockwatering; Approved August 20, 1947, for 0.0034 c.f.s. G. S.

11604.... 6–12–46....S. H. Manor; Laundry Spring; Stockwatering; Approved August 20, 1947, for 0.0034 c.f.s. G. S.

11605.... 6–12–46....Floyd Lamb and Carlton Lamb; Cliff Spring; Stockwatering and domestic; Approved August 21, 1947, for 0.0063 c.f.s. G. S.

11606.... 6–12–46....Floyd R. and Carlton P. Lamb; Unnamed Drainage Basin; Stockwatering and domestic; Approved August 21, 1947, for sufficient water for 200 head of cattle. G. S.

11607.... 6–12–46....Floyd R. and Carlton P. Lamb; Shirley Spring; Stockwatering and domestic; Approved August 21, 1947, for 0.0063 c.f.s. G.S.

11608.... 6–12–46....Floyd R. and Carlton P. Lamb; Indian Spring; Stockwatering and domestic; Approved August 21, 1947, for 0.0063 c.f.s. G.S.

11610.... 6–12–46....Floyd R. and Carlton P. Lamb; Live Oak Spring; Stockwatering and domestic; Approved August 21, 1947, for 0.0063 c.f.s. G.S.

11611.... 6–13–46....Thomas T. Schofield and Della Schofield; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved September 20, 1946, for 0.2 c.f.s. G. S.

11612.... 6–13–46....Bonnie Wood; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Cancelled October 1, 1947, because of failure of applicant to comply with provisions of permit.

11613.... 6–14–46....W. L. Petersen; Blackbird Creek; Irrigation and domestic; Approved May 10, 1947, for 10 c.f.s. G. S.

11614.... 6–17–46....Wm. Moore, Harold Hynes, B. E. Barron, and Joseph Schramm; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Approved January 14, 1947, for 0.5 c.f.s. G. S.

G. S. Good standing.

11616.... 6–18–46....Glen H. Rohlf; Unnamed Spring; Domestic and garden use; Cancelled December 4, 1946, because of failure to refile corrected application within statutory time.

11617.... 6–19–46....Joseph Hoffman and Marie Hoffman; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 2, 1946, for 0.2 c.f.s. G. S.

11618.... 6–19–46....A. R. and N. L. Ruppert; Underground (Las Vegas Artesian Basin); Irrigation and domestic; Approved October 2, 1946, for 0.2 c.f.s. G. S.

11619.... 6–19–46....Oran L. Ballinger; Virgin River; Irrigation and domestic; Approved October 16, 1946, for 0.4 c.f.s. G. S.

11620.... 6–24–46....El Rancho Hotel and Village, Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved January 14, 1947, for 0.5 c.f.s. G. S.

11621.... 6–24–26....El Rancho Hotel and Village, Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal; Approved January 14, 1947, for 0.5 c.f.s. G. S.

11623.... 6–25–46....Bonanza Lodge, Inc.; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic; Withdrawn by applicant July 3, 1946.

11624.... 6–27–46....The Virginia City Water Company; (Application to change point of diversion, manner and place of use); (Assigned to Henry E., Roy F., and Edwin E. Heidenreich); North Creek (Third Creek) and Tributaries; Irrigation; Approved March 10, 1947, for 5.5 c.f.s. G. S.

G. S. Good standing.

CHAPTER XIX

Certificates Issued Under Permits, 1946–1948

Following is a condensed statement giving the salient data in connection with Certificates Issued Under Permits during the biennium for the period July 1, 1946, to June 30, 1948, in the order of:

1. Certificate number.
2. Book number.
3. Permit number.
4. Name of appropriator.
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.

2945	9	11150	J. E. Cavanaugh and C. R. Cavanaugh (Assigned to Palmer-Murphy Cattle Co. February 21, 1948); Underground; Stockwatering	0.019	7–23–46
2946	9	10643	Otto Underhill and Loriene Underhill; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.05	7–23–46
2947	9	10664	V. E. Greenwald; Bryan Spring; Stockwatering	0.003	7–23–46
2948	9	10668	V. E. Greenwald; Seep Spring; Stockwatering	0.003	7–23–46
2949	9	11332	One Eleven Bar Cattle Company; Underground (Well No. 6); Stockwatering and domestic	0.0094	7–23–46
2950	9	11134	One Eleven Bar Cattle Company; Underground (Black Rock Well); Stockwatering and domestic	0.008	7–23–46
2951	9	11335	One Eleven Bar Cattle Company; Underground (Butte Well); Stockwatering and domestic	0.008	7–23–46
2952	9	9495	E. P. Walker (Assigned to Theresa J. Walker December 9, 1946); McCarthy Springs; Mining, milling, and domestic	0.044	7–23–46
2953	9	9662	Central Pacific Railway Company; New Boston Spring; Transportation (railroad) and domestic	0.052	7–23–46
2954	9	10749	United States of America; Cabin Spring; Stockwatering	.001	7–23–46
2955	9	10737	Louis Garavanta and Ray Clemmons; Sheehan Springs Nos. 1, 2, and 3; Mining, milling, and domestic	0.05	7–26–46
2956	9	10467	Albert Welch; Carpenter Spring; Stockwatering	0.009	7–27–46
2957	9	10461	Ellen McGuire; Little Red Wash; Irrigation and domestic	0.48	8–17–46
2958	9	8859	Arthur H. Brown; Meadow springs and tributaries; Stockwatering	0.025	8–17–46
2959	9	8882	Arthur H. Brown; Herman Sadler Homestead Spring and Creek; Stockwatering	0.025	8–17–46
2960	9	8962	Arthur H. Brown; Franklin Springs; Stockwatering	0.025	8–17–46
2961	9	8963	Arthur H. Brown; Browne Springs; Stockwatering	0.025	8–17–46
2962	9	8964	Arthur H. Brown; Dufour Springs; Stockwatering	0.025	8–17–46
2963	9	9311	Arthur H. Brown; Arthur Spring; Stockwatering	0.025	8–17–46
2964	9	8965	Arthur H. Brown; Salty Williams Spring; Stockwatering	0.025	8–17–46
2965	9	8969	Arthur H. Brown; Grassy Springs; Stockwatering	0.025	8–17–46
2966	9	8970	Arthur H. Brown; Peggy B Springs; Stockwatering	0.025	8–17–46
2967	9	8971	Arthur H. Brown; Alba Springs; Stockwatering	0.025	8–17–46
2968	9	9312	Arthur H. Brown; Aurora Spring; Stockwatering	0.025	8–17–46

2969	9	8616	H. F. Dangberg Land & Livestock Company; Well (Dangberg Well No. 1); Supplemental irrigation	1.34	8–20–46
2970	9	8617	H. F. Dangberg Land & Livestock Company; Well (Dangberg Well No. 2); Supplemental irrigation	1.34	8–20–46
2971	9	10975	S. H. Manor; Holland Spring; Stockwatering	0.0035	8–29–46
2972	9	11452	C. A. and Rachel C. Roberts; Lower Ranch Spring; Stockwatering and domestic	0.0046	9–10–46
2973	9	11453	C. A. and Rachel C. Roberts; South Spring; Stockwatering and domestic	0.0046	9–10–46
2974	9	11454	C. A. and Rachel C. Roberts; Cane Springs; Stockwatering and domestic	0.0046	9–10–46
2975	9	11455	C. A. and Rachel C. Roberts; Galvanized Tank Spring; Stockwatering and domestic	0.0046	9–10–46
2976	9	11456	C. A. and Rachel C. Roberts; Sheep Spring; Stockwatering and domestic	0.0046	9–10–46
2977	9	11457	C. A. and Rachel C. Roberts; Clay Bank Spring; Stockwatering and domestic	0.0046	9–10–46
2978	9	11458	C. A. and Rachel C. Roberts; East Spring; Stockwatering and domestic	0.0046	9–10–46
2979	9	11459	C. A. and Rachel C. Roberts; Rock Spring; Stockwatering and domestic	0.0046	9–10–46
2980	9	11460	C. A. and Rachel C. Roberts; Bootlegger Spring; Stockwatering and domestic	0.0046	9–10–46
2981	9	11461	C. A. and Rachel C. Roberts; West Spring; Stockwatering and domestic	0.0046	9–10–46
2982	9	11462	C. A. and Rachel C. Roberts; Big Timber Spring (Lower Diversion); Stockwatering and domestic	0.0046	9–10–46
2983	9	11463	C. A. and Rachel C. Roberts; Big Timber Spring (Upper Diversion); Stockwatering and domestic	0.0046	9–10–46
2984	9	11464	C. A. and Rachel C. Roberts; Center Spring (Lower Diversion); Stockwatering and domestic	0.0046	9–10–46
2985	9	11465	C. A. and Rachel C. Roberts; Center Spring (Upper Diversion); Stockwatering and domestic	0.0046	9–10–46
2986	9	10472	Lois Kellogg II; (Assigned to H. D. Cornell and Natalie F. Cornell July 17, 1947); Underground (Well No. 21 Pahrump Artesian Basin); Irrigation	2.2	9–16–46
2987	9	10571	Harold D. Cornell; Underground (Well No. 18 Pahrump Artesian Basin); Irrigation	2.2	9–16–46
2988	9	10600	Lois Kellogg II; (Assigned to H. D. Cornell and Natalie F. Cornell July 17, 1947); Underground (Well No. 25 Pahrump Artesian Basin); Irrigation	3.0	9–16–46
2989	9	11132	H. D. Cornell; Underground (Well No. 19 Pahrump Artesian Basin); Irrigation	4.0	9–16–46
2990	9	11486	E. L. Cord; Trail Creek; Irrigation	0.47	9–26–46
2991	9	11389	B. F. Porter Estate, A Corporation; Underground (Well); Stockwatering	0.016	10–19–46
2992	9	11390	B. F. Porter Estate, A Corporation; Crowbar Spring; Stockwatering	0.016	10–19–46
2993	9	11391	B. F. Porter Estate, A Corporation; Chipmunk Spring; Stockwatering	0.016	10–19–46
2994	9	11392	B. F. Porter Estate, A Corporation; Johnstone Spring; Stockwatering	0.009	10–19–46
2995	9	11393	B. F. Porter Estate, A Corporation; Whiterock Spring; Stockwatering	0.016	10–19–46
2996	9	11394	B. F. Porter Estate, A Corporation; Pinto Mountain Spring; Stockwatering	0.031	10–19–46
2997	9	11396	B. F. Porter Estate, A Corporation; Troughs Spring; Stockwatering	0.0125	10–19–46
2998	9	11398	B. F. Porter Estate, A Corporation; Battle Creek Spring; Stockwatering	0.023	10–19–46
2999	9	11399	B. F. Porter Estate, A Corporation; Lower Pigeon Spring; Stockwatering	0.003	10–19–46
3000	9	11400	B. F. Porter Estate, A Corporation; Mahogany Spring; Stockwatering	0.009	10–19–46
3001	9	10107	Lund Irrigation Company; Preston Big Springs, Cold Spring, and Nicholas Spring; Irrigation	7.5	10–19–46
3002	9	10108	Lund Irrigation Company; Lund Spring; Irrigation	6.0	10–19–46
3003	9	10709	Chas. E. Barbee and Silvia Barbee; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic	0.02	10–29–46
3004	9	11252	Mario Belli; Truckee River; Irrigation	0.18	11– 7–46
3005	9	10818	Opaco Lumber & Realty Company; Underground (Las Vegas Artesian Basin); Manufacturing, fire protection, and domestic	0.11	11– 7–46

3006	9	10900	F. W. Eccles; Warm Spring; Stockwatering	0.0163	11–15–46
3007	9	10721	Thomas E. Sharp; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.15	11–15–46
3008	9	10722	Thomas E. Sharp; Underground (Las Vegas Valley Artesian Basin); Irrigation and domestic	0.594	11–15–46
3009	9	10706	Las Vegas Land and Water Company; Underground (Las Vegas Artesian Basin); Municipal supply and domestic	1.0	11–25–46
3010	9	10707	Las Vegas Land and Water Company; Underground (Las Vegas Artesian Basin); Municipal and domestic	1.0	11–25–46
3011	9	11232	H. N. Sharp; Troy Creek; Irrigation and domestic	1.07	11–25–46
3012	9	10824	A. C. Florio; Underground (Holly Well); Stockwatering	0.094	12– 2–46
3013	9	10827	A. C. Florio; Underground (Hay Ranch Well); Stockwatering	0.094	12– 2–46
3014	9	9218	McGonigle and Gentry; (Assigned to D. D. Marron, V. F. Yorba, and Leo Yorba December 20, 1947); Grease Wood Basin Gulch; Stockwatering	0.00156	12– 2–46
3015	9	10821	O. J. Smith and Cloa Smith; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic	0.084	12–23–46
3016	9	11066	Albert Hooper; Underground; Stockwatering	0.0032	1– 3–47
3017	9	2942	Malvin A. Pedroli; Harmony Creek; Irrigation and domestic	0.174	1– 7–47
3018	9	7104	Prosper Hammond; Kelley Creek; Irrigation	1.132	1–21–47
3019	9	10555	Ella Marian L. Dana and Sidney H. Vail; Unnamed Spring (Hennen Spring); Stockwatering	0.0044	1–21–47
3020	9	11040	R. J. Bradshaw; Robber Roost Spring; Stockwatering	0.0036	1–23–47
3021	9	10118	Preston Irrigation Co.; White River; Irrigation	8.2061	1–23–47
3022	9	10176	Preston Irrigation Co., Inc.; Arnoldson Spring; Irrigation	3.82	1–23–47
3023	9	10177	Preston Irrigation Co., Inc.; Preston Big Spring; Irrigation	4.57	1–23–47
3024	9	10786	Lloyd R. Jones and Greta Jones; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.0133	2–26–47
3024a	9	10786	A. J. Rafael and Byrde Rafael; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.0067	2–26–47
3025	9	9520	Orvy W. Clark and Adleine E. Clark; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic	0.08	2–27–47
3026	9	10860	Gabryel Pahor and W. W. Martin; Underground (Las Vegas Artesian Basin); Quasi-municipal and domestic	0.035	2–27–47
3027	9	11329	Ira G. Blundell; Unnamed Spring; Stockwatering	0.00938	2–27–47
3028	9	11268	H. F. Dangberg Land & Livestock Company; Underground (William's Canyon Well); Stockwatering	0.05	2–27–47
3029	9	11269	H. F. Dangberg Land & Livestock Co.; Underground (Buckeye Windmill Well); Stockwatering	0.05	2–27–47
3030	9	11270	H. F. Dangberg Land & Livestock Company; Underground (Uhalde Well); Stockwatering	0.05	2–27–47
3031	9	10969	Lawrence Henz and Marguerite Henz; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.0076	2–27–47
3032	9	10691	United States of America, Forest Service; Unnamed Spring; Domestic	0.018	3– 7–47
3033	9	4372	J. J. Vignolo; (Assigned to Neal Cook October 30, 1947); McDonald Spring; Stockwatering	0.0015	3– 7–47
3034	9	3386	J. J. Vignolo; (Assigned to Neal Cook October 30, 1947); Cave Rock Spring; Stockwatering	0.005	3– 7–47
3035	9	11279	Ira H. Kent; Underground; Stockwatering	0.0047	3– 7–47
3036	9	11714	Bartholomae Corporation; Duckwater Creek; To change the point of diversion and place of use; Irrigation and domestic	1.19	3–20–47
3037	9	11053	Albert L. and Verena M. Hermenjat; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.13	3–20–47
3038	9	11479	Mrs. Margaret E. Bauer; Underground (Lafe Mathews Well); Irrigation	0.4935	3–20–47
3039	9	10866	H. N. Sharp; Deep Creek Canyon; Stockwatering	0.0156	3–20–47

3040	9	8673	Charles A. McKay; Misssissippi Spring; Stockwatering	0.003	3–21–47
3041	9	8674	Charles A. McKay; Eagle Spring; Stockwatering	0.003	3–21–47
3042	9	10938	Petan Company; Flood waters; Stockwatering	0.16	3–21–47
3043	9	11439	W. J. Stinson; Underground (Artesian Well); Stockwatering	0.0156	3–26–47
3044	9	11440	W. J. Stinson; Underground (Excavated Trench); Stockwatering	0.0156	3–26–47
3045	9	11051	Troy B. Hunt and Betty Hunt; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.04	4–10–47
3046	9	10835	Buck Horn Cattle Company; Troy Creek; Stockwatering	0.00156	4–10–47
3047	9	10836	Buck Horn Cattle Company; Unnamed Spring (Christen Spring); Stockwatering	0.00312	4–10–47
3048	9	10725	John Sigurdson; Las Vegas Artesian Basin; Quasi-municipal	0.03	4–21–47
3049	9	11112	Chris Dahlstrom; Unnamed Spring; Stockwatering	0.00156	4–21–47
3050	9	10657	J. O. Greenan; Willow Creek; Placer mining	1.00	5–26–47
3051	10	11039	Hotels El Roncho, Inc.; Underground (Las Vegas Artesian Basin); General Hotel Supply and domestic	0.208	5–26–47
3052	10	10662	Caliente Public Utilities; Underground (Well No. 3); Municipal	1.0	5–26–47
3053	10	10661	G. M. Standifer; Underground (Well No. 3); Mining	1.34	5–26–47
3054	10	8781	John E. Marble; Union Spring No. 1; Stockwatering	0.072	6–19–47
3055	10	8782	John E. Marble; Union Spring No. 2; Stockwatering	0.072	6–19–47
3056	10	8784	John E. Marble; Union Spring No. 4; Stockwatering	0.072	6–19–47
3057	10	8785	John E. Marble; Union Spring No. 5; Stockwatering	0.072	6–19–47
3058	10	11004	Angelo C. Florio; Underground (Grand View Well); Stockwatering	0.095	6–19–47
3059	10	10930	Jack F. Haake and Frankie Haake; Underground (Las Vegas Valley Artesian Basin); Irrigation and domestic	0.20	6–19–47
3060	10	11380	Jack F. Haake and Frankie Haake; Underground (Las Vegas Valley Artesian Basin); To change point of diversion (Permit No. 11288); Irrigation and domestic	0.28	6–19–47
3061	10	10951	Vera K. Clement, Merrill O. Clement, Lydell V. Clement, and Lee Waite; Underground (Las Vegas Valley Artesian Basin); Irrigation and domestic	0.045	6–19–47
3062	10	10601	Old English Gold Corporation; Troy Creek; Mining, milling, and domestic	0.50	6–19–47
3063	10	11033	Juanita W. Bleak and Cassey L. Wheeler; Dead Man Spring; Stockwatering	0.0031	6–19–47
3064	10	11657	John Sutherland; Underground (Artesian Well); Irrigation and domestic	0.035	7– 1–47
3065	10	11469	Yomba Shoshone Tribe; Underground (Kelly Well); Stockwatering	0.016	7– 1–47
3066	10	11284	Sunrise Acres Water Association, Inc.; Underground (Las Vegas Artesian Basin); Municipal	0.31	7–22–47
3067	10	11640	Sunrise Acres Water Association, Incorporated; Underground (Las Vegas Artesian Basin); Municipal	0.20	7–22–47
3068	10	11790	Alma Woods; Monitor Valley; Stockwatering	0.009	7–22–47
3069	10	11533	George H. and Mary McKaig; Underground (McKaig Well); Irrigation and domestic	0.10	7–22–47
3070	10	10580	G. C. Blaine and Clifford A. Jones; Underground (Las Vegas Valley Artesian Basin); Irrigation and domestic	0.045	7–30–47
3071	10	10970	James W. Cook and Mae Cook; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.01	8–27–47
3072	10	10996	William M. Metzer; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.0451	8–27–47
3073	10	11167	D. L. Stewart; Jumbo Spring; Stockwatering and domestic	0.003	11–27–47
3074-1	10	10990	Dave Campbell; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.02	11–17–47
3074-2	10	10990	Thomas W. Allen; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.08	11–17–47
3075	10	11355	Eugene A. Henroid; Underground (Henroid Well No. 3); Stockwatering	0.004	11–17–47
3076	10	10926	T. F. Brennen Land & Livestock Co.; Cottonwood Creek (Cottonwood Canyon); Irrigation	0.633	11–17–47

3077	10	11754	Nathan Realty Company; Underground (Well No. 2); Cooling air conditioners	0.25	11–17–47
3078	10	11755	Nathan Realty Company; Underground (Well No. 1); Domestic purposes (Drinking water)	0.00077	11–17–47
3079	10	11158	E. O. and Marion Loriene Underhill; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.197	11–17–47
3080	10	11170	Ogle Swingle; Big High Rock Creek; Irrigation and domestic	1.799	11–17–47
3081	10	11276	Ogle Swingle; King Spring; Irrigation and domestic	0.25	11–18–47
3082	10	10976	S. H. Manor; Rock Hill Spring; Stockwatering	0.0035	11–17–47
3083	10	11139	D. L. Stewart; Pony Spring No. 2; Stockwatering	0.00625	11–17–47
3084	10	10903	R. B. Stewart; Summit Spring; Stockwatering	0.044	11–21–47
3085	10	11200	A. F. Bordoli; Twin Springs Slough; Stockwatering	0.0078	12–10–47
3086	10	11886	McGonigle and Gentry (Assigned to D. D. Marron, V. F. Yorba, and Leo Yorba December 20, 1947); Hartman Wash; Stockwatering	0.0006	12–10–47
3087	10	11395	B. F. Porter Estate, a Corporation; Bartlett Peak Spring; Stockwatering	0.03125	1– 7–48
3088	10	10867	Las Vegas Land and Water Company; Underground (Las Vegas Valley Artesian Basin, Well No. 7); Municipal supply and domestic use	2.26	1–23–48
3089	10	10868	Las Vegas Land and Water Company; Underground (Las Vegas Valley Artesian Basin, Well No. 8); Municipal supply and domestic use	2.37	1–23–48
3090	10	10869	Las Vegas Land and Water Company; Underground (Las Vegas Valley Artesian Basin, Well No. 9); Municipal supply and domestic use	1.51	1–23–48
3091	10	10870	Las Vegas Land and Water Company; Underground (Las Vegas Valley Artesian Basin, Well No. 10); Municipal supply and domestic use	3.00	1–23–48
3092	10	11249	Las Vegas Land and Water Company; Underground (Las Vegas Valley Artesian Basin, Well No. 11); Municipal supply and domestic use	2.26	1–23–48
3093	10	11835	Alma Woods; Willow Creek; Stockwatering	0.01	1–23–48
3094	10	11836	Alma Woods; Underground (Alma Woods Well No. 1); Stockwatering	0.01	1–23–48
3095	10	7014	Henry Filippini; Springs (Burton Springs); Irrigation and domestic	0.3849	1–23–48
3096	10	11416	M. B. Bates and J. H. Sewell; (Monitor Land and Livestock Co., a partnership); Underground (Monitor Well No. 2); Stockwatering	0.0156	1–23–48
3097	10	11419	M. B. Bates and J. H. Sewell; (Monitor Land and Livestock Co., a partnership); Underground (Monitor Well No. 1); Stockwatering	0.0156	1–23–48
3098	10	11370	Washoe County, through its Board of Commissioners; Underground (20 artesian wells); Fish culture	2.00	2–17–48
3099	10	11371	Washoe County, through its Board of Commissioners; Underground (Well); Fish culture	2.00	2–17–48
3100	10	10495	Ray W. West and Grace M. West; West Springs; Mining and domestic	0.0125	2–17–48
3101	10	10873	Albert Romeo; Steptoe Creek; Irrigation	2.0	3–29–48
3102	10	11267	Albert Romeo; Underground; Irrigation	2.0	3–29–48
3103	10	11701	Fallini Brothers (E. W., Joe B., and R. A. Fallini); Twin Springs Wash; Stockwatering	0.032	4– 9–48
3104	10	11753	Fallini Brothers (E. W., Joe B., and R. A. Fallini); Twin Springs Wash; Stockwatering	0.032	4– 9–48
3105	10	11861	Fallini Brothers (E. W., Joe B., and R. A. Fallini); Underground (Buck's Water); Stockwatering	0.032	4– 9–48
3106	10	11915	Fallini Brothers (E. W., Joe B., and R. A. Fallini); Flood water of the Reveille Valley; (Midway Tank); Stockwatering	0.032	4– 9–48
3107	10	10972	Clay Hughes Tipton; Summit Creek; Irrigation and domestic	0.163	4–26–48
3108	10	11273	E. L. Cord; Water Hole Spring; Stockwatering	0.01	4–26–48

3109	10	11111	City of Las Vegas, Nevada; Underground (Las Vegas Valley Artesian Basin); Irrigation	0.10	4-26-48
3110	10	10284	W. S. Peterson; Underground (Sulphur Well); Mining and domestic	0.50	4-26-48
3111	10	11793	Kent Land and Livestock Company; Underground (Mountain Well); Stockwatering and domestic	0.03	5-15-48
3112	10	11794	Kent Land & Livestock Co., and Ira H. Kent; Underground (West Lee Well); Stockwatering and domestic	0.3	5-15-48
3113	10	11795	Kent Land & Livestock Company and Ira H. Kent; Underground (Sheep Canon Well); Stockwatering and domestic	0.03	5-15-48
3114	10	11796	Kent Land & Livestock Company; West Lee Canon Spring; Stockwatering and domestic	0.03	5-15-48
3115	10	11797	Kent Land & Livestock Company; Underground (Shirttail Well); Stockwatering and domestic	0.03	5-15-48
3116	10	11798	Kent Land & Livestock Company; Side Hill Springs; Stockwatering and domestic	0.03	5-15-48
3117	10	11101	R. J. Kaltenborn; Underground (Las Vegas Valley Artesian Basin); Domestic and irrigation	0.20	5-19-48
3118	10	10779	Defense Plant Corporation; Colorado River; Milling and metallurgical	45	6-21-48
3119	10	10799	Defense Plant Corporation; Colorado River; Municipal	12	6-21-48
3120	10	11102	Vassle and Charles R. Martin; Underground (Las Vegas Valley Artesian Basin); Domestic and irrigation	0.10	6-21-48
3121	10	11103	Lloyd H. and Rae Tritle; Underground (Las Vegas Valley Artesian Basin); Domestic and irrigation	0.10	6-21-48
3122	10	11306	E. W. Cragin and Lucille Cragin; Underground (Las Vegas Artesian Basin); Irrigation and domestic	0.20	6-21-48
3123	10	11862	Fallini Brothers (Partnership—E. W., R. A., J. B. Fallini, and Constant Vener); Underground (George's Water); Stockwatering	0.032	6-21-48
3124	10	11174	H. D. Cornell; Six Mile Manse Spring; Stockwatering	0.022	6-21-48
3125	10	11311	E. A. Henriod; Underground (Henriod Well); Stockwatering	0.017	6-21-48
3126	10	11313	E. A. Henriod; Moonshine Springs; Stockwatering	0.017	6-21-48
3127	10	11354	E. A. Henriod and James E. Doutre; Underground (Henriod-Doutre Well); Stockwatering	0.0	6-21-48
3128	10	4309	James M. Daniels; Brickyard Springs; Stockwatering and domestic	0.00125	6-21-48
3129	10	10594	W. T. Stewart; Naquinte Valley Dry Channel (Reservoir No. 1); Stockwatering and domestic	5*	6-21-48
3130	10	10595	W. T. Stewart; Belted Range Channel and Tributaries (Reservoir No. 2); Stockwatering and domestic	5*	6-21-48

*Acre feet per year.

CHAPTER XX

STATEMENT OF EXPENDITURES FROM APPROPRIATION FOR SUPPORT OF STATE ENGINEER'S OFFICE FOR THE PERIOD FROM JULY 1, 1946 TO JUNE 30, 1948, INCLUSIVE

Month and year	Appropriation by Legislature	Statutory salaries	Office salaries	Travel expense	Office expense	Equipment	Total	Balance
Balance July 1, 1946								$30,158.49
1946								
July		$965.82	$839.50	$294.43	$95.33		$2,195.08	
August		965.82	901.78	100.55	170.36		2,138.51	
September		965.82	865.45	124.57	118.59	$912.18	2,986.61	
October		965.82	1,127.00	276.57	152.67	32.75	2,554.81	
November		965.82	1,127.00	126.35	73.40	50.38	2,342.95	
December		965.82	1,127.00	267.75	201.69	39.50	2,601.76	
Totals		$5,794.92	$5,987.73	$1,190.22	$812.04	$1,034.81	$14,819.72	$30,158.49 14,819.72
Balance January 1, 1947								$15,338.77
1947								
January		$965.82	$1,127.00	$216.58	$165.80	$69.69	$2,544.89	
February		965.82	1,138.50	172.77	139.08		2,416.17	
March		965.82	1,138.50	83.12	88.49	261.75	2,537.68	
April		965.82	1,138.50	182.93	168.01	53.95	2,509.21	
May		965.82	1,138.50	191.29	18.66	169.90	2,484.17	
June		966.05	1,158.38	368.82	112.57	54.10	2,659.92	
Totals		$5,795.15	$6,839.38	$1,215.51	$692.61	$609.39	$15,152.04	$15,338.77 15,152.04
Miscellaneous refunds								$186.73 83.85
Reverted July 1, 1947								$270.58
1947								
July	$66,860.00	$1,067.90	$1,242.04		$83.40		$2,393.34	$66,860.00
August		1,067.90	1,242.04	$195.53	205.01	$268.89	2,979.37	
September		1,067.90	1,242.04	131.89	116.34		2,558.17	
October		1,067.90	1,242.04	384.96	126.27	649.97	3,471.14	
November		1,067.90	1,324.44	327.14	253.39	98.51	3,071.38	
December		1,067.90	1,258.04	133.28	112.34	8.59	2,580.15	
Totals		$6,407.40	$7,550.64	$1,172.80	$896.75	$1,025.96	$17,053.55	$66,860.00 17,053.55
Balance July 1, 1948								$49,806.45

1948								
January		$1,067.90	$1,242.04	$14.12	$60.21		$2,384.27	
February		1,067.90	1,242.04	255.54	193.39	$308.48	3,067.35	
March		1,067.90	1,242.04	80.76	102.93	59.70	2,553.33	
April		1,067.90	1,274.04	198.68	84.02	424.14	3,048.78	
May		1,067.90	1,242.04	102.70	95.34		2,507.98	
June		1,067.90	1,242.04	269.21	118.38		2,697.53	
Totals		$6,407.40	$7,484.24	$921.01	$654.27	$792.32	$16,259.24	$49,806.45
								16,259.24
								$33,547.21
Miscellaneous receipts—Refunds								176.64
Balance July 1, 1948								$33,723.85

STATEMENT OF FEES COLLECTED BY THE STATE ENGINEER FROM JULY 1, 1946, TO JUNE 30, 1948, INCLUSIVE

Month and year	Total fees received	Proofs of appropriation	Applications: Publications	Applications: State fees	Recording permits	Proofs of commencement	Proofs of completion	Proofs of beneficial use	Protests	Clerical	Blue prints	Excess collections	Advance for certificates
1946													
July	$916.00	.....	$287.50	$172.50	$351.00	$6.00	$15.00	$5.00	$5.00	$48.00	$12.00	$7.00	$7.00
August	1,031.00	.....	387.50	232.50	165.00	38.00	50.00	33.00	11.00	78.00	20.00	1.00	15.00
September	887.75	$30.00	225.00	135.00	403.00	13.00	3.00	.....	3.00	35.00	8.00	13.75	19.00
October	823.00	.....	175.00	120.00	398.00	17.00	18.00	18.00	1.00	59.00	6.00	.....	11.00
November	887.96	10.00	187.50	117.50	386.00	10.00	4.00	5.00	45.00	81.00	30.96	.....	11.00
December	588.92	.....	175.00	105.00	177.50	7.00	12.00	5.00	12.00	36.00	55.42	2.00	2.00
Totals	$5,134.63	$40.00	$1,437.50	$882.50	$1,880.50	$91.00	$102.00	$66.00	$77.00	$337.00	$132.38	$23.75	$65.00
1947													
January	$656.00	$30.00	$287.50	$172.50	$63.00	$15.00	$6.00	$2.00	$10.00	$55.00	$8.00	.....	$7.00
February	811.00	20.00	337.50	207.50	130.00	13.00	14.00	8.00	1.00	61.00	9.00	.....	10.00
March	895.30	.....	300.00	185.00	250.50	16.00	15.00	13.00	6.00	83.00	12.80	$2.00	12.00
April	871.80	.....	287.50	172.50	213.00	9.00	8.00	5.00	7.00	75.00	82.80	7.00	5.00
May	874.50	.....	250.00	160.00	268.00	21.00	9.00	8.00	12.00	114.00	28.50	.....	4.00
June	969.50	.....	375.00	235.00	190.00	25.00	10.00	11.00	16.00	72.00	16.50	7.00	12.00
July	1,366.00	.....	700.00	420.00	117.00	10.00	9.00	7.00	11.00	68.00	4.00	14.00	6.00
August	1,550.00	80.00	612.50	407.50	298.00	16.00	8.00	.....	5.00	73.00	44.00	4.00	2.00
September	1,118.25	20.00	462.50	282.50	207.75	10.00	8.00	3.00	2.00	42.00	80.50		
October	1,058.00	.....	412.50	247.50	239.00	15.00	19.00	9.00	5.00	99.00	7.00	.....	5.00
November	1,436.30	.....	662.50	407.50	200.00	10.00	11.00	8.00	13.00	68.00	31.30	14.00	11.00
December	1,080.00	.....	437.50	272.50	255.00	10.00	10.00	10.00	11.00	54.00	16.00	4.00	
Totals	$12,686.65	$150.00	$5,125.00	$3,170.00	$2,431.25	$170.00	$127.00	$84.00	$99.00	$864.00	$340.40	$52.00	$74.00
1948													
January	$2,127.00	.....	$1,137.50	$687.50	$179.00	$11.00	$7.00	$7.00	$11.00	$52.00	$23.00	.....	$12.00
February	1,258.65	.....	525.00	315.00	273.00	17.00	16.00	20.00	17.00	47.00	16.65	$1.00	11.00
March	2,411.90	.....	1,325.00	850.00	90.00	17.00	3.00	7.00	5.00	62.00	46.90	3.00	3.00
April	1,195.20	.....	450.00	275.00	235.60	6.00	10.00	6.00	106.00	56.00	34.60	10.00	6.00
May	1,307.25	.....	562.50	342.50	214.00	10.00	10.00	3.00	16.00	90.00	46.25	4.00	9.00
June	1,420.00	.....	625.00	405.00	169.00	27.00	15.00	10.00	7.00	84.00	21.00	50.00	7.00
Totals	$9,720.00	.....	$4,625.00	$2,875.00	$1,160.60	$88.00	$61.00	$53.00	$162.00	$391.00	$188.40	$68.00	$48.00

STATEMENT OF DISBURSEMENTS FROM STATE ENGINEER'S FUND FOR PERIOD JULY 1, 1946, TO JUNE 30, 1948, INCL.

Month and year	Total disbursements	Publications	Refunds	Recording certificates	Blue prints	Deposited with State Treasurer	Transfer to Revolving Fund
1946							
July	$1,166.00	$350.00	$194.50	$12.00	.....	$609.50	
August	859.55	212.50	1.00	18.00	$11.55	616.50	
September	1,367.08	612.50	126.25	19.00	13.33	596.00	
October	922.00	275.00	.....	13.00	.....	634.00	
November	1,009.48	337.50	.....	8.00	.....	663.98	
December	1,987.21	262.50	88.50	4.00	.....	382.21	$1,250.00
Totals	$7,311.32	$2,050.00	$410.25	$74.00	$24.88	$3,502.19	$1,250.00
1947							
January	$636.00	$287.50	$1.00	$8.00	$12.00	$327.50	
February	748.00	300.00	.....	9.00	.....	439.00	
March	727.40	137.50	2.00	13.00	.....	574.90	
April	843.84	162.50	57.00	5.00	.....	619.34	
May	743.75	125.00	12.50	.....	.....	606.25	
June	900.75	187.50	132.00	14.00	.....	567.25	
July	1,040.00	375.00	14.00	7.00	.....	644.00	
August	1 272.65	425.00	4.00	2.00	.....	841.65	
September	758.00	150.00	12.50	.....	.....	595.50	
October	774.50	125.00	12.50	.....	.....	637.00	
November	1,390.18	575.00	39.00	13.00	30.03	733.15	
December	1,185.50	500.00	53.00	2.00	.....	630.50	
Totals	$11,020.57	$3,350.00	$339.50	$73.00	$42.03	$7,216.04	
1948							
January	$1,204.00	$22[illegible].00	$1.00	$12.00	.....	$966.00	
February	1,279.82	550.00	13.50	3.00	.....	713.32	
March	1,287.60	200.00	3.00	2.00	$25.15	1,057.45	
April	1,542.40	700.00	122.50	8.00	.....	711.90	
May	1,556.12	837.50	4.00	6.00	.....	708.62	
June	1,520.50	712.50	79.50	1.00	.....	727.50	
Totals	$8,390.44	$3,225.00	$223.50	$32.00	$25.15	$4,884.79	

STATEMENT OF RECEIPTS AND DISBURSEMENTS, STATE ENGINEER'S FUND FROM JULY 1, 1946, TO JUNE 30, 1948, INCLUSIVE

Balance July 1, 1946	$6,849.27	
Receipts July 1, 1946, to June 30, 1948	27,541.28	
Transfer to Revolving Fund	1,250.00	
Disbursements July 1, 1946, to June 30, 1948		$26,722.33
Balance July 1, 1948		8,918.22
	$35,640.55	$35,640.55
Cash Reconcilement—		
Balance, Carson Branch, First National Bank of Nevada, June 30, 1948	$7,839.22	
Less outstanding checks	1,421.00	
		$6,418.22
Revolving Fund		2,500.00
Balance July 1, 1948		$8,918.22

HUMBOLDT WATER DISTRIBUTION DISTRICT

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$36,351.67
1946				
July	$1,354.00	$585.00	$1,939.00	
August	1,109.00	958.85	2,067.85	
September	1,035.00	643.62	1,678.62	
October	562.50	371.31	933.81	20.58
November		297.75	297.75	15.84
December		371.02	371.02	143.25
Totals	$4,060.50	$3,227.55	$7,288.05	$36,531.34
				7,288.05
Balance January 1, 1947				$29,243.29
1947				
January	$360.00	$194.96	$554.96	
February	360.00	323.96	683.96	
March	765.00	300.52	1,065.52	$304.22
April	1,042.50	450.05	1,492.55	
May	1,260.00	732.15	1,992.15	
June	1,723.50	726.07	2,449.57	20,199.78
July	2,393.50	962.95	3,356.45	
August	1,332.00	1,065.18	2,397.18	
September	1,717.50	565.50	2,283.00	
October	1,177.85	1,956.92	3,134.77	
November	997.85	2,277.75	3,275.60	
December	755.00	233.59	988.59	
Totals	$13,884.70	$9,789.60	$23,674.30	$49,747.29
				23,674.30
Balance January 1, 1947				$26,072.99
1948				
January	$851.00	$263.60	$1,114.60	$129.94
February	891.00	3,249.03	4,140.03	1.30
March	968.00	389.36	1,357.36	
April	1,171.00	664.33	1,835.33	
May	1,799.00	950.69	2,749.69	
June	1,981.00	1,515.90	3,496.90	22,600.83
Totals	$7,661.00	$7,032.91	$14,693.91	$48,805.06
				14,693.91
Balance July 1, 1948				$34,111.15

NOTE—The Humboldt Water Distribution District includes the Humboldt River, Little Humboldt River, Tony Creek, Six Mile Creek, and Quinn River.

MUDDY RIVER DISTRIBUTION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$1,345.60
1946				
August	$140.00	$2.80	$142.80	
September	70.00		70.00	
November	110.00	71.40	181.40	
December	40.00		40.00	
Totals	$360.00	$74.20	$434.20	$1,345.60
				434.20
Balance January 1, 1947				$911.40
1947				
January	$40.00		$40.00	
May	160.00		160.00	
June	70.00		70.00	
July		$81.11	81.11	637.20
November		9.23	9.23	
December	360.00	8.00	368.00	
Totals	$630.00	$98.34	$728.34	$1,548.60
				728.34
Balance January 1, 1948				$820.26
1948				
April	$160.00	$12.08	$172.08	
July				$1,116.10
Totals	$160.00	$12.08	$172.08	$1,936.36
				172.08
Balance July 1, 1948				$1,764.28

PAHRANAGAT LAKE DISTRIBUTION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$1,044.10
1946				
July	$225.00	$66.20	$291.20	
August	232.50	18.98	251.48	
September	232.50	139.34	371.84	
October		30.45	30.45	
Totals	$690.00	$254.97	$944.97	$1,044.10
				944.97
Balance January 1, 1947				$99.13
1947				
February		$13.57	$13.57	
June				1,017.02
August	$114.00	43.23	157.23	
September	186.00	34.22	220.22	
October	90.00	429.39	519.39	
Totals	$390.00	$520.41	$910.41	$1,116.15
				910.41
Balance January 1, 1948				$205.74
1948				
January				2.01
March		$14.91	$14.91	
April		19.95	19.95	
June	$75.00		75.00	1,017.02
Totals	$75.00	$34.86	$109.86	$1,224.77
				109.86
Balance July 1, 1948				$1,114.91

CURRANT AND DUCKWATER DISTRIBUTION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$2,974.76
1946				
July	$225.00	$77.00	$302.00	
August	232.50	79.55	312.05	
September	232.50	79.55	312.05	30.41
October	225.00	271.12	496.12	121.64
December	25.00		25.00	
Totals	$940.00	$507.22	$1,447.22	$3,126.81
				1,447.22
Balance January 1, 1947				$1,679.59
1947				
January	$25.00		$25.00	
February	25.00		25.00	
March	25.00		25.00	
April	25.00		25.00	
May	25.00		25.00	
June	232.50	$81.65	314.15	1,438.43
July	225.00	81.50	306.50	
August	232.50	83.05	315.55	
September	232.50	78.15	310.65	303.08
October	225.00	78.00	303.00	
November	220.00	72.50	292.50	
December	25.00		25.00	
Totals	$1,517.50	$474.85	$1,992.35	$3,421.10
				1,992.35
Balance January 1, 1948				$1,428.75
1948				
January	$25.00		$25.00	$110.23
February	25.00		25.00	
March	25.00		25.00	
April	25.00		25.00	
May	25.00	$56.30	81.30	
June	232.50	129.50	362.00	1,119.78
Totals	$357.50	$185.80	$543.30	$2,658.76
				543.30
Balance July 1, 1948				$2,115.46

BAKER AND LEHMAN CREEKS DISTRIBUTION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$446.09
1946				
July	$75.00		$75.00	
August	75.00	$1.50	76.50	
September	75.00		75.00	
October	37.50		37.50	
Totals	$262.50	$1.50	$264.00	$446.09
				264.00
Balance January 1, 1947				$182.09
1947				
May	$37.50		$37.50	
June	75.00		75.00	465.15
July	75.00		75.00	
August	75.00		75.00	
September	112.50		112.50	
Totals	$375.00		$375.00	$647.24
				375.00
Balance January 1, 1948				$272.24
1948				
January		$55.00	$55.00	
May	$60.00		60.00	
June	120.00		120.00	$465.15
Totals	$180.00	$55.00	$235.00	$737.39
				235.00
Balance July 1, 1948				$502.39

WHITE RIVER DISTRIBUTION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Administration	Total	Receipts
Balance July 1, 1946			$46.60
1948			
May	$293.30	$293.30	398.05
Totals	$293.30	$293.30	$444.65
			293.30
Balance July 1, 1948			$151.35

LAS VEGAS ARTESIAN BASIN

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$11,186.14
1946				
July	$281.25	$85.63	$366.88	
August	281.25	53.22	334.47	
September	281.25	921.03	1,202.28	
October	281.25	42.98	324.23	
November	281.25	724.81	1,006.06	
December	281.25	11.98	293.23	
Totals	$1,687.50	$1,838.50	$3,527.15	$11,186.14
				3,527.15
Balance January 1, 1947				$7,658.99
1947				
January	$300.00	$15.60	$315.60	
February	300.00	1,148.67	1,448.67	
March	300.00	157.87	457.87	
April	481.60	1,596.19	2,077.79	$1,524.66
May	460.00	67.62	527.62	
June	606.65	255.63	862.28	4,000.00
July	500.00	22.20	522.20	
August	500.00	187.72	687.72	
September	400.00	34.86	434.86	
October	300.00	66.00	366.00	
November	300.00	172.40	472.40	
December		40.19	40.19	
Totals	$4,448.25	$3,764.95	$8,213.20	$13,183.65
				8,213.20
Balance January 1, 1948				$4,970.45
1948				
January	$300.00	$24.75	$324.75	$421.29
February	300.00	142.27	442.27	
March	300.00	93.13	393.13	
April	300.00	57.89	357.89	
May	300.00	38.80	338.80	
June	300.00	646.47	946.47	3,292.50
Totals	$1,800.00	$1,003.31	$2,803.31	$8,684.24
				2,803.31
Balance July 1, 1948				$5,880.93

PAHRUMP VALLEY ARTESIAN BASIN

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$1,643.97
1946				
August		$43.41	$43.41	
September		270.38	270.38	54.06
Totals		$313.79	$313.79	$1,698.03
				313.79
Balance January 1, 1947				$1,384.24
1947				
June				250.00
November		$60.00	$60.00	
December	$300.00		300.00	
Totals	$300.00	$60.00	$360.00	$1,634.24
				360.00
Balance January 1, 1948				$1,274.24
1948				
February		$4.80	$4.80	$2.85
June				400.00
Totals		$4.80	$4.80	$1,677.09
				4.80
Balance July 1, 1948				$1,672.29

UNDERGROUND WATER INVESTIGATION

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$24,139.06
1946				
July	$490.00	$388.86	$878.86	
August	5,823.30	867.61	6,690.91	
September	940.46	972.19	1,912.65	
October	503.98	313.80	817.78	
November	508.90	1,669.88	2,178.78	
December	404.36	239.36	643.72	
Totals	$8,671.00	$4,451.70	$13,122.70	$24,139.06
				13,122.70
Balance January 1, 1947				$11,016.36
1947				
January	$143.75	$216.95	$360.70	
February	160.00	16.10	176.10	850.58
March	160.00	18.00	178.00	
April	8,693.84	134.54	8,828.38	
June	2,003.82	305.64	2,309.46	
Totals	$11,161.41	$691.23	$11,852.64	$11,866.94
				11,852.64
Reverted July 1, 1947				$14.30
Appropriation July 1, 1947				$40,000.00
1947				
July	$180.00		$180.00	
August		$165.33	165.33	
September	172.50	68.26	240.76	
October	120.00	144.40	264.40	
November	160.60		160.60	
December	377.50	9.70	387.20	
Totals	$1,010.60	$387.69	$1,398.29	$40,000.00
				1,398.29
Balance January 1, 1948				$38,601.71
1948				
January	$5,486.26	$84.07	$5,570.33	
February		127.95	127.95	
March		583.10	583.10	
April	4,240.85	166.89	4,407.74	
May		1,197.13	1,197.13	
June		245.78	245.78	14.50
Totals	$9,727.11	$2,404.92	$12,132.03	$38,616.21
				12,132.03
Balance July 1, 1948				$26,484.18

COOPERATIVE SNOW SURVEY

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Administration	Total	Receipts
Balance July 1, 1946				$682.96
1946				
July	$15.00	$93.42	$108.42	
September		114.69	114.69	
November		42.29	42.29	
December		54.22	54.22	2.65
Totals	$15.00	$304.62	$319.62	$685.61
				319.62
Balance January 1, 1947				$365.99
1947				
March	$265.18	$40.15	$305.33	
May	60.00		60.00	
Totals	$325.18	$40.15	$365.33	$365.99
				365.33
Reverted July 1, 1947				$0.66
Appropriation July 1, 1947				$3,000.00
1947				
September	$263.50		$263.50	
October	15.00	$87.03	102.03	
November		5.93	5.93	
December		14.05	14.05	
Totals	$278.50	$107.01	$385.51	$3,000.00
				385.51
Balance January 1, 1948				$2,614.49
1948				
January		$32.35	$32.35	
February	$46.00		46.00	
March	242.73	146.87	389.60	
April	683.92		683.92	
May	16.00	47.26	63.26	
Totals	$988.65	$226.48	$1,215.13	$2,614.49
				1,215.13
Balance July 1, 1948				$1,399.36

COOPERATIVE STREAM MEASUREMENT

Statement of Receipts and Disbursements from July 1, 1946, to June 30, 1948

Month and year	Salaries	Receipts
Balance July 1, 1946		$4,236.55
1946		
July	$1,736.55	
December	949.47	200.00
Totals	$2,686.02	$4,436.55
		2,686.02
Balance January 1, 1947		$1,750.53
1947		
February	$1,052.63	
April		300.00
May	997.90	
Totals	$2,050.53	$2,050.53
		2,050.53
Appropriation July 1, 1947		$9,000.00
1948		
February	$4,032.14	$200.00
Totals	$4,032.14	$9,200.00
		4,032.14
Balance July 1, 1948		$5,167.86

NEVADA POWER SURVEY

Statement of Disbursements from July 1, 1947, to June 30, 1948

Month and year	Administration	Balance
Appropriation July 1, 1947		$5,000.00
1947		
July	$55.00	
August	57.45	
September	60.95	
Totals	$173.40	$5,000.00
		173.40
Balance January 1, 1948		$4,826.60
1948		
February	$10.03	
April	2.00	
June	6.00	
Totals	$18.03	$4,826.60
		18.03
Balance July 1, 1948		$4,808.57

WELL DRILLERS LICENSE FUND

Statement of Receipts and Disbursements from July 1, 1947, to June 30, 1948

Month and year	Administration	Receipts
1947		
July		$175.00
August	$46.64	20.00
October		20.00
November	26.10	
December	16.80	
Totals	$89.54	$215.00
		89.54
Balance January 1, 1948		$125.46
1948		
February		$35.00
March		20.00
June	$41.20	106.00
Totals	$41.20	$286.46
		41.20
Balance July 1, 1948		$245.26

CHAPTER XXI

Proceedings of Second Nevada Water Conference

CARSON CITY, NEVADA, OCTOBER 17, 1947

MR. ALFRED MERRITT SMITH (State Engineer of Nevada):

The Conference will please be in order.

It is indeed gratifying to see the representatives of the various Federal and State organizations interested in water and water development and its use, that are here today.

Our Governor, who has done so much to initiate the ground water program that is underway in this State, is here this morning, and we are honored by his presence. Governor, will you speak to us a moment?

HON. VAIL PITTMAN (Governor, State of Nevada):

Mr. Smith, and representatives of the various Federal and State organizations, and guests: I am indeed pleased to be here today and have the opportunity to greet you and to extend to you the State's most cordial welcome.

It is a fine thing to have a group of men like you here assembled for a common purpose; one which is very vital to the State of Nevada and to the other public land States, the Western States. To have your cooperative thought here, expressed, and outlined, will be helpful.

We realize that the prosperity of Nevada is largely dependent upon water and land development, and I will also add, the development and use of cheap power. Those things combined do make this State what it is and what it will be in the future. You men have made exhaustive studies in your several departments of those matters, with the view of learning everything about it that is possible, and I believe that the future holds much for this State because we have come to the full realization of the necessity of developing every possible source of water that we have, and to bring into this State cheap power.

All of you are conversant, doubtless, with what is going on at Boulder Dam. Nevada is entitled to 18% of that power, and the Colorado River Commission, of which Mr. Smith here is a member and the Secretary, is working very diligently to bring our use program to fruition.

I feel confident that we are going to get the generators for that power reasonably soon, and that we are going to utilize it, and that usage will be reflected in a greater expansion of industry. The next important step is development of more water, both ground and surface water, and to conserve that water; and to do those things that are so necessary to the future welfare of this State.

Thank you.

MR. SMITH: Thank you, Governor Pittman.

We are honored, too, by having with us our distinguished representative in Congress, Charles Russell.

Congressman Russell, will you say a word to us?

CONGRESSMAN RUSSELL: Mr. Smith, I have nothing further to add to what Governor Pittman has said.

My purpose in being here at the meeting today is to learn as much as I can and to carry back what I can to Washington, so I can help out the State in the conservation and development of water.

I appreciate very much your invitation to be here; and, as I stated, I am present in a listening capacity, learning capacity; I want to find out as much as I can; and I am sure that any program proposed here in which I can help in any way, you may be assured that I will do so.

Thank you.

MR. SMITH: Thank you, Congressman Russell.

Our State legislative body is represented here by one who has done a great deal for the State, and whose interest is unwavering in developing water resources. He is a leader in our State Senate, Senator A. V. Tallman. Will you say a word for us, Senator Tallman?

SENATOR A. V. TALLMAN: Mr. Smith, Governor Pittman, Mr. Russell:

My sole interest in this whole program is that, as a member of the Legislature, we have to help dig up funds to pay for the development of the State of Nevada. There is only one way Nevada can carry the taxation load. It is to increase our taxable wealth.

Being an active engineer and farmer for the last 37 years, I can't help but feel that future substantial growth in this State depends upon bringing into cultivation new irrigable lands.

This study you have been putting up money for in the Legislature ties up with this growth of Nevada I hope will come about because of these studies. It also ties up with the program bringing about a low cost of power through the State, and making it available throughout the State. Those two things are the most important to me, and are things this State can benefit most by; and anything you gentlemen can do toward enlightening us on our underground water resources will be of material help to the next Legislature. We do feel that the money we are spending on this program is going to bring about an increase in our irrigable acreage and taxable wealth and make it possible for the people in this State to have more of the things people in other States have.

I thank you.

MR, SMITH: Thank you, Senator Tallman.

Now I will not undertake to introduce everybody here, but would like to have you all in turn stand, one at a time, and tell us who you are and who you represent, for the benefit of the record, and for purpose of getting better acquainted.

The following persons were present:

Clarence E. Byrd, Agricultural Extension Service, University of Nevada, Reno, Nevada.

A. H. Blanchard, U. S. D. A., Farmer's Home Administration, County FHA Supervisor, Reno, Nevada.

Eldon R. Campbell, U. S. D. A., Farmer's Home Administration, Field Representative, San Francisco, California.

Geo. G. Devore, Sierra Pacific Power Co., Reno, Nevada.

F. N. Dondero, State Engineer's Office, Carson City, Nevada.

S. R. Du Bravac, Colorado River Commission, Carson City, Nevada.

Fred F. Friend, Corps of Engineers, Los Angeles, California.

C. O. Gelmstedt, Walker River Irrig. Dist., Yerington, Nevada.

G. W. Hennen, State Engineer's Office, Elko, Nevada.

Clyde E. Houston, Div. of Irrigation, SCS Hyd. Engr., Reno, Nevada.

E. A. Hansen, U. S. Forest Service, Carson City, Nevada.

W. L. Hansen, U. S. Forest Service, Ogden, Utah.

Harry Jameson, Artesian Well Supervisor, Las Vegas, Nevada.

O. J. Loeltz, U. S. Geo. Survey, Carson City, Nevada.

H. W. Lindsey, Calif. Pacific Utilities, Winnemucca, Nevada.

M. R. Miller, Chemist, Nev. Ag. Exp. Station, Reno, Nevada.

Wayne McLeod, Surveyor General, Carson City, Nevada.

Paul Maloney, Nev. Ext. Service, Reno, Nevada.

R. B. Morrison, U. S. Geological Survey, Fallon, Nevada.

Howard G. Mason, Nev. Agricultural Exp. Sta., Reno, Nevada.

Wilson McConkie, U. S. G. S., Assistant Engineer, Elko, Nevada.

Thomas C. Mead, Engineer, Bureau of Reclamation, Boulder City, Nevada.

Edmund Muth, Deputy State Engineer, Carson City, Nevada.

Geo. B. Maxey, U. S. Geological Survey, Ely, Nevada.

Archie Millar, State Engineer's Office, Carson City, Nevada.

H. O. Petersen, U. S. Geol. Survey, Los Angeles, Calif.

C. J. Preece, Carson Indian Agency, Stewart, Nevada.

David A. Phoenix, U. S. Geological Survey, Carson City, Nevada.

Vail Pittman, Governor of Nevada, Carson City, Nevada.

Vernon Rupp, U. S. Weather Bureau, Regional Engineer, Los Angeles, California.

Charles H. Russell, Member of Congress, Ely, Nevada.

Thomas W. Robinson, U. S. Geological Survey, District Engineer, Carson City, Nevada.

L. J. Rees, Federal Power Comm., San Francisco, California.

Ruth C. Ruddell, Pershing County Water Conservation, Lovelock, Nevada.

Alfred Merritt Smith, State Engineer, Carson City, Nevada.

Hugh A. Shamberger, Assistant State Engineer, Carson City, Nevada.

Leon R. Sawyer, U. S. Geological Survey, Surface Water Division, Carson City, Nevada.

W. H. Slattery, U. S. Bureau Reclamation, Fallon, Nevada.

A. V. Tallman, Irrig. Engineer, Winnemucca, Nevada.

E. W. Walker, Reno Chamber of Commerce, Reno, Nevada.

MR. SMITH: Thank you, gentlemen. It is certainly a very gratifying representation.

(Mr. Smith reads a paper.)

God granting us international peace, water is the magic element that will increase our State wealth a hundred-fold within the span of years of men now living. Electric power, generated by streams on the eastern slope of the Sierra Nevada Mountains will turn the wheels of mills and mines in Central and Northern Nevada, and operate the pumps that will provide irrigation for farms located in many of the one hundred desert valleys we are just beginning to investigate. This is no imaginative dream. We have many examples of such developments throughout the Western States. Each well that is developed and put to use in the semiarid regions is an inexhaustable supply of wealth. It is a mine wherein the mineral values cannot be depleted, but are constantly restored when used. It is like the purse of Fortunatus in which the original gold coin when spent was magically replaced.

Nevada's ground water is her greatest latent resource. Without it much known mineral wealth cannot be economically developed. Given water many of our sagebrush plains will soon be dotted with homes, gray plains will become green meadows, and livestock will graze upon the surrounding hills.

Thanks to a forward-looking Legislature, we have under way a ground water exploration program, and I am fortunate in being associated with technical men who are making substantial and satisfactory progress. They are an inspiration to me and to all with whom they work. You will hear from them at this meeting.

We will have the pleasure of hearing from the various representatives of Federal and State groups here as we go on. Much good came out of our meeting last year. We know more will be accomplished as a result of our meeting here today.

At the convention of the National Reclamation Association in Denver in 1943, in a tribute to Delph Carpenter, champion of reclamation and author of many laws beneficial to western waters, former Governor Ralph Carr of Colorado quoted from an English writer certain sentiments that all men interested in the development of water should bear in mind. I quote:

> Although the tomb of Moses is unknown, the traveler of today slakes his thirst at the well of Jacob. The gorgeous palaces of the wisest and wealthiest of monarchs, with their cedar and gold and ivory, and even the great temple of Jerusalem, hallowed by the visible glory of the Deity Himself, are gone; but Solomon's reservoirs are as perfect as ever. Of the magnificent and costly architecture of the Holy City, not one stone is left upon another, but the pool of Bethesda commands the pilgrims' reverence at the present day. The columns of Persepolis are moldering into dust, but its cistern and aqueduct remain to challenge our admiration. The golden house of Nero is a mass of ruins, but the Aqua Claudia still pours into the city of Rome its limpid stream. The Temple of the Sun, at Tadmor in the wilderness, has fallen, but its fountain sparkles in the rays of the morning as when thousands of worshipers thronged its lofty

> colonnades. And if any work of this generation shall rise over the deep ocean of time, we may well believe that it will be neither a palace nor a temple, but some vast aqueduct or reservoir; and if any name shall hereafter flash brightest through the mist of antiquity, it will probably be that of the man who in his day sought the happiness of his fellow men and linked his memory to some such work of national utility or benevolence.

I will now deliver the meeting to my efficient coworker, who will be our Chairman, Mr. Hugh Shamberger.

MR. SHAMBERGER: Mr. Smith, Governor Pittman, Friends.

In order to better acquaint ourselves with the work that was done by the various Federal and State agencies on programs concerned with the development and conservation of our water resources, and to assist in the coordination of such programs and become better acquainted with the men who are carrying them out, the State Engineer invited representatives of all such agencies to attend the Nevada Water Conference held in Carson City, Nevada, on September 17, 1946. The meeting was highly successful and was attended by representatives of the U. S. Army Engineers, Bureau of Reclamation, U. S. Geological Survey, Farm Security Administration, Soil Conservation Service, U. S. Forest Service, U. S. Weather Bureau, Nevada Agricultural Experiment Station, U. S. Grazing Service, U. S. Fish and Wildlife Survey, U. S. Department of Agriculture and U. S. Indian Agency. It was the unanimous opinion of all present that such meetings should be held yearly. This then will be the Second Nevada Water Conference.

The ground water program will be discussed later, but at this time I would like to briefly mention some late additions to our ground water law. Perhaps the most important was the setting up of a license law for well drillers. Under this Act, every active well driller in the State must be licensed and must submit logs of every well drilled within thirty days following completion of the well. To date, some forty-two drillers have been licensed and are cooperating in fine manner and over 150 well logs have been received. The Act further provides that the State Engineer shall prepare rules and regulations for well drilling. Other important new phases of the present ground water law are: The providing for loss of water right by five successive years of nonuse or by abandonment; the defining of a vested right to ground water; providing for the adjudication of ground water in any one drainage basin; and providing for the restriction of well drilling in any portion of a designated area if it is determined that additional wells would cause undue interference.

The general water law of the State was also strengthened by the 1947 Legislature by the addition of certain amendments and new sections. I will only enumerate the most important.

Prior to the enactment of a State water law under which a statutory method was provided for the adjudication of water rights, the District Courts of the State adjudicated water rights on many of our smaller

streams under civil actions. The State Engineer had no authority to exercise any jurisdiction over such rights. Section 46½, chapter 159, has been added to the water law which provides a method whereby such decreed rights can be administered.

To aid in the distribution of water on the Humboldt River, the law now provides that the State Engineer can create a water district and appoint an advisory board of representative citizens within the district to assist him in formulating plans and projects for the conservation of the water resources and the use thereof in such district. Further provisions are made for the payment of a per diem and necessary travel expenses from the distribution fund.

A very important addition to the general water law is contained in section 75½, chapter 159. This provides that when the State Engineer brings into a district court any proceedings, either civil or of a criminal nature, concerning the administration of and for the enforcement of the provisions of a decree, wherein the validity of the decree or any of its provisions has been drawn into question by adversary parties and the decision or judgment of the said court is that the said decree is invalid, and/or void, the State Engineer shall be deemed to be a party in interest with the right to take an appeal from such decision or judgment to the Supreme Court. I might state that this section was added due to a recent decision by the Nevada Supreme Court, which ruled that it had no authority to decide matters pertaining to the merits of a certain controversy. In this case, the State Engineer brought criminal contempt proceedings in a district court and the District Judge ruled that the State Decree was faulty and uncertain, and that the complaints did not state facts sufficient to constitute contempt. The State Engineer sought certiorari in the Supreme Court upon the ground that the lower court had exceeded its jurisdiction in ruling on the State Decree. The Supreme Court decided in strict accordance with its rulings of many years standing, which was that the only question the Supreme Court will decide on certiorari is whether the lower court had the jurisdiction to make the ruling notwithstanding whether the lower court's ruling was correct in law or not. Under this new section 75½, the State Engineer now will be able to appeal any such decision made by a District Court to the Supreme Court.

Now, in the conference today, we will carry it on the same as we carried on the conference last year and will call upon representatives of the various agencies, both Federal and State, who are here today, to make reports on the work that they have been carrying on during the past year and their plans for the current year in connection with water development, conservation, and use.

We would like you to feel that this conference is entirely informal in nature. The purpose is to hear from the various representatives and to ask questions and have discussions; we want you to feel free, following the report of anyone, to ask that person questions, or start a general discussion. From such discussions will come a great deal of benefit.

I would like also to say that we have a few copies left of the report

on the meeting last year, and those of you who have not received a copy can take one of these with you.

We also have copies of the Nevada water law, brought up to date, the State Engineer's Biennial Report, and some copies of the ground water reports prepared by the U. S. Geological Survey in cooperation with the State Engineer's office.

I will first call on Mr. Thomas C. Mead, of the Bureau of Reclamation, Region 3, Boulder City. Mr. Mead, may we hear from you?

MR. MEAD: The Bureau has been conducting investigations in Moapa Valley, in the vicinity of Overton, in an area along the lower Muddy River, a tributary of the old Virgin River. The Muddy River flows into Lake Mead, near the head of the Virgin arm of the lake. About forty second-feet, which have their origin in springs near the head of the Muddy Valley, furnish a supply of water which is very satisfactory except for one thing: the supply coming from the springs is almost constant, but the irrigation demands vary; in the middle of the summer there isn't enough water to go around.

We have had our engineer, W. P. Adair, and party at Overton where he has been conducting an investigation to find out what can be done to improve the water situation. We have a reservoir site at the White Narrows and our geologists are now investigating that. It is believed that somewhere between 7,500 and 9,500 acre-feet of spring water can be stored at the White Narrows and be released as needed.

In general, the investigations have been similar to those followed on any irrigation project. Our engineers have gone over the existing distribution system to see what can be done to reduce losses. Drainage is a problem. The soil in certain parts is very tight. The Soil Conservation Service carried on piezometer readings for several years to determine ground water levels and the Bureau has continued this work of the Soil Conservation Service. We have also taken topography in order to revise the present distribution system, if that proves necessary. Our soil experts just recently completed the field work of land classification of this project.

I do not know what the results will be yet, but we have counted on about 2,800 acres of presently irrigated land to receive supplemental water, and perhaps 2,000 acres more of new land to be irrigated.

This project, like nearly all our present-day western projects, may be comparatively costly to construct, but the Moapa Valley is favored in having a good local market in Las Vegas, and a long and a good early growing season, which means good prices; and the valley has been raising some specialty crops, which further results in good prices.

The Bureau plans to complete the draft of its Moapa Valley Project report in the fall of 1948; that means that some time early in 1949 this report will have been submitted to the various agencies for criticism, and will be ready for action by Congress.

After the Moapa Valley Project investigation is completed, we plan to investigate Fort Mojave Project, one of former Congressman Scrugham's favorites. He had felt that the returning soldiers could be settled there. It is in the extreme southern tip of Nevada. The project at the time Congressman Scrugham was interested in it, included

some slope lands, but I think the Bureau now will probably attempt to find out first what can be done with about 2,600 acres of bottom lands and probably not include the less-promising slope lands at all, at least for the first stage of development. Part of the bottom lands are under the jurisdiction of the Indian Service, about 1,600 of the 2,600 acre total. The area to be developed is 11 miles below Davis Dam, and will receive power from Davis Dam for pumping from the Colorado River. The lift is comparatively small, somewhere from 15 to 25 feet, dependent upon whether the river stays stable or retrogresses further. The present clear water of the Colorado River removes the finer material on the river bottom and since there is no silt to replace it, the river will cut until its bottom is protected with enough coarse material to resist further erosion.

A project for the more distant future is the Las Vegas Pumping Project. If Las Vegas ever grows to be a city of fifty or sixty thousand people, or perhaps sooner, she will have to get water from Lake Mead; and it may be possible to develop some of the irrigable land around there by charging most of the construction cost and a large part of the pumping cost to municipal water.

As conditions now are, the Las Vegas Pumping Project isn't a promising irrigation project because the lift is somewhere between 900 and 1,000 feet. There are six and a half miles of tunnel and 24 miles of line canal. It is financially out of reach, at present, but if Las Vegas grows there is a possible project.

Other small projects in Nevada in the Colorado River Basin have been investigated, but they do not look promising at the present time. The trouble is the high pumping lifts make pumping costs so great that it doesn't look as if water users could even pay O. & M., and of course Congress does not, at the present time, look very long at projects which cannot pay for operation and maintenance charges.

That's about all at present.

MR. SHAMBERGER: Thank you, Mr. Mead.

Anyone have any questions to ask Mr. Mead? Mr. Mason.

MR. MASON: I would like to ask Mr. Mead if the Mojave, Fort Mojave, Project includes development from both sides of the Colorado River or if it is just within Nevada.

MR. MEAD: No, it is just within Nevada. We have one Mojave Valley Project on the other side of the river in Arizona, but we are not paying much attention to it because Arizona will want to use her water, presumably, in the Central Arizona and Yuma areas so we will probably give our attention to the places where the water is most wanted by the State before we investigate the projects like the Mojave Valley in Arizona.

MR. SHAMBERGER: Any further questions?

MR. MAXEY: In regard to the Bureau of Reclamation's policies on the development of small projects based on underground water, I wonder if you could make some statement as to how the Bureau might operate if the presence of ground water is proven within a valley somewhere in the State of Nevada, rather than along a great river, which is apparently the only place where much activity is being done.

I think possibly a lot of the prosperity for the State may be gotten through the development of projects based on ground water in valleys of the State.

Maybe I have not expressed myself very well. Do you (addressing Mr. Shamberger) understand what I am driving at?

MR. SHAMBERGER: Yes.

MR. MAXEY: I think it is important to bring that out at the meeting here because it is one of the vital things in the development of Nevada.

MR. MEAD: Maybe I had better not try to answer that directly. Our Central Arizona Project is very much involved in the question of ground water. The area in the general vicinity of Phoenix has been depleting its ground water. Unless we can stop the overdevelopment of ground water supplies, then if the Government should help by importing Colorado River water to Central Arizona we will, after the importation, see repeated the same situation that exists now near Phoenix—we will bring in water and then there will be an extraordinary development of pumping on the fringe of the area that is supplied, and the first thing you know, the ground water will be carried down so far by pumping that it will become uneconomical to pump. Unless the State of Arizona has a good ground water law, there will be a continual state of emergency following overdevelopment of groundwater supplies.

We have a small project near Joseph City, Arizona, on the Little Colorado in which we propose to pump from wells. The difficulty on that project is to estimate how much water can be supplied. Water users would like a firm contract, but how are we going to have a firm contract until we know how much water we can develop? It is quite a ticklish problem.

MR. SMITH: Mr. Mead, regarding the Las Vegas Pumping Project, you were referring to the excessive cost of pumping water through the 900-foot lift into Las Vegas Valley—your reference was more particularly to pumping water for agricultural purposes, was it not?

MR. MEAD: That's right.

MR. SMITH: For the raising of crops?

MR. MEAD: For the raising of crops; that's right. It means that irrigators would have to grow high-value crops to pay for the extraordinarily high price of water. Our economists, when I talked with them suggesting the growing of specialty crops, did not encourage that suggestion because specialty crops will be specialty crops only for a while, and to count on a project based on specialty crops is precarious business.

MR. SMITH: But, on the other hand, the use of that water and the cost of pumping for manufacturing purposes, for municipal use, and for specialized uses, are not limited—ornamental agriculture you might call it, for resort hotels and the like, suburban development to the city of Las Vegas—from that standpoint the high cost of pumping would be justified, would it not?

MR. MEAD: Yes.

GOVERNOR PITTMAN: Why do you say specialty crops will be of such short duration? What do you mean it would not be feasible? Specialty crops for a short time?

MR. MEAD: They will be satisfactory at first, but it is a precarious matter to count on them indefinitely.

I had heard of a Frenchman who had come into Nevada and grown flowers for perfume and had done very well indeed. When I cited this to Mr. West, who is one of our economists, he said, "That is very well, but the same pests that this man had in France may, in the course of time, come here to Nevada." Now that may or may not be true. One trouble with specialty crops is although they may not be beset by pests to start with in Nevada, you can never tell when the pests will be introduced, and it is not particularly safe to count on extraordinary situations.

The way out for high cost water is to raise high-value crops, but we much prefer, though, to count on staples. It is much safer to do that. If you can get away with high-value crops, that is the thing to do.

GOVERNOR PITTMAN: Do you know whether such crops could be raised in the southern part of Nevada profitably, such as grapefruit, celery, and crops of that nature?

MR. MEAD: Grapefruit has a tremendous competition with Texas now. I understand Moapa Valley, for a while, at any rate, was raising celery, and is raising tomato plants for shipment all over the United States, and doing very well indeed.

GOVERNOR PITTMAN: Isn't that possible for the southern part of the State?

MR. MEAD: That is just fine where they can do that.

MR. PETERSEN: I might make an observation. In talking with Mr. Wittwer, Clark County Agent, he brought up the same thing Mr. Mead mentioned regarding those pests. The tomato plant crops in Moapa Valley are already being bothered by some sort of pest which infects tomato plants. According to Mr. Wittwer, it is now beginning to show up and these fellows have got to go into a rotation of some kind, or make other provisions in order to continue this tomato plant growing. It is very profitable farming, as I understand it, but it is something that cannot be carried on indefinitely. It shows that specialty crops are not the profitable operation for all time that they appear to be in the beginning.

One other thing I would like to take up; I would like to go back to Mr. Maxey's question. I don't think it was quite as fully answered as Mr. Maxey would have it. I think Mr. Maxey was referring to areas in these valleys in which ground water might be found within a reasonable pumping distance of the surface.

I think what he was aiming at was to get some statement as to what the Bureau of Reclamation's attitude would be in developing those areas. In other words, if it were possible to find an area of some five or six thousand acres that could be developed by pumping, I think the Geological Survey could be in a position to furnish information regarding the amount of water available and so on, then the question

would be, would the Bureau be in a position or would it be interested in going there and developing wells and selling that water or however else they furnish it to settlers who might be induced to come in. I think that was what Mr. Maxey—

MR. MAXEY: Assuming the safety of such an operation was proven.

MR. MEAD: Just speaking as an individual, I think the Bureau is interested in any development that will furnish water; and the point of proving a safe yield of water is very important because the Bureau would be terribly handicapped in going into a project where the yield is uncertain because we could not fix up a farm repayment contract not knowing how much water could be developed.

MR. PETERSEN: I think that would be the work of the Geological Survey to investigate that—to make such an investigation.

MR. MEAD: That is one place where the Bureau and the Geological Survey could be working together.

MR. CLARENCE BYRD: Does that apply also to surface water dams to conserve and hold back water for development of land in these small valleys?

MR. MEAD: The Bureau, of course—

MR. BYRD: (Interrupting). You are talking, primarily, about underground water; I am wondering about something that's a regular geyser blowing itself off every spring.

MR. MEAD: The Bureau, of course, is interested in all irrigation projects, but small projects are not as easily developed as large ones because of the way the Bureau operates. Our overhead is too great a percent of the cost of a small project. Now, on a large project the overhead will represent only a small fraction of the cost of the project. For example, in the building of Hoover Dam—the overhead would represent only a small percent, but on a small project we have to go through certain procedures prescribed by law, and before we get through we may find that on very small projects that the overhead makes us ashamed. We can't help it; we have to go through a certain rigmarole; and it is probably true that the Soil Conservation Service and some of the other agencies of Government could do more to help than the Bureau of Reclamation on very small projects.

MR. MAXEY: I just wanted to carry my question a little further. I think the fundamental reason for the Ground Water Division of the Geological Survey being here in the State of Nevada, as I understand it, is to locate supplies of ground water for further development of land in the State in cooperation, more or less, with our program, and there will be agencies determining the quality of land; and, as Mr. Petersen says, if such areas of considerable extent are found that are apparently worth while developing, it seemed to me that the Bureau of Reclamation would be one agency in a position to carry the development on from where we leave off with the fact-finding function. And I, more or less, think it is a matter of importance to bring out at this meeting, an understanding of what, or how far we could go, because we are constantly asked the question, "What good are you doing us?

We know the water is there, too." The natives in the State will say that.

MR. MEAD: Yes.

MR. MAXEY: What we are trying to explain is that if we locate the water, its development can be taken up there by some other agency in cases where private enterprise cannot come in and develop it profitably at the present time. I believe I have knowledge of two or three areas, in my experience in this State, where such projects may be feasible.

MR. MEAD: That point is a good point. The Bureau does need to know the probable ground water yield before it can report on a ground water project. We can do better with very large projects than we can with very small projects, because our overhead is a smaller percentage of the large project cost. We have to submit our reports to various States for criticism, and we have to make our reports meet certain prescribed criteria; we have several kinds of specialists on field investigations; on very small projects the overhead is too large a percentage of the cost of investigation.

But the point you make is good. We are certainly glad to know what our underground yield is, or for that matter, the water supply of any prospective project.

MR. SHAMBERGER: In that connection, I might mention that I understand that there is a great deal of agitation throughout the West to have the Bureau of Reclamation organize a small projects division designed in such a way as not to have this great overhead you speak of.

MR. MEAD: I have not heard of it, but I am glad to hear of it. That would avoid one defect of our present system.

MR. SHAMBERGER: I am going to call upon another representative of the Bureau of Reclamation. As you probably know, Region 4, which has its headquarters in Salt Lake City, covers perhaps the major portion of the State, and Region 3, with headquarters at Boulder City, and the region Mr. Mead is from is the southern part of the State.

It is a pleasure to see that William Slattery, Engineer, Bureau of Reclamation, Region 4, is here today. Bill, will you say a few words.

MR. SLATTERY: Mr. Shamberger, Gentlemen: I am not one of those fortunate or unfortunate Irishmen who have kissed the Blarney Stone, but I have a few written statements here that I will attempt to read to you if you will bear with me.

First, I want to say that Regional Director E. O. Larson, who is Director of this region, was called down into Southern Colorado over the weekend. He was at Lovelock earlier in the week and regretted very much he had to return to Colorado, so the job of presenting his talk here, or representing the Bureau, fell upon me, and I didn't have any information upon it until yesterday about three o'clock in the afternoon. I will try to read some of the statements, and probably add something to them.

Now, as I understand, Mr. Smith wants a report on what activities the Bureau has been engaged in during the past year and what they have in mind during this current year.

Well, as you all know, we maintained a project planning office here in Carson City up until about the fifteenth of August, but due to lack of funds we were forced to close it. However, we have established an office at Fallon, Nevada, mostly for the investigation of rehabilitation work. And another thing I might add, I think the three Nevada projects received practically 50 percent of the funds that were allotted to the 10 projects in Region 4 for investigational work under this rehabilitation set-up.

LAHONTAN BASIN INVESTIGATION

A preliminary draft of the Lahontan Basin Report was completed in June 1947 and has since been distributed to various Federal, State, and other agencies for review and comment. The report in general has been very well received and has aroused widespread interest in potentialities for developing the water resources of the basin. Development plans presented for the Truckee, Carson, and Walker Rivers are unique, but the projects will require detailed field study before construction can be recommended.

It is planned to carefully consider all of the comments submitted on the report and to prepare a final draft for official submission to the States, the Congress, and other agencies in accordance with provisions of the Flood Control Act of 1944.

A prerequisite to the further detailed planning of projects on the Truckee and Carson Rivers is a careful determination of the water requirements of the Newlands Reclamation project which uses water from both rivers. An investigation intended, among other things, to make such a determination was underway during the past year under the direction of the Branch of Operation and Maintenance.

TRUCKEE RIVER STORAGE PROJECT EXTENSION

The investigation of the Truckee River Storage Project Extension was retarded during the year by a shortage of housing facilities for Bureau personnel.

A reconnaissance geological investigation was made of the Prosser Creek, Stampede, and Independence dam sites and of the Prosser-Boca and Boca-Mystic tunnel sites. A triangulation net was extended from the Boca Reservoir to the Stampede Reservoir site. Field ground locations and profiles of the Prosser-Boca and Boca-Mystic tunnel sites were completed. Periodic well measurements were taken.

CARSON RIVER PROJECT

The Carson River investigation also was retarded by the fact that houses could not be obtained for personnel. A survey of the Hope Valley reservoir site, intended to be made in the summer of 1946, was delayed for a year by lack of housing. Trailers were finally obtained for living quarters.

A reconnaissance investigation was made of the possibility of developing the Double Springs reservoir site as an alternative to the Hope Valley site and a rough report was prepared in the Regional Office. Reconnaissance geological investigations were made of potential storage sites on the Carson River and of the potential tunnel which would collect water from the East Fork of Carson River for storage in

the Hope Valley reservoir. The Bureau financed the installation of seven stream-flow recording gages on the East Fork of the Carson River to measure the flows divertible to the Hope Valley reservoir, and paid for the operation of the gages through fiscal year 1947.

WALKER RIVER PROJECT

The only work accomplished on the Walker River project investigation during fiscal year 1947 consisted of reconnaissance geological investigations of the Leavitt Meadows and Pickle Meadows reservoir sites, and of the potential power site below the Pickle Meadows reservoir.

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Reclamation Program in Nevada—Regional Branch of Operation and Maintenance

1. Of the sixteen Bureau of Reclamation operating projects in Region 4, three are located in Nevada. These three projects are the Newlands, in which storage, distribution, and drainage works were constructed by the United States to serve lands in the Truckee River and Carson River valleys; the Humboldt Project, where the Rye Patch Dam and Reservoir were constructed to furnish water to lands in the lower Humboldt Valley; and the Truckee River Storage Project, where the Boca Dam and Reservoir were constructed for irrigation of lands in Reno Valley. Combined, the three Nevada projects are capable of furnishing irrigation water for 138,000 acres of land, of which 113,000 acres were cropped in 1946.

2. We are very interested in the success of the operating projects and in their operation and maintenance. After planning activities and construction works were completed, the Bureau continued to assist the projects with their problems through direct contact with the project and in cooperation with State and Federal agencies on problems confronting the water users.

3. The Newlands Project (formerly the Truckee-Carson Project) was the first project on which construction work and the delivery of irrigation water were undertaken under the Reclamation Law. The ultimate irrigable area of the project is considered to be 87,500 acres, of which about 67,500 acres are covered by water right applications, and approximately 58,000 acres are being irrigated. There are a number of problems affecting the project which will have to be solved. The reclassification of project lands, opening of additional public lands to homestead entry, and the transfer of water rights from inferior lands are some of the local problems needing early consideration and solution.

4. A classification of project lands was made by the Board of Survey and Adjustments in 1926, and as a result of their findings the Omnibus Adjustment Act of May 25, 1926, gave authority, among other things, for suspension of construction payments against certain lands. At present a reclassification of such suspended lands is under way to determine if the lands are possessed of sufficient productive power properly to be placed in a paying status, whereupon payment of construction charges will be resumed. Should said lands be found to be permanently unproductive, the charges against them will be

charged off as a permanent loss to the Reclamation Fund. It is expected that the reclassification work will be completed this fiscal year.

5. During fiscal year 1948, in addition to the reclassification of temporarily unproductive Class 5 lands, it is planned to make a detailed classification and irrigable area survey to determine the suitability of certain vacant public lands within and adjoining the boundaries of the Truckee-Carson Irrigation District for opening to homestead entry by veterans. Canals and laterals have been constructed to serve some of such lands. Lands open to entry or private lands covered by water-right applications subsequent to January 1, 1942, are required to repay their proportion of the construction cost. In conjunction with the classification and the irrigable area determination, a program of water use investigations is being carried on.

6. In 1946 the Bureau undertook a program for determining canal linings that would be less expensive than those presently used and at the same time serve the needs of projects with respect to prevention of excessive canal losses, decreasing water logging and alkali accumulation, stabilizing subgrades for increasing structural permanency, and other reasons.

7. Three experimental linings have been approved for Region 4. One of those selected is on the Newlands Project. Experimental investigations are now under way. The actual lining work will be done next spring and the results studied after water is turned in for the irrigation season.

8. On the Humboldt Project the United States constructed the Rye Patch Dam on the Humboldt River; all other irrigation facilities serving the project area were privately constructed. The project is confronted with a serious drainage problem from which early relief is necessary by the construction of an adequate system of drains to protect the irrigable area. Investigations to determine ground-water elevations and future drainage have been in progress by the Bureau of Reclamation. Considerable work in the construction of dikes along the Humboldt River and rehabilitation of existing main outlet drain for flood protection have been done by the United States Army Engineers, and excavation of some new drains is under way by the Pershing County Water Conservation District of Nevada. It is considered highly important that such investigational work by the Bureau be continued and the drainage system extended to protect the land of the Humboldt Project. During the present fiscal year the drainage investigations will be continued, including investigations of water use and irrigation practices on the project, to determine the extent to which the need for additional drains is affected by such existing practices and other conditions.

9. Also, in conjunction with the drainage investigations, it is important that there be an accurate knowledge of the soil and land characteristics. During the next fiscal year it is planned to make a detailed land classification of a considerable portion of the project irrigable area to obtain this knowledge, together with a continuance of the drainage investigations, water use, and irrigation practices.

10. The Bureau of Reclamation is conscious of the fact that noxious

and other undesirable weeds growing in and on distribution systems contribute to inefficient operation and costly maintenance of distribution systems. The Bureau also recognizes that weeds on canal banks infest project farm lands, decreasing crop production and farm income. To alleviate the present condition and prevent the further spreading of weeds on distribution systems, the Bureau is active in keeping project operators informed of the latest methods of controlling weeds and encouraging them to put control measures into effect. Efforts are also being made to insure project farmers of a means of controlling weeds on their farms by the latest methods. Where county, State, individuals, or other agencies are active on projects, the Bureau fully cooperates with them. Where there are no active agencies or individuals, the Bureau encourages the establishment of a weed-control organization and aids in its formation.

11. To facilitate the weed control program and to provide further advancement in less costly and more effective weed control methods, the Bureau in cooperation with the Bureau of Plant Industry has established a research laboratory at Denver, Colorado, and two field experimental stations, one at Boise, Idaho, and the other at Phoenix, Arizona. The experimental work at Denver, since its inception less than a year ago, has developed a chemical compound which shows promise as an effective agent in controlling aquatic weeds. If further field trials substantiate the limited trials already made, this new chemical may be equal in efficiency and be far lower in cost than any other now used.

12. On the Nevada projects the water users are current in their payments of construction charges as required by their contracts with the United States.

I guess that's all I have to say. Thanks.

MR. SHAMBERGER: Thank you, Mr. Slattery. Does anyone have any questions to ask Mr. Slattery?

MR. MUTH: Bill, has anything been done about the growth of a type of moss in canals which is causing so much trouble in Lovelock District?

MR. SLATTERY: Well, I understand that a year ago some chemical company, I think it was the Denver Clay Potash Co., most of you engineers are familiar with the name of the company, they came over to Lovelock and used a solution, I think it is "Denttore," to exterminate moss in the canals. However, at the time they came, it was quite late in the season and they did not derive very many benefits. This summer I don't think there was any such work done on any of the canals in Lovelock. In fact, I think it worked to conserve water this year. The canals were badly mossed up; they didn't have to deliver so much water. The result was they kept more water in reservoirs; so they didn't work very hard on the eradication of moss.

MR. SHAMBERGER: Before we proceed with the next speaker, I would like to introduce two gentlemen who came in a little late, Mr. L. J. Rees of the Federal Power Commission, of San Francisco, and Mr. Ed Walker, Secretary of the Chamber of Commerce, Reno.

At this time, I am going to ask Mr. T. W. Robinson, District Engineer, U. S. Geological Survey, who is in charge of ground water study in Nevada, to give us a report. Mr. Robinson.

MR. ROBINSON: Mr. Chairman, members of the Conference:

The State-wide program of ground-water studies in Nevada in cooperation with the State Engineer began on July 1, 1945, as the result of an appropriation of $35,000 for the biennium by the Legislature in that year. For the biennium beginning July 1, 1947, the last Legislature continued the program by an appropriation of $40,000. Preceding the present program, a study of the geology and ground-water conditions was started in Las Vegas, Pahrump, and Indian Spring valleys in the summer of 1944. In July 1945 the study was made a part of the State-wide study.

The present ground-water studies are planned as a long-range program. This is necessary because of the size of Nevada, which is the sixth largest State in the Union. Development and cultivation of additional land in the State must be largely by the use of ground water, since practically all of the surface water in the streams has been fully appropriated.

The long-range program calls for a study of all of the valleys of consequence in the State. Nevada is characterized by a series of north-south trending mountains with intervening valleys. The ground water that may be readily developed occurs in the valleys. Recharge to the ground water in the valleys is largely from precipitation fall in the mountain ranges and then flowing out onto the valley floor. Enroute to the valley floor the streams pass over alluvial fans which are, in general, quite permeable, and readily absorb a part of the stream flow. There are between 80 and 90 valleys in Nevada. Not all of them have potentialities for development of ground water. Some are small and have an area of only twenty or so square miles, whereas the larger valleys have areas of more than 1,000 square miles. The drainage areas are, of course, much larger, ranging up to three times the area of the valley floor.

Under the present plans it is expected to complete coverage of all of the major valleys of the State, with a reconnaissance type survey, by the end of next field season in order to evaluate the ground-water possibilities. These surveys will not be in detail, but are intended only to give a general overall picture of the ground water conditions in the valley. Attention will be given to topography, drainage, general geology, and general ground water conditions, such as depth to water, and, where possible, character of the sediments. It is also planned to study some valleys quantitatively and in detail. In the valleys which are studied quantitatively, estimates will be made of the inflow to the valley, discharge out of the valley, and the quantity of ground water available for development.

During the present year, quantitative studies are being made in three valleys: Paradise and Grass Valleys in Humboldt County, and White River Valley in White Pine and Nye Counties. Qualitative, or reconnaissance, studies are expected to be completed in three other valleys before the end of the field season. These are: Diamond Valley

in Eureka County, Quinn River Valley in Humboldt County, lower Reese River Valley in Lander County. Weather permitting it may be possible to cover one other valley in the vicinity of Carson City. Considerable field work has been done in several other valleys: Spring Valley and Snake Valley in White Pine County, and Hamlin Valley in White Pine and Lincoln Counties, Fish Lake Valley in Esmeralda County, Argenta Swamp along the Humboldt River in Lander County, Washoe Valley in Washoe County, Eagle Valley in Ormsby County, Carson Valley in Douglas County, and in the Reno-Sparks area.

The comprehensive and detailed studies that were started in the Las Vegas area in 1944 were completed early in 1947, and a final report prepared. Mr. Maxey, who did most of the work, will discuss the Las Vegas Wash a little later.

A detailed study of the Meadow Valley Wash Drainage Area, began in the spring of 1946, has been completed and a report prepared. This report is now in Washington for review. The studies in the Meadow Valley Wash show that there is additional ground water for further development. In Panaca Valley it is estimated there is about 5,000 acre-feet yearly in addition to the pumpage in 1946 which amounted to about 750 acre-feet.

Studies were completed and a report prepared on the ground-water conditions in the vicinity of Elko. This work was done at the request of the city in order that they might increase their water supply which is inadequate. The development of ground water in the vicinity of Elko is complicated by a fault which apparently passes to the west of the city, and by the presence of warm or hot water. Drilling sites were located close to the city limits which avoid the undesirable hot water.

In 1945 and 1946 studies were made, and a report prepared, for increasing the water supply for the city of Lovelock by ground water. The ground water in the immediate vicinity of Lovelock is mineralized and not suitable for municipal use. The only site capable of developing sufficient water of good quality was found to be about 14 miles north of town near the city wells.

In addition to the field work numerous inquiries have been answered either by letter or conference in the office. In fact the number of inquiries for information on wells and ground water have been increasing steadily, more have been received this summer than any other previous period.

Through an arrangement with the State Engineer the results of the cooperative ground-water studies are published by the State Printer as a series of Water Resources Bulletins. To date, four printed Bulletins and two mimeographed reports. These are:

Progress Report on the Ground Water Resources of the Las Vegas Artesian Basin (Mimeographed).

Bull. 2. Ground Water in Lovelock Valley, Nevada.

Bull. 3. Water Levels and Artesian Pressure in Wells in Las Vegas Valley and in Other Valleys in Nevada, 1913–1945.

Bull. 4. Well Data in Las Vegas and Indian Spring Valleys in Nevada.

Bull. 6. Ground Water in Las Vegas, Pahrump, and Indian Valleys, Nevada (a summary).

Ground Water in the Vicinity of Elko, Nevada (mimeographed).

Shortly after the start of the cooperative ground-water studies in 1945 a rotary well rig was purchased for test drilling purposes. During the fall of 1945 and the field season of 1946 this rig was used to drill wells for observation purposes and also for test purposes. In all a total of 20 holes were drilled, ranging in depth from 20 to 1,005 feet. The total footage drilled was 2,759 feet, and the average depth of the holes was 142 feet. Cost of drilling was $2.96 per foot, which included depreciation and amortization of the equipment and overhead for office depreciation. Total distance travelled by drilling rig was 900 miles.

No drilling was done during the 1947 season, in part due to uncertainty of Federal funds and to personnel shortage.

I think Mr. Chairman, that about covers my report. If there are any questions, I would be glad to answer them.

MR. BYRD: I would like to ask Mr. Robinson—on your agenda if you plan to include Smokey Valley and the Duck Water area in Nye County?

MR. ROBINSON: Well, we are certainly going to try to cover both of these areas in qualitative type survey. I don't know if we can cover it with a quantitative type study in the immediate future. That requires a great deal more time, but we certainly want to do that if possible.

MR. BYRD: In regard to these reports you put out, are those available to our county agents?

MR. ROBINSON: They are available to all, to the general public.

MR. BYRD: We would like to have a copy of those reports, in the respective counties, of course, in which the county agents are interested.

MR. ROBINSON: Yes, we are trying to maintain a mailing list.

MR. BYRD: We would like to have our State office to have a copy, too. We have some of them, but not all.

MR. ROBINSON: Our policy of distributing these reports has been that the Geological Survey has been distributing to the Federal agencies, and the State Engineer's office to the State agencies.

MR. BYRD: I would like to ask another question in regard to this law. Take a rancher, for instance, that wants to do a little developmental work, survey his own water, on his own place, with his own apparatus, can it be done?

MR. SHAMBERGER: Yes, it can be done. Without licensing. The law does not apply to a man who wants to drill on his own property.

MR. BYRD: It is applied to commercial operators?

MR. SHAMBERBER: Yes.

MR. BYRD: Thank you.

MR. MORRISON: I would like to ask if there is any check-up on compliance with the law. Is there any provision for enforcement of drillers who are complying with the clause for sending in logs?

MR. SHAMBERGER: Yes, there is such a provision.

MR. MAXEY: May I say a word?

MR. SHAMBERGER: Yes.

MR. MAXEY: The most fundamental condition necessary to get the public to comply with the law is for someone to report violators. In other words, we are not, the State Engineer's office, I should say, is not exactly able to just go around and check up on every person.

I have noticed in at least three cases that have come to light since the well-drilling law went into effect, of drillers drilling in the State without license, and the ones that are reported I believe two of them have already gotten their licenses. The other one has moved out of the State. Those three I happen to know of. But the State Engineer has to know about it, so it is quite necessary for the public to cooperate and make the law 100 percent perfect.

MR. SHAMBERGER: Of all the well-drillers in the State drilling wells, we have received reports from all, I think, but one, and we are going to see him shortly; and I think they have all been cooperating very nicely, considering the fact that heretofore most of them only kept logs in their minds. It is quite a sudden change, but is working out very nicely.

MR. MASON: I would like to ask a question: If, in these quantitative studies you are giving consideration to possible measures of conserving present recharge sources, which may be destroyed through pipelines or storage or something that will wind up that particular recharge?

MR. ROBINSON: No, we have not. We recognize it, we give consideration to it, but there is little we can do about it as those pipelines are there. We recognize, immediately, of course, that the amount of recharge to the underground water is going to be cut down, and that is noted, but we can't go beyond that.

MR. SHAMBERGER: Mr. Petersen—

MR. PETERSEN: I would like to ask a point as to what Mr. Robinson has found the general prospects for development mentioned in the Panaca Valley, where you found some 5,000 acre-feet of water that might be developed. How about some of these other projects—are the prospects equally as good in other valleys?

MR. ROBINSON: Some of them, yes; in some of them, better. We have just completed a rather hasty investigation of the possibilities in Paradise Valley, and it seems we have good possibilities in Grass Valley, and Quinn River Valley seems to have possibilities.

MR. MAXEY: White Pine?

MR. ROBINSON: White River.

MR. SHAMBERGER: There are many valleys that seem to be possible projects, we have not yet made determinations.

MR. CAMPBELL: I would like to ask if all these men who are registered well-drillers have facilities for giving adequate tests of the water available after they finish drilling?

MR. SHAMBERGER: Some of them do; some do not. A good many just make bailer tests. Some of them actually make pumping tests, but there is a definite need of well-drilling test equipment in the State.

MR. MORRISON: May I ask a question?

MR. SHAMBERGER: Certainly.

MR. MORRISON: Are all of the drillers practicing adequate development, well development methods? That would make a big lot of difference in getting well capacity from your drilling operations.

MR. ROBINSON: I think the answer to that would probably be "no." I think they probably do not develop the well to the capacity of the well. Incidentally, the type of casing is usually perforated type, and is not the best type for well construction to yield the largest quantity of water. So far, in Nevada, they have not gone in for commercial screens in wells, and I feel, in fact, I know, it is backed up by numerous tests, that development through commercial screens, will give you a much better well development than the present method of construction.

MR. SHAMBERGER: If there are no more questions for Mr. Robinson—thank you, Tommy. I am going to call on Mr. Maxey of the U. S. Geological Survey, who has completed the Las Vegas and Pahrump Basin reports and who is now located at Ely, working in those valleys over there. Mr. George Maxey.

MR. MAXEY: Before I read this little paper I have prepared I would like to just say a couple of words about the people who assisted in the work that we have done in Las Vegas Valley, because so many times those men who have done much of the work are almost forgotten after the report is finished.

One of the most important factors in speeding up the work there was the ardent and faithful cooperation of the State Engineer's office, particularly their work in coordinating our work as one Government agency with other Government agencies in order to make for the most efficiency.

I see here some men I have worked with—Mr. Houston, who handles the Nevada Cooperative Snow Surveys, and Mr. Barnes of the Weather Bureau, who, I believe is represented, or replaced, by Mr. Rupp, at the present time.

Probably we would not have been able to get as good data, or get good data so fast, if we did not have this excellent cooperation from the State Engineer's office, and I think it is fitting to them to congratulate them for their fine work in this respect. And we certainly hope to see more coordination of this type in the State in the future. I believe that's fundamentally the reason why these water conferences were originated and will be called every year in Nevada.

I also want to mention here Mr. Harry Jameson, who has very faithfully and efficiently served, not only the Engineer's office, but the Geological Survey throughout the period of this investigation and for many years previously. Harry is the type of man who is invaluable

to the workings of any scientific organization; and I want to commend him for his fine service in Las Vegas Valley. Won't you stand up, Harry, and let them look at you?

(Mr. Jameson rises and assembly applauds.)

Also, I want to mention the staff of the Geological Survey which was of great assistance in reviewing the work that was done in Las Vegas Valley, and the valuable suggestions; and I should like to mention they were entitled to fully as much credit as the author of the paper.

GROUND WATER STUDIES IN LAS VEGAS, PAHRUMP, AND INDIAN SPRING VALLEYS

From 1907 until well into the thirties several agencies, including the Nevada State Engineer's office, the State Agricultural Experiment Station, and the Geological Survey, conducted studies of the ground-water supply in Las Vegas Valley, primarily for the purpose of developing water for irrigation. The influx of population resulting from the construction of Hoover Dam and, later, from wartime activities, resulted in increased concern over the water supply, not only for irrigation, but for domestic and industrial use.

In 1938, a study to determine underground leakage from wells in the valley was undertaken by the city of Las Vegas, the water company, and the Geological Survey. This study resulted in increased conservation of water through repair of leaky wells and control of wells not in use. However, conservation of water did not wholly solve the problem, for water levels continued to decline and more and more wells ceased to flow. The amount of water used and the rate of water-level decline increased considerably in the early forties. The State Engineer realized that the safe yield of the valley may have been exceeded and, in 1944, asked the Geological Survey to make a detailed study of the ground-water resources. Accordingly, in July 1944, this study was started in conjunction with studies in Pahrump and Indian Spring Valleys.

The scope of the studies in the three valleys included a detailed investigation of the geology in relation to occurrence of ground water, a ground-water inventory for a period of three years, study of the chemical character of the ground waters, and study of the relationship of precipitation, run-off, and recharge to the occurrence of ground water. Five publications showing the results of the study were prepared during the course of the investigation. These publications are:

1. Progress Report on the Ground-water Resources of the Las Vegas Artesian Basin, Nevada: Mimeographed report, Nevada State Engineer's office, 1945. (By G. B. Maxey and C. H. Jameson.)

2. Water Levels and Artesian Pressure in Wells in Las Vegas Valley and in Other Valleys in Nevada, 1913–1945: State of Nevada, Office of the State Engineer, Water Resources Bulletin No. 3 (in press) 1947. (By G. B. Maxey and C. H. Jameson.)

3. Well Data in Las Vegas and Indian Spring Valleys, Nevada: State of Nevada, Office of the State Engineer, Water Resources Bulletin No. 4, 1946. (By G. B. Maxey and C. H. Jameson.)

4. Ground Water in Las Vegas, Pahrump, and Indian Spring Valleys, Nevada (a summary): State of Nevada, Office of the State Engineer, Water Resources Bulletin No. 6, 1947. (By G. B. Maxey and T. W. Robinson.)

5. Geology and Water Resources of Las Vegas, Pahrump, and Indian Spring Valleys, Clark and Nye Counties, Nevada: in preparation (edited by Washington) and will be published as Water Resources Bulletin No. 5 this coming winter. (By G. B. Maxey and C. H. Jameson.)

The main ground-water aquifer and reservoirs in the three valleys occur in the early alluvial deposits of the alluvial apron and the valley fill.

Formations of secondary importance as aquifers are certain limestone of Middle Paleozoic age, which are permeable but, for the most part, are above the regional ground-water level; and the valley fill and wash materials of recent age, which are limited in both vertical and horizontal extent and are only locally permeable. The other formations in the area are only of minor importance as aquifers or act as barriers to the movement of ground water.

The only source of ground water for the three valleys is precipitation on the higher areas of the Spring and Sheep Mountains. However, only a small part of the precipitation recharges the alluvial fan and valley fill materials that compose the ground-water reservoirs. The rest of the water from precipitation on the area is lost by evaporation and transpiration.

Estimates based on the available precipitation data, and checked with information from all available geologic and hydrologic data, show that the annual recharge to the ground-water reservoir in Las Vegas Valley is between 30,000 and 35,000 acre-feet.

The total annual discharge from the ground-water reservoirs in Las Vegas Valley probably never exceeded 35,000 acre-feet until 1946, when that figure was exceeded for the first time. Water levels have been declining and are continuing to decline in the valley. The ground-water levels may be expected to continue to decline until the cones of depression in the piezometric or pressure-indicating surface caused by the withdrawal of water from wells and springs have grown sufficiently to intercept the recharge necessary to balance the total withdrawals of ground water. Locally much of the excessive decline of water levels in Las Vegas Valley has been a result of local overdevelopment caused by close spacing and heavy pumping of wells. However, the available data indicate that ground water is now being pumped from storage, that is, more water is being taken from the reservoirs than is entering them from the recharge areas, and, therefore, that part of the water-level decline has resulted from overpumping. Thus, continued withdrawal of substantially more than 35,000 acre-feet of ground water annually will result in continued, and possibly increasing decline of the water level and in overdevelopment of the ground water supply in Las Vegas Valley.

Of the total discharge of ground water in Las Vegas Valley probably 5,000 to 8,000 acre-feet, or 12 to 15 percent, is lost by evaporation

and transpiration. Also, it is estimated that possibly 15 percent of the total discharge is wasted through lack of conservation, mostly within the city of Las Vegas. It appears that at least half of the water thus wasted can be utilized by further development of wells in the "near-surface" reservoir, and by increased, more efficient, conservation of supplies now obtained from the confined water reservoir.

In Pahrump Valley approximately 23,000 acre-feet of water are annually available for recharge, and about 17,000 acre-feet are annually discharged from wells and springs. Water levels have declined during the short period of record and they may be expected to decline until the cones of depression have grown sufficiently to intercept the recharge necessary to balance the total withdrawals of ground water. However, some ground water is available for additional development in Pahrump Valley. Although sufficient data are not available to show whether there is a substantial unused supply in Indian Spring Valley, it appears that some additional ground water is also available there.

I think that's all.

MR. SHAMBERGER: Mr. Mead made a prediction that Las Vegas may grow to a town of 50,000. Our studies indicate, conclusively, that the use of water in the Las Vegas Valley is now greater than the annual recharge, and for that reason we helped sponsor legislation in the last Legislature making it possible to set up a water district in Las Vegas Valley. I am glad to see that this movement has now started, and when this new district is formed they contemplate negotiating for the Las Vegas Land & Water Company which supplies the town of Las Vegas; and they will look to Lake Mead water to supplement the ground water, Mr. Mead.

MR. MEAD: That figure of 50,000 should not be taken too seriously because we have not made any close studies.

MR. HANSEN: As a matter of human interest, I would like to ask Mr. Maxey regarding his work in the Pahrump Valley, if he heard a rumor from some of the old timers that there was a subterranean river coming down there, fed by artesian wells. I was stationed at Charleston Mountain near there for a time, and that's all I heard—they could not believe any of the water came from the mountain.

MR. MAXEY: I might elaborate a little on that. I have never learned, from inquiry in the area, whether the mythical subterranean river originates in Canada, or from Walker Lake. (Laughter.)

Apparently the reason Walker Lake is declining so rapidly, is because it is draining out into Las Vegas Valley.

Seriously, as far as any scientific determination can be made, the entire recharge to Pahrump Valley and Las Vegas and Indian Spring Valleys is from the surrounding mountain ranges. I might add it is one of the most efficient; the spring mountain range is one of the most efficient water gatherers I have ever seen in my experience, for the reason that alluvial gravels extend far up the range and they immediately absorb the precipitation which eventually reaches the ground-

water reservoirs. It is a very efficient storage reservoir for water. Does that answer your question, Mr. Hansen?

MR. HANSEN: Yes.

MR. SHAMBERGER: Before getting off the ground-water subject, I might make a little observation. It is the purpose of our ground water program to make detailed quantitative studies of the valleys in the State which we feel have possibilities, which include Smokey and all the other valleys of the State; and the purpose is to determine how much the annual recharge is into each valley. By means of our ground water law, now in effect, we can restrict drilling and protect recharge into the valleys so as not to interfere with the economical lift.

MR. SHAMBERGER: We will have slides presented as the first report this afternoon, by Mr. Hansen, U. S. Forest Service, Ogden, Utah, on watershed protection. We will get started on the slides at exactly 1:15, and proceed just as rapidly as possible in order to finish. It is now just a few minutes of twelve. Unless we have other questions on the subjects already covered, we will recess until 1:15.

(Recess at 11:55 a. m. until 1:15 p. m.)

AFTERNOON SESSION

MR. SHAMBERGER: The conference will be in order. We will get started now. I will now introduce Mr. W. L. Hansen, U. S. Forest Service, Ogden, Utah. Mr. Hansen.

MANAGEMENT OF WATERSHED LANDS

Mr. Chairman, Ladies and Gentlemen:

The Forest Service is glad to be represented and participate in this water conference. Mr. Rice, Regional Forester, regrets that he was unable to attend.

We are intensely interested in the water resource. In the West, water is now becoming the limiting factor on which our future development depends. Therefore, it becomes increasingly more important that our watershed lands be given adequate protection and administration and that our water supply be used more efficiently for public good.

The Forest Service was created and given a specific assignment to protect the public water supply. Water is undoubtedly the most valuable renewable resource our mountain lands supply; therefore, it is important that the watersheds be so managed that they will yield their maximum of usable water.

Water as a resource cannot be divorced from other renewable resources such as timber, grazing, and recreation, because they are all produced by the same acre of mountain land. If this land has a stable soil held in place by plant growth and possesses a high infiltration and water-holding capacity, then all these resources, as a product of mountain land, are compatible and interdependent. If watershed lands are managed for usable water yield, then the other resources will be safely provided for.

The Forest Service is conducting flood-control studies in various parts of the region, and this fall plan to initiate studies on the Virgin River Meadow Valley Wash drainage. It is hoped that this study will be completed during next year.

In addition to these larger drainage basin studies, we are working on small watershed units. Generally these units are small in area when compared to a river drainage, but to the dependent population they are very important. (Reference to map of Carson River drainage contrasted with small municipal watersheds for Carson City, Virginia City, Glenbrook, and Reno.) These small areas of watershed land supply water for domestic, irrigation, and power uses and are therefore highly important.

Where these small but highly important watershed lands are in unsatisfactory condition, rehabilitation programs should be worked out with the dependent water users, land owners, and administrative land agencies on a cooperative basis.

Under this program, preliminary studies have been made of the Carson City watershed. This area, like much of the east slope of the Sierras, is in a depleted condition. Excessive timber cutting during the early day mining operations stripped these mountains of their virgin forest. Following this destructive logging, uncontrolled fires and grazing completed the devastation. Lands that formerly produced valuable resources to maintain the State have been robbed of their power to produce because of the loss of forest growth and the rich layer of top soil. Now, over 60,000 acres of these forest lands produce only brush, and the remaining area is poorly stocked with tree growth that will require careful protection for 50 to 100 years before they can again produce timber to bolster our diminishing supply.

The original timber has been estimated at two billion board feet. If this had been harvested judiciously it would have produced an annual cut of about fifteen million board feet. However, reforestation or long-range planning for continuation of the resource was not considered by the early loggers, and today these highly important watershed and timber producing lands have only 28 million board feet of timber, and this is being cut more rapidly than it is growing.

Nevada might well consider securing public control of these steep watershed lands and initiating a reforestation and rehabilitation program. In order to more clearly illustrate the depleted watershed condition that exists, I would like to show some slides. The pictures were taken on the Carson City watershed during September of this year.

1st Slide—From Carson City looking toward mountains that show a general worn-out condition of the mountain slopes.

2d Slide—Sketch showing Carson City and watershed of 8,000 acres. King, Ash, and Vicee Canyons furnish water for State Capitol and Carson City (a population of 3,500), the V. & T. Railroad and irrigation water for 600 acres of farm land. Over $250,000 has been invested in these systems, or the equivalent of $31 per watershed acre.

3d Slide—Stumps and bare ground. This forest area was cut out in 1860 and 1870. Nothing has grown since because provisions were not made for continuing the forest cover or to protect the rich top soil

from fire and erosion. Stump markings indicate that in places as much as one foot of top soil and litter has been lost from this area, thus making the land unproductive.

4th Slide—Unsatisfactory timber reproduction from early cutting and the extremely poor reproduction on the area burned in 1926. This area should be planted to get this land producing its maximum of timber and thus recreate a stable watershed.

5th Slide—Good timber reproduction, indicating what land is capable of producing if it is properly managed.

6th Slide—Cheat grass comes in following fires if area is not planted to trees and perennial grass. Cheat grass constitutes an extreme fire hazard, and as it continues to spread, fire will become a more serious problem in the future. Nevada in recent years has stepped up its fire control organization, but more intensive control will be needed to eliminate extreme losses. In 1912 less than 500 acres were burned in the State. This year the burned area has exceeded 200,000 acres. This increase can be largely attributed to the spread of cheat grass and other flashy fuel plants.

7th–9th Slides—Showing depleted vegetative cover. Bare soil has lost its original ability to hold water and produce timber and forage to help sustain our civilization. For 50 to 70 years these lands have been unproductive. They should be planted to stimulate production.

10th Slide—Wash in Vicee Canyon indicates that large quantities of soil have been washed from the mountain.

11th Slide—At water diversion in Ash Canyon. Sand must be cleaned from the settling box every two or three days. In the spring there is so much sand in the water the farmers do not use it for irrigation. Such water is unusable and represents a loss to the water user who depends on this supply to irrigate his land.

12th Slide—Small mud-rock flow from burned area on Carson River. This debris washed from a damaged watershed finds its way into Carson River and adds to the sedimentation problem for the river and Lahontan Reservoir.

13th Slide—Deposits of sediment in Carson River. The top layer is fresh deposit washed from area burned this summer. A continuation of this deposit will finally become a serious problem to farmers in the valley and decrease the storage capacity in Lahontan Reservoir.

14th Slide—Picture of sign on highway north of Carson City. "At this point the high pressure pipe line crosses, carrying the water from the high Sierras to Virginia City. Pressure on pipe line 900 lbs. System completed in 1875 at cost of $3,000,000. The Virginia City Water Company." Water values have increased since 1875 because of increased population and uses.

15th Slide—View from Carson City to mountains. Carson City depends on these mountains for its domestic water supply. Precipitation on these mountains is about 30 inches; in the valley it is only about 10 inches. The water that flows in the canyon streams and that recharges the underground supply comes from these mountain lands. Therefore, the supply of usable water depends on how these mountain watershed lands are protected and managed.

The growth and security of our western civilization depends on how well we maintain and manage watershed lands and how efficiently we collect, distribute, and utilize our water supply.

Thank you, Mr. Chairman.

MR. SHAMBERGER: Are there any questions for Mr. Hansen? That was a very nice talk; thank you, very, very much.

MR. HANSEN: Thank you.

MR. SHAMBERGER: Mr. Morrison, did you wish to ask Mr. Hansen a question?

MR. MORRISON: I was wondering if I could get a clarification of a few points; I was wondering whether the trouble might not be improved—I don't know if I understood you correctly—whether some of the terms could not be clarified as to whether you mean total run-off from the area, or dependability from the run-off where storage does not take place.

MR. HANSEN: I think I understand what you are referring to. Good vegetation on the watershed will reduce the total flow somewhat, but it will also retard and taper off more gradually the summer flow, so that there is a slight increase during that season. The largest decrease will be noted in reducing the high flow, particularly following summer storms.

MR. MORRISON: I was wondering, say down in the Lahontan Reservoir, people there might actually be benefited by deforestation up here. That would not be the case where there was not storage, but some water that might be stored in Lahontan Reservoir would be saved by less evaporation and transpiration loss. There would be a greater loss in the drainage area of the high mountains.

MR. HANSEN: I am not prepared to answer that because I don't know what the evaporation on the Lahontan Reservoir might be. I would guess it might be pretty high; you know more about it than I do. It seems to me, however, that deforestation of mountain lands to acquire a little more water for storage in reservoirs is a serious point of consideration, inasmuch as the soil movements off the slopes do considerable damage in the valleys, threatens valley improvements, shortens the effective life of your down-stream structures, such as the Lahontan Reservoir, and it fails to contribute lumber and other resources we get from the mountain areas that our civilization is so dependent on.

MR. MORRISON: Yes, the other was just more of an academic point.

MR. HANSEN: I think probably the greatest loss of deforestation is the soil loss, because that affects water infiltration and holding capacity and it seriously reduces the producing capacity of the land.

This area (indicating Carson Watershed on map), is like a sieve. Water runs through its course granite sand. When we dug a hole on the bare spot, shown on the slide, just six or eight feet from the lupine, moisture was found in a few inches and extends down several feet or as far as our test holes were dug. When we dug a hole in the lupine

area we did not find moisture; the plant growth had apparently used all the moisture and the soil is unable to support a more dense stand of vegetation; and so, the water, as I said, probably goes through this soil too fast. I think a watershed rehabilitation program should be directed toward slowing it down to make more moisture available for plant growth and delayed ground storage. Protection of the vegetation cover would in time permit a slow recovery of vegetation which will hold the soil in place and add the organic material that is now insufficient for good watershed purposes. I think Nevada should look to this slope of the Sierra Nevada Mountains for water and timber supply. Water and timber are the greatest renewable resources available in the State, and I believe they might very seriously consider a reforestation program to reestablish forest cover on those slopes.

MR. MAXEY: Is the Forest Service doing any research on the various amounts or fractions of water consumed by transpiration of plants in the high mountain areas, and evaporation in the fraction that enters the ground, water from the high mountain areas?

MR. HANSEN: Yes, they have been making studies in the Wasatch Range in Utah and farther east, and I am not certain, but I think they are making studies in Colorado, but we have not in Nevada.

MR. MAXEY: Are their investigations in completed form, from which reliable information is available on such projects?

MR. HANSEN: I think there are some in the East, but the data on the Wasatch I do not think has been completed.

MR. MAXEY: You mean east of the Mississippi?

MR. HANSEN: Yes.

MR. PETERSEN: Croft has published something on that.

MR. HANSEN: I am not acquainted with it.

MR. MAXEY: That happens to be in the Geological Survey's memo; it is a subject about which we know very little but on which we should know very much.

MR. HANSEN: That's right; we need to know a lot about it. I believe our fellows just recently conducted a tour with some of your fellows in Salt Lake. I am not familiar with the results of their discussion or findings.

MR. SHAMBERGER: I will now call on Mr. Clyde Houston of the Soil Conservation Service. Mr. Houston.

MR. HOUSTON: Mr. Shamberger, Members of the Conference: My little talk will just be limited to snow surveys in Nevada.

A major accomplishment during the past year was the completion of a cooperative agreement between Nevada State Engineer, Nevada Agricultural Experiment Station, and Division of Irrigation and Water Conservation of the Soil Conservation Service, to conduct snow surveys and irrigation investigations throughout the State. This agreement insures that the snow survey work of the three agencies will be coordinated and conducted on a more formal basis than previously. Greater

efficiency in both administrative and technical operations will result.

The program of shortening snow courses, mentioned last year at this conference, which entailed a great deal of statistical work on the part of Professor Boardman and others, was completed. Thirty snow courses were shortened. This decreases the labor of the surveyor and in turn increases the accuracy of the surveys.

Ten more courses were permanently marked with iron pipe set in concrete. This brings to 60 the number of courses so marked in Nevada.

In cooperation with the U. S. Geological Survey and Walker River Irrigation District, a series of observation wells were established in Bridgeport Valley, California. It is hoped that after a few years of record a correlation correction can be obtained from these measurements to be applied to the snow-water runoff relationship in order to obtain greater accuracy in forecasting discharge of East Walker River near Bridgeport.

Three new snow courses were established during the past year. Two are on Duck Creek Watershed in White Pine County, in cooperation with Kennecott Copper Company at McGill for purposes of forecasting the discharge of Duck Creek into Duck Creek Reservoir. The other was established on McAfee Creek in the White Mountains of Esmeralda County to assist in the Federal-State ground water investigation of Fish Lake Valley. There now are 97 active snow courses in Nevada and in the eastern slope of the Sierra in California, which are used for forecasting Nevada stream-flow.

In general, the snow water content as measured April 1, 1947, throughout the mountains was from 40 to 60 percent of normal, indicating a subnormal water supply in prospect for the irrigation season. Throughout the central and eastern part of the State irrigation season rainfall varied from about 140 percent of normal at the higher elevations to 80 percent in the valleys, while in the west and on the eastern slope of the Sierra it varied from about 70 percent in the mountains to 30 percent in the valleys. Streamflow forecasts from snow surveys are based on the assumption of normal precipitation during the runoff season; therefore the above normal rainfall in the Eastern part of the State increased the runoff while the subnormal rainfall on the Sierra and in Western Nevada had the effect of reducing runoff from the amount predicted.

A partial summary of 1947 runoff forecasts in percent of the 1936–1945 average and the measured runoff for the irrigation season in percent of the same average are shown in the following table:

COMPARISON OF FORECASTS AND PRELIMINARY DISCHARGE DATA FOR THE PERIOD APRIL THROUGH JULY

Station	Forecast in percent of 1936–1945 average	Measured runoff in percent of 1936–1945 average	Difference in percent
Owyhee River at Mt. City, Nevada	40	49	9
Lamoille Creek near Lamoille, Nevada	61	93	32
South Fork Humboldt River, near Elko, Nevada	40	50	10
Humboldt River at Palisade, Nevada	40	38	2
Martin Creek near Paradise, Nevada	29	41	12
Carson River at Fort Churchill, Nevada	50	40	10
West Walker River near Coleville, California	61	60	1
Maximum usable storage in Lake Tahoe after April 1	640,000*	602,000*	5

*Acre-feet.

Future operations are planned along the same lines as in the past. To the extent that funds will allow, the permanent marking program will be continued as well as needed expansion of Nevada's snow course network. There is imperative need of a snow survey shelter cabin on the headwaters of Trout Creek in Elko County. Current lack of funds prevents such construction, but it is first on the list of "musts" when funds, labor, and materials become available. It is hoped that the forecast network can be expanded next year by including forecasts of runoff of West Fork Carson River at Woodfords and East Fork of Carson River near Gardnerville. By these inclusions the upper Carson Valley, consisting of about 50,000 acres of irrigated land, will be benefited.

I again wish to emphasize the fact that the Nevada Snow Survey program could not be carried on without the cooperation of the following organizations: U. S. Bureau of Reclamation, U. S. Fish and Wildlife Service, U. S. Forest Service, U. S. Geological Survey, U. S. Soil Conservation Service, U. S. Weather Bureau, Nevada State Engineer, Nevada Agricultural Experiment Station, California Division of Water Resources, Kennecott Copper Company, Sierra Pacific Power Company, Truckee-Carson Irrigation District, Virginia City Water Company, Walker River Irrigation District, Washoe County Water Conservation District, and Wells Power Company. Thank you.

MR. SHAMBERGER: Does anyone have any questions to ask Mr. Houston? If not, we will go to the next speaker.

I will ask Mr. Vernon Rupp, who is with the United States Weather Bureau at Los Angeles, to favor us now. Mr. Rupp.

MR. RUPP: Mr. Chairman, Fellow Representatives: I received notice of this meeting while I was out on a field trip, so I did not prepare a formal paper. I do have a few things that I wish to say, carrying on where Mr. Barnes left off last year. I had an opportunity to read his report and think he did an excellent job of bringing the Weather Bureau program up-to-date.

I will briefly outline some of the functions of the Bureau, reiterating some of Mr. Barnes' statements.

The Bureau has four main divisions—the first is forecasting comprised of weather forecasts for airways, fruit frost warnings, special flight forecasts, hurricane warnings, and precipitation forecasts.

Second, is the climatological service comprised of collection of climatological records, including precipitation, evaporation, temperature, and so on. The climatological service maintains approximately 130 stations in Nevada, some of which are recording stations. Most recording stations were started during the period 1940 to 1944.

Third, is the organization for the development of new weather instruments. One of the latest developments is a storage gage for collecting precipitation data in the mountains where we have no regular observers. From this storage gage the logical step is to go into a recording and radio reporting type of instrument. Such instrumentation is physically possible. However, there are plenty of practical problems to be met.

Fourth, is the division of special services. This division makes reports of hydrologic and meteorological nature dealing with extremes of rainfall, storms, and weather phenomena that may occur under certain conditions. Reports of this type are available for the San Joaquin and other areas. Many of these reports are prepared in cooperation with the Bureau of Reclamation and the Corps of Engineers, U. S. Army.

We have available maps covering the United States that show the collection points of hydrologic data, including stream-flow measuring stations, snow survey courses, precipitation and temperature stations. These were prepared cooperatively with various Federal agencies.

We have established this year three storage precipitation gages in the Humboldt Basin of Nevada. Considerable difficulty was encountered in installing them. These are only a start. They will give us much needed data at higher elevations. An evaluation of the precipitation distribution in the higher mountains may be obtained from storage gages by correlation with data from stations at lower elevations.

Another phase of Bureau activity that may be of interest is the proposed new program of placing weather data on punch cards. This will be started soon in this region. The punch card program will enable users of data to obtain summaries, means, frequency distribution, and so on, quickly and easily by machine methods, eliminating a great deal of work.

No provision has been made to place back data on punch cards. At present this is being done in other States by interested groups such as universities or other organizations wishing to set up such a project for their own purposes.

An interesting development over the past four or five years has been the correlation study between precipitation and runoff data. We have found a high degree of correlation between seasonal precipitation and annual runoff. We have found considerable value being placed on early estimates of runoff, particularly January and February forecasts. In that connection, the Bureau has, in the past few years, issued forecasts of water supply in various basins such as the Colorado, the Great Basin, and the Rio Grande. Next year we plan to make available during the first part of January, forecast for some of the streams

in this area. These forecasts will be based entirely upon antecedent and current precipitation.

According to plan, data will be received and forecasts made by the 5th of each month, January to May. Printing and mailing will take place after that date. I have several copies of last years' forecasts which I will leave with the Chairman and, in that way, you can see what we are doing. Some of you have seen them and are familiar with the methods that are being used.

Methods of these forecasts permit analyses of many years of past record. It permits exact methods of verification of forecasts, it also permits an uncommonly exact method of determining limits of error within the procedure.

Among the points we expect to forecast this year in Nevada are the following: West Walker at Bridgeport, East Walker near Coleville, Carson River at Fort Churchill and Carson City, Tahoe at the outlet.

The Water Supply Forecast Unit will be located at the Salt Lake City Weather Bureau Office. In the forecasting procedure as set up for this unit, the effect of storms occurring immediately after the release of the forecast may be easily evaluated in terms of runoff. This may be done in a very few minutes after precipitation data for key stations has been received by the unit. Thank you.

MR. SHAMBERGER: Are there any questions?

MR. ROBINSON: You mentioned you were getting close correlation between precipitation and runoff, and I am very much interested in that phase, but I am wondering how far can you establish those, for instance if you have drainage areas in the mountain, runoff, can that be applied to other mountainous areas with the same altitude, with any degree of accuracy?

MR. RUPP: Not likely. That is something that would have to be investigated. You might find an occasional correlation. Our correlation studies deal with the relationship between rainfall and measured runoff. They do not deal with the relationship between precipitation and measured runoff from one area as compared to unmeasured runoff in some other area.

MR. ROBINSON: In other words, if you have a portion of stream in mountainous areas, due to this, of runoff in that total mountain area you could not apply what you had in that mountain stream to the remainder of the area, with any degree of accuracy?

MR. RUPP: If I understand your question, I would say no, probably not. There are too many unknown factors. It might work out occasionally through coincidence.

MR. ROBINSON: In other words, if you have a portion of stream in mountainous areas, due to this, of runoff in that total mountain area you could not apply what you had in that mountain stream with the, to the remainder of the area, with any degree of accuracy?

MR. RUPP: No, you could not do that—too many elements entering into the picture; it might work out occasionally.

MR. SHAMBERGER: Thank you very much.

Now I am going to call on a representative of the Corps of Engineers, Mr. F. F. Friend, Chief of the Flood Control Report Section of the Los Angeles office of the Corps of Engineers. Mr. Friend.

MR. FRIEND: My remarks will be very limited. First, the Los Angeles district includes about two-fifths of this State. The remaining three-fifths is covered by the Sacramento District of the Corps of Engineers. Then the work of the Corps of Engineers is, principally, flood control work, which is definitely prescribed by Congress. No work of investigation or study is undertaken without specific authorization from Congress.

In the case of the Nevada area in our district, there are about six thousand (6,000) square miles now covered by Congressional authorization for investigation and study. That is the Virgin River Basin which includes about 6,000 square miles of the southern part of the State. The Congress authorized an investigation previous to the beginning of the war. A preliminary study was made which showed there were sufficient flood damages and reasons for intensive study of this Virgin River area.

A survey was authorized by the Chief Engineer. This was prepared and certain recommendations were made by the District Office and concurred in by the Division Office. This study went on to the office of the Chief Engineers for final review before presentation of the report to Congress.

The Chief of Engineers, because of the nature of the study, the rather low justification in the area for the projects considered, and because of local interests, consideration of the White Narrows project in that basin returned the report to our district for review, reconsideration, and resubmittal.

The war intervened and interrupted our activities in the study of this area. Since that date, we have suffered a very severe reduction in forces; and little has been done. However, the report is definitely scheduled and will be worked on during the next year and will be complete early in 1949. In the meantime, Congressman Bunker, Senators McCarran and Malone have submitted to the Chief of Engineers various inquiries as to certain local areas within that region, and these areas have been reported on in some detail to the Chief of Engineers and these reports have been submitted to the inquiring Congressman and Senators.

The individuals of our organization greatly appreciate the opportunity to attend a conference of this character. We appreciate that here in the arid west much of the present value comes from the utilization of water and much of the future growth will depend upon such utilization. These developments require protection from floods. So we try to keep in touch with all the planning that relates to these areas, to learn of the basic data that is being accumulated by other Government agencies. Thank you.

MR. SHAMBERGER: Thank you, Mr. Friend. Does anyone have any questions to ask Mr. Friend?

MR. BYRD: Mr. Chairman, I would like to ask the gentleman what, briefly, are your boundaries for your two-fifths and your—(question not concluded).

MR. FRIEND: I have a map here that will show that.

MR. BYRD: It is just ignorance on my part. I just—

MR. FRIEND: (Producing map.) It is of such a size it does not include the Carson City area. It is this portion including the upper reaches of the Meadow Valley Wash over here on the eastern side, and then roughly east and west, then southwest (indicating on map)—

MR. SHAMBERGER: About Lincoln and Clark County, isn't it, Mr. Friend?

MR. FRIEND: Clark, Lincoln, and most of the counties southwest.

MR. SHAMBERGER: Thank you.

MR. FRIEND: I will leave this with you. (Leaves map of Los Angeles district boundaries on Chairman's table.)

MR. SHAMBERGER: Are there any other questions? (No response.) We are greatly interested, Mr. Friend, in that area of the Upper Meadow Valley Wash, Pine Canyon, and Mathews Canyon. I think you have made preliminary reports in that area, too.

MR. FRIEND: This survey report presented by the district office, as I said, included and reviewed by the division office recommended two dams, Pine Canyon and Mathews Canyon. These projects were recommended on rather low justification—that is, low monetary justification. However, it was left because of the large damage suffered by the Union Pacific and the possibility of loss of life in communities below these dam sites that the projects were worthy of recommendation. Justification was worked up on pre-war values of the areas and pre-war costs of the improvements. There is some question as to what the ultimate relationship will be, if the justification is reconsidered on the basis of present prices and thorough investigation of the sites. Formerly some of the studies were based on rather sketchy information on the dam sites. Now the policy is to go thoroughly into the exploration of dam sites, and it's been our experience to find many dam sites are not as good as they at first seem to be. As to the ultimate outcome—that is a matter of considerable speculation at this time, and it will not be determined until the report is almost done.

MR. SHAMBERGER: Thank you.

Now we will hear from Mr. Eldon R. Campbell, Field Representative of the Farmers Home Administration. Mr. Campbell is from San Francisco.

MR. CAMPBELL: It is a pleasure to again attend this meeting and be able to learn more about the activities of other agencies working toward development of water and agricultural resources in Nevada and to outline the part the Farmers Home Administration can play in such development.

Mr. Hollenberg, State Director of the Farmers Home Administration, wanted to be here and asked me to express his appreciation for the invitation to attend this meeting.

First of all, I would like to explain briefly some of the salient features of the F. H. A. loaning programs and explain how these programs relate to the development and use of the water resources of the State.

As you undoubtedly know, the Farmers Home Administration was brought into existence through passage of the Farmers Home Administration Act a little over a year ago. Under the Act, the F. H. A. was authorized to assume the activities previously carried on by the old Farm Security Administration and the Emergency Crop and Feed Loan Office of the Farm Credit Administration.

There are three principal types of loans available in Nevada at the present time, all of which can directly or indirectly assist individual farmers and/or groups of farmers incident to development and use of water resources. First, there are Production and Subsistence loans which provide credit to individual farm families for periods up to five years for the purchase of livestock, machinery, seed, feed, and other farm and family operating expenses. The interest on this type of loan is 5 percent on the unpaid balance. The second type is the Farm Ownership, Enlargement and Development loans which provide credit for the purchase, enlargement, and development of family-type farms. These loans have a 40-year repayment period. Interest is 3½ percent. Repayments are made on a variable payment plan which permits repayment of large amounts in favorable years so that a reserve may be built against possible low income in bad years. Loans are made only after a county committee of three local persons, two of whom are farmers, has appraised the farm and certified that it can be purchased at a price based on long-time earning capacity values.

The third type is the Water Facilities loan. This is the loaning program which most directly has helped and can continue to help in the development of Nevada's water resources.

The Water Facilities Program is administered by F. H. A., although it is carried on under separate legislation. The program was brought into existence through passage of the Pope-Jones Act in 1937. The Act was a direct outgrowth of the report of the President's Great Plains Committee which recognized the need for the development of small water facilities in the arid and semiarid parts of the West.

The objective of the Act is to provide facilities for water storage and utilization in the arid and semiarid areas to alleviate wastage and inadequate utilization of water resources on farm, grazing, and forest lands. These arid and semiarid areas comprise the seventeen Western States. Part of Nevada's need in the development of her water resources can be met through this basic objective.

Water Facilities assistance is mostly provided by making of loans. Such loans are for the purpose of construction, repair, and rehabilitation of irrigation facilities. Funds are used also for construction and improvement of what we call farmstead water facilities.

In addition, funds can be loaned to purchase water stock, a water right and membership in, or the payment of assessments to an association. We have just recently been authorized to loan WF money for land leveling. Water associations can purchase equipment needed for construction or maintenance of a farmstead or irrigation water system.

Loans are made to individual farmers or groups of farmers including associations. Individuals can borrow up to $5,000. A group loan cannot exceed $50,000. Any applicant must first determine that adequate credit is not available from other local sources before receiving

a water facilities loan. Loans are repayable over a period of 20 years at 3 percent interest on the unpaid balance.

With all loans made, engineering and other planning assistance is given. Engineering help is given in laying out and supervising the construction and operation of a facility. F. H. A. personnel assist applicants in working out farm management plans which provide for efficient use of land and water. These services are an essential part of each loan. Often, they are more important than the loan itself.

This fiscal year, Congress appropriated $1,750,000 for operation of the Water Facilities Program. This amount is the same as appropriated during 1947. Prior to 1947, Water Facilities had normally received an annual appropriation of around one million dollars.

In Nevada during the year ending June 30, 1947, loan funds in the amount of $67,460 were advanced. This included loans to one association and about 10 individual farmers. During the history of the program, there has been about $135,000 loaned in the State. This isn't very much for a State where so much of the water development needed is for small individual or group water facilities. The funds are distributed to States on a first come, first served basis. Funds are limited. Nevada has more than its share of need for the water facilities program. It is expected that applications will come in at a faster rate than in the past. Veterans are continuously attempting to get established on farms. Our offices are receiving inquiries and applications consistently from veterans. Demand for assistance for all types of loans is increasing and is expected to continue to increase. Now that water facility loans can be made for leveling of land where justified, it is expected that additional applications will come from farmers needing this type of assistance. Advancing of loan funds, however, for land leveling will only be made where such land leveling is needed in connection with the development of other water facilities.

With the expanded uses for which funds can be used and with the increased number of applications coming in, it is expected that Nevada will this year obtain its fair share of the limited funds available.

Now to mention some of the work of WF here in the State. A loan was made in 1946 to the Alamo Irrigation Company for $46,200 to line their ditches with concrete. Work was started on this project this summer. Some delay was experienced in getting started because of the time taken in attempting to locate contractors to take the job on a reasonable bid. The company has gone ahead and is doing the work themselves under a competent foreman and supervision of an F. H. A. engineer. Most of the work will be completed by the end of this winter. Approximately $20,000 of the loan is to be repaid from ACP payments which the company expects to earn this year from carrying out this improved practice. The Alamo job is one example of the type of development needed in many areas of the State. We find that often the need is not development of additional water, but the more efficient use of land and water already available.

A few individual farmstead WF loans have been made. Most of these consist of drilling of domestic wells, putting in pressure systems and laying distribution systems throughout the farmstead. Individual

irrigation facilities this past year have consisted of pipe lines for bringing water over alluvial fans, drilling of wells, and installing pumps and power units.

I believe that's about all, Mr. Chairman.

MR. SHAMBERGER: Thank you, Mr. Campbell. Does anyone have any questions to ask of Mr. Campbell? If not I am going to call on Mr. M. R. Miller of the Experiment Station at the University of Nevada.

MR. MILLER: Mr. Chairman and Gentlemen. Not having prepared a formal paper for this occasion I feel that a few observations on the work of the Laboratory of Research Chemistry of the Nevada Agricultural Experiment Station relating to the quality of irrigation water in the State might be of interest to you.

The Experiment Station Laboratory began its first systematic studies of the quality of irrigation water in 1942 when a project on the subject was approved by the Office of Experiment Stations at Washington. The principal work of our laboratory, as well as all the other work of the Nevada Agricultural Experiment Station, is conducted on a project basis. Each of the station projects, in order to become operative, must have their approval when submitted to the office at Washington and our station is answerable to that office. Until the last session of Legislature, no funds have been provided by the State for Experiment Station investigations and we have been somewhat limited as to what we could do in the way of service to Nevada agriculture. All that has been done in the past has been done for the most part at the expense of time taken from our regular project work.

Institution of the project on the quality of irrigation water of the State was urged by Dr. C. S. Scofield who was then in charge of the work of the Division of Irrigation Agriculture in the Bureau of Plant Industry. Information on the quality of the water of the Humboldt River was desired and needed, both by the Bureau and in the areas irrigated by those waters, and inasmuch as this river is not an interstate stream the Division of Irrigation Agriculture could not enter this field as they had done on the Rio Grande and other rivers of the West.

On approval of the project which was set up particularly for the study of the waters of the Humboldt River, our laboratory, with the cooperation of the State Engineer's Office and the Pershing County Water Conservation District and others interested, established a number of sampling stations at gauging points on the river and began systematic sampling and analysis of samples from these points. With the passage of time and the pressure of other duties the original number of five stations were reduced to two; samples being taken at Palisade and the Ryepatch dam. The weekly samples taken at these stations are sent to the laboratory for analysis, with no charge to the cooperating agencies, and the results are published and kept available for anyone interested in them. The results we have obtained have been eagerly sought by the Geological Survey, the Bureau of Reclamation, and others interested in irrigation water quality.

As for the present, the smaller run-off this year on the Humboldt River watershed is now being reflected in a smaller storage in Ryepatch

Reservoir than in former years and also in a drop in the quality of the water from the irrigation standpoint. It would appear that the present week will just about represent the maximum concentration of salines to be expected for this year and with any precipitation at all the quality will again begin to improve. Do not understand that there is particular danger to crops as water of far higher salinity is used successfully for crops in other places, but it would be desirable that there should be an improvement. The salines of Ryepatch Reservoir have shown fluctuations in concentration in the past and because of the relatively small storage capacity moderate increments of river water are quickly shown in the analysis. We can expect that this is a characteristic of the reservoir. There is a feeling on the part of some of the users of Ryepatch reservoir water that salt is being extracted from the banks of the reservoir. We have not had any analytical data to directly support such a conclusion since the concentration of saline material in the water can be practically all accounted for by the salts brought in by water flowing into the reservoir and through the concentrating effects of evaporation of the water from the surface.

This project on the Humboldt River is to be continued, and when more propitious times come the project may be expanded to include one or more of the other major water sources of the State.

Some cooperative work has been done with the office of the State Engineer, the Geological Survey and other agencies in making analyses of water since it has been felt that such service should be rendered for the sake of the agriculture of the State so far as could be done, and in spite of the fact that no provision existed for such work. In Nevada the scarcity of water for agricultural purposes makes it the more necessary that the quality of the available water be given greater attention.

The scarcity of laboratory assistance during the past few years and the lowered purchasing power of our fixed income finally has made it necessary to greatly curtail the service work requiring the time of the laboratory regardless of the desire on our part to continue our services in these lines. Not only has analytical work for the agencies interested in irrigation and water quality had to be given up but also, for the most part, the analyses of miscellaneous water samples for individuals has had to be diminished. Another class of water analyses, those made to determine the value of given waters for domestic purposes, has been made by the Nevada State Food and Drug Laboratory. As with the Experiment Station Laboratory, the Food and Drug Laboratory has its functions clearly outlined and the real duties of that laboratory do not include such miscellaneous work. Also, as with the Experiment Station Laboratory, the Food and Drug Laboratory has been faced with a scarcity of time for such service work.

The question then remains, who shall do this type of service work which is of definite value to the permanent agriculture of the State, and to the State in general, if the divisions which have formerly done it can no longer carry on. The answer might be found in another service department of the University which was established in 1912. I refer to the State Analytical Laboratory. Provision for the maintenance of a State Analytical Laboratory as a public service division of

the University was made by Legislature by which free examinations and analyses of soils, minerals, ores, and waters would be made for citizens of the State. The University arranged that examination of the minerals and ores would be made in the School of Mines, and the soil and water samples would receive attention by the Agriculture Division and the Laboratory of the Food and Drug Division, respectively. For a long time when money and help were more abundant this arrangement was satisfactory. The water samples were examined by Prof. Dinsmore in the Food and Drug Laboratory and the soils received attention by the agriculture and soils departments of the University Experiment Station. On the passing of Prof. Dinsmore and the steady increase in demands for analyses, arrangements were made with Mr. Wayne B. Adams, the new Commissioner of Foods and Drugs, whereby his burden was lightened by a sharing of the work whereby the irrigation waters were examined by our Station Laboratory and the domestic waters by the Food and Drug Laboratory. The State Analytical Laboratory all this time then has given service, and the work of this analytical laboratory has justified no criticism whatever.

Incidentally, the growth of public service work in other lines which were and are now carried out by the University has in the past been very similar to the growth of the demands for examinations of soils, ores, and waters. With the growth from similar beginnings of service work in other lines has evolved finally the State Food and Drug Laboratory, the State Hygienic Laboratory, and the State Veterinary Control Service. These have all lessened the demand on the time of the University and Experiment Station staffs and have set up specific agencies for the work to be done.

It would appear, then, that possibly the time is now at hand when the same thing might profitably be done to provide expanded service to agriculture by the State Analytical Laboratory. The frame work of a more comprehensive State Analytical Laboratory is already in existence and by a slight expansion and rearrangement the demands for water and soil analyses could be taken care of. Professor Walter Palmer, the Director of the State Analytical Laboratory, and who is now carrying on the mineral and ore work, Mr. Adams, Commissioner of Foods and Drugs, Mr. Spencer and myself of the Experiment Station staff, who have been looking after the waters and soils, are all favorable to such an expansion and consolidation. We all, of course, would be available for advice and consultation when necessary. We feel that if, possibly the State Engineer's office could meet with the University officials, it might be that some such an expansion might be devised and by so doing the needed service work could be done more satisfactorily and expiditiously than is possible at present. It is felt that the services of a full-time suitably qualified man with a very small extra expenditure for added equipment would be sufficient when added to the personnel of the present State Analytical Laboratory to provide these services.

Mr. Chairman, I feel that this is an opportune time to indicate my appreciation of the fine cooperation which has been given the laboratory which I represent by the State Engineer's office and those other agencies which are interested in the water supply of the State, the

U. S. Geological Survey, the Bureau of Reclamation, the Soil Conservation Service, and all the others which have given assistance.

Thank you.

MR. SHAMBERGER: Are there any questions to be asked of Mr. Miller?

Mr. Miller, your suggestion for a State Water Laboratory is extremely important, not only for the individual farmers, but to our ground-water studies.

Mr. Robinson told me some time ago we should have a number of samples analyzed, and if they are sent out of the State it would cost about $10 a sample.

The State Engineer's office has cooperated with the Geological Survey, their surface water program, and that program has been increased and has gone a long way. We need further increases. It is extremely important to determine the runoff in these streams, not only as an aid to distribution work, but for the working out of plans for better use, and better conservation. In this State, Mr. L. R. "Tom" Sawyer, of the U. S. G. S., is in charge of that work. I will call Mr. Sawyer now.

MR. SAWYER: Mr. Chairman, Gentlemen: In outlining achievements and activities of the State of Nevada-Geological Survey cooperative surface water investigations program since the last meeting of the Nevada Water Conference held in this city on September 17, 1946, I am pleased to report that good progress has been made.

At the time of the last conference we had just made a good beginning on the construction of eight new gaging stations requested by the U. S. Bureau of Reclamation and three requested by the Corps of Engineers in the Carson, Truckee, and Walker River Basins. Installation was completed on all of the stations during the following months so that satisfactory records were obtained covering the past snow runoff period.

Seven of the stations requested by the Bureau of Reclamation are located in the Carson River Basin in connection with the proposed project of diverting streams tributary to the East Carson by aqueduct to the West Carson for storage in the Hope Valley reservoir. The water would be later released for irrigation and power development. Available head for the proposed power plant would be about 1,200 feet, which would be largely responsible for financing the construction work. Gaging stations to determine the water supply are located near the proposed conduit line at an elevation of about 7,300 feet. Several are located at remote locations where it was necessary to convey construction materials by pack train. These gage house structures were built of timber, while those located at accessible sites were constructed of corrugated pipe. Cableways from which high water discharge measurements are made were necessary at all locations except on the West Fork where a satisfactory bridge was available.

One gaging station requested by the Bureau was constructed on the Little Truckee River near Hobart Mills and one requested by the Army Engineers on the Truckee River near Reno. These gages were required to ascertain water supplies in connection with irrigation, power, and flood control projects being considered by both agencies in the Truckee River Basin. The two stations requested by the Army

Engineers on the East Walker and West Walker at the head of Mason Valley are for flood control studies by that organization. Gage house structures for the latter four stations were constructed of corrugated pipe and standard cableways were installed.

Although the Bureau of Reclamation financed the construction and the first year's operation of the stations requested, it was with the understanding that continued operation would be financed by the State-Federal cooperative stream gaging program. In compliance with this proposal the Nevada State Legislature increased its cooperative appropriation by $2,000 for the current fiscal year. Since the new stations are actually located in California and that State will also receive power, flood control, and irrigation benefits, Mr. Ed. W. Hyatt, State Engineer, allotted $1,000 of California cooperative stream gaging funds to assist in the operation and maintenance of this program.

It was originally anticipated that some gaging stations in the Truckee River Basin now being operated by the local water users could be rehabilitated and added to the State-Survey program. However, because of restricted funds by both the State and Federal legislatures no new work will be possible this fiscal year. All funds available will be required for operation and maintenance purposes.

Stream gaging activities in the Humboldt River Basin for the past year have been restricted primarily to the maintenance and operation of existing stations. Two stations in that basin, namely, the Humboldt River at Comus and the Lovelock Irrigation, Light and Power Company feeder canal, were rehabilitated with the installation of new corrugated pipe gage house structures.

The total number of gaging stations, including lakes and reservoirs, now being operated under the Nevada cooperative program is as follows:

Humboldt River Basin	20
Owyhee River Basin	4
Muddy River Basin	1
Carson River Basin	10
Truckee River Basin	4
Walker River Basin	8
Total	47

To improve field operating procedure and to have stream-flow records readily available for use of State officials and citizens, a Surface Water Division office was established at Carson City during the past year. The work is under my direct supervision, assisted by two engineers and one clerk. One engineer, Mr. McConkie, is stationed at Elko, so that current measurements and records will be available to local users of water supply data. All basic data collected for the past several years and files in connection with surface water investigations in Nevada have been transferred from Salt Lake City to Carson City. Only minor administrative supervision, principally in regard to accounts, purchases, and personnel assignments, will be continued from the Salt Lake City District office.

Surface water supplies, particularly those in the Humboldt River Basin, for the water year ending September 30, have been much lower than those for several previous years. Although the first month

of the water year in the Humboldt River Basin started with a flow of 329 percent of normal and the first six months developed over 250 percent, the last half of the water year dropped to an average of only 67 percent. This low water flow for the period April-September was in marked contrast to the excellent runoff for the six preceding years which were unusually good, averaging 218 percent of the 25-year normal, 1921–1945. With the exception of the last six months, flow in the Humboldt River Basin has also been unusually high in comparison with adjacent basins. Runoff from streams draining the Sierra Nevada Mountains has averaged near normal for the same period—the West Walker River near Coleville, California, recording 105 percent of its 25-year normal. Based on preliminary computations, runoff for the water year ending September 30, 1947, totaled 137,000 acre-feet, or 70 percent of the 25-year normal. Stream flow in the southern part of Nevada has been relatively low as reported by the gaging station on Meadow Valley Wash at the Delmues dam site. This station was established in November 1944. Total runoff at that location for the water years 1945 and 1946 was 4,800 acre-feet, respectively. Although records have not yet been completed for the past water year, total runoff was in the same general magnitude. From these records it appears doubtful that there is sufficient water to justify a dam for storing an irrigation supply at this location.

And I would also like, at this time, to express my appreciation to the State Engineer's office, Forest Service, Bureau of Reclamation, Soil Conservation Service, and the Sierra Pacific Power Company, all of whom have been very cooperative and helpful in furnishing data, the Forest Service in furnishing the use of their Ranger Station for shelter, and just general encouragement in some cases.

I had an opportunity of returning some of it the other day when I accompanied Mr. Houston up McAfee Creek to establish a snow survey course. I was glad to do it once, but I don't want to have to do it again.

MR. SHAMBERGER: Thank you, Tom. I will now call on Mr. C. J. Preece, Irrigation Manager, Indian Service.

MR. PREECE: Mr. Chairman, I have a very short report here showing our irrigation activities in the agency last year.

During the fiscal year ending June 30, 1947, irrigation construction was accomplished on the Duckwater, Campbell Ranch, and Walker River projects in Nevada, to the following extent:

At Duckwater, 5 miles of new canal were constructed doing away with the old canal and worn-out structures entirely. The headworks at the Big Warm Spring were completed. This is a rubble masonry structure, 14 feet in height and 30 feet in length, containing approximately 275 cubic yards of masonry. A 24″ Calco measuring gate is installed for the Indian canal leading north, and a 30″ gate to turn water to other water users below and onto the storage basin during winter months. A concrete check constructed 900 feet down the ditch from the 30″ gate is for use in turning the winter water onto the so-called "Big Warm Springs Plateau" for storage.

For the Indian farmers, twelve 16″ Calco measuring lateral gates with concrete checks and corrugated pipe turnouts were installed along the canal leading to their lands. The two turnouts, one on each

side of Duckwater Creek at the old Florio blacksmith shop, were installed in a combination and check structure of reinforced concrete. Several small wooden bridges were built for use of individual farmers.

The reconstruction of the Duckwater works is expected to result in a considerable saving of water and time consumed in trying to operate the old system.

At Campbell Ranch, near Yerington, 1½ miles of 4′ bottom and from 2.5 to 5′ depth drain was constructed leading from the lower north boundary of the Indian Campbell Ranch to the Perazzo slough. This drainage ditch, while not being deep enough for heavy drainage, will carry away 3 or 4 second feet of waste water from the Campbell Ranch and other nearby ranches.

At Walker River, about ½ mile below Schurz, 800 cubic yards of loose rock were placed in the Walker River for protection to the abutments of a lateral flume and as protection against further erosion of the river banks. Two small laterals near the shore of Walker Lake, on the east side of the river, were extended in length for a total distance of three miles to spread water over additional lands used for tribal pasture. Some 3,000 acres of fairly good pasture lands have been developed in this way, making use of excess water which would otherwise be wasted into Walker Lake.

Approximately $42,000 was expended on the three projects.

Our proposed work for this fiscal year will consist of the following:

On the Fort McDermitt project a rock masonry diversion dam will be built on Quinn River to divert water from the Hearn ranch, replacing two rock and brush dams used for many years. Two miles of domestic water pipe are to be laid from a small spring on the side of the mountains northeast of the Fort McDermitt school to a 42,000 gallon capacity metal storage tank just above the agency houses, which will furnish a supply of pure drinking water to the people of this community.

The McDermitt Indian Tribal Council are planning on the installation of several small turnouts and checks for water distribution on the Giaccometto ranch.

On the Pyramid Lake project riprapping and construction of the five rock check dams are to be started, but may not be completed this year. One-half mile of small lateral is to be constructed to shorten the distance of delivery, one and one-half miles, to a tract of farm land on the lower end of the irrigated area.

On the Washoe project, near Gardnerville, river protection work is proposed, consisting of rock riprap and rock groins along the Carson River bank within the Indian lands.

At Reese River one small diversion dam of rock construction is to be built and reconstruction of some three miles of small canals will be accomplished.

The canal systems on Walker River and Pyramid Lake projects will be cleaned where the need is most urgent.

And that about concludes the construction of the various projects. Thank you.

MR. SHAMBERGER: Thank you, Mr. Preece.

We have a few other gentlemen in the room who know a great deal

about the Nevada water problems, and I know they will have some interesting observations to make.

First, I want to call on Mr. H. O. Petersen. Mr. Petersen is with the Water Facilities Branch of the United States Geological Survey from Los Angeles. While he is not directly connected with our groundwater study, he is a highly qualified hydrologist and has been interested on a great number of occasions in locating well sites for the Bureau of Land Management and Indian Service; and has been of assistance to us. I know he has some interesting remarks to make. Mr. Petersen.

MR. PETERSEN: Mr. Shamberger, Gentlemen: I didn't come up here with any idea of making a talk, although Mr. Shamberger, in his invitation, did ask that I be prepared to participate in the discussion.

First of all, I think the State Engineer, who is connected with this conference, deserves your commendation. I do work in a great many States in the West and come in contact with a great number of officials, and I don't know of any place where the water problems of the entire State are so well summarized and so widely disseminated as they are in conferences of this kind; and, therefore, I consider Nevada is to be commended in starting this sort of conference, held annually, or less often, or more often, if need be; and I think the practice might very well be adopted in a good many other States where the water problems are perhaps just as acute as they are in this State.

In speaking of that, it is interesting to see the progress that has been made in the few years these conferences have been occurring. I think it was only possibly three years ago, maybe less, that I attended the first conference of this kind. That was held here, when the proposed program of investigation of ground water resources of the State was brought up. At that time it was sort of a nebulous plan. The State Engineer's office and those who had traveled around the State realized there were underground resources of ground water and other types of water in this State, but just how to reach out and bring that water in, how to develop new land and water and make them produce, was something that had not been decided upon. At that meeting, there were certain phases of the program that were outlined and it was decided the program was to start.

Last year I missed the conference, but I understood that considerable progress has been made. Today we have reached a point where, as I listened to the various speakers, we are coming to a determination of how much water is available and how much land we have to put under irrigation and put into production. If we go along, I say "we," if the program goes along in this fashion, I think that a year from now, or possibly two years from now, this group of engineers and other men interested in the primary development of the water, will be augmented by another group. Then we will begin to wonder how to acquire title, or how to transfer title of these various lands we have determined can be placed under irrigation from the present ownership, or State ownership, into private ownership. I think the conference will probably want to have some bankers present who will give some ideas as to how actual financing can be taking place, because

once your water has been determined to be present, it is then a question of drilling wells, installing machinery, bringing that to the surface, to the ground, where it can be put into production.

You also need to have considerably more work done by such agencies as the Soil Conservation Service, in planning forms, and things of that kind.

I am always interested in western development. Possibly a year from now there will be a very decided need for men of this kind, possibly a need for architects who have some ideas of how farm houses should be built on these newly developed areas. It is very satisfactory to me, as one interested in conservation and development of this western country, very satisfactory to me to see some progress being made.

My particular interest in Nevada is not closely associated with the development as you have heard it outlined here. Our work is largely in the public domain development, water for range purposes, and other work that is connected with the development of the range. By doing that work, I have had an opportunity to get over a large part of the State. Some of the things I have watched have been touched upon here today, and one of these has been the development of water in a great number of valleys that occur in the State of Nevada.

Due to its peculiar geographic set-up the waters that occur in Nevada belong strictly to the State; there is no chance they will be transferred out. Nevada has internal drainage waters from the mountains in those valleys and are confined there. The question of whether that water is used, or not, does not become an interstate question at all, it becomes strictly a question of the State of Nevada. If those waters are allowed to waste, it is entirely Nevada's loss. If it is put to land development, it is going to be Nevada's gain.

One thing that has been touched upon here today which possibly deserves consideration for future studies of this kind, has to do with many large springs in the State of Nevada.

I think Mr. Mead of the Bureau of Reclamation mentioned this morning that the Bureau recognized a need for some kind of storage to hold waters in the Moapa Springs which irrigate lower Moapa Valley. We have, particularly in the eastern and southeastern part of Nevada a great number of springs, ranging in size from five second feet to maybe thirty or forty, even larger. These springs have a constant flow. During the nonirrigation season that water is wasted in most localities. I think as the study goes along, serious consideration should be given to conserving that water that is wasted during the nonirrigation season. It is possible that storage dams can be developed for some of them to conserve that water in surface reservoirs. In others, it might be well, too, for that terrain immediately surrounding, to see if it could be put into some sort of basin during the off-season period, if possible, to see if it cannot be repumped when it is needed next season.

There are many other problems connected with the State water development that probably deserve some consideration. I am particularly cognizant of that, seeing what occurred in the northeastern part of the State. That area, as you recall, was formerly under the

jurisdiction of and largely owned by the old U. C. Land & Cattle Co. Some three or four years ago that ranch was sold and subsequently it was divided up into smaller units—it is now being mostly resold, I said "mostly"—it has been resold to smaller operators. The group of men that arise to my mind is a very aggressive group of ranchers who, according to plans I received, are going to make a very substantial development in the State of Nevada. Some of the underground waters, particularly along Thousand Springs Creek, are to be developed, and some of the meadows which are now producing small crops of rather a poor grade of hay, are contemplated to be changed over, water tables being lowered. If they have their way, those meadows will be converted into land which will produce higher class crops and more crops, such as alfalfa hay, grain, and other produce of that kind.

I think with that particular type, the State is going to see a very substantial development—it will be something I think will be worth watching. The men who have bought in there happen to be rather wealthy individuals, which is probably to their credit, but because of that they probably will be able to go into a development program which the ordinary individual would not be able to consider; but, nonetheless, I think it is going to be a very worthwhile procedure to watch.

I think any observing person who has traveled over the State of Nevada recognizes the need which is gradually being solved by meetings of this kind.

Any geologist, any hydrologist, going through, recognizes a dry lake, a swamp, and so on, where water is being gradually lost through evaporation and transpiration and represents a distinct waste which in our period of development should not be allowed to exist. That water should be put into producing something which this country and the world at large needs.

In closing, I would like to repeat that it is very pleasant to me to see the progress this conference is making. I think it is something other States in the West could very well copy.

MR. SHAMBERGER: Thank you, Mr. Petersen.

Does anyone have any questions?

MR. PHOENIX: I might add, Mr. Petersen, in regard to spring conservation, we found a little area in Moapa Valley where it is feasible to reclaim that spring water and put it underground. It is just an example of what can be done. It is economically possible. When the safe yield is being reached in the valley it is a potential source of water which can be reached at least during nine months of the year.

MR. PETERSEN: That is fine to know. Thank you.

MR. SHAMBERGER: I will call on Howard Mason of the Agricultural Experiment Station, who knows about as much as anyone about lands and water conditions in Nevada. Howard Mason.

MR. MASON: I question very much whether I am entitled to the privilege of standing up here after hearing all these reports and accomplishments during the year, because I think the surface work

on irrigation problems that is accomplished is pretty hard to see, but we do hope at least to get out a comprehensive report on our reconnaissance inventories of land and water resources in Nevada which has been held up pretty much during the War. We have not done much with it during that period. However, the material in this study has been made available to a good many agencies, but the report will spread it much wider.

I want to take this opportunity to reiterate a little of what I said last year, that our findings, our conclusions, are that there is not a great opportunity for expansion—that is, the spreading of our major water supplies over on more land. I was glad to hear this morning several speakers mention possibilities for developing small streams, small supplies of water. There is very considerable opportunity for both extensive development, that is, spread over more acreage, but also more water on the same acreage that is being irrigated at the present time, and greater production per acre. These small-scale developments have been retarded by two conditions. One is the absorption of most of our irrigation engineers and other technical people by the large projects. There is no great amount of relief for this situation in sight. The other condition I have in mind is the association of most of our small to medium irrigation water supplies with stock-ranch operation using public grazing lands. There are a few apparent exceptions to the general rule. In these the water supplies have been very materially improved by storage reservoirs or pipe line transportation. When examined these prove to be special cases in which the water development corrects a previous lack of balance in the ranch organization. The present price inflation may result in some development which would not otherwise occur, and more might be stimulated by land policies designed to secure more complete use of resources.

I think that's all I have to say.

MR. SHAMBERGER: Thank you, Mr. Mason.

We have another member of the Geological Survey we have not heard from. Mr. R. B. Morrison of Fallon, who is with the Geological branch, and is carrying on this special study in the Lahontan Basin.

I think a part of his work is studying the whole of Lake Lahontan, and while it is not directly connected with the ground water program, his findings will, no doubt, be of great help to the men carrying on the ground water investigations. I am sure we would all be interested in having Mr. Morrison tell us a little about his work over there. Mr. Morrison.

MR. MORRISON: Mr. Chairman, and Gentlemen of the Conference: I don't know whether you realize that only 70 percent of the land area has been mapped. That is the reason for the detail on that geological map. In order to get accurate information on underground water supplies, adequate geological maps are very essential, and no more true than here in Nevada. There are big gaps in our geological knowledge, particularly in this State. We have a lack of determination on Tertiary and Quaternary deposits, materials that fill our basins between the mountain ranges. These deposits are the big yielders of ground water, but we do not have much information about them as yet, only knowledge of a general character, by and large.

As a small step forward to improve our store of knowledge on that subject, the Geological branch of the survey has started some basin studies in the Great Basin. The first studies began under the direction of Charles B. Hunt, who is our Regional Geologist for the Salt Lake City region of the Geological Branch. He has had four or five parties doing mapping for nearly two years in the east side of the Salt Lake Basin close to the Wasatch Range, and that mapping has been aerial geological mapping. It was begun with rather a purely scientific approach, but it is yielding dividends in an important way and will continue to yield more dividends in terms of ground water. The most intensively developed and populous region in Utah has also engineered the geology for various uses, such as road use and concrete aggregate; it's a big problem getting suitable gravel and other construction materials.

As of June of this year I started work on a project in the Lahontan Basin. The project set up has aerial mapping on the scale of one inch to the mile. A series of six quadrangles, 15 minute quadrangles, in the southern two-thirds of the Carson Basin is centered around Fallon. Work will be aerial geological mapping of the deposits, interpretation of the geological history, with emphasis on the Quaternary geology, and the Tertiary, more probably on the sediments, although the other is also important.

Probably more important than we realize now, and probably very important to that region, hydrologically, will be the history of ancient Lake Lahontan.

We expect to get some dividends from that, in ground water studies and engineering geology, and also in mineral deposits. There is no particular order being stated.

There is a possibility of natural gas within the Basin, but that is not unique in the Great Basin region. There are possibilities of natural gas being explored there, and also formations favorable to nonmetallic and metallic mineral deposits.

With respect to ground water in the Truckee-Carson Irrigation District, I have had trouble with alkalinized soil conditions, salinity in soils; and studies of these conditions are needed.

There is another possibility where ground water work could be done, where an accurate knowledge of the geology in the low lands of the Basin, the farming area, would help. There is a possibility, but it is too early to say now, of a very limited area where water might be developed for irrigation, although, by and large, the Carson Sink Basin has had too fine deposits to support a very large development, or very large yields for irrigation wells.

MR. SHAMBERGER: Thank you, Mr. Morrison.

This morning, when we were discussing in detail the ground water program, Mr. Robinson mentioned a valley in which work is now being carried on. I think it would be interesting if we could have Mr. Maxey report, briefly, on the valleys in the eastern part of the State a little more in detail, especially White River Valley where he is carrying on a quantitative study. I know that would be interesting.

Would you do that, George, just a brief summary?

MR. MAXEY: This is a subject that catches me with my pants down, figuratively, because I was sent to the eastern part of the State early

in August and I spent most of my time confined in a hospital bed recovering from an automobile accident, and I have had very little opportunity to explore the ground except from the existing literature.

However, I have been able to conduct reconnaissance trips into White River Valley in which we are planning quite a detailed investigation, and where the possibilities of the development of water and development of good land seem to be quite favorable.

I have also been able to look briefly at Hamlin Valley, a large part of which lies in Utah, but certain areas of which may prove to be quite productive lie over the State line in Nevada. I have been able to see Snake Valley, and have also spent a few days in Diamond Valley in Eureka County, and I have made one brief trip to Railroad Valley which lies, largely, I believe, in Nye County.

As I said before, the most optimistic conditions I have seen in eastern Nevada, so far, in my brief trips, have been the conditions in White River Valley where there are at least four large springs of the type Mr. Petersen and Mr. Phoenix and others have mentioned.

I believe it was Mr. Mason who brought up, or it might have been someone else, who asked Mr. Robinson if ground water developments in the White River Valley might possibly affect the yield of these large springs.

Apparently, from what little bit of study has been made, ground water development will not affect, particularly, the yield of those springs, for the ground water development that will be done, certainly in the near future, will be at considerably lower elevations than where the springs crop out; and it is quite probable that the springs afford, in large part, recharge to ground water that will be developed. This is particularly true around Preston and Lund in the central part of White River Valley. In this area, and south of Lund, for approximately five miles, I would roughly estimate, there is as much as three or four thousand acres and possibly a good deal more good land available for cultivation providing ground water can be placed on it; and over considerable areas of that three or four thousand acres the ground water level is close to the surface, within 40 feet.

Such conditions certainly justifies further detailed investigation, and with the possibility that, if deemed necessary, test wells be drilled to determine what the materials are and how that will yield water to wells.

In Diamond Valley, in Eureka County, north of Eureka, there are considerable areas of what is apparently good land.

I might say one of our great difficulties in this investigation is proving to be that of determining just which areas to investigate where ground water is obviously available, because we are not soils men and very little is known of the soils in these valleys. One of the big helps would be soil studies, of course as detailed as possible, but even brief soil studies would be of great help in certain portions of these valleys to outline, more or less, the soils that would be arable, providing water could be supplied to them. Diamond Valley is one such valley. As far as I know no soil studies have been made there and, as far as I know, there is no way to determine the value of soils except by rule of thumb, or guess-work. And I am not confident that

the investigation of a ground water problem in such a valley is particularly valuable to the State if the soils are not capable of being used.

Apparently Diamond Valley offers considerable opportunity for development. There is a high water table, that is, one within 50 feet of the surface over a large area, and apparently there is a large amount of water available for recharge.

I managed to visit Spring Valley in two brief trips. There again large quantities of ground water undoubtedly are available and will not be utilized in the most efficient way. Here again, the problem of whether it is worthwhile investigating such water supplies because of our lack of knowledge of where favorable soils are so limited. Apparently areas of good soils are quite limited in Spring Valley.

In Snake Valley, along the eastern bounds of the State there undoubtedly is a large quantity of ground water available. There is considerable loss by transpiration; and one of the finest recharge areas in the State of Nevada is tributary to this valley. However, I have not had an opportunity to look very deeply into the details.

I have no other remarks now.

MR. SHAMBERGER: You have supplied much information, George.

MR. MASON: I would like to ask a question. I am particularly interested in that Hot Creek Springs down below us—a very large spring surrounded by almost worthless land. Would it be possible to tap that source some place, trace it, and tap it at some other place where there is good land, and then abandon the present use of the water?

MR. MAXEY: I'm pipe-dreaming now, but I have an alternative suggestion. Hot Creek Spring has, for years, flowed into the old Adams-McGill reservoir, which originally was constructed, I believe, to irrigate the land below the spring. Apparently either the land was not of good value or it was in some financial difficulty. Apparently, the water cannot be utilized that way. However, to the west of Hot Creek Spring there is a considerable area of good land which should be surveyed and investigated at the earliest opportunity because the Hot Creek Springs does represent one of these small areas concerning which I was questioning Mr. Mead about this morning, in relation to development. There apparently is good land there. I know there is ground water available in some quantities, but it is believed Hot Creek Spring can be diverted and swung back around. In other words, it is quite possible a considerable area of land can be developed and a little farming community could grow up there.

As I say, I am pipe-dreaming, as many of the engineering details, and the soil details, have not been gone into, but Hot Creek Springs certainly represents a problem in White River Valley, and, at the present time, very little use is made of approximately 14 second-feet of water.

MR. MILLER: Mr. Chairman, I might suggest in connection with this subject, that the water of some of these Hot Springs should be analyzed. Some of them are dynamite. Steamboat Springs for example, throws out a little water but it is not suitable for agricultural use. Some hot waters have too much chlorine in them. Those

things have got to be taken into consideration, along with the quantity and amount available. The land on which the water can be applied in the vicinity of such springs will, very often, eliminate them immediately from further investigation, unless for exploitation as mineral water.

MR. SHAMBERGER: Your statement shows the great need for a State Laboratory.

MR. MILLER: That's why I put that plug in.

MR. SHAMBERGER: Thank you, Mr. Miller.

We have the Chief Engineer of the Sierra Pacific Power Company, Mr. George Devore, here today, and I am sure he would like to make a few remarks regarding what he has heard this afternoon.

MR. DEVORE: I came here to be a blotter—and absorb, not to give forth. I am afraid I might presume on your time as I have not given any thought to making any remarks. But it has been most interesting to hear the thoughts the speakers are giving today.

As a power company and water department over there, we try to apply some of the ideas you bring out at these meetings. We are especially interested in the Truckee River and Carson and, potentially, in Walker. In snow surveys we take quite an active part. And the regulation of the Truckee River—it might be interesting to you to know that in the Truckee River this year I think we have had a loss of a major quarter of one percent, or one-tenth of one percent of water, due to accidents on the Fallon-Truckee Canal more than any other season. In Carson River there's been not a drop of water wasted, as far as I know, this year. Any waste in the upper part of the valley has been taken care of by the Lahontan storage.

Our storage in the Truckee this year is not over 40 percent of the normal storage, although we were able to go through with the normal supply, having carry over from previous years.

I think we might benefit in some of our future meetings if we can get somebody to give us a talk on the economics of some of these subjects. I had in mind Lake Tahoe. We always looked at Tahoe as a beautiful reservoir, 750,000 acre-feet, and yet if you start thinking of the economics of Tahoe it is probably irrigating about 45,000 acres instead of the 150,000 acres that amount of stored water could irrigate.

Then we have Washoe Lake. I suppose others have had the same idea. Its evaporation, roughly, would irrigate 1,000 or 2,000 acres of land. There might be a solution. Our State Engineer may be able to devise a way of making a tule lake out of Washoe, cultivate the land after pumping the water out for irrigation of the adjacent higher dry areas.

The Army Engineers and the Reclamation Bureau are both working on studies of the development of the Truckee River and the Carson and Walker. We have these dry years, such a year as this where there is no storage at all, on the Truckee and Carson. That involves an economic problem which is, presumably, our baby to look after, but I think we are all interested in how to take care of the development of stable power, to take care of the irrigable lands where they are not permitted, according to law, to store water. Adversely, there is no water to store in such a year as this.

I don't know of anything special I could add to the discussions here, but I will say I have enjoyed very much hearing the remarks you made.

MR. SHAMBERGER: Thank you, Mr. Devore.

Mr. Petersen says next year we might have bankers and architects here also, but this year we have the Secretary of the Reno Chamber of Commerce. Ed, you have been here listening today, will you give us a few comments?

MR. E. H. WALKER: Mr. Chairman, Gentlemen: I know very well I am no expert on water. I can't offer anything regarding the technicalities of the situation, but I do appreciate very much the invitation I had to attend this meeting. I have learned a whole lot about the work that is going on. I don't think the public generally realized what the State Engineer's office and the Government agencies are doing in the interest of the conservation and development of water. I can assure you that the Reno Chamber of Commerce is interested and realizes the importance of the development and conservation of water; and if we can be of cooperation in any way possible in the development problems, you can count on us; I assure you of that.

MR. SHAMBERGER: If there is anyone else I have not called upon who would like to give us a few words, I would like for him to stand up.

If not, I am going to turn the meeting back to Mr. Smith, the State Engineer. Tom, if you please.

MR. SMITH: I wanted to get out of this entirely. I guess Hugh and I have worked together so much that when he can shoulder off something on me, he does it, and I, having the whiphand most of the time, shoulder most of it off on him because I know he can do it thoroughly, and better than I.

I think there are several men here who could add substantially to our story, but who have not been called on. Mr. Rees was to have added something in regard to the interest of the Federal Power Commission in our set-up, inasmuch as they are engaged in making a comprehensive power market survey for the entire State, but he felt that, inasmuch as Mr. Lesher Wing could not be here, he had but little to add, for the reason that ground water was somewhat out of his field. He has taken advantage of his time here to confer with Mr. du Bravac who has been employed by the Colorado River Commission of Nevada especially to work on the power market survey, and he has, also, found time to confer with the Public Service Commission, also with Mr. Jay Carpenter of the State Bureau of Mines, so it is hardly likely he will get back in time to add anything to our meeting.

I note that Mr. Miller had something to say while I was called out of the meeting. He brought up the matter of the necessity of having a water analysis laboratory at the University of Nevada, or for the establishment of a branch of some one of the existing laboratories for the exclusive work of water analysis, which is growing in importance, and, in connection with this work, is of the greatest importance.

Do you have anything further to say on that, Mr. Miller?

MR. MILLER: I don't think there is anything I can add to it, at present, Mr. Smith. There's nothing that occurs to me right now.

Probably when I get home tonight I will think of a lot of things I could have said.

MR. SMITH: Would you suggest some procedure that might be taken by this group, or perhaps you already have?

MR. MILLER: I don't think it is a matter of procedure for the group. I think the Engineer's office could handle it by sending a representative over to meet with Mr. Gorman, President Moseley, Wayne Adams, and myself; and I think the thing can be laid out for use for your purpose. I think a suitable laboratory up there would be more comprehensive and suitable than the State Analytical Laboratory. There is no criticism of the State Analytical Laboratory, whatever. It is functioning well, within its limits, but now I think is the time to expand it. I think it can be expanded with a great deal of benefit.

MR. SMITH: We have here Carl Gelmstedt, Secretary of the Walker River Irrigation District these many years, and we would like to hear from Carl.

MR. GELMSTEDT: Mr. Smith and Gentlemen: I came to learn. I don't believe I have anything to offer that would be of interest to you. The importance of the comments of the representatives of these various agencies have been very interesting and instructive; and I deeply appreciate the invitation to be present.

MR. SMITH: Well, this will be the last call. We are yet early in the evening and if any of you gentlemen here would like to ask some more questions, propound a problem, or suggest something that will help us in our future procedure, now is the time to do it.

MR. H. W. LINDSEY: Mr. Smith, Gentlemen: My name is Lindsey from Winnemucca. I don't know if you will remember that, or not, but I have been very happy to attend this session today and see everybody so very interested in the development of the State. I can take back some information now I have been looking for. Thank you.

MR. SHAMBERGER: May I say, Mr. Lindsey, after the meeting we would like Senator Tallman and you to meet with Mr. Robinson and me for a few minutes, to arrange probably a future meeting either up there or later on today.

MR. LINDSEY: Thank you.

MR. SMITH: Anyone else?

MR. PETERSEN: I would like to make a suggestion, Mr. Smith, and that is that everybody has been asked for suggestions as to how you might improve the State program. Now I would like to see if the State Engineer's office has any suggestions as to how the agencies might improve their programs.

MR. SHAMBERGER: We will take that up next year, Mr. Petersen.

MR. SMITH: These meetings, you must know, you gentlemen who are experts in your particular lines, are a great aid to us. We gain our ideas and our hope of progress and good results from you people. That is why we don't want you to be bashful when you are at a meeting like this. Don't be modest or have any inhibitions; please get up on your two feet and tell us what we should do.

MR. PHOENIX: Mr. Smith.

MR. SMITH: Mr. Phoenix.

MR. PHOENIX: That's an invitation.

The chief handicap to all work in the State has been the lack of maps. I suggest something be done about that. I can't make any concrete suggestion, but I do know there are many incomplete maps and usable maps in the files of the various Government organizations throughout the State. Perhaps we do not have access to some of them, I would like to see a compilation of maps made in the State of Nevada so we can more easily pursue our work throughout the State.

We have been slowly compiling maps in our office, but I believe there are other compilations which we do not have and if there are we would certainly like to obtain them.

MR. SMITH: Thank you for the suggestion, Dave; and I think we all know we need a closer and more active coordination of the mapping program, and that you people would like to have maps to use in your work right now. We will see what we can do regarding your suggestion. We have already done something along that line, but our progress has been slow; perhaps we can do more.

MR. PHOENIX: It occurs to me, Mr. Smith, that is certainly the most basic thing we are dealing with and it seems to me the most important thing we have to contend with—this lack of maps throughout the State.

MR. SMITH: Yes, I agree with you, Mr. Phoenix.

MR. SHAMBERGER: You have in mind that all the Government agencies make an inventory of the maps they have in Nevada, as well as the State Engineer's office, the Highway Department, and have that information available so they know where to go to get maps?

MR. PHOENIX: Yes. As a matter of fact, this suggestion was brought up last year. It seems to me it would be advisable not only that maps be assembled, but also factual data that has been assembled, and put it in a common pool so it can be obtained, without too much delay, by the different agencies interested in obtaining the information, thinking more of geological data and its associated information, hydrological data, and soils information enumerated by the Soil Conservation in the forms of small reports. I realize it would be rather difficult, but it occurs to me we might be able to create some central point where you could go for information and find out quickly whether there is information in a given area where we are now or will be working.

MR. MORRISON: I suppose that Mr. Phoenix also refers to aerial photos.

MR. PHOENIX: Certainly.

MR. MORRISON: I know that is growing by leaps and bounds. If you look at a map of this region, aerial topography of the United States, this is certainly a white spot in the country. I know these rather small areas this summer where they are planning to have it done in many districts, by oil companies in one or two cases, and some by the Geological Survey and other Government bureaus.

MR. MAXEY: I don't know how much good it will do, but I would like to carry Dave's suggestion a little further on a little different line.

I don't know if it is possible or not, but I feel that Congress and some of our Government agencies should be apprized of the fact Nevada does not have many maps; and, not only that, but large sums of money could be saved by having mapping done. I know they have been apprized of the fact by other agencies, but this is just one more agency to add to the list. Possibly we could make some kind of resolution here. This conference might feel the need to make a resolution to suggest that more areas in Nevada be mapped.

I think it is vital to the operation of every agency concerned that they have good maps. The maps do not exist actually. They should be made.

And back in 1878 the Geological Survey was organized to map the United States in a period of fifty (50) years, I believe the law read, and the only reason they were not mapped was because the money was not appropriated. Probably the reason no money was appropriated was because there was no pressure put on it. I think if each organization adds its voice to the whole, eventually Congress will hear of a broader map program for this State.

Maybe I'm out of line, but after working along without a map you get rather radical.

MR. PETERSEN: Mr. Smith, I am wondering if there isn't one other step we might pursue farther in that line. There are quite a number of agencies working in this State in various localities. I am wondering if it would not be possible to get those agencies together and possibly by each contributing something, get a map made. Thinking particularly of our own problem, we plan this coming spring to make a rather detailed geological map for development of range purposes in the northeastern part of Nevada, northeast of Wells. We certainly would be willing to contribute considerable to get an adequate mapping of that area. There may be other agencies in the same position, maybe not in a position at this time to contribute toward the cost of mapping, but possibly in their future budget estimates or something of the sort. If they could be brought together and each of us contribute something it might be possible to get maps of the kind desired with not too much cost to any one agency.

MR. SMITH: I hardly think it is necessary, in view of our universal interest in this matter, to pass a resolution. We are all interested; and you can be assured that the Department of the State Engineer will do all it can to promote a better mapping program and get the data, and will communicate with the various agencies, and help with the work.

We greatly appreciate the sustained interest of our Congressman Charles Russell. He has listened most attentively to the various discussions here today.

We are wondering if you would like to comment, Congressman Russell, on our meeting, and if you would favor us, in closing.

CONGRESSMAN RUSSELL: Mr. Smith. I have come through about six weeks of somewhat similar meetings, starting out the latter part of

August, in which I visited, I believe, all the major dams and water projects of the Western States.

You know it is funny for a person who has lived and was reared in the State of Nevada to go back to the eastern coast where they have so much water they are trying to get rid of it instead of saving it.

Last spring I spent three days making a more or less complete coverage of the Tennessee Valley Authority Project where their problem is flood control and getting rid of the water. After going over that project and then coming West and seeing what has been done in other States, how water has been developed, land been reclaimed, has been intensely interesting to me; and then to follow through in Nevada where we realize the one source of water we have left and must utilize is the underground water.

Most other States have their large rivers. We followed the Snake River through Idaho, from its inception in the Jackson Hole country, followed it down, and the Columbia River, and the Sacramento River in California, and also followed for many miles the Colorado River and the dam development, and how the water could be used from that great river in the southern part.

I know that the storage of underground water has been tried in a number of places. I visited one place in Davis County, Utah, where floods in the upper reaches are being stored to be utilized in irrigating later, and in building up water tables.

This meeting has been very interesting to me. It is a phase we did not cover in any of the other States. I have listened with interest, and if there is any way I know that I can cooperate, or the two Nevada Senators, we will be very pleased to do so.

MR. SMITH: Thank you, Mr. Russell.

To go off on a slight tangent, there has been some discussion here and it comes up in various meetings, the fact that we have in this State a large number of hot springs; and, so far as I know, the tremendous amount of energy created by these hot springs is wasted. It may have occurred to some of you engineers, that in some manner we should take advantage of this energy now going to waste.

I have in mind one hot spring, absolutely a geyser in the southern end of Smoky Valley. It is pouring out thousands of gallons of water every day, boiling hot water. There are many others, such as Steamboat Springs near Reno. Probably a good many of such hot springs are not good for irrigation, but have a lot of heat energy, and they should be and, no doubt, sometime in the future, will be used for the heat they contain. It was freshly brought to my mind recently at a meeting of the Western States Engineers I attended in Boise. In that city there are a number of houses that have for many years been heated by waters from hot springs. They are free from the expense of heating with fuel. They not only utilize that hot water for heating, but for all other purposes hot water is used for. That is one example of what may be done with this resource where the water is free from chemicals or mineral ingredients that would render it deleterious.

I am wondering if anyone here has ideas as to how we might do something about that? Probably we are overlooking a substantial resource by passing it over and waiting too long for future development. Does anyone have anything to say on this topic.

Mr. Devore, water and power is right up your alley. Do you think there is any possible future utilization of Steamboat Springs, for example?

MR. DEVORE: Well, they tried out something along the lines of Steamboat Springs in Lake County, California, at some steel plant, but, as far as I know, the efforts were not very successful, probably due to the chemicals in the water they had to combat with. I have never heard the details, but anyway the plan was given up. I think the General Electric Company had something to do with that.

That does not mean, however, that somebody is not going to find, sometime, the answer to the puzzle. I think probably it is more in the chemical engineers' field than in the hydraulic.

MR. SMITH: What do you think about that Mr. Slattery?

MR. SLATTERY: I don't know. Klamath Falls, Oregon, has practically used some hot water from springs, but they are not contaminated with any minerals, no residue or anything like that.

MR. MASON: I believe, of course I am not an engineer, I believe there are some new developments in extraction of heat by investigating the same process used in chemical refrigeration, where the quality of the water would not affect its usefulness at all. You take the heat out of it and throw it away. Probably some of the engineers here are more familiar with that than I am.

MR. SMITH: I just threw this subject into the hopper while we had you men here, as something to think about. It is possible there's something here now going to waste that will be of great future value. We have many hot springs in Nevada.

I think Mr. Miller here has given thermal waters some attention. Have you any thought on that?

MR. MILLER: I think the extraction of the energy, in many cases, is from pretty large springs that put out a good deal of heat energy. Many of our mineral springs in this State would be negligible in other parts of the West. It's been said Lake County, California, has more springs than all of Europe. I don't doubt Nevada has more springs than Lake County, California, and there are very few medicinal resorts, rest cures, in this State. There might be some opportunity for the development of that. Of course that would be along Ed Walker's line, the Reno Chamber of Commerce, but, nevertheless, it would be utilization of the springs. And, of course, there is the old perennial outlet—put it up into bottles, and advertise it for medicine and get suckers to buy it.

MR. ROBINSON: Nevada has the second largest number of hot springs in the United States, topped only by California. That census was made about ten years ago, and it was not complete for Nevada at the time because I have found three or four hot springs not listed for Nevada. Nevada ranks second in the Union for hot springs.

MR. SMITH: Anything further?

If not, I declare our meeting adjourned; and wish to thank you all very much for coming here, and for your valuable contributions to this work.

(Adjourned at 4:35 o'clock p. m.)

CHAPTER XXII

COLORADO RIVER COMMISSION

Synopsis of Proceedings June 1, 1946, to May 31, 1948

FOREWORD

The past biennium was a period of great activity for this commission, whose acts have been of such importance and magnitude that it may be deemed advisable to publish the full detailed proceedings in a separate volume. For inclusion in the State Engineer's report we have prepared and submit herewith a brief statement of the most important proceedings. Lack of space forbids a more complete report, and in view of a probable forthcoming verbatim volume it is unnecessary.

Work on the commission as its secretary, and as a member of its engineering committee, has consumed much of the State Engineer's time, and has required considerable travel. During the last quarter of 1947 the commission authorized the secretary to employ an engineering assistant, but increasing work at Las Vegas and Henderson made it necessary to remove him to Henderson. Authority to employ another assistant has been obtained for the Carson City office.

The decision of the commission to take over the control and operation of the great Basic Magnesium Project at Henderson has necessarily resulted in a mass of new work and new responsibilities. The rapid growth of the Las Vegas area, with new development and calls for power have expanded our work. The 1947 Legislature ordered the preparation of a State-wide power market survey, by the commission, and it is now nearing completion, requiring much coordinated work with other State and Federal departments. The Legislature also authorized and instructed the commission to handle all matters covering the purchase and sale of power for use by the State from sources other than the Colorado River, making it in effect a Nevada Power Authority, without such official title.

These activities have increased the work of the State Engineer and his staff, particularly in view of the augmented volume of office routine and State water administration business, which is explained elsewhere. It has been suggested that the work of the commission be separated from work of the State Engineer, which would be more satisfactory to the State Engineer and his department, but this has not been favored by the Governor because of the long experience of the State Engineer in Colorado River water and power affairs. However, the official work has grown so rapidly that there is a necessity for increased personnel in both the commission and the office of the State Engineer which becomes more urgent daily.

In this chapter, I have included, in addition to major activities, copies of several legal agreements whereby the commission assumed the operation of Basic Magnesium Project, and the agreement under which certain California allottees supply power for the industries at Basic, during the three-year interim which must elapse before Basic

Magnesium Project can receive Nevada energy under the General Regulations governing the Boulder Canyon Project Adjustment Act. A number of reports ordered by the commission are also appended.

The commission wishes to gratefully acknowledge the use of the chambers of the Las Vegas City Council, and the offices of the Las Vegas Chamber of Commerce, for various meetings. We also thank the engineers of the Bureau of Reclamation, Regions Nos. 2 and 3, for helpful advice on many occasions, and the contribution of engineering and hydrological data. We also thank our Senators and our Congressman in Washington, who have been untiring and ceaseless in their sympathetic work upon the problems of the commission.

ALFRED MERRITT SMITH,
Secretary.

COLORADO RIVER COMMISSION MEETINGS

LAS VEGAS, NEVADA, JUNE 28, 1946

The provisions of a proposed contract between Edison Company and Defense Plant Corporation to supply demand energy for lessees at Basic Magnesium Project, were reviewed and agreed to as presented, with suggestions as to minor changes. Mr. H. H. Gillings was present at the meeting, representing J. H. Montgomery Company, operators of the Basic Magnesium Project for Reconstruction Finance Corporation, and he also had been employed by the commission as an advisory engineer. Gillings stated that he was leaving at once for Washington to confer with upper level War Assets Administration officials, and hoped to have the contract ready for execution by Edison Company on his return.

The State of Nevada and its Colorado River Commission were a party to the said proposed contract only to the extent of agreeing not to supply energy to the Basic Magnesium Project until the contract with Edison Company terminates in 1951. This contract was eventually executed and is in effect at the date this is written and under its terms energy is being supplied to all operators at Basic Magnesium Project. The full text of the contract is given at the end of this chapter as Appendix No. 1.

A proposal to establish an experimental farm for Clark County under the auspices of the State Department of Agriculture was considered. It had been suggested that the commission cooperate in such work, but no decision was made. An opinion prevailed among the members that probably the limited supply of water that could be pumped into Las Vegas Valley through the existing pumps and pipe line might as well or better be used for rapidly increasing municipal and suburban developments in and adjacent to Las Vegas, as a higher beneficial use.

LAS VEGAS, NEVADA, AUGUST 10, 1948

It was decided that conferences with the California allottees should be continued regarding additional generating capacity for Nevada, standby service, and equipment made idle by Nevada's energy withdrawals. The details of the City's proposal to generate and supply energy for Basic Magnesium Project are given in full by the City in the following letter:

WATER AND POWER
THE CITY OF LOS ANGELES
207 So. Broadway, Box 3669 Terminal Annex,
Los Angeles, 54

May 16, 1946.

HON. VAIL PITTMAN, *Governor of the State of Nevada, Carson City, Nevada.*

DEAR GOVERNOR: This is written in compliance with your request that I give you in brief the new basis formulated by the City of Los Angeles and Southern California Edison Company for furnishing, after May 31, 1946, electrical energy for use at Basic Magnesium plant. Since the last meeting relative to this matter further study has been given to the possibility of fixing the rate for the energy, exclusive of the demand charge, at 2¼ mills per kilowatt-hour, as suggested by you. The new formula arrived at by the City and Edison Company results in a kilowatt-hour rate for the energy approximately equal to that suggested by you so long as the Boulder Firm rate does not increase substantially and the cost of fuel oil is the same as it was at the time you made the suggestion, namely, $1.10 per barrel.

You will recall that the original rate suggested by the City and Edison Company, exclusive of the demand charge, was 2½ mills per kilowatt-hour, and provision was made in the proposal for an incremental fuel charge of two-tenths of a mill per kilowatt-hour for every 10 cents per barrel increase in the cost of fuel, such incremental fuel cost to be applied to one-half the energy being supplied.

The new formula, briefly stated, is as follows:

1. During such years as there shall be available to the Boulder allottees at the Boulder project under the General Regulations, by declaration of the Integrating committee, or otherwise, energy in the amount of 5,750,000,000 kilowatt-hours or more, the rate per kilowatt-hour to the State of Nevada for the energy supplied shall be the then Boulder firm energy rate plus one mill.

NOTE—Our studies have indicated that during a normal Boulder water year, making available 5,750,000,000 kilowatt-hours of energy, probably all the energy for Nevada will not be generated by steam.

2. During such years as there shall be available to the Boulder allottees at the Boulder Project under the General Regulations, declaration of the Integrating Committee, or otherwise, less than 5,750,000,000 kilowatt-hours of energy, the rate per kilowatt-hour for energy supplied to Nevada shall be an amount equal to the aggregate of the then Boulder firm rate, one mill, an incremental fuel charge at the rate of one-tenth of a mill for each 10 cents per barrel increase in the cost of fuel oil above $1.10 per barrel up to a per barrel cost of $1.25, and an incremental fuel charge at the rate of two-tenths of a mill for each increase of 10 cents per barrel in the cost of fuel oil above $1.25.

NOTE—This provision is designed to cover increases or decreases in the cost of energy generated by steam plants in Los Angeles as affected by increases or decreases in the price of fuel oil. The significance of the one-tenth of a mill incremental fuel charge between the fuel cost of $1.10 and $1.25 per barrel is that the California agencies will apply the proposed two-tenths of a mill incremental fuel cost to one-half of the energy supplied while the fuel cost is less than $1.25 per barrel.

You will note that the application of the formula set forth in the two numbered paragraphs above, with the present Boulder firm rate, results in a per kilowatt-hour charge to Nevada of 2.244 mills so long as the cost of fuel oil is not in excess of $1.10 per barrel, and such a rate also prevails, irrespective of the cost of fuel oil, during normal water years at Boulder when 5,750,000,000 kilowatt-hours of energy, or more, are available. However, under low water conditions at Boulder when less than 5,750,000,000 kilowatt-hours of energy are available, and the price of oil increases above $1.10 per barrel, the per kilowatt-hour charge to Nevada increases at the rate of one-tenth of a mill for each 10 cents increase between $1.10 and $1.25 per barrel for fuel oil, and at the rate of two-tenths of a mill for each 10 cents per barrel increase in fuel oil cost over $1.25 per barrel. Under this formula the rate to Nevada per kilowatt-hour will be, if the present Boulder firm rate is in effect and the price of fuel oil is $1.25 per barrel, 1.244 mills (the present Boulder firm rate) plus one mill, plus 15-hundredths of a mill, or 2.394 mills per kilowatt-hour. If, however, the price of fuel oil should go to $1.35 per barrel and the present Boulder firm rate is in effect, then the kilowatt-hour rate to Nevada would be 1.244 mills, plus one mill, plus 15-hundredths of a mill, plus two-tenths of a mill, or 2.594 mills per kilowatt-hour.

Besides the formula for arriving at the per kilowatt-hour charge for the energy, the City and Edison Company have likewise agreed that the contract, when and if consummated, should provide:

(1) In addition to the energy charge, Nevada to pay monthly 50 cents for each kilowatt of 30-minute maximum demand created by Nevada for Basic Magnesium Project up to 35,000 kilowatts, with a minimum monthly payment of $12,500 and a monthly charge of $1 per kilowatt for demands in excess of 35,000 kilowatts if created by Nevada, with no obligation on the part of the City or Edison Company to supply such excess demands;

(2) A weighted average monthly power factor of 85 percent;

(3) A term of five years with Nevada having the right to terminate after three years, with six months' notice;

(4) Nevada to agree not to withdraw energy from the Boulder Project for use at Basic Magnesium Plant during the five-year period from June 1, 1946;

(5) Both the City and Edison Company to have the right to reduce or discontinue service to the State of Nevada without penalty to the extent that it may be necessary to maintain service to the consumers of either of them.

I trust that the above, which should be regarded not as a proposal to Nevada but as a suggested basis for negotiations, provides a plan upon which an agreement mutually satisfactory to all concerned may be worked out.

Sincerely,

SAMUEL B. MORRIS,
General Manager and Chief Engineer.

The "oil escalator" clause in this proposal was subject to much subsequent study and discussion, but was eventually agreed to with minor changes, at a later date, and after further conferences with the City.

A desire was expressed by the commission to know more of the status

of J. M. Montgomery Company and its operations at Basic Magnesium Plant, and to obtain copies of their agreements with lessees operating at the former magnesium plant. A committee was appointed by Chairman Pittman for this purpose.

This committee learned and reported that J. M. Montgomery Company was a reliable company and its operations at Basic Magnesium Plant had been reasonably satisfactory.

The advisability of Nevada remaining on the Committee of Colorado River Basin States as it had been reorganized at Salt Lake City on July 29, 1946, following the withdrawal of California from the Committees of Fourteen and Sixteen of the Colorado River Basin States, was carefully considered. It was the opinion of the chairman, concurred in by all members that Nevada had nothing to contribute or to gain by continuing as a member of the reorganized committee, and would be in a weak position as a downstream State without the support of California. Furthermore, Nevada was in agreement with California on the controversy over the volume of water to be delivered to Mexico from the Colorado River which had resulted in the split and demise of the Committees of Fourteen and Sixteen, long representative of the Colorado River Basin States. The commission decided that the Committee of Fourteen in this very important treaty legislation had represented neither the established water users, nor U. S. water rights upon the Colorado River system, and had defeated the desires and damaged the rights of said United States water users by urging and securing a firm allocation and delivery of excessive water to Mexico by international treaty. The commission had given active assistance to the newly organized Colorado River Water Users Association, which had vigorously opposed the Mexican water treaty prior to its ratification by the U. S. Senate.

A motion was passed that Nevada, as represented by the Commission, withdraw from the Colorado River Basin States Committee. The commission voted to supply $100 from its funds to assist in publishing the transcript of proceedings of the second annual meeting of the Colorado River Water Users Association at Salt Lake City held on February 11, 12, and 13, 1946.

CARSON CITY, NEVADA, SEPTEMBER 24, 1946

This meeting was called to act upon an application to the Bureau of Reclamation for withdrawal of an additional 23,000,000 kilowatt-hours of energy annually from Boulder Dam Plant, to be designated Withdrawal No. 15. The order was to supply a request for 20,000,000 kilowatt-hours by Southern Nevada Power Company at a demand of 875 horsepower, and 3,000,000 by Lincoln County Power District No. 1 at no additional horsepower, that district having previously had sufficient generating capacity allocated to meet its additional withdrawal in kilowatt-hours. The application was approved.

LAS VEGAS, NEVADA, OCTOBER 24, 1946

The commission voted to request Attorney General Alan Bible to draw up the form of legislation that would give the commission authority to order and install a generator and necessary additional machinery at Boulder Dam power plant.

In response to a former request by the commission, A. J. Shaver had written and published in various Nevada newspapers a series of interesting and instructive articles describing the chemical manufacturing industries located at Basic Magnesium Project. The commission ordered that these articles be combined and published in pamphlet form. The order was carried out and the pamphlet was given wide distribution throughout the State.

Favorable comment was made upon the Compiled Reports of the Colorado River Commission, September 1, 1935, to June 1, 1946. Attorney General Bible suggested that all members of the Legislature be supplied with copies of the 276-page report which had been prepared and published by the Secretary.

The status of a request by Nevada for an allocation of power from Davis Dam upon its completion was considered. The commission had formally requested of the Bureau of Reclamation, an allotment of 45,000 kilowatts of capacity (being one of the five generators to be installed) or 200,000,000 kilowatt-hours annually. The request had been acknowledged by the Bureau, and it was believed that by this order Nevada had established equal priority on the output of Davis with Arizona and California. The allocation and sale of power from Davis Dam is under entirely different law than that governing Boulder Dam. Power allotted from Davis must be taken at once when made available, otherwise it will be sold to other applicants by contract. Power for Nevada from Boulder Dam, up to 17.6259%, is allotted to Nevada in perpetuity, subject to regulations regarding withdrawal, and installation of generating machinery by the State.

Subsequently the commission increased its order to one-third of the total energy to be developed at Davis. On June 3, 1948, the allocations were fixed by the Department of the Interior, by which Nevada will receive one-fourth of the total energy to be generated. It is anticipated that the dam and power plant will be completed sometime in 1950. The power allocations and an analysis of the same are given in Appendix No. 10.

At this meeting of the commission in 1946, trading Davis power for Boulder power was considered quite possible, which would make its use more flexible for Nevada. That possibility appears to still be open.

A difference of opinion amounting to a minor controversy had arisen with California allottees concerning Nevada withdrawals of energy under the government regulations. Nevada's contracted generating capacity, limited to 44,000 kilowatts on the City of Los Angeles' generators A-1 and A-2 was being very rapidly used up, and as yet no new capacity had been applied for or was in sight for the reasons that (a) Nevada was unable under the State law to financially obligate the State for new machinery, and (b) three years are required to install a generator, and the present power demand had developed so rapidly that it had created an emergency. The Bureau of Reclamation could no longer supply energy to Nevada for use at Basic Magnesium Project, as it had during the war, at which time waivers on notice of withdrawals by Nevada were granted by all other allottees. Hence, the necessity of conserving present generating capacity in the face of growing demands upon it, as well as obtaining energy for lessees at Basic Magnesium Project became urgent.

Power Company had requested the commission to look into this. Transmission from Boulder by way of existing line to Pioche from thence on to Ely and Eureka was gone into and reports of examinations the commission's engineer had made were quoted. One investigation had been made by the Nevada Farm Bureau, desirous of rural electrification in remote districts. It was clearly evident that the expense of such long lines and service would be too excessive to be justifiable under present conditions.

HENDERSON, NEVADA, DECEMBER 12–13, 1946

By arrangement this meeting was held with representatives of Reconstruction Finance Corporation, War Assets Administration, J. M. Montgomery Company, and Guy F. Atkinson Co., in order to clarify to the commission the status of Basic Magnesium Project.

By motion passed at a meeting of the commission at Carson City, February 4, 1947, this record is made a part of the minutes of the meeting of December 11, 1946.

The Reconstruction Finance Corporation representative explained that Reconstruction Finance Corporation was turning over the operation and liabilities of the Basic plant to War Assets Administration. He stated that there had been rumors of various and varying text regarding the plant and that they wanted to spike any of these rumors and tell our group the whole story. The speaker stated: "We are here to answer your questions and to let you know what is going on."

He stated that the Reconstruction Finance Corporation has relinquished properties as "disposal agency" and Reconstruction Finance Corporation is now transferring these various properties to War Assets Administration with recommendation that they be disposed of, or operated, as they suggest—this recommendation of operating the properties being particularly applicable to the Basic properties.

He stated that Basic Magnesium Project had been declared surplus to war needs in 1945, but that War Assets Administration was not ready at that time to pick this property up and run it, so Reconstruction Finance Corporation decided to make a "multitenancy" unit at Basic Magnesium Project with J. M. Montgomery Company as their agent, to secure leases, arrange for rentals, power supply and all facilities and utilities necessary to keep the project going as an abovementioned "multitenancy" operation.

War Assets Administration had been vested with the authority to continue the operations at Basic. After 1945, Reconstruction Finance Corporation was to continue to operate until such time as War Assets Administration could take charge of the operations, which is the present time. The transfer of these properties will be made as of February 1, 1947, with the Guy F. Atkinson Company then acting as agent for War Assets Administration.

Reconstruction Finance Corporation will retain J. M. Montgomery Company after February 1, long enough to complete inventories, etc.

In arranging for the transfer from Reconstruction Finance Corporation to War Assets Administration, the Reconstruction Finance Corporation called for bids for operation of the facilities, and the successful bidder was the Guy F. Atkinson Company.

Governor Pittman stated that he and the commission were gratified to know that War Assets Administration would continue to operate

the site, and that every attempt would be made to keep the industries going at Henderson.

Leases—It was stated that no lessees at the plant at present had a signed lease, with one small exception. All others have Letters of Intent. The Stauffer Company has such letter, but a long-term lease is being drawn up which provides for allocation of profits, etc.—this to be done after a full year of operation through which figures may be available on costs, operations, etc. It is expected that this lease will be signed shortly. Others are being worked on. No lease will be for less than five years, with option of renewal.

The Governor asked, "Where is the proposed agreement with Edison Company under which power was to be supplied to the Basic enterprise?" Sullivan stated that he did not believe the contract was yet signed by War Assets Administration. He stated that the Washington office said that the agreement was being sent to the San Francisco office for further handling. Gillings stated that the allottees had not yet signed the agreement as it had not been sent out by the War Assets Administration from their Washington office. Gillings further stated that he thought the allottees would want some arrangement made on the use of N-7 before they would sign the proposed contract, and believed the agreement on N-7 would be separate and apart from this agreement concerning energy. He stated that he thought they had an understanding on the use of N-7 but a signed agreement must be entered into before allottees would sign. Sullivan said this was a complicated problem, and had been handled by Mr. Marshall of the War Assets Administration.

Mr. Gillings stated that after the 13th of this month he would no longer be general manager for the Montgomery Company at Henderson. Mr. Hancock will take over the duties on that date formerly held by Gillings.

Governor Pittman stated that he felt the War Assets Administration should sign the agreement immediately and get the allottees to sign in order to have a feeling of security for this commission and for the public on this problem which so vitally affects Henderson and the Basic Magnesium Project.

The Governor then asked what assurance could the War Assets Administration give that this agreement would be signed. Mr. Walter Sullivan stated that he would call Washington, D. C. and would let the Governor know Friday morning before he (the Governor) left for Carson City by plane.

On December 13, 1946 a Conference Was Held at El Cortez Hotel, Las Vegas, Nevada, at the Request of the Governor

At this meeting, which Senator McCarran attended, and which had been called at the Senator's request, Mr. Walter Sullivan, Regional Director, War Assets Administration, stated that he had talked with Washington officials, and that Mr. Marshall, director in charge, of the War Assets Administration, would be out to Henderson the following week with the agreement under which Edison Company would supply War Assets Administration with power. Mr. Marshall would then continue on to Los Angeles to obtain signatures of the allottees. The Governor was to be notified, so that he could have representatives of

the commission at Henderson to confer further with Mr. Marshall when he arrived.

Senator McCarran outlined a plan he had been working on whereby he hoped the State could take over Basic Magnesium Project without cost. He briefed various discussions he had had with the Federal departments, and suggested a procedure for the commission. This was the first in a series of steps which led to the State assuming ownership and control of Basic Magnesium Project on May 1, 1948.

CARSON CITY, NEVADA, JANUARY 17, 1947

This meeting was called to vote on an application for more energy by Southern Nevada Power Company, which had requested an additional 25,000,000 kilowatt-hours per year at a maximum demand of 3,830 horsepower. The request was granted, and an application to the Secretary of the Interior for this energy was submitted by the commission, designated Withdrawal No. 16.

LOS ANGELES, CALIFORNIA, JANUARY 21, 1947

Honorable J. A. Krug, Secretary of the Interior, by letter addressed to Governor Pittman had asked that a conference be arranged between representatives of the Boulder Canyon Project allottees and the Bureau of Reclamation to consider certain modifications of the existing system for administration of Colorado River power, particularly with respect to the Boulder Canyon Project. The subjects he wished to bring up were:

(a) Full integration of Boulder Power Plant with any and all sources of power on the Colorado River so as to permit the Bureau of Reclamation to supply power to satisfy present Boulder contracts from any source it might have available.

(b) Assumption of complete operation of the Boulder Power Plant directly by the Bureau of Reclamation to facilitate full integration and to effect the reduction of personnel and other economies possible through such operation.

(c) Establishment of a definite rate for power delivered to allottees at Boulder and the elimination of any further interest of such allottees in the operating costs of the project.

Opportunity would also be afforded for a discussion of the possibility of a lower rate of interest for the Boulder Canyon Project.

Commissioner Michael Straus of the Bureau of Reclamation had written each allottee of power from Boulder Dam plant suggesting that this conference be scheduled for January 21, 1947 in Los Angeles. This was agreed to and the conference was held in the directors' room of the Metropolitan Water District Building. It was well attended by one or more representatives from each of the interested organizations. The Secretary of the Interior was represented by H. F. McPhail, Chief of Power Utilization, Bureau of Reclamation, and also by other Bureau of Reclamation officials.

The Secretary's proposals were for the most part received in silence. All present said the proposals were entirely new, and none were ready to discuss them. In general, the reaction was negative on the part of all California allottees, with Arizona and Nevada neutral. One direc-

tor of Metropolitan Water District said the proposal seems to contemplate a Colorado River "TVA," and did not think it had enough merit to warrant serious consideration.

It was decided to have the group convene again at some later date after some concrete plan had been worked out and presented by the Bureau. E. A. Moritz, Regional Director of Region No. 3, who had arranged the conference at the request of the Secretary of the Interior, thanked the group for attending, especially before a definite proposal had been worked out for their consideration. It was the opinion of the Nevada group that the meeting was in the nature of a "trial balloon" to obtain the allottees reaction to the Secretary's desires with respect to the Boulder Project as well as future Colorado River power development. To date, nothing further has been heard of the proposal.

CARSON CITY, NEVADA, FEBRUARY 4, 5, 1947

The advisability of a State-wide power market survey was debated. One member said he favored the commission conducting such a survey so far as it affected the field to which Boulder power could be transmitted. It was decided to have a report on the subject made at the next meeting by engineers Shaver and Compton. State Senator C. D. Baker who was present, suggested that an Act to cover the survey be presented to the Legislature, and that an engineer's estimate of the cost would be of value in securing an appropriation for the work.

The 1947 session of the Legislature thereafter passed an Act directing the Colorado River Commission to make a State-wide power survey, and appropriated $5,000 toward the expense thereof. The survey is being made by the Federal Power Commission in cooperation with the State Engineer and the Colorado River Commission, and it is contemplated that it will be completed and published in November 1948. Following is the text of the law under which the survey is being made:

Page 82, Chap. 53—*An Act authorizing the Colorado River Commission of Nevada to make a state-wide power survey, defining its duties in connection therewith, and providing an appropriation therefor.*

(Approved March 15, 1947)

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Colorado River Commission of Nevada is hereby authorized, empowered, and directed to make a state-wide power survey, to collect and arrange all data and information pertaining to the development and use of power from all sources, and to determine the economic feasibility of the extension of power to the various mining, industrial, and agricultural areas of the state. The commission is further empowered to cooperate with federal, state, and private agencies and, if deemed advisable, it is specifically authorized to contract and enter into agreements with such agencies for the purpose of conducting the necessary comprehensive state-wide power survey.

SEC. 2. The commission shall have the power to employ such engineers and technical experts as it may find necessary to carry into effect the purposes of this act. The commission shall fix the salaries of said

employees, and in addition to their compensation they shall be entitled to mileage and per diem at the statutory state rate. Upon completion of said survey, the commission shall cause to be filed with the secretary of the commission, in its office at Carson City, Nevada, the written findings and recommendations of the study made hereunder. Such written report shall be given as wide publicity as possible and shall, at all times, be open to the inspection of the public.

SEC. 3. Power conferred by this act are in addition to the present powers and duties imposed upon the commission.

SEC. 4. For the purpose of carrying out the provisions of this act, there is hereby appropriated out of the general funds of the state treasury, not otherwise appropriated, the sum of five thousand ($5,000) dollars to be expended by the said commission on or before June 30, 1949.

SEC. 5. This act shall be effective from and after its passage and approval.

At this meeting progress toward stabilizing industries at Basic Magnesium Project was reviewed and Senator McCarran's work on his proposal that the State assume control for a time until the project could be absorbed by private interest was favorably discussed, and the next measures for that purpose were decided upon. Realizing that at this date the State could only take over the vast project if it were first underwritten by private interests, the commission arranged for talks and correspondence with some of the present lessees at Basic, some of whom had already been approached.

Some members of the Legislature, which was in session at the time, were present. Clifford Jones, Lieutenant Governor, stated that legislation should be passed without delay to enable the commission to act in regard to assuming control of Basic Magnesium Project.

A copy of a letter addressed to President Truman by Senator McCarran was read, as follows:

January 30, 1947.

THE HONORABLE HARRY S. TRUMAN, *President of the United States, The White House, Washington, D. C.*

MY DEAR MR. PRESIDENT: With reference to the subject of our discussion at the Executive Office this morning, and which you said you would probably submit to Mr. Steelman, I would like to reiterate some of my suggestions made to you this morning and expand somewhat on them.

From the notes that I left with you this morning it can be readily seen that there is great confusion as to the present or future status of the Basic Magnesium Plant, so-called, located at Henderson, Nevada.

Six industrial organizations now occupy space in the plant and are actively operating. These six are named in the notes that I left with you this morning.

These industrial organizations have no agreement as to tenure or leasehold. They occupy entirely under a Letter of Intention issued by the Reconstruction Finance Corporation and there exists in the War Assets Administration no authority to issue such letter or instrument.

As stated in the notes left with you this morning, the industrial

organizations that occupy part of the plant have invested large sums of money and each of them, as I am advised, contemplate the investment of additional sums of money to carry on and expand their industrial activities at the plant. These private concerns are much perplexed and appear to be rather in bewilderment as to what their present or future status may be.

I am reliably advised, by reason of many months of personal attention to this plant, that within a very short time the entire plant could be leased out to private industry of various kinds if the policy was established for continuation, and if private interests could know that they were secure in their investment. This plant is being run now at a serious loss to the Government. In my judgment, it could be run in a way to meet all of its expenses and to bring in a profit to some agency having the right to establish policy, fix tenures, issue leases, and curtail expenses.

I find that the Reconstruction Finance Corporation, which now really controls the plant, has no policy for the future. I find that the War Assets Administration which appears to have a tentative control of the plant, or perhaps it might be termed a dual control with the Reconstruction Finance Corporation, has no policy for the future.

The War Assets Administration makes known to the public that it is not an agency to carry on or to build, but it is rather an agency to dispose of or destroy. These latter expressions naturally cause considerable turmoil in the minds of those who wish to invest large sums of money to occupy the plant for industrial purposes.

I have discussed with Governor Pittman and members of the Colorado River Commission of the State of Nevada, the plan and feasibility of utilizing the priority that rests in the State of Nevada, to take over this entire plant if, as, and when we can induce the Government, acting through its agencies (Reconstruction Finance Corporation, War Assets Administration, Bureau of the Budget) to announce their readiness or establish their policy to dispose of the plant, giving priority where it properly rests.

In order to bring about the establishment of a policy and in order to set at ease the unhappy situation that prevails at Basic Magnesium, as is indicated in the notes that I left with you this morning, I respectfully suggest as follows: That Reconstruction Finance Corporation designate one or two of its members with authority to speak for the Corporation, that War Assets Administration designate some of its organization with authority to speak for that Administration, and that the Bureau of the Budget designate one or more persons from the Bureau to speak for the Bureau, and that in each instance the representatives of the respective governmental agencies be clothed with the authority to formulate policy.

I further suggest that these designated officials meet at a specified time in the very near future, at Henderson, Nevada, with representatives of the Legislature of the State of Nevada now in session, the Governor of the State of Nevada, and such officials of the State of Nevada as the Governor may designate, at which time and place I would hope to present to them and to discuss with them a plan or policy for the State of Nevada, exercising its priority, to take over the

entire Basic Magnesium plant together with all domestic water facilities, power facilities, and housing facilities connected therewith.

As I stated to you this morning, I am most anxious to encourage and promote industry at the site of this great plant and I feel certain that we can accomplish this result if the burden is not made too great on the State of Nevada and if a definite policy is established for future use of the plant by the State of Nevada, taking over the same under its priority.

I believe that such a meeting as I have suggested, on the location of this property, will readily show the need for immediate action of some nature. I am convinced that as the matter now stands the potential value of this great plant is being seriously impaired by disposal of component parts which are essentially necessary to the operation of any industry which might acquire the same for the purpose of continued operation.

I know of no agency or department of the Government other than the ones referred to above, which might have an interest in the matter or have authority to act in the matter. However, if there are such, I assure you that it has been an oversight on my part not to have mentioned the same, and I respectfully suggest that such agency which I may have overlooked, be also represented at the meeting.

Inasmuch as I understood that this matter would be referred by you to Mr. Steelman for consideration, may I respectfully suggest that you likewise refer this letter to him?

I am grateful for your kind expression of concern in this matter and for the opportunity given me to discuss these problems with you today.

Very respectfully,

PAT MCCARRAN.

The secretary was instructed to write to the Nevada Congressional delegation urging them to sponsor and try to obtain enactment of legislation for payment of revenue to Nevada in lieu of taxes at Davis Dam, similar to that in effect at Boulder Dam. This was done and Senator McCarran prepared and presented appropriate legislation in December 1947, but it met with too strong opposition, and was not successful.

The secretary was ordered to write the Nevada Congressional delegation and urge on behalf of the Commission that the appropriation to carry on work at Davis Dam include funds for the construction of a power transmission line from Davis Dam to Boulder Dam.

The Commission at this meeting amended its former request for Davis Dam energy, increasing the order to one-third of the total plant output. As formerly stated, Nevada was eventually granted one-fourth of the total Davis power, to be taken and used when made available.

CARSON CITY, NEVADA, MARCH 28, 1947

Present by invitation were representatives of the power division of Region No. II, U. S. Bureau of Reclamation, to discuss Nevada's interest in Shasta Dam power, also H. F. McPhail, Director, Branch of Power Utilization, Bureau of Reclamation. McPhail's presence was due to the following letter from the Secretary:

COLORADO RIVER COMMISSION OF NEVADA

CARSON CITY, NEVADA, May 13, 1947.

HARVEY F. MCPHAIL, *Director, Branch of Power Utilization, 2900 Thirtieth Street, S. E., Washington, D. C.*

DEAR MR. MCPHAIL: Some complications have developed in regard to supplying Sierra Pacific Power Company with energy from Shasta Dam power plant for northern Nevada.

We have recently been informed that energy generated at Shasta Dam power plant may not be transmitted and used outside the State of California. This of course would stop consideration of our getting power for Nevada from there, unless by exchange with Boulder Dam or Davis Dam. Will you kindly advise if this is correct?

Mr. George Devore, Assistant Manager of Sierra Pacific Power Company, informs me that his company has a contract with Pacific Gas and Electric Company of California to purchase firm energy to the extent of a minimum of $75,000 per year, plus $30,000 a year for stand-by service. This is approximately 50 percent of all energy presently sold by the Sierra Pacific Power Co. It is being supplied under a 20-year contract, which will not expire for another ten years.

The ability of Sierra Pacific Power Company to serve customers depends upon this contract. Mr. Devore states that P. G. & E. Company, in order to meet its increasing obligations, is installing a heavier copper transmission line from their Drumm Station to Donner Summit. Sierra Pacific Company is likewise now installing a heavy copper line from Truckee to Donner Summit.

If Nevada should now request a block of energy from Shasta Dam for delivery to Sierra Pacific Company at Shasta Dam switchboard, a new contract would have to be negotiated between P. G. & E. and S. P. P. Companies for use of the P. G. & E. transmission facilities, which might not be favorable to S. P. P. Co., or perhaps be impossible to work out if P. G. & E. Company should object. It might develop that the over-all price of energy to S. P. P. Co., would be no lower than now, and lower rates to the consumers could not therefore be fairly made. Reduced rates to the consumer is one of our objectives.

If power from Shasta Dam should prove to be uneconomical and impractical, can we consider delivering power from either Boulder or Davis Dam by exchange through the California transmission grid system as at first suggested? The Colorado River Commission of Nevada anticipates immediately requesting the installation of a major unit generator at Boulder Dam. Sierra Pacific Power Company's present contracts with P. G. & E. Company may take care of its needs until one, or both, of these Nevada sources of Colorado River energy becomes available. We would like for you to analyze this situation before we embark on a program that might result in no cheaper energy for northern Nevada.

We will appreciate your writing to us on this subject.

Very truly yours,

ALFRED MERRITT SMITH,

Secretary.

cc: Members Colorado River Commission.
Attorney General Alan Bible.

Representatives of the U. S. Mining, Smelting, and Refining Company were present and tentatively stated their power and plant needs and a desire to operate a branch plant at Basic Magnesium Project if conditions were favorable. Their preliminary power requirement would be 15,000 kw., expanding to 20,000 kw. The company was interested in the State's procedure of selling power at cost. They agreed to look into the situation again a few months later, but until this time, August 1948, nothing further has developed.

LAS VEGAS, NEVADA, APRIL 9, 1947

The chairman, Governor Pittman, presented letters written by Senator McCarran to General R. H. Littlejohn, Administrator, War Assets Administration, and to John R. Steelman, Assistant to the President, and the replies received by the Senator from these men were read and commented upon. The correspondence was in regard to the desire of Nevada to preserve the Basic Magnesium Plant and to take control of the same if a satisfactory plan could be worked out.

At the time of this meeting it seemed that no definite plan or proposal had yet been developed in response to Senator McCarran's request, and it appeared that probably Nevada would be placed in the same category as other bidders for the project or for parts of it, but with a priority as a public municipality, although a guarantee might be required that the property would not be disposed of for monopolistic purposes.

Commissioner Mueller was authorized to investigate all phases of the Basic Magnesium Plant sale or salvage proposal and if necessary go to Washington, D. C. for personal conferences with War Assets Administration officers and others, the contacts to be arranged by Senator McCarran. Commissioner Smith and Engineer Advisors Shaver and Compton were designated to assist Mueller in Nevada.

Compton on behalf of Southern Nevada Power Company requested that his company be allowed to purchase from War Assets Administration the north transmission line of two lines extending from Boulder to Basic. The request was left to Mueller for further examination. Discussion indicated rejection of the request, as a Federal order freezing Basic Magnesium Project plant was being contemplated pending the negotiations for a take-over of the entire plant by the State.

LAS VEGAS, NEVADA, MAY 15, 16, 1947

Commissioner Mueller had returned from Washington and reported upon his work looking to acquisition of Basic Magnesium Project by Nevada. The delay in Washington in getting out the Edison—War Assets Administration Interim Contract for Basic Magnesium Project energy had been due to an objection by War Assets Administration to the oil escalator clause. (See contract, Appendix No. 1.)

He said Hon. John R. Steelman, Assistant to the President, and also others in official authority, wished to make a plan under which Nevada could take over the Basic Magnesium Project. The War Assets Administration was anxious to have the State take the operation in charge for it had been running heavily in the red since the time the government ceased manufacturing magnesium metal. Mueller had been given authority to examine the War Assets Administration accounts.

Robt. E. Hunnicutt, Asst. Administrator, War Assets Administration, had come out to Henderson from Washington to look into the affairs and to assist Nevada in its work to hold the complete project intact. Mueller was positive in stating that the State should be able to operate Basic Magnesium Project at a profit, although Reconstruction Finance Corporation and War Assets Administration had been continuously operating at a heavy loss.

There was much discussion concerning availability of Boulder power, both for the State's present contractors, as well as for Basic Magnesium Project in the future. During the war a major unit 82,500 kw. generator had been installed by Reconstruction Finance Corporation to generate additional power for the manufacture of magnesium metal at Basic. A contract had been made whereby the Metropolitan Water District of Southern California could take over this generator and its appurtenant transformers and switching machinery (designated as Secs. G-7 and T-7, the generator alone as N-7) by giving two years advance notice, also, that the District must take over the generator in 1966. At the end of the war and shut-down of the magnesium plant, War Assets Administration was left with this generating machinery, upon which it had to pay the annual charges, amounting to some $325,000. To get relief from this financial burden War Assets Administration had leased N-7 to Edison Company until June 30, 1951. Edison and the City had for some time previously been endeavoring to arrive at an agreement with War Assets Administration to use N-7. Nevada also wanted N-7 if it could be freed from restrictions, for three main reasons: First, the amortization costs were definitely fixed, and probably lower than what they would be on a new generator if it should be installed by the State, due to rising prices. Second, the generator would be available on July 1, 1951, while it might take a year longer to install a new generator. Third, the costs on the generator being known, an accurate energy rate could be quoted to Nevada contractors.

Objectionable features to the State taking N-7 were: First, Metropolitan Water District might recall it on two years notice, which would not give the State time in which to install another generator, at least three years being necessary. Second, in any event Metropolitan Water District's contract required it to take over N-7 for its own use in 1966, at which time the State must have another generator or a contract for generating capacity on machines installed for the use of other allottees.

Eventually, in 1948, Metropolitan Water District agreed to give the State four years advance notice prior to taking over N-7, but stated at a conference, that so far as they could foresee, they would definitely require N-7 generator in 1966. Meanwhile, the commission ordered 82,500 kw. of additional generating capacity from the Bureau of Reclamation but did not order the installation of a generator, or at this time request the allocation of N-7 in 1951.

There was much discussion at this meeting as to whether or not the commission should provide for stand-by service before requesting additional generating capacity but no action was taken.

Compton, speaking for Southern Nevada Power Company, then submitted a proposal of great interest. He stated that his company would

underwrite the installation of a half-size generating unit, 45,000 kw. under certain conditions, outlined as follows:

Southern Nevada Power Company would pay $15,000 per month in advance and in excess of its energy bills to the commission for a period of four years, which would total $720,000. In return they asked that their present public power rates be undisturbed for the four-year period, by the Public Service Commission, until after the machinery had been installed and was in operation. They would also agree to hold in reserve certain capacity for Lincoln County Power District and Overton Power District.

Compton was informed by Chairman Pittman that the Colorado River Commission could not and would not use any pressure or influence upon the Public Service Commission with respect to public power rates. Compton's proposal was received with considerable favorable comment, although the advisability of the commission "paddling its own canoe" with respect to getting a generator was not lost sight of. Inclination to look with favor on Southern Nevada Power Company's proposal was in part due to the fact that under the State Constitution the commission could not assume the financial obligation to pay for a generator without first having resale contracts for energy in amount equivalent to the obligation to pay for such machinery.

Eventually, on May 6, 1948, a contract between the commission and Southern Nevada Power Company was agreed to and executed, but having various additions and changes from what had been originally proposed by the power company. This contract represented an obligation to underwrite a full unit, N-7, but reserving 31,000 kw. to Southern Nevada Power Company, and 14,000 kw. to Lincoln County District and Overton District. The contract is designed as Appendix No. 2, at the end of this chapter.

On May 16 the commission again convened to hear Senator McCarran. The Senator complimented Commissioner Mueller on the work he had done in Washington with War Assets Administration, looking toward Nevada's control of Basic Magnesium Project. He said they had learned that War Assets Administration was running behind at an enormous rate at Basic, and very much wanted to get rid of that cost, fearing Congress would soon "raise hell" with them for sustaining an unnecessary public expense.

The commission suggested that Mueller return to Washington for further work on the problem.

The sum of $300 was voted for the support of the Colorado River Water Users Association.

CARSON CITY, NEVADA, JUNE 23, 1947

A resolution was passed authorizing the withdrawal of an additional 16,000,000 kilowatt-hours from Hoover Dam Power Plant at no additional horsepower demand, to be designated Withdrawal No. 17. This was necessary because of requests to the commission by Southern Nevada Power Company for equivalent additional energy.

The chairman stated he had received a telegram from Senator McCarran and requested that it be included in the minutes of this meeting. The telegram is as follows:

GOVERNOR PITTMAN, *Carson City, Nevada*: There has just been delivered to me and to Congressman Russell and to the Junior Senator from Nevada a letter over the signature of Major General Robert M. Littlejohn. A similar letter is being transmitted to you. The full text of the letter is as follows: "The War Assets Administration recently made a contract with the Industrial Research Corporation of Detroit, Michigan, to secure an Industrial Survey of the Basic Magnesium Plant at Las Vegas, Nevada, with a view to disposing of this plant to the best interest of the Federal Government and the State of Nevada. We are currently involved in paying out monthly a substantial sum of money for plant maintenance and protection. The best interest of the Federal Government necessitates eliminating these fixed charges through disposal of this plant at the earliest practicable date. It will take the industrial engineers sixty to ninety days to complete their survey. There are a number of major problems involved in finding a proper solution to the disposal problem and both the United States and the State of Nevada are involved. In order that the time in preparing plans may be reduced to a minimum and in order that the best interest of the State of Nevada be duly considered it seems to me that the War Assets Administration and the State of Nevada should work jointly in perfecting a suitable disposal plan. Currently the major problems requiring an immediate solution are: (1) Completion of a physical inventory of personal property, (2) Completion of industrial survey, (3) Finding a permanent solution to the water and power problem, (4) Filling the property with tenants as a result of action taken above, (5) The final disposal of the entire property. We need the continued advice of the State of Nevada in developing an over-all disposal program and in finding a solution to the problems set forth above, I therefore request the appointment of a single individual to represent the State of Nevada to work with this administration continuously for the next few months and assist us in developing programs and in solving problems in which the United States and the State of Nevada are mutually concerned. I am addressing a similar letter to Senator Malone, Representative Russell, and Governor Pittman of Nevada. I should like to ask further that you, Senator Malone, Representative Russell, and Governor Pittman of Nevada, agree on the individual who is to represent the State of Nevada. May I further suggest that the individual selected by you four gentlemen be an outstanding business man who is thoroughly familiar with the local economic problems in your State. Cordially yours, signed Robert H. Littlejohn." On receipt of this letter I have wired General Littlejohn here in Washington designating John V. Mueller as my choice of the individual to represent the State of Nevada to work with the War Assets Administration. Congressman Russell who was present in my office when I received the letter from General Littlejohn, is today also communicating with the General and he too is designating John Mueller as the choice to represent the State of Nevada. I hope that it will be in keeping with your best judgment that you also wire General Littlejohn designating Mueller to represent the State of Nevada to work with the War Assets Administration. Kindest regards.

PAT MCCARRAN.

Governor Pittman wired his reply as follows:

June 21, 1947.

HON. PAT MCCARRAN, *Washington, D. C.*: I am in receipt of wire from Senator McCarran setting forth contents of letters written to Nevada's Representatives in Congress, and to me, in connection with the working out of plans for the disposal of Basic Magnesium Plant and facilities. In connection therewith I note that you suggest that we agree upon some competent man to represent Nevada in dealing with War Assets Administration. You are hereby advised that my selection is John V. Mueller, member of Nevada Colorado River Commission. Mueller was appointed some months ago to deal with the War Assets Administration, looking to Nevada's taking over Basic Magnesium Plant together with transmission lines and water facilities. Mueller in my opinion is the proper person to represent Nevada in this matter. Regards.

VAIL PITTMAN, *Governor of Nevada.*

CARSON CITY, NEVADA, AUGUST 6, 1947

Copies of a "Letter of Intent" (Appendix No. 3) with respect to the State taking control of certain utilities at Basic Magnesium Project were distributed by the secretary. Mueller detailed his work in Washington, and said he expected an early agreement upon a plan for Nevada to take over and operate the entire project.

An interesting point came up with respect to water supply. Mueller said the Letter of Intent contains a provision for the commission to supply water to Las Vegas if it is available, but that there would be very little water for that purpose. The War Department had requested four million gallons per day, after which, inclusive of the necessary water for Basic Magnesium Project, there would be little left.

There was much discussion as to the terms of the Letter of Intent and other matters relating to the proposed State operation of the utilities at Basic Magnesium Project, apart from operation of the entire Basic Magnesium Project.

On September 16, 1947, this agreement for the State to take over all utilities at Basic Magnesium Project was signed by the Colorado River Commission and by War Assets Administration. (Appendix No. 3.)

LAS VEGAS, NEVADA, AUGUST 20, 1947

Mr. Compton analyzed his company's proposal to underwrite the installation of a so-called half-unit generator (45,000 kw). At this time it was agreed to give it further study, but with no action to be taken until the proposal by Los Angeles Department of Water and Power to supply all energy, including stand-by, for Nevada had been received. Meanwhile the City of Los Angeles had agreed to submit its detailed proposal by September 15, 1947.

The commission decided to sign the Letter of Intent (Appendix 3) when War Assets Administration had entered into a satisfactory contract with Edison and the city for energy during the time that would elapse before the State could either install or acquire generating equipment. The commission engineers and War Assets Administration representatives were asked to do all they could to hasten the execution of such an interim power contract.

The secretary read a letter from Jess Larson, General Counsel, WAA, dated August 13, 1947, asking the commission to expedite consideration of the Letter of Intent to assume control of the utilities at BMP and also to take steps to withdraw power for use at BMP. Following is the letter:

WAR ASSETS ADMINISTRATION
Washington 25, D. C.

August 13, 1948.

COLORADO RIVER COMMISSION, *Carson City, Nevada.*

GENTLEMEN: On June 19, 1947, this Administration authorized the execution of an agreement with your commission for the lease of certain utility facilities located at the Basic Magnesium Project, Henderson, Nevada. Acting on this authority, a Letter of Intent, dated July 3, 1947, was prepared and submitted for your acceptance. To date, this Administration has received no official information as to the approximate date that your commission will accept the above-mentioned Letter of Intent and assume operation of the utility facilities and services covered thereby.

The assurance of a supply of firm power at reasonable rates is of paramount importance if the Basic Magnesium Project is to continue operations, and such operation we believe is of utmost importance, both to the State of Nevada and the Federal Government. The State of Nevada, through your commission, appears to be the only logical source of such a supply of power. This is true whether your commission accepts the Letter of Intent and assumes the obligation to supply power, or if this Administration continues to operate the facilities and supply the power requirements.

The State of Nevada is an allottee of power from the Hoover Dam project. As such it has certain rights with respect to the withdrawal of energy generated at Hoover Dam, which energy, if so withdrawn, could be made available to the Basic Project at what are thought would be reasonable rates.

In order that the long-term power situation at the Basic Magnesium Project may be cleared up as rapidly as possible, it is suggested that your commission expedite consideration of the above-mentioned Letter of Intent. However, regardless of the outcome of such consideration, it is requested that you proceed with whatever steps are necessary for the State of Nevada to exercise its rights of withdrawals of energy from the Hoover Dam Project, such energy to be made available for use at the Basic Magnesium Project.

After detailed exploration of the problem of an adequate power supply for the Basic project we have come to the conclusion that the only means by which the continued operation and development of this project can be assured, is through the exercise of the withdrawal rights of the State of Nevada, and we are prepared to cooperate with your commission to the extent necessary to accomplish this result.

Cordially yours,

JESS LARSON, *General Counsel.*

The commission thought these points would be clarified for WAA at a Senate special committee hearing then being conducted in Las

Vegas on BMP affairs by Senators Joseph R. McCarthy, George W. Malone, and John L. McClellan. Secretary Smith said he would thereafter write Mr. Larson. The Senate committee continued its hearing through August 20 and 21, and approved the measures taken by the Colorado River Commission, complimenting the commissioners upon their vigorous activity in preserving the great project intact for Nevada.

On August 25 the secretary wrote Mr. Larson as follows in regard to obtaining power for the project.

COLORADO RIVER COMMISSION OF NEVADA

August 25, 1947

JESS LARSON, *General Counsel War Assets Administration, Washington 25, D. C.*

Your reference: PID-LI, Basic Magnesium Project, Inc., Henderson, Nevada.

DEAR SIR: Receipt of your letter dated August 13, 1947, is acknowledged.

Your letter refers to two separate subjects: 1st, a Letter of Intent which was submitted by War Assets Administration to the Colorado River Commission of Nevada which when signed by the proper representatives of the Colorado River Commission conveys the information to War Assets Administration that it will enter into a contract to take over the power, water and sewerage utilities at Basic Magnesium Project, Henderson, Nevada.

This Letter of Intent dated July 3, 1947, was reviewed at a meeting of the Colorado River Commission on August the 20th at which time by unanimous vote the secretary was requested to inform War Assets Administration that it is the intention of the commission to sign the said Letter of Intent if and when a satisfactory contract is entered into by the War Assets Administration and Southern California Edison Company for the delivery of electrical energy to present lessees operating at Basic Magnesium Project for a period of time which will be necessary for Nevada to install a generator for Nevada's use, and for withdrawals of energy by War Assets Administration and/or its lessees to become effective under the General Regulations governing the use of energy from Hoover Dam, and also according to the laws of Nevada.

A committee appointed by the commission, which has been working on this Interim Contract, and which has heretofore made contacts with the Edison Company and the City of Los Angeles and representatives of War Assets Administration was requested to again immediately proceed to Los Angeles and endeavor to have this contract executed by War Assets Administration and Edison Company. The committee will meet with said representatives in Los Angeles tomorrow, August 26, and endeavor to expedite the interim contract, under which lessees now at B. M. Project will continuously receive low-priced energy. As stated before, the Colorado River Commission's signature to the Letter of Intent to take over the facilities at BMP will depend upon the consummation of a satisfactory contract.

The second subject in your letter is a request that the State of

Nevada exercise its right of withdrawal of energy from the Hoover Dam power plant, for use at Basic Magnesium Project. It has been explained in considerable detail on various occasions to representatives of the Defense Plant Corp. and again more recently to War Assets Administration that the State of Nevada can withdraw power from its allotment at Hoover Dam power plant only in accordance with a fixed plan and schedule conforming both to the General Regulations set up by the Department of the Interior and, also, according to the laws of Nevada. It appears to us that the only manner in which effective cooperation to accomplish such withdrawals can be rendered by War Assets Administration for this purpose will be for War Assets Administration or its lessees to submit a request to the State of Nevada for a definite amount of energy according to the following requirements:

1. A request to the secretary of the Colorado River Commission of Nevada for a definite amount of energy in kilowatt-hours at a definite maximum demand in horsepower. The schedule of time necessary to make such a request effective will depend upon the amount of horsepower withdrawn as fixed by the regulations and varies from six months for 5,000 horsepower to three years for 20,000 horsepower or more.

2. Agreement to enter into a contract with the State to take and/or pay for said energy and posting of a bond by War Assets Administration or its lessees in sufficient amount, according to decision of the Colorado River Commission, to safeguard the State in payments to the United States.

Upon receipt of such a request for energy in kilowatt-hours, and entering into a contract and bond, the Secretary of the Interior and the Director of Power at Hoover Dam are informed that the State wishes to make the withdrawal. If necessary, the Generating Agents for the Government at Hoover Dam plant will be requested to supply additional generating capacity. If generating capacity is not then available it will be installed by the Bureau of Reclamation and charged to the State of Nevada.

This in brief is the method by which power may be obtained from Nevada's allotment. The initial procedure depends upon the applicant and not upon the State. If War Assets Administration is in a position to make such an application to the Colorado River Commission, the commission can thereafter proceed with the withdrawal, but not otherwise.

All of this and other details regarding the Nevada power allotment were brought out and discussed in much detail at the hearing held by the Senate Investigating Committee in Las Vegas on August 21 and 22. Various lessees under War Assets Administration at Henderson were present, and also officials of WAA; all of whom should now be fully acquainted with the procedure Nevada must follow, and the restrictions and regulations governing power withdrawals.

Very truly yours,

ALFRED MERRITT SMITH, *Secretary.*

The commission engineering committee was instructed to go to Phoenix, Arizona, in compliance with a recommendation made by the

Bureau of Reclamation, and there confer with the Arizona Power Authority as to the advisability of Nevada and Arizona jointly installing two major unit generators for mutual use and stand-by. Thereafter on August 28, 1947, the committee carried out this order for a conference, but no agreement was reached with Arizona.

On August 27, 1947, the engineering committee and Alan Bible, Attorney General for Nevada, held a conference with City officials in Los Angeles at which time the oil increment or "escalator" clause was changed in the Interim Contract (see Appendix No. 1) to use the words "bid price" instead of "posted price," and time of notice for cancellation was shortened to thirty days.

CARSON CITY, NEVADA, SEPTEMBER 5, 1947

This was a conference with the two principal lessees at Basic Magnesium Project to determine their needs and fully inform them what the State could do to help them, and the limitations placed upon the State by law. Stauffer Chemical Company was represented by C. W. Schedler, Consulting Engineer; Western Electrochemical Co. by Joe C. Schumacher, Vice President. Both companies contemplated expanding their operations and these representatives at this time expressed an opinion that their companies should underwrite the present annual charge of $150,000 for power.

LAS VEGAS, NEVADA, SEPTEMBER 17, 1947

It was decided that the commission retain its sustaining membership in the National Reclamation Association and continue to contribute $150 annually. The National Water Conservation Conference membership was also sustained by a contribution of $250.

The secretary stated he had been unable to secure a satisfactory assistant. The commission authorized him to offer more salary than $300 a month if it was necessary in order to secure a competent electrical engineer.

LAS VEGAS, NEVADA, OCTOBER 22, 1947

The commission moved to advise General Littlejohn that it was in receipt of his Letter of Intent and is ready to negotiate, with intention to take over the B. M. Project if the State could do so and not incur a financial obligation which would be contrary to State law.

Frank Case, former manager for Anaconda Copper Company at Basic during the wartime operation, Lawrence McNeil, of McNeil Construction Company, and others, were mentioned as possible managers of the project for the State.

Mueller was asked to expedite and submit as soon as possible a comprehensive statement of present operations and finances. A State-wide committee to investigate the plan to take over Basic Magnesium Project was proposed by the Governor, but after discussion no definite action on this was taken.

It was decided to employ Lawrence McNeil of McNeil Construction Co., Los Angeles, to make a study and report of the project, and the Government's offer, as soon as possible.

With respect to the proposal of the City of Los Angeles to generate Nevada's energy (see Appendix No. 11), E. W. Rockwell, Assistant

Chief Electrical Engineer of Metropolitan Water District, formerly in the employ of the commission at Las Vegas for a time after the death of C. F. DeArmond, had been consulted and had agreed to review and comment on the City's proposal. He would also consider separately a plan for the State to install a generator and go on its own, and endeavor to determine which procedure would be the better for Nevada. Rockwell's report had been received and was read.

The report by E. W. Rockwell is attached as Appendix No. 4.

A request by Southern Nevada Power Company for the withdrawal of 7,000,000 additional kilowatt hours at a maximum demand for 1,170 horsepower. This was approved and designated Withdrawal No. 18.

JOINT MEETING OF THE COLORADO RIVER BOARD OF CALIFORNIA AND COLORADO RIVER COMMISSION OF NEVADA AT SACRAMENTO, CALIFORNIA, DECEMBER 4, 1947.

Thirty-four people were present, including Governor Earl Warren of California, and Governor Vail Pittman of Nevada, and representatives of various departments and companies in both States. Seven press representatives attended the meeting.

The purpose of the meeting was to discuss several subjects in which the interests of the two States seem to correspond and upon which there was a common meeting ground.

Governor Vail Pittman expressed the hope that the meeting would be productive of much good and that California and Nevada could formulate plans whereby their position and strategy for justice would be advanced to prevent Arizona from taking additional water from the Colorado River which would leave the two States with an insufficient supply. He expressed the conviction that there should be an equitable division of the water and it appeared at this time that the only solution is to have Congress enact legislation directing litigation to determine the rights of each State.

Chairman Evan T. Hewes, of Colorado River Board of California, in presenting the agenda for the meeting, recalled that at the last joint meeting in Las Vegas it was felt desirable to meet again after finding what position was taken on several subjects at the National Reclamation Association in Phoenix and the meeting of the Colorado River Water Users Association.

Hewes announced as No. 1 item on the agenda "The proposed legislation to provide for litigation in the Supreme Court of the United States to determine respective rights of the Lower Basin States to the use of Colorado River water." At the request of the chairman, Mr. Shaw lead the discussion and stated that as a result of correspondence and exchange of views between the two Governors last March, it was concluded that the advisable thing to do was to proceed in Congress to obtain authorization for commencing litigation. As a result of this decision a resolution was introduced by the Nevada and California Senators, as well as several Congressmen independently, to initiate action in the form of an interpleader.

Mr. Arvin B. Shaw, Jr., Assistant Attorney General of California, indicated that the resolution was assigned to the Public Lands Committee in the Senate, and the Judiciary Committee in the House, and discussed the prospects of the resolution being favorably reported by

each committee. He declared that in order to explore these matters it is proposed that a small group be sent to Washington to confer with California and Nevada Senators and Congressmen, and bureau and departments heads, and decide the best way to expedite the hearings. He called attention to a dispatch from a Denver paper to the effect that the Rump Committee of Ten (Upper Basin States) has decided to appear in opposition to the California and Nevada resolutions. It was his hope that it might be possible for the Department of the Interior to see its way clear to support the California position. He concluded his remarks with the expressed feeling that the California board would appreciate assistance of Nevada Senators and Congressman in laying the groundwork for future action.

In reply to Mr. Shaw's remarks Governor Pittman said that California could count on Nevada's representation at the meetings planned to be held in Washington and the support of Nevada's representatives in Congress. He made it clear that Nevada has no quarrel with Arizona and declared that he wanted Arizona to get all the water to which she is entitled. He said he felt there was a great deal of misunderstanding on the whole matter and that he was lead to believe that all the basin States would be benefited by an adjudication of this water issue.

After a brief discussion by Governor Pittman and the Nevada delegation, it was stated that arrangements would be made if possible for Alfred Merritt Smith, State Engineer, and Alan Bible, Attorney General, to go to Washington with the California group.

The chairman then asked Governor Warren for any criticisms or suggestions on the proposed program. Governor Warren said that he was in full agreement with Governor Pittman regarding the settlement of differences among the western States, and particularly that between California and Arizona, over the use of water from the Colorado River. He further stated that these differences were quite natural and human, that each State is anxious to make the most of its area and no one can be blamed for this difference of opinion. He declared, however, that when a difference arises there are three ways of solving the problem, namely:

(1) to sit down together and make an agreement;

(2) try to find a settlement through arbitration if an agreement is not concluded, and

(3) failing in the other two methods, to seek judicial determination.

It was Governor Warren's conclusion that the only alternative left was litigation. He felt that if California is going to be limited to less water than it honestly believes it is entitled to, it would be better to know it now and be able to plan accordingly, rather than to be at loggerheads with Arizona, and for another quarter of a century have the plans of both States frustrated and feelings intensified.

Chairman Hewes then asked Mr. Smith if he had any comments, to which Mr. Smith replied that he was convinced that only by judicial procedure could this matter be settled. He pointed to the fact that over the years the people of Nevada had acted more or less as neutrals in an effort to bring Arizona and California together, but that each meeting seemed to find them further and further apart. As a result

of this impasse, he declared he was in agreement with this plan whereby California representatives are going to work out strategy and methods of approach so that the bill will be passed to authorize this suit.

When asked for his comments, Mr. A. J. Shaver, Engineer for the Nevada Colorado River Commission, said that he felt as did Governor Pittman and Mr. Smith. He also observed that when he attended the National Reclamation Association meeting in Phoenix, he had noticed a vigorous publicity campaign being conducted by Arizona which placed the blame on California for drying up and starving Arizona. Mr. Shaver felt that the right kinds of publicity on behalf of the California-Nevada point of view would offset the opposition.

Mr. M. J. Dowd, Engineer, California, was asked to speak on the next item of the agenda, The Treaty Administrative Bill. He was of the opinion that a Treaty Administrative Bill is necessary to fix the responsibility for the amount of water to be delivered, to guard against arbitrary change of policy, and to set up guideposts whereby the American section of the International Boundary and Water Commission would be able to make proper decisions under the treaty. He stated that the language of the treaty is very loose, that it sets up no criteria by which surplus or drought could be determined and is silent with regard to the quality of the water. He briefly reviewed the sections of the bill and explained the reasons and necessity therefor.

Governor Warren and Governor Pittman questioned Mr. Dowd about the provisions of The Treaty Administrative Bill relating to quality of water. Mr. Dowd explained these provisions in detail and stated that although the Upper Basin States and Texas would probably object, he felt that a solution of the problem is essential to a determination of the actual amount of water which will be required to fulfill the Mexican demands under the treaty.

Chairman Hewes asked Mr. Dowd to advise the Governors regarding the status of this legislation and the conference that took place between the officials of the Imperial Irrigation District of the Departments of Interior, Justice, and State, and the American section of the International Boundary and Water Commission.

Mr. Dowd said that a hearing had not been set on the bill but that for the past year and a half the Imperial Irrigation District had proposed a conference on the problems which might involve its properties in Mexico. When this discussion was finally held the Department of Justice also had representatives present. It was apparent to Mr. Dowd that these departments had not given much thought to the treaty or much weight to the reservations because they didn't have answers to the questions asked and seemed to be surprised that such questions were asked.

Mr. Hewes observed that the difference of opinion expressed by the various Federal departments and agencies were such that a clarification of some of the ambiguous language of the treaty should be obtained. He felt that this would be of assistance to the judiciary when it tried to resolve the rights to the waters of the Colorado.

Governors Pittman and Warren, Chairman Hewes, and Mr. Dowd were the chief participants in the discussion which followed regarding the amount, quality, and the source of water for delivery to Mexico

under the treaty. It was generally agreed upon that as a result of the treaty, Mexico would receive 1,500,000 acre feet each year, but according to American negotiators, water delivered would be without regard to quality and might include return flow of high salinity from Arizona, estimated by witnesses at the treaty hearings to amount to 900,000 acre feet annually. It was also agreed that since the intention of those who made the treaty was very clear as to what they were doing, and many of the same Senators who supported the treaty are still in Congress, it is now important that legislation be considered to clarify the treaty and guide its administration during the present Congress, which would be likely to act more favorably than might some future Congress.

Chairman Hewes called on Mr. Roy Martindale, Chief Engineer, Los Angeles Department of Water and Power, to discuss Item 5, "Additional projects for storage and power development on the Lower Colorado River."

Mr. Martindale presented figures on the use of electric power in the Nation and in California, as well as the increased needs by 1950. He outlined the power potential represented in the proposed Glen Canyon and Bridge Canyon dams and compared the costs with generation by fuel oil consuming plants.

Questions were put to Mr. Martindale by Governor Pittman and Governor Warren dealing with silt and flood control, evaporation losses, use of power generated, and the relation of various projects to over-all power development. It was pointed out that there is no material controversy between the States of Nevada, California, and Arizona as far as power is concerned.

Governor Pittman remarked that all of the power was allocated prior to the building of Hoover Dam and he asked what policy would be followed in case the proposed Bridge Canyon and Glen Canyon dams were built. Mr. Martindale stated that this was a part of the strategy to be worked out in the joint meeting and he asked Mr. Tillman to explain legislation under consideration to authorize the power development of these dams.

Mr. Tillman said that the legislation is still in the discussion stage and when it is determined that a fair bill has been drawn up it will be taken up with all agencies concerned, including the State of Nevada. He indicated that Arizona would probably regard such a bill to be inconsistent with the Central Arizona Project bill. However, he stated that Arizona would likely favor power development at Bridge and Glen Canyon dams providing it was coupled with the Central Arizona water development and California and Nevada paid for the Central Arizona project by using the power. Governor Warren inquired regarding the fixing of power rates by the Department of Interior after the project is constructed. Mr. Tillman replied that a part of the report of the Department of Interior would deal with rates at which power can or would be sold, but that he didn't believe there would be any suggestion that the Central Arizona project can pay its own way and reimburse the costs.

Governor Warren expressed the opinion that at the outset there was no reason why California would be in conflict with Arizona since both would want a dam that would produce a maximum amount of power.

Mr. Tillman replied that he felt the same way about the matter, but that the reclamation commissioner, Mr. Straus, had told him that he didn't believe Arizona would join with California in authorizing a power project apart from the Central Arizona Project.

Governor Pittman asked whether power conditions at Hoover Dam would be adversely affected in the event Bridge Canyon Dam is built and Arizona gets its Central Arizona project. Mr. Tillman said it would unquestionably effect power output and contracts at Hoover Dam, according to proposals set forth in the reports to the Bureau of Reclamation on the Central Arizona projects.

In the discussion of power capacity of Bridge Canyon and Glen Canyon dams, Mr. Shaver pointed out that if Glen Canyon Dam is not built the silt would rapidly render Bridge Canyon Dam useless.

Mr. Hewes stated that Mr. Smith, State Engineer of Nevada, had a very concise water budget of the Colorado River which he would explain prior to Mr. Mathew's discussion in order to clear up some points which the chair felt were not properly clarified in the morning session, and also prove useful in connection with Mr. Mathew's remarks.

Mr. Smith presented figures on the Colorado River water budget and concluded that the figures which originated from certain sources in Arizona but had been revised to some extent by him in collaboration with Mr. Dowd and Mr. Matthew, indicated that there would be a minus quantity of 1,371,000 acre-feet of water a year available for the Central Arizona Project after meeting the requirements of existing and authorized projects and the Mexican Water Treaty.

It was brought out by Mr. Smith in the discussion that certain individuals in Arizona would admit that there would be the above stated shortage and that some of the representatives of the upstream States are becoming worried about what might eventually happen. An indication of this concern came from State Engineer Bishop of Wyoming who favored including a limitation on the exportation of water of not more than 25 percent of the total amount allotted to each of the upstream States.

Mr. Raymond Matthew, Chief Engineer, Colorado River Board of California, pointed out the difference between the Central Arizona Project (S. 1175), and the proposed power project described by Mr. Martindale in the morning session. He described the nature of the hearings on S. 1175 as well as subsequent developments. He referred to Colorado River Report submitted by the Secretary of the Interior in July 1947 to the Congress, which presented an inventory of 134 potential new projects. Mr. Matthew stated that the Secretary of the Interior, and the Bureau of the Budget, were quoted as not being prepared to recommend any of the 134 new projects until there had been a determination of the respective rights of the States to the water of the Colorado River system.

There followed a discussion of power costs, rates, and value of land in the Central Arizona area. It was brought out in the discussion that land limitation practices in Central Arizona disregarded the 160 acre limitation of the Reclamation Law. When questioned by Governor Warren how this condition was justified, Mr. Matthew said that no explanation was made, and he added that farmers of the Central Arizona area admit there are flagrant violations. Governor Warren

was of the opinion that the general violation was only 2 or 3 percent. Mr. Hyatt, State Engineer of California, was asked for his opinion and indicated that a careful study showed a 2 or 3 percent violation, but in the Salt River Valley Project the percentage was about 15 percent. Mr. Hewes stated that it was his personal knowledge that the Bureau of Reclamation, all through the 30's and up to 1941, sold lands taken over, subject to nonpayment to landowners in the Yuma Valley, irrespective of the acreage limitations.

Mr. Matthew continued the discussion by explaining the Bureau of Reclamation estimates of power revenue and inaccuracies of the estimates. He also explained evaporation losses and chargeability thereof to the Upper or Lower Basins, with reference to the Bridge Canyon and Glen Canyon reservoirs. He pointed out that there were two alternative plans for the Central Arizona Project; the one a plan of pumping water, and the other a gravity diversion through an 80-mile tunnel. The former was estimated by the Bureau of Reclamation to cost about $600,000,000 and the latter about $1,000,000,000. If either of the alternates were followed there would be a drastic change in the operation of the Hoover Dam under the proposals made by the Bureau of Reclamation.

Mr. G. E. Arnold, Attorney for San Diego, stated that when the point of diversion of water to San Diego was transferred as a result of a merger with the Metropolitan Water District, the Bureau of Reclamation made San Diego subsidize the power loss that would have developed and amortize it at a cost of $300,000. He said that he understood that the Bureau of Reclamation was not doing that in the Central Arizona plan.

In reply to an inquiry, Matthew explained the effect of the Central Arizona Project on California as relating to the Seven-Party Agreement of 1931, required by the Secretary of the Interior as a part of his contracts with the California agencies. The assignment of priorities under the Seven-Party Agreement, and the contracts in addition to the Limitation Act, gave California reason to believe it had annual rights to 5,362,000 acre-feet of water. Matthew said that if the Central Arizona Project were built it would divert 1,200,000 acre-feet from the Colorado River and have the effect or threat of infringing upon the later priorities in the California agreement which would affect the metropolitan areas in Southern California and the City of San Diego.

At the conclusion of Matthew's remarks, Chairman Hewes recalled the agreement of Nevada and California at the Las Vegas meeting to oppose authorization of the Central Arizona Project prior to a determination of the rights of these States to the waters of the Colorado. Governor Pittman stated that Hewes was correct and that he saw no reason why Nevada should not go along with California in any way that is designed to prevent Arizona from diverting the water.

Smith agreed with Governor Pittman and said that the water simply was not available for all these projects, and if the legislation for them goes through, it will short us in our power, and our future water.

Hewes thanked Governor Pittman and State Engineer Smith for their expressions of the attitude of Nevada toward the Central Arizona project legislation. He commented on the probable submission of a report on the project by the Bureau of Reclamation within a month or

so, which would be made available to the Governors of the affected States, and he asked Governor Warren if he would consider having the Central Arizona Report handled in the same way that the Comprehensive Report for the entire Basin was handled. Governor Warren stated that all such reports would go to Mr. Purcell, Director of Public Works, and that the same procedure would be followed as with the Comprehensive Report.

Chairman Hewes then called upon Gilmore Tillman, Chief Counsel, Los Angeles Department of Water and Power, to lead the discussion on item 4 of the agenda, which concerned pending legislation to amend the Reclamation Law with respect to feasibility standards and repayment provisions.

Tillman explained that under the Reclamation Act of 1939 the Secretary of the Interior could first determine the total cost of any proposed project, then determine the amount which power could repay, and the amount water could repay. If these balanced out and could repay the cost, that project stood authorized by the finding of the Secretary of the Interior without action necessarily by Congress. He said it was the understanding of Congress apparently, that included within the charges against commercial power, would be interest at 3 percent. He pointed out that a recent decision of the Solicitor of the Interior held squarely that they did not have to fix power rates to repay to the United States the capital charge to power, plus interest. The net effect of that was a bookkeeping arrangement by the Department of Interior by the terms of which they show a single dollar from power revenues as representing the repayment of 3 percent interest, and at the same time that same dollar as representing a full dollar of capital repayment, so that a single dollar does double duty. Mr. Tillman stated that the Reclamation Association as a whole, took the matter up at its last session and endorsed the Rockwell Bill (H. R. 2873), making various changes in the Reclamation Project Act of 1939. The bill which is now pending before Congress provides that power rates must be fixed at an amount sufficient to repay in 78 years the capital allocated to power, with 2½ percent interest. Two percent as interest and one-half of one percent toward the repayment of water capital.

Governor Warren questioned Tillman regarding use of the 2 percent by the Bureau of Reclamation under this bill. Mr. Tillman stated that it now goes into the Reclamation Fund and can be used only by subsequent congressional appropriation.

Governor Warren then commented on the specific situation of Folsom Dam to the effect that the War Department had been authorized by Congress to construct this dam, and the last few months the Bureau of Reclamation has taken the position that if the Army is permitted to build the dam, it will be obliged to put the interest from power back into the general treasury, whereas if the bureau builds it, interest of 3 percent or 2 percent, or whatever it is, can be used to subsidize other phases of the project that couldn't pay their own way.

Dowd stated that the bureau may contend that, but that was one reason the bureau was sliced on its appropriation last year. He added that the House appropriations committee favored the holding in abeyance, the application of any interest for repayment of capital as proposed by the bureau under the solicitor's opinion.

Tillman declared that it was the common feeling of his group that, if the interest rate is reduced in general from 3 to 2 percent, the same reduction should be applied in connection with Hoover Dam power, but that the Bureau of Reclamation has consistently refused to support that view and the committee has refused to add such a provision in a bill.

Governor Warren inquired whether the Army projects and the Reclamation projects would be on the same footing if the bill (H. R. 2873) were enacted into law. Dowd replied that generally they would, although under the Flood Control Act there is no interest set out. Governor Warren thought that the bill at least had some merits if it can aid in doing away with this outrageous situation whereby turmoil is created in the minds of people of a State or region. Mr. Dowd stated that a national power policy is actually needed.

Matthew said that the Rockwell bill had been referred to the Bureau of the Budget for a report, and that information has been received that it cannot understand how this one-half of one percent interest collected as a part of the power revenue can be properly applied to the repayment of capital.

Franklin Thomas, California attorney, asked Tillman whether, if the Rockwell bill were adopted in present form, it would apply to the Central Arizona Project. Tillman was of the opinion that the last bill by Congress would control the situation and anything it chose to do in the way of additional subsidies for the Central Arizona Project would not be affected by this bill. Hewes pointed out that the bill (H. R. 2873) did break down present standards of feasibility and was fundamentally unsound.

The chairman brought up for discussion the matter of interstate relations. He stated that J. H. Buehler, president of the Colorado River Water Users Association, was at the Las Vegas meeting and it was agreed to see to what extent support might develop among the other States, particularly on the Treaty Administrative Bill, in an effort to work with any of the people in any or all of the Colorado River Basin States wherever there is a common ground upon which to meet to oppose harmful legislation and propose sound practices.

Governor Pittman, Smith and Shaver of the Nevada delegation pointed out various ways in which mutuality of interests might be developed and followed through with the other States of the Colorado River Basin. Governor Warren added his views in this connection and stated that it was desirable for every door to be left open whereby the western States could stand together in order to progress.

Shaw related efforts that Matthew and he had made during the summer to secure cooperation from the Upper Basin States on the Treaty Administrative Bill, the Litigation Bill, and other objectives, and how assurances made at the time had been recently nullified by actions taken at a meeting of the Upper Basin States committee. At the same time, he expressed a willingness to keep trying whenever the other States were willing to get together. Dowd told of the experience in connection with the treaty bill provisions and the difficulties inherent in trying to get agreement. He felt that we should be and are working along to improve conditions regardless of the kind and type of opposition met.

The meeting concluded following remarks by several persons on the Litigation Bill, and the statement by Governor Warren that differences could, and should be worked out for the mutual welfare of all the States involved. He pledged that every effort would be made to secure justice and harmony, but that at the present time he felt that only by a submission of the issue to the Supreme Court could settlement be accelerated and each State know upon what it had to plan for the future.

LAS VEGAS, NEVADA, JANUARY 6, 1948

Lawrence McNeil, President, McNeil Construction Company stated that he was ready to present his report on the Basic Magnesium Project. The chairman suggested that it be read aloud and discussed afterward.

Following the reading of the report, M. L. Godman stated that the War Department had now removed restrictions imposed under the National Securities Act regarding sale property at Basic Magnesium Project with the exception of that in use by Western Electro Chem. Co. McNeil said such removal of restrictions would be beneficial to the State's operation as it would permit sale of parts of the plant by the State, subject to War Assets Administration approval, and also permit changes in building and more flexibility of operation by prospective lessees. McNeil said his report had been completed before he had learned that the National Security Act had been lifted from the plant.

A summary of the report by McNeil Construction Company is attached as Appendix No. 9.

General discussion of the report ensued. The McNeil report indicates that a yearly profit of $29,814 will be made under the State operation if McNeil's recommendations as to operations are carried out, as detailed in the attached report.

The fair value of the plantsite property and the townsite facilities, including utility services and town facilities has been appraised at $35,227,648, according to McNeil's report. The salvage value of the same is appraised at $12,447,949. The scrap value has been appraised at $8,054,559. These appraisals give no consideration to restrictions of sale under the National Security Act, existing at the time the report was prepared.

In arriving at a "fair use" value of the Henderson townsite and the plantsite, as determined by the revenue that can be produced during the life of the plant, in the light of present revenue, operating expense and potential additional revenue, the report recommends that the use-value of the facilities be placed at not more than $2,500,000 payable over a period of fifteen years.

Kenneth Walsh came into the meeting at 11:15 a. m. and was asked by the chairman to expand upon and explain his statement before the Senate sub-committee on Basic Magnesium Project affairs in Las Vegas on January 5. The statement referred to indicated that Mr. Walsh and his associates would negotiate for the purchase of the plant for $25,000,000 and were prepared to pay $9,000,000 or $10,000,000 as a cash payment, pending agreement on a final price. Mr. Walsh was embarrassed by the chairman's questioning, and said that his replies

to the questions of Senator Malone and Senator McCarthy at the hearing, had not been well considered and his answers did not convey his thoughts; that he had no idea what the plant might be worth, and did not wish to interfere with the objective of the State to acquire the property, and that he had no plans or objectives for himself and associates when he had been called before the senators. He agreed, however, to appear before a War Assets Administration board, including Wm. Godman, in Washington, D. C., the following week, but repeated his statement that he would not interfere with any proposal made by the State.

Irving Gumbel, Chief of the Light Metals Division, War Assets Administration, informed Walsh that any proposal that might be offered Walsh would not contain the same terms that had been offered to the State, and if the project is offered for private sale it would have to be put up for bids. The State will take over and operate the plant at no profit, as all the profits from operations would apply on the purchase price, whereas, it is assumed that private capital would not be interested unless it paid profits to the stockholders.

Upon further questioning Walsh declined to reveal his associates or backers.

E. T. Ross of Stauffer Chemical Company, stated that his company, a large electric power user, could not get power at a low cost without the help of the State, and if a private concern should take over the plant, they could not operate without very low-priced power. He is not in favor of private operation of Basic Magnesium Project, and said that Walsh's proposal had only served to "muddy the waters" of an orderly and reasonably rapid procedure for the State to assume the control, and to operate at cost, at least until a number of industries had been established.

Harvey McPhail, Chief of Power Utilization, U. S. Bureau of Reclamation, stated to the commission the reasons for the Bureau of Reclamation's desire to own the two transmission lines from Boulder Dam to Basic Magnesium Project. He said it would effect a great economy in the interchange hook-up between Boulder Dam and Davis Dam, perhaps $1,000,000 in construction costs, which would be reflected in lower generation charges for Davis Dam power, of benefit to Nevada and all users of Davis power. Nevada would also be relieved of the responsibility of operating and maintaining the two lines. Some objection to the plan was expected from the City of Los Angeles as the proposed hook-up would permit exchange of energy with the Metropolitan Water District's system which City engineers say is unsafe for the City's operation because the City's energy which is subject to great fluctuations of load beyond safe capacity of Metropolitan's transmission line.

Lloyd Compton stated that upon his own initiative he had gone alone to Phoenix, Arizona, to confer with the Arizona Power Authority, in an effort to secure a more economical and satisfactory proposal or agreement, for a generating capacity and stand-by set-up than the one that had been submitted to the commission by the Los Angeles Department of Water and Power. He had outlined the basis of an agreement with Arizona which he read to the commission. Mr. M. J. Dougherty, Chairman of the Arizona Power Authority, and N. Pike,

Engineer of the Arizona Coordinating Council, representing Central Arizona Power Company, and other Arizona power interests serving the Salt River Valley, were present by invitation of the commission.

The Arizona men were questioned concerning their plans, and it appeared that several conditions set forth in the proposal, as written by Mr. Compton, had not been agreed upon and would have to be subject to negotiation. The commission decided to consider the proposal over night, after which the engineering committee would meet with the Arizona men again the following morning at Boulder City. The Arizona men then left the meeting. The commission thereafter debated whether to further consider the Arizona proposal or proceed at once in attempting to conclude the contract with Los Angeles, as War Assets Administraiton was pressing Nevada for prompt assurance of power for Basic Magnesium Project. It was decided to delay further discussion with Arizona until the Governor and other members of the commission had time to go into their proposal. The Arizona proposal had been presented by Compton, too late for study, and the commission had had no time to evaluate and weigh the probable over-all results, including the effect such an agreement would have upon our present cooperative programs with California agencies on various matters relating to Colorado River power and water. The engineering committee was asked to call upon Messrs. Dougherty and Pike at Boulder City the next morning and advise them no action could be taken, and no further discussions with them would be necessary until the Governor and the commission had fully considered the proposal that had been submitted to them by Los Angeles on the 15th of September, 1947, and had been under engineering and economic study by them since that date. Accordingly Smith and Shaver met the Arizona representatives in Boulder City on the morning of January 7, 1948, and advised them that no further talks would be necessary until their proposal had been studied by the commission. Mr. Dougherty said they understood our position, and that they would be ready to meet with the commission's representatives at any time.

The chairman asked for a report by the Engineering Committee on the status of the Interim Contract between War Assets Administration, Edison Company, Los Angeles Department of Water and Power, and the State of Nevada. It was emphasized that the State had signed a Letter of Intent with War Assets Administration, under which the State is to assume control of the utility facilities at Basic Magnesium Project sixty days after the execution of said Interim Contract for power, and that at the request of War Assets Administration, said contract had been back dated December 1, 1947.

Smith stated that the proposed contract had been reviewed by all of the parties thereto, and approved by the Attorney General. It had been signed on behalf of the State, and sent to the City for signing by the City and Edison Company, after which it was to be sent to Washington for final execution by War Assets Administration. Smith said over a month had elapsed since the City received the contract, and he might find a fully executed copy in his office upon his return there.

Mueller stated that the contract was still in Washington, and while there he had asked for the cause of delay, and had been told that the contract would not be signed until a War Assets Administration and

Edison and/ or the City had agreed with them on a satisfactory plan for the use and payment of generator N-7.

NOTE—On January 22, 1948, your secretary was informed from Washington that the Interim Contract had been signed by the Secretary of the Interior.

Mueller told of his work in Washington with War Assets Administration in the preparation of a contract for Nevada to take control of Basic Magnesium Project.

A half-hour of discussion followed concerning the employment of a general manager for Basic Magnesium Project if the State takes control. Several names were discussed, but no action was taken.

A motion was passed to instruct A. J. Shaver to set up the operation of facilities and utilities-at Basic Magnesium Project.

CARSON CITY, NEVADA, FEBRUARY 18, 1948

Shaver gave an account of work of the engineering committee in Los Angeles on February 9, 10, and 11. He said the committee first called on E. W. Rockwell, advisory engineer for the commission, on Monday morning, February 9, to whom Compton outlined a proposed new plan under which Southern Nevada Power Company would underwrite the cost of generator N-7 for the State. The plan would contemplate: (a) acquisition of N-7 by Nevada on June 1, 1951; (b) retention of our present interest and capacity in sec. G-3, and (c) acquisition of an allocation of Davis Dam energy, previously requested. The plan also provided for an extension of the Metropolitan Water District time of two years in which to exercise its option on N-7 time up to four or five years. The plan outlined would be in lieu of the City's proposal to Nevada. Rockwell thought the new proposal excellent and better than the City's proposal.

Shaver stated that in the afternoon the engineering committee met with representatives of the City in the Municipal Power and Light Building. Present for the City were Messrs. Vogel, Kodil, Martindale, Garman (at times) engineers, and John Mathews, attorney. The City was asked if they could reduce the kilowatt charge and the minimum obligation of their proposal. Martindale, spokesman, said they could make no reduction in the $7.50 per kilowatt charge. Before the conference ended on the following day, he said they would be willing to reduce, or even entirely eliminate, the minimum obligation of 50,000 kilowatt, but a reduction in the $7.50 per kilowatt charge could not be considered.

Nevada's new plan was detailed to the City of Los Angeles. They offered no objection to it, and the remainder of the conference was devoted to discussions regarding the physical and engineering requirements, and the effects on the several allottees. The procedure was not worked out, and the City requested a few days for more study before making additional suggestions. Both Shaver and Compton stated that at the time of this meeting there appeared to be no serious obstacles to the new plan.

Compton related his conference with the Arizona Power Authority had on February 5 and 6. A Mr. Wingfield was chief representative for Arizona. Wingfield had formerly been employed by the power division of the Department of the Interior, and he is familiar with the Hoover

contracts. Compton tried to keep Nevada's obligation down to $200,000 in discussions, seeking a minimum, for the reason that Southern Nevada Power Company would be called upon to underwrite the payments. No agreement was reached as to a joint procedure that would be acceptable to Southern Nevada Power Company and the commission, and it was the opinion of both Compton and Wingfield that the negotiations should be dropped for the time being.

Compton said the proposal of Southern Nevada Power Company to underwrite generator N-7 was subject to two conditions: First, to use advance payments by his company to build up a reserve fund as a "cushion," on which to draw for generation charges until we find ourselves with more machinery and equipment that we will need during the period we still must meet the $330,000 per year additional for generating equipment; and second, if N-7 should not be required to meet Nevada's energy requirements in the next few years, that we find a way for that unit to be used by Edison and/or the City as a "roving unit" within the plant for maintenance purposes of other units undergoing repairs. He had discussed this with Edison Company who said they can use N-7 during maintenance periods. The City was not so positive as to their need of N-7 as a "roving unit," but thought it possible. He also said it would be necessary for Metropolitan Water District to agree to give advance notice of five years before exercising their option to take possession of N-7, instead of the presently required advance notice of two years, and also have them give further consideration of being relieved of having to take over N-7 in 1966. The Metropolitan district engineers we consulted thought that their board of directors would approve of such an extension of the time of notice to be given prior to exercising their option. Compton was of the further opinion that the agreement of May, 1942, for power supply to BMI, signed by Nevada, Edison, City, and Metropolitan district, would have to be amended in order to accomplish this. Compton suggested the following detailed procedure:

First, a letter from Colorado River Commission to Metropolitan Water District, requesting formal approval by the district of a modification of their option, extending the time of notice to five years. Upon receipt of the district's approval, the commission should then address a letter to the Bureau of Reclamation requesting an amendment or modification of the agreement, entitled "Arranging of Power Supply for Defense Plant Corporation at BMI Plant." Consent to this change should be all that is required in order for Nevada to take over N-7.

In addition to possession of N-7, we would then still have by Federal contract, 44,000 kilowatt of generating capacity in Sec. G-3 (Units A-1 and A-2). We can arrange to use that 44,000 as stand-by. At our conference, Los Angeles seemed to think that when we acquire a major unit, our right to 44,000 kilowatt in Sec. G-3 would cease to exist. We do not think so, and do not think that Los Angeles will press the point, as they can make use of any idle capacity in Sec. G-3. At present Nevada uses about 35,000 kw. of Sec. G-3, which under the separate differing load factors amounts to about 207,000,000 kilowatt-hours per year.

Relative to Nevada's request for one unit at Davis Dam, or

200,000,000 kw.-hrs., our suggestion was that through exchange facilities, our Davis energy be given to the City at Davis, and we taken an equal amount from the City's units of Los Angeles units at Boulder. The City could also exchange its prospective allotment at Davis with Arizona for Boulder power, after Arizona's generating units have been installed.

Compton stated that Arizona will at once request for its use the installation of Units A-3 and A-4, and Attorney Mathews of the City had drafted for them the form of a letter to be addressed to the City, as the government's generating agent, formally requesting the installation. The proposal and letter will be presented to the Arizona Power Authority for approval at once. On February 18, it had not yet returned to the City by Arizona. Harvey McPhail of the Bureau of Reclamation Power Division had advised Compton that such a request should be in Washington within two weeks in order to be considered for an appropriation soon.

A further matter regarding the City's proposal to generate for Nevada developed. The Arizona agents said they would protest delivery of generator N-7 to Nevada if Nevada entered into the proposed contract with the City, and they (Arizona) would apply for N-7 for use by Arizona. Opinion of members was that negotiations for N-7 had progressed so far in behalf of Nevada, that regardless of the type of contract or plan Nevada finally made for generating capacity, Arizona could not get N-7.

Compton was not satisfied with the way the bureau is handling transformer Bank Y. This bank was requested by Nevada and installed for its use. Soon thereafter, energy for Kingman, Arizona, Needles, California, and the Bureau of Reclamation plant at Boulder, were also loaded onto it, and now it is fully loaded, with no extra capacity for Nevada. California Electric Power Company now supplies Kingman with 8,000 kilowatts through its own generating facilities, but has given notice it can no longer do so, and because of physical difficulties, within 90 days the Bureau of Reclamation will be obliged to put this additional load on Bank Y, forcing Southern Nevada Power Company to transfer that much additional load onto its own transformer at Basic, in order for Boulder City to have power. The bureau should make provision for taking care of Nevada's load, and permit Nevada to utilize the transformer originally installed for the State.

With respect to N-7, Compton thought that an appropriate part of its capacity should be reserved for the early Nevada contractors, which are the Southern Nevada Power Company, Lincoln County Power District, and Overton District, for future expansion. He said the commission should give very careful consideration to protecting the future needs and slow expansion of present contractors. He said their future needs should be definitely provided for, as well as their present demands. He said that by offhand estimates, Overton District now used 5,000,000 kilowatt-hours per year, and 15,000,000 should be placed in escrow for that district; Lincoln County Power District uses 50,000,000 and should have 75,000,000 in escrow; Southern Nevada Power Company 142,000,000, and should have 300,000,000. In kilowatts, at present load factors, he said Overton would need 6,000, Lincoln 10,000, and Southern Nevada 70,000, total 77,000 kilowatts.

Governor Pittman remarked that was about the limit of the one major generator to be acquired, and the present 44,000 kilowatts would not be enough for B. M. Project and stand-by. Compton said that when Arizona came in for Boulder power, and we also had still another 45,000 kilowatts at Davis Dam, then by economical coordination of loads, we would have much extra capacity. Present Basic Magnesium Project load is about 220,000,000 kilowatt-hours, and calls for 35,000 kilowatt capacity.

Compton was asked to explain his offer to underwrite N-7. He replied that Southern Nevada Power Company would make an advance payment of $15,000 per month, beginning now, to the State of Nevada, for transmission to the Bureau of Reclamation as a credit, which would be in addition to billing for energy actually used. This would continue for four years, or until a credit of $750,000 had been accumulated. At the end of that time, when payments on N-7 began, his company would pay the full charge of about $330,000 annually. Similar advance payments are now being made by the municipalities of Burbank and Glendale, to build up their credit. The cost of N-7 and the related necessary machinery will be between four and five million dollars. The annual payments will be about $330,000 per year. The continuing payments on Sec. G-3 will be about $110,000 per year. Mueller said he thought a resolution to accept the proposal of Southern Nevada Power Company and for Nevada to take over N-7 was now in order. He therefore made the following motion:

"I move that the Colorado River Commission take all steps necessary to acquire N-7; all steps necessary to see that the Southern Nevada Power Company properly underwrites the cost thereof, and that all proper steps are taken to see that the Southern Nevada Power Company provides the financial 'cushion' it has offered."

Smith asked if the proposed advance payments were not in the nature of a loan to the commission, which would be repaid later as a credit on power bills which would be owed to the State. Compton replied that he did not so consider the advance payments, and that they would be an operating expense, as a cost of power. They would come back to Southern Nevada Power Company in installment credit over a period of years to be agreed upon. He said they should be considered as a part of the cost of production of power, and would be reflected in the rates to the company's consumers.

Shaver asked if the advance payments could not be retained by the commission on its own books, instead of being an advance payment to the Bureau of Reclamation.

Compton replied that the Bureau has advanced $5,000,000 to install this N-7 machinery and equipment, and will be charging the State 3 percent interest on that fund advanced. When we make advance payment to them—say for easy figuring, of $1,000,000, the Bureau of Reclamation is then out of pocket net $4,000,000, and they will charge us interest only on the $4,000,000; therefore, by making the advance payments direct to the Bureau of Reclamation, those advance payments decrease the State's payment of the 3 percent interest charges on the equivalent sum of money.

Compton said that few, if any of the lessees at Basic Magnesium Project, were able or willing to enter into long-term contracts. His

proposal provided a means for them to obtain power on short notice, for which his company took the risk. For his own prospective requirements far less power than a full unit would be necessary. In assuming the obligation for a full unit, a building up of reserve money was necessary, for otherwise they might not be able to meet the annual payments when due, if their revenue from power sales should decrease.

Smith inquired if Compton could estimate what energy rate lessees at Basic Magnesium Project would be required to pay under the new program. Compton replied that he would suggest, as the initial operation, a charge of $6 per kilowatt year (50 cents a kilowatt month,) which is the same charge as they are now paying, plus the Boulder firm-energy rate, be quoted to the lessees for Boulder energy. At a 70 percent load factor, the fixed charges would be approximately one mill, and with an assumed falling water rate of 1.28 mills, would make a cost of 2.28 mills per kilowatt-hour delivered at 230,000 volts at the switchyard at Boulder. If the Bureau of Reclamation is operating the two Basic Magnesium lines from Boulder to Basic, under the proposed Davis operation, and would make a charge of .5 mills per kilowatt-hour for transmitting State of Nevada energy from Boulder to the Basic Magnesium Project, that would make a cost of 2.78 mills at Basic. He said be believes that lessees paying 3 mills per kilowatt-hour could make a successful operation, with this initial charge of $6 per kilowatt year, and after the State had an experience record, quite likely the rate could be adjusted downward.

Shaver asked if the "wheeling" charge of .5 mill from the 230 KV bus at Boulder to the 15.8 KV bus at Basic did not also include the distribution cost inside the Basic Magnesium Project plant grounds.

Compton replied that the inside-plant distribution would be small, and he thought it could be included in the .5 mill charge.

Smith said he wished to have his position on the Southern Nevada Power Company proposal perfectly clear before voting on the resolution; which was his understanding that N-7 would be underwritten as proposed, without any strings being tied to the proposal by Southern Nevada Power Company, unless it might be that the commission reserve an adequate amount of power to meet the future needs of the present State contractors.

Compton replied that the statement was correct, and repeated that he believed the advance payments were necessary, because his company was agreeing to underwrite a generator very much larger than would be necessary if their own needs alone were considered in order to meet their demands for the next 5- or 10-year period.

Mueller stated that the financial risk would fall upon Southern Nevada Power Company alone, for Lincoln County Power District cannot be called upon for any part of it, or be held liable for any part of it. That district is a nontaxable municipality. Their financial set-up does not permit them to be mortgaged or take on any financial liability until their power bonds are paid, bonds bought in part by the government in order to construct a transmission line to Pioche for their use. Overton Power District's use of energy is small and they could not be of much help. The Southern Nevada Power Company must bear the risk, and for that reason he believed we, the Colorado River Commission, should seek to accumulate the advance payments

as a "cushion" available, especially in case of a depression, to help meet future payments.

Cahlan asked that if the proposal is accepted, would it be necessary for lessees at Basic Magnesium Project plant to put up a guarantee to the Colorado River Commission for their power, or would Southern Nevada Power Company take over that responsibility?

Compton replied that the Southern Nevada Power Company would be under obligation to supply power to the machines at Basic. The lessees would be required to obligate themselves to the commission for their energy needs. Their obligation to the commission would be that which the commission incurred in withdrawing the kilowatt-hours for their operations, under the terms of the General Regulations governing withdrawal of power from Boulder Plant by Nevada.

In response to a question by Cahlan as to whether the lessees would be required to post guarantees in advance of receiving power, Compton replied: "As far as the generation of that power—that interpretation that you have stated is correct. Their (the lessees) obligation to the Colorado River Commission of Nevada would be that obligation incurred by the Colorado River Commission in withdrawing the kilowatt-hours of energy which they had advised the commission they would need for their operation. The Colorado River Commission would have to protect itself for that obligation incurred in its withdrawal of the power, or the kilowatt-hours, by asking the lessees to secure to whatever the amount they agree upon, the obligation incurred by the State, only insofar as that obligation is computed, based upon the withdrawn kilowatt-hours. As far as the generating machine or the annual fixed charges upon the generating machine which will be used to supply power to the lessees, the Southern Nevada Power Company is underwriting that obligation for the benefit of Nevada."

Cahlan asked what the obligation of the lessees would be, approximately.

Compton said: "The obligation of the lessee would be the Boulder firm energy rate, estimated at present at 1.28 mills, times the number of years that would be required by the State of Nevada to relinquish that energy under the General Rules and Regulations. If one kilowatt-hour is withdrawn by the lessee at 1.28 mills, and the lessee then advises the commission that he wishes to relinquish that energy and the commission so advises the Secretary in accordance with the Rules and Regulations, the State obligation—if it doesn't use that power and it takes three years to relinquish that energy—the State's obligation would be 1.28 times 3, or 3.84 mills per kilowatt-hour times the number of kilowatt hours which he had withdrawn for his account."

Governor Pittman asked if there was a second to the motion before the commission. It was seconded by Smith, and upon vote was passed unanimously.

Cahlan asked if the Secretary was required to make a complete record of all the proceedings and was informed by Governor Pittman that the secretary recorded all proceedings, clerical and otherwise, and did all of the official work, as his duty.

Mueller said he thought the Governor should be congratulated, as he considered this to have been the most "forward move" ever taken by the Colorado River Commission. He said: "We have been talking

for months, made many trips, done a great many things. We may have taken a little more time than we should have, but I think we've all been diligent. But we have, in my opinion, secured a tremendous proportion of our energy at Boulder Dam at the least possible cost, and we certainly have not involved the State in one single nickel's worth of liability."

The Governor thanked Mueller, and assured the commission that he greatly appreciated the fine cooperation and work done by the members. The Governor said: "I know the engineers have worked diligently and have made many trips to Los Angeles to confer with the City of Los Angeles, the Southern Edison Company, and other interested parties. I think the members, as a whole, are to be congratulated for working out this excellent plan. I think that Mr. Compton has rendered valuable service in bringing this solution about."

Smith said that a number of steps must now be taken, the first of which were given in a letter received by him that morning from Shaver, which he read to the commission as follows:

LAS VEGAS, NEVADA, February 16, 1948.

ALFRED MERRITT SMITH, *Secretary, Colorado River Commission, Carson City, Nevada.*

Following our Engineering Committee discussions with the City of Los Angeles last week, and your conversation with me subsequent thereto, I would like to make the following recommendations:

That the State of Nevada take these four steps in securing generating capacity at Boulder (Hoover) Power plant.

(1) Request the retention of N-7 by the State of Nevada on June 1, 1951.

(2) Retain our interest in present generating capacity in Section G-3.

(3) Reaffirm our request for an allocation of Davis Dam energy.

(4) Enter into negotiations with Metropolitan Water District for the extension of the "recapture" time on N-7.

I believe these steps are necessary, inasmuch as we cannot look forward at the present to any relief in the terms of the Los Angeles proposal, and it would appear that the State of Nevada will protect itself by taking such steps.

In this manner, we acquire the use of generator N-7, and if necessary we may, if desirable, continue our conversations with the City of Los Angeles or the Arizona Power Authority, or we may proceed independently of either.

With this programming of Nevada's needs, we remain an allottee of Boulder energy and not a "purchaser" of capacity from the City of Los Angeles.

I would suggest also, if these steps are taken, that Nevada meet with the Arizona Power Authority, the City of Los Angeles, and the other operating agents, the Metropolitan Water District, and the Bureau of Reclamation, to formulate plans and suggest operating procedure, looking toward the most efficient use of Boulder facilities and the delivery of energy to all allottees.

Very truly yours,

A. J. SHAVER, *Resident Engineer.*

Mueller stated that he had had a telephone long-distance call that morning from War Assets Administration asking him to present to the Colorado River Commission a request on the part of the WAA for an option on N-7 to be made officially by the Colorado River Commission. He suggests that the commission ask WAA to place any ownership or claim WAA may have to N-7 in the form of an option to Nevada, or whatever form the attorney general thinks is proper, and that it be made a part of the Letter of Intent covering the B. M. Project utilities, in order that its transfer to Nevada may be facilitated. He said he had every reason to think WAA would do it, but they would like an official request from the commission.

Mueller thereupon moved that the secretary of the commission notify the WAA that it is the desire of the commission to have an option on N-7 made a part of the Letter of Intent, or if not, be made on an option, such instrument as is recommended by the attorney general. The motion was seconded by Thompson and unanimously carried.

Cahlan asked if the commission should act on the recommendations of Shaver.

Smith said it was his opinion that Shaver's recommendations should be followed up at once.

Compton said that the motion first passed would necessitate the taking over of N-7, and require following the sequence of steps set out in Shaver's letter. The first step would be to request the retention of N-7 by the State of Nevada. That would require correspondence, or the proper letters by the secretary of the commission to the MWD, and when MWD have advised the commission that their board of directors are agreeable to changing their present option of two years by extending it to five years, in consideration of being relieved of their obligation in 1966, then the next step would be to so advise the Bureau of Reclamation in order that the agreement of 1942, to which Nevada is a party, by which Defense Plant Corporation obtained energy from Nevada, could properly be revised or amended to provide for the modification of the option and relief from the obligation; that the reaffirming of the State's request for an allocation of Davis Dam energy also be done. He said he believed that within a week or ten days the Bureau of Reclamation would address a request to the commission asking them to reaffirm their former request for energy from Davis Dam.

Compton then requested that Shaver describe the steps taken by which a settlement was arrived at with the City and Edison Company, on Thursday of the past week in Los Angeles, regarding the overdraft of kilowatt-hours incurred by the State's contractors during the year of operation ending May 31, 1947.

Mueller moved that the Shaver letter of February 16, subject to the consent of the members of the engineering committee, all of whom were present, be submitted as the report of the engineering committee. The motion was passed.

Shaver then proceeded with an account of the discussions had with Roy Martindale representing the City of Los Angeles, regarding the overdraft of energy made by Nevada contractors during the operating year 1946–1947. Our contractors overdrew their obligations in the

The City contended that each Nevada withdrawal in kilowatt-hours should not exceed a maximum demand of 100 percent in kilowatts or horsepower. The Nevada engineers held that so long as the total of all withdrawals made in the past have a combined demand of less than 100 percent, for the total State's load, the State is entitled under the General Regulations to more kilowatt-hours from its total allocated generating capacity, or a total of up to 100 percent. The present total State system load factor being only 36 percent, which is very low, the commission's engineers held that the commission had considerable generating capacity already withdrawn upon which to generate additional kilowatt-hours, and until this capacity had been used up, they should be permitted to withdraw kilowatt-hours without designating any, or at least a very low additional demand. The California allottees were inclined to the view that each separate withdrawal should be based on a demand not to exceed 100% regardless of the total system load demand.

The Bureau of Reclamation at a later date upheld the position of the State, and withdrawals in kilowatt-hours are now being made on the capacity allotted in the past to each contractor, until such capacity has been exhausted on the basis of 100 percent load factor.

LAS VEGAS, NEVADA, OCTOBER 24, 1946

The commission and the City had been negotiating a proposal suggested by the commission to have the City install generators and generate and supply all of Nevada's energy at agreed charges. Apprehension at delay by the City in preparing a contract to supply the State with said generating capacity was expressed, also delay on all sides in working out a settlement on the Nevada energy withdrawals question. Ultimately the withdrawals situation was cleared up.

During this time the commission, through Senator McCarran, had initiated studies looking to acquisition of Basic Magnesium Project, which tentatively entailed the commission taking over major unit generator designated as N-7, which had been installed for the magnesium plant during the war, and upon which War Assets Administration was still obligated for annual charges amounting to about $325,000 per year. While this was under consideration, the City withdrew its proposal to install machinery and generate energy for the State. This did not inconvenience the State, but it rendered useless the great amount of time and expense that had been incurred both by the State and City in working on the proposal with the City.

War Assets Administration had succeeded Reconstruction Finance Corporation in the management of Basic Magnesium Project, and H. J. Atkinson Company had succeeded J. M. Montgomery Company as agent for War Assets Administration at Basic. The commission had experienced some difficulty in obtaining copies of the "Letters of Intent" under which lessees were operating at Basic, due to reluctance of both Reconstruction Finance Corporation and War Assets Administration to send them out prior to making firm contracts.

Several matters of far-reaching importance were discussed, but no action was taken. These included possibility of exchange of energy whereby California allottees would receive Boulder power in exchange for Shasta Dam power for use in northern Nevada. The Sierra Pacific

amount of 22,689,259 kilowatt-hours. Martindale some time previously had requested that we give this our attention without too much delay. Shaver said, "The commission authorized me, as their engineer, to settle the matter. I talked with Martindale Thursday morning, in the presence of Kodil, Vogel, also representing the City, and also two men from Edison Company, one of them named Mason. This overdraft affects the City of Los Angeles, the Southern California Edison Company, and California Electric Company, because the payment, if any is made, will be prorated between them in the ratio of 55, 40, and 5 percent, respectively. We all agreed on the amount of energy overdrawn as 19,570,387 kilowatt-hours."

Compton interrupted, saying that was Southern Nevada Power Company's portion, that the total overdraft was 22,689,259, which Shaver said was correct. Continuing, Shaver said, "Lincoln County Power District's overdraft was 1,732,157; Overton District 1,386,715." Shaver asked Martindale to submit his proposal for settling the overdraft. Martindale asked Kodil to submit figures concerning the cost of the overdraft. Kodil quoted the cost under which Edison Company and the City agreed to supply Arizona with steam-generated energy. I said I was not interested in any figure like five or six mills. They then quoted a figure something like 3.86 mills as being their oil increment cost, and Kodil had that cost based on the prorated cost at each of the City's four steam plants, the cost at each differing slightly.

"Martindale suggested that since Nevada has already paid the 'falling water' charge, and have already paid the generating charges, not including, or not to be excluded from the cost of the two sections, the net cost, or net value of the overdraft was about 2.06 mills. Martindale suggested that since the overdraft had been created by Nevada contractors through no fault of theirs particularly, and it was not allowed through any particular fault of the City, but was a condition created by a series of events brought about by the discussion of certain items brought up in our Withdrawal No. 14, and Relinquishment No. 5, that each party take a half share of the burden. This brought the figure down to 1.03 mills as a net result. I made a suggestion that Nevada be allowed to pay, not in money, but in kilowatt-hours. We could do this by over-obligating ourselves this year or next and deliberately returning those kilowatt-hours to them as secondary energy. They would pay the falling water rate for secondary energy of something under 4 mills. We would have paid for the falling-water charge of roughly, 1.25 mills. So the net difference in falling-water in this event would be a little under one mill—.8 or .9 of a mill. Nevada could pay this in the next year or two, in this way, without cash obligation. The City and Edison thought it would be desirable to settle the 1946–1947 overdraft in money, now; before the end of the current operating year. They were willing to suggest to their respective boards that they be repaid at a rate of one mill. I said I would report to the Nevada contractors, which I have done. Compton stated to me the one mill figure was acceptable to his company. Lincoln District made no commitment, but indicated that it would be satisfactory if o.k. with Overton District, the officers of which I have not yet had time to contact."

Compton said that, by telephone that morning to Martindale, he

had learned that one mill was satisfactory to both Edison and to California Electric Company and that informally he knew it would be satisfactory to the City when brought before their board of directors for action.

Shaver further stated that it had been agreed that if the terms were acceptable to all parties, he was to send a letter addressed to City, Edison, and California Electric, stating the terms of the compromise and the arguments upon which it was based, and that the commission will, for the State contractors, accept a billing of one mill on these overdrafts created during the operating year of 1946–1947. With the commission's assent, he would draft such a letter to be sent by the Secretary to the City, Edison, and California Electric.

Smith moved that the compromise on payment of the Nevada overdraft at Boulder Dam Plant arrived at by Shaver and the California allottees be approved, and that the secretary be instructed to address letters to the interested parties that the compromise proposal would be accepted. Cahlan seconded the motion which was carried by unanimous vote.

Governor Pittman stated that the time had come when we must hasten the proposed contract for sale of the Basic Magnesium Plant at Henderson to the State of Nevada by War Assets Administration. He said all of the men present had read the proposed contract and were familiar with it. He said a motion should be made that will tend to bring the deal to a head in the shortest possible time.

Cahlan then proposed the following resolution:

WHEREAS, The War Assets Administration has submitted to the Colorado River Commission, the fourth draft of a Letter of Intent concerning the acquisition of Basic Magnesium Plant; and

WHEREAS, The Colorado River Commission after careful analysis of the terms and conditions of said Letter of Intent, do approve in principle said Letter; and

WHEREAS, It is the sense of this commission that in taking over said Magnesium Plant, that great and manifold benefits will accrue to the Federal Government, and the State of Nevada as a whole, and particularly to Southern Nevada, where this project is located in close proximity to the great Boulder Canyon Project.

Now Therefore, Be It Resolved, That John V. Mueller be authorized and instructed to proceed to Washington at an early date to confer with the War Assets Administration with a view to bringing negotiations to an early conclusion, in order that the State of Nevada may take over Basic Magnesium Plant without further delay.

The motion was seconded by Thompson, and was passed by unanimous vote. Cahlan said he wished to congratulate the Governor, for the record, for the able manner in which he had carried on the negotiations; to congratulate Mr. Mueller, and the other members of the commission, and to say on behalf of Southern Nevada that he thought this was the most important thing that has happened in the history of the State since the construction of Boulder Dam. The Governor thanked Cahlan and said he concurred in the idea that this was the most important development that had happened in the history of Nevada for a long time, and the most important act of the commisison since its inception.

He said: "We realize that there are many more important things to be done, and we will proceed to carry those matters through to a successful conclusion as best we possibly can. It has been a great pleasure for me to sit with this commission, where everything is discussed in such a free and open manner. Everyone has been frank and honest, and their opinions have been given without reservations. I believe that is the reason we have come to a common conclusion and accord, feeling that it is for the best interest for the State of Nevada."

Mueller said that last night he had been called by long distance telephone by Project Administrator Colonel John Reilly, who said he would need some assistance in being certain that the utilities are taken over, and inasmuch as we had appointed Mr. Shaver as our representative to do so, he thought it would be well to let Mr. Shaver know that he is going to be a very busy man for about 30 days.

Cahlan asked when the State would take over the utilities at Basic Magnesium Project.

Mueller replied that War Assets Administration was very anxious to have us take over all of Basic Magnesium Project. He said: "That is one of the incentives for us to take over everything at once, both utilities and plant, which is much more simple than to take out one particular item. Inasmuch as we have actual title and control of the utilities, we should let nothing interfere with taking them over as soon as possible. I am hopeful that procedure in taking over the plant will catch up with taking over the utilities, as it would simplify procedure."

Smith said action had been taken sometime ago by the Chamber of Commerce of Las Vegas looking toward the formation of a water district. This was about six months ago and the project seemed inactive. He inquired if the commission would like to take some action that might push it along. He suggested a letter to Mr. Archie Grant, chairman of their committee, asking what progress is being made.

Mueller said they were now actively going ahead, and Shaver said that he had learned that all the petitions were in, excepting one, and they wanted to get that one in before taking action. He said they already had enough signatures to call for the water district election. The chairman said that if there was no objection it would be the desire of the commission that the secretary address a letter to Mr. Grant inquiring as to progress. (The formation of such a district is primary to obtaining Mead Lake water for Las Vegas partly through the pipe line and pumping facilities now in control of the Colorado River Commission.)

Smith referred to the request by the Colorado River Commission for an allocation of 90,000 kilowatts of energy per year from Shasta Dam power plant, for withdrawal and use as needed in northern Nevada, made on June 4, 1947. He said that since the request was made it had been consented to by the Bureau of Reclamation subject to availability of transmission facilities, and that the bureau had prepared and had submitted to the commission a tentative contract. (Copies of said contract had been sent to all members of the commission and its engineers by the secretary.)

Smith said that since the contract had been received, the Sierra Pacific Power Company, apparently to forestall effective action on the part of the State and the bureau to bring in lower-priced power, had

entered into a new contract with Pacific Gas and Electric Company for sufficient energy to apparently meet all northern Nevada needs for several years. He had not seen the contract but the deal had been widely publicized in newspapers as a boon to Nevada, with statements that it would make ample power available for industry and that the rates would be lower. Smith said he had been asked recently by Harvey McPhail, chief electrical engineer for the Bureau of Reclamation, as to what Nevada's intentions were, and if we had plans for marketing the energy we had asked for.

Smith said the success of the plan had been contingent upon transmission of the energy over the transmission lines of P. G. & E., and Sierra Pacific, into the Reno area, and sale of it as a block to Sierra Pacific for their markets. His inquiries and suggestions to Sierra Pacific Company that an attempt be made to do this had met with negative reception by Sierra Pacific, who are opposed to direct entry of Shasta Dam power into the area being served by them under Nevada franchise.

Smith thought the new P. G. & E.-Sierra Pacific contract might forever prevent the advent of lower priced energy from Shasta Dam coming to Nevada. All Shasta Dam energy would now be sold to P. G. & E. at the damsite, as the sole major marketing agency, and the additional requirements of Sierra Pacific Company would then be supplied by P. G. & E. and be marketed by Sierra Pacific, both being private companies which can to a considerable extent control their rates. The terms of sale of energy to Sierra Pacific, and charge for transmission over the lines of P. G. & E. to a point in the Sierra Nevada mountains, plus the cost to Sierra Pacific for transmission over its own lines from the point of junction to Reno, would now determine the energy rate.

At this point Shaver, in order to have a statement in the record, referred to the situation developing at Boulder in regard to Transformer Bank Y. Technical discussion of location and use of machinery followed, showing that several agencies were now taking advantage of Bank Y, but that Southern Nevada Power Company was being forced out of Bank Y in part and onto their own transformer at Basic. Changes in the setup of transformers were recommended to overcome this trouble. Mueller asked if Bank Y had not been installed at the request of Nevada, and we therefore should have first call on its use. Smith said that although Bank Y had been put in for Nevada, and Nevada was obligated to make the payments on it, the bank, like all other machinery at the plant, remained the property of the United States. In short, we buy it, and pay for it, but the U. S. owns it. So when, as a matter of expediency the bureau wished to help Metropolitan Water District sell its unused kilowatt-hours to Kingman, Arizona, and the easiest way was through our Bank Y because we were not then making use of its full capacity, the bureau used the idle capacity in the bank and credited us with that part of the charges. Then other similar loads were placed on the bank until now it is fully loaded, and there is no more capacity in it for Nevada. For a time this helped us by relief of a part of the carrying charges which lowered our costs, and is reflected in our rates, but now when we need the full 45,000 KVA of the bank we cannot get it, as other parties are on it.

Mueller said that as we are now being shoved off to a further extent

to make room for others, why should not some of these be made to provide their own transformer facilities, since we need Bank Y. All we can get off it now is 39,000 KVA which is less than the load of Southern Nevada Power Company.

Compton said the bureau could not very well help itself with respect to the Boulder City load, and to help them out, he asked if the commission would have any objection to allowing the Bureau of Reclamation to use the No. 9 Bank at Basic for the length of time it would take them to secure the delivery of suitable transformers to supply the Boulder City load, and then return the No. 9 Bank to Basic at no cost to the Federal Government, War Assets, or the State of Nevada. In reply to a question by Mueller, Compton said that there should be a payment made by the bureau for the use of this equipment. In other words, the No. 9 Bank, and the No. 3 Bank (now at Parker Dam, but State property) would be rented to the bureau until the bureau can secure the additional equipment needed. Compton said he would take this up with the bureau and get its views for presentation at the next meeting of the commission. Mueller expressed approval, saying it would result in income for the commission, as we own the transformers, and the suggested plan is the type of business we must now follow.

Shaver asked them: "When this Bank No. 3 is brought back from Parker Dam, where it now is in use by the bureau, would the bureau buy it or continue to rent it from us and place it in the Boulder Project, or would they acquire it by some other means and charge it to the Boulder Project? The bureau is now paying a rental of either $1,200 or $1,700 per month to WAA for use of Bank 3. Mueller said he thought it was close to $3,000 per month. Shaver said Nevada would like to now receive that revenue, on taking over B. M. Project. Compton said that with respect to the bureau paying to the Colorado River Commission a monthly lease rental, whatever lease or rental is agreed upon would have to take into consideration that when the bureau returns the transformer to the Basic plant, the rental would stop. The Bureau of Reclamation would then have no further use for the transformer. But if they put it down in the vicinity of the Metropolitan District switchyard at Boulder, he thought Nevada should analyze the purposes it would be used for; how much of it will be used for Boulder City load, and how much of it might be used to supply stand-by to Nevada's power operations, and then determine what the rental should be on the part of the bureau for its partial use of the bank. He said that there might be engineering and/or physical difficulties that would prevent such an operation, but he would discuss it with the bureau. He considered that a suggestion which had been made by the bureau to put a transformer on top of the roof of the powerhouse for this purpose was impractical.

There followed a long off-record discussion between Mueller and Smith regarding the Shasta Dam power situation. Mueller stated that when all elements of cost and expense were considered, the bureau's proposal would permit no lower rates—or not as low—as would be possible under S. P. P. Co's. new contract with P. G. & E. Co. Governor Pittman suggested that Smith discuss the contract with George

Devore, assistant manager of S. P. P. Co. No action was taken by the commission.

The meeting was adjourned at 5:30 p. m.

LAS VEGAS, NEVADA, MARCH 9, 10, 1948

A committee from the town of Henderson, which had heard that as soon as the commission took charge of the utilities, housing rentals at Henderson would be increased, or that a charge would be made for electricity, water and service heretofore delivered free by the government was present, and several of the committeemen made statements and presented reasons as to why no change should be made in rentals, and suggesting that no change be made in the procedure from as it had been in the past under government control.

The unequivocal position of the commission was that every legitimate source of income should be taken advantage of in order to eliminate the losses at which the project had been operated by RFC and its successor, WAA, for otherwise neither the operation of the utilities or the project could successfully be undertaken by the State.

The committee from Henderson proposed:

1. If the utility service (light, water, sewerage, maintenance of household equipment, etc.) was to be charged for, the rent on the houses should be reduced to offset it.

2. Delay action with respect to the housing until the State can take over both the utilities and the plant at the same time.

3. When the State takes the utilities, War Assets Administration should provide operation and maintenance amounting to about $3,000 per month.

Henderson housing rentals, which were below the average for the Las Vegas area, and also included free utilities, were discussed at length. Representatives of Stauffer Chemical Co., and Guy F. Atkinson Co., who were present, were averse to a change, fearing an increase in rents of houses for their employees would be at once reflected by labor union requests for increases of pay. War Assets Administration representatives on the other hand advocated such in increased charge for utilities be made by the State, although they had not made such charge during their own operations.

Various phases of the problem were discussed, including a proposal to sell houses to employees at Basic Magnesium Project, but not to others. Governor Pittman explained to the Henderson committee that if the State took over the Basic Magnesium Project utilities only on April 1, the State would have no other source of revenue to supply the houses with electricity and water than what could be derived from a charge for same, but if both the Basic Magnesium Plant and the utilities were acquired at one and the same time, possibly a different plan could be worked out with the assistance of the unions and the lessees operating the plant. He said they all must realize that the State is not trying to make a profit, but it could not run behind for the Legislature had not set up any fund to provide payment if the commission ran behind. In case of a deficit, the State would have to turn the utilities back to War Assets Administration as quickly as possible,

and that would probably result in the destruction of the complete Basic Magnesium Project. The Governor also said:

"Your problems and ours are mutual, and we most earnestly want to work them out. Everyone of you may feel sure that we are going to do all we can to arrive at a good, fair, and practical solution of this question. But we cannot give you an answer now, for we do not know what it will be. We want to do all we can for the people out there at Henderson and we are working to that end with all the sincerity we have in our making."

Some members of the Nevada State Board of Control were present at this meeting. The law under which the commission had authority to acquire Basic Magnesium Project required the joint consent of the Board of Control and the Colorado River Commission. Some members of the Board of Control had felt they were not sufficiently familiar with the proposal to intelligently vote on it, and a few days prior to this meeting had asked the secretary of the commission in the absence of the Governor, who was out of the State at the time, to more fully acquaint them with the proposal and such steps as had been taken. Thereafter the secretary met with the Board of Control and detailed the measures taken up to that time and submitted copies of the Letter of Intent to take over the project.

The fifth and last draft of the Letter of Intent to take over Basic Magnesium Project was read and discussed by the Attorney General. It had been approved by the Administrator and the General Counsel of War Assets Administration. Approval as to form and legality by the Attorney General of Nevada was also required.

The Letter of Intent being an agreement for Nevada to take over control and operation of all utilities at Basic Magnesium Project, was formally approved by the commission. The text of this document as finally executed on October 6, 1947 is attached as Appendix No. 3.

A. J. Shaver, who had formerly been authorized and instructed to set up the utilities for the commission, made a brief report, and stated that payment of utility employees would have to be made out of present Colorado River Commission funds until the first returns came in from the utilities. Shaver was asked to proceed in forming a complete utility organization so as to be ready when the commission took over the utilities on April 1.

At this meeting the commission voted to increase its application for Davis Dam power to one-third of the total plant output.*

It was ordered that the State charge of one-tenth mill per kilowatt-hour be increased to two-tenths, as the Colorado River fund had decreased to about $60,000, and a further increase of expenses was expected.

Sustaining membership in the sum of $250 was voted for the Colorado River Water Users Association.

*On August 20, 1948, the commission received official information from the Bureau of Reclamation that the State of Nevada had been allocated 45,000 kilowatts from Davis Dam to be sold temporarily by the bureau to Los Angeles, Pasadena, Glendale, and Burbank, but subject to recapture by Nevada in any increments desired upon one year's advance notice to the bureau. The complete allocation and explanatory text by the bureau is attached as Appendix No. 11.

CARSON CITY, NEVADA, MARCH 24, 1948

All five members of the State Board of Control were present, including the Governor. The Letter of Intent, being an agreement on the part of the commission, acting for the State, to take over the Basic Magnesium Project was, after some discussion and questions, approved by the Board of Control, one member present not voting, as he said that he had not had time to study the proposal.

It was agreed by the State to take control of both the utilities and the B. M. Project plant entirely on April 1, 1948.

Compton, speaking for Southern Nevada Power Company, asked if the commission after taking charge of the B. M. Project, would desire to renew a contract with his company to deliver power to Henderson Townsite at 69,000 volts, for another year, until May 31, 1948. If so, Southern Nevada Power Companay desired to withdraw an additional 20,000,000 kilowatt-hours.

Compton also asked if the commission would like to renew a contract for power for pumping water for Basic Magnesium Project from June 1, 1948, to May 1, 1949. About 9,000,000 kilowatt-hours were annually required for pumping, which the company supplied at 3½ mills per kilowatt-hour.

These two contract renewals were approved, together with Southern Nevada Power Company's request for the withdrawal of an additional 20,000,000 kilowatt-hours, to become effective October 3, 1948, as Withdrawal No. 21.

Compton said he had prepared a contract for Southern Nevada Power Company to underwrite generator N-7 and associated equipment, and wished to submit it for consideration. The chairman suggested that copies of the contract be handed the members for study, after which action could be taken on it at a meeting to be held in Las Vegas on March 30, 1948.

A request by the U. S. Air Force for delivery of five large motor-generator sets at Basic was considered and denied, as the members considered they add much to the value of the plant, and their disposal could easily prevent the consummation of highly desirable leases, very necessary to make the project successful.

Shaver, engaged in setting up operation of the utilities at Henderson for the commission, submitted utility rates he had prepared to be filed with the Public Service Commission.

LAS VEGAS, NEVADA, MARCH 30, 1948

Compton read his proposed supplemental contract to underwrite generator N-7, which is included in this chapter as Appendix No. 2, previously referred to. Compton made the following statement regarding the contract, which statement is given verbatim as transcribed at its meeting:

"Mr. Chairman, the payment of $15,000 per month, commencing January 1, 1948, and terminating May 31, 1951, constitutes a payment of $615,000 in a form of generating costs. After May 31, of 1951, the State will be responsible for 100 percent payment of the generating charges allocated against the State by the United States for Sections G-7 and T-7. The Southern Nevada Power Company, under this supplemental contract, underwrites the State of Nevada 100 percent for

such cost as will be allocated to the State by the United States for such charges on Sections G-7 and T-7. The draft submitted a few days ago, which Mr. Smith has discussed, provided that starting May 31, or June 1, 1951, the company would be entitled to certain credits; one credit being $6,000 per month, or $72,000 per year, the other credit being $6 per kilowatt per year of kilowatts of capacity in Sections G-7 and T-7 served by the State to other State power contractors.

"At a meeting in September of 1947, the Southern Nevada Power Company presented a form of request to the Colorado River Commission for Generator A-9, stating therein they required 40,000 kilowatts or the capacity of half-unit A-9, which could be 45,000 or 50,000, as the capacity required by the company for the operation of its own system. The State of Nevada has a right to request generating capacity at Boulder to meet the requirements of its power users, and in the judgment of the power company, for our own operations we will require 45,000 kilowatts of capacity. The Colorado River Commission decided that the installation of Generator A-9, plus the A-3 Transformer Bank, equivalent to a full-sized unit, would not fulfill the State's requirements for power insofar as other State power contractors were involved. Therefore, no request was made, and no further action was taken by the State on the Southern Nevada Power Company's request. The company now has submitted another supplemental agreement.

"The basis of this new plan is that the company requires 45,000 kilowatts capacity for its own use. At the meeting in September the Lincoln County Power District representatives objected to 45,000 kilowatts of generating capacity (for which the company was willing to pay 100 percent of such cost) being installed for the exclusive use of our company. To satisfy Lincoln County Power District, and Overton Power District, we provide in this supplemental contract, that 14,000 kilowatts of capacity shall be held in reserve for their (L. C. P. D. and Overton Dist.) uses. It shall not cost them any money until such time as they notify the State that they desire a portion or all of the 14,000 kilowatts. The Southern Nevada Power Company will pay those costs for the other power users until such time as these other power users' power requirements are such that they desire to use a portion of this 14,000. That is a concession to the Lincoln County Power District by the Southern Nevada Power Company. Southern Nevada Power Company, as I stated, wants 45,000 kilowatts of capacity. That's what we feel our operations will require, and we are willing to pay for.

"N-7 genenator has a capacity, or a name-plate rating of 82,500 kva, which at 100 percent load factor is 82,500 power factor. Forty-five thousand kilowatts for Southern Nevada Power Company, Lincoln County Power District, and Overton Power District, leaves 35,000 kilowatts for use by other State power contractors. The lessees at the Basic Magnesium Project are now using approximately 32,000 to 35,000 kilowatts of capacity. The remaining capacity in N-7 is 35,000 kilowatts, which will carry the existing loads at the Basic Magnesium Project, for which the contract provides they shall pay $6 per kilowatt-year. The power cost to the lessees at Basic at $6 per kiolwatt-year, with a firm energy rate of 1.28 mills per kilowatt-hour, which is slightly greater than the present firm energy rate, makes a power cost of 2.26

mills. Assuming $320,000 as the annual cost of Generator N-7, which the Southern Nevada Power Company is willing to underwrite for the State, and further assuming that the lessees at Basic shall have a demand of 35,000 kilowatts at $6 a kilowatt-year, means that the power lessees would pay a total sum of $210,000 annually for the 35,000 kilowatts. The Southern Nevada Power Company would pay $320,000 less $210,000 or $110,000. Now on the surface that might not look equitable, but I believe there isn't a member of the Colorado River Commission who says or feels that the Southern Nevada Power Co. should necessarily pay a higher power cost for its power from Boulder than any other State power contractor shall pay. Using the figures that are quoted, and the estimated generating charges prepared by the Bureau of Reclamation for the year ending May 31, 1948, the Southern Nevada Power Co. will pay, in addition to the $110,000 on N-7, $86,000, or a total payment of $196,000, and based on the assumed kilowatt-hours used in the estimated generating charges for the year of operation ending May 31, 1948, the Southern Nevada Power Company's power cost is 2.73 mills per kilowatt-hour. In other words, gentlemen, the Southern Nevada Power Company is paying five-tenths of a mill per kilowatt-hour more for its power than the lessees at Basic. We're underwriting a unit on which the lessees at Basic can come and go, in accordance with withdrawal and relinquishment provisions under the General Regulations. They can enter into a five-year contract, a ten-year contract, a 15-year contract, or any length of contract they desire, but for the charge of $6 per kilowatt-year, they are getting their power for less cost than the Southern Nevada Power Company.

"I believe Mr. Smith has in mind also that portion of the contract which provides that, as determined by the company, there is unused capacity in the 45,000 kilowatts, except for the use of the company and that other State power contractors may use that excess at $6 per kilowatt per year. Unless the load increases and existing load requirements on Southern Nevada Power Company system are drastically reduced by economic reasons within this area I don't believe the Southern Nevada Power Company should, or the Colorado River Commission members will, ask the Southern Nevada Power Company to give up kilowatts of capacity in N-7 to-wit, up to 45,000 kilowatts, because actually 45,000 less 14,000 reserved for Lincoln and Overton, leaves Southern Nevada only 31,000 kilowatts, and that 31,000 kilowatts will all be required by the company. As additional power requirements are required for lessees at Basic, the additional power requirements will have to come through either of two ways: Davis Dam energy, or the installation of additional generating machinery and equipment at Boulder. When additional machinery and equipment are installed at Boulder, all of you are aware that whoever contracts for that installation shall contract to pay for the balance of the 50-year period or until May 31, 1987. So as the first step in a solution to the power problem and a power supply for the lessees at Basic, there's 35,000 kilowatts in N-7 at a cost per kilowatt-hour less than what Southern Nevada Power Company will pay, what Lincoln County Power District will pay, and what Overton Power District will pay, and by blending that power within a certain ratio with kilowatt-hours available from Davis, power deliveries can be made to the lessees

at Basic at reasonable power cost, and when I say reasonable, I mean probably cheaper than you can get it any other place in the country."

The engineering committee was authorized to contact E. W. Rockwell of Metropolitan Water District, for engineering services in a study of the proposed contract between Southern Nevada Power Company and the State of Nevada, and for any other purposes necessary.

Mueller raised a question as to whether, under the terms of our agreement with War Assets to take over Basic Magnesium Project, we could enter into a contract with Southern Nevada Power Company that specified a charge of $6 per year demand charge to lessees, which might possibly, under some conditions, yield a profit. Our contract with War Assets Administration requires that the commission sell power to the Basic Magnesium Project lessees at net cost.

Subsequently sub-sections 15(a) and 15(b) were rewritten in such a way as to prevent any profit in the sale of power by the State. (See Appendix No. 2).

Mr. Ralph Alsup, President of the Metal Trades Council, appeared and presented arguments for not raising house rentals at Henderson.

A letter from War Assets Administration dated March 19, 1948, signed by M. L. Godman, Deputy Administrator, Office of Real Property Disposal, was read as follows:

GENTLEMEN: Reference is made to that certain Letter of Intent covering the Basic Magnesium Plant located at Henderson, Nevada, executed on March 17, 1948, by the War Assets Administrator, and to be executed by the Chairman and Secretaries of the Colorado River Commission, and the State Board of Control, upon presentation.

In accordance with the provisions of this Letter of Intent, representatives of the War Assets Administration and the Colorado River Commission have agreed that the purchaser shall be placed in possession on April 1, 1948. This letter, when duly signed by the Deputy Administrator, Office of Real Property Disposal, War Assets Administration, accepted by the Colorado River Commission, and approved by the Nevada State Board of Control, together with the above referenced Letter of Intent, when executed, shall be your authorization to enter the premises of the Basic Magnesium Plant and take possession thereof

It has been determined that it is feasible for your commission to take actual possession as of April 1, 1948, of all the area contained in such plant which is now under lease, as well as all the entire electric transmission and distribution systems, the water supply system and the sewage disposal systems, will be placed under the custody and control of your commission on April 1, 1948. It is essential that this Administration retain certain portions of this facility to complete certain plant inventories, disposal of chapels and hospital, and for other purposes. It is understood and agreed that these portions of the plant will be turned over to the Colorado River Commission, from time to time, as the need for same by the War Assets Administration is fulfilled.

All rentals and other income accruing after April 1, 1948, shall be payable to the Colorado River Commission, and the Colorado River Commission shall assume all responsibility and liability for taxes,

maintenance, fire protection, power costs, and any other expenses incidental to the operation or maintenance of the portion of the Basic Magnesium Plant placed in the custody of the commission as of April 1, 1948. Your commission will assume the same responsibility and liability for other portions of the plant at the date that same is placed in your possession. The Project Administrator, Colonel John R. Reilly, is authorized to determine the prorata portion of expenditures for protection and maintenance which must be paid by Colorado River Commission until such time as they assume the total cost on the whole plant.

This letter is executed in duplicate, and it is requested that you return one copy to this office upon the acceptance and approval of same as indicated by the proper State officials.

Sincerely yours,

M. L. GODMAN,

Deputy Administrator, Office of Real Property Disposal.

At this meeting a formal motion was passed to not make any changes in Henderson rentals or place a charge for utilities and service at this time.

On the morning of April 1st the commission reconvened, and upon the report and recommendation of the engineering committee, formally approved the contract for Southern Nevada Power Company to underwrite Generator N-7 (Appendix No. 2).

In response to questions, and during discussions as to the power rate that would develop under this contract and new conditions, Compton made the following statement:

"A figure of 3 mills per kilowatt-hour was arrived at by taking a six-dollar per kilowatt per year charge at a 90 percent load factor and adding thereto the Boulder Firm energy rate of 1.28 mills per kilowatt-hour and also adding .5 of a mill per kilowatt-hour as a charge of getting the power from the Boulder switchyard to the lessees at Basic. That, on those assumptions will be the charge for the lessees at Basic who have purchased capacity and are taking that power from Section G-7, but it must be borne in mind through the interchange agreement that will be entered into between the State of Nevada and the Bureau of Reclamation for the interchange of Boulder-Davis energy over the Boulder-Davis 230 kv. transmission line, will result in stand-by capacity to the N-7 generator. It is not possible to state what the result in charge as coming out of that contract will actually be, but I feel that taking into account the various charges that have been referred to in the Letter of Intent that the power lessees will be able to get their power for a charge of approximately 3 mills to 3½ mills, and I believe there is very good indication that a charge of 3 mills per kilowatt-hour will probably be the prevailing rate for Boulder energy alone delivered for use of lessees at the Basic Plant."

Smith stated: "Mr. Chairman, I think the contract with Southern Nevada Power Company is very fair. It has been carefully worked out, and is fair to present lessees and it offers strong inducement to future operators coming in to locate at Basic for the reason that a definite power cost can be given them—at least definite within certain

narrow limits, and it is a desirable setup from every point of view. It solves a large number of perplexing problems that have been troubling us for some time. I am very much in favor of the contract and I will vote for its approval."

The contract was signed by the parties thereto on May 6, 1948.

It was ordered that the licensing board of Clark County be requested to issue no gambling or liquor linceses for Henderson Townsite.

Discussion of accounting methods, employees, bonding of employees, followed.

A recess was then taken to go out to Henderson. Upon arrival there the meeting reconvened with representatives of War Assets Administration present, and formally took possession of Basic Magnesium Project. The Letter of Intent, which was signed by Governor Pittman and Secretary Smith on March 30, 1948, under which the State took possession, is attached hereto as Appendix No. 5.

Under the terms of the agreement Col. John R. Reilly, War Assets Administration Project Administrator at Henderson, had been designated to remain as War Assets Administration representative.

CARSON CITY, NEVADA, APRIL 8, 1948

The meeting had been called in response to a request by Senator George W. Malone, who was accompanied by Harvey F. McPhail, Director, Branch of Power Utilization, U. S. Bureau of Reclamation. Present also from U. S. B. R. Region II were J. P. Elmore, Chief, Marketing and Sales Division, and Leland O. Graham, Attorney, Region II, U. S. B. R.

Senator Malone at some length stated his ideas regarding a prepared plan for the State of Nevada to contract for the 90,000 kilowatts from Shasta Dam that had been reserved for it at the request of the commission. The Bureau had submitted a tentative contract to the commission which is commented upon elsewhere in this chapter and is included as Appendix No. 6. The main objective of the meeting was, however, consideration of means by which northern Nevada might obtain a limited amount of Shasta power at once, without delay, to relieve a distressing power shortage and "brownout."

A committee was appointed by the Governor from the large number of representatives of civic, business, and municipal groups present, which committee agreed to meet with the commission's engineers that night to work out an emergency contract with the bureau. This was done and the contract was sent to Washington for official processing by the bureau's heads. Long before this had been accomplished the power shortage was relieved by timely storms in the Sierra Nevada Mountains.

The necessity for such an emergency contract still exists. Western power production, particularly in California and Nevada, cannot keep up with the demand. Outlook for power supply to the Reno area served by Sierra Pacific Power Company has improved as a result of a new contract it has made with Pacific Gas and Electric Company, which requires additional and heavier transmission lines over the Sierras, but the "wheeling" of any bureau power over any of these lines has been denied by the power companies. Possible use of such Federal power has reached an impasse as a result of a lack of Nevada

resale contracts, which are required by Nevada law before the State, as represented by the C. R. C., can contract for electric power from the bureau or any other source. The development of northern Nevada is retarded by lack of sufficient electric power, in the opinion of all municipalities represented at the conferences.

LAS VEGAS, NEVADA, APRIL 30, 1948

The commission had been told by certain members of the Bureau of Reclamation that if Nevada delayed securing a space or pit in Boulder Dam plant for the installation of a generator, the few remaining pits might be filled by the generators of other allottees, and then at a later date, when Nevada would need to withdraw energy from its allotment, no space in which to install the machinery would be available, in consequence of which the State would be shut out from obtaining additional energy from Boulder Dam plant, regardless of its 18 percent allocation.

The commission, as well as other members of the bureau, are of the opinion that the Boulder Canyon Project Act and the Supplementary Boulder Canyon Project Adjustment Act insured to Nevada a total of 17.6259 percent of the total firm energy generated at Boulder Dam, and the responsibility of delivering same to Nevada, subject to the General Regulations which are a part of said Acts, rests squarely upon the Bureau of Reclamation.

The commission ordered that a letter be directed to the Secretary of the Interior on the subject, asking for a commitment that no situation be permitted to develop at Boulder Dam which would in any way prevent or interfere with withdrawal by Nevada of its full allotment of energy.

Subsequently the commission's secretary and the attorney general sent the following letter:

May 12, 1948.

HONORABLE JULIUS A. KRUG, *U. S. Secretary of the Interior, Washington, D. C.*

DEAR MR. SECRETARY: In accordance with the Boulder Canyon Project Adjustment Act (54 Stats. 774) and the General Regulations approved and promulgated for generation and sale of power thereunder, dated May 20, 1941, the State of Nevada was allocated 17.6259 percent of the firm energy generated at Hoover Dam Power Plant.

The government's obligation to deliver energy to the State is set forth in Section 10(a) of the Master Contract between the U. S. of America and the State of Nevada, dated May 29, 1941, and reads as follows:

"10. (a) Subject to:

(i) * * * * * * * * * and

(ii) * * * * * * * * *; the

United States will deliver to the State energy in the manner required by this contract, in the quantity to which the State is entitled hereunder, and in accordance with the State's load requirements."

Also, see Section 8(b) and 9(a) of the same contract.

Section 4(b) (iv) of the said General Regulations provides the manner in which the States (Arizona and Nevada) may withdraw and use

the energy allocated to each. This section in part provides as follows:

> Except as hereinabove provided in this article, each of the States of Arizona and Nevada may at any time prior to May 31, 1987, enter into a contract or contracts with the United States which shall entitle it to all or any part of the energy allocated to it for use within such States. Such contract or contracts shall continue in force until May 31, 1987, but shall obligate the United States to deliver energy, and the State to take and/or pay for the same, only in accordance with notices of withdrawal of energy and notices of relinquishment of energy given as hereinafter provided.

So much of the energy allocated to the States not contracted for by them, and not in use by them or the Metropolitan Water District of Southern California, shall be taken and paid for by the other allottees according to specified percentages for each allottee. Section 4(b) (iv), under "Schedule of Withdrawal of Energy," also provides: "* * * All energy taken by the State shall first be released by the City, the Company, and the Nevada-California Electric Corporation severally in the proportion of their respective obligations with reference thereto. In the event that energy required by the State shall be in quantity exceeding that which the above allottees are obligated so to release, such excess, to the extent that energy allocated to the State may be in use by the District, shall be released by the District."

All of the energy allocated to the States is now being generated upon machinery installed for use by other allottees, and is in use by them, except such energy as has been withdrawn by Nevada. This generating machinery, however, remains the property of the Government. It it apparent when such energy is diverted to the States, that subject to physical facilities for delivery it may still be generated in the same manner as when it is in use by other allottees, and upon the same generators. In accordance with the contract and regulations it is the responsibility of the Bureau of Reclamation to see that the States receive the energy allocated to them when withdrawals are made.

Recently a question has arisen as to whether a condition might develop under which it would be impossible for the State of Nevada to take the energy to which it is entitled.

Generators and appurtenant transformers and switching equipment are installed at the request of the respective allottees to meet their demands. There are spaces for 15 major unit generators of 82,000 kva and 2 units of 40,000 kva in Hoover Dam Power Plant. Major unit generators have been installed in 12 spaces; two more are requested by the State of Arizona. One of the two smaller generators has been installed. There now remains available only one space for a major unit designated as N-8, on the Nevada side of the power plant, and one space for a so-called half unit, A-9, on the Arizona side of the plant.

If for any reason other allottees should request and have generators installed in the two remaining spaces, would Nevada be prevented from taking the remainder of its allocation of energy? The State has requested and is in process of contracting for use of Generator N-7 after June 1, 1951, at which time it will assume the annual charges upon

that unit. The State will require an additional unit, or the equivalent of the capacity of another unit, from some other source in the power plant in order to withdraw its full allocation, but it cannot legally at this time assume the responsibility of requesting a second generator in order to hold a space for it in the power plant.

The foregoing details are explanatory of a request which is hereby made that you take such steps as may be necessary in order to protect the State of Nevada's interests and rights to generating capacity through which it may withdraw and use its full allotment of energy from Hoover Dam Power Plant; and to put each allottee on notice that no generating machinery and equipment shall be installed at said power plant in such a manner that it may in any event preclude Nevada from withdrawing the full allotment of energy to which it is entitled at any time in the future.

Respectfully yours,

COLORADO RIVER COMMISSION OF NEVADA.

ALFRED MERRITT SMITH, *Secretary.*

ALAN BIBLE, *Attorney General for Nevada, Legal Advisor.*

cc: E. A. Moritz, U. S. Bureau of Reclamation, Director Region No. 3, Boulder City, Nevada; C. P. Christensen, Director of Power, Hoover Power Plant, Boulder City, Nevada; Samuel B. Morris, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, and Harvey McPhail, Director, Branch of Power Utilization, U. S. Bureau of Reclamation, Washington, D. C.

The following reply was received from the Department of Interior seven weeks later:

UNITED STATES DEPARTMENT OF INTERIOR
OFFICE OF THE SECRETARY

WASHINGTON 25, D. C., July 7, 1948.

MR. ALFRED MERRITT SMITH, *Secretary, Colorado River Commission of Nevada, Reno, Nevada.*

MY DEAR MR. SMITH: Reference is made to your letter of May 12, 1948, relative to reservation of generating capacity at Hoover power plant for the State of Nevada.

Consideration has been given to your request that steps be taken to protect the State of Nevada's interest and rights to generating capacity through which it may withdraw and use its full allotment of energy from Hoover dam power plant. You have stated that your State has requested and is in the process of contracting for the use of generator N-7 after June 1, 1951. It is assumed that the use of Unit N-7 would take care of the State's additional needs at that time.

No allottee has requested installation of Unit N-8 or A-9. If some agency other than Nevada makes such a request first, then will be the time to consider the question you are now raising. It is impossible at the present time to predict the conditions that will exist, if and when some allottee other than Nevada requests the installation of N-8 and A-9, but if and when that occurs such request will not be acted upon without giving full consideration to the views and rights of your State.

The need for generating capacity from which Nevada may withdraw and use its full allotment of energy is recognized. Regional Director Moritz informs me that during a conference in Boulder City, May 8, 1948, with representatives of the State of Arizona and your operating agent relative to arrangement of switching facilities for Units A-3 and A-4, there was considerable discussion about arranging all new equipment so that generating units or capacity therein may be reassigned if and when the States require additional capacity.

Sincerely yours,

WILLIAM E. WARNE,

Assistant Secretary of the Interior.

The Attorney General and the commission feel that while the letter from the Department of the Interior offers some assurance that Nevada's power will be safeguarded, to a certain extent it still "begs the question," and further clarification of this important point is necessary.

It was ordered by the commission that the Southern Nevada Power Company-Colorado River Commission agreement for the said company to underwrite Generator N-7 be submitted to War Assets Administration, and thereafter be put in such form as would be satisfactory to War Assets, after which, with the approval of Southern Nevada Power Company, it was to be resubmitted to the Attorney General, and following his approval as to form and legality, it be approved by the commission. It was agreed by the commission that in order to save time, approval of the final contract could be made by each member after examining it, without the formality of a meeting.

Applications for withdrawal of additional energy by Southern Nevada Power Company were read and approved. The first application, No. 22, was for 5,000,000 kilowatt-hours, maximum demand 768 HP energy, to become available on or about November 3, 1948. The second application, No. 23, for 7,600,000 kilowatt-hours, maximum demand 1,170 HP, to be available about May 3, 1949.

It was noted that these applications were for capacity in excess of the amount remaining available to Nevada on Sec. G-3 under the State contract with Los Angeles. However, the commission is making arrangements for additional capacity, and demands for energy over our allotted right on Section G-3 are to be supplied from new sources.

It was stated that there had been a meeting in Reno of a group composed of city of Reno officials, representatives of the Reno Chamber of Commerce, the Sierra Pacific Power Company, and officials from several other towns in Northern Nevada, to discuss the advisability of approving a contract between the Sierra Pacific Power Company and the Pacific Gas and Electric Company, which would make more energy available and provide for extensive installation of additional transmission lines and other improvements. A report on the proposed contract had been prepared by Secretary Smith in compliance with a request by the above group, and the report was read at the meeting after which the proposed contract between the two power companies was approved by the group. The text of this contract appears as Appendix No. 7, and the report of the secretary as Appendix No. 8.

The secretary stated that the committee appointed by the aforesaid group had decided to continue investigations for securing Shasta Dam power, and in particular to provide against another "brownout."

No action was taken by the commission at this time as the emergency power shortage in Northern Nevada had ceased to exist.

Mr. Shaver stated that the total overdraft of energy above Nevada's authorized withdrawals would probably amount to 8,000,000 kilowatt-hours out of a total of about 174,000,000 kilowatt-hours of Nevada use, or 4 percent. He said he thought the City was trying to drive a rather hard deal with Nevada on a settlement for this overdraft by charging the full Los Angeles steam-power generating rate for it. He stated that it would be difficult if not impossible to forecast the annual use by Nevada closer than 4 percent of the total.

A lease to the Coulter-Hardin Company was approved, covering Building J-2 and other equipment, to be used in a process for the recovery of magnesium metal from slag and dross left in the plant at the time Defense Plant Corporation suspended operations.

Authority was granted John V. Mueller to approve and ratify assignments of contracts from War Assets Administration to the Colorado River Commission.

CONCLUDING NOTES

On June 27, 1948, subsequent to the last meeting here recorded, Charles A. Thompson, member of the commission since December 23, 1943, died. The members were deeply grieved to lose a valuable and beloved associate, who was an outstanding leader in Southern Nevada.

At this date, August 10, 1948, the Basic Magnesium Project is operating under the temporary management of John V. Mueller, a member of the Colorado River Commission, at no salary other than the legal fixed rate of pay per day for service as a commissioner when officially occupied, including travel and subsistence. Leases at the Project are being transferred from War Assets Administration to the commission. The two major lessees, Stauffer Chemical Company and Western Electrochemical Company, are operating to the full extent of their present capacity and both of these firms plan increased operations.

No detailed cost and income statements have been submitted to the commission by the temporary management at this date, August 10, 1948, but incomplete information indicates that the income exceeds expenses, and that War Assets Administration, which maintains representatives at the plant who must approve all transactions and procedures, is satisfied with the takeover proceedings as they are being conducted by the Colorado River Commission.

LIST OF APPENDICES

1. War Assets Administration-Southern California Edison Company contract to supply Basic Magnesium Project with power to May 31, 1951.
2. Southern Nevada Power Company Supplemental Contract with Colorado River Commission to underwrite Generator N-7.
3. Letter of Intent—Operation of Basic Magnesium Project Utilities by Nevada.
4. Analysis of City of Los Angeles Proposal for Supplying All Generating Capacity for Nevada, by E. W. Rockwell.
5. Letter of Intent—Purchase and Operation of Basic Magnesium Project.
6. Proposed Contract with United States Bureau of Reclamation for Shasta Dam Power.
7. Pacific Gas & Electric Company-Sierra Pacific Power Company Contract.
8. Report on Contract Between Pacific Gas & Electric Company and Sierra Pacific Power Company, Relating to Shasta Dam Power.
9. Summary of L. G. McNeil Report on Basic Magnesium Project.
10. Allocation of Davis Dam Power by U. S. Bureau of Reclamation.
11. Los Angeles Proposal to Supply All Generating Capacity for Nevada.

APPENDIX 1

Contract for Sale of Electric Energy to War Assets Administration for Use at Its Basic Magnesium Project

1. THIS CONTRACT, made this first day of June 1946, between WAR ASSETS ADMINISTRATION (hereinafter referred to as "WAA"), established by Executive Order 9689 (11 F. R. 1265); the CITY OF LOS ANGELES, a municipal corporation of the State of California and its DEPARTMENT OF WATER AND POWER (said department acting herein in the name of the CITY but as principal in its own behalf as well as in behalf of the CITY, and the term "CITY" as herein used being deemed to include both the CITY OF LOS ANGELES and its DEPARTMENT OF WATER AND POWER); the STATE OF NEVADA, a body politic and corporate, and its COLORADO RIVER COMMISSION (said COMMISSION acting in the name of the STATE but as principal in its own behalf as well as in behalf of the STATE and the term "NEVADA" as herein used being deemed to be both the STATE OF NEVADA and its COLORADO RIVER COMMISSION); and the SOUTHERN CALIFORNIA EDISON COMPANY, LTD., a private corporation organized and existing under the laws of the State of California (hereinafter referred to as EDISON).

WITNESSETH THAT:

2. WHEREAS, that certain contract (hereinafter referred to as "DEFENSE PLANT CONTRACT") dated the ninth day of May 1942, Symbol and No. 11r-1387, was entered into between DEFENSE PLANT CORPORATION, (a corporation created by RECONSTRUCTION FINANCE CORPORATION pursuant to Section 5d of the RECONSTRUCTION FINANCE CORPORATION ACT, as amended), which said corporation pursuant to Public Law 109, approved on June 30, 1945, was dissolved effective July 1, 1945, and all of its functions, powers, duties, and authority, together with its documents, books of accounts, records, assets, and liabilities, of all kind and nature, were transferred to Reconstruction Finance Corporation (hereinafter referred to as RFC) to be performed, exercised, and administered by Reconstruction Finance Corporation in the same manner and to the same extent and effect as if originally invested in the Reconstruction Finance Corporation, and severally United States, City, Edison, California Electric Power Company, Metropolitan Water District, and Nevada, wherein a power supply as made available to Defense Plant Corporation for use at its Base Magnesium Plant (hereinafter referred to as "Basic") near Las Vegas, Nevada, which contract terminated as to such power supply as of midnight, May 31, 1945, and—

3. WHEREAS, That certain contract (hereinafter referred to as District Resale Contract), dated the 31st day of May 1945, Symbol and No. 11r-1458, was entered into between the United States (acting for that purpose by Harold L. Ickes, Secretary of the Interior) and severally RFC, a corporation created by the Reconstruction Finance Corporation Act, as amended, the City, Edison, California Electric Power Company, and the Metropolitan Water District wherein, among other things, a power supply was made available by City and Edison

to RFC's Basic Plant, and the said power supply provisions of said contract terminate as of midnight May 31, 1946, and—

4. WHEREAS, WAA has acquired all the rights and title of RFC to the Basic Plant and electric equipment used in connection therewith, including among other things 220,000 volt transmission lines from its Basic Plant to Boulder Powerhouse and certain 220 kv. switching facilities at said Boulder Powerhouse known as Section T7A, and WAA is desirous of obtaining a power supply for said Basic Plant for a five-year period commencing June 1, 1946, and—

5. WHEREAS, City and Edison are willing upon the terms and conditions hereinafter set out to supply WAA the electric energy required for the operation of its Basic Plant, provided Nevada agrees not to withdraw Boulder energy for said purpose, and Nevada is willing to so agree in consideration of City and Edison agreeing to supply said electric energy.

6. NOW, THEREFORE, In consideration of the provisions and conditions herein contained the parties hereto agree as follows, to wit:

7. *Electric Energy Supply.*

(a) Electric energy will be delivered by the City and Edison Company to Section T7A at the Boulder Power Plant at approximately 220 kv. in the form of three (3) phase alternating current at a frequency of approximately sixty (60) cycles per second.

(b) The electric energy required to be delivered under this contract shall be for use solely at the Basic Plant and operations incidental thereto including the pumping of water from Lake Mead for said plant but exclusive of electric energy for use at Henderson townsite.

(c) All electric energy delivered hereunder will be measured at approximately 13,200 volts at the Basic Plant on metering equipment installed and maintained at said plant at the sole expense of WAA. For the purpose of computing the maximum demand and the amount of energy delivered to WAA at Section T7A at Boulder Power Plant one and one-quarter per centum (1¼%) shall be added to the meter readings to cover line and transformer losses. Meters shall be tested at any reasonable time at the request of either WAA, City, or Edison, and in any event shall be tested at least once each year. If the test discloses that the error of any meter exceeds one percent (1%) such meter shall be adjusted so that the error does not exceed one-half of one percent (½ of 1%). Meters shall be kept sealed between tests and all tests of said metering equipment shall be conducted only when representatives of WAA and City and/or Edison are present.

8. *Rates.*

(a) The rate for energy delivered hereunder shall consist of a combination demand charge and energy charge.

(b) The demand charge for all monthly demands up to a maximum of 35,000 kws. shall be fifty cents (50¢) per kilowatt of monthly thirty (30) minute maximum demand, but not less than $12,500 per month in any event.

(c) For all thirty (30) minute monthly maximum demands in excess of 35,000 kilowatts the demand charge shall be seventy-five cents (75¢) per kilowatt of such excess monthly demand.

(d) The basic energy charge per kilowatt-hour shall be the Boulder firm energy rate effective in each Boulder contract year plus one (1) mill per kilowatt-hour .

(e) In any contract year when the output of the Boulder Power Plant for such year is 5,750 million kilowatt-hours or more, the basic energy charge of paragraph (8d) above shall be the total energy charge.

(f) In any contract year when the output of the Boulder Power Plant for such year is less than 5,750 million kilowatt-hours a fuel charge shall be added to the basic energy rate of paragraph (8d) above as follows:

1. For each five (5) cents that the average daily posted (ADP) price of PS400 (or equivalent) fuel oil in the Los Angeles Basin is in excess of $1.10 per barrel up to and including $1.25 per barrel, the added fuel charge shall be 0.05 mills per kilowatt-hour.

2. For each five (5) cents that the ADP price of such fuel oil in the Los Angeles Basin is in excess of $1.25 per barrel, the added fuel charge shall be 0.10 mills per kilowatt-hour.

3. The fuel charges of (1) and (2) above shall be computed monthly.

(g) For the purposes of determining the charges under this contract monthly, the electric energy output at the Boulder Power Plant for each contract year shall be the last previous output agreed upon for said year by representatives of the Boulder Operating Agents and the United States Bureau of Reclamation (commonly referred to as the Boulder Integrating Committee) as provided in Article 20b(ii) of the Contract for the Operation of the Boulder Power Plant, dated May 20, 1941, Symbol No I1r-1333.

9. *Service.*

(a) In any year of operation during the term of this contract, neither City nor Edison shall be obligated to deliver to WAA more than fifty percent (50%) of the kw-h. required by WAA for said purposes, and in the event either City or Edison shall fail to make available all or any part of said fifty percent (50%) of said kw-h., the other shall not be obligated to make good said deficiency or any part thereof; provided nothing herein shall prevent either City or Edison, in case of deficiency, from supplying at its option said deficiency or any part thereof. In the event either City or Edison supplies any such deficiency in kw-h., the party so supplying shall be entitled to be paid therefor upon the basis herein set out.

(b) City and Edison shall not be liable for any damage or loss resulting directly or indirectly from interruptions in service occasioned by strike, fire, drought, act of God, or the public enemy, or other reasonably unforeseen or unavoidable cause.

(c) Edison and/or City shall not be required to curtail or impair service to customers within the State of California, including deliveries to other utilities; and Edison and/or City shall have the right to reduce or discontinue service to WAA without liability, when deemed by either of them to be necessary to prevent any such impairment or

curtailment, provided that there shall be a prorata reduction in the monthly demand charges in the event of such reduction or discontinuance of service.

10. *Withdrawal by Nevada.*

Nevada agrees that it will not during the five-year term of this contract withdraw electric energy from the Boulder Project under the terms of existing contracts for delivery directly or indirectly to the Basic Plant in lieu of energy to be delivered by City and Edison under this contract except as to withdrawals which will be effective on or after June 1, 1951, provided, that such agreement by Nevada shall not limit or in any way affect Nevada's right to withdraw energy for any other purpose.

11. *Billing and Payment.*

City and Edison shall each bill WAA monthly on or before the tenth of the month for their respective shares of the demand charge and energy charge for the previous calendar month. WAA shall pay said bills within twenty days after receipt thereof. At the end of each contract year the said monthly payments shall be subject to adjustment to reflect the correct billing for the year in accordance with the terms hereof.

In the event WAA shall fail to pay bills rendered when due, the City and/or Edison may, at their option, discontinue service. If bills are not paid when due, an interest charge of one per centum (1%) of the amount unpaid shall be added thereto, and thereafter an additional interest charge of one per centum (1%) of the principal sum unpaid shall be added on the *30th* day of each succeeding calendar month until the amount due, including such interest, is paid in full. Nothing contained herein shall be construed as in any manner abridging, limiting, or depriving City and/or Edison of any means of enforcing any remedy, either at law or in equity, for the breach of any of the provisions hereof which it would otherwise have. In the event there is any dispute with respect to any billing under the terms of this contract, payments made shall be subject to adjustment upon final determination by the Board of Control.

12. *Board of Control.*

The City, Edison, and WAA, shall each designate in writing, a person to constitute a Board of Control, and as between City, Edison, and WAA, said Board of Control shall determine all matters involved in connection with the delivery of electric energy under the terms of this contract, and their decision shall be binding upon the parties hereto. In the event of disagreement between the members of the Board of Control, the decision of such person as shall be selected by them shall be accepted by the parties as the decision of the Board of Control, and be controlling.

13. *Waiver.*

The waiver of a breach of any of the provisions of this contract shall not be deemed to be a waiver of any provision hereof or of any other subsequent breach of any provision hereof.

14. *Terms.*

The term of this contract shall be from June 1, 1946, to May 31,

1951, inclusive, provided that WAA shall have the right to cancel this contract at any time after three years upon written notice given six months in advance.

15. *Notices.*

(a) Any notice, demand, or request required or authorized by this contract to be given or made to or upon the City shall be delivered or mailed postage prepaid to the General Manager and Chief Engineer of the Department of Water and Power, City of Los Angeles, Los Angeles, California.

(b) Any demand, notice or request required or authorized by this contract to be given or made to or upon the Edison Company shall be delivered or mailed postage prepaid to the President of the Southern California Edison Company Ltd., Los Angeles, California.

(c) Any notice, demand or request required or authorized by this contract to be given or made to or upon WAA shall be delivered or mailed postage prepaid to.....with copy thereof to the Manager, Basic Magnesium Project, Las Vegas, Nevada.

(d) Any notice, demand or request required or authorized by this contract to be given or made to or upon Nevada, shall be delivered or mailed postage prepaid to the Chairman of the Colorado River Commission of Nevada, Carson City, Nevada.

(e) The designation of any person specified in this article or in any demand or request or the address of any such person may be changed at any time by notice given in the same manner as provided in this article for other notices.

16. *Officials Not To Benefit.*

No member of or delegate to Congress or resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract as made by a corporation or company for its general benefit.

17. *Identification of Contract.*

This contract shall be known as WAA's Basic 1946 Energy Contract.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be executed the day and year first above written.

Attest:
.....

WAR ASSETS ADMINISTRATION,
By.....

Attest:
.....
Secretary.

THE CITY OF LOS ANGELES,
Acting by and through its Board of Water and Power Commissioners,
By.....
President.

Attest:
.....
Secretary.

THE CITY OF LOS ANGELES,
Acting by and through its Board of Water and Power Commissioners,
By.....
President.

Attest:

.....
Secretary.

STATE OF NEVADA, Acting by and through its Colorado River Commission,

By.....
Chairman.

Attest:

.....
Secretary.

STATE OF NEVADA, Acting by and through its Colorado River Commission,

By.....
Chairman.

Approved as to form and legality this.....day of....., 1946,
Ray L. Chesebro, City Attorney.
By.....
Chief Assistant City Attorney.

Attest:

.....
Secretary.

SOUTHERN CALIFORNIA EDISON COMPANY, LTD.,

By.....
President.

APPENDIX 2

Supplemental Contract to the Contract Entitled "Contract For Electrical Energy With Southern Nevada Power Company" of October 10, 1941.

1. This supplemental agreement made this .... day of May, 1948, by and between the STATE OF NEVADA, a body politic and corporate, and its COLORADO RIVER COMMISSION (said commission acting in the name of the State, but as principal in its own behalf as well as in behalf of the State; the term State as used in this supplemental contract being deemed to be both the State of Nevada and its Colorado River Commission or its successors), acting in pursuance of an act of the Legislature of the State of Nevada, entitled, "An Act creating a commission to be known as the Colorado River Commission of Nevada, defining its powers and duties, and making an appropriation for the expense thereof, and repealing all acts and parts of acts in conflict with this act," approved March 20, 1935, (Chapter 71, Statutes of Nevada, 1935) and acts amendatory thereof or supplemental thereto, (hereinafter referred to as the State), and the Southern Nevada Power Company, a corporation organized under and by virtue of the laws of the State of Nevada, and being empowered to carry on, conduct and transact the business of buying, selling, and transmitting electrical energy for profit as a public utility, (hereinafter referred to as the Company).

RECITALS

2. WHEREAS, The State and the Company did enter into a contract dated October 10, 1941, for the sale of electrical energy generated at Hoover Power Plant, and

3. WHEREAS, The State did, pursuant to the Boulder Canyon Project Act, enter into a contract with the United States of America for the sale to the State of electrical energy generated at Hoover Power Plant, and it is provided in said contract that the State of Nevada shall be entitled to generation of electrical energy by means of Section G-3; and

4. WHEREAS, The kilowatts of generation capacity now available in Section G-3 for use by the State at Hoover Power Plant is no longer sufficient to meet the State's power requirements and it is necessary to provide for additional generating machinery at Hoover Power Plant to meet the State's additional power requirements; and

5. WHEREAS, The transformer capacity of Section T-1-B.1, commonly known as transformer bank "Y" through which the present State of Nevada Power contractors receive electrical energy is fully loaded and it is necessary to provide for additional transforming capacity at Hoover Power Plant to meet the State's additional power requirements; and

6. WHEREAS, The Company, in the performance of its obligation as a public utility to supply electric energy to the inhabitants of Clark County, Nevada, in accordance with a Certificate of Public Convenience and Necessity as granted by the Public Service Commission of Nevada, dated July 5, 1929, finds it necessary to request the State to provide for

its use additional generating and transforming capacity at Hoover Power Plant to meet the growing demands of customers; and

7. WHEREAS, Lincoln County Power District No. 1, Overton Power District No. 5, and Southern Nevada Power Company, are joint users of Sections G-3, T-1-B.1 and T-1-B.2 and each pay their prorata share of operation, amortization and replacement costs in the ratio of the number of kilowatt-hours of energy used by each; and

8. WHEREAS, Article 12 (a) of the contract dated October 10, 1941, referred to above provides as follows:

Energy Rates and Generating Charges

The rates and charges to be paid by the Company for electrical energy shall be as follows:

A. The cost to the State as charged the State by the United States Government, under the provisions of Exhibit 3, for all electrical energy contracted for by the Company or for all electrical energy delivered to it if such electrical energy is in excess of the minimum herein contracted for and such additional charge as the State may deem necessary, but not exceeding three-tenths mill ($0.0003) per kilowatt-hour, to apply toward reimbursing the State for the costs of administration incurred by the Colorado River Commission of Nevada.

The Company shall pay hereunder its pro rata share of the annual costs of operation, amortization and replacements of all facilities installed by the United States Bureau of Reclamation and required and used for the delivery of electrical energy to the Company, with the intent and purpose that said costs shall be borne equitably and on pro rata basis by all contractors of power using facilities through contracts with the State, or otherwise.

If, in the opinion of the State, any cost to be paid by the State to the United States cannot equitably be apportioned between all contractors purchasing energy from the State in the ratio of the number of kilowatt-hours of energy used by each, then the Company shall pay such proportion of the said cost as the State may determine to be equitable and just; and

9. WHEREAS, Sections G-7 and T-7 (Unit N-7 and N-7-8) Transformer Bank and associated 230-Kv. Switchyards were installed by the United States for use by Defense Plant Corporation under an agreement to which the United States of America, Defense Plant Corporation, Metropolitan Water District of Southern California, therein called "District," the City of Los Angeles, therein called "City," and all other power allottees from Boulder Canyon Project are parties, entitled "Agreement Arranging and Power Supply for Defense Plant Corporation," dated May 9, 1942, which contract provides in Article 305 thereof, in part, as follows:

* * * During the period of segregation Sections G-7 and T-7 may be used to generate Boulder Energy, if any which Defense Plant may have procured; and during said period of segregation the Secretary may arrange for the use of said sections for other parties, including the United States, which

may have rights to take Boulder Energy, and the receipts from such arrangements shall be credited to Defense Plant's obligation regarding said sections during said period * * *; and

10. WHEREAS, The said agreement dated May 9, 1942, also provides in said Article 305 thereof, in part as follows:

> * * * Said period of segregation shall terminate, and the District agrees to assume all generating costs for Sections G-7 and T-7, on June 1 of the year of operation following the year of operation in which either one of the following events has occurred:
>
> (a) The usage by the District in the operation of its aqueduct system has exceeded 1,000,000,000 kilowatt-hours in any one year of operation;
>
> (b) The integrated 30-minute demand in the operation of the District's aqueduct system has exceeded 150,000 kilowatts; but in no event later than June 1, 1966; *provided*, that at the option of the District it may terminate said period of segregation and assume said costs at an earlier date *upon written notice of two years* to the Secretary, through the City as Operating Agent; and

11. WHEREAS, The Colorado River Commission of Nevada, by letter dated February 20, 1948, addressed to the Metropolitan Water District of Southern California stated in part as follows:

> At a regular meeting of the Colorado River Commission of Nevada, held in the Governor's Chambers, Carson City, Nevada, on February 18, 1948, this Commission voted to take over Sections G-7 and T-7 at Boulder (Hoover) Power Plant to be used in generating a power supply for the State of Nevada, providing above-mentioned Article 305 is amended so that the Metropolitan Water District of Southern California will not be obligated to assume the generating costs of Sections G-7 and T-7 on May 31, 1966, or under any condition except through exercising an option upon written notice of five years; and

12. WHEREAS, It is contemplated that the Metropolitan Water District of Southern California will agree to such an amendment and as a result the generating costs of Sections G-7 and T-7 will then become the obligation of the State of Nevada;

AGREEMENT

13. NOW, THEREFORE, In consideration of the premises and of the provisions, covenants and conditions herein contained, the parties hereto agree that the Agreement between the parties hereto dated October 10, 1941, be and the same is hereby supplemented and amended as follows, to-wit:

14. That the State shall arrange with the United States for the generating rights of Sections G-7 and T-7 at the Hoover Power Plant.

15. That:

(a) 45,000 kilowatts of the capacity of said sections G-7 and T-7

shall be for the use of the Company in the performance of its obligation as a public utility to supply electric energy to the inhabitants of Clark County, Nevada, in accordance with the Certificate of Public Convenience and Necessity granted to the Company by the Public Service Commission of Nevada, under date of July 5, 1929. Portions of said 45,000 kilowatts, not in excess of a combined demand of 14,000 kilowatts, may be used by Lincoln County Power District No. 1 and Overton Power District No. 5 at a generation charge of $6 per kilowatt per year, or at the generation charge specified in paragraph 15(b) hereof, whichever is the smaller.

The remaining capacity of said Sections G-7 and T-7 may be used by other State power contractors at a generation charge of $6 per kilowatt per year, or at the generation charge specified in paragraph 15(b) hereof, whichever is the smaller; *provided, however,* that when the Company requires additional kilowatts of capacity in excess of the amount available to the Company from Sections G-3 and T-1-B.1 (Bank "Y") and Sections G-7 and T-7, then said remaining capacity of Sections G-7 and T-7 (to-wit: The amount in excess of 45,000 kilowatts) shall be for the use of the Company to the extent said remaining capacity has not then been contracted for by other State power contractors. During such times as the whole of the said 45,000 kilowatts of capacity of said Sections G-7 and T-7 is not required by the Company, as determined by the Company, other State power contractors may use such unused portions thereof, at a generation charge of $6 per kilowatt per year, or at the generation charge specified in said paragraph 15 (b) hereof, whichever is the smaller, during such time as such unused portion is not required by the Company.

(b) During any year of operation in which the combined kilowatts withdrawn by or the kilowatt demand (whichever is the greater) of all purchasers of capacity from Section G-7 and T-7, multiplied by $6 per kilowatt will equal or exceed the total annual generating charges on said sections for such year of operation, then and in such event the generation charge per kilowatt for such year, will be the total annual generating charge for said Sections divided by the combined kilowatts withdrawn by, or kilowatt demand (whichever is the greater) of all said purchasers. By the words "year of operation" as herein used shall be meant the period from June 1st of one year to May 31st of the next succeeding year, both dates inclusive.

(c) Each contract entered into by the State covering the sale of capacity in Sections G-7 and T-7, shall provide that each contractor shall be required to pay for the amount of capacity so contracted for throughout the life of such contract and that such contract may not be terminated, nor may the amount of capacity contracted for thereunder be relinquished, except upon the effective date of "Notice of Relinquishment," given as provided in Article 4(b) (iv) of the General Regulations. In each such contract, provision shall also be made that the contractor shall be obligated to pay for the kilowatts withdrawn for its account or for the kilowatts of its actual demand, whichever is the greater.

(d) The State will not enter into contracts for the sale of capacity in Sections G-7 and T-7 for use in the area then being served by the Company, without its written consent.

(e) In addition to the charge for the generation of electrical energy stated herein, and herein called "generation charge" each State power contractor shall pay to the State the usual electrical energy charge at the firm energy rate in effect during the year of operation such energy is generated.

16. All State power contractors will make their own arrangements with the State for the withdrawal and relinquishment of electrical energy and horsepower to meet their requirements in accordance with the General Regulations.

17. In addition to the payments provided for in the agreement between the parties hereto, to which this is Supplementary, the Company shall pay to the State hereunder, as follows:

(a) For the period beginning January 1, 1948, and ending May 31, 1951, the sum of fifteen thousand ($15,000) dollars per month. It is agreed that said payment, as made by the Company to the State shall immediately be paid by the State to the United States, pursuant to Article 22 of the General Regulations.

(b) For the period commencing June 1, 1951, and until the termination of this Supplemental Agreement, the Company shall pay to the State the annual cost of amortization, replacement and operation of said Sections G-7 and T-7, as said costs shall be allocated by the United States to the State, pursuant to Article 17 of said General Regulations, *provided, however*, that the generating charges paid to the State by the Company under Section 17(a) herein, shall, at the option of the Company be reflected in the form of reduced generating charges to the Company after June 1, 1951, in a manner and in an amount determined by the Company, of which manner and amount, the Company will notify the State in writing; *and provided further*, that for the period commencing June 1, 1951, and until the termination of this Supplemental Agreement, the Company shall be entitled to a credit in an amount equal to the amount charged for all capacity from said Sections G-7 and T-7 sold by the State or contracted to be sold by the State to power contractors other than the Company.

18. The kilowatts of capacity to which the Company, the Overton Power District No. 5 and the Lincoln County Power District No. 1 are entitled in Sections G-3 and T-1-B.1 (Bank "Y") shall be deducted from their respective total withdrawals or their respective kilowatt demands, whichever is the greater, in computing the generation charge set forth in Section 15(b) hereof.

19. The State agrees that the present State power contractors will preserve to each other the proportions of generating and transforming capacity in Sections G-3, T-1-B.1 and T-1-B.2 as such proportions existed during the year of operation ending May 31, 1947.

20. It is agreed between the parties hereto that should the Metropolitan Water District of Southern California exercise the option referred to in Article 305 of the "Agreement Arranging a Power Supply for Defense Plant Corporation," dated May 9, 1942, as the same may be amended, this Supplemental Agreement shall terminate as and when said Sections G-7 and T-7 shall have been taken over by said Metropolitan Water District of Southern California through the City of Los Angeles as Operating Agent.

21. It is understood and agreed by and between the parties hereto

that if the remaining capacity of said Sections G-7 and T-7 (to-wit: The amount in excess of 45,000 kilowatts) plus the amount of power offered the State from Davis Dam Project on or before June 1, 1951, is less than 80,000 kilowatts, then and in such event the parties hereto will renegotiate this contract as may be necessary to provide for an equitable distribution of the generating capacity of the said Sections G-7 and T-7.

22. Except as herein specifically supplemented and amended the said contract of October 10, 1941, shall remain in full force and effect.

STATE OF NEVADA, acting by and through its Colorado River Commission.

Attest:
ALFRED MERRITT SMITH,
Secretary.

VAIL PITTMAN,
Chairman.

COLORADO RIVER COMMISSION OF NEVADA.

Attest:
ALFRED MERRITT SMITH,
Secretary.

VAIL PITTMAN,
Chairman.

SOUTHERN NEVADA POWER COMPANY.

S. J. LAWSON,
President.

C. WENGART,
Director.

G. RONNOW,
Director.

W. R. BRACKEN,
Director.

Attest:
C. WENGART,
Secretary.

ALLYE LAWSON,
Director.

I, the undersigned, the Honorable Vail Pittman, Governor of the State of Nevada, do hereby ratify and approve the foregoing Contract for Electrical Energy, under the power vested in me by Chapter 71 of the 1935 Statutes of Nevada, pages 147–152.

Dated this 6th day of May, 1948.

VAIL PITTMAN,
Governor of the State of Nevada.

Attest:
JOHN KOONTZ, *Secretary of State.*
By MURIEL LITTLEFIELD, *Deputy.*

APPENDIX 3

Letter of Intent—Operation of BMI Project Utilities by Nevada

WAR ASSETS ADMINISTRATION

Washington 25, D. C., September 16, 1947.

In reply refer to: AGR-I, Plancor 201, Basic Magnesium, Henderson, Nevada, (Electric, Water and Sewerage Systems).

COLORADO RIVER COMMISSION, *Carson City, Nevada.*

GENTLEMEN: With respect to the proposal of the Colorado River Commission, dated June 12, 1947, to lease, take over and operate the entire electric transmission and distribution systems, the water supply system and the sewage disposal system located at the Basic Magnesium Project, Henderson, Nevada, the War Assets Administrator, acting for and on behalf of Reconstruction Finance Corporation, under and pursuant to Executive Order 9689, dated January 1, 1946, and the powers and authority contained in the provisions of the Surplus Property Act of 1944 (58 Stat. 765) and SPA Reg. No. 1, as amended (11 F. R. 408) (hereinafter called "Lessor") has approved such proposal for the leasing, taking over and operating of the above referenced electric, water and sewerage systems by the Colorado River Commission (hereinafter called "Lessee") upon the following terms and conditions:

A. The rental for the leased premises shall be one dollar ($1) per year payable upon the execution of this Letter of Intent. Said rental of $1 per year shall be payment in full by the Colorado River Commission of Nevada for the use and occupancy of the premises and also payment in full for the value of any options, preferences or rights of War Assets Administration for the purchase of power for BMI property, the exercise or enjoyment of which may be necessary or convenient to the Colorado River Commission under this lease.

B. The lease shall run for a period of one (1) year from the date of acceptance of this Letter of Intent and may be terminated on thirty (30) days' notice by either party in the event such services are no longer required for the operation of the Basic Magnesium Project. The lessee shall have the right to renew this lease for ten additional periods of one year each upon the same terms and conditions, by giving notice of such renewals thirty (30) days prior to the expiration of each term.

C. The Colorado River Commission shall operate and maintain such systems as economically as possible and furnish the lessees now in the plant, as well as future lessees in the plant, any purchaser or purchasers of any or all of said plant, and the War Assets Administration, or its successors, such service as is required at actual cost.

D. Coincident with such lease, War Assets Administration shall assign to the Colorado River Commission whatever rights it may have at that time to any agreement for the purchase of power for the Basic Project.

The following items are to be allowed in computing the cost of supplying power:

1. Cost to Nevada for firm energy delivered at present delivery points in Boulder Switchyard.
2. Demand changes, if any.
3. Transmission losses.
4. Distribution losses.
5. Labor for maintenance and operation.
6. Materials for maintenance and operation.
7. Telephone line rental for load dispatcher.
8. Reasonable general overhead and administrative costs.
9. Power factor penalties.
10. Pay roll taxes and insurance.
11. Operation of necessary automotive equipment.
12. Premiums for comprehensive and public liability insurance.

The following charges are not permissible as items of cost:

(a) State of Nevada and Clark County taxes on the transmission and distribution systems.

(b) Amortization charges on the transmission and distribution systems.

(c) Any profit from the power deliveries to the plant lessees or War Assets Administration.

(d) Rectifier operation, unless paid for by the consumer.

The following items of cost are allowed in computing the cost of the operation of the water and sewerage systems:

1. Labor for operation and maintenance.
2. Pay roll taxes and insurance.
3. Reasonable general overhead and administrative costs.
4. Materials for operation and maintenance.
5. Power for pumping and operation, at rates based on paragraph C above.
6. Operation of necessary automotive equipment.
7. The following charges are eliminated as items of cost:

(a) State of Nevada and Clark County taxes on water and sewerage systems.

(b) Amortization charges on the water and sewage systems.

(c) Any profit to the Colorado River Commission or its agent from the sale of water to plant lessees or War Assets Administration.

E. Statement of the State Auditor of Nevada shall be furnished to War Assets Administration at the termination or expiration of this lease and annually thereafter in the event of extension thereof, showing the actual costs for the year. (Charges not justified by such audit shall be adjusted.)

F. The lessee shall be permitted to enter into contracts with other parties for the sale of water, or for the pumping of such water, with the approval of such contracts by the lessor.

G. The lessee shall be permitted to charge the individual domestic and commercial consumers in the town of Henderson, Nevada, the legally established rates for electric and water services, such charges to cover the cost of purchased power for the town of Henderson, Nevada, and the expense of maintenance and operation of the utility facilities located therein.

H. In the event the Southern Edison Company does not submit a proposal deemed acceptable to lessor for the use of generator known as N-7, located at Hoover Dam, Nevada, whatever rights lessor may have to the use of this generator may be assigned to the lessee on a mutually agreeable basis.

I. Lessee at its own expense shall carry insurance on the property and equipment covered by this agreement against fire, windstorm and such other hazards in such companies and amounts as shall be satisfactory to lessor. Such insurance policies shall be made payable to the Treasurer of the United States for the protection of all interests and be delivered to lessor for safekeeping. In the event lessee fails to procur such insurance as it is obligated to procure, or pay any of the premiums when due, the lessor may at its option procure such insurance and pay any delinquent premiums and require lessee to immediately reimburse it for such cost, which cost shall be considered additional rental and immediately become payable. Lessee shall be obligated to save lessor harmless against any loss or damage because of injury to persons occurring on the said leased property during lessee's occupancy thereof. Lessee will procure and maintain at its cost public liability insurance and property damage insurance in such amounts and with such companies as lessor shall approve or require. Policies evidencing such insurance shall name Reconstruction Finance Corporation, acting by and through the War Assets Administration, as assured, and be delivered to lessor.

J. Lessee agrees to operate all the above-mentioned utilities, including but not limited to water treatment, softening and chlorination, to the satisfaction of the lessor or its representatives, and to grant free access at all times to any and all parts of the leased property to the lessor or its representatives for inspection of the premises and methods of operation. Lessee shall likewise be granted free access to enter any portion of lessor's properties known as Basic Magnesium Project for the purpose of carrying out the provisions of this agreement.

K. The lessee agrees to obtain firm commitments from consumers of power at Basic Magnesium Project to take and pay for specified amounts of electrical energy.

L. The lessee agrees to use diligence in promptly exercising its rights to withdrawal of electrical energy in order to provide an ample supply of power for Basic Magnesium Project at the lowest costs possible.

M. As long as this interim use lease is in force, lessee shall keep the leased property and equipment which it uses hereunder in a good state of repair, at its cost, for the period of such use, ordinary wear and tear, damage or destruction by fire, flood, hurricane, acts of God, war, riot, insurrection or public disorder, or due to causes without lessee's fault or negligence excepted.

N. The lessor reserves the right to assume the obligations of any or all plant lessees, in whole or in part, for the furnishing of such utility services by lessee at any time.

This Letter of Intent is executed in quadruplicate and it is requested that you indicate your acceptance hereon by having the chairman and secretary of the Colorado River Commission execute and return to this administration three (3) counterparts hereof. Upon your acceptance, your possession of the above-described premises for the purposes

herein set forth and subject to the foregoing terms and conditions is authorized effective sixty (60) days after the execution of the interim power contract now under negotiation between War Assets Administration and Southern California Edison Company.

Sincerely yours,
M. L. GODMAN, *Deputy Administrator,*
Office of Real Property Disposal.

Accepted this 6th day of October, 1947.

COLORADO RIVER COMMISSION.
VAIL PITTMAN, *Chairman.*
ALFRED MERRITT SMITH, *Secretary.*

Approved: STATE BOARD OF CONTROL.
VAIL PITTMAN, *Chairman.*
ALICE C. MAHER, *Secretary.*

APPENDIX 4

Analysis of City of Los Angeles Proposal For Supplying All Generating Capacity For Nevada

October 20, 1947.

MR. ALFRED MERRITT SMITH, *Colorado River Commission, Office of State Engineer, Carson City, Nevada.*

MY DEAR SIR: I have examined the City's proposed agreement for "Furnishing Generating Capacity for the State of Nevada" which you handed me in Carson City on October 6, 1947, and I have compared the City's proposed generating system with a State's system consisting of electrical equipment authorized and paid for by the State and installed at Hoover Dam. Comparative cost data for the two systems are included in a report entitled an "Analysis of City's Proposal for Generating Capacity for Nevada," which is transmitted herewith. The report indicates that there is but little difference in the cost of the two systems; the State's system being lower in cost for loads of low load factor and the City's system being lower in cost for loads of high load factor. However, the State's system has a slight advantage in lower cost on the basis of selling unused generating capacity to other users of Boulder energy.

The report also indicates that the City's proposal should include additional benefits to the State in order to place the two systems on a more equal basis as follows:

1. The proposed rate of $7.50 per kw.-year covers the cost of one generating unit and sufficient transformer capacity for stand-by generation. Should stand-by capacity be sold to another party such as the State of Arizona, the charge for stand-by to Nevada should be reduced by one-half the cost of stand-by commonly used by both parties.

2. The proposed rate for power taken in excess of requests and withdrawals at steam plant rates of $18 per kw.-year and 350 kwh. per barrel of oil should be modified to more closely simulate average steam costs. A value of 500 kwh. per barrel of oil would be more suitable with the $18 per kw. year demand rate.

3. The proposed rate of $7.50 per kw. year provides for an adjustment which is based upon the actual cost of generating equipment at Hoover Dam. Such an adjustment should not include steam plant costs as indicated in section 12 of the proposal. Apparently this is an error in the proposal for it is believed it was not the intent to include steam costs in the adjustment of hydro costs.

4. The City's proposal does not provide for an adjustment of rate when the State uses its full allotment of Boulder energy. At that time the State will require more than the output of one Hoover Dam generating unit with stand-by capacity. The rate of $7.50 per kw. year would pay for all facilities provided by the City for the State when the State's load attains a value of about 110,000 kw. Under these conditions the rate should be modified to limit the yearly payment to the

actual cost of facilities furnished, or the rate should be reduced to a value of about $6 per kw. per year. Cost data in the report used the first method of limiting the yearly payment.

5. The City should relieve the State of any obligation to pay the City for property rendered idle.

Respectfully yours,

E. W. ROCKWELL,
Consulting Engineer.

ANALYSIS OF CITY'S PROPOSAL FOR GENERATING CAPACITY FOR NEVADA

In analyzing the City's proposition to furnish generating capacity for the electric power system which uses energy allocated to Nevada under the Boulder Canyon Project, a comparison has been made with generating equipment at Hoover Dam authorized and paid for by the Colorado River Commission of the State of Nevada. The generating systems compared were substantially equal insofar as each was suitable to supply power to the required load. There were minor differences in electrical characteristics and capacity furnished, but for the purpose of supplying power to the load both systems were suitable. The generating system proposed by the City of Los Angeles is shown in Exhibit A and consists of a full-sized generator unit, with stand-by capacity in the form of a 100,000 kva transformer bank connecting to Units A1 and A2. This system is referred to as "City System," or simply "City." The generating system with which the comparison was made is shown in Exhibit B and consists of generating Unit N7 and Bank N7–8, half-sized Unit A9 and 40,000 kva of transformer capacity connecting to Units A1 and A2. This system is referred to as the "State's System," or simply "State." This system has two sources of generation, Unit N7 and Units A1 and A2 through Bank A3 that cannot be operated in parallel due to connection to systems paralleled at other places. However, it is believed that no great hardship will be imposed by operating the Nevada system with the loads divided between two generating systems.

In comparing the two systems in regard to initial cost there is a rather odd situation, in that the City's proposal requires an initial expenditure by the State for metering equipment and extension of 230-kv lines at Hoover Dam and for a new 40,000-kva substation at Basic Magnesium amounting to about $500,000. On the other hand, the State's system requires no initial expenditure other than assuming the yearly costs of equipment at Hoover Dam. However, the estimated yearly costs for the two systems with 70,000 kw and 80,000 kw are:

City	$598,000	$665,000
State	686,000	686,000

In considering the costs of the two systems for different loads, the fixed yearly cost of the State's system favors lower cost power as the load increases regardless of load factor, provided that the system peak is within the capacity of the system; and the method of charging for generating capacity at the rate of $7.50 per kilowatt per year for the City system favors lower cost power as the load factor increases. This comparison is shown in Exhibit D.

The City's proposal is for one generator with stand-by. The proposed charge of $7.50 per kilowatt per year of maximum demand was based upon a firm output of 70,000 kilowatt and the estimated cost of one unit with stand-by capacity. No mention is made regarding the furnishing of additional generating capacity which the State most likely will require when it uses all of its firm allotment of Boulder energy. This energy averages about 700 million kilowatt-hours per year which at a load factor of .70 requires 115,000 kilowatts of generating capacity, an amount considerably above the firm capacity in the City's proposal. Should the City agree to furnish this additional generating capacity at $7.50 per kilowatt per year, the cost of two generating units with stand-by transformer capacity would be paid for completely by Nevada and the City would have the use of a large portion of the generating capacity. An estimate of the cost of the City's system with two full-sized units with stand-by capacity is shown in Exhibit E as $827,000 per year. This cost is equaled when the State takes 110,000 kilowatts at $7.50 per kilowatt-year. Therefore, it would appear reasonable to adjust the charges for the ultimate City system so that the State would not pay more than the total cost of capacity set aside for its use. This may be accomplished by continuing the charge of $7.50 per kilowatt-year, but limiting the total payment to the actual cost of equipment installed for the State. Another method would be to adjust the demand charge, using the total cost of equipment provided for the State and the maximum firm output of the equipment. This would give about $6 per kilowatt per year.

The City's generating capacity for the State's ultimate requirements would probably be set up as shown in Exhibit F, and consists of two generators Units A3 and A4 with stand-by capacity of the original 100,000-kva transformer bank connecting to Units A1 and A2. The State's generating capacity for the same conditions is shown in Exhibit G and consists of Unit N8, Unit A3, and Unit A9. This gives a stand-by capacity of only 40,000 kva due to use of Unit A9, but it is believed that this amount of stand-by capacity will be ample. Both systems require an initial expenditure by the State of about $450,000 for 40,000 kva of transformer capacity at Basic. The estimated yearly cost for the two systems with 110,000 kw and 140,000 kw are:

City	$930,000	$937,000
State	900,000	900,000

The above comparison assumes that the City's charge is $7.50 per kilowatt per year but that the total charge does not exceed the cost of equipment furnished. A comparison of the cost of generating capacity under different loads is shown in Exhibit H.

The over-all cost of the City's and State's systems were compared for an estimated load-building program, which started in 1952 with 400 million kilowatt-hours and increased 20 million kilowatt-hours per year until 1967 when it reached 700 million kilowatt-hours at which point it remained until termination of Boulder Canyon Project contracts in 1987. The comparison was made with power used at load factors of .50, .60, .70, and .80, and in each case additional generating capacity was added to form the ultimate system when the load demand exceeded 82,500 kilowatts, the rating of a full-sized generating unit.

Generation costs for the ultimate City system assumed $7.50 per kilowatt per year but not to exceed the cost of equipment. Results are given in Exhibit I.

From the foregoing data on cost of generating capacity, it is apparent that there is not a great difference in the cost of generating capacity furnished by the City or State, provided the City's proposition for ultimate generating capacity is reasonable If it is believed that the load factor will be high, the City's proposition will probably be the lowest in cost.

In providing for State's generating capacity an agreement is required between the City and Municipalities for the apportionment of generation costs on Sections G1 and G3. The present regulations provide that apportionment be made on use or withdrawal of energy, whichever is greater. It is apparent that it is not reasonable for Nevada to use withdrawn energy for apportionment when such energy is in excess of that which can be generated on Sections G1 and G3. It is suggested that energy for apportionment of charges be either a fixed amount each year or an amount determined by the product of capacity available to Nevada from Sections G1 and G3 and the product of system load factor and 8,760 hours.

Should the City's proposal be accepted there are several items that should be covered:

1. Provision should be made for generating capacity in addition to the one unit and stand-by capacity. This should include the method of charging for the additional capacity. If no provision is made for additional capacity the State should have the right to terminate the contract when additional generating capacity is required.

2. It is possible that Arizona may require stand-by capacity and that the City would furnish it from stand-by capacity paid for by Nevada. Should Nevada's payments for such stand-by include capacity paid for by Arizona, there should be a reduction in Nevada's payments.

3. The State should be relieved of any liability resulting in the reapportioning of generating charges for Sections G1 and G3. This involves the determination, if any, of Nevada's and Kingman and Needles share of generation costs in Sections G1 and G3 so that the Municipalities will not be required to pay for that portion of generation used by others as covered in the $7.50 rate.

4. It would appear that the City, at this time, would be in a position to relieve the State of the possibility of paying for property rendered idle, in so far as the City is concerned.

5. An agreement must be made with Kingman and Needles as to the cost of generation. A charge of $7.50 per kw. year amounts to $7.50 x 5,000 kw. = $37.500 for 5,000 kw. of generating capacity. The load of Kingman and Needles is about 22 million kw.-hr. per year. This gives a cost of generation of

$$\frac{\$37{,}500}{22\text{ M kw.-hr.}} = 1.7 \text{ mills per kw.-hr.}$$

This is about twice as much as their present charge and does not allow anything for transmission over the Basic and Southern Nevada Power Company lines to their lines.

6. Costs in the City's proposal appear somewhat high, particularly for the Basic switch positions which appear to use breakers now on the Basic line.

Under the City's proposal it would be possible to put the system into effect after completion of the 100,000-kva bank installation with a connection to the 230-kv bus of Unit N7, and the assumption of charges by City for Unit N7. Should it be desirable to operate Unit N7 in parallel with the City's system, it would be necessary to separate the Metropolitan Water District's line and Units N5 and N6 from Unit N7. A rearrangement of the District and Basic Magnesium switch positions would be desirable but not essential.

One of the features of the State's system is the possibility of selling the surplus generating capacity of Unit 7 for the initial development and Units N8 or A3 for the ultimate development. Last year the Edison Company used Unit N7 more than one-third of the time with practically no generation of secondary energy. Withdrawals of State's energy tend to reduce possible sales of surplus generating capacity to City and Edison, but secondary energy generated by City and Edison will often be greater than the energy withdrawn. Assuming that the cost of generation is reduced $100,000 per year by the sale of surplus capacity for twenty of the years shown in Exhibit I, the total reduction of $2,000,000 lowers the generation charge by .087 mills per kw.-hr. The comparison of charges using data of Exhibit I become:

Load factor	.50	.60	.70	.80
State's system, cost per kwh	1.33	1.31	1.28	1.24
City's system, cost per kwh	1.46	1.42	1.36	1.23

EXHIBIT C

Cost of City's and State's Systems—Initial Development

CITY'S SYSTEM—INITIAL DEVELOPMENT

Unit A-3 and 287/230 kv Bank

	Investment	Yearly cost
287/230 kv Bank and 3-287 kv OCB	$1,868,000	$129,000
Two transformer positions with four 230 kv OCB	1,078,000	72,800
A-3 generator with 100,000 kva Bank	4,347,000	295,000
Two line positions 230 kv	*539,000	36,400
		$532,200

For a firm capacity of 70,000 kw this gives $\frac{532,200}{70,000}$ = $7.50 per kw year.

	Investment	Yearly cost
Extension of lines and metering	$50,000	$5,000
Old 40,000 kva Bank at Basic	150,000	15,000
New 40,000 kva Bank at Basic	450,000	45,000
		$65,000
Total for City's System		$597,200

*Breakers are moved from T7A; appears to be too much money.

STATE'S SYSTEM—INITIAL DEVELOPMENT

Units N7 and A9 and Bank A3 of 40 mva

	Investment	Yearly cost
Unit N7 with Bank N7-8	$3,692,213	$328,665
Unit A9 40,000 kva	2,390,000	178,000
Bank A3, rating 100 mva, use 40 mva	770,000	54,000
Generation for Bank A3	.....	110,000
Old 40,000 kva Bank at Basic	150,000	15,000
Total		$685,665

EXHIBIT E

Cost of City's and State's Systems—Ultimate Development

CITY'S SYSTEM—ULTIMATE DEVELOPMENT

Units A3 and A4 and 287/230 kv Bank

	Investment	Yearly cost
287/230 kv Bank and three 287 kv OCB	$1,868,000	$129,000
Two transformer positions with four 230 kv OCB	1,078,000	72,800
A-3 generator with 100,000 kva Bank	4,347,000	295,000
A-4 generator with 100,000 kva Bank	4,347,000	295,000
Two line positions, 230 kv	539,000	36,400
		$827,200

Cost per kw on 140,000 kw base $\frac{827{,}200}{140{,}000}$ = $5.90 per kw year.

Extension of lines and metering	$50,000	$5,000
Old 40,000 kva Bank at Basic	150,000	15,000
Two new 40,000 kva Banks at Basic	900,000	90,000
		$110,000
Total for City's System		$937,200

STATE'S SYSTEM—ULTIMATE DEVELOPMENT

Units N8, A9, and A3

	Investment	Yearly cost
Unit N8 with Bank N7-8	$3,692,213	$328,665
Unit A9 with 40 mva Bank	2,390,000	178,000
Unit A3 with 100 mva Bank	4,347,000	295,000
230 kv Rack for A3 with two OCB	539,000	36,400
230 kv Line from A3 to T2	25,000	2,500
Old 40,000 kva Bank at Basic	150,000	15,000
New 40,000 kva Bank at Basic	450,000	45,000
Total		$900,565

EXHIBIT I

Year	Mkwh	Peak Mw at L.F.of 50	60	70	80	CITY SYSTEM $1,000 Yearly cost at L.F.of 50	60	70	80	STATE SYSTEM $1,000 Yearly cost at L.F.of 50	60	70	80
1952	400	91	76	66	57	790	635	560	490	900	686	686	686
1953	420	96	80	69	60	830	665	585	515	"	686	"	"
1954	440	100	84	72	63	860	740	605	535	"	900	"	"
1955	460	105	88	75	66	900	770	625	560	"	"	"	"
1956	480	110	92	79	69	937	800	655	585	"	"	"	"
1957	500	114	95	82	72	"	820	680	605	"	"	"	"
1958	520	119	99	85	74	"	850	750	625	"	"	900	"
1959	540	123	103	88	77	"	880	770	645	"	"	"	"
1960	560	128	107	92	80	"	910	800	665	"	"	"	"
1961	580	132	110	95	83	"	937	830	730	"	"	"	900
1962	600	137	114	98	86	"	"	850	750	"	"	"	"
1963	620	141	118	102	89	"	"	880	780	"	"	"	"
1964	640	146	122	105	92	"	"	900	800	"	"	"	"
1965	660	150	126	108	95	"	"	920	820	"	"	"	"
1966	680	155	130	112	97	"	"	937	840	"	"	"	"
1967	700	160	134	115	100	"	"	937	860	"	"	"	"
Total 1952–1957, inclusive, 8,800 Mkwh						14,624	13,629	12,284	10,805	14,400	13,972	13,116	12,474
Total 1968–1987, inclusive, 14,000 Mkwh						18,740	18,740	18,740	17,200	18,000	18,000	18,000	18,000
Total 1952–1987, inclusive, 22,800 Mkwr						33,364	32,369	31,024	28,005	32,400	31,972	31,116	30,474
Cost per kwh in mills						1.46	1.42	1.36	1.23	1.42	1.4	1.36	1.33

100,000 kva 287/230 kv Bank and 3—287kv Oil Circuit Breakers

4—33,333 kva 287/230 kv transformers @ $4.50 per kva	$600,000
3—287 kv oil circuit breakers @ $200,000	600,000
7—287 kv disc switches @ $15,000	105,000
2—Switchyard positions	100,000
287 kv line extension to Bank A1-2	100,000
Miscellaneous	150,000
Installation	200,000
	$1,855,000
City's estimate	$1,868,000

Amortization	.0388	$72,600
Replacement	.0125	23,400
Office and maintenance		33,000
		$129,000

230 kv Switchyard Position with 2–OCB

2—230 kv OCB @ $100,000	$200,000
4—230 kv disc switches @ $10,000	40,000
Switchyard position	100,000
Miscellaneous	100,000
Installation	100,000
	$540,000
City's estimate	$539,070

Amortization	.0388	$21,000
Replacement	.0125	6,700
Office and maintenance		8,700
		$36,400

Unit A3 with 100,000 kva Bank

4—33,333 kva 230/16.5 kv transformers @ $4.50 per kva with 3d winding of 13,333 kva @ 69 kv	$600,000
2—27 kv OCB	150,000
27 kv enclosed bus	60,000
Miscellaneous and 69 kv OCB	50,000
Installation	50,000
	$910,000
A-3 generator	3,436,000
Total for Unit A-3	$4,346,000
City's estimate	$4,346,985
Yearly cost (City's estimate)	$295,402

Transformer Bank A–3 100,000 kva

4—33,333 kva 230/16.5 kv transformers @ $4.50 per kva with 3d winding of 13,000 kva @ 69 kv	$600,000
Rearrange present Bank Y OCB	10,000
27 kv enclosed bus	60,000
Miscellaneous and 69 kv OCB	50,000
Installation	50,000
Total	$770,000

Yearly cost .07 × $770,000 = $54,000

Cost of Unit A–5, Section G6 and T6

Section G-6	$2,135,113	Factor 1.7	3.6
Section T-6	557,611	Factor 1.5	.8
	$2,692,724		4.4

Unit A9—40,000 kva Bank 69/13.8 kv

Generator			$1,950,000
Transformer			440,000
			$2,390,000
Amortization	.0388	$93,000	
Replacement	.0125	30,000	
Office and maintenance		48,000	
		$171,000	
Common facilities		7,000	
		$178,000	

Cost of Unit A8, Sections G5 and T5

Section G5	$885,801 × 1.75 =		1.7
Section T5	239,987 × 1.5 =		.3
	$1,124,788		2.0

Cost of Unit N7, Sections G7 and T7

Section G7		$2,959,181
Section T7		733,022
		$3,692,203
Yearly cost—		
Section G-7		$217,603
Section T-7		71,053
Common facilities		15,109
		$303,765
Office and maintenance, Section T7A		24,900
		$328,665

40,000 kva 230/69 kv Bank at Basic

3—Transformers 13,333 kva 230/69 kv @ $6.50	$260,000
1—230 kv OCB	60,000
1—230 kv disc switch	12,000
1—69 kv OCB	15,000
1—69 kv dis switch 3 pole	2,000
Miscellaneous	50,000
Installation	50,000
	$449,000
Say	$450,000

Yearly cost .10 × $450,000 = $45,000

Assume yearly cost of present 40,000 kva 13.8/69 kv Bank at Basic to be	$15,000
Moving 230 kv OCB and disc switches	$10,000
Extending Basic 230 kv lines to Arizona side	$40,000

APPENDIX 5

Letter of Intent For Colorado River Commission To Purchase Entire Basic Magnesium Project

(Fifth and Final Draft)

COLORADO RIVER COMMISSION, *Carson City, Nevada.*

Attention: Governor Vail Pittman.

GENTLEMEN: Reference is made to the proposal dated October 7, 1947, wherein the War Assets Administration, acting for and on behalf of the Reconstruction Finance Corporation, under and pursuant to Reorganization Plan I of 1947 (12 F. R. 4534), and the powers and authority contained in the provisions of the Surplus Property Act of 1944, as amended (58 Stat. 765), and War Assets Administration Regulation One, as amended (11 F. R. 408), hereinafter called Seller, offered the State of Nevada, acting by and through its Colorado River Commission, hereinafter called Purchaser, an opportunity to negotiate for the purchase or lease of the entire holdings of the United States Government known as Plancor 201, Basic Magnesium Plant, located at Henderson, Nevada. On November 5, 1947, the Colorado River Commission, through its Secretary, Mr. Alfred Merritt Smith, advised that such commission, at a formal meeting held on October 7, 1947, had determined that it desired to negotiate for the purpose of taking over this property. Subsequent to negotiations, it was determined that the entire facility would be sold and transferred to the State of Nevada, acting by and through its Colorado River Commission, upon the following terms and conditions:

1. Title shall be vested in the Colorado River Commission in absolute fee ownership with the Purchaser being obligated to pay the Seller at the time of the execution of the instruments of transfer, One Dollar ($1) in cash and thereafter, as an additional consideration all of the net rentals, revenues, or other emoluments derived from the operation of the property through sale, lease, or otherwise (except returns on minerals) for a period of twenty (20) years, or until a sum of $24,000,000 has been paid to the Seller, whichever is earlier.

2. The conveyance of the property shall be in absolute ownership with the Purchaser having the full right of sale or lease of the property conveyed to it, or any part thereof, subject to the approval of the Seller upon terms and conditions to be mutually agreed upon.

3. The Seller shall reserve all minerals and mineral rights for its exclusive benefit, and all income from such minerals or mineral rights, either through bonuses, royalties, or sales, shall go to the Seller. This reservation shall be subject to the understanding that any development of the property for mineral purposes shall be conducted in such manner as to not unreasonably interfere with the use of this property as an industrial site.

4. Seller shall retain title to all chapels located within the boundaries of this facility. The ultimate determination as to which denomination may purchase these chapels shall be made by the Chief of Chaplains in

accordance with the provisions of War Assets Administration Regulation 5, Order 16. The seller shall also retain title to the hospital and adequate grounds therefor. It is proposed to transfer the hospital to Rose de Lima Hospital, a corporation, with agreement that hospital facilities be made available to Henderson residents.

5. Net rents, revenues, profits and other emoluments shall be turned over to the Seller for the period of years hereinabove set out, as proceeds of this disposition, within the meaning of the Surplus Property Act of 1944, as amended, and shall be deemed to mean all gross rent, revenue, and other emoluments of any kind received by the Purchaser in the leasing, operation or sale of all or any part of the facility and including, but not limited to, furnishing utilities or rendering services in connection with the operation of the facility, less deductions for (a) the usual and ordinary costs (including direct labor, materials and overhead) of current upkeep, insurance, maintenance and operation of the facility by the Purchaser; (b) administrative costs at the facility not to exceed quarterly the sum expended for such costs during the last quarter of 1947 which has been estimated to be $50,000; (c) costs of promotional work and other activities in obtaining tenants or making sales, which costs shall not exceed $20,000 per year. Administrative costs allowable in (b) above shall be limited to the following departments: Executive, Cashier, Purchasing, Accounting, Billing and Statistics, Personnel, Timekeeping and Pay Roll, and Disposal Negotiations and which include the following expenses: salaries of the above departments, travel expenses of employees on official business, office supplies and expenses, postage, telephone rental and tolls, telegrams, auditing expenses, legal and collection expenses, taxes (other than ad valorem), bad debts, and sundry general expenses. Any administrative costs not covered by the foregoing shall be subject to the approval of Seller.

6. In the event the revenue produced from the property through sale, lease, or operation does not provide sufficient funds for the proper upkeep and maintenance of the property, the Purchaser shall have the right and option at any time to (a) supply the deficiency in the amount necessary for upkeep and maintenance from its own funds, or (b) to reconvey the plant and property to the Seller subject to such dispositions as may have been made and such leases as may be outstanding upon three (3) months' written notice of its intention, and in the event the option to reconvey is exercised the Purchaser shall, upon reconveyance being effected, be released from any and all further responsibility with respect to the property.

7. An Arbitration Committee shall be appointed for the purpose of settling any controversial questions of fact that may arise in carrying out any of the provisions of this Letter of Intent. This Arbitration Committee shall consist of three persons; one to be appointed by each party to this Letter of Intent and the third to be appointed by the Senior Judge of the Circuit Court of Appeals for the Ninth Federal Circuit. If either party hereto shall refuse or neglect to appoint an arbitrator within thirty (30) days after the other party shall have appointed an arbitrator and served written notice thereof upon the other party requiring it to appoint an arbitrator, then, upon request

to the Senior Judge of the Circuit Court of Appeals for the Ninth Federal Circuit, said Judge shall appoint such arbitrator within a period of twenty (20) days. The finding or an award of a majority of the arbitrators shall be binding upon the parties.

8. It is understood and agreed that Seller shall be granted one (1) year from and after the date of the execution of this Letter of Intent, or until the Nevada State Legislature shall meet and enact legislation to permit the Colorado River Commission to sell or dispose of subject facilities, whichever date may first occur, within which to obtain a bona fide purchaser for this entire facility from private industry who will agree to continue the operation of the plant in productive industrial enterprise. In the event Seller procures such a purchaser from private industry within the period hereinabove set out, Purchaser agrees to reconvey the facility subject to any outstanding leases, to Seller, or convey same to such purchaser as Seller may designate upon sixty (60) day's written notice. The entire electric transmission and distribution systems, the water supply system and the sewerage disposal system which are covered by that certain Letter of Intent entered into by and between the War Assets Administration and the Colorado River Commission on September 16, 1947, are hereby excluded specifically from the transfer provided for in this paragraph. In the event this facility is reconveyed to Seller within one (1) year under the provisions of this paragraph, an accounting shall be made at the time of such reconveyance.

9. At any time after three (3) years from the date of the execution of this Letter of Intent, the Arbitration Committee, duly appointed as hereinabove set forth in paragraph 7, may meet at the discretion of the Seller and determine on an equitable basis the total minimum payment to be made by Purchaser under the terms of this agreement, which shall in no event exceed $24,000,000.

10. In the event the revenue produced from the property, whether through sale, lease or operation, is not adequate to provide sufficient funds for payments to Seller as hereinabove set out in paragraphs 5 and 9, and extraordinary maintenance as provided in paragraph 14 for a period of three (3) years, Seller shall have the right to require reconveyance of the property upon three (3) months written notice to Purchaser by the Seller.

11. Purchaser shall be obligated to promote and develop sales or leases for the property in good faith at no less than the minimum values to be established and if such values are adhered to Seller will approve the disposal. If at any time Seller should determine that Purchaser is not exercising diligence and reasonable effort in disposing of any of the property, Seller shall serve notice to that effect on Purchaser and call upon Purchaser to appoint an arbitrator to meet with two other arbitrators, as provided in paragraph 7 hereof, who shall constitute an Arbitration Committee for the purpose of determining if the Purchaser has not been promoting disposal of the property in good faith and with diligence. Should this Arbitration Committee find that the Purchaser is unable to fulfill its obligation in this respect, then Seller shall have the right to either (a) develop bona fide disposals for any part of the property in line with the minimum

value and upon recommendation of such disposal Purchaser will consummate the disposal immediately, Seller to receive the net proceeds from all disposals after allowable deductions set forth in paragraph No. 5 herein, or (b) Seller may require the Purchaser to reconvey all the property which has not been sold subject to any outstanding leases.

12. The Munitions Board has placed a portion of this facility under the provisions of the National Security Clause. In the event the Munitions Board does not remove this restriction prior to the date of actual transfer, Purchaser hereby agrees to accept this facility subject to all conditions contained therein.

13. On such portions of the property or facilities to which the National Security Clause is not applicable, the Purchaser shall have the right to erect structures or make any improvements it may desire on the property subject to the approval of Seller and shall have the right to deduct from any rents, revenues, or any moneys received from the lease of such new structures or improvements. (a) interest at the rate of five (5) percent per annum on the amount invested on any construction and improvements, and (b) five percent per annum of the cost thereof for the amortization of the same with any balance remaining to be considered as a part of the gross rents, revenues, and emoluments from the facility.

14. The Purchaser shall establish a fund in the amount of $300,000 for the purpose of providing extraordinary maintenance and other contingencies not covered by existing leases. This fund shall be created by permitting the Purchaser to reserve not in excess of $75,000 for any one year from the net rents, revenues, and emoluments. Any expenditures made from this fund shall have prior approval of Seller and this fund shall become the property of Seller in the event of reconveyance.

15. Purchaser shall be required to remit within forty-five (45) days after the close of each quarter-year the net rents, revenues and other emoluments received from the property after deduction from such net revenues, one-quarter of the annual amount of the extraordinary maintenance fund as set out in paragraph 14 above, all of such remittances to be accompanied by proper accounting statements signed by a duly authorized representative of Purchaser. Should there remain no net rents, revenues or other emoluments at the close of a quarter after allowable deductions are made, a proper accounting statement to that effect shall be submitted. Purchaser shall further be required to submit to Seller within 120 days after the close of each calendar year, a statement duly certified by the State Auditor of the State of Nevada, or a certified public accountant selected and compensated by the Purchaser, and approved by Seller, verifying or correcting the accuracy of the quarter annual statements submitted by the Purchaser for such calendar year. In the event that it is found there has been an error in the net revenue paid or due, it shall be adjusted at the time of the next quarter annual statement.

16. Any sums remaining in operating maintenance funds provided for hereinabove at the time of final settlement will be turned over to the Seller along with any other moneys which may be due at that time, provided that the total amount to be paid to Seller pursuant to

this Letter of Intent shall not exceed the sum of $24,000,000 as required in paragraph 1 hereof.

17. Purchaser shall be responsible for necessary insurance coverage, taxes, maintenance and other expenses of this facility from and after the date that Purchaser is put into possession of this property. The minimum insurance requirements shall be approved by Seller but in any event there shall be ample coverage on all leased portions of the plant and all buildings and facilities essential in its operation.

18. Included at the present time in plant inventories are certain items of machinery, equipment and spare parts which are not considered to be essential to future operation of subject facility. Title to such items shall be retained in Seller and Seller shall dispose of and remove such items at its own expense. There are other items of machinery, equipment and spare parts presently located at subject facility which are considered to be a part of the realty or which may be essential to future use, operation, maintenance or disposal of the plant. Title to the latter machinery, equipment and spare parts shall be conveyed to purchaser. Plant site records at the date Purchaser is placed in possession of the premises adjusted by mutual agreement as to the surplus items, will be the basis of such conveyance of title to Purchaser. Opportunity will be granted to Purchaser to verify plant site records but such verification, as well as determination of surplus and transfer of title shall be completed within six (6) months from the date of this agreement.

19. The Seller shall not warrant, expressly or impliedly, that the future use by Purchaser or others of any equipment, machinery or other facilities incorporated in or of any process to be practiced at said plant, is free from patent infringements or obligations to pay royalties, and does not assume any liability to protect, defend, or save harmless Purchaser or others against any claims, demands or causes of action predicated on such use arising out of any United States Patent. Purchaser agrees to hold harmless and defend the Government in any suit under any United States patent directed to the sale of the future use of any equipment, machinery or other facilities incorporated in or at any processes to be practiced in said plant or for the collection of profits, damages or royalties arising out of such sale or use. Purchaser assumes and agrees to indemnify the Government against any and all existing obligations (including obligations to pay royalties) affecting the future use, transfer or resale of the equipment, machinery or other facility which were entered into expressly or impliedly by Seller with the approval or on behalf of Defense Plant Corporation or Reconstruction Finance Corporation.

20. A complete list of leases, options to purchase and all agreements of every kind and character heretofore made by representatives of the United States Government, to others than the Purchasers, shall be supplied to Purchaser by Seller, and such leases and agreements shall be assigned to the Purchaser by appropriate assignment agreements effective as of the date of delivery of possession of the premises hereunder; and Purchaser agrees to take this Government-owned facility subject to all commitments so listed and assigned.

21. The transfer of this property shall be made subject to the agreement to permit the Bureau of Reclamation of the Department of the

Interior to negotiate for the acquisition of the entire transmission system. Such acquisition shall be subject to the provisions of a Letter of Intent entered into by and between the parties hereto dated September 16, 1947, which Letter of Intent shall be suspended upon the execution of this agreement. In the event this facility shall be reconveyed to Seller prior to termination of the Letter of Intent dated September 16, 1947, such contract shall be reactivated and remain in full force and effect until the termination date thereof.

22. Six (6) months after the execution of the firm power contracts under which an adequate supply of power will be assured for the operation of this facility, Purchaser will submit a concrete plan for advertising sale of this facility. This plan shall be submitted to Seller for approval. In the event Seller approves the plan submitted, Purchaser hereby obligates itself to advertising the facility for sale in accordance with such plan within four months from the date of such approval. Failure to comply with this provision shall be cause for termination of this agreement or reconveyance of the property to the Seller at its option.

23. Seller shall place Purchaser in possession of the premises on a date to be determined mutually by War Assets Administration and Purchaser, and the Purchaser from and after such date shall be responsible for all maintenance and upkeep of the property.

24. It is mutually agreed that Seller shall retain the right to keep a representative or representatives on the premises until the full purchase price is paid or for such shorter term as may be determined by Seller. Such representative or representatives shall have control over Seller's interest in this facility and Purchaser shall consult with this representative regarding all matters requiring the approval of Seller. Seller shall vest such representative or representatives with adequate authority to make decisions and sign documents at the plant site which will facilitate all actions. Purchaser further agrees to furnish adequate office space together with necessary heating, light and such other usual facilities essential to the operation of an office to Seller's representative without cost.

25. Purchaser will obtain at its own expense and affix to the Quitclaim Deed transferring title such revenue and documentary stamps as may be required by law, and will pay all recording fees incidental to recordation. Seller will make available for Purchaser's inspection and use such abstract of title and other title papers as are in its custody, and will cause to be transferred to Purchaser whatever title insurance policies Seller now has covering the Plancor involved, but it is understood that Seller will not be obligated to furnish any later or continuation title report, title insurance, or pay for any title expense pertaining to this transaction.

26. Upon the expiration of the present agreement between Seller, Southern California Edison Company, and the Department of the Interior, providing for the use by the Southern California Edison Company of sections G-7 and T-7 located at Hoover Dam and the assumption by Southern California Edison Company of the generating costs pertaining thereto, Seller will transfer to Purchaser, on a mutually agreeable basis, whatever rights Seller may have to the use of said electrical equipment.

27. Purchaser warrants that it has not employed any person to solicit or secure this sale upon any agreement for a commission, percentage, brokerage, or contingent fee.

28. Purchaser agrees that in the performance of the terms of this sale that it will comply with and give all stipulations and representations required by applicable Federal laws, and that it will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin.

29. No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this sale or to any benefit that may arise therefrom.

30. It is understood and agreed that when and if you accept and approve this Letter of Intent, a formal contract, in accordance with the provisions hereof, will be drawn and executed as promptly as possible.

31. This Letter of Intent is executed in quadruplicate and it is requested that you indicate your acceptance hereon by having the chairman and secretary of the Colorado River Commission execute and return to this Administration three (3) counterparts hereof.

Accepted this 30th day of March, 1948.

COLORADO RIVER COMMISSION,
VAIL PITTMAN, *Chairman.*
ALFRED MERRITT SMITH, *Secretary.*

APPENDIX 6

United States Department of the Interior, Bureau of Reclamation—Central Valley Project, California—Contract for Electric Service to Colorado River Commission of Nevada.

1. This Contract, made this.....day of....., 19....., in pursuance of the Act of Congress approved June 17, 1902 (32 Stat. 388) and Acts amendatory thereof or supplementary thereto and particularly pursuant to the Acts of Congress approved August 26, 1937 (50 Stat. 844, 850), entitled "An Act authorizing the construction, repair and preservation of certain public works on rivers and harbors, and for other purposes," as amended, and August 4, 1939 (53 Stat. 1187) entitled "Reclamation Project Act, 1939" all collectively herein styled the Federal Reclamation Law, between the United States of America, hereinafter called the United States, represented by the officer executing this contract, his duly appointed successor, or his duly authorized representative, hereinafter called the contracting officer, and the Colorado River Commission of Nevada, a public body duly organized, created and existing under and by virtue of the laws of the State of Nevada, hereinafter called the Commission, its successors and assigns:

Witnesseth:

2. In consideration of the mutual covenants herein set forth, the parties hereto agree as follows:

ELECTRIC SERVICE TO BE FURNISHED

3. (a) The United States, under the terms and conditions stipulated herein, will furnish electric service to the Commission from and after the date of initial service as hereinafter defined, at or near Donner Pass, California, the specific point to be agreed upon by the parties hereto.

(b) The electric energy involved hereunder will be delivered as three-phase, alternating current, at a nominal frequency of sixty (60) cycles per second, and at a nominal delivery voltage to be agreed upon by the parties hereto. The electric energy will be so delivered in amounts which the commission may from time to time require up to a maximum rate of delivery, hereinafter called contract rate of delivery, of ..... kilowatts: *Provided,* that if power therefor is available, as conclusively determined by the contracting officer, said contract rate of delivery may be increased at any time by the filing of a request therefor by the commission with the contracting officer and subsequent approval thereof by the contracting officer. Said request shall include a proper showing of the commission's need for such increase. Said increased contract rate of delivery shall immediately become effective after the date of its approval by the contracting officer. The commission may from time to time, in the absence of objection by the contracting officer, use energy at rates greater than the contract rate of delivery in effect, but such greater use shall

not be deemed to establish in the commission any right thereto and the commission shall cease any such greater use whenever and for the periods of time requested by the contracting officer.

(c) The electric service will be furnished continuously except (1) for interruptions or reductions due to uncontrollable forces, as herein defined, and (2) for temporary interruptions or reductions which, in the opinion of the contracting officer, are necessary or desirable for the purpose of maintenance, repairs, replacements, installation of equipment, or investigation and inspection: *Provided,* That the United States, except in case of emergency as determined by the contracting officer, will give the commission reasonable advance notice of such temporary interruptions or reductions and will remove the cause thereof with diligence.

SCHEDULE OF RATES

4. Beginning with the date of initial service as hereinafter defined and except as specified in other articles of this contract, the commission shall pay for the electric service furnished hereunder at rates, charges, and upon conditions as follows:

(a) For power and energy furnished at the delivery point, billed in accordance with schedule R2-F1, which is attached hereto and made a part hereof.

(b) For a fractional part of a billing period at the beginning or end of service hereunder, the demand charge, the kilowatt hour blocks of the energy charge, and the minimum charge shall each be proportionately adjusted in the ratio that the number of hours that electric service is furnished to the commission in such fractional billing period bears to the total number of hours in the billing period involved.

(c) Should the delivery of electric energy be interrupted or reduced, because of conditions on the power system of the United States, below the contract rate of delivery or below the rate of delivery required by the commission at the time of such reduction, whichever is the lesser, for a period or periods of one (1) hour or longer in duration each, the total number of hours of curtailed service in any billing period shall be determined by adding the sum of the number of hours of interrupted service to the product of the number of hours of reduced service multiplied by the percentage of said reduction below said contract rate of delivery or below the rate of delivery required by the commission at the time of such reduction, whichever is the lesser. The demand charge, the kilowatt-hour blocks of the energy charge, and the minimum charge shall each be proportionately adjusted in the ratio that the total number of hours of such curtailed service as herein determined bears to the total number of hours in the billing period involved. The commission shall make written claim, within thirty (30) days after receiving the monthly bill, for reduction on account of any curtailment to service, for a period or periods of one (1) hour or longer in duration each, alleged to have occurred and which is not reflected in such bill. Failure to make such written claim within said thirty (30) day period shall constitute a waiver thereof. All curtailments to service, for any reason whatsoever, which are due to conditions on the power system of the United States, shall be subject to the provisions of this section (c) and the commission shall be limited in its remedy therefor to the relief granted by this section (c).

RESALE OF ELECTRIC ENERGY

5. With respect to the resale of electric energy it is recognized that the commission does not now propose to operate an electrical transmission or distribution system itself, but that delivery via systems of private and public agencies, hereinafter called its subcontractors, will be made to the ultimate consumers. The commission agrees that it will give preference in its resale of power contracted for hereunder to public agencies and cooperatives in accordance with the provisions of Reclamation Law and will limit the margin between the cost of power under the terms of this contract and the resale price to its subcontractors to no more than a reasonable amount to cover the commission's costs of handling the transactions involved.

MODIFICATION OF RATES

6. Should the United States, during the term of this contract, modify the rates for furnishing electric service from the project, under terms and conditions similar to those under which electric service is furnished hereunder, as conclusively determined by the contracting officer, it will promptly notify the commission thereof. The commission may, if it so elects, receive the advantage of such modified rates, effective as of the date the rates were so modified by the United States. The commission shall be deemed to have elected to take advantage of the modified rates if it does not advise the contracting officer in writing to the contrary within sixty (60) days after the date of such notification.

BILLING AND PAYMENTS

7. The United States will submit bills to the commission on or before the tenth day of each month for electric service furnished hereunder during the preceding month, and payments will be due and payable by the commission on the first day of the month immediately succeeding the date each bill is submitted. If the commission fails to pay any bill when due, (a) an interest charge of one percent (1%) of the amount unpaid shall be added thereto as liquidated damages, and thereafter, as further liquidated damages, an additional interest charge of one-half of one percent (½%) of the principal sum unpaid shall be added on the first day of each succeeding calendar month until the amount due, including interest, is paid in full, and (b) the United States shall have the right to discontinue furnishing electric service to the commission and any or all of its subcontractors only after fifteen (15) days' advance written notice of nonpayment of bills, and to refuse to resume same so long as any part of said amount due remains unpaid. Such a discontinuance of electric service will not relieve the commission of liability for the minimum charge during the time said electric service is so discontinued. The rights given herein to the United States shall be in addition to all other remedies available to the United States, either at law or equity, for the breach of any of the provisions hereof.

MEASUREMENT OF ELECTRIC POWER AND ENERGY

8. The electric power and energy delivered hereunder to the commission will be measured as subsequently agreed by the parties hereto.

FACILITIES TO BE PROVIDED BY THE COMMISSION

9. The commission and its subcontractors, for the purposes hereof, will operate and maintain the electric facilities necessary to receive or carry the power contracted for hereunder away from the delivery point.

FACILITIES TO BE PROVIDED BY THE UNITED STATES

10. The United States, for the purpose of rendering electric service hereunder, will operate and maintain, or will attempt to obtain the use of, the electric facilities necessary to deliver the power contracted for hereunder to the delivery point.

POWER FACTOR

11. The United States will not be required to deliver power and energy at any point at a power factor less than ninety percent (90%) lagging: *Provided,* That delivery at lower power factor will be made when conditions are such, as determined by the contracting officer, that such lower power factor will not prevent the United States from making full use of its available generating and transmission facilities.

TERM OF CONTRACT

12. (a) This contract shall become effective.....and shall remain in effect until midnight of.....: *Provided,* That the commission may terminate this contract upon thirty (30) day's written notice.

(b) The date of initial service hereunder hereby is defined as the date upon which the United States is ready and able to furnish and the commission is ready and able to receive electric service.

LIABILITY

13. The United States, its officers, agents, and employees, or any of them, shall not be liable for any claims, demands, costs, losses, causes of action, damages, or liability of whatsoever kind or nature, arising out of or resulting from the operation and maintenance of the facilities of the commission or its subcontractors under this contract.

TRANSFER OF INTEREST IN CONTRACT

14. No voluntary transfer of this contract or of the rights of the commission hereunder shall be made without the written approval of the contracting officer, and any successor or assignee of the rights of the commission, whether by voluntary transfer, judicial sale, foreclosure sale, or otherwise, shall be subject to all the provisions and conditions of this contract to the same extent as though such successor or assignee were the original contractor hereinunder: *Provided,* That the execution of a mortgage or trust deed, or judicial or foreclosure sales made thereunder, shall not be deemed voluntary transfers within the meaning of this article.

UNCONTROLLABLE FORCES

15. Neither party shall be considered to be in default in respect to any obligation hereunder, if prevented from fulfilling such obligation by reason of uncontrollable forces, the term uncontrollable forces being

deemed for the purposes of this contract to mean any cause beyond the control of the party affected, including, but not limited to, inadequacy of water for the generation of the electric power and energy herein contracted for and conclusively determined by the contracting officer, failure of facilities, flood, earthquake, storm, lightning, fire, epidemic, war, riot, civil disturbance, labor disturbance, sabotage, and restraint by court or public authority, which by exercise of due diligence and foresight such party could not reasonably have been expected to avoid. Either party rendered unable to fulfill any obligation by reason of uncontrollable forces shall exercise due diligence to remove such inability with all reasonable dispatch.

WAIVERS

16. Any waiver at any time by either party hereto of its rights with respect to a default or any other matter arising in connection with this contract shall not be deemed to be a waiver with respect to any subsequent default or matter.

NOTICES

17. Any notice, demand or request required or authorized by this contract shall be deemed properly given if mailed, postage prepaid, to the Regional Director, Bureau of Reclamation, P. O. Box 2511, Sacramento 10, California, on behalf of the United States, except where otherwise herein specifically provided, and to the Secretary, Colorado River Commission of Nevada, Carson City, Nevada, on behalf of the commission. The designation of the person to be notified or the address of such person may be changed at any time by similar notice.

CONTINGENT UPON APPROPRIATIONS

18. Where the operations of this contract extend beyond the current fiscal year, the contract is made contingent upon Congress making the necessary appropriation for expenditures hereunder after such current year shall have expired. In case such appropriation as may be necessary to carry out this contract is not made, the commission hereby releases the United States from all liability due to the failure of Congress to make such appropriation.

OFFICIALS NOT TO BENEFIT

19. No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract if made with a corporation or company for its general benefit.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be executed the day and year first above written.

THE UNITED STATES OF AMERICA
By.....

COLORADO RIVER COMMISSION OF NEVADA
By.....
Chairman.

Attest:
.....
Secretary.

Ratified and approved this.....
day of....., 1948.
.....
Governor of the State of Nevada.

Attest:

.....

Secretary of State.

Approved as to form:

.....

Attorney General of Nevada.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION, REGION II
Central Valley Project, California

INTERIM SCHEDULE OF RATES FOR WHOLESALE FIRM POWER SERVICE

Effective: March 6, 1945.

Available: In the area served by the Central Valley Project.

Applicable: To wholesale power customers for light and power service supplied through one meter at one point of delivery. Not applicable to stand-by or auxiliary service or to the sale of dump energy.

Character and Conditions of Service: Alternating current, sixty cycles, three-phase, normally delivered and metered at the low-voltage side of substation.

Monthly Rate: Demand charge: $0.75 per kilowatt of billing demand. Energy charge: First 130 kilowatt-hours per kilowatt of billing demand at 4 mills per kilowatt-hour. Next 130 kilowatt-hours per kilowatt of billing demand at 3 mills per kilowatt-hour. Balance of energy used each month at 2 mills per kilowatt-hour.

Minimum Bill: $1 per month per kilowatt of the larger of: (a) billing demand for the current month. (b) contract rate of delivery. (c) 75 percent of the highest billing demand for the preceding eleven months, exclusive of irrigation and drainage pumping loads.

Billing Demand: The billing demand will be the highest 30-minute integrated demand measured during the month.

Adjustments: For character and conditions of service: If delivery is made at transmission voltage of 33,000 volts or higher so that the United States is relieved of substation costs, the total bill as computed at the above rates will be subject to a discount of 5 percent.

For transformer losses: If delivery is made at the high-voltage side of the customer's substation but metered at the low-voltage side, the meter readings will be increased two percent to compensate for transformer losses.

For Power Factor: None. The customer will normally be required to maintain a power factor at the point of delivery of not less than 90 percent lagging.

APPENDIX 7

Pacific Gas and Electric Company-Sierra Pacific Power Company Power Contract

THIS AGREEMENT made by and between PACIFIC GAS AND ELECTRIC COMPANY, a California corporation, hereinafter called Pacific, and SIERRA PACIFIC POWER COMPANY, a Maine corporation, doing business in the State of California, hereinafter called Sierra.

WITNESSETH that:

WHEREAS, Pacific owns and operates two 60 kv circuits delivering power from its Drum and Spaulding generating plants, respectively, to Summit, all in Placer and Nevada Counties, State of California, each of said circuits having a capacity of 15,000 kw and both of said circuits combined having a capacity of 30,000 kw of electric energy for delivery to Sierra; which is sufficient to meet Sierra's present demands on Pacific of approximately 29,000 kw; and

WHEREAS, The parties hereto have heretofore entered into an agreement dated June 6, 1938, hereinafter called Former Contract, pursuant to which Pacific promised to sell and deliver to Sierra, and Sierra promised to purchase and receive from Pacific electric energy, during a period expiring November 1, 1953, for use in the conduct of Sierra's utility electric business, and Sierra had the right to purchase power from other parties than Pacific subject to payment to Pacific, in addition to a prescribed stand-by charge, of a sum of not less than $75,000 for each year during which such purchases might be made from other parties; and

WHEREAS, The parties hereto desire to supersede said Former Contract by the agreement herein set forth.

NOW, THEREFORE, In consideration of the premises and of the respective promises of the parties hereto, they mutually agree as follows, to-wit:

1. Pacific shall sell and deliver to Sierra and Sierra shall purchase and receive from Pacific all of the electric energy which Sierra shall, during the term hereof, require for resale to its customers and for use in the conduct of its electric business, except such electric energy as Sierra may generate in its existing electric generating plants, and such quantity of electric energy as Sierra now purchases or may hereafter purchase from others under minor stand-by and minor exchange agreements.

2. All electric energy delivered and received hereunder shall be three phase, sixty cycle, alternating current, and shall be delivered and metered at a nominal electro-motive force of approximately 60 kv and 110 kv, slight variations in frequency to be allowed. Points of delivery and metering to be as hereinafter provided.

3. All of such electric energy shall be sold and delivered to and purchased and paid for by Sierra in accordance with Pacific's applicable rules and regulations duly and regularly established from time

to time by or under authority of law and on file with the Public Utilities Commission of the State of California.

4. For all electric energy delivered hereunder, Sierra will pay Pacific in accordance with the following schedule of rates:

Demand Charge—

First 2,000 kw of maximum demand $1,338.75 per month; All excess kw of maximum demand $0.34 per kw per month.

PLUS—

Stand-by Charge—

For not more than 4,000 kw payable in equal monthly installments, $30,000 per year.

PLUS—

Energy Charge—

First 150 kwh per kw per month 6.79 mills per kwh.

Next 150 kwh per kw per month 4.85 mills per kwh.

All over 300 kwh per kw per month 3.88 mills per kwh.

Except that for all energy furnished in excess of 8,000,000 kwh per month, the above energy rates shall be reduced by .485 mills per kwh.

Minimum Charge—

Applicable when the maximum demand in the current month or in the preceding 11 months has exceeded 25,000 kw; $1 per month per kw of such maximum demand.

Special Conditions—

(a) *Demand:* The maximum demand in any month will be the average kw delivery of the 30-minute interval in which such delivery is greater than in any other 30-minute interval in the month. The maximum demand to be used in computing charges under the above rates will be the mean of the actual maximum so determined for the current month and the highest such demand occurring in the year ending with the current month.

(b) *Off Peak Demand:* Demands occurring between 10:30 p. m. of one day and 6:30 a. m. of the next following day, and on Sundays and legal holidays, will be ignored in determining the demand used for computing charges.

(c) *Power Factor:* The total charge for any month as computed on the above rates will be decreased or increased, respectively, by 0.25% (0.2% if energy used in the month exeeeded 8,000,000 kwh) for each 1% that the average power factor of customer's load in that month was greater or less than 85%, such average power factor to be computed (to the nearest whole percent) from the ratio of lagging kilovolt-ampere-hours to kilowatt-hours consumed in the month; *provided, however,* that no power factor correction will be made for any month when customer's maximum demand was less than 10% of the highest in the preceding eleven months.

Sierra shall at all times so conduct its operations that the power factor at the time of peak loads each day at the point of delivery hereunder shall not be less than 95 percent.

5. The stand-by requirements of Sierra may at the option of either

party hereto be reviewed and adjusted at the end of each successive three (3) year period during the term hereof.

In the event that during any such three (3) year period it shall be demonstrated by actual experience that Sierra's stand-by requirements exceed 4,000 kilowatts, then such greater number of kilowatts shall be deemed to be the stand-by requirements of Sierra and the stand-by charge shall be increased proportionately until again adjusted, as provided in the preceding paragraph, to such lesser or greater number of kilowatts and stand-by charge as may be mutually agreed upon.

6. Sierra shall upon receipt of bill therefor pay Pacific monthly at its office in San Francisco, California, for all electric energy delivered hereunder.

7. Pacific shall, at its sole cost and expense, construct a three-phase, 110 kv pole and wire electric transmission line (hereinafter called first 110 kv line) of a capacity of approximately 40,000 kw, extending from its Drum Power House to the said point of delivery at Summit, and shall endeavor to complete the same ready for operation by October 1, 1949, or as soon thereafter as circumstances permit, which first 110 kv line shall at all times be and remain the sole property of Pacific. Inasmuch as it will be impracticable, on account of winter and other conditions existing at Summit, for Pacific to build, maintain and operate a substation at Summit for the purpose of transforming said electric energy from 110 kv to 60 kv for delivery hereunder, after said first 110 kv line of Pacific shall have been constructed, it is therefor agreed that Sierra will, at its sole cost and expense, construct a three-phase, 110 kv pole and wire electric transmission line, of approximately 40,000 kw capacity (hereinafter called Sierra's first 110 kv line) extending from Summit to a substation to be constructed by Sierra at a convenient point within the State of California, and Sierra will also construct said substation (hereinafter called California Substation) with a capacity of 40,000 kw for the purpose of reducing from 110 kv to 60 kv the voltage of the power to be transmitted over Sierra's first 110 kv line. Sierra's first 110 kv line and California Substation shall at all times be and remain the sole property of Sierra, and shall be operated and maintained by it. In consideration of the construction, operation and maintenance by Sierra of Sierra's first 110 kv line and California Substation, Pacific will pay to Sierra each month, from the date said line and substation are placed in operation and for the remaining term of this agreement (however not to exceed a period of fifteen (15) years), a sum equal to one-twelfth of annual costs of operation of said substation, plus one-twelfth of the annual fixed charges for interest, depreciation, maintenance and taxes, based on the installed cost of said substation. The amount of said annual fixed charges for this purpose shall be deemed to be 10 percent of Sierra's investment in said substation (estimated to be approximately $300,000), but in no event shall the combined one-twelfth of said costs of operation and of said fixed charges exceed $2,500 per month, $30,000 per year.

8. If at any time during the term hereof Sierra shall require more power and electric energy than Pacific can supply reasonably through

the said two existing 60 kv lines and Pacific's said first 110 kv line, to be constructed by it hereunder as aforesaid, then Pacific shall either construct, maintain and operate a second 110 kv transmission line to Summit, or convert one of said existing 60 kv lines to 110 kv (either of which lines, as shall be thus constructed or converted, shall hereinafter be designated second 110 kv line), and Sierra will, correspondingly either construct a second 110 kv transmission line, or will convert to 110 kv one of Sierra's existing 60 kv lines, in order to receive the electric energy which Pacific will deliver from said second 110 kv line to Sierra at Summit, provided that if such further construction or conversion of said second 110 kv line is required of Pacific after January 1, 1950, Sierra will then extend the present contract for a period of fifteen (15) years from the date when said second 110 kv line goes into service. In the event that further additions to the capacity of California substation, or any other 110/60 kv substation, are required by reason of the construction of second 110 kv line, said additions shall be constructed, operated, and maintained by Sierra without any additional compensation from Pacific.

9. All electric energy purchased hereunder shall be delivered to Sierra at the point where Pacific's lines contact those of Sierra at the location known as "Summit" in Placer County, California. All electric energy delivered hereunder from Pacific's existing two 60 kv circuits to Sierra's 60 kv lines shall be metered at Summit, and all electric energy delivered hereunder from Pacific's first 110 kv line, when constructed as hereinbefore provided, shall, for the mutual convenience of the parties hereto, be metered at 60 kv at California substation. If during the term hereof, Pacific shall be required, as hereinbefore provided, to construct a second 110 kv line, then Pacific shall deliver and meter at 110 kv at Summit such electric energy as is delivered by means of said second 110 kv line. The readings of all meters referred to in this section 9 shall be combined, and simultaneous demands shall be used, for billing purposes hereunder.

10. Sierra, in the event of selling, leasing, or otherwise disposing of its business of selling electric energy, may assign this agreement to the lessee or purchaser thereof, provided such lessee or purchaser shall have assumed and covenanted to perform this agreement but otherwise Sierra shall not assign this agreement without Pacific's written consent.

11. This agreement shall be and remain in full force and effect until December 31, 1964, or fifteen (15) years after the date when the first 110 kv line goes into service, whichever is later, unless extended as herein provided, and this contract shall supersede said former contract.

12. This agreement shall become effective as of January 1, 1948, upon the procurement of an order by the Public Utilities Commission of the State of California authorizing the parties hereto to carry out the terms and conditions hereof. This agreement shall at all times be subject to such changes and/or modifications as said commission may from time to time direct in the exercise of its jurisdiction.

Time is of the essence of the respective provisions hereof.

IN WITNESS WHEREOF, the parties hereto have executed these presents in duplicate this 4th day of March, 1948.

SIERRA PACIFIC POWER COMPANY,
By F. A. TRACY, *Its President.*
And by H. P. DAYTON, *Its Assistant Secretary.*

PACIFIC GAS AND ELECTRIC COMPANY,
By N. R. SUTHERLAND, *Its Vice President in Charge of Public Relations and Sales.*
And by RAYMOND KINDIG, *Its Secretary.*

Approved as to Form: P. E. Sloane, Attorney.
Approved: James F. Pollard, Manager Commercial Dept.

APPENDIX 8

Report on Power Contract Between Pacific Gas and Electric Co., and Sierra Pacific Power Co., Relating to Shasta Dam Power

Report by ALFRED MERRITT SMITH, *Chairman Engineering Committee, Colorado River Commission of Nevada, April 26, 1948.*

In this matter it was the desire of the commission to investigate the possibility of obtaining, for use in northern Nevada, power allotted to it by the Bureau of Reclamation from Shasta Dam Power plant under the terms of a proposed contract for withdrawal of up to 90,000 kilowatts. The contract had been submitted by the Bureau as a basis for negotiations. An engineering committee appointed by Governor Pittman was asked to look into the merit and the possibilities of the proposal. I was designated to act as chairman of that committee.

The only present market of sufficient magnitude to justify the State in making such a contract with the Bureau is the area now served by Sierra Pacific Power Company. Furthermore, the law does not permit the Colorado River Commission to make a contract for purchase of power unless the same is correspondingly covered and protected by resale contracts.

Preliminary talks with Sierra Pacific Power Company and with the Bureau brought out that Sierra and Pacific Gas & Electric Company of California do not wish to use their facilities across the mountains, which link Nevada with Shasta Dam for the entry of competitive Federal power. Pacific Gas & Electric Company has gone on record by letters to the Bureau that it declines to have its transmission lines used to give power to its customer, Sierra Pacific Company for the purpose of separating it from its own market.

The two companies then entered into a new contract, under which better service and more electricity will be made available to Northwestern Nevada. The contract will require the expenditure of much money for new transmission lines, for which a bond issue of $3,500,000 is contemplated. The contract, under California law, requires approval by the Public Utilities Commission of California.

The Public Service Commission of Nevada, the Colorado River Commission and representatives of several municipalities served by Sierra Pacific appeared before the California Public Utilities Commission on April 15, 1948, and requested that action on the contract be delayed until its probable effect on Nevada could be looked into, particularly in view of the possibility of securing Federal power at lower cost. The request for delay was opposed by both power companies, but a stay of action was granted until May 3 by the California Commission, probably due to the Nevada people having only received the proposed contract a few days, and not having had time to go into it.

Acting for the engineering committee, I submitted all of our data and letters on the Shasta Dam power situation to E. W. Rockwell, Electrical Engineer, Metropolitan Water District of Southern California, who has been employed at various times over a period of years by the River Commission. On April 20, 1948, A. J. Shaver, Resident

Engineer for the River Commission at Las Vegas, called on E. W. Rockwell to discuss the Shasta power problem. Rockwell said he had not had time to get all he needed for a report, but so far as he had gone, the following are the conclusions he had reached, which so far as Shaver and I have gone into, are also our own opinions. We hope to have a written report from Rockwell very soon.

I have numbered the paragraphs in order to facilitate discussion and reference. They all point toward approval of the proposed contract between the two power companies, rather than attempt delay in a further effort to obtain a direct block of power from Shasta Dam.

1. Bureau power will be available only from one source, which is Shasta Dam power plant, on the Sacramento River.

2. Reports upon the water available in Shasta Reservoir, after irrigation needs have been supplied, indicate that for some months each year there would be a lack of water to supply the present California power contract requirements. Here is a record of the testimony of R. L. Boke, Director Region No. 2, U. S. Bureau of Reclamation, March 12, 1948, transcript pages 15–16:

Sworn testimony of R. L. Boke, Regional Director of Bureau of Reclamation, March 12, 1948, transcript pages 15–16.

GENERATION AT SHASTA POWER PLANT

	Contract requirements kwhr	Delivery kwhr	Excess over contract
January	80,000,000	94,450,000	
February	22,000,000	68,962,000	
March	24,000,000	77,000,000	
April	24,000,000	112,000,000*	88,000,000
May	30,000,000	135,400,000*	105,000,000
June	35,000,000	145,150,000*	110,000,000
July	110,000,000	177,070,000	67,000,000
August	110,000,000	117,070,000	7,000,000
September	100,000,000	114,912,000	15,000,000
October	100,000,000	100,000,000	
November	85,000,000	85,000,000	
December	80,000,000	80,000,000	

*Lack of Bureau transmission lines between Shasta and Shasta substation, authorized by Congress July 1947, and not expected to be completed by Bureau until middle of 1948, will limit transmission of some of this energy.

3. From these figures by the Bureau, which are substantiated by the California Utilities Commission engineer, Mr. McNaughton, firm power would not be available to Nevada from Shasta Dam Power Plant, even if the Bureau signs a contract to supply Nevada with firm energy. In order to make it firm the Bureau or the State would have to obtain additional power from some other source, which would increase the cost.

4. The construction of 115 kv transmission line from Elverta, California, to Reno, Nevada, which is being studied by the Bureau, would depend upon Congress appropriating the money for it. Such an appropriation is doubtful unless markets for enough energy to justify it are assured. There is also a division of opinion in Congress as to

whether Federal power should invade established private market fields. The fight over this in California (P. G. & E. Co. versus the Bureau of Reclamation) is bitter. The administration, motives and the plans of the Bureau are under violent attack. This controversy may have the results of blocking, or at least delaying the Bureau's suggested line into Reno.

5. There is a feeling among the farming element in California that Shasta Dam was built for them for irrigation and flood control on the Sacramento River. They are required to pay the cost of this dam under the reclamation law. The power developed is incidental, was never designed to be firm power, after irrigation and flood control releases of water are met. They consider it their power. That they greatly need it for irrigation pumping cannot be denied.

6. In order to secure transmission line stand-by for Nevada necessary for dependable service, assuming that dependable power might be available, the Bureau would have to build two complete lines into Reno, greatly increasing the cost and possibly further decreasing the chance of getting an appropriation to do it with.

7. If the Bureau fails to build a line, the other alternative is to have the Bureau's energy brought in over the P. G. & E. and S. P. P. Co. lines, which cannot be done without the consent of both. These companies have both decisively declined to wheel Bureau power over their lines.

8. Assuming for discussion that P. G. & E. would consent to wheel Bureau power, a reasonable charge would have to be paid for transmission based on investment, operation, and maintenance. When this charge is computed and added to the Bureau rate now offered, the total rate is practically the same as the rate under the new Pacific and Sierra contract. The lowest figure for stand-by would be around 20 percent of all other charges.

9. The dependability of service under the Pacific and Sierra contract is better, for as Pacific has more sources of power, many interconnected power plants. To these will be added the generation at Shasta Dam. This will lessen the danger of another brown-out, but will not prevent one. California power supply cannot catch up with its growing needs, and Nevada's needs will also grow. An acute water shortage in the future may put us in the same bad fix that we have been in, unless diesel or steam stand-by is provided, or a greatly expanded hook up with other power systems is accomplished.

10. Other conditions being equal, the State has no desire to injure in any way the present large taxpaying utility so long as it supplies reasonably adequate service. Nevada has too few taxable resources and cannot afford to cut into them.

11. With added new facilities, and more power available, Sierra should soon be able to extend lines and service into new areas as development warrants, and at reasonable rates, which are always under regulation by the people through the Public Service Commission.

12. At present the commission cannot make a resale contract for sufficient power to justify the Federal expense, outside of Sierra's franchise and field of service.

13. Nevada needs more power at once, and this cannot be supplied under the Bureau's proposed contract. We cannot wait two or three

years for them to build a line, even if Congress should appropriate money, which is doubtful. The present Sierra contract will give us the continuous energy we must have for steady growth.

14. The possibility of future use of Federal power is not foreclosed by accepting the Sierra contract. Studies should continue, and will continue. More and more power will be needed. Possibly some of the secondary power at Shasta Dam can be made available later on. The extension of lines from the Colorado River into northern Nevada will be in the picture, bigger than ever with the coming construction of Bridge Canyon Dam and with the completion of Davis Dam in 1950. We have made application for one-third of the total energy to be generated at Davis Dam, but as is the case with Shasta, we must have it sold before we can take it, and there must be sufficient present available markets to justify the investments in power lines. Federal and private power seem to get along together fairly well in Southern California. We hope that may happen here, but the Federal power must be low in cost and be dependable. We must take for granted, and as a permanent condition, the rivalry that exists between public and private power service. While our present form of government exists we shall have both types of power for keeps. They can and must compromise and get along together, and until this is done, the public will not get the best service.

15. A further delay to study or debate changes in the contract may have the effect of making Sierra's $3,500,000 bond issue less salable. I am advised by officials of the California Utilities Commission that the bond market is very sensitive, and if buyers feel there is something wrong with the project which delays the contract, they may not buy, or use such a condition as a means to buy at a lower price. Fulfillment of the contract assuring us prompt and ample power depends upon the sale of the bonds. Without it, Sierra's project cannot be built, and we would then be left just where we are now, with increasing power demands and far from enough power to meet them.

16. I do not believe further study will change our opinion in this, although we know the time allotted us has been short. Mr. Rockwell, our consultant, has not been given time in which to prepare his report, but Mr. Shaver, electrical engineer for the Colorado River Commission, and I have twice been in consultation with Mr. Rockwell, and the foregoing comments are the result of our talks. Since last seeing Mr. Rockwell he has talked with Mr. Elmore, Chief of Power marketing, U. S. Bureau of Reclamation Region No. 2, at Sacramento, as a result of which he sent me the following telegram last Saturday afternoon:

> Alfred Merritt Smith, El Ranch Otel, Carson City, Nevada.
>
> Don't see how you can do other than accept power contract telephoned Elmore of Central Valley Project. He states that rate schedule submitted with their proposal covers power delivered at Donner Summit about three years would be required to provide for power delivery at Summit purchase of power from Central Valley in 1948 would save about 136 thousand dollars or about 1.7 miles per kilowatt-hour.
>
> E. W. Rockwell.

Rockwell's considered opinion is that our course should be to offer no objection to the proposed contract.

17. The Washoe County Water Conservation District has transmitted a copy of a resolution passed by their board of directors, addressed to the Colorado River Commission, expressing satisfaction with the Sierra-P. G. & E. contract and a desire to have it approved.

18. Section 8 of the proposed contract calls for the construction by P. G. & E. of a second 110 kv line from Summit to a substation in California, if certain proposed improvements in transmission should not be adequate. Sierra will then enlarge its own transmission facilities to take the extra power. It is then provided that the time of contract shall be extended 15 years from the time P. G. E. puts in this extra line. If the extra line should not be needed for several years, when built it would extend the time of contract accordingly. It could have the effect of making it a 29-year contract. It was suggested that this be discussed with Sierra, the feeling being that a 15-year contract should be ample, unless good reasons are shown for a longer term.

APPENDIX 9

Summary of L. G. McNeil's Report on Basic Magnesium Project

December 8, 1947.

COLORADO RIVER COMMISSION, *Carson City, Nevada.*

Attention: Hon. Vail Pittman, Chairman.

GENTLEMEN: In accordance with your request of October 24, 1947, we have given careful consideration to the War Assets Administration's offer to the State of Nevada to negotiate for the purchase of the entire holdings of the United States Government, known as the Basic Magnesium Plant, located in the southern part of Nevada, and we submit herewith our findings and recommendations of the action to be taken by the State of Nevada.

In order to determine whether it was economically feasible to manage the property at a profit, we analyzed the present income and expenses of the Henderson Townsite proper and the plant, but did not include in our analysis of the proposed program the operations of the electrical transmission and distribution systems, the water supply system, nor the sewage disposal system. These utilities have already been taken over by the State of Nevada under a lease dated September 16, 1947, and it is our understanding that these facilities will be operated separate and distinct from the plant operations, either by a department of the State or a public utility company.

The assets offered by the War Assets Administration to the State of Nevada consist of approximately 8,600 acres of land, the Henderson Townsite, and the plant; Victory Village and Carver Park Housing project are not included.

We have not included a list or detailed analysis of the component parts of the Henderson Townsite or the Magnesium Plant, as these are set forth in a very comprehensive report made by the Industrial Research Corporation, submitted to the War Assets Administration on October 1, 1947. This report was made available to us, and should be referred to for a more detailed description of the assets to be transferred to the State of Nevada.

At the present time, the properties included in this offer are under the control of the War Assets Administration, acting for and on behalf of the Reconstruction Finance Corporation. The management consists of representatives of War Assets Administration, the Reconstruction Finance Corporation, and the organization of an independent contractor, employed to operate the facilities. The total number of employees as of November 20, 1947, was 337. All financial reports which we have reviewed included the income and expenses of these three organizations. However, in making our analysis we used only the income and expenses that directly pertained to the management of the Henderson Townsite and the Magnesium Plant. Expenses incurred by the War Assets Administration and the Reconstruction Finance Corporation in the disposal of surplus property, the management of the manganese ore plant, and the warehousing of surplus materials are not included. Accurate financial reports are only available from

February 1, 1947, to November 1, 1947. The reports, reviewed by us, were based on actual cash income and outgo, and did not take into account county property taxes nor depreciation on buildings and equipment.

The financial statement for the operation of townsite and plant indicated the following for the last nine months:

a. Average total monthly income	$177,045.39
b. Average total monthly expense	232,177.29
c. Average monthly loss	$55,131.90

The last current month (October 1, 1947, to October 31, 1947):

a. October income	$181,837.70
b. October expense	199,884.40
c. October loss	$18,046.70

The reduction in the monthly loss in the month of October is due to a considerable reduction in the personnel, and a reduction in the services rendered to lessees. Our survey indicates that the loss of $18,000 per month will be an approximate average under the present method of operation without depreciation.

After reviewing all the current leases, income, and expenses, and studying the function of each department of the management, we believe that a simplified program can be put into effect which will result in the following financial condition.

Proposed Program (Exclusive of Utilities):

a. Average monthly income	$70,100.75
b. Average monthly expense	67,616.25
c. Average monthly profit	$2,484.50

The above monthly profit can result only if the following recommendations are carried out:

a. The operation of the Electrical Transmission and Distribution System be assumed by a public utility company. As stated herein before, this assumption was made in our report. However, negotiations should be completed as soon as possible so as to provide for an independent electrical service from the Dam Site to the consumer with all expenses incurred and revenue received by the management of the public utility company.

b. The operation of the Water Distribution System be assumed by a public utility company. As stated herein before, this assumption was made in our report. However, negotiations should be completed as soon as possible so as to provide for an independent water supply from Lake Mead through the reservoir and treatment plant to consumers in the Henderson townsite and to the main plant site with all expenses incurred and income received by the management of the water company.

c. The operation of the sanitary sewerage system be assumed by a public utility company. As stated herein before, this assumption was made in our report. However, negotiations should be completed as soon as possible so as to provide for independent sewage disposal

for the townsite and plant occupants, with all expenses incurred and revenues received by the sewage disposal company.

d. The operation of the telephone system be assumed by the Southern Nevada Telephone Company with all expenses incurred and revenue received by the telephone company.

e. The operation of the railroad facilities be assumed by the Union Pacific Railroad Company with all expenses incurred and all revenues received by the railroad company.

f. Revise townsite rental agreements to discontinue free utilities. Charges for electric lights, water and sewerage can be handled directly by the public utility companies as recommended above. Existing housing rental rates shall be retained. Revise plant site agreements to provide for the purchase of electrical requirements direct from the public utility company.

g. Discontinue all maintenance on all property and equipment which cannot be utilized for the production of income.

h. Install a new management to provide minimum forces necessary to operate and maintain the facilities in use and available for use. The proposed organization upon which this report is based is shown in the attached Exhibit No. E.

i. Provide cash reserves from net revenues for current operations, before payment on the principal amount to the United States government. Cash reserves should be for current operating expenses, financing accounts receivable, and contingent maintenance costs. We estimate this cash reserve should be not less than $250,000.

j. Start negotiations for electric power at a rate of 3.5 mills per kwh or less, to be made available for the present and potential lessees of the plant facilities. Present power rates are higher than rates in other comparable industrial areas. During the month of October, the Stauffer Chemical Company paid 4.80 mills per kwh for power at the plant, and other smaller users are paying 7.00 mills per kwh.

k. Start an intensive drive to encourage new industries to make use of the facilities available at the Basic Plant. In setting up the proposed organization, we have included a promotion manager and secretary, whose duties would be to encourage new industries to locate at the Basic Magnesium Plant. A large number of potential industries are considering moving from the east coast to the Los Angeles area and should be encouraged to locate at the Basic Magnesium Plant. At the present time only approximately three-quarters of the facilities are being utilized. Buildings now occupied, with the respective lessees, are shown on the attached Exhibit No. D.

l. The sale and transfer of all plant equipment and material be immediately stopped. Negotiations have been completed for the transfer of major equipment which will vitally effect the future income of the plant. The David Taylor Model Basin, United States Navy, Washington, D. C., has completed negotiations for the purchase of five Allis-Chalmers motor generator sets. These must be kept at the plant site.

m. The fair value of the plant site property and the townsite facilities, including utility services, has been appraised by the Industrial Research Corporation at $35,227,648. The maximum salvage or re-use value of the plant site property and the town facilities, including utility services, has been appraised at $12,447,949. The scrap value

of the plant site property and the townsite facilities, including utility services, has been appraised at $8,054,559. However, these appraisals were made without giving any consideration to the National Security Clause. The offer to negotiate for purchase, upon which the negotiations between the State of Nevada and the United States Government will be based, states that the sale of property will be subject to the restrictions of the National Security Clause.

The restrictions imposed vitally affect the appraised value of the project, as any portion of the property cannot be disposed of, for a period of twenty years, without the written approval of Secretary of War. Therefore, in arriving at a "fair-use" value of the Henderson townsite and the plant site, the value of the property must be determined by the revenue that can be produced during the life of the plant. After considering the present revenue, operating expense, and potential additional revenue, we recommend the use value of the facilities be placed at not more than $2,500,000, payable over a period of fifteen years.

As a result of our investigation of the present condition of the Basic Magnesium Plant, as indicated by the facts presented herein and our recommendations for the future operation of the plant, we recommend that, if the Colorado River Commission carries out the program outlined, that the State of Nevada proceed with the purchase of Henderson townsite and the Basic plant. This recommendation is predicated upon the assumption that if the State decides to purchase the townsite and plant, it will immediately appoint and install its general manager so that he may familiarize himself with the plant and present personnel, and be in a position to assume control at the time a formal transfer of management is made.

Very truly yours,

McNeil Construction Co.,

L. G. McNeil, President.

Exhibits attached for ready reference:

A. War Assets Administration's offer to the State of Nevada, dated October 7, 1947.

B. Copy of yearly lease between War Assets Administration and State of Nevada, leasing electrical distribution system, water distribution system, and sewerage distribution system.

C. Plot plan of Magnesium plant and Henderson, showing land to be purchased.

D. Plot plan of Magnesium plant, showing buildings under lease at present time.

E. Proposed organization chart for management of plant and facilities.

F. Copy of National Security Clause.

List of additional information:

Industrial Survey, volume 1 and 2, Plancor 201–201H, dated October 1, 1947, prepared by Industrial Research Corporation, 2511–13 Book Tower, Detroit 26, Michigan.

APPENDIX 10

Allocation of Davis Dam Power by United States Bureau of Reclamation

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION
REGION III, BOULDER CITY, NEVADA

August 18, 1948.

COLORADO RIVER COMMISSION OF NEVADA, *Carson City, Nevada.*

Attention: Mr. Alfred Merritt Smith, Secretary.

GENTLEMEN: Receipt is acknowledged of your letter of March 13, 1948, transmitting to this office your application for electric power and energy from Davis Dam.

Following a detailed analysis of all applications, a recommendation for the allocation of Davis power and energy was made by the Commissioner of the Bureau of Reclamation to the Secretary of the Interior by a memorandum dated June 3, 1948. A copy of this memorandum is enclosed for your information. The secretary officially established the allocation of Davis power and energy by his approval of the memorandum on June 23.

The information in tables 1 and 2 of the memorandum shows that the total of all applications received was far in excess of the amount of power to be developed at Davis Dam. It was for this reason that direct allocations were recommended only to those applicants holding the highest priorities and considered to be in the greatest need for additional power and energy or those to whom the bureau had made previous contractual commitments.

In recommending allocations to the numerous applicants in Arizona, consideration was given to the legislative provisions which have been made by that State in creating the Arizona Power Authority as a marketing agent for electric power and energy generated on the Colorado River. The authority by combining its allocation of Davis power and energy with that which it is planning to obtain simultaneously from Hoover Dam is considered to be in a better position than the bureau to make equitable distribution of the available power and energy to applicants in Arizona.

The negotiations of contracts with those applicants listed in table 3 of the enclosed memorandum has been undertaken. I regret that every applicant for Davis power and energy could not be listed in table 3 as having been allotted the full amount of its application.

Very truly yours,
E. A. MORITZ, *Regional Director.*

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION

MEMORANDUM

Washington 25, D. C., June 3, 1948.

To: Secretary J. A. Krug, (Through Division of Power).
From: Commissioner.
Subject: Proposed allocation of Davis power and energy to applicants therefor—Davis Dam Project.

Following your approval on February 10, 1948, of the Interim Schedule of Rates for Wholesale Firm Power Service (Schedule R3-F3) for the Davis Dam Project, Regional Director Moritz dispatched a letter to all prospective applicants for Davis power announcing your approval of the schedule of rates and requesting completion of an application form by March 31, 1948. The letter, which was dated February 27, 1948, is enclosed and marked Exhibit A.

In response to the announcement and request, Mr. Moritz received applications for Davis power in a total amount far in excess of the 180,000 kilowatts that is expected to be available at load centers from the Davis Power Plant. The individual applications and a summary thereof by applicants are enclosed and marked, respectively, Exhibits B and C. A summary of the applications filed, grouped by States, is shown in table 1.

TABLE I

Summary of Applications Filed

(Power in kilowatts and energy in millions of kilowatt-hours annually)

State	CLASSIFICATION OF PROSPECTIVE CUSTOMERS — Preference		Nonpreference		Total	
	Power	Energy	Power	Energy	Power	Energy
Arizona	501,325	2,394	125,500	584	626,825	2,978
California	222,480	1,149	66,200	397	288,680	1,546
Nevada	60,000	350	.....	.....	60,000	350
Utah	10,300	33	.....	.....	10,300	33
Total	794,105	3,926	191,700	981	985,805	4,907

Table 2 shows the summary of applications in table 1, after the elimination of the apparent duplications.

TABLE II

Summary of Applications After Elimination of Apparent Duplications

(Power in kilowatts and energy in millions of kilowatt-hours annually)

State	CLASSIFICATION OF PROSPECTIVE CUSTOMERS — Preference — Power	Preference — Energy	Nonpreference — Power	Nonpreference — Energy	Total — Power	Total — Energy
Arizona	300,280	1,193	22,500	101	322,780	1,294
California	222,480	1,149	66,200	397	288,680	1,546
Nevada	60,000	350	.....	.....	60,000	350
Utah	10,300	33	.....	.....	10,300	33
Total	593,060	2,725	88,700	498	681,760	3,223

In view of the applications for Davis power far exceeding the amount which will be available, the power allotment of Davis capacity becomes a difficult problem. In considering this problem the bureau has used the following priorities:

(a) Fulfillment of commitments for power from other Colorado River sources in present contracts for Parker power.

(b) Federal agencies within the Department of the Interior.

(c) Other Federal agencies.

(d) Certain small contractors which have preference under reclamation law and also are now served directly by the Parker power system.

(e) Other applicants which have preference under reclamation law.

(f) All other applicants.

Using these priorities and limiting allotments to applicants which could be either served directly by the Parker-Davis transmission system, which has been described to the Congress in requests for appropriations, or applicants in the State of California which manifestly could make transmission arrangements with other agencies, the bureau has prepared and recommends the allotment shown in Table 3.

TABLE III

Allocation of Davis Power (Kilowatts)

(a) Fulfillment of commitments in contracts for Parker power—	
Gila Project	2,500
Bagdad Copper Corporation (Contract I2r-13,919)	4,000
Colorado River Indian Irrigation Project (Contract I1r-1,398)	2,000
Imperial Irrigation District (Contract I2r-11,729)	15,000
San Carlos Indian Irrigation Project (Contract I1r-1,329)	5,000
Tucson Gas, Electric Light and Power Co., (Contract I2r-11,533)	15,000
Subtotal	43,500

TABLE III—*Continued*

(b) Federal agencies within the Department of Interior—	
San Carlos Indian Irrigation Project	9,000
(c) Other Federal agencies—	
Army Engineer Board, Imperial Dam, Arizona	3,000
Army Air Force Stations, California	15,000
Veterans Administration Center, Whipple, Arizona	225
(d) Certain small contractors which have preference under Reclamation Law, and also are now served directly by the Parker power system—	
Gila Valley Power District	2,000
Yuma Irrigation District	1,500
(e) Other applicants which have preference under Reclamation Law—	
State of Nevada through its Colorado River Commission*	45,000
Imperial Irrigation District†	15,000
State of Arizona through the Arizona Power Authority‡	45,775
Total	180,000

*To be temporarily sold by the Bureau of Reclamation, as explained in the text.

†Subject to recapture by the Bureau if and when the Imperial Irrigation District places the proposed Pilot Knob Power Plant in operation.

‡Includes 14,600 kilowatts subject to withdrawal by the Bureau upon two years' notice for use in the operation of the Gila Project.

After providing for the immediate requirements for operation of the pumping plants of the Gila Project, the requirements of applicants having rights to power from other sources in contracts for Parker power to the extent of the commitments in such contracts, and the applications of the San Carlos Indian Irrigation Project, the Army Engineer Board, the Veterans Administration Center, and two districts now being served by the Parker power system, aggregating in total 59,225 kilowatts, there remains 120,775 kilowatts for allotment to other applicants. Of this amount, 45,000 kilowatts is recommended for the State of Nevada (Nevada has applied for 60,000 kilowatts, or one-third of all Davis power), and 30,000 kilowatts is recommended for customers in the State of California. All of the remaining 45,775 kilowatts is recommended to be allotted to the State of Arizona because the most desperate need for power in the Davis market area, which has been described to the Congress as central and southern Arizona, southern Nevada, and southern California, is in Arizona.

It is understood that the State of Nevada does not contemplate immediate need for Davis power, but is conducting a campaign for introduction of additional industries in the Basic Magnesium Plant, predicated on the availability of Davis power to supplement its power from Hoover Dam. In view of this situation, it is recommended that the allocation to the State of Nevada be temporarily sold by the Bureau to the municipalities of Los Angeles, Burbank, Glendale, and Pasadena, subject to withdrawal by the State of Nevada upon one year's

notice in such increments as the State may desire. Such power would be apportioned among the four California municipalities in the ratio of the amounts requested by those municipalities and withdrawals would be made in the same proportion.

One-half of the 30,000 kilowatts allotted for use in the State of California is recommended for the Imperial Irrigation District, a preference customer. Since the capacity of the proposed Pilot Knob Power Plant and the plants at the Drops on the All-American Canal plus 15,000 kilowatts of Davis power under the commitment in the district's contract for Parker power would make ample hydroelectric capacity available to the district, it is recommended that the 15,000 kilowatts of Davis power over and above the 15,000-kilowatt Parker contract commitment be subject to recapture by the Bureau if and when the district places the proposed Pilot Knob Power Plant in operation.

The Arizona Power Authority has been allotted all of the 45,775 kilowatts recommended for Arizona to be made available to other applicants which have preference under Reclamation Law. After elimination of apparent duplication, such other preference applicants have applied to the Bureau for 228,000 kilowatts of Davis power. The Authority is in a better position than the Bureau to apportion such 45,775 kilowatts among all such applicants because the Authority can supplement Davis power and energy with its Hoover Dam energy for which it has not yet exercised its right to take. Such allotment of the entire amount to the Authority was recommended to you by the Arizona Electric Coordinating Committee in its letter of March 26, 1948, and such allotment has been advocated by representatives of the Rural Electrification Administration. It will be the Bureau's proposal in contracting with the Authority to require it to observe the preferences established in Reclamation Law in the resale of Davis power. It must be pointed out, however, that the preference provisions governing disposition of power by the Authority (section 6(b) of the Arizona Power Authority Act, as amended) are not in all respects identical with the preference provisions of the Reclamation Law, although the Authority is itself a preference customer under Reclamation Law. Accordingly, without an amendment to its Act, the Authority could lawfully follow the preference provisions of Reclamation Law only to the extent that such law is consistent with the Authority's powers under its own act.

In order to assure the use in Arizona of Davis power which will be required for the operation of the pumping plants of the Gila Project as its development proceeds but which is not required at the present stage of development of the Project, such increased requirements of the Project for Davis power have been included in the 45,775 kilowatts allotted to the Arizona Power Authority. However, it is recommended that 14,000 kilowatts of the 45,775 kilowatts be subject to withdrawal by the Bureau upon two years' notice in such increments as are required for use in the operation of the Gila Project.

A detailed analysis of the applications granted or rejected, including the amounts thereof and the reasons therefor, is enclosed and marked Exhibit D.

It is recommended that you approve the allotment of Davis power

shown in Table 3 subject to the negotiation of acceptable contracts. Upon receipt of such approval the Bureau will immediately undertake negotiation of such contracts.

Enclosure 308. (Sgd.) MICHAEL W. STRAUS.

I concur: June 16, 1948.

Walter Seymour, Director, Division of Power.

Approved June 23, 1948: J. A. Krug, Secretary of the Interior.

Copy for Division of Power.

cc-Reg. Dir., Boulder City, Nevada.

Reg. Cal., Los Angeles, California.

I concur: June 17, 1948. W. E. W., O. L. C.

APPENDIX 11

Proposed Basis For An Agreement For Furnishing Generator Capacity Stand-By Service and Additional Energy to the State of Nevada.

1. This agreement will become effective after completion of Unit A-3 and 220 kv switchrack on Arizona side of Hoover Dam power plant.

2. Prior to effective date of this agreement, an interim agreement will be made for supplying energy to Nevada in addition to that available from present equipment.

3. Immediately after completion of 220 kv rack and sources of energy to this rack, the State of Nevada will transfer all of State's load to 220 kv lines and order discontinuance of service at 69 kv from existing equipment.

4. The transfer of Nevada's 220 kv lines will be made by Nevada at no cost to the City.

5. All remaining 69 kv circuits for delivery of energy to USBR or special contractors will be transferred to Nevada's 69 kv lines at no cost to the City. The distribution of charges and energy losses on these circuits and methods of measuring energy and maximum demands on same will be agreed upon by Nevada and parties concerned.

6. All payments to USBR for new 287.5 kv, 220 kv and additional generating equipment used for delivering energy to 220 kv switchrack will be assumed by the City.

7. All energy delivered and maximum demands to the State of Nevada over the State's 220 kv circuits will be measured by meters installed on Nevada's circuits. The cost of all such metering equipment to be borne by Nevada.

8. Monthly maximum demands on energy delivered to Nevada shall be the highest half-hourly average simultaneous combined demand delivered over Nevada's circuits, less deliveries over these circuits to special contractors or USBR.

9. On or before the 31st day of May of each year the State of Nevada will notify the City in writing the generating capacity required by Nevada for the next contract year (June 1-May 31). Such required kw will not be less than effective withdrawals made by Nevada and in no event less than 60,000 kw.

10. The City agrees to deliver to Nevada all energy required by Nevada for which Nevada agrees to pay to USBR as follows:

10.1. For energy withdrawn by Nevada in accordance with regulations, firm energy rates in effect.

10.2. For energy taken in excess of withdrawals to the credit of the City for each 350 kwh taken, an amount equal to the average cost of 6,250,000 btu of fuel delivered to the City's steam electric plants including taxes and delivery charges during the month such delivery of energy is made by the City. If no fuel is purchased by the City during such month, then the charge will be based on the delivered cost of the last 50,000 units of 6,250,000 btu delivered.

11. For generation of all energy delivered to Nevada the State of

Nevada agrees to pay to USBR to the credit of the City the following generating charges:

11.1. For maximum demands requested in accordance with Article 9 hereof, $7.50 per kw per year, increased or decreased by a factor determined in Article 12 hereof.

11.2. For maximum demands in excess of requests made in accordance with Art. 9 hereof, $18 per kw per year, increased or decreased by a factor determined in Article 12 hereof.

11.3. Annual charges in accordance with Article 11.1 hereof, will be billed monthly at the rate of 1/12 of such annual charge each month.

11.4. Annual charges for overdrafts in accordance with Article 11.2 hereof shall be billed 1/12 of such charge for the month during which such overdraft occurs and a similar charge during each of 11 following months provided no higher overdraft occurs during these months.

12. 24.0 percent of charges in accordance with 11.1 and 11.2 will be multiplied by a factor obtained by dividing the actual annual interest, amortization, replacement, operation and maintenance charges on newly installed 287.5 kv-220 kv 100,000 kva transformer bank including but not to exceed three (3) 287.5 kv circuit breakers by $129,000.

55.5 percent of charges in accordance with 11.1 and 11.2 will be multiplied by a factor obtained by dividing all annual charges on Unit A-3 and A-3 100,000 kva transformer bank by $296,000.

20.5 percent of charges in accordance with 11.1 and 11.2 will be multiplied by a factor obtained by dividing all annual charges on 220 kv switchrack, including 2 circuit breakers for the tie-bank, 2 circuit breakers for A-3 bank and all breakers on Nevada's 220 kv circuits, but excluding any and all equipment installed exclusively for use of Arizona, USBR, or special contractors by $110,000.

100.0 percent—$535,000.

13. In case this agreement becomes operative before some of the above major groups of equipment enumerated in Article 12 hereof are installed, then for the purpose of this agreement, the substitute equipment is assumed to be supplied by the City from its existing sources, and the factors enumerated in Article 12 are assumed to be unity.

14. Nevada agrees that any future withdrawals of energy by the State of Nevada, in accordance with Article 4 of the Regulations, the time limitations for horsepower withdrawn will be in accordance with regulations and any energy withdrawals made either with or without withdrawal of horsepower of capacity, shall be according to the following schedule:

SCHEDULE OF WITHDRAWALS OF ENERGY

A Notice Which Together With All Prior Notices Given by Nevada Within 12 Consecutive Months

Exceeds in kwh withdrawn	*And does not exceed kwh withdrawn*	*Period of notice*
0	32,000,000	6 months
32,000,000	80,000,000	12 months
80,000,000	128,000,000	18 months
128,000,000	256,000,000	24 months
256,000,000	.....	36 months

15. This agreement does not waive the rights of the City, Southern California Edison Company, Ltd., or California Electric Power Company for compensation for idle plant as provided in Article 4(b) of Regulations.

16. Payments due to the City, in addition to those payable to USBR, shall be made before the first of the month after such bill has been rendered or within 20 days after receipt of such bill, whichever date is the latest, and if not paid within the above period, then 1 percent monthly shall be added to such unpaid bill.

17. Payments payable to USBR to the credit of the City shall be paid in accordance with payments due to USBR.

18. This agreement will not be affected by installation of additional equipment for service to State of Arizona.

19. City will not be held liable for failure to comply with provisions of this agreement caused by failure of equipment or other causes beyond control of the City.

HOOVER POWER PLANT—ADDITIONAL COSTS TO CITY OF LOS ANGELES FOR EQUIPMENT TO SERVE NEVADA

	Estimated capital costs	Annual Fixed Charges Based on 1946 — Amortization	Replacement	Operation and maintenance	Estimated capital costs, Total
New 220 kv switchrack on Arizona side—					
A3 transformer position (2-OCB's)	$539,070	$20,951	$6,738	$8,720	$36,409
287.5/220 kv transformer position (2-OCB's)	539,070	20,951	6,738	8,720	36,409
Nevada transmission line positions (2-OCB's)	539,070	20,951	6,738	8,720	36,409
	$1,617,210	$62,853	$20,214	$26,160	$109,227
Unit A3, including transformers	4,346,985	168,948	54,337	72,117	295,402
287.5/220 kv transformer, including 3-287.5 kv OCB's	1,868,000	72,601	23,350	33,000	128,951
Total	$7,832,195	$304,402	$97,901	$131,277	$533,580

FINANCIAL TABLES

FINANCIAL

STATEMENT OF RECEIPTS AND DISBURSEMENTS, COLORADO RIVER COMMISSION FUND, FOR THE PERIOD JULY 1, 1946, TO JUNE 30, 1948, INCLUSIVE

Commission Office, Carson City, Nevada

Month and year	Total disbursements	Compensations	Travel expense	Express, postage	Telephone and telegraph	Supplies, equipment	Publications, printing	Miscellaneous	Receipts
1946									
Balance July 1, 1946									$90,960.96
July	$559.91	$130.00	$244.79	$0.75	$25.37	.....	$159.00	.....	$906.79
August	265.24	20.00	130.22	9.00	6.02	.....	100.00	.....	983.96
September	1,478.97	55.00	328.38	25.49	19.10	.....	1,051.00	.....	1,003.73
October	868.52	20.00	523.42	.....	303.25	.....	21.85	.....	924.72
November	680.99	320.00	286.86	.....	10.97	$30.16	33.00	.....	1,080.49
December	169.47	20.00	79.93	15.00	31.67	22.87	.....	.....	1,440.31
Totals	$4,023.10	$565.00	$1,593.60	$50.24	$396.38	$53.03	$1,364.85	.....	$97,300.96
Less disbursements Commission Office								$4,023.10	
Less disbursements Las Vegas Office								3,897.46	
									7,920.56
Balance January 1, 1947									$89,380.40
1947									
January	$2,260.24	$244.30	$249.85	.....	$17.30	$1,748.79	.....	.....	$1,563.58
February	537.30	60.00	235.21	.....	87.09	21.00	$64.75	$69.25	1,848.65
March	452.15	70.00	164.58	.....	32.33	103.74	.....	81.50	1,282.12
April	1,070.37	515.00	456.63	$19.00	45.04	34.70	.....	.....	1,175.00
May	730.14	260.00	380.03	.....	58.21	28.90	.....	3.00	1,028.47
June	1,542.02	490.00	1,020.75	.....	27.77	3.50	.....	.....	1,050.50
July	546.89	225.00	264.99	.....	40.90	16.00	.....	.....	1,172.56
August	2,278.36	673.00	994.81	28.00	52.91	229.64	.....	300.00	1,197.07
September	928.73	202.50	415.87	.....	25.71	284.65	.....	.....	1,297.14
October	2,074.19	907.70	841.03	.....	20.06	132.55	16.75	156.10	1,169.47
November	1,893.74	695.00	969.08	36.00	50.41	27.15	.....	116.10	1,217.89
December	636.26	385.00	151.30	.....	37.75	6.61	49.50	6.10	1,824.81
Totals	$14,950.39	$4,727.50	$6,144.13	$83.00	$495.48	$2,637.23	$131.00	$732.05	$105,207.66
Less disbursements Commission Office								$14,950.39	
Less disbursements Las Vegas Office								10,657.30	
									25,607.69
Balance January 1, 1948									$79,599.97

1948									
January	$2,285.25	$969.10	$1,303.30	----------	----------	$6.75	----------	$6.10	$2,199.15
February	3,130.33	745.00	1,488.56	----------	$90.82	487.35	----------	318.60	2,102.88
March	1,828.51	875.00	814.93	$31.00	31.78	30.25	$18.85	26.70	2,000.26
April	1,343.95	666.55	561.71	1.92	54.95	7.40	45.00	6.42	1,864.64
May	1,522.74	780.40	499.88	7.65	70.11	127.75	30.85	6.10	2,662.41
June	769.28	169.10	512.56	1.34	36.28	32.85	17.15	----------	2,520.26
Totals	$10,880.06	$4,205.15	$5,180.94	$41.91	$283.94	$692.35	$111.85	$363.92	$92,949.57

Less disbursements Commission Office	$10,880.06	
Less disbursements Las Vegas Office	35,085.12*	
		45,965.18
Balance July 1, 1948		$46,984.39

*The Colorado River Commission has advanced the sum of $28,543.24 for the Basic Magnesium Project, which is to be reimbursed just as soon as their fund is large enough to take care of the amount advanced.

STATEMENT OF DISBURSEMENTS, COLORADO RIVER COMMISSION FUND FOR THE PERIOD JULY 1, 1946, TO JUNE 30, 1948, INCLUSIVE

Las Vegas Office

Month and year	Total disbursements	Compensations	Travel expense	Express, postage	Telephone and telegraph	Supplies	Equipment	Rent	Miscellaneous	Advance for Basic Magnesium Proj.
1946										
July	$549.28	$456.66	$24.49	$19.14	.....	.....	.....	$40.00	$8.99	
August	580.05	416.66	96.51	2.00	$16.30	$0.25	.....	40.00	8.33	
September	662.88	456.66	120.34	3.46	31.53	.....	.....	40.00	10.89	
October	792.60	456.66	237.79	2.98	37.34	.....	.....	40.00	17.83	
November	774.38	456.66	236.39	3.09	28.41	.....	.....	40.00	9.83	
December	538.27	456.66	16.52	2.00	11.76	3.00	.....	40.00	8.33	
Totals	$3,897.46	$2,699.96	$732.04	$32.67	$125.34	$3.25	.....	$240.00	$64.20	
1947										
January	$581.54	$456.66	$12.44	$2.24	$34.66	$2.91	.....	$40.00	$32.63	
February	651.55	456.66	109.29	3.50	29.92	3.85	.....	40.00	8.33	
March	711.05	456.66	163.16	2.75	39.40	.....	.....	40.00	9.08	
April	865.70	557.41	213.18	4.37	34.16	.....	.....	40.00	16.58	
May	1,947.67	491.66	61.07	2.00	35.48	14.13	$1,295.00	40.00	8.33	
June	740.12	491.66	149.90	5.00	50.46	.....	.....	40.00	3.10	
July	748.68	491.66	146.95	5.00	39.04	9.50	.....	40.00	16.53	
August	1,042.77	822.30	120.61	4.00	42.21	.30	.....	40.00	13.35	
September	899.83	575.00	191.04	4.00	69.55	.....	.....	40.00	20.24	
October	936.28	645.55	208.50	.....	20.93	3.80	.....	40.00	17.50	
November	772.33	575.00	85.00	3.45	38.93	5.50	.....	40.00	24.45	
December	759.78	575.00	77.21	4.24	36.58	.....	.....	40.00	26.75	
Totals	$10,657.30	$6,595.22	$1,538.35	$40.55	$471.32	$39.99	$1,295.00	$480.00	$196.87	
1948										
January	$907.86	$575.00	$239.17	$2.32	$33.87	.....	.....	$40.00	$17.50	
February	778.40	575.00	120.13	3.00	29.07	$0.70	.....	40.00	10.50	
March	840.48	575.00	174.39	4.50	36.29	.....	.....	40.00	10.30	
April	29,381.89	575.00	128.70	2.00	89.18	.....	.....	40.00	18.52	$28,528.49
May	969.67	615.90	241.36	6.46	41.20	.....	.....	40.00	10.00	14.75
June	2,206.82	1,255.00	804.42	6.63	90.42	.35	.....	40.00	10.00	
Totals	$35,085.12	$4,170.90	$1,708.17	$24.91	$320.03	$1.05	.....	$240.00	$76.82	$28,543.24