

A STUDY OF THE USE OF WATER FOR

IRRIGATION ON THE RIO GRANDE DEL NORTE
ABOVE FORT QUITMAN, TEXAS
By: W. W. Follett

PROCEEDINGS OF THE INTERNATIONAL
BOUNDARY COMMISSION

November 1896

1-R-20

152

A STUDY OF THE USE OF WATER FOR
IRRIGATION ON THE RIO GRANDE DEL NORTE
ABOVE FORT QUITMAN, TEXAS
BY
W.W. FOLLETT
PROCEEDINGS OF THE INTERNATIONAL BOUNDARY COMM.

November 1896

1-R-20

NEW MEXICO STATE ENGINEER
LIBRARY

FILE COPY
APRIL

A STUDY OF THE USE OF WATER
FOR
IRRIGATION ON THE RIO GRANDE DEL NORTE
ABOVE FORT QUITMAN, TEXAS

BY

W. W. FOLLETT

NOVEMBER, 1896

PROCEEDINGS OF THE INTERNATIONAL BOUNDARY COMMISSION

STATE ENGINEER

LETTER OF TRANSMITTAL

EL PASO, TEX., November 17, 1896.

Capt. George McC. Derby,
Corps of Engineers, U. S. A.

DEAR CAPTAIN: With this I hand you my report on a study of the use of water for irrigation in the drainage of the Rio Grande del Norte above El Paso, Tex.

This study was made for the purpose of investigating the claim of the Mexican Government that the people of the United States have taken from the inhabitants of Mexico water which was theirs by ancient right of prior appropriation. It also extends to a consideration of the probability of there being a water supply sufficient to successfully serve a reservoir at El Paso, the construction of which by the United States is suggested as a recompense to the Mexicans for their alleged loss of water.

Yours truly,

W. W. Follett,
Civil Engineer.

EL PASO, TEX., November 17, 1896.

Capt. Geo. McC. Derby,
Corps of Engineers, U. S. A.

Dear Captain: On August 22, 1896, you handed me in El Paso, Tex., the following letter of instructions:

"EL PASO, TEX., August 22, 1896.

"Mr. W. W. FOLLETT, C. E.

"El Paso, Tex.

"Dear Sir: The commission have decided to adopt the plan of operations outlined by Colonel Mills in his memorandum to Mr. Osorno. The questions referred to me for report are, therefore, those mentioned in the second paragraph of that memorandum.

"I would like you to begin at once collecting and arranging such data as can be obtained bearing upon these questions, and report them to me in such form as to make them readily available as the basis of an opinion.

"As the first step in this direction, I would like you to proceed at once to Denver, and to such points as you may think necessary in the valley of the Rio Grande in Colorado and New Mexico, and

interview the state engineer of Colorado and such other officials and individuals as may be able to give you information which will enable you to complete a table showing as nearly as practicable a complete list of all of the ditches that have been taken out of the Rio Grande and its tributaries, with the date of construction of each ditch, its carrying capacity, the amount of water which it is legally authorized to take from the stream, and the amount that it has actually taken yearly since 1880.

"Please make a similar report as to proposed and existing storage reservoirs in the basin of the Rio Grande above El Paso, and incidentally collect any information that you may be able to as to the annual flow of the river.

"Owing to the limited time allowed for this investigation, I do not think it will be practicable to do any useful work in measuring the actual flow of ditches, as their flow at the time of observation will be no criterion as to their flow for the whole year.

"Should you be unable to obtain from records, reports, etc., reliable information as to the carrying capacity of the various ditches, I would request that you so report as early as practicable, as it may in such an event become necessary to send

a number of agents through the valleys to measure the slope and cross section of all the ditches.

"In submitting your report upon this investigation I would be glad to have you accompany it with any suggestions you may be able to offer bearing upon the subject under consideration.

"Until further orders will you kindly submit a weekly report detailing the progress made during the week?

"On your trip through Colorado and New Mexico you will be accompanied by one of Mr. de Ibarrola's young assistants, to whom you will please give the fullest access to all of the data collected and ample opportunity to keep himself informed as to the impartiality and accuracy alike of the results and the methods employed. It has been understood with Mr. de Ibarrola that in complying with these instructions you are not to delay the progress of the work, as it is intended that the cooperation of his assistant shall be an assistance to you and no obstruction.

"Very respectfully,

"Geo. McC. Derby,

"Captain of Engineers, U. S. A.

In addition to the above, you verbally instructed me to complete this field work by October 15. No copy of the memorandum referred to in the first paragraph of the above letter was furnished me, although I have seen the paper.

The work you outlined in this letter was for the purpose of gathering data to enable you to answer two questions raised by Mr. Richard Olney, Secretary of State, and Senor M. Romero, Mexican minister at Washington, in a convention signed by them on May 6, 1896. These two questions are suggested in the following paragraphs of the above convention:

"First. The amount of water of the Rio Grande taken by the irrigation canals constructed in the United States of America.

"Second. The average amount of water in said river year by year before the construction of said irrigation canals and since said construction, the present year included."

On August 25 I left El Paso accompanied by Mr. Alberto Flores, chief of Mr. de Ibarrola's staff.

We stopped one day at Santa Fe, N. Mex., where I found that there was no documentary data of the New Mexico irrigation, but that all information I obtained must be from actual field work. This I

reported fully to you by mail from Santa Fe on the night of August 26, and after calling your attention to the small amount of funds available for field work and the limited time at our disposal, both of which precluded the actual measurement of carrying capacity of each ditch and the area watered therefrom, suggested the following:

"Now, the only procedure which I can suggest that seems at all feasible is this: I will go on to Denver and get the available Colorado data, and then move into the San Luis Valley and there obtain from the water commissioners their statements as to the carrying capacities (when different from the decrees) of the ditches under each man's control, but make no effort at measurements of canals. Then we will go to Chama, N. Mex., hire a team and driver, go down the Chama to Espanola and through that valley and up to Taos. I will measure en route the larger ditches and gather the best data I can as to the smaller ones. When we have finished that trip I will send that team back to Chama, and we will come here (to Santa Fe) by train and get another

team, go down Santa Fe Creek to the Rio Grande, and then follow the valley of that river, gathering by inquiry what data we can as to its tributaries and measuring the ditches taken out of the main river."

We reached Denver on the 27th and found that the State engineer's office had on file but little data relating to the use of water in the San Luis Valley beyond copies of the decrees in each district, partial copies of which we already had. These copies I completed and, after getting what information I could in Denver from gentlemen familiar with the country to be examined, we left there on September 3, en route for the San Luis Valley. Before leaving Denver I received the following telegram from you:

"Go ahead as proposed in your report of August 26; in the meanwhile I will see if additional funds can be obtained."

We went first to Del Norte in order to consult with Mr. Francis T. Anderson, the superintendent of irrigation in water division No. 3 of Colorado, which comprises the whole of the San Luis Valley. We found him an energetic and intelligent man, and he has been of much assistance to me in this

investigation. He informed us that he had instructed the commissioner in each of the seven water districts under his control to furnish him complete statistical reports of the use of water and acreage irrigated during the year. I requested him to have them give him, in addition to the information already asked for, the actual capacity of each ditch in its present condition, regardless of its original size or of its decree, and to furnish me with a copy of all data thus obtained. This he agreed to do.

After careful consideration of the time it was absolutely necessary to devote to the New Mexico drainage in order to enable me to make anything approximating a complete statement of the use of water therein, I decided that it would be best to trust to Mr. Anderson to furnish the Colorado data, and to go on to Chama as quickly as possible.

This we did, after spending one day in district No. 35, a small area where the canals have never been adjudicated and which has no commissioner, and a day at Antonito, where we obtained much valuable information from Bishop John C. Dalton, of Mauassa, the water commissioner for district No. 21. Later developments have shown that it

would have been better for us to have spent a few days more in the valley, as the commissioners were very slow in getting their information into Mr. Anderson's hands, and their reports as to carrying capacity are not correct, being ⁱⁿ several districts merely copies of the sizes given in the decrees. These, as I will show you more in detail later, may have no relation whatever to the actual capacities. This was not Mr. Anderson's fault, but probably a misunderstanding on the part of the water commissioners.

We reached Chama on September 7. There we were delayed two days getting our outfit together for the wagon trip. On the 9th Mr. Flores was called by wire to Mexico, and he left by rail that day. I regretted his enforced departure very much, as I found that he had a clear insight into the purpose of our work and he had been of great aid to me during the few days we had been together.

On the day of Mr. Flores's departure I started down the Chama on horseback with team, camp, and driver, adopting the method of work

outlined in my letter of August 26. I so laid out my line of travel as to enable me to reach and examine the larger areas watered. I measured the larger ditches, obtained either from the more intelligent residents or by examination and rough estimate the area watered, and picked up what information I could as to the age of ditches, relative amount of land watered each year, abnormally dry years, etc. For the irrigated areas which I was unable to reach in the limited time at my disposal I obtained what information I could from the inhabitants of the country passed through and supplemented this with the knowledge I already had of the country, obtained by reconnaissance work done for the United States Geological Survey in the winter of 1889-90. On the two trips I saw over 95 per cent of the irrigated land in the New Mexico drainage of the Rio Grande. On this last one I traversed between 75 and 80 per cent of it.

Early in the progress of this investigation I became convinced that the capacity of the ditches was not a safe basis for an estimate of the amount of water used, as I will explain to you more fully

further on, and so obtained estimates of the acreage served as well as of the carrying capacity of the ditches listed.

I covered the Rio Grande drainage of New Mexico above Santa Fe fairly well by September 19, leaving my team at Antonito on that date and coming to Santa Fe September 21. There I was sick for four days, but outfitted with team, camp, driver, and saddle horse and left there September 25. I was joined at Santa Fe by Mr. M. G. Canton, a young Mexican engineer sent by Mr. de Ibarrola to represent his Government on the trip. I found Mr. Canton to be a bright and energetic young man, a congenial companion, and a valuable assistant in our work.

Between September 25 and October 11 we covered the Rio Grande drainage above El Paso, traveling some 500 miles by wagon in that time. On the latter date we started our team, driver, and saddle horse north from Anthony, N. Mex., 20 miles north of El Paso, while we came to the latter place by rail.

Since my arrival in El Paso I have been compiling and arranging the statistics gathered, so as to present them to you "in such form as to

make them readily available as the basis of an opinion."

Accompanying this report are:

A land-office map of Colorado, showing the water districts of the San Luis Valley, marked "Exhibit A."

A map of the San Luis Valley, showing the location of some of the larger ditches, marked "Exhibit B."

A map of a portion of district No. 22, marked "Exhibit C."

A land-office map of New Mexico, marked "Exhibit D."

Some 95 double pages of compiled statistics and tabulations therefrom, more specifically described in the table of contents prefacing this report.

Before entering into a discussion of these records I wish to give you a brief description of the country under consideration, with special reference to its water supply, and a rough history of its development, thinking that, as it is a country, a population, and an economic condition unfamiliar to you, such a statement may be an aid to you in forming your opinion on the subjects under consideration.

II. DESCRIPTION OF COUNTRY

Please refer to Exhibits A and D.

The drainage area tributary to the Rio Grande above El Paso has an area of about 38,000 square miles, and is roughly divided as follows:

	Square miles
Area in the mountains above Del Norte, Colo. (this area furnishes all the water which passes the Del Norte gauging station).....	1,400
Area in the rest of the mountain drainage tributary to the San Luis Valley.....	3,200
Area of the San Luis Valley proper.....	<u>2,400</u>
Total area of drainage in Colorado...	7,000
Area in New Mexico whose run-off enters the Rio Grande above Embudo gauging station, including Taos Mesa.....	<u>2,600</u>
Total area of drainage above Embudo..	9,600
Area of Chama drainage.....	3,300
Area in addition to Chama drainage whose run-off enters the Espanola Valley.....	<u>800</u>
Total area of drainage above Rio Grande gauging station.....	13,700
Area of Jemez drainage.....	900
Area of Puerco.....	6,400
Area of tributary small drainages whose run-off enters the Rio Grande above San Marcial	5,700

	Square miles
Area above San Marcial sloping to the Jornado del Muerto.....	3,300
Area below San Marcial furnishing no run- off.....	1,300
Area between San Marcial and El Paso furnishing a small run-off.....	<u>6,700</u>
Total area above El Paso.....	38,000

Of the total area of 9,600 square miles above the Embudo gauging station, some 2,600 square miles in the north end of the San Luis Valley furnishes no water to the river, so that the net area giving run-off to the Embudo gauging station is about 7,000 square miles.

This same 2,600 square miles deducted from the total area of 13,700 square miles above the Rio Grande gauging station leaves about 11,000 square miles furnishing run-off.

From the 26,700 square miles above San Marcial should be deducted this 2,600 square miles and also about one-third of the Puerco drainage (of 2,100 square miles) from which no run-off comes, and there is left 22,000 square miles furnishing run-off to the attempted San Marcial gauging station.

From the 38,000 square miles above El Paso should be deducted this 4,700 square miles and also the two areas of 3,300 and 1,300 square miles on the Jornada del Muerto, leaving some 30,700 square miles furnishing run-off to the El Paso gauging station.

This drainage area stretches through $6\frac{1}{2}$ degrees of latitude (from 32° to 38° $30'$ north), ranges in elevation from 3,700 feet above sea level at El Paso to 7,500 in the lowest part of the San Luis Valley, 8,000 along its margins, and over 14,000 on the peaks surrounding it, and has an annual precipitation ranging all the way from less than 10 inches at El Paso and for a long distance up the valley to over 30 inches in some parts of the mountains of Colorado.

The Rio Grande's source is high up on the continental divide, where the Sangre de Cristo range of mountains springs from the parent hills and sweeping to the north and east around the San Luis Valley, then swinging to the south, extends with its snow-capped peaks to the Glorieta divide east of Santa Fe, throwing out a spur to the west above that place, which, after parting in a chasm through which the river flows, terminates in the lofty

Jemez Mountains, while the Conejos range on the west runs southward between the main river and its largest tributary, the Chama, furnishing to both a large amount of snow water from its high plateaus and peaks. It is from this portion of its drainage area that the Rio Grande receives the greater part of the water which passes El Paso. On it the snowfall is heavy in ordinary winters, while south of Santa Fe and the Jemez Mountains but little snow ever falls and none remains any length of time upon the ground. The annual precipitation there comes in violent downpours. The streams are torrential rather than perennial, as are nearly all those above the Jemez Mountains.

In detail the topography and water supply of the country is about as follows:

The great valley on the head of the river, formerly known as San Luis Park, is properly divided into two sections. All of it which is included (see Exhibit A) in water districts Nos. 25, 26, and 27, together with that portion of district 20 which lies north of Alamosa, aggregating in area about 2,600 square miles, never furnishes any water, so far as surface flow is concerned, to the

Rio Grande, while its subsurface flow, if there be any, is very small. Not only is this true now, when large sections of the area in question have been irrigated, but it has been so since 1874 at least, and was probably so prior to that date.

The remainder of the Colorado area all furnishes water to the main river.

The San Luis Valley is a wide stretch of smooth land with a fall of 3 to 5 feet per mile along the main stream and a fall from the hills to the channel of the river of from 5 feet per mile up to 15 or 20 feet. The soil is generally underlaid with gravel, and when supplied with sufficient water produces a good crop of wheat, oats, or barley. The season is too short for the production of corn. The Rio Grande flows some 60 miles through the mountains before entering this wide plain at Del Norte. There its course continues nearly due east to Alamosa, where it swings to the south. Its channel, while well defined, is shallow, being at Alamosa only 6 to 8 feet below the general level of the ground. It is in coarse gravel, not easily eroded, and headworks of ditches are easily maintained.

Near the lower end of the San Luis Valley

the river receives tributaries, the most important being the La Jara, Alamosa, Conejos, and San Antonio from the west, and the Trinchera, Culebra, and Costilla from the east. All of these bring into the main river large amounts of water each spring, except when the snowfall of the previous winter has been abnormally light.

Across the lower end of the valley is thrown a lava flow through which the river cuts its way, forming a canon which is about 100 feet deep at the State line, but deepens to fully 700 at the mouth of the Rio Hondo and holds that depth until within a few miles of Embudo. No living water enters this canon from the west, but several good streams bring water from the east. These are the Rio Colorado, Rio Hondo, Taos, and Penasco, or Embudo, all rising in the Sangrede Cristo range, here called the Taos Mountains. They are all good streams flowing the year around, except that during the summer of exceptionally dry seasons the Taos sometimes goes dry below the Taos mesa, all of its waters being used for irrigation. There is no arable land along the main river in this canon, but all of the streams coming from the east water good bodies of land. The fall of the river is some 30 feet to the mile

from the Colorado line to Embudo.

Immediately below Embudo the river enters the Espanola Valley, which is some 25 miles long and from 1 to 3 miles wide. In this valley it receives the water of Santa Cruz River from the east and that of Chama from the west. The latter is an important stream, draining a large area of mountain country and furnishing much water to the Rio Grande. The Espanola Valley is very fertile and produces grapes, apples, and peaches in abundance, besides corn and wheat.

At the lower end of the Espanola Valley the river cuts through the high ridges, before mentioned as connecting the Santa Fe and Jemez Mountains, forming White Rock Canon, a narrow, tortuous gorge, some 15 to 20 miles long and, in places, 500 feet deep. Here the fall of the river is some 10 feet to the mile, its fall in the Espanola Valley being somewhat less than this amount.

About due west of Santa Fe the river leaves the White Rock Canon and enters a long and narrow valley, bounded on either side by mesas which rise abruptly to a height of 300 to 500 feet above the valley and then slope gently upward to the foot of

the mountains. Nearly all of these mesas have a good soil, but no water supply for irrigation, and hence are valueless except for pasturage.

This valley extends as far south as San Marcial, some 150 miles below the canon, there being two or three short canons in this distance. It varies in width from 1 to 3 or 4 miles, and outside of that portion occupied by the wide, sandy, and ever-shifting bed of the river, is a fertile agricultural land. But one tributary enters the river in this distance which brings in any large amount of snow water, and this comes for a short time in the spring only. This is the Jemez, which has its source in the high mountains west of the White Rock Canon, where the snowfall is quite heavy. Santa Fe and Galisteo creeks also sometimes deliver from the east some water in the spring, but they are usually dry.

Sixty miles below Albuquerque the Rio Puerco enters from the west. This river drains a large area of country, but on all of it the snowfall is very light, and the rainfall comes principally in sudden heavy downpours, so that the Puerco is a torrential stream when in flood, but is dry nine-

tenths of the time. While its drainage area, as before stated, is about 6,400 square miles, it is not likely that over two-thirds of this area ever delivers water to the Rio Grande.

From San Marcial to a point some 20 miles above Rincon, about 100 miles by river, the hills abut closely onto the channel of the stream, there being but little valley land. From the west enters several small tributaries, which have cut down deep into the Mesa Cuchilla Negra; each of these has along it a narrow fertile valley, and while each brings to the Rio Grande some snow water in the spring from the Black Range lying to the west, dependence for a summer water supply rests on springs which appear in the bed of the stream about halfway between the mountains and the Rio Grande.

A range of hills jut out from the Cerro Montoso northeast of Socorro and abut to the river. South of these begins a wide and level mesa, which extends south to Las Cruces. It is named the Jornada del Muerto, and is about 125 miles long and from 15 to 30 miles wide. About 200 square miles of its surface are covered with a lava flow, but at least two-thirds of the rest is

good pasture land, producing a heavy growth of grama grass. The Caballo and Fra Cristobal mountains separate the Jornada from the river near the middle of its length.

There is a good valley reaching 20 miles or more up the Rio Grande from Rincon, and then the mesas again close into the river, forming Seldon Canon.

At Leasburg, some 25 miles below Rincon, the hills flatten out and recede from the river and the Mesilla Valley begins. This is some 60 miles long, going south to the pass 4 miles above El Paso, Tex., and is from 2 to 4 miles wide. The pass is only 3 or 4 miles long, and then the river, which here forms the boundary line between the United States and Mexico, enters the El Paso Valley.

III. HISTORICAL

Before the middle of the sixteenth century the Spaniards entered New Mexico and the valley of the Rio Grande and there found the Pueblo Indians, living in their many-storied towns and cultivating the land of the valleys, bringing

water unto it by acequias, or irrigating ditches, many of which are still in use to this day. How long these Indians had been on the ground is unknown, but they were even then old inhabitants, and raised not only grain and fruit, but even flowers, as one poetical and doubtless homesick Spaniard wrote that roses bloomed along the acequias bank "as bloomed the roses of beautiful Aragon." There are some seventeen or eighteen of these settlements of Pueblo Indians in New Mexico, each holding a land grant 2 leagues square and each with its old pueblo, containing from 200 to 600 people. There were at least this number of pueblos when the Spaniards came to the country, and probably several more, as the ruins of three or four still exist. The inhabitants of each pueblo were then much more numerous also than now. In other words, prior to the middle of the sixteenth century, three hundred and fifty years ago, there were some 15,000 to 20,000 people living from products raised by irrigation in the Rio Grande drainage above Jornada del Muerto, and the area of irrigated land probably exceeded 30,000 acres.

While the Spaniards first entered New Mexico from Sonora and the Gulf of California, the first attempts at colonization were made from El Paso as a base, the Spanish conquest of Mexico having extended to the Rio Grande. This first attempt was made in 1598, and the first Spanish capital of New Mexico was then established at Chamita, in the Espanola Valley, just above the mouth of the Chama. This was abandoned in 1605, and the inhabitants and capital transferred to Santa Fe, where they and their descendants remained until 1630, engaged principally in mining. Then the Pueblo Indians revolted and drove the Spaniards from the country. In 1692 it was re-occupied by the Spaniards and permanently held. Bernalillo was founded about 1700 and Albuquerque in 1706. Settlements were made along the Rio Grande, both in the Albuquerque and Espanola valleys, and also up the Chama, the Abiquiu grant on the latter stream being made to the inhabitants of that town in 1739. El Rito some 20 miles northeast of Abiquiu was occupied in 1730.

The Mexicans did not penetrate to the San Luis Valley, judging from the water rights there granted, until after 1850, the oldest water claim in that valley being that of the San Luis

People's Canal, on Culebra Creek, whose appropriation dates back to 1852. For the ten or twelve years after 1852 the settlements in the San Luis Valley were confined to the country on the Costilla and Culebra and to the Conejos Valley, the town of Conejos being founded in 1855. In 1866 and 1867 settlements were started on the Rio Grande, San Luis, and Saguache, while the next three years saw farms opened and small ditches taken out on the Carnero, the La Gavita, Alamosa, and La Jara, but all of these, except those at Conejos, were confined to the little valleys back in the hills around the margin of the San Luis Valley proper. On these farms, the principal product was hay. This the Mexicans fed in winter to their stock, to which the main valley furnished abundant pasturage for the greater portion of the year.

About 1873 or 1874 the Americans began to move into the San Luis, but still the farm lands were confined to the small side valleys. The first settlement in the San Luis Valley proper, outside of Conejos, was made by the Mormons, who founded Manassa in 1878 or 1879. Soon after this time the

Denver and Rio Grande Railroad built into the valley. The main industry was still cattle raising, however, until about 1882. Then commenced the era of large canal building, which continued for ten years. During this time were built the Rio Grande, Monte Vista, Empire, San Luis Valley, Costilla, Prairie, and Farmers' Union Canals, besides many others. All those named head on the Rio Grande between Del Norte and Alamosa, and stretching 30 or 40 miles north and south from the river, cover the whole of the western half of the valley with their network of laterals. Colonists were brought in as rapidly as they could be found, and a great and brilliant future was predicted for the San Luis. But it was found that the water of the Rio Grande was not sufficient to supply these monster canals, that the soil was not in all cases as fertile as expected, and that the climate was very trying. For these reasons immigration was checked, and since 1892, the valley, instead of rapidly extending its irrigated areas, has not held its own.

While quite a large native American population has come into the Rio Grande drainage in New Mexico since the construction of the

railroads in 1880, it is confined principally to the towns, and to-day fully 90 per cent of the irrigating in this section is done by Mexicans and Indians. These people pursue their ancient methods of irrigation unaffected by modern progress.

IV. IRRIGATION LAW AND SUPERVISION IN COLORADO

Under an enabling act passed by Congress March 3, 1875, the people of Colorado adopted a constitution July 1, 1876, and the Territory became a State by Presidential proclamation on August 1, 1876.

The constitution of the State recites in Article XVI:

"Sec. 5. The water of every natural stream not heretofore appropriated within the State of Colorado is hereby declared to be the property of the public, and the same is dedicated to the people of the State subject to appropriation as hereinafter provided.

"Sec. 6. The right to divert unappropriated waters of any natural stream to beneficial use shall never be denied. Priority of appropriation shall give the better right as between those using the water for the same purpose, but when the waters of any natural stream are not sufficient for the service

of all those desiring the use of the same, those using the water for domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes."

Section 5 established what was then an innovation in the ownership of water, denying the old doctrine of riparian rights, which vests the title to the water of a non-navigable stream in the owners of abutting property. California was the only State in the Union in 1876 where irrigation was in vogue, and the supreme court of that State decided recently that riparian rights must there be respected. I think, however, that the constitutions of several of the States admitted since 1876 have followed the Colorado precedent in the framing of the clause of their constitutions relating to the ownership of water.

In 1879 the Colorado legislature passed voluminous irrigation laws. These provide for the division of the State into water districts, bounded by natural watersheds, and for the adjudication of water rights in each district by the district court within whose jurisdiction the territory may lie. These districts were afterwards grouped into water divisions and the governor authorized to appoint a superintendent for each division and a commissioner of each district from men recommended by the county commissioners of the county or counties in which the water division

or district lies. The duty of these officials is to distribute water among the different ditches in the proportions and priorities prescribed by the court decree. The water commissioners report to the superintendent and the superintendent to the State engineer. The system is very faulty in its working, because the State engineer has no disciplinary power over his staff, except to recommend to the governor the removal of an offending subordinate, and likewise the superintendent of a division can not compel obedience from the commissioners under him. Moreover, the water commissioners receive their pay from the county, their bills for service being first passed on by the county commissioners, and the latter may reduce or reject altogether these claims, so that a water commissioner, when carrying out peremptory orders from the State engineer or the superintendent of his division, has no assurance that he will be paid for his labor. The working of the system is very cumbersome and unsatisfactory.

The San Luis Valley constitutes division 3, and is subdivided into eight districts,

numbered respectively 20, 21, 22, 24, 25, 26, 27, and 35. The boundaries of these districts are shown in red on Exhibit A.

As the adjudication of water rights in a district is a very tedious process, the taking of testimony is generally placed in the hands of a referee, who is, unfortunately, obliged to be guided in his decisions entirely by the ex parte testimony of the claimants for water. They, of course, place their date of appropriation as early as possible, the carrying capacity of their ditch as large as they dare, and the area irrigated or irrigable just as large as they can figure it, and, unless some neighbor calls them down, the referee has no check on the accuracy of their statements. This results in ditches frequently getting appropriations-
are
or decrees, as they/ commonly called--largely in excess of their carrying capacity. For instance, 107 ditches in district 22 have an actual aggregate carrying capacity, as stated by the water commissioner, of 1,034 second-feet,

while their decrees amount to 2, 978.42 second-feet and their claimed capacity to over 4,000 second-feet. One hundred and seventy-one ditches in district 25 claim to have a carrying capacity of 2,501 second-feet, while the decrees amount to but 919.18 second-feet. The decrees of the San Luis Valley were made on various bases, averaging about 1 second-foot of water of decree for each 50 acres irrigated.

All the districts except district 25, in division 3, have been organized and adjudicated and decrees issued on the following dates:

District 20.....	Nov. 17, 1881
District 21.....	July 11, 1883
District 22.....	1880
District 24.....	June 14, 1880
District 25.....	Mar. 23, 1880
District 26.....	Nov. 25, 1889
District 27.....	Feb. 23, 1880

In district 20 a new decree was issued in the spring of 1886 and the district was operated thereunder this year. The validity of the new decree has been assailed, with a good prospect of success, and as the district has worked under the old one for four years and is likely to return thereto next year or the year after, I have based my study of the district on the old decree.

The State Legislature of 1889 passed a bill, which became a law, instructing the State engineer to gather each year and embody in his biennial report statistics as to the amount of water used and land irrigated by each ditch in the State. It became the duty of the water commissioners to collect this information under instructions from the State engineer and superintendents of the several divisions. The work had to be paid for, however, by the counties, and prior to 1886 the county commissioners in several counties have refused to allow the bills of the water commissioners for this work. This has resulted in either no statistics being gathered in those counties, or in what were obtained being collected in a perfunctory way from the returns made by the owners or managers of the different ditches, without any attempt at eliminating errors and obtaining accurate results. This has been especially true in the third division, no agricultural returns whatever having been made from there until 1895, when partial reports were returned from districts 20, 21, 24, 25, 26, and 27. This year Mr. Anderson, the superintendent

made an heroic attempt to obtain accurate returns. He has succeeded fairly well, although there are still many apparent discrepancies in them.

My report on the use of water in Colorado is based on the returns for 1895 and 1896, supplemented by quite a voluminous correspondence, both by mail and wire, with Mr. Anderson and other parties, and some information I collected in Denver, Alamosa, and Antonito. As before stated, it is to be regretted that more time was not spent in the valley in the personal gathering of data, as a few days of such work would have added very materially to the accuracy and consequent value of this report. This, however, was not done, and hence the statistics given you herewith must be considered with the limitations specifically stated under each district.

V. COMPILATION OF COLORADO DATA.

My methods of procedure in collecting the data of each Colorado district has been as follows:

First. From the copy of the decree a list of ditches was made. This list was entered on a blank form containing 16 columns headed and filled in as follows:

1. "No. of ditch," starting from 1 in each district. The ditches of each district are numbered in the order of their priorities, as given in the decree, and are supposed to show their chronological order of construction, regardless of their location.

2. "Name."

3. "Stream," being the source of water supply.

4. "Date of first use." This date was assumed to be the year of appropriation when it was made prior to July 15 and the following year when it was after that date. It is likely that in some cases this rule gives a date of **first** use one or two years too early, as appropriations are usually claimed as being made when the first action is taken looking to the construction of a ditch, and may antedate its actual use by several years, provided the claimant can show that he used "due diligence"

in the prosecution of the work of construction. It is impossible to say just when this occurs, and so the above rule was adopted as the one most likely to be correct. Where several appropriations are made to the same ditch the several years are entered in this column.

5. "Decree." This is the amount of water which a ditch is legally authorized to take from the stream. In this column is entered the sum of all the appropriations made to a ditch, while the several appropriations for each year are entered in the last column on the sheet. Decrees are given in cubic feet per second.

6. "Possible acreage." This column is filled from the returns of the commissioners and the areas given are not reliable; in fact, it would be extremely difficult to say, even after a survey, how much and what land could be irrigated from each ditch, as conflicting ditches, extensions, etc., will constantly change the conditions.

The information is given merely as a guide to show, in a general way, what proportion of irrigable lands in each district are now cultivated.

7. "Capacity." In districts 20, 21, 22, and 24 the quantities in this column are approximations to the actual capacities, but are none of them exact, as no rating flumes are in existence in the San Luis Valley and but few of the ditches have been rated. In districts 25, 26, and 27 the capacities returned by the water commissioners are copied from the decree, which, as before stated, is made up from the testimony of the claimants for water, many of whom do not know whether their ditch falls 10 feet or 100 feet to the mile, and who will give its size at its widest and deepest place, regardless of the rate/^{of} movement of the water through the cross section. As a natural result, the capacities given in these districts aggregate an amount several times as large as the total of the decree and probably many times as large as the actual carrying capacities. These are in cubic feet per second.

8. "No. of days," being the number of days that water ran in each/^{ditch} in 1895, as given in the returns for that year.

9. "Average per day," being the second-feet supposed to have been carried each day, taken from the returns for 1895.

10. "Acre-feet." Being (except as stated later on) the product of the number of days by twice the second-feet. This gives the correct result within 0.7 per cent an acre-foot, being 43,500 cubic feet of water, or the amount necessary to cover an acre of ground 1 foot deep .

11. "Acres." I had at hand only the totals for each water district for 1895, and so distributed the total amount uniformly among the several ditches included in the return.

12,13,14,15. Same as 8,9,10,11, but for 1896, except that the acres watered are as given for each ditch in the returns.

16. "Remarks." This column is filled principally with the separate items (where there is more than one) of each decree.

Second. After the list of ditches was compiled from the decrees and made up on this form all the information contained in the returns for 1895 and 1896 was entered in the proper place, together with what other information I might have. As before stated, I found early in the investigation that neither the carrying

capacity of the ditches nor their decrees formed a safe basis for an estimate of water used, and so have put into these tables the acreage watered, in addition to the data specified in your letter of instructions.

Third. Wherever no returns were made-- and some ditches were omitted in nearly every district--a reasonable assumption was made and the missing data supplied. This was done because totals are what you need and not partial returns.

Fourth. An assumption of total acreage was made in each district for each year from the date of the decree down to 1895. This assumption was based on what information I might have and its proportion to area watered in 1895 and 1896, as stated under the discussion of each one. This acreage was distributed among the different sheets of the district in proportion to the decrees shown thereon and the totals carried to the summation sheets for the district. I did not attempt to show separately the amount of water used by each ditch each year since 1880, as instructed, because it was, in my opinion, impracticable to do so, and, even if it could have been done, would have made the

~~tabulations~~ some four times as bulky as they now are, without adding materially to the information which is now contained on the summary sheets which I have compiled for each district.

Fifth. Starting from the date of the decree and with the acreage assigned to each ditch of a sheet, and the total decree and capacity shown thereon, I worked backward toward 1880, deducting year by year the decrees issued for the succeeding year, and a proportionate part of the capacity and acreage of each ditch having a lapsing decree where a prior decree existed, or the whole capacity and acreage of a ditch where all of the decree was gone. The results thus obtained were entered in the summary table for each district, thus filling up the table, with the exception of the amount of water used.

Sixth. After a careful study of all of the available data, I arrived at the conclusion that the maximum amount of water which can be absorbed and retained or evaporated by an acre of land in one season is 4 feet in depth over its surface, or 4 acre-feet per acre. In apparent contradiction of this conclusion will be found the fact that the returns give an amount of water run through

many ditches, and supposedly used on the acreage returned, which equals much more than 4 feet per acre. This occurs as follows: A large percentage of the irrigated lands in division 3 are grass lands, lying along the margin of the streams. On these lands a constant flood of water is poured as long as there is an available supply, the greater part of which runs across the meadow and back into the stream to be again diverted by the ditch next below, where a large portion is again returned to the stream, but the whole amount is charged up in the returns against each ditch. Again in seasons of short water supply a small amount, say 1 to 5 second-feet, may be kept running through a ditch to supply the inhabitants thereon with water for domestic use, they being forbidden the use of it for irrigation and the greater part of this water returns again to the stream and is used for irrigation by some ditch lower down with a right prior to the one above. Yet all this water is charged to the first-mentioned ditch. Hence, in filling columns 10 and 14 of the statements, when the number of days water ran multiplied by twice the amount carried **in** second-feet would

equal more than four times the acreage, I have inserted the latter product instead of the former.

This has given me the total amount of water used in 1896, and, where the returns were complete for 1895, the amount used that year also, For the years from 1880 to 1895 I proceeded as follows:

From Mr. Anderson I obtained the following statement:

I give you herewith the consensus of opinion regarding water for irrigation from 1879 to 1896, inclusive. It is fairly accurate.

<u>YEAR</u>	<u>REMARKS</u>
1879..	High water in Rio Grande; scarcity in other streams.
1880..	Surplus water in Rio Grande; plenty in other streams.
1881..	Do
1882..	Do
1883..	Do
1884..	High water in Rio Grande; plenty in other streams.
1885..	Surplus water in Rio Grande; plenty in other streams. Very heavy snows covered the valley in winter of 1885-36.
1886..	Surplus water in Rio Grande and other streams.
1887..	Sufficient water in Rio Grande and other streams.
1888..	Sufficient water in Rio Grande and other streams.
1889..	Do
1890..	Shortage all over valley and other streams.

YEAR	REMARKS
1891..	Do
1892..	Do
1893..	Do
1894..	Great scarcity all over the valley.
1895..	Very short until after the middle of July excessive rains produced high water in all of the streams until late fall.
1896..	Very great scarcity all over the valley; commenced closing down ditches on the Rio Grande. June 7 low-water marks (at Del Norte) 240 second-feet.

This statement agrees fairly well with the other data I have and was made my basis for assuming the amount of water to charge to each acre in the different years, as stated in detail in the discussion of each district.

After thus making up a summary for the different sheets of each district the totals from each are collected onto the three sheets headed "summary of use of water in San Luis Valley, Colorado."

In looking over these sheets you will notice that with the exception of districts 24 and 25 no new ditches appear after the decrees were granted. The returns for district 21 give the names of four ditches without decrees, but

no data as to land irrigated, and so I could not include them in the statement for that district. Judging from their names they are all Mexican ditches and probably small affairs which may have been built and in use long before the decree was issued, but whose owners failed to appear in court. It is likely that their aggregate use of water forms but a small percentage of the whole use in the district. The decree of 1896 for district 20, instead of adding any ditches to the former decree, omits the last six given decrees in 1891. These were either granted decrees conditional on their being built, or after being built were abandoned. This indicates no new construction work in district 20 since 1891. In district 22 I am quite sure that no new ditches have been built since 1890, and from my knowledge of districts 26 and 27 I should say that it is not likely any new ditches have been built in recent years, as those in existence when the decrees were made largely overappropriated the available water.

VI. DISTRICT NO. 20, COLORADO

Area, about 2,500 square miles.

Adjudicated, November 11, 1891.

Number of ditches, 266, shown on eleven sheets.

Number of separate decrees, 425.

Summation of decrees, 5,561.76 second-feet.

Capacity of ditches, 6,054 second-feet (actual).

District NO. 20 is the most important one in the San Luis Valley, as it includes about one-half of the irrigated lands in the valley and has within its boundaries several of the largest irrigation canals in the United States. It consists of the immediate drainage of the Rio Grande above the mouth of the Conejos and includes not only the main river, but all the numerous small creeks as well which lie between La Garita Creek drainage on the north and Alamosa Creek drainage on the south. Several of these, at San Francisco Creek, Rock Creek, and Cat Creek, never deliver any water to the main river except in seasons of heavy spring floods. Exhibit B shows the eastern portion of

this district and the location of its larger ditches.

On the head waters of the Rio Grande, as well as along the small tributaries, are little valleys which have been occupied as hay ranches for over twenty years. The decrees date back to 1873 and 1874, a few going back as far as 1867.

On passing Del Norte the river enters the main valley, and the elevation of its channel is such that canals leaving the river there run almost due north and south. After passing Alamosa the river, whose course so far has been easterly, swings to the south.

The earliest settlements in the district were made in 1866 by Mexicans, who located below Alamosa, on some low bottom lands along the main river. Up to about 1881 all the ditches built were small ones, although in that year nearly 200 of them were in use in the district. Then came a boom in irrigation development, and several very large canals were constructed in the next six or eight years.

Judging from the dates given in the decree, the first large canal to be started was the Rio Grande (No. 198 of the list), first called the Del Norte. Its first appropriation dates back to 1882, although I do not think that the main part of the canal was built until 1886 or 1887. Leaving the main river just above Del Norte, it skirts the foothills until the valley is reached and then turns north and extends across district 27 to Saguache, in district 26. The returns for 1896 state that it can water 60,000 acres. Its capacity of 1,500 second-feet is sufficient to serve twice that area.

The Monte Vista Canal, No. 204 (formerly called the Citizens' Canal), also has an appropriation dating from 1882, but the main canal was not built until later. It leaves the river above Monte Vista and runs south across district 21, finally tailing into the Conejos in district 22. Its claimed available area is 45,000 acres. Its capacity of 650 second-feet is fully sufficient for this amount.

The Empire Canal, No. 214, comes next in the list of large canals. Its first decree runs from 1883, but the main work of construction

was not done until 1887 or 1888. Leaving the Rio Grande near Monte Vista, it runs southerly across district 21 into district 22. The returns assign it an available area of 50,000 acres. Its capacity of 1,000 second-feet is large enough to serve much more than this amount of land.

The Farmers' Union, No. 254, heads some 3 miles below Del Norte and runs north and north-east. It was built in 1888 or 1889, its first decree being dated November 7, 1887. (First use given in table as 1888.) The returns assign it 60,000 acres, but only give it a capacity of 325 second-feet. I have retained this size in the tabulation, although I am quite sure it was built to carry 800 feet or more. It has probably been neglected and filled up with sand blown in by the wind, as the waters of the San Luis Valley carry no silt, and so it could not have lost its original carrying capacity from the deposit of mud.

You will see that these four canals have an aggregate capacity of 3,475 second-feet or more, and there are several other ditches, each having a capacity of 100

second-feet or more. As the mean summer flow of the Rio Grande at Del Norte is less than 1,500 second-feet, while its minimum goes down during the irrigation season below 250 second-feet, it is easy to see that these canals stand but little chance of getting water for any large portion of the arable land covered by them. At the time they were built, however, there had been two or three successive years of heavy snowfall, and the river was carrying each summer much water beyond that used by the existing ditches. It was known even then that there was not a water supply sufficient for all of the projected canals, but the manager of each of the rival construction companies pushed the completion of his canals, hoping to obtain by some means a right to all the water, thus leaving his rivals with none.

A good many immigrants settled under the large canals immediately after their construction, and the ditch owners also farmed on a large scale for two or three years, about 1891 and 1892. It is stated that the Empire watered 75,000 acres in 1892.

I have estimated 40,000 served for that year. In the returns for 1896 it is credited with serving but 7,450 acres. Some 50,000 acres were watered in 1892 by the canals north of Alamosa, where the area tilled in 1896 was small.

About 1892 the canal companies got into financial difficulties and internal dissensions and the bonanza farming was abandoned. The residents of the valley say that more land is tilled now than in 1892, but I do not quite credit the statement. While there are probably more resident farmers than in 1892, each on 30 or 160 acres of land, it takes a large number of them to farm 40,000 acres, as did the owners of the Empire.

District 20 was first adjudicated in 1891, but readjudicated in the winter of 1895-96. My work, as before stated, is based on the first decree. The new decree gives appropriations aggregating only about 2,660 second-feet against an award made by the first decree of over 5,560 second-feet. The first adjudication named 272 ditches. Of these, the second decree omits

12, 6 being noted as having water rights in the Rio Grande Canal and the last 6 of the first decree being dropped. I have retained in my list the first 6, but have assigned them no acreage, thinking their watered area would be returned with that of the Rio Grande Canal. The last 6 I have omitted from my list. They were probably never built or, if built, abandoned. The sum of their decrees was only 12.30 second-feet, so that their omission or insertion cuts no material figure in the totals. The return for 1895 from district 20 was very meager, only giving data relating to 16 of the incorporated ditches.

For 1896 the return is more complete. It gives data for all the ditches on the Rio Grande below Del Norte with the exception of the Prairie No. 249, and gives the average flow of the tributaries, together with the acreage watered on each, all of the flow returned having been used for irrigation. I have entered on the eleven detail sheets of this district the returns for 1896, distributing among the ditches on each branch stream the total returned acreage thereon in proportion to the size of their decrees.

There were then a few small ditches without any return, and I assigned an assumed acreage, based on the decree of 1896, thinking that the latter was more likely to indicate the acreage now watered than was the decree of 1891. The number and size, however, of the ditches on which no return is made is small, the whole area filled in by the assumption as above described forming only about 2 per cent of the total area watered in the district. This is aside from the Prairie, which, although in use, was by some oversight omitted from the returns. For it I assumed 5,500 acres, basing the assumption on the decree for 1896.

Wherever the returns charged more than 4 acre-feet of water to an acre of land I reduced them to that amount in accordance with the plan and for the reasons before outlined. Only 34 out of the 266 ditches were overcharged. When these deductions are made, the average for the whole district is some 1.85 feet of water used per acre of land irrigated in 1896.

The returns for 1895 give a total acreage for 16 of the larger ditches, which is 20 per cent greater than the returns for the same ditches in 1896. In assigning acreage for the other ditches for 1895, however, I added but 10 per cent to the area of those ditches for 1896, thinking that the amount of land watered under the smaller ditches was not so likely to change as under the large ones. In this way the acreage for 1895 was made up.

Prior to 1895 I assumed that the areas under each ditch would be the same as that of 1895 until some of its decrees lapsed, except in the cases of 9 of the larger ditches. I had assigned to the Prairie 5,500 acres for 1895 and 1896. This I carried to 1892, but gave it 4,500 in 1891 and 3,500 in 1890. To the Excelsior, Rio Grande, Monte Vista, Empire, San Luis Valley, Costilla, Farmers Union, and Kenelworth, I assigned the areas given in the table on the last sheet of the summary for district 20, this table being made up from average of information obtained in various places.

From 1892 back the area of each ditch was reduced in the proportion of its lapsing decrees, as before fully explained.

The return of 1895 charges to the 16 ditches returned a total of 835,330 acre-feet of water used on 126,540 acres, or an average of 6.6 acre-feet per acre. The other ditches on the Rio Grande below Del Norte gauging station watered about 22,000 acres in 1895. If these were charged with the same proportionate use of water as were the others the total charge for 1895 would be 970,000 acre-feet. As the total recorded flow of the Rio Grande past the Del Norte gauging station from April 1 to September 30, 1895, was but 545,000 acre-feet, it is evident that no dependence is to be placed on these returns so far as they relate to the amount of water used, although the acreage is probably fairly reliable.

After studying the tables of gauging at Del Norte, to be described later on in this report, and Mr. Anderson's statement, I have assumed the following use of water in District

No. 20:

Up to 1887, inclusive, 4 acre-feet per acre.

Up to 1888 and 1889, 3.5 acre-feet per acre.

Up to 1890 and 1891, 3 acre-feet per acre.

Up to 1892 and 1893, 3 acre-feet per acre for first 150 ditches; 2 acre-feet per acre for the rest.

Up to 1894, 3 acre-feet per acre for first 150 ditches; 1.6 acre-feet per acre for the rest.

Up to 1895, 3 acre-feet per acre for first 150 ditches; 2.3 acre-feet per acre for the rest.

For 1896 the returns show 3 acre-feet per acre for the first 150 ditches; 1.65 acre-feet per acre for the rest.

The first 150 ditches are all small, watering but about 15 per cent of the total area served in the district. The detailed returns for 1896 give them, as above stated, an average of 3 acre-feet per acre, and as this is the driest year on record, I thought best

to give them the same all the time since any shortage commenced to be felt in the district. For the others, the amount is determined in a measure from the gaugings at Del Norte, remembering that all the water of the six months between April 1 and September 30 can not be used, as some comes before and some after the irrigation season and some comes also in the spring flood, when it is not at all probable that the whole flow of the river would be used. The totals for the district are entered, sheet by sheet, on the "Summary, district 20," and also in the "summary for Colorado."

The capacities given are furnished me by Mr. Anderson and are intended to be actual. They are probably close approximations thereto.

VII. DISTRICT NO. 21, COLORADO

Area, about 550 square miles.

Adjudicated, July 11, 1888.

Number of ditches, 75, shown on three sheets.

Number of separate decrees, 91.

Summation of decrees, 1,877.67 second-feet.

Capacity of ditches, 799 second-feet (actual).

District No. 21 comprises the drainage of Rios La Jara and Alamosa, including that of Hot Creek. The streams all flow at first through long, deep canons, widening occasionally into little valleys. The first settlements were made in these valleys. About the mouth of Hot Creek the two rivers, there close together, enter the level valley and then run easterly to the Rio Grande nearly parallel and only 1 to 2 miles apart. Only in flood time does the water of either river reach the main stream or even enter the valley. Nearly all is used up on the little valleys of the canons and a high mesa between Hot Creek and the Alamosa, watered from the latter, and what escapes the ditches sinks into the ground and probably goes to the supply of the shoal La Jara artesian basin, for around the town of La Jara flowing wells, with light pressure, are obtained at a depth of from 30 to 50 feet.

The Empire Canal extends into the eastern portion of district 21, and during 1891 and 1892 watered many thousand acres therein. This land is included in the estimate of acreage in district 20.

The Monte Vista (formerly called the Citizens) Canal, crosses this district just under the toe of the foothills, but does not, I understand, water any land in the district.

The returns from this district are complete for both 1895 and 1896. The capacities given are actual, and not those shown in the decree. As would be anticipated from the description of the district and from the fact that 1895 was a year of good water supply after the middle of July, the returns for that year charge more than 4 acre-feet of water per acre to a large number of the ditches, or to 40 out of the total of 75. But the acreage under these ditches was small compared with that served by the other 35, so that, after reducing all

excess charges to 4 acre-feet per acre, the average for the district amounts to 2.6 feet per acre. This is to be expected, as there is said to be a shortage always in the district, as there is much more good land under ditch than the water will supply.

The returns for 1896 give an excess of water in 13 ditches, all small affairs. When these are reduced to 4 acre-feet per acre the average for the district is 0.7 acre-feet per acre. The area watered in 1895 was about 3,500 acres more than in 1896. The returns for 1896 give, as before mentioned, the names of five ditches without decrees, but no statements of areas watered. Their names are: J. A. Ortiz, El Chamiso, Damien Nunez, Ramon Domingo, Frank de Herrera. They are probably small affairs and cut no material figure in the totals.

The greatest acreage of the district was probably in 1891. I assumed for the year an increase of about 10 per cent over 1895, and for 1889 about the same as for 1895, making the assumed acreage the following for the years after the decree:

Acres

1888.....	42,000
1889.....	42,000
1890.....	44,000
1891.....	46,000
1892.....	45,000
1893.....	44,000
1894.....	42,000

The decrease of acreage in this district from 1891 to 1896 was probably due to the short water supply of the intervening years. As the supply is normally short in this district, any diminution thereof would be more quickly felt than in the other districts.

Prior to 1885 the acreage in the district was small and principally grass land, so I assumed 4 acre-feet used on each acre watered prior to 1885, including that year. In 1886 acreage was increasing, and I assumed 3.5 acre-feet per acre. In 1887, 1888, and 1889 there was sufficient water supply in the valley as a whole, but the acreage in district 21 was increasing quite rapidly and the water supply was fully appropriated. I therefore assumed for those years 3 acre-feet of water used per acre irrigated. From 1890 to 1893, inclusive, the

supply of water was short, and the amount used here is assumed to be 2 feet per acre. In 1894, when it was very short, the assumption was 1.5 acre-feet per acre. The returns show 2.6 acre-feet per acre for 1895, and 0.7 for 1896, as before stated.

Prior to the decree given in 1888 the same method was employed to obtain acreage as was used in district 20. From the acreage thus obtained and the above assumptions as to use of water the "Summary district 21" was made up from the three sheets and the totals carried from it to the summary for Colorado.

VIII. DISTRICT NO. 22, COLORADO.

Area about 550 square miles.

Adjudicated, 1890.

Number of ditches listed, 110 shown on five sheets.

(The 3 Taos Valley canals are rejected from the totals for reasons fully given further on, leaving 107 ditches carried to the summary.

Number of separate decrees, 142.

Summation of decrees, 2,978.42
second-feet.

Capacity of ditches, 1.034 second-
feet (actual).

District No. 22 comprises the drain-
age of the Conejos and its tributaries.
As in district 21, the streams all flow at
first in long, deep canons, widening to
occasional valleys and meadows, and in these,
and on the edge of the main valley near
Conejos, are the oldest ditches in the dis-
trict.

The San Antonio, the largest tributary
of the Conejos, has its source in New Mexico,
and Los Pinos Creek, while rising in Colorado,
flows through New Mexico in a portion of its
course. There are small ditches on both of
these streams in New Mexico. They are in-
cluded in the list of ditches for that
Territory.

Exhibit C is a large scale map of a portion
of district 22, issued by the State engineer
of the Colorado, on which are shown the larger

ditches. You will see that the Citizens (now called Monte Vista) Canal runs to the Conejos, as before mentioned. It is my belief, however, that no land in the district was ever watered from it.

In 1888-89 a company named the Taos Valley Irrigation Company constructed in this/^{district}three large canals known as Taos Valley canals Nos. 1, 2, and 3, each with an original carrying capacity of over 500 second-feet. No. 1 was built for the purpose of diverting water from the Conejos to the San Antonio River, reaching the latter stream about a mile south of Antonito. Here a dam was thrown across the river, and canal No. 2, heading at the south end of the dam, was built through the solid lava rock to the State line, reaching it some 5 miles southeast of the dam. Canal No. 3 also headed in the San Antonio several miles below the head of No. 2, and ran to the southeast. It was the intention of the promoters to water a large body of land in New Mexico, but they found that in order to reach the land their canals would have to be dug through solid rock for

many miles, that only a small percentage of the area they would cover was arable, and that the water rights granted them in the decree of 1890, while making the grand showing on paper of 500 second-feet for each canal, or 1,500 second-feet in all, were valueless, as all of the mean flow of the two rivers was absorbed by prior appropriations.

The original promoters therefore dropped the scheme and the bondholders took hold. The latter built a reservoir under Canal No. 3, called Cove Lake, whose capacity is said to be some 9,700 acre-feet. When they got it built, however, they discovered that there was only a thousand acres or so of arable land commanded by it. This land they have attempted to colonize, but so far have failed, and I infer from a conversation I had with their manager in Antonito that they are about to abandon the project. No land has ever been watered by these three canals, although/^{Canal}No. 2 ran full during the spring flood for several years. The water

was turned loose at its lower end onto the mesa and found its way into the canon of the Rio Grande somewhere below the Colorado line. On account of these conditions I have thought it best to omit these three canals from the totals while giving them in the list of ditches for this district, because I considered that including them would be confusing. So, while the list gives the names of 110 ditches, the totals show but 107 with their respective capacity and decree in district No. 22.

Mr. John C. Dalton, the commissioner of this district, gave me the capacities of all the ditches. He has been commissicner for four years and is very familiar with the district; so that although there are no rating flumes in the ditches, nor have any of them been carefully measured, the capacities given are no doubt near approximations to the true capacities. It is in this district that the actual capacities amount to 1,034 second-feet, the decree to 2,978.42 second-feet, and the claimed capacities to about 4,000 second-feet, all of these totals exclusive of the Taos Valley canals.

The returns for 1396 give an aggregate of

60,625 acres watered during the year, and surplus water for 19 of the 107 ditches returned. When these are reduced to 4 acre-feet per acre, however, the average for the whole district is but 1.75 acre-feet per acre.

Mr. Dalton stated that to the best of his recollection about 40,000 acres were watered in 1893, 46,000 in 1894, and 51,000 in 1895. I am inclined to the belief that his figures are small, as he is a conservative man.

From all I can learn I judge that the acreage of 1890, the year of the decree, was about that of 1896, and so have assumed the following acreages for the respective years:

	Acres
1890.....	60,000
1891.....	55,000
1892.....	50,000
1893.....	45,000
1894.....	50,000
1895.....	55,000

Back of 1890 the acreage is computed by the lapsing of the decrees, as in districts 20 and 21.

This district has generally had a very good water supply, so prior to 1890 I assumed 4 acre-feet per acre. As there was a shortage in the entire valley in 1890, 1891, 1892, and 1893, I assumed 3 acre-feet used on each acre in district 22. In 1894, when the drought was more severe, I assumed 2.5 acre-feet per acre, and in 1895, 3 acre-feet per acre. In the last-named year there was an abundance of water after July 15, and the grass lands would have used the full amount of 4 acre-feet per acre, but the large **M**ormon population around Manassa and Ephraim raise principally wheat and oats, and this water came too late in the season for them, so that I assume an average for the district of 3 feet per acre.

With these assumptions are made up the two sheets headed "summary district 22," and the totals are carried therefrom to the summary for Colorado.

IX. DISTRICT NO. 24, COLORADO

Area about 700 square miles.

Adjudicated June 14, 1889.

Number of ditches listed, 25,
shown on one sheet.

Number of separate decrees, 23
(two ditches have no decrees).

Summation of decrees, 265.50
second-feet.

Capacity of ditches, 356 second-
feet.

Districts No. 24 and 35 lie
entirely within the Sangre de Cristo
Spanish grant. That portion of this grant
included in district No. 24, together with
a large area in New Mexico, is known as the
Costilla estate, while the portion which
forms district 35 is called the Trinchera
estate.

District No. 24 covers the drainage of
Rio Culebra and that portion of the Rio Cos-
tilla drainage lying in Colorado. Its sur-
face outside of the mountains is more uneven
than is that of the rest of the valley, the
San Luis hills and San Pedro mesa break-
ing up the western portion.

The returns for 1896 give the actual
capacities of the ditches, not those men-
tioned in the decree. The total acreage re-
turned in 1896 is 7,050 acres, while the

returns for 1895 show 9,500 acres watered. I assumed that nearly the maximum average was watered in 1895, or that the maximum was 10,000 acres.

There are 25 ditches in the district, 23 having decrees. Two were built on the Costilla after the decree was given.

The returns for 1896 give an excess of water used in 20 out of the 25 ditches, but when these are reduced to 4 acre-feet per acre the average for the district is 3.2 acre-feet per acre. While all the water in the district is now appropriated and in dry years practically all is now used, the supply is very steady and uniform, as all the streams have their sources high up on the Sangre de Cristo Mountains (here called Culebra Range). So that, while the years 1890, 1891, 1892, 1893, and 1894 were years of scanty water supply for the valley in general, I assumed the following use of water in this district: 1890, 4 acre-feet per acre; 1891 and 1892, 3.5 acre-feet per acre; 1893 and 1894, 3 acre-feet per acre.

In 1895 I assumed 4 acre-feet per acre,

and prior to 1890 4 acre-feet per acre
also.

As there was but one sheet of the list
for this district, there is no summary sheet,
but the totals are entered directly in the
summary for Colorado.

X. DISTRICT NO. 25, COLORADO.

Area, about 950 square miles.

Adjudicated March 28, 1890.

Number of ditches listed, 171,
on seven sheets.

Number of separate decrees, 235.

Summation of decrees, 919.18 second-
feet.

Capacity of ditches, 2,501 second-
feet (from decrees).

District No. 25 covers the whole western
slope of the Sangre de Cristo Range north of
Sierra Blanca, its western boundary being
San Luis Creek on the southern half and the
divide between it and the Saguache on the
northern half. There are no large streams
or ditches in the district but its water
is carried in many small creeks. As a
result the number of ditches is large in

proportion to the area watered. The Luis Maria Baca Spanish grant No. 4 occupies about 150 square miles of the best portion of the district and has on it some 23 small ditches.

No water from either district 25 nor from 26 or 27 ever reaches the Rio Grande on the surface. Near the south end of the district, on the line between it and district 20, you will notice on Exhibits A and B several small lakes. These are called the San Luis Lakes. The larger is about $2\frac{1}{2}$ miles long, with an area of about 1,500 acres. The smaller ones have areas of from 100 to 300 acres each, the total area of all being somewhere between 2,500 and 3,500 acres. These lakes receive the flood waters of district 25, 26, and 27. Sometimes the surplus waters of seasons of heavy snowfall will raise the lakes 3 feet. But no one that I could find has ever seen water run from these into the Rio Grande.

All of the streams in these three districts begin to decrease in size on reaching the open plain, their waters apparently sinking into the

gravelly substratum of the plain and probably furnish the water for the deep artesian basin which is tapped by a large well at Alamosa.

The returns from this district are complete for both 1895 and 1896, but I doubt their accuracy for either year. In both years each ditch is charged with carrying its full decree for the season, which is given as from fifty to one hundred and twenty days in 1895, but is averaged for the whole district as sixty-five days in 1896. After reducing the excess returns for 1895 to 4 acre-feet per acre, the total gives 3.77 acre-feet per acre used that year. This is likely to be something near the correct amount. In 1896, however, the returns give over 2.5 acre-feet per acre, and this I believe to be largely in excess of the amount used. I have no means of correcting it, however, and so must let it go as it is.

The returns for 1895 give 1,515 acres watered by ditches without decrees, and for 1896 1,625 acres, but no statement as to the number or capacity of the ditches serving

this land. Whatever their number, it is likely that they were built soon after the decree was given in 1890, as the dry years of 1891, 1892, 1893, and 1894 would discourage the construction of new ditches. In 1896 there was a little over 3,000 acres more cultivated than in 1895, and the acreage of 1896 would just about equal the amount the decree was supposed to cover, which, at 50 acres per second-foot, would be about 46,000 acres for the decree of 919.18 second-feet. I therefore made the following assumptions as to acreage:

Prior to 1890, and 1890, assume full decrees cultivated, decreasing the amount as the decree lapse; 1891, assume 800 acres more than decree, this for new ditches; 1892, assume 1,600 acres more than decree, this for new ditches; 1893, assume decree; 1894, assume 1,500 acres less than the decree.

While the district receives its water supply from the western slope of the Sangre de Cristo Mountains, the same as does district 24, the water is all carried in small streams, and so the shortage of the years after 1890

was probably felt more severely here than in district No. 24. I therefore assumed the following use of water:

For 1889 and prior thereto, 4 acre-feet of water per acre; for 1890, 1891, 1892, and 1893, 3 acre-feet of water per acre; for 1894, 2.5 acre-feet of water per acre.

From these assumptions the three sheets, marked "Summary district No. 25," were made up, remembering that sheet No. 7 of the list must carry, in excess of the amount due from its decrees, the several amounts allowed for ditches without decrees, viz, 800 acres in 1891; 1,600 acres in 1892, 1893, and 1894; 1,515 acres in 1895, and 1,625 acres in 1896. The totals were carried to the summary for Colorado.

In this district the water commissioner returned the capacity of ditches mentioned in the decree, summing 2,456 second-feet for the 171 ditches besides 45 second-feet allowed the ditches without decrees. There is no probability that the total capacity of ditches in this district exceeds or even equals the decree, viz, 919 second-feet.

XI. DISTRICT NO. 26, COLORADO.

Area, about 900 square miles.

Adjudicated November 23, 1889.

Number of ditches listed, 184 on
eight sheets.

Number of separate decrees, 207.

Summation of decrees, 561.76 second-
feet.

Capacity of ditches, 1, 509 second-
feet (from decree).

District No. 26 covers the drainage of Saguache River and its tributaries. Fully three-fourths of the land watered is hay land and pasture land. All of the ordinary flow of the drainage is appropriated, and has been for many years. Of the 184 ditches granted decrees, 161 were built prior to 1885, and all prior to 1888. The flood waters of the Saguache, on passing into the main valley, spread out into marshes and sink away, but very little ever going as far south as the San Luis lakes. The irrigated area is made up of many small farms, each having its own ditch, so that the average area served by each ditch is only about 25 acres.

The return for 1895 is incomplete, while that for 1896 gives the names of the owners

of the ditches instead of the names under which the decrees were granted, so that it was impossible for me to identify all of the ditches named in the return. The number of ditches returned corresponds fairly well with the number given in the decree. I identified as many as possible, and then added to the total return for those identified the balance of the return to obtain the total for the district.

The return for 1896 gives 20,205 acres irrigated, while the amount given in 1895 is 16,850 acres. It is likely that the preceding four dry years had discouraged the farmers, and so less acreage was cultivated in 1895, but the copious rains of that summer encouraged them to expand again in 1896. As the returns can not be completely identified either for 1895 or for 1896, the only course open for me is to proportion among the several ditches the total acreage according to the size of their decrees. The acreage for 1895 gives 30 acres per second-foot of decree, and that of 1896 gives 36 acres per second-foot, the total decree being 562 second-feet. While this decree was based on 50 acres for each second-foot, it is

not likely that the average amount ever exceeded 40 acres. This I have assumed as the condition in 1889 and 1890, the years of probable maximum for this district, or, there being 562 second-feet of decree, an acreage of 22,500 for those years. I proportioned the decrease from 1890 to 1895 among the different years. Prior to 1889 the acreage is deduced from the decrees, as in the other districts.

The water in this district is over-appropriated, as is shown from the returns for 1896, charging an average of but 0.8 acre-foot of water to each acre irrigated. Prior to 1880 the acreage was about three-fourths of the amount now cultivated. It is likely that even then the water supply was scanty. I assumed 3 acre-feet per acre for all years shown in the summary up to and including 1889. For 1890, 1891, 1892, and 1893, 2 acre-feet is assumed, and for 1894, 1.5 acre-feet, this being the driest year prior to 1896. In 1895 I could not identify the returns, and so assumed 3 acre-feet per acre.

From these assumptions is made up the summary by sheets for this district and the totals are carried to the summary for Colorado.

The return from this district gave no capacities, and I estimated the capacities indicated by the sizes mentioned in the decree. While these total 1,509 second-feet for the district, it is not likely that the total capacity of the ditches exceeds or even equals the decree, viz, 562 second-feet.

The return shows no ditches without decrees, and it is not likely that any exist.

XII. DISTRICT NO. 27, COLORADO

Area about 350 square miles.

Adjudicated February 23, 1890.

Number of ditches listed, 49 on two sheets.

Number of separate decrees, 51.

Summation of decrees, 47.42 second-feet

Capacity of ditches, 173 second-feet

(taken from decree).

District No. 27 covers the drainage of Carnero and La Garita Creeks. It is a small and unimportant section. The irrigation is old, all dating back to 1880.

The returns for 1895 ~~for 1895~~ give a total acreage of 4,040, over 3,000 acres of which is natural grass, while those for 1896 give but 2,670. No explanation for this sudden and large decrease of area is given. The only assumption for acreage prior to 1895 that I can reasonably make is that 4,000 acres, including pasture land, have been watered each year prior to 1895, and this is done in the total summary sheet. This assumption, however, gives an average of about 90 acres of land watered by each second-foot of decree. The only explanation of this large acreage I can offer is, that pasture lands are not included in the decree, but are actually watered when there is a sufficient supply and are included in the returns as natural grass. When water is short, as in 1896, they are not watered. This would also account for the sudden decrease in 1896.

The returns for 1896 show 2.6 acre-feet of water used per acre. This is distributed uniformly among the ditches. The returns for 1895 are in such shape that the different ditches can not be identified, nor can I compute the total amount of water used. As there seems to be a good supply for the land watered, I assumed 4 acre-feet per acre up to and including 1889, 3 acre-feet per acre for 1890, 1891, 1892, and 1893, 2.5 acre-feet per acre for 1894, and 4 acre-feet per acre for 1895. While the amount per acre assumed for 1894 is less than that used per acre in 1896, the acreage for the former year is assumed to be much greater than was that for 1896, so that the total amount of ^{used} water/in 1894 is considerably more than the returns show for 1896.

The capacities given are taken from the decree, and are not reliable.

XIII. DISTRICT NO. 35, COLCRADO.

Area about 500 square miles.

Not adjudicated.

Number of ditches listed, 48 on two sheets.

Capacity of ditches, 346 second-feet
(actual).

District No. 35 includes the drainage of Sangre de Cristo and Trinchera creeks, and covers that portion of the Sangre de Cristo grant which is known as the Trinchera estate.

While irrigation is old in this district, some of it dating ~~back~~ to 1855, the courts have not yet adjudicated it, and there is no water commissioner in the district. Mr. Flores and I spent a day at and near Garland, and gathered the data from which the table is made up. In it the ditches are arranged according to their position on the drainage, working from the head of the stream downward instead of chronologically, as in the other Colorado districts. I did this because I was not sure as to the date of construction of many of the ditches in district 35, and did not wish to make up a list which might do injustice to some of them.

The water supply of this district is small, not being enough to water one-tenth of the available land. With two exceptions the ditches are small and each waters but one man's land. In 1838 two large canals were built, one heading on the Trincherea Creek and one on Sangre de Cristo Creek. Each claims an appropriation of 212 second-

feet, and each will now carry 100 second-feet; but there is practically no water for either one, and the amount of land served is small.

In 1896 the total amount of land watered in the district was 4,180 acres, and in 1895, 4,450 acres. From 1889 to 1894 the two large canals above mentioned watered a little more/than ^{land} was served afterwards, so that the total for those years is given as 4,780 acres. Prior to 1889 the amounts watered by the ditches said to have been built a certain year are deducted from the total for that year to obtain the acreage for the preceding year.

The amount of water used is assumed to be 4 acre-feet per acre prior to 1890, 3 acre-feet per acre for 1890, 1891, 1892, and 1893, and 2.5 acre feet per acre for 1894. For 1895 and 1896 the amount varies with the different ditches, as given in the table.

It is probable that, while this district is not organized and we have record of decrees carried out to the hundredths of a second-foot, the returns here given are fully as reliable as those from the other Colorado districts.

With the assumptions above given, the summary for the district was made up and the totals transferred to the summary for Colorado.

XIV. RESUME OF COLORADO STATISTICS

This completes the detailed description of the Colorado irrigation in the Rio Grande drainage. The total number of ditches listed (see last sheet of summary for Colorado) is 925, with a stated capacity of over 12,700 second-feet, and a probable actual capacity of about 10,000 second-feet. Of these, 877 are authorized by law to divert over 12,200 second-feet of water. Their owners claim that 635,000 acres of land are "under ditch," or that the ditches can now serve that amount. The maximum area watered in the valley was in 1892, when some 400,000 acres were served. This dropped to 340,000 acres in 1895 and 320,000 in 1896, but will probably increase slowly hereafter, although the maximum above given is not likely to be reached again unless storage reservoirs are

built, for the land now irrigated demands the full water supply of the valley. I will discuss the reservoir problems before closing this report.

It is likely that the total acreage given in these tables is within 10 per cent of the amount cultivated during 1895 and 1896. The aggregate statement of amount of water used during those years is probably within 15 or 20 per cent. Prior to 1895, however, the statements of the acreage may not be nearer than 15 per cent, and the statement of water may not be nearer than 25 per cent, or possibly 30 per cent, to the actual quantities in each case. I think that these percentages of error in the totals are maxima, as a large error one way on one ditch or in one district may be balanced by an error the other way in another district.

Owing to the method adopted by stopping acreage when a decree stops, before explained, the acreage is sure to be large enough each year prior to about 1889, as a ditch very seldom

waters its full amount of land the first year of its construction, while the supposition on which the acreage was handled is that the ditch does do this.

Before discussing the significance of the totals for Colorado and the probable effect on the river of the increased use of water since 1880 in the San Luis Valley, I will describe the New Mexico data and give all the available information concerning the flow of the Rio Grande, so that you^{may}/have all the facts in view before any attempts is made at reaching conclusions.

Following you will find a tabulated statement of the allowances of water made for the several years in the various districts of the San Luis. All this information is given under the discussions above, but is collected here for convenience of reference. The quantities are in acre-feet of water charges to each acre each year and for each district mentioned.

ESTIMATED USE OF WATER---SAN LUIS VALLEY, COLORADO

YEAR	DISTRICT								
	20	21	22	24	25	26	27	35	
Before 1880,.....	4	4	4	4	4	3	4	4	
1880.....	4	4	4	4	4	3	4	4	
1881.....	4	4	4	4	4	3	4	4	
1882.....	4	4	4	4	4	3	4	4	
1883.....	4	4	4	4	4	3	4	4	
1884.....	4	4	4	4	4	3	4	4	
1885.....	4	4	4	4	4	3	4	4	
1886.....	4	3.5	4	4	4	3	4	4	
1887.....	4	3	4	4	4	3	4	4	
1888.....	3.5	3	4	4	4	3	4	4	
1889.....	3.5	3	4	4	4	3	4	4	
1890.....	3	2	3	4	3	2	3	3	
1891.....	3	2	3	3.5	3	2	3	3	
1892.....	3 for first 150 days;2 for rest..	2	3	3.5	3	2	3	3	
1893.....	3 for first 150 days;2 for rest..	2	3	3	3	2	3	3	
1894.....	3 for first 150 days;1.6 for rest..	1.5	2.5	3	2.5	1.5	2.5	2.5	
1895.....	3 for first 150 days;2.3 for rest..	2.6	3	4	3.8-	3	4	3.4-	
1896.....	3 for first 150 days;1.65 for rest..	.7-	1.75	3.2	2.56	.8	2.6-	2.5-	

XV. IRRIGATION LAW AND PRACTICE IN NEW MEXICO

New Mexico has no working irrigation law. I think that the last legislature passed a bill to regulate the use of water, but it has not been enforced. There is no Territorial engineer or other officer having control of the distribution of water. Whenever the owners of a ditch think that some acequia built after theirs, but higher up the stream, is diverting water which rightfully belongs to them, they can apply to the district court for an injunction restraining the owners of the later ditch from taking the water, and possibly, months after their crops are ruined, win their suit. The few rights of the Territory which have been adjudicated have gone through this process.

In the northern third of the Territory, where the waters are moderately free from silt, and hence very little work is needed to keep the ditches in working order, the only official of a community ditch organization is a mayor-domo, whose duty it is to distribute the water among the different claimants under the ditch.

Farther south, where the water carries much silt and the ditch requires frequent and extensive cleanings, the organization consists, in addition to the mayor-domo, of one or three commissioners. The latter roughly measure the land each man wishes to irrigate each year and assess him a certain amount of work each week on his holding, to be devoted to cleaning the ditch of sediment whenever such cleaning is necessary. The amount of assessment varies with the location of the ditch and the amount of silt usually borne by the water, from a day's work per week for 5 to 8 acres of land watered in the country just below the mouth of the Puerco to one for 15 to 20 acres above there.

There is no systematic attempt to distribute among the different ditches the water of any stream. So that on the Rio Grande, for instance, water may be lavishly used in the Espanola Valley and above Albuquerque at the same time that the crops farther down the stream are dying from drought. Whenever there is a prospect of shortage, the owners of

each ditch take all the water they can possibly use, instead of trying to use the water sparingly, and the people below, to whom no water is coming, watch their crops dying and say, "It is the will of God."

As before stated, fully 90 per cent of the farming in New Mexico is done by Mexicans, and they cultivate largely varying areas in different years. The area given in the tables of New Mexico ditches are means, as near as I could judge, of the areas cultivated. A part of the commissioners along the Rio Grande ditches were able to give me statements of acreage which were pretty close, but where there were no commissioners it was difficult to learn the area watered. Whatever land I saw I estimated as well as possible, and obtained from the inhabitants their estimates also as a check on mine.

In considering the information relating to New Mexico the methods of obtaining it must be borne in mind and due allowance made for its probable error. I believe that the total ^{of} area/irrigated land given for each district is within 15 per cent, and possibly within 10 per

cent, of the area actually watered an average year. The statements as to total amount of water used, however, are not so close, because it is difficult to say how much water is used per acre. I should say that the latter statements are within 25 per cent of the true amount of water used. They show, however, relative amounts for the different years within what is likely to be a nearly constant percentage of approximation, and so will serve the purpose of determining the relative use of water each year since 1880. These remarks apply to the Colorado data as well.

That there have been years of scanty water supply between 1890 and 1896 I do not doubt. In a few cases I have been able to locate them for small areas, but not with sufficient certainty of the extent of the shortage to justify me, except in the case of the year 1889, in saying that there was a short water supply a certain year all over the territory. The year 1889 was, I believe, however, a short year for the whole Territory except the Chama and northern New Mexico

country. That season the Rio Grande was dry at El Paso for several months after July 15, showing that the usual summer rains of the Puerco and adjacent drainages did not come. In the whole Territory, except the extreme northern portion, partial dependence for water is placed on the summer rains. So I have in all districts, except 1,2, and 3 (see description of districts farther on), where the snow water is the chief reliance, made a reduction in the estimate for 1889. Whenever I could definitely locate other dry years for any particular section of country, I have made the estimate of water used short for/section. Otherwise I have given full allowance for each year.

XVI. WATER DISTRICTS OF NEW MEXICO

For the purpose of this report I have divided the New Mexico drainage of the Rio Grande into seventeen districts, whose description and boundaries I will give in the detailed description of each one.

The assumed numbers, names, and drainage areas are about as follows, being outlined by red lines on Exhibit D:

No.	Names	Approximate drain- age Area.
		Sq. Miles.
1	San Antonio.....	250
2	Chama.....	3,300
3	Cerro Mesa.....	710
4	Taos Mesa.....	480
5	Embudo Creek.....	430
6	Santa Cruz.....	480
12	Espanola (Rio Grande).....	1,050
7	Santa Fe Creek.....	480
8	Galisteo.....	1,400
9	Jemez.....	900
13	Upper Albuquerque (Rio Grande).....	830
14	Lower Albuquerque (Rio Grande).....	940
10	Puerco.....	6,400
11	Salado to Berendo.....	5,500
15	Socorro (Rio Grande).....	800
16	Rincon (Rio Grande).....	600
17	Mesilla Valley (Rio Grande).....	150
	Add for unassigned territory west of river(no water).	2,300
	Add for unassigned territory east of river(no water).	4,000
	Total New Mexico drainage of the Rio Grande, as before.....	31,000

These will be considered in the order of the numbers, although here arranged geographically. The system of numbering used is adopted so as to place the study of the Rio Grande valleys together.

The tables showing the ditches in each district are made up with thirteen columns, headed and filled in as follows:

1. "Number of ditches," being the number of ditches described on each line. As there were many groups of small ditches which could readily be described in a body, I have thought best to do this in order to keep the lists as short as possible. This first column is simply to facilitate getting the total ditches described on each sheet.

2. "Number on streams," calling the ditch highest up on each stream No. 1, and numbering downstream.

3. "Name." Where a ditch has no specific name I have marked it "Private." It is a general rule that where a ditch serves two or more farms it has a special name, while many serving but one farm have also names; so that it is safe to assume that all those marked "Private" serve but one farm.

4. "Stream," being the source of water supply.

5. "When built." Whenever possible, I obtained the date of construction of each ditch listed, but when I could not obtain that I traced the existence of a ditch back as far as possible, and then entered it as built before the earliest date at which I satisfied myself it was in use.

6. "Approximate location of head," given in Land Office terms as follows: The surveys of the public lands of New Mexico are based on an initial point at San Acacio, on the Rio Grande, about 10 miles below the mouth of the Puerco. Through this initial a meridian was run due north and south and a base line due east and west. The country was then cut into townships 6 miles square and these into sections 1 mile square. These townships are numbered north and south and east and west from the initial point, the number of the townships north or south being called townships (usually abbreviated to T. or Tp.) and the number east or west being called ranges (usually abbreviated to R.). Thus T. 32 N., R.5 E., would indicate that particular township whose northeast corner was 32 by 6 (192 miles) north and 5 by 6 (30 miles) east of the initial point. The sections are numbered in the usual

way, No. 1. being in the northeast corner of the township, 6 in the northwest, and the numbers running back and forth across the township, ending with section 36 in the southeast corner. In column 6 is entered the section, township, and range in which is located the head of each ditch, this location being generally taken from a map. These locations are not exact, but are definite enough to locate and identify the portion of a drainage under consideration.

7. "Capacity." Being the estimated carrying capacity of each ditch in cubic feet of water per second.

8. "Total capacity." This column is put in to facilitate the addition of capacity on each sheet, as on nearly every one there will be some entries of several ditches on one line which have the average capacity of each entered in column 7, and an attempt to sum column 7 is confusing.

9. "Acres irrigated." Being the mean area, unless otherwise stated.

10,11,12. "Acre-feet of water used in 1894-1896." See explanation below.

13. "Remarks," which are self-explanatory.

In figuring the amount of water used, I have in no case allowed over 4 acre-feet per acre, as I believe this to be the maximum amount used in New Mexico, as well as in Colorado. I have allowed this freely, however, even on grain land, whenever there is ^a good water supply, unless the surroundings were such as to point conclusively to a smaller use of water. It is not likely that over 2 feet is ever actually used to raise a crop of corn, nor over 3 feet for a crop of wheat, but in places much water is run into low places and evaporated, and in the northern part of the Territory they frequently irrigate heavily in the fall so as to sprout the weed seeds and so kill them by frost, so it is likely that nearly or quite 4 acre-feet is diverted from a stream when the water is to be had, and not returned thereto, for each acre watered, even when planted in corn.

These tables show no columns of decrees, or the amount a ditch is legally entitled to take from a stream, as your letter of instructions directed me to show, because, as no adjudication of New Mexico ditches has been made, they have no legal title to any water.

XVII. DETAILED DESCRIPTION OF NEW MEXICO DITCHES
OUTSIDE OF RIO GRANDE

1. District No. 1, San Antonio

Area, about 250 square miles.

Number of ditches listed, 11, on one sheet.

Aggregate capacity, 32 second-feet.

Acres watered, 1,270.

I have made district No. 1 to include those portions of the Pinos and San Antonio drainages which lie in New Mexico. This district all lies above 8,000 feet in elevation, usually has a good water supply in spring from the heavy snows of the Conejos Range, and contributes water to district 22 of Colorado.

The settlement is old, all dating back to 1830. Until this year there has never been a shortage of water in the district. So I have allowed the maximum of 4 feet per acre for all years except 1896. In the last-named year the two lower ditches on San Antonio Creek are charged with but 3 acre-feet per acre.

All totals from this, as well as all the New Mexico districts, are entered directly onto the summary for New Mexico, the total acreage for each year being obtained, unless otherwise stated,

by deducting from the acreage shown on the detail sheets that portion of it charged to ditches built after the year in question.

2. District No. 2, Chama.

Area about 3,300 square miles.

Number of ditches listed, 123 shown on three sheets.

Aggregate capacity, 1,016 second-feet.

Acres watered, 27,520.

The area I have assigned to district No. 2 comprises the whole Chama drainage except an area of some 4,500 acres, which is watered by ditches taken from the Chama but lies in the Espanola Valley, and is included in the Espanola sheet. This district lies between the Conejos Range, whose summit, prolonged south into the Black Mesa, bounds it on the east, and the Continental Divide, which forms its western limit. It reaches from the Colorado line (a small portion being, in fact, in that State) to the Jemez Mountains on the south.

Taken as a whole, this drainage is very broken, and in parts it is mountainous; the northern portion occupying the forks between the Continental Divide and the Conejos Range. It lies at an elevation

above sea level of from 6,000 feet near the mouth of the Chama to over 10,000 feet on the Conejos Range. The heavy snowfall of that range furnishes the principal source of water supply, as the snow and rain fall on the Continental Divide to the west is light in winter. Summer rains along it, however, frequently send large and sudden floods down the river, when it delivers the first silt-bearing waters which enter the Rio Grande.

The main Chama has but little valley land along it above Abiquiu, except a small area reaching from the town of Chama down the river to Puente Plaza, just below Parkview. The two largest cultivated areas in the district are the mesa lying around Parkview at the mouth of the Brazos or East Chama, as it is locally called, and El Rito Valley. The first usually has an abundant water supply from the Brazas while the latter is always short of water.

Up the drainage of the Rio Caliente, which flows south close under the western toe of the Black Mesa and includes the Tucas or Petaca and Vallecito, there are numerous narrow valleys for which there is always an abundant water supply.

West of Chama and north of the Gallinas drainage the country is broken and valueless for agriculture, although much valuable pine timber is found there, as well as on the head of the main drainage and down along the Conejos Range as far south as Mitritas Creek.

In the southwestern portion of the drainage on Rio Puerco and Rio Gallinas (this Rio Puerco being a branch of the Chama, and not the large torrential stream of that name, which lies farther south) there is a large area of fertile land, but a very scanty water supply. Out of probably 50,000 acres of good land on the Gallinas only 400 acres are cultivated, and even that small area is never fairly well supplied with water. On the Puerco a larger proportionate area is irrigated, but the limit of water supply was reached many years ago.

From above Abiquiu, 25 miles above the mouth of the Chama, down to the Rio Grande, there are narrow bottoms of very fertile land, which have been cultivated for one hundred and fifty years or more. The water supply is usually ample, although it was a little short in 1896.

Along the Chama above Parkview there are some Americans who have settled there within the last fifteen years, but reference to the three sheets giving the list of ditches in this district will show you that nearly all the agriculture is old, dating back as far as 1730, at which date El Rito Plaza was founded.

I found it impossible to obtain any reliable information as to years (if any) after 1830, when

the water supply was abnormally short in this district. I therefore, for the years prior to 1894, assumed the maximum use of 4 acre-feet per acre for all lands having a good water supply, 3 acre-feet per acre for that having a fair supply, including the upper Nutrias, the Cebolla drainage from 1887 to 1890, the Canjilon prior to 1890, and El Rito prior to 1886; 2.5 acre-feet per acre for Canjilon in 1891 and 1892 and El Rito in 1887 to 1890, and 2 feet for those two sections until 1893 and for the Puerco and Gallinas country from 1880 on. This is based on a statement that the Cebolla and Canjilon water supply has been shrinking since 1837, and a known gradual decrease of water supply at El Rito.

The detail sheets show the amount charged to each ditch for the years 1894, 1895, and 1896.

3. DISTRICT No. 3, Cerro Mesa.

Area, about 710 square miles.

Number of ditches listed, 28, shown on one sheet.

Aggregate capacity, 194 second-feet.

Acres watered, 9,280.

The country assigned to district No. 3 reached from the Rio Grande Canon on the west

to the top of the Sangre de Cristo Range on the east, and from the Colorado line, on the north, southward as far as the Rio Hondo, including the irrigation in the valley of that stream, but excluding an area of 1,500 acres which is watered by a ditch from the Rio Hondo, but lies on the Taos Mesa and is included in district No. 4. It includes that portion of the drainage of Costilla Creek which lies in New Mexico, that of several small streams flowing into the Cerro Mesa, Red River, and Cabresto Creek, Lerma Canon, San Cristobal and Lobo creeks, and Rio Hondo. The northern portion contains a large smooth mesa, called Cerro Mesa, which reaches from the Colorado line to Red River, and forms a fine body of grain land, lying at an elevation of about 8,000 feet, or a little less, above sea level. From Red River to Rio Hondo the country is broken and contains but little arable land. In the Rio Hondo there are two good valleys.

The water supply in the Costilla, Cabresto, Red River, and Rio Hondo is good, coming as it does from the summit of the Grange de Cristo, locally called the Costilla Mountains. The south end of the Cerro Mesa is watered from Cabresto Creek,

and always has all the water needed. The central portion of the mesa is watered from four small creeks. The Mexican settlement of Cerro, started in 1852, has for many years used the entire flow of these creeks, and then had but a scanty supply. In 1883 their crop was a failure from lack of water. In 1886 some Americans settled on the streams below the Cerro ditch and by some means obtained a court decision or a compromise with the Mexicans of Cerro Plaza, which awarded to them one-fourth of the water in the creeks. The result is that the supply of water, already scanty, is spread over a larger area than before, all are very short, and only partial crops are raised each year.

The town of Río Colorado, located at the junction of Red River and Cabresto Creek, was founded in 1842, and irrigation soon spread over the south end of the Cerro Mesa, the Llano ditch from Cabresto Creek being built in 1851. The people are good farmers, who do not waste much water. For this reason I have allowed but 3 acre-feet per acre under the main ditch here and 3.5 acre-feet per acre under the next in size instead of 4 acre-feet.

On San Cristobal Creek the water supply is just about enough for the small amount of land under ditch. On the Lobo the supply is scanty and several men who have tried to farm there have abandoned the attempt.

The Rio Hondo/^{supply}is usually good.

I could locate no years of special drought in this district except 1883, and so have estimated a uniform use of water.

4. DISTRICT NO. 4 TAOS MESA

Area, about 480 square miles.

Number of ditches listed, 61, shown on one sheet.

Capacity of ditches, 346 second-feet.

Acres watered, 18,050.

Stretching from the brink of the Rio Hondo Canon southward to the foot of the Picuris Mountains--some 20 miles--is a level mesa which forms the most historic portion of New Mexico outside of the city of Santa Fe. It is called the Taos Valley, but is really a high mesa some 7,000 feet above sea level, and lying between the foot of the Sangre de Cristo Mountains (locally called Taos Mountains) and the Canon

of the Rio Grande. The area of arable land is fully 40,000 acres, but the water supply is only sufficient for about half this land, and it has been fully utilized for over forty years. This section I have made district No. 4, its boundaries being the Rio Grande Canon on the west, the top of the range on the east, the south side of the Rio Hondo Canon on the north, and the top of the Picuris Mountains on the south. It is watered by Lucero, Pueblo, and Taos creeks, Rio Chiquito, and the Rio Grande del Ranchos de Taos. All these streams carry snow water from the high divide, run in canons until the plain is reached, and then cross it in shallow channels. Up Taos Canon are numerous small valleys, each occupied by a small ranch and ditch, but no valleys are found on the other streams.

The Mexican settlement of Fernandez de Taos was made about 1800, possibly prior to that time, and the settlers found the land along Lucero and Pueblo creeks already occupied by the Taos pueblo of Indians, who had lived there for an unknown length of time. Prior to 1830 the Arroyo Seco settlement was started on the north end of the mesa, water being first taken from Arroyo Seco

and then by an extension to the ditch southward along the foothills from Lucero Creek. It was soon found that this source of water supply was uncertain, and in 1830 a ditch was taken out of the Rio Hondo and brought out of the mesa west of the plaza. Some time prior to 1860 the waters of the Rio Chiquito and Rio Grande de Taos were taken out and as much of the mesa as possible put under ditch.

On Lucero and Pueblo creeks the water is all distributed by numerous small ditches, whose positions are changing each year. It was difficult to for me to form even an approximate estimate of the acreage in the limited time at my disposal as well as to get the exact number of ditches. I believe, however, that the aggregate given on the sheet is fairly accurate.

On this mesa the people have learned to be careful in the use of water, so that the average amount used, even in years of plenty, is about 2.5 acre-feet per acre. I think that 1894 and 1895 were average years, and so have assumed that the use of water shown on the sheet for those years is a good average for the use during the years prior thereto, except 1889. For 1889 I deducted

15 per cent from the amount charged to the other years, thinking that the shortage of that year, due to small rainfall, would have been felt here to the above amount. The detailed estimate made under each ditch shows an average for 1896 of about 1.75 acre-feet per acre.

5. DISTRICT NO. 5, EMBUDO CREEK

Area, about 430 square miles.

Number of ditches listed, 32, shown on one sheet.

Aggregate capacity, 236 second-feet.

Acres watered, 9,120.

South of the Picuris Mountains is the drainage of Embudo Creek, made up of the main stream, called Penasco on its upper portion, Picuris or Pueblo Creek, Las Trampas, and Ojo Zarco creeks.

The main stream joins the Rio Grande a short distance above the railroad station of Embudo, near the north end of Espanola Valley. The surface of this district is broken, each stream flowing in a deep valley, which widens occasionally to a mile between the hills, but is generally narrow. The Picuris and Penasco head on the range, and carry a large and constant volume of water. Las Trampas carries a fair supply, but Ojo Zarco

is a very small stream.

The valleys in this district were occupied by Mexicans at a remote date, probably about 1815, but the Picuris pueblo of Indians were already on Picuris Creek, and had been there for an unknown length of time. After the first settlement the valleys quickly filled up, and before 1880 even the little meadows up the canon of the Picuris were occupied. The water supply was ample for all. In 1880 the owners of the Mora Grant, which lies east of the range, came onto the head of Picuris Creek and diverted some of its waters through a pass in the mountains onto their land. There was still water enough for all until 1890, when it is stated that these people built a second ditch and took away an additional amount of water as large as they had at first appropriated. Since then there has been a shortage each year on Picuris Creek, reaching its maximum this year. A fair crop was made, however, in 1896.

On Penasco and the main stream there is always an ample supply of water. The irrigated land lies close along the streams all through this district and has a gravelly subsoil, which quickly returns to the channel all water not evaporated or

transpired by the growing crop. I have thought best, therefore, to estimate but 3 acre-feet per acre each year. On Picuris Creek I made this allowance prior to 1839 and for that year, and afterwards I allowed 2.5 acre-feet per acre up to 1896. In the last-named year I estimated 2 acre-feet per acre.

6. DISTRICT NO. 6 SANTA CRUZ.

Area, about 480 square miles.

Number of ditches listed, 43, shown on one sheet.

Aggregate capacity, 156 second-feet.

Acres watered, 5,800.

Between the drainage of Embudo Creek and that of Santa Fe Creek is a rough and broken country, traversed by two main streams called the Santa Cruz River and Pojuaque or Nambe Creek. These head on the Sangre de Cristo Range (here called Santa Fe Mountains) and carry from it snow water to the Espanola Valley. This area I have called district No. 6, excluding therefrom all land watered from the Santa Cruz or Pojuaque but lying in the Espanola Valley. The irrigation is confined to the long, narrow valleys which border each stream. The date of settlement is

uncertain, but remote, possibly as far back as the first or second decade of the eighteenth century, although the Nambe and Pojuaque Indians occupied thier pueblos on the more southerly stream at a period much more remote than this date.

On Santa Cruz River the water supply is fair, but on the Nambe it is poor. There has been no known change in acreage since 1880. In 1889 I deducted 15 per cent from the estimated water used in 1894, making the estimate for all other years prior to 1894 the same as for that year. The estimate for 1894, 1895, and 1896 are shown in detail on the sheet.

7. DISTRICT NO. 7, SANTA FE CREEK

Area, about 480 square miles.

Number of ditches listed, 44 shown on two sheets.

Aggregate capacity, 97 second-feet.

Acres watered, 5,920.

The drainage of Santa Fe Creek forms district No. 7 and extends from the top of the Sangre de Cristo (here called Tacs Mountains) on the east to the Rio Grande on the west. After leaving the

foothills some 4 miles east of Santa Fe, the creek of that name flows in a shallow channel through a level plain for some 15 miles. It then enters a canon, which it follows to La Bajada, where it again enters an open country. The principal use of water is in the country around Santa Fe, which lying at an elevation of about 7,000 feet above the sea and protected by hills on all sides except the west, produces cereals and apples to perfection. This valley is the most historic spot in New Mexico. Here was established the nucleus of the Spanish occupation in 1600; here were they defeated in 1680 and forced by the **Pueblo** Indians to abandon the country; and here they finally conquered the natives in 1692 and firmly established themselves in the possession of the land. Even prior to 1600 the Indians occupied the site of Santa Fe and farmed the surrounding land, although the later conquest forced them to abandon their pueblo.

For a great many years the full flow of Santa Fe Creek has been utilized for irrigation, and the scanty amount of water available has been husbanded with great care and made to serve as much land as possible. The water is alternated among the

different ditches, and the amount carried annually by each ditch on the main stream is said to be equal, in ordinary years, to the full capacity of the ditch flowing forty days. In 1896, and probably in 1889, the amount carried was probably some 20 per cent less than this. On this basis was the estimate for 1894, 1895, and 1896 made for the ditches shown on sheet No. 1.

The ditches listed on sheet No. 2 are all, except the last two, on side drainages fed by springs, and the use of water by them has been larger and more constant than on the main stream. La Bajada usually has plenty of water, as there are springs in the canon above the head of the ditch, but no water flows into the Rio Grande except in time of flood. The small portion of the ordinary flow which escapes La Bajada ditch sinks away in the sandy channel of the river just below the plaza.

8. DISTRICT NO. 8 GALISTEO

Area, about 1,400 square miles.

Number of ditches listed, 23, shown on one sheet.

Aggregate capacity, 60 second-feet.

Acres watered, 2,240.

The Sangre de Cristo Range ends abruptly southeast of Santa Fe, the country rapidly falling to the south into the wide, barren Galisteo plain. Galisteo Creek is the last stream carrying any snow water west into the Rio Grande, and its supply is small and precarious.

Between the Galisteo plain and the Rio Grande is a range of hills called the Sandia Mountains, which have a few little valleys with a small supply of spring water. All this section I have placed in district No. 8. It is a barren, desolate country. Irrigation is confined to the little valleys along Galisteo Creek and those mentioned in the Sandia Mountains. Around Galisteo plaza there is a large area of fertile land, but water for only a small percentage of it.

All of the settlements in district No. 8 are old, antedating 1880 by many years. To all years except 1889 and 1896 I have given the same use of water, amounting to nearly 2 acre-feet per acre, as shown on the sheet; but in the two years mentioned I have allowed but about 1.3 acre-feet per acre.

That portion of the Rio Grande drainage east of the river and south of the Sandia Mountains and Galisteo plain is devoid of living water all the way to El Paso. There is not, so far as my acquaintance extends, an acre of cultivated land in this whole area east of the river bottom. A portion of this area is included in districts 14 and 15. The rest is unattached.

9. DISTRICT NO. 9, JEMEZ

Area, about 900 square miles.

Number of ditches listed, 27, shown on one sheet.

Aggregate capacity, 131 second-feet.

Acres watered, 5,790.

South of the Chama and west of the White Rock Canon of the Rio Grande there lies a group of high and rugged mountains called the Jemez Mountains. Their highest peaks reach an altitude of over 11,000 feet, while the average height is over 9,000 feet above sea level. They present precipitous battlements to the north, west, and east, but their summits form the rim of a huge basin which slopes inward and to the south. The Jemez River gathers the drainage of

this basin through several branches. High up near the summits are large, open parks, where, as well as on the peaks, the snowfall is generally heavy. Deep canons lead from these parks to the lower country, where are long and narrow, but very fertile, valleys. Below these valleys the river runs through a barren, sandy country to its junction with the Rio Grande. Much of its water sinks away in the sands or spreads out and is evaporated under the hot sun, so that but little water enters the main river from it except during the spring floods.

Before the advent of the Spaniards, some hundred years or more ago, three tribes of Indians occupied their pueblos on this river. They were named the Jemez, Zia, and Santa Ana, the Jemez being highest up the river. The Spaniards on entering the country occupied a vacant body of land lying above the Jemez Pueblo and another lying below it, but above the Zia and Santa Ana pueblos, and appropriated the water which had been formerly used by the two last-named pueblos. The Santa Anas were first to suffer, and they were finally forced to take up and cultivate land on the Rio Grande, some 10

miles away. Such is the tenacity, however, with which these Indians cling to their ancient pueblos that, although this change was made nearly or quite a hundred years ago, the Santa Anas still pack the season's crop each fall over a horrible trail 10 miles up from the Rio Grande to their ancient home, steadfastly refusing to abandon it and build anew near their tillable land.

The Zia Indians still eke out a precarious existence from the use of what little water passes the Jemez Indians and the Mexicans of San Ysidro. Above them, however, there has never been known to be an injurious shortage of water until 1896, although there was a sensible diminution of the usual water supply in 1894 and 1895. I could not learn that the shortage of 1889 affected this drainage, and so have made no reduction in the estimate for that year.

There are some grass lands watered from the high ditches, while lower down the climate is warm, evaporation great, and the soil such as will not readily return to the river surplus water. I have therefore allowed prior to 1894,

1895, and 1896 (the allowance for which years are shown on the detail sheet), 4 acre-feet per acre for lands above San Ysidro, 3 acre-feet per acre for its lands, and 1.5 acre-feet per acre for the Zia lands.

10. DISTRICT NO. 10, PUERCO

Area, about 6,400 square miles.

Number of ditches listed, 62, as shown on two sheets.

Aggregate capacity, 580 second-feet.

Acres watered, 18,390.

West and southwest of the Jemez Mountains the character of the country changes. Still broken and hilly, its altitude is 2,000 feet or more lower than that of the Jemez, and, as there is but very little snowfall, there are few perennial streams. It is subject, however, to heavy rains, the annual precipitation sometimes coming in a few hours, and the resulting torrents have washed down from the hills and mesas large quantities of earth, which have formed extensive alluvial valleys. While the country slopes from the Continental Divide toward the Rio Grande, a large percentage of it never furnishes water to the river, as the broken surface of the arid

land absorbs the whole precipitation.

In district No. 10 I have included the whole area tributary to the Rio Puerco, although but a small per cent of the total area is arable land, and but a small fraction of the latter has a water supply. This district extends to the Continental Divide on the west and to the summit of the watershed between the Puerco and Salado on the south. Northward it extends up past the Jemez Mountains to the Rio Chama drainage. The northwestern half consists of the barren Chama Mesa, which ends in Mount Taylor on the south and breaks over into the Chama drainage on the northeast.

The Puerco River runs from north to south through the eastern portion of district No. 10. Aside from storm waters its whole supply is derived from the western slope of the Jemez Mountains. Several little streams run down from this slope; each has a little valley on it and each valley is tilled. A small amount of water reaches the main Puerco, but is there used on the fertile alluvial soil of the river valley. At Cuba the channel of the stream is cut down

some 40 feet into the ground, but has not yet reached the bottom of the soil. On the upper half of the immediate valley of the Puerco the rainfall is greater than farther south, and this, together with the great capacity of the soil for retaining moisture, enables the farmers to raise good crops of corn, even when they have water for irrigation but a month or six weeks in the spring. These summer rains come suddenly and heavily, and the Puerco sometimes changes, in two or three hours, from a dry, sandy bed to a torrent of 15,000 or 20,000 second-feet. These floods carry as high as 15 per cent of silt.

The headwaters of the Puerco originally formed part of the Apache Indian country, and settlements were not made by the Mexicans until 1872; but then a large body of them moved in at once and all of the available water was quickly appropriated.

The only tributary of importance to the Puerco is the San Jose or Blue water, which has its source in the Zuni forest, on the continental divide. It generally receives from this forest considerable water in the spring. After leaving

the mountains its valley is much like that of the Puerco, a deep, rich alluvial soil. The Laguna and Acoma Pueblo Indians are the original settlers, the former having two outlying communities, Ensenada and Pajuate.

A few farms were taken up in 1880 on the Zuni plateau, while the springs around the base of Mount Taylor north of the San Jose were appropriated at a much earlier date.

I could not learn of but one years' unusual shortage of water on the Puerco prior to 1896, viz, 1889. The people there live in a chronic state of short water supply. On the San Jose, however, it seemed to be the impression that there was not so much water available since 1889 as prior to that year. I therefore assumed that the amount of water returned on the main Puerco for 1894 represented the use back to 1880, except for 1889, when a proper reduction was made all over the district; but prior to 1889 I added 20 per cent to the San Jose use of water for 1894.

You will notice that ditches Nos. 5 and 6 on the Blue Water are large and recently constructed. In 1894 a company built a dam and reservoir on the Zuni plateau, the site being a very fine one, and

dug these two ditches, which are said to cover some 5,000 acres of fertile land. The reservoir was filled with water in the winter and spring of 1894-95, settlers placed on the land, and some 1,600 acres cultivated in 1895.

But the winter of 1895 failed to bring the usual snowfall on the plateau, their reservoir was not filled, and the season of 1896 saw but some 600 acres cultivated, with a small supply for even that. It was the intention of the owners to raise the dam this year so as to impound more water, but this failure has discouraged them and the future of the enterprise is uncertain. The reservoir will be described further along in this report.

11, DISTRICT NO. 11, SALADO TO BERENDA
Area, about 5,500 square miles.

Number of ditches listed, 26, shown on one sheet.

Aggregate capacity, 85 second-feet.

Acres watered, 2,550.

All of its drainage area west of the Rio Grande and between the Puerco drainage and the Mexican line is a rough and broken country, with a scanty water supply. There are a few small streams, however, and the area including them I have placed

in district No. 11.

The first stream met going south is the Salado, which empties into the Rio Grande a short distance below the mouth of the Puerco. While this stream is a torrent after heavy rains, it is practically dry nine-tenths of the year. In valleys among its hills there are two small settlements, whose inhabitants eke out a scanty livelihood.

The country for 60 miles to the south of the Salado is without water for irrigation. Then, cutting deeply through the Cuchilla Mesa, are met several lines of drainage leading from the Black Range to the Rio Grande. Only in seasons of excessive snowfall or after heavy rains does the water flow from the hills to the river. But about midway between the two springs are found in the dry channels, and the water from these is led into the long, narrow valleys below. While the water supply is scanty, it is constant, and the users have learned to utilize it fully, and they raise good crops with an amount of water so small that it would mean failure anywhere else in the Territory. The settlements all antedate 1880.

The water supply is regular, and the amount estimated for 1894 and 1895 is assumed to be the amount used back to 1830, except in 1889, when a slight reduction is made.

XVIII, RIO GRANDE VALLEYS.

For the purpose of studying the use of water along the main river, I have so divided the valley as to place in the same district those portions of it where the conditions as to water supply are somewhat similar.

There are six of these districts, numbered and briefly described as follows:

District No. 12.. Espanola Valley: water supply good; cultivation continuous.

District No. 13. From White Rock Canon to Albuquerque; water supply good at upper end, but sometimes fails at lower end; cultivation nearly continuous.

District No. 14. From Albuquerque to the mouth of the Puerco; water supply precarious; cultivation nearly continuous.

District No. 15. From mouth of the Puerco to San Marcial; water supply precarious, but helped by summer floods from the Puerco and Salado; cultivation in patches.

District No. 16. From San Marcial to old Fort Seldon; water supply scanty, but better than above on account of local drainage; cultivation in patches.

District No. 17. Mesilla Valley; water supply scanty, but usually sufficient to mature crops; cultivation continuous.

I will first describe these districts in detail, and then discuss the water supply as a whole.

1. DISTRICT NO. 12, ESPANOLA VALLEY

Area, about 1,050 square miles, including 50 square miles of valley proper.

Number of ditches listed, 32, shown on two sheets.

Aggregate capacity, 400 second-feet.

Acres watered, 14,060.

On leaving the lower end of the long canon which begins near the Colorado line the Rio Grande enters the Espanola or Chamita Valley. This valley is some 20 miles long and as much as 4 miles wide, having an area of about 50 square miles of arable land. About one-half of this area is now cultivated. This valley, including some small irrigated areas in the lower end of the canon above Embudo station, I have called district No. 12.

The altitude of the Espanola Valley is about 5,500 feet above sea level, and the climate is such that peaches, apples, and grapes are raised. It is surrounded by hills. At its lower end the river enters White Rock Canon. The upper end is watered by ditches taken from the main river, but the central and lower portion obtains its supply from streams entering the valley from its sides. These are the Chama and Santa Clara on the west and the Santa Cruz and Pojuaque on the east. The Chama furnishes water sufficient for some 4,500 acres, while the other streams, all of which are small, scantily serve about 3,500 acres.

In 1598 Chamita was founded by the Spaniards on the delta at the mouth of the Chama. They found three Indian pueblos in the valley, which they named the San Juan, Santa Clara, and San Ydelfonso. The date of their construction is unknown.

The settlement of Chamita was soon abandoned, but Santa Cruz Plaza was founded in 1609, and it is believed that it has been inhabited continuously by Spaniards and Mexicans ever since, except during the interval between 1680 and 1692.

The water supply of those ditches heading in the Rio Grande is ample, their aggregate capacity being only some 150 second-feet, while the minimum flow recorded during the irrigation season at the Embudo gauging station, situated at the upper end of the valley, is about 200 second-feet, although the record for September, 1889 and 1890, is a little smaller than this amount.

The Chama also furnishes a fair supply of water, although there was a shortage in 1896. This was not of sufficient extent, however, to injure crops.

The land depending upon the other streams for water receives a very scanty supply. The San Ydelfonso Indians get so little water from Pojuaque Creek that they have extended the Hobart ditch (taken from the Rio Grande) down to their land, and will use water from it in 1897. There is a large canal projected to leave the river on the east side about Embudo and cover all of the land of the valley east of the river. Owing to the many diverse interests involved, the ignorance and apathy of the native population, and the jealousy existing between them and the Indians,

it is doubtful if any agreement can ever be reached and the canal constructed.

All of the ditches in the Espanola Valley long antedate 1880, except the Hobart ditch. This was built in 1893, but waters land formerly covered by Santa Cruz ditch No. 5, but cut off from it in 1884 or 1885 by a caving bank breaking the ditch. This land laid idle from 1885 to 1893.

I have made a small reduction from the average use of water to obtain the probable amount used in 1889. Aside from that and from the amount used in 1896, the use is about constant. For all the land watered from the Rio Grande, 4 acre-feet per acre is assumed. For those from the side streams, varying amounts are assumed, fully shown on the detail sheets. The water supply of this district need not be further considered.

2. DISTRICT NO. 13, UPPER ALBUQUERQUE

Area, about 830 square miles.

Number of ditches listed, 22; shown on one sheet.

Aggregate capacity, 311 second-feet.

Acres watered, 8,070.

On leaving White Rock Canon about due west of Santa Fe the river enters a long valley of

varying width, bounded by the low hills which form the edge of the mesa on either side. That portion of this valley which lies between the mouth of the canon and Albuquerque I have included in district No. 13, naming it Upper Albuquerque district.

The soil is very fertile, but the land lies low and nearly level and has very poor drainage.

In district No. 13 are four Indian pueblos, viz, Cochiti, Santo Domingo, San Felipe, and Sandia, which all have ancient ditches. The Santa Anas also have two ditches in this district, as mentioned in the description of the Jemez drainage.

The Mexicans or Spaniards, settled on the vacant land in this district from one hundred to three hundred years ago. While the arable land probably amounts to over 40,000 acres, only about 8,000 is under cultivation. Much of the balance has been tilled at some time in the past; but as the land lies nearly level, and so has little natural drainage, as mentioned above, the lavish use of water has filled it with alkali and much of it has been abandoned, the owners simply moving back onto a little

higher ground. I could see nothing, however, to lead me to the belief that the total acreage had raised materially in the past fifteen years.

Before considering the use of water from the main river below White Rock Canon I will describe the remaining districts and then collate and arrange chronologically all the more important information which I collected concerning the water supply and deduce therefrom a general scheme for estimating the amount of water used since 1880.

3. DISTRICT NO. 14, LOWER ALBUQUERQUE
Area, about 940 square miles.

Number of ditches listed, 33, shown on two sheets.

Aggregate capacity, 1,168 second-feet.

Acres watered, 17,840

District No.14 I have made to cover the valley of the Rio Grande from Albuquerque to the mouth of the Puerco, and have named it the Lower Albuquerque district. The general conditions are about the same as above Albuquerque, although the valley is a little wider here than there. The Isleta Indians are the oldest inhabitants. The Mexicans came in from one hundred to three hundred years ago, and all the settlements long antedate

1880. San Jose ditch No. 2 was built in 1888, but it was the result of a neighborhood quarrel, and covers land previously watered by San Jose No. 1.

While there is fully 75,000 acres of arable land in the district, less than one-fourth of this amount is cultivated. Much formerly watered has been abandoned and is now marsh land, white with alkali.

In this district and in district No. 15 evidence exists of there having been more land under cultivation at one time than is now tilled. I am satisfied that shrinkage in these two districts is fully 10 per cent, the larger proportion of it being in district No. 15. I was told that this contraction of area occurred about 1880, being caused by the Mexicans leaving their land to work on the construction of the Atchison, Topeka and Santa Fe Railroad. I have therefore added to district 14 about 1,500 acres prior to 1880 and about 500 acres for 1880.

The lower end of this district suffers worse from a scanty water supply than does any other portion of the river valley. In the past ten years there has frequently been a shortage as far north as Albuquerque.

4. DISTRICT NO. 15, SOCORRO

Area, about 800 square miles.

Number of ditches listed, 16, shown on one sheet.

Aggregate capacity, 300 second-feet.

Acres watered, 5,790.

After passing the mouth of the Puerco, the valley of the Rio Grande becomes narrower and the mesa bluffs higher and more rugged. District No. 15 I have made to include what valley land there is between the mouth of the Puerco and San Marcial, and have named it the Socorro district. The occupation of the district as far south as Socorro is quite old, this place having been, I am told, settled about the same time as Albuquerque. Below Socorro, however, the settlement is more recent, one small ditch having been built as late as 1881.

There is probably not more than 20,000 acres of arable land in the whole distance of 50 miles from the mouth of the Puerco to San Marcial, and of this less than 6,000 acres is tilled. The evidence of a shrinkage in the area cultivated was here plain, and I therefore added to the 1894 acreage 1,200 acres prior to

1880, and enough to make a total of 6,000 acres in 1880.

The water supply is precarious, but better than in district No. 14, on account of storm waters entering this district from the Puerco and Salado. These streams are moderately certain to bring in a large quantity of mud and water at some season of the year. The labor of keeping ditches clean is here excessive, and each landowner is assessed a day's labor per week for each 5 or 6 acres watered.

5. DISTRICT NO. 16, RINCON.

Area, about 600 square miles.

Number of ditches listed, 17. (Two of these are abandoned.)

Aggregate capacity, 295 second-feet.

Acres watered, 9,850.

District No. 16 extends from San Marcial to Old Fort Seldon, at the upper end of the Mesilla Valley, and I have named it the Rincon district. Just below San Marcial the river swings to the westward, running around Fra Cristobal and Caballo mountains, which form the western battlements of the Jornada del Muerto. The bluffs are near together and leave between them only small valleys

until the river turns eastward again around the Caballos, toward Rincon. There the valley widens and four-fifths of the tillage in the district is found in an almost solid body, which is watered by two large ditches, the Colorado and Loma Padre.

This country was overrun by the Apaches until about 1360 and no settlements were made until 1862 or 1863. The part of the small upper valleys were occupied, and a few years later the lower and larger valley was settled and the Colorado ditch built. About 1884 some people took up the remaining small valleys. In 1892 a large number of families who had become disheartened by the continued failures of crops in El Paso and the lower end of the Mesilla Valleys left that country and moving into the bosque above Rincon, took out the Loma Padre ditch, irrigating their first crop in 1893. The whole colony is now flourishing, having raised a good crop in 1896 from an area of about 3,600 acres, all of which has been reclaimed from the bosque in the last four years.

The water supply of district No. 16 is rather precarious, but the irrigators are skillful and crops are raised with a small amount of water.

6. DISTRICT NO. 17, MESILLA VALLEY

Area, about 150 square miles.

Number of ditches listed, 12. (One of these is abandoned.)

Aggregate capacity, 679 second-feet.

Acres watered (1896), 27,100.

The Mesilla Valley extends from Old Fort Seldon to the pass, some 5 miles above El Paso. Together with the El Paso Valley below the pass, it forms the most fertile area along the whole river. The altitude of the Mesilla Valley is a little under 4,000 feet. The climate is warm, and fruit of remarkably fine flavor is raised in abundance.

I could not learn, however, that the valley was settled at an early day. Dona Ana was in existence in 1846, but was then new. It is probable that the Apaches prevented earlier Spanish or Mexican occupation.

The valley filled up rapidly after 1846. In 1865 some 35,000 acres were in cultivation. In that year the river made a change of channel breaking up the ditches, and the acreage decreased somewhat. The year of 1879 was one of poor water supply. As a result of this, the Picacho ditch, watering some 2,500 acres west of the river, about

opposite Las Cruces, was abandoned. A considerable area under the Dona Ana ditch was also soon after abandoned, the land watered by it decreasing from 7,000 acres in 1882 to 4,600 acres in 1888. All of this 2,400 acres still remains idle except some 800 acres, which a man named Schiller has colonized and is irrigating with water pumped from wells. This area is not included in my estimate of acreage.

In 1884 a severe flood started another change of channel near the lower end of the valley, and the high waters of 1885 and 1886 completed the work. This change of channel cut into several pieces La Union ditch, previously watering some 4,000 acres, and caused the temporary abandonment of nearly all of the land. In 1892 the people took out a new ditch on the east side of the river, the old one having been on the west side, and are now reclaiming and cultivating their old land.

The changes of acreage since 1880 have been so many in the Mesilla Valley that I append to the list of ditches for the district a table showing the probable acreage watered each year since 1880 by the individual ditches.

XIX. USE OF WATER IN THE RIO GRANDE VALLEYS.

The following is a compilation of the specific information I have at hand concerning the flow of the Rio Grande, with especial reference to summer seasons of abnormally low water:

1851. River dry at Las Cruces for one month.
1861. River dry from Socorro down to and below El Paso.
There was another year between 1861 and 1879 when the river was dry, but I am not able to locate it.
1879. At Del Norte. High water in main river.
At Los Lunas. River dry two weeks.
At Picacho. River dry; no crop raised.
At Socorro. River dry six weeks.
At San Marcial. River dry six weeks.
At Palomas. River dry six weeks.
At Las Cruces. River dry from the end of July to the end of October.
At La Union. River dry.
At El Paso. River dry.
1880. At Del Norte. Surplus: more than needed for irrigation.
1881. At Del Norte. Surplus: more than needed for irrigation.
1882. At Del Norte. Surplus: more than needed for irrigation.
1883. At Del Norte. Surplus: more than needed for irrigation.
At Palomas. Surplus.
1884. At Del Norte. Largest flood known to residents of the valley.
At Albuquerque. Flood.
At Socorro. Big flood in May.
At Palomas. Big flood in May.
At Las Cruces. Big flood in May.
1885. At Del Norte. More water than needed for irrigation.
At San Marcial. Flood.
At Palomas. Flood.
At Las Cruces. Small flood.
1886. At Del Norte. Heavy snows in valley in 1885-86; surplus.
At San Marcial. Flood.

1887. At Del Norte. Good average flow.
1888. At Del Norte. Good average flow.
At Socorro. Thought to have been dry (?).
1889. At Del Norte. Gauge showed mean flow.
At Embudo. Summer flow about mean flow.
1889. At Las Cruces. River went dry.
At Picacho. River went dry.
At Socorro. River went dry.
At Palomas. River went dry.
At Mesilla. Very dry until late fall.
At El Paso. River was dry from August 5 to the latter part of December; longest time recorded.
1890. At Del Norte. Gauge showed mean flow.
At Embudo. Gauge showed large flow.
At Los Lunas. Had water all summer.
At Socorro. Thought to have been dry (?).
At Palomas. A good amount of water.
At Mesilla. All the water needed.
At El Paso. Summer flow large, shown by gaugings.
1891. At Del Norte. Gauge showed mean flow.
At Embudo. Gauge showed largest summer flow recorded.
At Los Lunas. Had water all summer.
At Socorro. Thought to have been dry (?).
At San Marcial. Water all summer.
At Palomas. Dry a short time (?).
At Mesilla. Had all the water needed.
At El Paso. Summer flow very large.
1892. At Del Norte. Summer flow small.
At Embudo. Gauge showed summer flow to be above mean.
At Los Lunas. River was dry July 1 to September 20. No flood in the spring.
At Socorro. Thought to have been dry.
At Socorro. Dry six weeks (?). High water in spring (?).
At San Marcial. River was dry.
At Palomas. River was dry a long time.
At Mesilla. Had all the water needed. (?).
At El Paso. Gauge showed dry from early in August until fall.
1893. At Del Norte. Gauge showed summer flow small.
At Embudo. Gauge showed summer flow a little below mean.
At Los Lunas. Had waterable summer, but there was no spring flood.

At Socorro. Had waterable summer.
 At Socorro. Dry six weeks (?).
 At San Marcial. River dry until September
 or October (?).
 At Palomas. A good deal of storm water, but
 normal flow small.
 At Colorado (above Rincon). Somewhat short
 of water.
 At Mesilla. Said to have been the poorest
 water supply for six years.
 At El Paso. River was probably dry in June,
 then a flood, and no record beyond that time.
 1894. At Del Norte. Gauge showed smallest summer
 flow recorded (smaller than 1896).
 At Albuquerque. River was dry during July.
 At Los Lunas. River was dry June 24 to
 August 10.
 At Sabinal. River was dry June 22 to July
 22.
 At Picacho. River was dry one month.
 At Socorro. River was dry.
 At San Marcial. River was dry June to
 November (?).
 At Palomas. River was dry a long time.
 At Colorado. Short of water.
 At Las Cruces. Waterable the season (?).
 At Mesilla. River did not go quite dry.
 At Chamberino. Short of water, but fair crop.
 At El Paso. No gauge record; river was dry
 in July.
 1895. At Del Norte. Gauge showed summer flow a
 little above the mean.
 At Del Norte. Gauge showed summer flow about
 mean.
 At Albuquerque. River was dry through July
 (?).
 At Los Lunas. Had water all summer, but
 no flood in spring.
 At Sabinal. River was not dry.
 At Picacho. River was not dry.
 At Socorro. River was nearly dry.
 At Socorro. River was dry two weeks in June.
 At San Marcial. River was dry a few days.
 At Palomas. River was not dry.
 At Colorado. Good supply of water.
 At Las Cruces. River went dry last of June
 and then the supply was precarious.
 At Mesilla. River was dry six weeks.

At Chamberino. Water enough to make a good crop.

At El Paso. No gauge record that can be used.

1896. At Del Norte. Gauge showed summer flow small; said by old residents to be the driest year ever known.

At Embudo. Gauge showed very small flow.

At Pena Blanca. River lowest ever known.

At Albuquerque. River was dry June 20 to September 19.

At Los Lunas. River was dry June 18 to July 20; a small flow July 20 to August 5. Dry August 5 to September 20.

At Sabinas. River went dry June 15, and was still dry October 3; weeds growing clear across the channel.

At Picacho. River went dry June 10, and was still dry October 3.

At San Marcial. River was dry from early June to latter part of August; then there was a little water.

At Mitchell's Ranch. River was dry June 14 to July 6; then very small flow.

At Palomas. River was nearly dry June 1; entirely dry June 15 to September, then up and down. (There is a rock reef across the river near here which forces to the surface the seep water moving in the sands of the river, the minimum flow here is 6 second-feet.)

At Loma Padre. River was dry two weeks in July, but then there was water from rains.

At Colorado. Short of water.

At Las Cruces. River was dry June 10 to July 1, then water in spurts.

At Mesilla. River was dry June 4 to July 21, then precarious.

1896. At San Miguel. River was dry June 1 to July 25; water July 27 to August 4.

At San Miguel. River was dry August 4 to September 1, then water. (The San Miguel notes are accurate, being taken from a record.)

At Chamberino. River was dry May 27 to August 1; there was water one-third of August.

At Chamberino. River was dry September 1 to September 20, then water; short crop.

At El Paso. Gauge record shows very low water after May 1, and dry as follows:

May 26 to July 2, July 7 to July 17, August 23 to September 2, and September 7 to September 22. The flow between these dates was small.

General. Believed in the San Luis Valley that omitting 1896, the dry years, and 1884, the flood year, the other years average up, and as much water now comes from the mountains as ever. But owing to the destruction of timber both by fire and sawmill men, the snows melt earlier in the spring and run off more quickly, and so the flood comes sooner and does not last as long as formerly.

At Embudo. The summer flow since 1889 or 1890 is estimated to be about one-half that of former years.

At San Felipe, above Albuquerque. There is always plenty of water to here, but it begins to fail below.

At Albuquerque. Said to have always been a "big river" all summer prior to 1884 (?).

At Pena Blanca. Believed to be only one-third as much water now as formerly.

At Picacho. There was a dry year between 1879 and 1889.

At Palomas. There was a dry year between 1879 and 1889.

At Dona and Las Cruces. The water began to fail in 1884 or 1885. (This was the summer flow, not spring.)

You will notice many conflicts in this testimony. I have marked the more uncertain with a question point. But I thought it best to give you all the evidence I have so you may be able to weigh it yourself. Of course, the personality of the informants enter largely into a consideration of the testimony. I have borne this in mind in my study of it.

From this data, supplemented by a personal

knowledge of the country covering the last seven years, and by a study of the meager rainfall records available, I have made up the following allowances of water per acre for the different years on irrigated land along the river between White Rock Canon and El Paso:

- Prior to 1880. Allow 4 acre-feet per acre.
This is to represent an average use for ordinary years. In 1879 less than this was used.
1880. Allow 4 acre-feet per acre.
1881. Allow 4 acre-feet per acre.
1882. Allow 4 acre-feet per acre to Albuquerque.
Allow 3 acre-feet per acre to San Marcial.
Allow 2.5 acre-feet per acre to La Union.
1883-1886. Allow 4 acre-feet per acre.
1887. Allow 4 acre-feet per acre to Hunnings Ditch at Los Lunas.
Allow 3 acre-feet per acre to La Union.
1888. Allow 4 acre-feet per acre to Albuquerque.
Allow 3 acre-feet per acre to San Marcial.
Allow 2.5 acre-feet per acre to La Union.
1889. Allow 4 acre-feet per acre to Bernalillo.
Allow 3 acre-feet per acre to Albuquerque.
Allow 2.5 acre-feet per acre to Hunnings Ditch (No. 55).
Allow 2 acre-feet per acre to Jarales Ditch (No. 65).
Allow 1.5 acre-feet per acre to mouth of Puerco.
Allow 2 acre-feet per acre to La Union.
1890. Allow 4 acre-feet per acre to San Marcial.
Allow 3 acre-feet per acre to La Union.
1891. Allow 4 acre-feet per acre to San Marcial.
Allow 3 acre-feet per acre to La Union.
1892. Allow 4 acre-feet per acre to Bernalillo.
Allow 3 acre-feet per acre to Hunnings ditch (No. 55).
Allow 2.5 acre-feet per acre to mouth of Puerco.
Allow 3 acre-feet per acre to Socorro.

1893. Allow 2.5 acre-feet per acre to La Union.
 Allow 4 acre-feet per acre to Lemita ditch (No. 77).
 Allow 3 acre-feet per acre to San Marcial.
 Allow 2.5 acre-feet per acre to Loma Padre ditch (No. 103).
1894. Allow 2 acre-feet per acre to La Union.
 Allow 4 acre-feet per acre to Bernalillo.
 Allow 3 acre-feet per acre to Hunnings ditch (No. 55).
 Allow 2.5 acre-feet per acre to mouth of Puerco.
 Allow 3 acre-feet per acre to Socorro.
 Allow 2.5 acre-feet per acre to La Union.
1895. Allow 4 acre-feet per acre to Hunnings ditch (No. 55).
 Allow 3 acre-feet per acre to Colorado ditch (No. 104).
 Allow 2.5 acre-feet per acre to La Union.
1896. Allow 4 acre-feet per acre to Santo Domingo lower (No. 24.)
 Allow 3 acre-feet per acre to Bernalillo.
 Allow 2.5 acre-feet per acre to Albuquerque.
 Allow 2 acre-feet per acre to Hunnings ditch (No. 55).
 Allow 1.5 acre-feet per acre to Jarales ditch (No. 65).
 Allow 1 acre-foot per acre to mouth of Puerco.
 Allow 2.5 acre-feet per acre to Lemitar (No. 77).
 Allow 2 acre-feet per acre to Loma Padre (No. 103)
 Allow 1.5 acre-feet per acre to lower end district 16 (No. 106)
 Allow 2.5 acre-feet per acre for Dona Ana, Las Cruces, and Mesilla.
 Allow 2 acre-feet per acre to La Mesa ditch (No. 114).
 Allow 1.5 acre-feet per acre to La Union.

In all cases the ditch named is given the amount mentioned as used above it.

You will notice that the evidence concerning flow indicates a dry year between 1879 and 1889. As the rainfall for 1882 was light, I have assumed

it to be the year of shortage. It was either 1881 or 1882, and I am inclined to think it was the latter.

From these estimates the detail sheets for districts 12 to 17, inclusive, are filled in for 1894, 1895, and 1896 and the summary for New Mexico for the previous years.

I wish here to call your attention again to the fact that the amount of water I have estimated as used each year is not supposed to be all actually applied to the beneficial irrigation of a growing crop, but it is intended to show the approximate amount diverted by the ditches and lost to the drainage, being either dissipated by evaporation or by transpiration through the growing crops, or held in the soil but not quickly returned to the drainage.

You will notice that the capacity of many of the ditches listed is sufficient to carry many times the amount of water charged to them. For instance, Rio Grande ditch No. 53, named Los Lentos, has a capacity of 40 second-feet or 80 acre-feet per day, while the maximum charged against it is 2,400 acre-feet, or but thirty days' run of its full capacity. In a year of plenty this ditch may carry water for over two

hundred days, but a large part of its flow will tail directly into the river or into a lower ditch and eventually into the river. Another large part runs across the surface of the ground and so goes back, while only a small portion of the water taken from the river is actually put to a beneficial use.

As before stated, I recognized this condition early in the investigation and so resorted to collecting statistics as to acreage watered, studying at the same time the methods of irrigation employed, with a view of determining a maximum amount of water that it was likely was used per acre. The result of my study is the assumption of 4 acre-feet per acre.

XX. EL PASO VALLEY.

On passing El Paso, the Rio Grande, which here forms the boundary between the United States and Mexico, enters El Paso or Ysleta Valley. This valley is some 50 miles or more long, and varies in width from 4 to 5 miles. The Emory and Salazar boundary survey map gives this valley an area, by scale, of about 220 square miles. Of this area, probably two-thirds is arable land, the rest being

river channels, either abandoned or in use, swamps, or sand hills. This makes the estimated acreage of arable land in the El Paso Valley about 95,000 acres.

This valley was occupied by the Spaniards over three hundred years ago. In 1600 Paso del Norte (now called Juarez) was an important town, and records are in existence over two hundred and eighty years old which refer to the Acequia Madre of Paso del Norte as being then in use.

Owing to the limited time at our disposal, and also to the fact that the use of water which had supposedly injured this valley was all, of course, above it, we did not extend our detailed examination below El Paso. From all I could learn, however, from old inhabitants, I should judge that in former years some 40,000 acres of land were tilled in this valley more than half of which was on the Mexican side of the river. This was watered by numerous ditches believed to have had an aggregate capacity of some 500 second-feet. This valley has long been noted for the fine quality of its fruits. The mission grape here grows to perfection, while fine peaches are also raised.

At the present time there are five or six ditches on the Mexican side, with an aggregate capacity of 200 second-feet or more. On the United States side there are a larger number of ditches, but all except the El Paso Canal are of small capacity. The El Paso Canal was built in 1888, with a claimed capacity of 400 second-feet. In its present condition its carrying capacity is not likely to exceed 150 second-feet. I am unable to give you an estimate as to the acreage now cultivated in this valley, but can safely say that it is considerably less than the amount formerly tilled--at least so far as the upper end of the valley is concerned. The water supply has become precarious and many farms have been abandoned, while crops have been light on those still cultivated.

It is in the El Paso Valley that damage to the residents of Mexico is claimed from the diversion of the waters of the Rio Grande in the United States. While, for reasons which I will state farther on in this report, I believe that this claim is well founded, I can not give you even an approximate estimate of the amount of damage done, nor do I consider it to be within

the scope of this paper to take up the subject. I will say, however, that the citizens of the United States here have suffered to the same extent as their Mexican neighbors, and that the loss to both has been much greater than it has been to the inhabitants farther up the river-- for all have suffered as far north as Albuquerque-- because as the flow of water decreased a greater and greater portion of what remained has been diverted above El Paso.

XXI. GAUGINGS AND FLOW OF THE RIO GRANDE

In the winter of 1888-89 the United States Geological Survey organized a hydrographic branch and started work on the Rio Grande.

Stations were established in 1889 at Del Norte, Colo., Embudo, N. Mex., and El Paso, Tex., and a record of the height of water in the river at each place has been kept for a portion of the time since, while attempts have been made to obtain records at other points on the main river, but so far without any trustworthy results.

On four sheets of the tables (see table of contents for the numbers thereof) I have arranged the records of these three stations and also that of another station established in 1895

at the upper end of the White Rock Canon and named Rio Grande. It is an important station, although the record is now too short to be of much value.

In tabulating these records I have divided them into two portions, which I have called, respectively, summer and winter flow, the first covering April to September and the second October to March. While the irrigation season in the San Luis begins after the middle of April and ends early in September, and while lower down the river it begins much earlier and ends later, I thought that the above division would fit all the conditions fairly well, and it would be safe to assume that the summer flow was all available for irrigation except in time to waste, but that the winter flow was all, or nearly all, unavailable and unused for irrigation.

In order that the record of a gauging station may be of value, the cross section of the station should be moderately permanent, not changing by scouring out in sudden rises and filling up on a falling river, the channel of the river must be straight for some distance above the station, and enough actual meter gaugings of the stream must be had, taken at the various stages between extreme

high and low water, to render it possible to make a rating table showing the amount of water corresponding to a given reading on the gauge. As the cross section, unless in solid rock, will be subject to change, a new rating table must be made from time to time.

1. GAUGING STATION AT DEL NORTE, COLO.

The Del Norte gauging station is located some 3 miles above the town of Del Norte and is above the head-gates of all the large canals. It is said to be a good station, the cross section being quite permanent and the channel straight, so that the flow of water through the station is uniform. A large number of gaugings were made here in 1889 and 1890, and the records for those years are reliable. But one gauging was made in 1891, one in 1892, and none in 1893, while in 1894 but two were made, both in a small river. The records for these years are therefore not trustworthy as far as deduced actual flow is concerned. The Thirteenth Annual Report of the Survey gives, on page 94 of Part III, the flow up to and including 1892 and computes the annual run-off, both to an

exactness hardly justified by the conditions. For 1893, 1894, and 1895 the survey publishes gauge readings only, and these, as well as the record for 1896 up to October 1, I have reduced to second-feet of flow and acre-feet of run-off by an approximate rating table which I made up from the few gaugings made since 1892 of which I have a record. This rating table and the gaugings on which it is based is given in the tables.

It is likely that the run-off shown in the table is, taken as a whole, within 20 per cent of the actual amount which has passed Del Norte since October, 1889, and possibly within 10 per cent.

You will notice that the summer flow largely exceeds the winter flow, but that the latter is much more constant than the former, and that the summer flow varies from a minimum of 330,000 acre-feet, recorded in 1894, to about 715,000 acre-feet for 1891. Although the total summer flow for 1894 was less than that for 1896, it was distributed more uniformly through the irrigating season and so furnished a better supply for the ditches than did that of 1896.

Following the description of the different stations you will find the totals for each station grouped for convenience of reference.

2. GAUGING STATION AT EMBUDO, N. MEX.

The Embudo station was established in January, 1889. The choice of location is unfortunate, being in a sharp bend in the river, with a shingle bar on one side, which is likely to vary in height between high and low water. I have never seen this station in time of flood, but I should judge that the current must then vary greatly in different portions of the cross section. The record is not complete, no gauge readings having been taken for a greater portion of 1894. Numerous gaugings were made here in 1889 and 1890, and also in 1895 and 1896. These show some change between the two sets of gaugings, but not an excessive amount; and it is likely that the totals (see page 86) for this station are within 20 per cent of actual amounts passing it.

You will notice a greater variation in the summer flow of the different years here than at Del Norte, the minimum recorded being that of 1896, when 275,000 acre-feet passed, although 1894

probably would have shown a smaller total flow, while the maximum is for 1891, when over 1,000,000 acre-feet is supposed to have passed.

3. GAUGING STATION AT RIO GRANDE, N. MEX.

The Rio Grande station, situated in the upper end of White Rock Canon is said to be the best station on the river. I have never seen it. This will become an important station if the water rights of the river below the canon are ever adjudicated, as it will form the basis for distributing the water of the river the same as Del Norte now does for district No. 20, of Colorado. The rating table used for this station is approximate only. It is based on some ten or twelve gaugings which cover the range of the river from high to low water. They have all been made by Mr. P. E. Harroun, of Santa Fe, who established the station.

You will notice that the record for the summer flow is here some 75 per cent more than at Embudo, only 35 miles above it. This addition is supposed to come from the streams entering the Espanola Valley, of which the Chama delivers the major portion of the water, but may be partly due to errors in the two rating tables, the Embudo one showing too

small a flow and the Rio Grande one too large a flow.

A record has been kept for some time of the height of the water at San Marcial, but the channel is of so unstable a nature that nothing can be learned from the record.

4. GAUGING STATION AT EL PASO, TEX.

The El Paso station was first located at old Fort Bliss, 2 miles above El Paso and a short distance above the dam at the head of the Juarez acequia. Some time prior to 1889 a fairly permanent concrete dam was built at the head of that ditch, but prior to that construction it was merely a reef of small stones thrown into the river. A few weeks after the gauging station was established this dam was raised about a foot, so changing the readings on the gauge.

The cross section of the station was such, being alluvial deposit, that it was subject to constant change, and only by a series of systematic measurements, carried through each rise and fall of the river, could a rating table be made up and corrected for each change of cross section which would give a volume of flow approximating at all closely to the water actually passing the station. This

was done for 1889, and I think for a portion at least of 1890, and the records for those two years are reliable.

But while the gauging station was abandoned some time in 1890, so far as taking meter measurements was concerned, the readings on the gauge were still recorded, and the Thirteenth Annual Report, before referred to, gives on page 94 of part III, the flow in second-feet for this station for each month between 1890 and the dry river of 1892, carried to a degree of precision hardly justified by the conditions obtaining at the station. In a bulletin issued to cover the work of the hydrographers for 1893 and 1894, gauge readings are published for this station, and also a rating table, which is based, I suppose, on the meter gaugings of 1889 and 1890. While in the absence of any other information I have reduced the gauge readings by this rating table, I do not think that the results are at all reliable, and this should be borne in mind in any study of them. As the change, however, occurring most quickly is a sudden scour caused by a rising river, when much more water will pass the station than the gauge

reading would indicate, it is likely that fully as much water passed the station as is indicated by the gauge readings except in time of low water. At that time the raising of the Mexican dam in 1891 is likely to so affect the gauge readings as to make them indicate more water passing than was actually doing so. As a mistake, however, of 1,000 second-feet in a flood for a day would balance one of 100 second-feet in low water for ten days (the flood being underestimated and the low-water flood overestimated), it is still likely that the run-off given in the table on page 86 is under rather than over the true amount.

This station was abandoned in June, 1893, and no attempt at a record was made until January, 1895, when a new station was established at the pump-house belonging to the smelter some 3 miles above El Paso. This moved the gauge about a mile upstream, thus removing it from the immediate neighborhood of the Mexican dam, but in other respects the choice of location was an unfortunate one. A rock point juts into the river on the east side, against which the water strikes and rebounds, forming cross currents and eddies. There is a large rock in the middle of the channel just above the gauging station. The water pours over this in high water,

but runs around it in low water. As a result the bottom of the gauging cross section scours out and fills up with great rapidity and through a large range of depth, a difference of 14 feet of water having been observed with only a difference of 0.8 feet on the gauge.

While this station was established nearly two years ago, but ten or twelve meter measurements have been made, all but one being during low water. The largest measured flow is about 1,000 second-feet or more. During October, 1896, a sudden flood came down the river. Mr. de Ibarrola took daily measurements of it, and these showed that the maximum was reached on October 19, when 5,900 second-feet was flowing, there being 4,000 the preceding day. The readings on the gauge, however, showed an average of the same height for the two days and an extreme range between the two days of only 0.4 foot. So that I have not been able to make any reliable estimate of the flow through this station for 1895 and 1896, hence the table stops with 1893.

The records of these stations are here consolidated for convenience in comparison, all in acre-feet, to nearest thousand:

Time	Del Norte	Embudo	Rio Grande	El Paso
May to September, 1889 (5 months).....	.....	.....	.....	366,000
April to September, 1889 (6 months) ..	.....	578,000	.....	.....
Winter, 1889-90.....	163,000	173,000	.....	59,000
Summer, 1890.....	706,000	860,000	.....	863,000
Winter, 1890-91.....	306,000	239,000	.....	243,000
Summer, 1891.....	714,000	1,046,000	.....	1,621,000
Winter, 1891-92.....	151,000	315,000	.....	228,000
Summer, 1892.....	444,000	725,000	.....	847,000
Winter, 1892-93.....	296,000	147,000	.....	29,000
Summer, 1893.....	453,000	494,000	.....	320,000
Winter, 1893-94.....	293,000	168,000	.....	.....
Summer, 1894.....	332,000	.....	.....	.....
Winter, 1894-95.....	207,000	178,000	.....	.....
Summer, 1895.....	545,000	687,000	1,113,000	.....
Winter, 1895-96.....	329,000	223,000	316,000	.....
Summer, 1896.....	369,000	275,000	488,000	.....

XXII. SUGGESTIONS

This places before you the data available on which to base an answer to the two questions raised by Mr. Romero and Mr. Olney, and I will now give you my suggestions thereon, in accordance with your instructions:

First. Taking up the consideration of the summary for New Mexico, you will notice the following: Prior to 1880 there were 183,000 acres watered by 553 ditches, having a total capacity of 5,600 second-feet. While the number of ditches increased to 573, adding, however, 50 second-feet to the capacity, this area slowly decreased to 180,000 acres watered in 1884. Then it suddenly fell to 173,000 acres in 1885, this fall being due to three ditches, with an aggregate capacity of 130 second-feet, being washed out and entirely abandoned, while others were badly injured by the great flood of 1884. The area cultivated remained practically constant until 1889, although some 18 new ditches, with an aggregate capacity of 120 second-feet, were built in the interim. In 1890 the acreage commenced to increase, and in 1895 it reached a total of 187,000 acres, the same amount being watered in 1896. It is likely that a slightly increased area will be watered in 1897.

The total number of ditches in use in 1896 was 603, with an aggregate carrying capacity of 6,060 second-feet, or an increase over 1879 of 50 ditches carrying 450 second-feet of water. These tables show, however, that while the number and aggregate capacity of the New Mexico ditches has increased nearly 10 per cent since 1879, the acreage has increased but 2 per cent since that year, falling in the interval between 1879 and 1896 to a minimum area, which was nearly 6 per cent below that of 1879.

An examination of the detail sheets for New Mexico districts will disclose the fact that a large percentage of the irrigation is ancient. Over 75 per cent of it dates back to 1860, while 20 or 30 per cent is of unknown age, but over one hundred years old. The different tribes of Pueblo Indians now cultivate about 20,000 acres in the Rio Grande drainage.

In view of these statistics, I would suggest that the injury claimed to have been done to the El Paso Valley by recent diversions of the waters of the Rio Grande has not come from an increased use of water in New Mexico.

Second. Taking up the consideration of the

summary for Colorado and referring also to the detail sheets of each district, you will observe the following:

The earliest settlement in the San Luis Valley, judging from the date of the decree, was made in 1352. In 1370 the settlements had increased until there were some 147 ditches in use, with an aggregate capacity of about 1,300 second-feet, and these watered 50,000 acres of land.

In 1379 the use of water had there extended to the irrigation of 122,000 acres, served by 571 ditches, with a probable aggregate capacity of 3,500 second-feet and which were afterwards granted decrees which amounted to 2,700 second-feet.

This area, together, with the number of ditches and the total carrying capacity thereof, increased steadily up to 1890, when ditch construction stopped, although some were afterwards enlarged. Then the total number of ditches had reached 925, with a capacity of about 9,500 second-feet (afterwards increased to about 10,000 second-feet) and decrees amounting to 11,700 second-feet. In 1890 these ditches served over

300,000 acres, the acreage having increased at a moderately uniform rate from 1879. The next two years saw a large increase, over 350,000 acres being watered in 1891 and nearly 400,000 in 1892. The latter was the year of maximum acreage, the amount falling back to 350,000 acres in 1893 and 340,000 acres in 1894. In 1896 there were 925 ditches in use, with a total capacity of 10,000 second-feet or more, 877 of these having decrees aggregating over 12,200 second-feet, and they served 320,000 acres of land. The short water supply of 1896 cut down the area watered in 1896, so that the area of 1894 (viz, 340,000), which was also the area of 1895, is probably the normal amount for the valley. It is likely to become greater rather than less from year to year, although no new ditches will be built, nor will there be any great increase of acreage served directly with water, because all of the supply available for direct irrigation is now in use. The construction of reservoirs, a subject taken up later on, may some time add water enough to the direct supply to serve some 30,000 acres, and that amount may in the future be added to the area now tilled.

These totals show a permanent increase of about 220,000 acres over 1879, or an increase of nearly 200 per cent in the area under cultivation, and nearly that increase in the use of water in Colorado since 1879. This result is deduced in acres of land rather than in acre-feet of water, because the amount of water varies so greatly in different years on the same area of land that it is misleading to quote acre-feet without an accompanying study of the special conditions obtaining the year when the amount quoted was used. Later on I will analyze more fully the effect of this increased use of water. Here I would suggest that this general proposition is established by a study of the Colorado statistics, viz:

The El Paso Valley, as well as the valleys on the river, as far north in New Mexico as Albuquerque, have suffered from the increased use of water in Colorado.

Third. Taking up the consideration of the flow of the river, before and since the construction of the Colorado ditches.

There are no gauge records of flow which antedate the end of the construction period in

Colorado. Reference to Section XIX will show you all the general information I was able to gather concerning the flow. From this and the records of gaugings already discussed you will see---

A. That the river went dry many years before the large use of water in Colorado began. The records show that in 1851 it was dry as far north as Socorro, N. Mex. Again in 1860 or 1861 it was dry in the Mesilla Valley, and 1878 was the driest year of record prior to 1889, the flow ceasing nearly or quite as far north as Albuquerque. In 1889 it was dry for over four months at El Paso, and this dry river was continuous farther north than Albuquerque.

B. That since 1889 the river has been low at El Paso every year except one (1891) and dry nearly every year, although 1889 still has the record for the longest drought. In 1896 the water failed earlier than ever before, the flow, which had been small all winter, ceasing May 26; but the copious summer rains on the New Mexico drainage of the river sent down water in July, and its flow was intermittent after that date.

C. That floods are not so frequent as in former years, the last destructive one occurring in 1884. There was a small one in 1891, but it was not so large as was that of 1884.

so

There are many different climatic conditions obtaining in the various sections of so large an area as the one under consideration that it is difficult to draw general conclusions from a study of these conditions. In 1889, for instance, the records show a large volume of water in the river at Del Norte and the channel dry from Albuquerque southward, while in 1894, with a very small amount in the river in the San Luis, it did not go dry at Albuquerque, but was dry thirty days for a long distance below there, and was not dry for any length of time in the Mesilla Valley. The absence of the usual summer rains in New Mexico accounts for the condition of 1889, while heavy precipitation in the southern country accounts for that of 1894. While these explanations are satisfactory, the conditions in these two years show that it is impossible to foretell the condition of the river at El Paso from the Colorado snow fall and the subsequent spring and summer flow at Del Norte.

Another condition which probably affects the time, duration, and volume of the spring run-off from the mountain country is as follows: In the past ten or fifteen years there have been large areas of forests destroyed on the head waters of

the Rio Grande either by fire or by the ax of the lumberman. It is commonly believed that this denuding of the hills causes the snow to melt much more rapidly in the spring than it did when protected by the timber, so that its water quickly leaves the mountains instead of being held back until the summer when it is needed for irrigation. Not only is this true, but it is quite likely, as suggested by Colonel Mills, that what may be called the dry evaporation of snow from these bare hillsides is also a potent factor in the diminution of the water supply. It is a well-known phenomenon in the arid regions of the mountains to see a snow fall of several inches disappear from the open plains in two or three days when the temperature has remained constantly below the freezing point, but the sun has been bright and the wind strong, while at the same time the snow which was protected from the wind and sun is practically undiminished in quantity. So it may be that high up on the mountain sides the heavy snows of winter, which, formerly protected by the dense foliage of the fir and spruce, remained until late spring, are now, falling as

they do on the barren hillsides which have been denuded of their timber, largely evaporated and dissipated in the air long before the warm days of spring come. From this it is easy to infer the necessity of conserving what forest areas still remain in the mountains.

On the foregoing I would base the suggestion that the dry rivers at El Paso are not always caused by the increased use of water in the United States, but that this use has increased the frequency of recurrence thereof and the lengths of their duration, as will appear more fully from the following discussion. Before entering upon that discussion, however, I would also suggest: So many different and varying conditions simultaneously affect the flow of the Rio Grande that it is difficult to say just what change in this flow is due to a radical and permanent change in one of these conditions, the others still constantly changing as before.

Fourth. Taking up a detailed consideration of the effect on the river of the Colorado use of water. The conditions we have to consider are: A long river flowing sluggishly through a wide and sandy bed, with a minimum flow at

the lower end of the stretch under consideration but little, if any, more than sufficient in years of ordinary low water to supply the demands thereof, and it is asked what effect will doubling the amount of water used on its headwaters have on its lower reaches, the irrigation on its head being already some two-fifths of the total of the river. The answer must be that the minimum flow lower down will be decreased. The question may be considered more in detail as follows:

In studying the effect on the Rio Grande of diverting its waters in the San Luis Valley, only those areas should be considered which are irrigated by water taken from those streams whose flow enters the main river. This condition segregates all of districts 25, 26, and 27, and should also reject a small percentage of district 20 and 21. But the area that would be rejected in the latter districts is small and would not materially affect totals. Therefore, in the following discussion all land watered in the valley will be considered except that in districts 25, 26, and 27.

While much more water will be used in a year of plenty than in one of scarcity, it is the effect on the river of the use of water when the supply

is short that we wish to obtain, and so our attention should be directed to the use of water in those years alone. The seasons of 1894 and 1896 show the shortest water supply of any years of which we have reliable record in the San Luis, and I think it will be a fair consideration of the problem to confine our computations to those two years, and to obtain, if possible, an estimate of the amount of water diverted from the river during these two years in excess of what would have been used if the same area had been watered in 1894 and 1896 as was irrigated prior to 1880.

Deducting from the totals for prior to 1880, 1894, and 1896, the area and water charged to districts 25, 26, and 27, there remains:

YEAR	ACRES	ACRE-FEET
Prior to 1880.....	69,775	240,100
1894.....	272,865	526,265
1896.....	248,760	418,270

Now, you will see that the area prior to 1880 was charged with nearly 3.5 acre-feet of water per acre, but it is not likely that, even had

that small area been watered in 1894 and 1896, it would have used that much water. In district 20, I found that the smaller ditches used an average of 3 feet in 1896--and it will be fair to assume that the 70,000 acres of old land used that amount of water per acre in 1894 and 1896--or 209,325 acre-feet were used on it. Then we have, deducting the acreage and above amount of water from the totals above, for 1894, 203,090 acres new land, using 319,940 acre-feet of water, and for 1896, 178,815 acres of new land, using 208,955 acre-feet of water. The mean of the two is about 192,000 acres of new land, using 264,000 acre-feet of water in excess of the land and water use which antedates 1880.

This 264,000 acre-feet equals about 1,300 second-feet flowing one hundred days. This is about the length of time the irrigation season lasts in the San Luis Valley. Hence, making all due allowance for water charged twice, seepage return, both present and prospective, the probable overestimate of acreage made by owners who wish their ditches to make a good showing, and the errors in guessing at the amount of water flowing in the different ditches

by men whose notions of a cubic foot of water are pretty hazy, and who are almost sure to overestimate a stream, it is safe to say that the low water flow of the Rio Grande in dry years has been decreased by the new irrigation of the San Luis an amount equal to at least 1,000 second-feet of water flowing for one hundred days, and as the probable future seepage returns is likely to be nearly or quite all offset by increased acreage, that the river has permanently lost this amount of water.

As the evaporation and percolation in the river's channel will remain practically constant from year to year from Colorado to Texas, provided there is any water in it at all, and as the use of water in New Mexico, when any is to be had, is about constant also, this taking 1,000 second-feet from the river in Colorado means taking practically that much from the flow at El Paso. And as the San Luis season begins some time in the latter part of April, while the largest use of water is in May and June, and as it probably takes water twenty to thirty days to travel from there to El Paso, it is seen that the San Luis maximum diversion of water in May or June would most greatly affect the river at El Paso in June

or July, months when the water supply is likely to begin to fail. The July use of water in the San Luis, which is quite large, would be felt at El Paso in August.

While this discussion indicates that the mean summer flow at El Paso has probably been decreased 1,000 second-feet at least, and perhaps more, by the increased use of water in Colorado, it does not mean that there were no more water diverted in Colorado than was used prior to 1880, 1,000 second-feet would be running in the river at El Paso when it is now dry, because it might go dry without any water being used in Colorado, as it did in 1851 and 1861. It means that the average summer flow would be 1,000 second-feet, or thereabouts, larger than it now is.

What proportion this amount bears to the whole flow of the river is not material to this discussion, as it is the effect of its diversion on the minimum flow at El Paso we wish to obtain, and not what per cent of annual flow is used in Colorado.

The question may occur to you, Why, since the Colorado use of water increased rapidly prior to 1839, was no disastrous effect felt at El Paso before that date? The answer is: The years of

1883, 1884, 1885, and 1886 were all years of heavy snowfall in Colorado, and, so far as I know, of average summer rainfall lower down the river, so that there was a large amount of surplus water. And while the acreage has largely decreased since 1892 in the San Luis, the snowfall has been scanty for three years past, and the water supply is short, so that no beneficial effect resulting from this decreased acreage has been felt at El Paso. If the coming years bring more snow, the area watered in the San Luis will probably increase again, as it is now limited by the water supply being exhausted, and not by there being no more available land.

The condition, therefore, to be considered at El Paso is that of a dry river likely to recur every year. The suggestions I would make, which are based on this discussion, are already formulated and presented in their proper places.

Before considering the remedy for this condition, I will give you data as to storage project, completed, proposed, or probable, in the drainage above El Paso.

XXIII. RESERVOIRS

On the last sheet of the tabulated matter I have listed 4 reservoirs, constructed in the Rio Grande drainage, with an aggregate capacity of 31,300 acre-feet; 4 projected, with an aggregate capacity of about 300,000 acre-feet, and 6 possible sites, with an aggregate capacity of about 430,000 acre-feet. This I will consider in detail further on.

In the winter of 1889-90 I was employed by the United States Geological Survey to reconnoiter and report on all the possible reservoir sites in the drainage of the Rio Grande, so that the public lands lying within their limits might be withdrawn from sale. My instructions were to report all possible sites without regard to the water supply, land available for irrigation, or cost per acre-foot of water stored. Under these instructions I reconnoitered and reported 52 sites, including the El Paso site, with an aggregate estimate capacity of over 2,000,000 acre-feet, or about 1,500,000 acre-feet aside from the El Paso site. A number of these have since been platted on the General Land Office map of New Mexico and shown on the published copies thereof as Government reservoir sites.

But one of the number has been approved. This is the one on the head of the Blue Water in the Puerco drainage, No. 33 on the General Land Office map.

While these sites exist as reported by me to the Geological Survey, and it is physically possible to make a reservoir of each one, the adverse conditions surrounding nearly all either as to scanty water supply, no available land on which to use the water, probable excessive cost of site, or of the necessary dam, are such as to preclude all probability of their construction. Specific statement of the reasons leading me to this conclusion in the case of each site condemned would be beyond the scope of this report.

Quite a large number of reservoir filings have been made on sites said to exist around the San Luis Valley. Being familiar with the conditions under which nearly all of these filings were made, I have no confidence in their being built, and so have listed none of those filed on as "projected," except Santa Maria lakes, although two are included under possible sites.

(a) RESERVOIRS ALREADY BUILT

1. Saguache.--This is in district 26, Colorado,

and was built by the State. The water supply is scanty, and in its present condition the reservoir will not hold what water does enter it, the bottom being porous. None of the water to be diverted into this reservoir ever reaches the river, so that its construction has not affected the water supply of the Rio Grande. Its capacity is said to be 1,200 acre-feet.

2. Cove Lake.--This lies in district 22, Colorado, and is filled by surplus waters from Conejos and San Antonio rivers. Water diverted to it would otherwise enter the Rio Grande. While the capacity of the lake is 9,700 acre-feet, there is not land enough under it to utilize more than a third of this amount, so that the reservoir should be charged with a probable draft on the drainage of not over 4,000 acre-feet.

3. Santa Fe.--This is built above Santa Fe. The water it impounds would otherwise be used for irrigation, as the stream has not for many years delivered any water to the river, except in time of flood. This reservoir serves as an equalizer distributing the use of water more uniformly throughout the year. Its capacity is 4,000 acre-feet. It can be omitted from the discussion.

4. Blue Water.--This is Government reservoir site No. 33, and is built on Blue Water Creek, in the Zuni Mountains, to a capacity of 20,000 acre-feet. It can be made to hold 70,000 acre-feet, but the water supply is uncertain. It stores no water that would ever reach the Rio Grande, and so may be omitted from the discussion.

(b) RESERVOIRS PROJECTED WITH A FAIR PROSPECT
OF CONSTRUCTION.

1. Santa Maria Lakes.--This site is in district 20, Colorado, near the head waters of the Rio Grande. If utilized, it will furnish water for one of the large canals in the San Luis Valley. All of its capacity of 20,000 acre-feet would be drawn from water which would otherwise flow down the river.

2. Mormon.--This site is in district 22. It may never be built, but I thought it possible that it might be, and so listed it. All of its capacity of 20,000 acre-feet would be drawn from water which would otherwise flow down the Conejos.

3. Western Homestead Land and Investment Company's Reservoir.--This site lies northwest of Albuquerque and would be filled from the flood waters of the Puerco. While it would

draw a supply from the sudden summer floods of this river, much of which water would otherwise sink away into the sand, it must be considered as menacing 20,000 acre-feet of flow, as this is its capacity.

4. Elephant Buttes.--This is a large reservoir site on the Rio Grande west of the Jornada del Muerto. The dam site and main part of the reservoir site lie on the Pedro Armendaris Grant No. 33, to which the United States has given patent. The projectors claim 255,000 acre-feet capacity with an 80-foot dam. I reconnoitered the site on October 7 and estimated its capacity to be 230,000 acre-feet with a 100-foot dam. This must be considered for the reason that, while its construction is not at all assured and may not even be a future probability, its effect, if built, on the flow of the river would be very serious, and so it should be carefully studied.

(c) RESERVOIR SITES WHICH MAY BE IMPROVED
AT SOME FUTURE TIME.

1. La Jara Meadows.--This site lies on the head of La Jara Creek, in district No. 21, Colorado. This is a fine site, with large

capacity, but the water supply is not abundant, as the tributary drainage area has an extent of only some 40 or 50 square miles and is not likely to furnish over 20,000 acre-feet. This amount is assumed as the capacity. The site is now occupied by hay ranches. All the water stored would otherwise flow down La Jara Creek, but much of it would sink away into the La Jara artesian basin. Assume that one-half of the above amount, or 10,000 acre-feet, may some time be stored here, which would otherwise reach the main river.

2. Elk Creek Meadows.--This site is a tributary of the Conejos River, in district 22, Colorado. It, together with one on Pinos Creek, are now filed on by some parties who are using them for fishing purposes with no intention of utilizing them for storage reservoirs. Its whole capacity of 8,000 acre-feet would form a draft on the surplus waters of the Conejos.

3. Pinos Creek Meadows.--This site is on a tributary of San Antonio River, in district 22, Colorado. Its capacity is 5,000 acre-feet, which would form a draft on the surplus waters the San Antonio.

4. Brazos Lakes.--This site is on the head of the South Fork on the Brazos River, in the Chama drainage on the New Mexico land grant of Tierra Amarilla. If ever improved, it will be for the purpose of storing water to be used on the mesa around Parkview. Its whole supply will be taken from the surplus waters of the Chama drainage. The total capacity could be made 50,000 acre-feet, but the available water supply is not likely to exceed 20,000 acre-feet, and this amount must be considered.

5. Hot Springs.--This is Government reservoir site No. 37, and is a fine site, but with water supply which must come from rains rather than from snow, and is, therefore, uncertain. It is near the head of Alamosa Creek, in district 11, New Mexico. This stream is one of those which cut down into the Cuchilla Negra Mesa. Practically its whole supply would be taken from the surplus waters of the Rio Grande. Its maximum capacity is 36,000 acre-feet, but its drainage area is not likely to furnish over 20,000 acre-feet. This amount must be considered as a possible draft on the waters of the Rio Grande.

6. Old Fort Craig.--This is Government site No. 38, and lies on the Rio Grande west of the

Jornado del Muerto and some 35 miles above the Elephant Butte site. With an 80-foot dam I estimated its capacity to be 360,000 acre-feet. This would, of course, all be drawn from the surplus waters of the river. It is not likely that both this and the Elephant Butte reservoir would ever be built, as either will store a supply of water amply sufficient to serve all the available land.

This list comprises all the sites which I think are likely to be occupied. Those outside the main valley of the river which will impound water that would otherwise enter the Rio Grande will, if built, withhold from it an aggregate of 137,000 acre-feet.

XIV. WATER SUPPLY FOR EL PASO RESERVOIR.

In accordance with your letter of instructions, in which you request from me any suggestions that may occur to me bearing on the problem under consideration, I add the following discussion of the probable water supply for the El Paso reservoir:

The first problem is to determine how much water will be needed each year. As before stated, the arable land in the valley is about 95,000 acres. This includes the good valley lands on both sides of the river. Under the hot sun of

this valley 2 acre-feet of water are needed for each acre of land in order to produce a crop, or 190,000 acre-feet must be furnished the valley for irrigation. The area of the proposed lake, when it is full, if the dam be built 60 feet high above the river bed, is, in round numbers, 25,000 acres, while the evaporation from a pan placed in the river was found to be about 7 feet during the year 1889.

I do not think that the evaporation from so large an area of water as would be formed by this lake would be over one-half this amount per year. In 1889 I estimated that the evaporation would be as much from the lake as from the pan; but I now believe that estimate to have been in error. The longest time that water would have to be stored, unless carried over from one year to the following, would be four to six months. So that, even if the daily evaporation were as great from the lake as from the pan, the total loss by it from the stored water would only equal half the annual evaporation. As it is not at all likely that the rate of evaporation from the lake will exceed one-half that from the pan, an allowance of three feet over the whole surface for the loss

from evaporation during the time stored water is held, is probably ample, or 75,000 acre-feet might be so lost.

The first time the reservoir was filled the seepage would be great, as stated in my former report; but after the first or second filling loss from this source would become so small as to be safely ignored.

An available supply must therefore be in sight of 190,000 acre-feet of water for the service of land and 75,000 acre-feet for evaporation, or 265,000 acre-feet in all, and must be likely to remain in sight to render safe the water supply in this reservoir. In my report to Col. Anson Mills, made in 1832, I estimated the capacity of this lake to be 535,000 acre-feet. Hence, remembering that evaporation would be greater for the longer time that stored water would have to be held, you will see that until sediment filled a portion of it the reservoir will hold sufficient water to supply the demand on it for about two years. This filling will occur, however, and hence reliance can not be safely placed on this storage capacity, but water enough ought to be in sight each twelve months for the

necessities of the coming twelve, leaving the extra storage room as an element of safety.

Recurring to the meager records of the flow at El Paso (page 297), you will see that the flow for the eleven months prior to March 31, 1890 (this time including the long drought of 1889), was 425,000 acre-feet; for the year ending March 31, 1891, it was 1,100,000 acre-feet; for the year ending March 31, 1892, it was 1,350,000 acre-feet; for the year ending March 31, 1893, it was 875,000 acre-feet.

April, 1889, it was, I think, a month of heavy flow, being nearly, if not quite, as large as was May, when 190,000 acre-feet passed El Paso. Assuming that 150,000 acre-feet passed in April, the flow for the first year in the above table becomes 575,000 acre-feet and the mean 1,100,000 acre-feet. It is the minimum, however, and not the mean, that we must consider. The 575,000 acre-feet above given is that minimum, so far as the records go. Reference to the Embudo records show that the river there carried less water during the year ending March 31, 1894, than for any other year, the record not including the flow for the year ending March 31, 1895.

At Del Norte the minimum was for the year ending March 31, 1895, when it was 30 per cent less than for any other year. There was water all the season, however, at El Paso the summer of 1895, so that either 1890, 1894, or 1896 must be the year of minimum flow here.

Judging from the looks of the gauge readings for the two years prior to October, 1896, all efforts to reduce them to any definite quantity having been futile, I should judge that the flow for the year ending March 31, 1896, was something like 700,000 or 800,000 acre-feet, nearly all of this passing during the first three months of the time included, while I should estimate that 200,000 acre-feet or more had passed in the seven months prior to October 31, 1896. There was practically no flood in the spring of 1896. This accounts for the small flow given. If the same conditions should prevail for the coming five months, the annual flow may not exceed 300,000 acre-feet. Heavy snows are already falling in Colorado, however, and there is every reason to expect a good flow in the river next spring. The conditions are now, in my opinion, at their

worst, and can change but to mend. While this minimum flow may last for the balance of the year, it is not likely.

I therefore think it safe to say that at least 400,000 acre-feet of surplus water is likely to be in the drainage of the Rio Grande some time during every year, and would pass El Paso if no drafts for storage were made on it.

Reference to the closing paragraphs of the discussion of reservoir sites shows a possible future draft on this surplus water from the use of reservoir sites outside of the valley of the Rio Grande of 127,000 acre-feet, while either the Fort Craig or the Elephant Buttes reservoir are still to be considered. This will leave about 273,000 acre-feet available, provided neither of the latter reservoirs are built, for the El Paso reservoir, in what may be termed a mean year of minimum flow, with a possibility of its falling to 200,000 acre-feet in an excessively low year. Unless two consecutive years are excessively dry, however, dependence may be placed for many years on the extra storage capacity of the reservoir.

So that a minimum annual flow of even less than 200,000 acre-feet, with all of the reservoirs mentioned built, except the Elephant Buttes and Fort

Craig would not mean a loss of crops in the El Paso Valley.

I would therefore suggest that the water supply is likely to be sufficient for the El Paso reservoir, provided no large storage reservoirs are constructed above it on the main river, but without any restrictions of probable reservoirs on the tributaries.

XXV. CONCLUSION.

As several times before stated, the statistics on which the assumptions and inferences deduced in this paper rest are approximate only. Their probable error ranges from 10 to 20 per cent for areas watered, from 10 to 50 per cent for amount of water used, and from 10 to 50 per cent or more for the flow of the Rio Grande, the largest error in the last-named case relating to flood discharge, when for our present purpose an error is of little importance.

Notwithstanding this large possible element of error in the premises, I think it safe to say that the suggestions I have made and the opinions I have expressed, either directly or by implication, are well supported by the evidence, are safely conservative, and are the most probable ones to be derived from a careful study of all the information

at hand. Their recapitulation is as follows:

1. The fact of a decrease in the flow of the river at El Paso exists, as claimed, and dates back to 1838 or 1839. Before those years the river went dry at intervals of about ten years. Since 1838 it has been dry every year but two.

2. The use of water for irrigation has not materially increased in New Mexico since 1880, and hence is not the cause of this decreased flow.

3. The use of water in the San Luis Valley of Colorado has very largely increased since 1880, and at the present stage of development it takes from the river, in excess of what was taken in 1880, an amount of water equivalent to a flow of 1,000 second-feet, running for one hundred days; at least this amount is taken, and possibly more.

4. It is impossible to state specifically how much water was in the river prior to this increased use of water and since, as the records do not antedate this increased use, and as the flow since the records began varies within very wide limits.

5. This flow of 1,000 second-feet, if allowed to remain in the river, would do much toward preventing a dry river at El Paso. Hence,

6. The Mexican and American citizens of the El Paso Valley have suffered in common with their neighbors of the Mesilla Valley and those still farther up the river by this Colorado increased use of water. The suffering has been greater in the El Paso Valley than elsewhere.

7. All of the summer flow of the streams in the San Luis Valley, except their flood waters, are now appropriated, and therefore the use of water therein for direct irrigation is not likely to materially increase in future.

8. Storage reservoirs may be built outside of the main valley of the river, with an aggregate capacity of about 125,000 acre-feet. One of some 250,000 acre-feet capacity is projected in the river's valley above El Paso.

9. There are some 95,000 acres of arable land in the El Paso Valley, about equally divided between the United States and Mexico. To supply a reservoir with water sufficient for the irrigation of this land, together with the amount that will be evaporated from the surface of the reservoir, will require about 265,000 acre-feet of water each year.

10. While there is a possibility of a year's flow past El Paso going below 300,000 acre-feet

before deducting the amount that can be stored above there, outside of the river's valley, the likelihood is that it will never ordinarily go below 400,000 acre-feet in a dry year. If from the latter amount is taken the 125,000 acre-feet which can be stored outside of the river's valley, there remains 275,000 acre-feet available for the El Paso reservoir, Hence,

11. The water supply is likely to be sufficient for the El Paso reservoir after deductions are made for all the probable storage schemes except that one above the Mesilla Valley, But,

12. There is not a sufficient water supply in sight to serve both the Elephant Buttes and El Paso reservoirs, and one scheme must give way to the other. If the United States Government can find any way to control the storage of water at Elephant Buttes, such control should be exercised. If that dam is built at all, its use of water should be conditional on its stopping no flow when the supply of water at El Paso is short.

Yours truly,

W. W. FOLLETT,
Civil Engineer.

WINTER FLOW OF THE RIO GRANDE AT DEL NORTE, COLO.
 (From Geological Survey records. Area contributing run-off, 1,400 square miles)

Month	1889-90		1890-91		1891-92		1892-93	
	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.
October.....	280	17,360	470	29,140	345	52,390	260	16,120
November.....	320	19,200	430	23,800	375	22,500	260	21,600
December.....	280	17,360	565	35,050	325	20,150	920	57,040
January	550	34,100	990	61,580	*300	18,600	1,170	72,540
February.....	795	44,520	1,295	72,520	*300	17,400	*1,200	67,200
March.....	485	30,070	1,280	79,360	315	19,520	*1,000	62,000
Total.....	.....	162,610	.....	206,220	....	150,570	.....	296,500

*Estimated.

WINTER FLOOD OF THE RIO GRANDE AT LEE HORSE, COLO.
 (From Geological Survey records. Area contributing run-off, 1,400 square miles)

Month	1893-94		1894-95		1895-96	
	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.
October.....	300	18,600	345	21,590	420	26,040
November.....	340	20,400	270	16,200	325	19,500
December.....	795	49,290	360	22,320	945	58,590
January.....	1,210	75,020	345	52,390	1,370	84,940
February.....	1,200	67,200	970	54,270	1,230	71,140
March.....	1,015	62,920	650	40,300	1,115	69,120
Total.....	.....	297,440	.....	206,930	.....	329,340

-106-

SUMMER FLOW OF THE RIO GRANDE AT DEL NORTE, COLO.
(From Geological Survey records)

Month	1890		1891		1892		1893	
	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.
April.....	910	54,600	1,410	84,650	1,045	62,700	690	41,400
May.....	4,350	268,460	3,235	207,670	3,605	161,510	2,950	181,900
June.....	3,305	228,300	4,145	248,700	3,185	151,100	2,525	151,500
July.....	1,515	93,950	1,630	104,780	740	45,380	520	32,240
August.....	610	37,850	665	41,220	445	27,590	410	25,400
September.....	585	32,100	525	31,500	360	15,600	225	12,500
Total.....	.....	706,210	.....	714,480	.....	444,530	.....	452,960

-131-

continued-191-

Month	1894		1895		1896	
	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.	sec.-ft.	a.-ft.
April.....	860	51,600	3,115	126,900	1,535	92,100
May.....	2,510	155,620	3,195	136,090	3,575	159,650
June.....	980	58,800	3,490	149,400	800	48,000
July.....	355	22,010	980	60,760	385	23,870
August.....	380	23,560	725	44,950	260	16,120
September.....	345	20,600	450	27,000	480	28,800
Total.....	.....	382,190	.....	545,100	.....	368,540

- 3 191 -

RATING TABLE BY WHICH THE ABOVE TABLE FOR 1893, 1894, 1895, 1896 WAS
 COMPUTED IN SECOND-FEET

(Actual gaugings in black-face figures)

Feet	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
1....	150	165	185	210	235	260	300	350	415	490
2....	550	610	670	730	790	850	910	970	1,040	1,120
3....	1,210	1,310	1,420	1,545	1,685	1,840	2,010	2,195	2,395	2,600
4....	2,820	3,060	3,320	3,600	3,900	4,220	4,560	4,920	5,300	5,700

WINTER FLOW OF THE RIO GRANDE AT EMBUDO, N. MEX.
 (From Geological Survey records. Area contributing run-off, 7,000 square miles)

Month	1888-89		1889-90		1890-91		1891-92	
	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.
October.....	.....	.....	530	17,360	560	34,730	1,680	104,100
November.....	.....	.....	365	21,900	615	36,900	775	46,500
December.....	.....	.....	540	33,480	645	39,990	550	34,100
January.....	430	26,660	435	26,970	585	36,270	495	30,690
February.....	475	26,600	555	31,030	615	34,440	595	34,510
March.....	785	48,670	680	42,160	915	56,730	1,050	65,100
Total.....	.....	*191,930	.....	172,950	.....	239,050	.....	315,060

*Three months.

continued-193

Month	1892-93		1893-94		1894-95		1895-96	
	sec.ft	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.
October.....	200	12,400	485	50,070	†380	23,560	495	30,690
November.....	315	18,900	†450	27,000	†400	24,000	610	36,600
December.....	325	20,150	445	27,590	†420	26,660	520	32,240
January.....	450	27,900	435	26,970	480	29,760	535	33,170
February.....	535	29,960	450	25,200	490	27,440	545	31,610
March.....	605	37,510	†500	31,000	760	47,120	955	59,110
Total.....	.....	146,820	.....	167,830	.....	178,540	.....	223,420

† Estimated

SUMMER FLOW OF THE RIO GRANDE AT EMBUDO, N.MEX.
(From Geological Survey records)

-194-

Month	1889		1890		1891		1892	
	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.
April.....	2,260	135,600	2,080	124,800	2,370	142,200	2,980	178,800
May.....	3,430	212,660	4,960	307,520	5,965	369,830	4,890	303,180
June.....	2,920	175,200	4,105	246,300	5,040	302,400	3,145	188,700
July.....	470	29,140	1,590	98,530	2,355	146,010	555	33,170
August.....	205	12,710	815	50,530	930	57,660	190	11,780
September...	210	12,600	545	32,700	470	28,200	150	9,000
Total...	.....	577,910	.....	860,430	.....	1,046,300	.....	724,630

continued-194

Month	1893.		1894.		1895.		1896.	
	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.
April.....	1,370	82,200	.....	.....	2,580	154,800	1,795	107,700
May.....	3,125	193,750	.....	.....	2,635	163,570	1,600	99,200
June.....	2,540	152,400	.....	.....	3,025	181,500	370	22,200
July.....	330	20,460	.....	.....	1,335	82,770	200	13,600
August.....	340	21,080	.....	.....	1,070	66,340	220	13,640
September...	405	24,300	*155	9,300	635	38,100	230	13,800
Total....	.....	494,190	.....	.....	.....	686,230	.....	275,140

*Estimated.

RATING TABLE BY WHICH THE ABOVE TABLE FOR 1893, 1894, 1895, AND 1896
 WAS MADE UP

Feet	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
7	125	155	185	215	245	275	310	345	380	420
8	460	500	540	580	620	660	700	750	800	850
9	900	960	1,020	1,090	1,160	1,240	1,330	1,430	1,540	1,650
10	1,760	1,870	1,980	2,100	2,220	2,350	2,470	2,590	2,720	2,850
11	2,980	3,110	3,240	3,380	3,520	3,660	3,800	3,940	4,080	4,220
12	4,360	4,520	4,660	4,800	4,940	5,090	5,250	.....	.....	.....

WINTER FLOW OF THE RIO GRANDE AT RIO GRANDE STATION
 (From the Geological Survey records. Area contributing run-off, 11,000 square miles)

Month	1894-95		1895-96	
	sec.ft.	a.ft.	sec.ft.	a.ft.
October.....	.....	.....	705	43,710
November.....	.....	.....	835	50,100
December.....	.....	.....	710	44,020
January.....	.....	.....	*760	47,120
February.....	590	23,040	*790	45,820
March.....	1,370	84,940	1,370	84,940
Total.....	.....	†117,980	.....	315,710

*Estimated

†Two months.

SUMMER FLOW OF THE RIO GRANDE AT RIO GRANDE STATION
(From Geological Survey records)

Month	1895		1896	
	sec.ft.	a.ft.	sec.ft.	a.ft.
April.....	5,070	304,200	3,480	208,800
May.....	4,615	286,130	2,710	168,020
June.....	4,630	277,800	580	34,800
July.....	1,770	109,740	440	27,280
August.....	1,480	91,760	195	12,090
September.....	720	43,200	590	36,580
Total.....	.....	1,112,830	.....	487,570

APPROXIMATE RATING TABLE FROM WHICH THE ABOVE IS COMPUTED

Feet	.0	.1	.2	.3	.4	.5	6.	7.	8.	.9
4.....	...	265	305	345	390	435	480	530	580	630
5.....	680	730	780	830	880	940	1,005	1,080	1,160	1,250
6.....	1,340	1,440	1,550	1,670	1,800	1,930	2,070	2,210	2,350	2,490
7.....	2,640	2,790	2,940	3,090	3,250	3,410	3,570	3,730	3,900	4,070
8.....	4,250	4,430	4,620	4,820	5,030	5,250	5,470	5,700	5,930	6,180
9.....	6,430	6,680	6,940	7,200	7,470	7,750	8,040	8,300	8,630	8,930

WINTER FLOW OF THE RIO GRANDE AT EL PASO, TEX.
 (From Geological Survey. Area contributing run-off, 30,700 square miles)

Month	1889-90		1890-91		1891-92		1892-93	
	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.
October.....	Dry	0	65	4,030	1,485	92,070	Dry (?)	.....
November.....	Dry	0	285	17,100	340	20,400	Dry (?)	.....
December.....	70	4,340	535	33,170	345	21,390	Dry (?)	.....
January.....	195	12,090	450	27,900	325	20,150	135	8,370
February.....	290	16,240	810	45,360	475	27,550	140	7,840
March.....	425	26,350	1,865	115,650	750	46,500	*200	12,400
TOTAL.....	.....	59,020	.....	243,190	.....	228,060	.....	28,610

*Estimated.

SUMMER FLOW OF THE RIO GRANDE AT EL PASO, TEX.
(From Geological Survey reports)

Month	1889		1890		1891		1892		1893	
	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.ft.	sec.ft.	a.f
April.....	.....	.....	2,190	131,400	4,265	255,900	3,145	188,700	910	54,600
May.....	3,115	193,130	5,770	357,740	11,850	734,700	7,090	439,580	3,760	233,120
June.....	2,635	158,100	4,405	264,300	6,715	402,900	2,945	176,700	225	13,500
July.....	235	14,570	855	53,010	2,270	140,740	665	41,230	No record	
August.....	DRY	.....	735	45,570	660	40,920	15	930	No record	
September..	DRY	.....	175	10,500	765	45,900	DRY(?)	.....	No record	
Total....	.....	*365,800	.....	862,520	.....	1,621,060	.....	847,140	.....	.....

*Five months.

RATING TABLE BY WHICH THE ABOVE IS COMPUTED (?)

Feet	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
5....	115	140	170	210	260	320	390	470	560	660
6....	770	890	1,040	1,240	1,500	1,785	2,070	2,355	2,640	2,925
7....	3,210	3,495	3,780	4,065	4,350	4,635	4,920	5,205	5,490	5,775
8....	6,060	6,345	6,630	6,915	7,200	7,485	7,770	8,055	8,340	8,625
9....	8,910	9,195	9,480	9,765	10,050	10,335	10,620	10,910	11,200	11,490
10....	11,780	12,070	12,360	12,650	12,950	13,250	13,550	13,850	14,150	14,450

1-R-20

8
~~10-11~~

A STUDY OF THE USE OF WATER
FOR
IRRIGATION ON THE RIO GRANDE
ABOVE FORT QUITMAN, TEXAS
BY
W. W. FOLLETT
NOVEMBER, 1896
VOLUME II TABLES

**DO NOT REMOVE
FROM LIBRARY**

SUMMARY OF USE OF WATER IN SAN LUIS VALLEY, COLORADO

District	Prior to 1880					1880				
	No. of ditches	Cap.	Decreases	Acres	Acre-ft.	No. of ditches	Cap.	Decreases	Acres	Acre-ft
20.....	182	844	628.83	22,935	91,740	182	979	751.55	26,205	104,820
21.....	42	328	591.08	12,900	51,600	51	382	684.07	15,100	60,400
22.....	45	420	1,147.07	22,800	91,200	50	456	1,215.88	24,100	96,400
24.....	19	300	255.50	8,500	34,000	20	307	259.50	8,650	34,600
25.....	108	1,587	661.76	33,050	132,200	121	1,689	682.10	34,100	136,400
26.....	117	1,002	390.82	15,650	46,950	130	1,090	416.32	16,880	50,040
27.....	42	156	39.15	3,285	13,140	49	173	47.42	4,000	16,000
35.....	36	120	.....	2,640	10,560	36	120	.....	2,640	10,560
Total...	571	4,757	3,714.01	121,760	471,390	629	5,196	4,056.84	121,475	509,220
Increase.....						68	439	342.83	9,715	.....

-202-

continued-202-

District	1881					1882				
	No. of ditches	Cap.	Decrees	Acres	Acre-ft	No. of ditches	Cap.	Decrees	Acres	Acre-ft.
20.....	197	1,103	891.33	29,670	118,680	213	2,057	1,580.49	44,115	176,460
21.....	56	431	760.59	17,300	71,200	57	447	732.15	18,300	73,200
22.....	54	517	1,233.64	31,200	124,800	59	566	1,414.16	33,700	134,800
24.....	22	315	262.25	8,700	34,800	22	315	262.25	8,700	34,800
25.....	133	1,768	706.26	35,340	141,360	137	2,025	717.98	35,950	143,800
26.....	136	1,135	431.16	17,270	51,810	141	1,167	441.56	17,680	53,040
27.....	49	173	47.42	4,000	16,000	49	173	47.42	4,000	16,000
35.....	36	120	.....	2,640	10,560	36	120	.....	2,640	10,560
Total...	683	5,582	4,337.65	148,620	569,210	714	6,870	5,246.45	165,085	642,660
Increase.	44	368	330.81	15,145	.....	31	1,308	358.80	13,465	.....

SUMMARY OF USE OF WATER IN SAN LUIS VALLEY, COLORADO-continued

-205-

District	1883.					:	1884.				
	No. of ditches:	Cap.	Decrees	Acres	Acre ft.		No. of ditches:	Cap.	Decrees	Acres	Acre ft.
20.....	223	:2,554	:2,013.65	:56,315	:225,260	:	232	:2,670	:2,118.77	:58,735	:235,140
21.....	59	:456	:812.65	:19,900	:72,600	:	60	:493	:311.13	:22,000	:85,000
22.....	87	:686	:1,684.69	:44,400	:177,600	:	89	:708	:1,727.19	:45,400	:181,600
24.....	23	:321	:265.50	:3,800	:35,200	:	23	:321	:265.50	:3,800	:35,200
25.....	141	:2,059	:738.28	:36,310	:147,240	:	152	:2,173	:782.78	:39,120	:156,480
26.....	151	:1,273	:467.76	:18,725	:56,175	:	161	:1,335	:509.06	:20,380	:61,140
27.....	49	:173	:47.42	:4,000	:16,000	:	49	:173	:47.42	:4,000	:16,000
35.....	36	:120	:.....	:2,640	:10,560	:	37	:122	:.....	:2,670	:10,680
Total....	769	:7,642	:6,027.95	:191,590	:747,635	:	803	:8,000	:6,361.90	:201,155	:784,240
Increase..	55	:772	:781.50	:26,505	:.....	:	34	:358	:333.95	:9,565	:.....

continued-204-

District	1885					1886				
	No. of ditches:	Cap.	Decrees	Acres	Acres-ft.	No. of ditches:	Cap.	Decrees	Acres	Acres-ft.
20.....	238:	2,797	2,230.36	61,935	247,740	246	3,083	2,507.25	66,045	264,180
21.....	63:	551	1,019.50	24,000	96,000	66	612	1,165.53	29,300	102,550
22.....	92:	780	1,301.69	51,700	206,800	95	854	2,110.19	56,400	225,600
24.....	23:	321	265.50	8,800	35,200	23	321	265.50	8,800	33,200
25.....	156:	2,188	789.78	39,450	157,800	159	2,218	300.08	39,930	159,720
26.....	162:	1,344	515.86	20,655	61,965	168	1,380	520.56	21,230	63,690
27.....	49:	173	47.42	4,000	16,000	49	173	47.42	4,000	16,000
35.....	37:	122	.....	2,670	10,680	39	126	.....	2,890	11,560
Total..	820:	8,276	6,670.11	213,210	832,185	845	8,767	7,426.53	228,595	878,500
Increase.	17:	276	308.21	12,055	.....	25	491	756.42	15,385	.....

-204-

District	1887					1888				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft. :	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft
20.....	253	: 3,440:	2,896.31	: 72,675	: 290,700	: 265	: 4,261:	3,837.03:	88,630	: 310,205
21.....	69	: 735:	1,624.43	: 36,200	: 114,600	: 75	: 799:	1,877.87:	42,000	: 126,000
22.....	98	: 938:	2,722.24	: 57,400	: 229,600	: 106	: 1,009:	2,901.42:	59,400	: 237,600
24.....	23	: 321:	265.50	: 8,800	: 35,200	: 23	: 321:	265.50:	8,800	: 35,200
25.....	162	: 2,280:	820.54	: 40,950	: 163,800	: 169	: 2,405:	872.28:	43,600	: 174,400
26.....	130	: 1,487:	554.46	: 22,210	: 66,630	: 184	: 1,509:	561.76:	22,505	: 67,515
27.....	49	: 173:	47.42	: 4,000	: 16,000	: 49	: 173:	47.42:	4,000	: 16,000
35.....	39	: 126:	.....	: 2,890	: 11,560	: 41	: 326:	.....	4,040	: 16,160
Total..	873	: 9,500:	8,930.90	: 247,125	: 928,090	: 912	: 10,803:	10,363.08:	272,975	: 983,080
Increase.	28	: 733:	1,504.37	: 18,530	:	: 39	: 1,303:	1,432.18:	25,850	:

District	1889					1890				
	No. of ditches	Cap.	Decree	Acres	Acre-ft.	No. of ditches	Cap.	Decree	Acres	Acre-ft
20.....	266	4,685	4,359.83	97,535	341,370	266	5,465	5,050.31	112,480	337,440
21.....	75	799	1,877.67	42,000	128,000	75	799	1,877.67	44,000	88,000
22.....	107	1,034	2,974.42	60,000	240,000	107	1,034	2,978.42	60,000	180,000
24.....	23	321	265.50	8,800	25,200	25	356	265.50	10,000	40,000
25.....	171	2,456	919.18	45,950	183,800	171	2,456	919.18	45,950	187,850
26.....	184	1,509	561.76	22,505	67,515	184	1,509	561.76	22,505	45,010
27.....	49	173	47.42	4,000	16,000	49	173	47.42	4,000	12,000
35.....	47	344	.....	4,520	18,080	48	346	.....	4,780	14,340
Total..	922	11,321	11,005.78	285,310	1,027,965	925	12,138	11,700.26	303,715	854,640
Increase.	10	518	642.70	12,335	.....	3	817	694.48	18,405	.....

District	1891					1892				
	No. of ditches:	Cap.	Decree	Acres	Acres-ft.	No. of ditches:	Cap.	Decree	Acres	Acres-ft
20.....	266:	5,572	5,137.81:	166,480	499,440	266:	6,034	5,561.76:	216,885	455,925
21.....	75:	799	1,877.67:	46,000	92,000	75:	799	1,877.67:	45,000	90,000
22.....	107:	1,034	2,978.42:	55,000	165,000	107:	1,034	2,978.42:	50,000	150,000
24.....	25:	356	265.50:	10,000	35,000	25:	356	265.50:	10,000	35,000
25.....	171:	2,480	919.18:	46,750	140,250	171:	2,501	919.18:	47,550	142,650
26.....	184:	1,509	561.76:	21,430	42,860	184:	1,509	561.76:	20,290	40,580
27.....	49:	173	47.42:	4,000	12,000	49:	173	47.42:	4,000	12,000
35.....	48:	346	.....:	4,780	14,340	48:	346	.....:	4,780	14,340
Total	925:	12,269	11,787.76:	354,440	1,000,890	925:	12,752	12,711.71:	398,305	940,495
Increase	.....:	131:	37.50:	50,725	.....	.....:	483:	423.95:	43,865	.....

107

- 903 -

District	1893					:	1894				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft. :		No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft.
20.....	266	: 6,034:	5,561.76:	179,785	: 382,125	:	266	: 6,034:	5,561.76:	166,085	: 297,315
21.....	75	: 799:	1,877.67:	44,000	: 83,000	:	75	: 799:	1,877.67:	42,000	: 63,000
22.....	107	: 1,034:	2,978.42:	45,000	: 135,000	:	107	: 1,034:	2,978.42:	50,000	: 125,000
24.....	25	: 356:	265.50:	10,000	: 30,000	:	25	: 356:	265.50:	10,000	: 30,000
25.....	171	: 2,501:	919.18:	46,200	: 138,600	:	171	: 2,501:	919.18:	44,750	: 111,875
26.....	184	: 1,509:	561.76:	19,160	: 38,320	:	184	: 1,509:	561.76:	18,020	: 27,030
27.....	49	: 173:	47.42:	4,000	: 12,000	:	49	: 173:	47.42:	4,000	: 10,000
35.....	48	: 346:	.....:	4,780	: 14,340	:	48	: 346:	.....:	4,780	: 11,950
Total..	925	: 12,752:	12,211.71:	352,925	: 838,395	:	925	: 12,752:	12,211.71:	339,635	: 676,170
Increase.	....	: .....	.....:	-45,380	: .....	:	...	: .....	.....:	-13,290	:

SUMMARY OF USE OF WATER IN SAN LUIS VALLEY, COLORADO--continued

District	1895					1896				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft.:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft.:
20.....	266:	6,034:	5,561.76:	164,795:	394,815:	266:	6,034:	5,561.76:	139,795:	257,270:
21.....	75:	799:	1,877.67:	41,550:	109,050:	75:	799:	1,877.67:	37,940:	26,335:
22.....	107:	1,034:	2,978.42:	55,000:	165,000:	107:	1,034:	2,978.42:	60,625:	98,285:
24.....	25:	356:	265.50:	9,500:	38,000:	25:	356:	265.50:	7,050:	25,980:
25.....	171:	2,501:	919.18:	42,940:	161,975:	171:	2,501:	919.18:	46,295:	118,100:
26.....	184:	1,509:	561.76:	16,850:	50,550:	184:	1,509:	561.76:	20,205:	16,170:
27.....	49:	173:	47.42:	4,040:	16,160:	49:	173:	47.42:	2,670:	6,740:
35.....	48:	346:	.....:	4,430:	15,020:	48:	346:	.....:	4,180:	10,410:
Total.....	925:	12,752:	12,211.71:	339,105:	950,570:	925:	12,752:	12,211.71:	318,760:	559,290:
Change.....	.....:	.....:	.....:	-530:	.....:	.....:	.....:	.....:	-20,345::

-209-

SUMMARY OF USE OF WATER IN RIO GRANDE DRAINAGE OF NEW MEXICO

District	Prior to 1880				1880				1881			
	No. of ditches:	Cap.:	Acres	Acre-ft:	No. of ditches:	Cap.:	Acres	Acre-ft:	No. of ditches:	Cap.:	Acres	Acre-ft
1.....	11	32	1,270	5,080	11	32	1,270	5,080	11	32	1,270	5,080
2.....	108	908	24,340	83,570	109	933	24,750	84,800	109	933	24,750	84,800
3.....	17	161	8,360	25,430	17	161	8,360	25,430	17	161	8,360	25,430
4.....	60	334	17,750	45,250	60	334	17,750	45,250	60	334	17,750	45,250
5.....	30	204	7,200	21,340	31	220	8,160	24,220	31	220	8,160	24,220
6.....	43	156	5,800	13,750	43	156	5,800	13,750	43	156	5,800	13,750
7.....	44	117	5,920	10,590	44	117	5,920	10,590	44	117	5,920	10,590
8.....	23	60	2,240	4,350	23	60	2,250	4,350	23	60	2,250	4,350
9.....	21	119	5,410	19,390	21	119	5,410	19,390	21	119	5,410	19,390
10.....	52	422	16,410	33,330	61	440	16,980	35,040	61	440	16,980	35,040
11.....	26	85	2,550	4,270	26	85	2,550	4,270	26	85	2,550	4,270
12.....	31	400	14,160	44,580	31	400	14,160	44,580	31	400	14,160	44,580
13.....	22	311	8,070	32,280	22	311	8,070	32,280	22	311	8,070	32,280
14.....	32	1,138	19,300	77,200	32	1,138	18,400	73,600	32	1,138	17,840	71,360
15.....	15	288	7,000	28,000	15	288	6,000	24,000	16	300	5,790	23,160
16.....	8	162	6,150	24,600	8	162	6,150	24,600	8	162	6,150	24,600
17.....	10	710	31,200	124,800	9	650	28,700	114,800	9	650	28,700	114,800
Total.	553	5,608	182,130	597,810	563	5,606	180,660	586,030	564	5,618	179,910	582,950
Change..	...	...	...	...	+10	-2	-2,450	...	+1	+12	-770	...

-210-

District	1882				1883				1884			
	No. of ditches	Cap.	Acres	Acres-ft.	No. of ditches	Cap.	Acres	Acres-ft.	No. of ditches	Cap.	Acres	Acres-ft.
1.....	11	32	1,270	5,080	11	32	1,270	5,080	11	32	1,270	5,080
2.....	109	933	24,750	84,800	109	933	24,750	84,800	109	933	24,750	84,800
3.....	17	161	8,360	25,430	17	161	8,360	23,370	18	167	8,560	25,730
4.....	60	334	17,750	45,250	60	334	17,750	45,250	60	334	17,750	45,750
5.....	31	220	8,160	24,220	31	220	8,160	24,220	31	220	8,160	24,220
6.....	43	156	5,800	13,750	43	156	5,800	13,750	43	156	5,800	13,750
7.....	44	117	5,920	10,590	44	117	5,920	10,590	44	117	5,920	10,590
8.....	23	60	2,250	4,360	23	60	2,240	4,350	23	60	2,240	4,350
9.....	23	123	5,510	19,690	23	123	5,510	19,690	26	129	5,710	20,490
10.....	61	440	16,980	35,040	61	440	16,980	35,040	61	440	16,980	35,040
11.....	26	85	2,550	4,270	26	85	2,550	4,270	26	85	2,550	4,270
12.....	31	400	14,160	44,580	31	400	14,160	44,580	31	400	14,160	44,580
13.....	22	311	8,070	32,280	22	311	8,070	32,280	22	311	8,070	32,280
14.....	32	1,138	17,840	53,520	32	1,138	17,840	71,360	32	1,138	17,840	71,360
15.....	16	300	5,790	17,370	16	300	5,790	23,160	16	300	5,790	23,160
16.....	8	162	6,150	15,370	8	162	6,150	24,600	11	179	6,496	25,960
17.....	9	650	28,700	71,750	9	650	28,300	113,200	9	650	27,900	111,600
Total.	566	5,622	180,010	507,350	566	5,622	179,600	579,590	573	5,651	179,940	583,010
Change...	↓2	↓4	↓100	.....	...	.....	-410	.....	↓7	↓29	↓340	.....

-212-

District	1885				1886				1887			
	No. of ditches:	Cap.:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Acres:	Acre-ft:
1.....	11:	32:	1,270:	5,080:	11:	32:	1,270:	5,080:	11:	32:	1,270:	5,080:
2.....	109:	933:	24,750:	84,800:	109:	933:	24,750:	84,800:	110:	941:	25,050:	83,440:
3.....	18:	167:	8,560:	25,730:	28:	194:	9,280:	25,730:	28:	194:	9,280:	45,700:
4.....	60:	334:	17,750:	45,750:	61:	346:	18,050:	45,700:	61:	346:	18,050:	24,220:
5.....	31:	220:	8,160:	24,220:	31:	220:	8,160:	24,220:	31:	220:	8,160:	13,750:
6.....	43:	156:	5,800:	13,750:	43:	156:	5,800:	13,750:	43:	156:	5,800:	10,590:
7.....	44:	117:	5,920:	10,590:	44:	117:	5,920:	10,590:	44:	117:	5,920:	4,350:
8.....	23:	60:	2,240:	4,350:	23:	60:	2,240:	4,350:	23:	60:	2,240:	20,490:
9.....	26:	129:	5,710:	20,490:	26:	129:	5,710:	20,490:	26:	129:	5,710:	35,040:
10.....	61:	440:	16,980:	35,040:	61:	440:	16,980:	35,040:	61:	440:	16,980:	4,270:
11.....	26:	85:	2,550:	4,270:	26:	85:	2,550:	4,270:	26:	85:	2,550:	43,980:
12.....	31:	396:	13,960:	43,980:	31:	396:	13,960:	43,980:	31:	396:	13,960:	32,280:
13.....	22:	311:	8,070:	32,280:	22:	311:	8,070:	32,280:	22:	311:	8,070:	62,070:
14.....	32:	1,138:	17,840:	71,360:	32:	1,138:	17,840:	71,360:	32:	1,138:	17,840:	17,370:
15.....	16:	300:	5,790:	23,160:	16:	300:	5,790:	23,160:	16:	300:	5,790:	16,920:
16.....	9:	143:	5,590:	22,360:	9:	143:	5,590:	22,360:	10:	147:	5,640:	65,100:
17.....	8:	560:	22,100:	88,400:	8:	560:	21,700:	86,800:	9:	590:	21,700:	
Total..	570:	5,521:	173,040:	555,610:	581:	5,560:	173,660:	553,960:	584:	5,602:	174,010:	510,380:
Change...	-3:	-130:	-6,900:	.....:	+11:	+39:	+620:	.....:	+3:	+42:	+350::

District	1888				1889				1890			
	No. of ditches:	Cap.:	Acres :	Acre-ft:	No. of ditches:	Cap.:	Acres :	Acre-ft:	No. of ditches:	Cap.:	Acres :	Acre-ft:
1.....	11	32	1,270	5,080	11	32	1,270	5,080	11	32	1,270	5,080
2.....	110	941	25,050	83,440	112	948	25,130	83,760	117	968	25,420	84,770
3.....	23	194	9,280	35,730	23	194	9,280	25,730	23	194	9,280	25,730
4.....	61	346	18,050	45,700	61	346	18,050	39,000	61	346	19,050	45,700
5.....	31	220	8,160	24,220	31	220	8,160	23,230	32	236	9,120	26,110
6.....	43	156	5,800	11,750	43	156	5,800	11,700	43	156	5,800	13,750
7.....	44	117	5,920	10,590	44	117	5,920	8,040	44	117	5,920	10,590
8.....	23	60	2,240	4,350	23	60	2,240	2,930	23	60	2,240	4,350
9.....	27	131	5,790	20,810	27	131	5,790	20,810	27	131	5,790	20,810
10.....	61	440	16,980	35,040	61	440	16,980	24,840	61	440	16,980	30,600
11.....	26	85	2,550	4,270	26	85	2,550	4,000	26	85	2,550	4,000
12.....	31	396	13,960	43,980	31	396	13,960	39,750	31	396	13,960	43,980
13.....	22	311	8,070	32,280	22	311	8,070	26,140	22	311	8,070	32,280
14.....	33	1,168	17,840	53,520	33	1,168	17,840	37,860	33	1,168	17,840	71,360
15.....	16	300	5,790	17,370	16	300	5,790	11,580	16	300	5,790	23,150
16.....	10	147	5,640	14,120	10	147	5,640	11,280	10	147	5,490	16,470
17.....	9	590	21,800	54,500	9	590	21,950	43,900	10	600	22,650	67,950
Total.	586	5,634	174,190	488,750	588	5,641	174,420	421,630	595	5,687	176,220	526,690
Change..	+2	+32	+180	.....	+2	+17	+230	.....	+7	+46	+1,800	.....

District	1891				1892				1893			
	No. of ditches:	Cap.:	Acres	Acre-ft:	No. of ditches:	Cap.:	Acres	Acre-ft:	No. of ditches:	Cap.:	Acres	Acre-ft:
1.....	11	32	1,270	5,080	11	32	1,270	5,080	11	32	1,270	5,080
2.....	120	986	26,120	83,290	123	1,016	26,820	85,590	123	1,016	27,340	86,790
3.....	28	194	9,280	25,730	28	194	9,280	25,730	28	194	9,280	25,730
4.....	61	346	18,050	45,700	61	346	18,050	45,700	61	346	18,050	45,700
5.....	32	236	9,120	26,110	32	236	9,120	26,110	32	236	9,120	26,110
6.....	43	156	5,800	13,750	43	156	5,800	13,750	43	156	5,800	13,750
7.....	44	117	5,920	10,590	44	117	5,920	10,590	44	117	5,920	10,590
8.....	23	60	2,240	4,350	23	60	2,240	4,350	23	60	2,240	4,350
9.....	27	131	5,790	20,810	27	131	5,790	20,810	27	131	5,790	20,810
10.....	61	440	16,980	31,380	61	440	16,980	31,380	61	440	16,980	31,380
11.....	26	85	2,550	4,270	26	85	2,550	4,270	26	85	2,550	4,270
12.....	31	396	13,960	43,980	31	396	13,960	43,980	32	406	13,980	44,040
13.....	22	311	8,070	28,140	22	311	8,070	28,140	22	311	8,070	28,280
14.....	33	1,168	17,840	71,360	33	1,168	17,840	48,880	33	1,168	17,840	71,360
15.....	16	300	5,790	23,160	16	300	5,790	15,640	16	300	5,790	17,320
16.....	10	147	5,490	16,470	10	147	5,490	13,720	11	187	5,690	12,200
17.....	10	600	22,700	68,100	11	679	23,500	58,750	11	679	24,700	49,400
Total..	593	5,705	176,970	522,270	602	5,814	178,470	482,470	604	5,864	180,490	501,160
Change..	+3	+18	+750	.....	+4	+109	+1,500	.....	+2	+50	+2,020	.....

District	1894				1895				1896			
	No. of ditches:	Cap.:	Acres :	Acre-ft:	No. of ditches:	Cap.:	Acres :	Acre-ft:	No. of ditches:	Cap.:	Acres :	Acre-ft
1.....	11	32	1,270	5,080	11	32	1,270	5,080	11	32	1,270	4,450
2.....	123	1,016	27,420	86,390	123	1,016	27,520	84,630	118	978	26,870	65,870
3.....	28	194	9,280	25,450	28	194	9,280	24,530	28	194	9,280	22,500
4.....	61	346	18,050	45,700	61	346	18,050	45,700	61	346	18,050	32,060
5.....	32	236	9,120	26,110	32	236	9,120	26,110	32	236	9,120	24,520
6.....	43	156	5,800	13,750	43	156	5,800	13,750	43	156	5,800	10,450
7.....	44	117	5,920	10,590	44	117	5,920	10,590	44	117	5,920	8,040
8.....	23	60	2,240	4,350	23	60	2,240	4,350	23	60	2,240	2,930
9.....	27	131	5,790	20,810	27	131	5,790	20,210	27	131	5,790	16,240
10.....	61	440	16,980	31,390	62	580	18,380	33,990	62	580	17,380	20,650
11.....	26	85	2,550	4,270	26	85	2,550	4,270	26	85	2,550	3,470
12.....	32	406	14,020	44,180	32	406	14,060	44,280	32	406	14,060	38,040
13.....	22	311	8,070	28,140	22	311	8,070	32,280	22	311	8,070	23,860
14.....	33	1,168	17,840	48,880	33	1,168	17,840	62,070	33	1,168	17,840	28,940
15.....	16	300	5,790	15,640	16	300	5,790	17,370	16	300	5,790	12,650
16.....	11	247	6,490	16,210	15	295	8,500	25,500	14	285	9,700	16,900
17.....	11	679	26,000	65,000	11	679	27,100	67,750	11	679	27,100	58,250
Total.	604	5,924	182,630	491,940	609	6,112	187,280	522,460	603	6,064	186,830	389,820
Change..	...	+60	+8,140	.....	+5	+188	+4,650	.....	-6	-48	-450	.....

SUMMARY -- DISTRICT NO. 20, COLORADO

-216-

Sheet	Prior to 1880					1880				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft.	No. of ditches:	Cap.	Decree	Acres	Acre-ft.
1.....	25	137	117.30	4,400	17,600	25	142	125.03	4,520	18,080
2.....	25	193	117.67	4,330	17,320	25	214	132.07	4,930	19,720
3.....	25	93	67.28	1,570	6,280	25	93	67.28	1,570	6,280
4.....	25	140	114.86	3,440	13,760	25	143	116.46	3,475	13,900
5.....	25	55	47.05	1,480	5,920	25	55	47.05	1,480	5,920
6.....	25	76	61.21	1,800	7,200	25	106	87.01	2,610	10,440
7.....	12	150	103.46	5,915	23,660	25	190	154.75	7,160	28,640
8.....	.....	.....	.....	.....	.....	7	36	21.90	460	1,840
9.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total...162	844	628.83	22,935	91,740	182	979	751.55	26,205	104,820	

SUMMARY -- DISTRICT NO. 20, COLORADO - continued

Sheet	1881					1882				
	No. of ditches	Cap.	Decree	Acres	Acre-ft.	No. of ditches	Cap.	Decree	Acres	Acre-ft
1.....	25	145	125.83	4,540	18,160	25	145	129.03	4,630	18,520
2.....	25	244	156.27	5,850	22,600	25	250	162.57	5,820	23,280
3.....	25	95	72.54	1,650	6,600	25	95	72.54	1,650	6,600
4.....	25	144	117.66	3,550	14,200	25	144	117.66	3,550	14,200
5.....	25	55	47.05	1,480	5,920	25	60	53.05	1,670	6,680
6.....	25	111	91.01	2,750	11,000	25	111	91.01	2,750	11,000
7.....	25	218	132.35	8,120	32,480	25	232	194.55	9,320	37,280
8.....	22	93	98.62	1,930	7,720	25	235	653.18	12,000	48,000
9.....	.....	.....	.....	.....	.....	13	185	106.90	2,725	10,900
10.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.	197	1,103	891.33	29,670	118,680	213	2,057	1,580.49	44,115	176,460

-217-

Sheet	1883					1884				
	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft
1...	25	153	139.83	4,930	19,720	25	153	139.83	4,930	19,720
2...	25	253	164.17	5,880	23,520	25	253	164.17	5,880	23,520
3...	25	112	88.98	2,005	8,020	25	112	88.98	2,005	8,020
4...	25	144	118.26	3,565	14,260	25	144	118.26	3,565	14,260
5...	25	60	53.05	1,670	6,680	25	60	53.05	1,670	6,680
6...	25	114	95.51	2,840	11,360	25	117	95.91	2,920	11,680
7...	25	232	194.55	9,320	37,280	25	250	206.15	9,750	39,000
8...	25	336	654.18	19,000	76,000	25	340	661.38	19,300	77,200
9...	23	650	507.12	7,105	28,420	25	710	558.62	7,495	29,980
10...	..	..	.....	.....	.....	7	31	32.42	1,270	5,080
11...	..	..	.....	.....	.....	..	..	.....	.....	.....
Total.	223	2,554	2,013.65	56,315	225,260	232	2,670	2,118.77	58,785	235,140

Sheet	1885					1886				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	153	139.83	4,930	19,720	25	154	141.33	4,970	19,880
2....	25	253	164.17	5,880	23,520	25	255	166.97	6,030	24,120
3....	25	112	88.98	2,005	8,020	25	112	88.98	2,005	8,020
4....	25	144	118.26	3,565	14,260	25	147	121.60	3,640	14,560
5....	25	60	53.05	1,670	6,680	25	60	53.05	1,670	6,680
6....	25	121	100.08	3,000	12,000	25	129	106.78	3,230	12,920
7....	25	250	206.15	9,750	39,000	25	256	214.82	10,000	40,000
8....	25	877	695.38	20,570	82,280	25	908	724.04	21,560	86,240
9....	25	710	558.62	7,495	29,980	25	725	567.06	7,700	30,800
10....	13	117	105.84	3,070	12,280	21	337	322.62	5,240	20,960
11....	...	...	.....	.....	.....	...	...	.....	.....	.....
Total.	238	2,797	2,230.33	61,935	247,740	246	3,083	2,507.25	66,045	265,180

Sheet	1887					1888				
	No. of ditches:	Cap.:	Decree	Acres	Acres-ft:	No. of ditches:	Cap.:	Decree	Acres	Acres-ft
1....	25	154	141.33	4,970	19,880	25	154	141.33	4,970	17,395
2....	25	255	166.97	6,030	24,120	25	255	166.97	6,030	21,105
3....	25	112	88.98	2,005	8,020	25	112	88.98	2,005	7,015
4....	25	147	121.60	3,640	14,560	25	147	121.60	3,640	12,740
5....	25	60	53.05	1,670	6,680	25	62	53.85	1,700	5,950
6....	25	132	109.58	3,330	13,320	25	140	116.99	3,520	12,320
7....	25	261	218.68	10,200	40,800	25	274	230.99	10,540	36,890
8....	25	948	752.64	22,660	90,640	25	1,000	790.54	24,125	84,440
9....	25	779	605.86	8,630	34,520	25	1,229	957.26	15,750	55,125
10....	25	578	546.72	8,780	35,120	25	583	553.12	9,010	31,535
11....	3	14	90.90	760	3,040	15	305	615.40	7,340	25,690
Total	253	3,440	2,896.31	72,675	290,700	265	4,261	3,837.03	88,630	310,205

Sheet	1889					1890				
	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft
1.....	25	: 154:	141.33:	4,970:	17,395 :	25	: 154:	141.33:	4,970:	14,910
2.....	25	: 255:	166.97:	6,030:	21,105 :	25	: 255:	166.97:	6,030:	18,030
3.....	25	: 112:	88.98:	2,005:	7,015 :	25	: 112:	88.98:	2,005:	6,015
4.....	25	: 247:	121.60:	3,640:	12,740 :	25	: 147:	121.60:	3,640:	10,920
5.....	25	: 62:	53.85:	1,700:	5,950 :	25	: 62:	53.85:	1,700:	5,100
6.....	25	: 148:	123.69:	3,760:	13,160 :	25	: 155:	129.39:	3,960:	11,880
7.....	25	: 278:	232.99:	10,620:	37,170 :	25	: 288:	239.49:	10,840:	32,520
8.....	25	: 1,080:	849.44:	26,100:	91,350 :	25	: 1,155:	924.54:	29,000:	87,000
9.....	25	: 1,390:	1,134.16:	17,100:	59,850 :	25	: 1,966:	1,622.64:	26,825:	80,475
10.....	25	: 583:	553.12:	9,010:	31,535 :	25	: 695:	667.82:	10,910:	32,730
11.....	16	: 476:	893.70:	12,600:	44,100 :	16	: 476:	893.70:	12,600:	37,800
Total..	266	: 4,685:	4,359.83:	97,535:	341,370 :	266	: 5,465:	5,050.31:	112,480:	337,440

1892

Sheet	1891					1892				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:
1....	25	154:	141.33:	4,970:	14,910	25	154:	141.33:	4,970:	14,910
2....	25	255:	166.97:	6,030:	18,090	25	255:	166.97:	6,030:	18,090
3....	25	112:	88.98:	2,005:	6,015	25	112:	88.98:	2,005:	6,015
4....	25	147:	121.60:	3,640:	10,920	25	151:	126.20:	3,800:	11,400
5....	25	62:	53.85:	1,700:	5,100	25	66:	56.15:	1,755:	5,265
6....	25	155:	129.39:	3,960:	11,880	25	156:	130.59:	3,995:	11,985
7....	25	288:	239.49:	10,840:	32,520	25	288:	245.74:	10,840:	21,680
8....	25	1,230:	976.54:	31,000:	93,000	25	1,681:	1,270.24:	42,980:	85,960
9....	25	1,998:	1,658.14:	56,325:	168,975	25	2,000:	1,774.04:	76,500:	153,000
10....	25	695:	667.82:	12,910:	38,730	25	695:	667.82:	15,410:	30,820
11....	16	476:	893.70:	53,100:	99,300	16	476:	893.70:	48,400:	96,800
Total	266	5,572:	5,137.81:	166,480:	499,440	266	6,034:	5,561.76:	216,685:	455,925

Sheet	1893					1894				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:
1....	25	154	141.33	4,970	14,910	25	154	141.33	4,970	14,910
2....	25	255	166.97	6,030	18,090	25	255	166.97	6,030	18,090
3....	25	112	88.98	2,005	6,015	25	112	88.98	2,005	6,015
4....	25	151	126.20	3,800	11,400	25	151	126.20	3,800	11,400
5....	25	66	56.15	1,755	5,265	25	66	56.15	1,755	5,265
6....	25	156	130.59	3,995	11,985	25	156	130.59	3,995	11,985
7....	25	288	245.74	10,840	21,680	25	288	245.74	10,840	17,345
8....	25	1,681	1,270.24	42,980	85,960	25	1,681	1,270.24	42,980	68,770
9....	25	2,000	1,774.04	43,100	86,200	25	2,000	1,774.04	31,600	50,560
10....	25	695	667.82	14,410	28,820	25	695	667.82	13,410	21,455
11....	16	476	893.70	45,900	91,800	16	476	893.70	44,700	71,520
Total.	266	6,034	5,561.76	179,785	382,125	266	6,034	5,561.76	166,085	297,315

-224-

Sheet	1895					1896				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft
1...	25	154	141.33	4,970	14,910	25	154	141.33	4,475	13,000
2...	25	255	166.97	6,030	18,090	25	255	166.97	5,130	17,580
3...	25	112	88.98	2,005	6,015	25	112	88.98	1,825	4,655
4...	25	151	126.20	3,800	11,400	25	151	126.20	3,350	8,705
5...	25	66	56.15	1,755	5,265	25	66	56.15	1,545	3,295
6...	25	156	130.59	3,995	11,985	25	156	130.59	3,330	11,855
7...	25	288	245.74	10,940	25,160	25	288	245.74	9,370	27,730
8...	25	1,681	1,270.24	42,980	98,855	25	1,681	1,270.24	36,545	64,750
9...	25	2,000	1,774.04	31,600	72,680	25	2,000	1,774.04	24,790	50,545
10...	25	695	667.82	13,170	30,290	25	695	667.82	12,400	29,315
11...	16	476	393.70	43,550	100,165	16	476	393.70	37,035	25,840
Total	266	6,034	5,561.76	164,795	394,815	266	6,034	5,561.76	139,795	257,270

ESTIMATE OF AREAS WATERED UNDER LARGE CANALS

Year	Excelsior: No. 153	Rio Grande: No. 198	Monte Vista: No. 204	Empire : No. 214	San Luis: Valley No. 225	Costilla: No. 239	Farmers' Union No. : 254	Kenelworth No. 265
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1896.....	3,000	30,340	8,845	7,450	7,500	1,050	34,755	550
1895.....	3,500	36,000	10,500	10,000	10,000	1,260	41,000	850
1894.....	3,500	36,000	10,500	10,000	10,000	1,500	42,000	800
1893.....	3,500	36,000	12,000	15,000	15,000	2,500	43,000	1,000
1892.....	3,500	36,000	15,000	20,000	20,000	3,500	45,000	1,500
1891.....	3,500	24,000	15,000	30,000	10,000	2,000	30,000	1,200
1890.....	3,500	22,000	9,825	10,000	5,000	1,000	20,000	1,000
1889.....	3,280	20,400	9,150	4,000	2,000	1,000	10,000	700
1888.....	.....	.....	.....	.....	.....	.....	5,000	.....

SUMMARY---DISTRICT NO, 21, COLORADO

Sheet	Prior to 1880					:	1880				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:		No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1...	25	160	294.12	6,000	24,000	:	25	160	294.12	6,000	24,000
2...	17	1168	296.96	6,900	27,600	:	25	217	382.75	9,000	36,000
3...	..	...	.....	.....	.....	:	1	5	7.20	100	400
Total.	42	328	591.08	12,900	51,600	:	51	382	684.07	15,100	60,400

Sheet	1881					1882				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1.....	25	160	294.12	6,000	24,000	25	160	294.12	6,000	24,000
2.....	25	217	382.75	9,000	36,000	25	227	409.96	9,300	37,200
3.....	6	54	83.72	2,800	11,200	7	60	78.07	3,000	12,000
Total.	56	431	760.59	17,800	71,200	57	447	782.15	18,300	73,200

Sheet	1883					:	1884				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft		No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1.....	25	160	294.12	6,000	24,000	:	25	160	294.12	6,000	24,000
2.....	25	227	409.96	9,300	37,200	:	25	247	486.26	10,000	40,000
3.....	9	69	108.57	4,600	18,400	:	10	91	130.80	6,000	24,000
Total.....	59	456	812.65	19,900	79,600	:	60	498	911.18	22,000	88,000

Sheet	1885					1886				
	No. of ditches	Cap.	Decree	Acres	Acre-ft	No. of ditches	Cap.	Decree	Acres	Acre-ft
1.....	25	160	294.12	6,000	24,000	25	160	294.12	6,000	21,000
2.....	25	247	486.26	10,000	40,000	25	247	486.26	10,000	35,000
3.....	16	144	289.12	8,000	32,000	16	205	385.15	13,300	46,550
Total	66	551	1,019.50	24,000	96,000	66	612	1,165.53	29,300	102,550

Sheet	1887					1888				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	: 160	: 366.75	: 6,700	: 20,100	: 25	: 160	: 366.75	: 6,700	: 20,100
2....	25	: 284	: 690.16	: 12,300	: 36,900	: 25	: 284	: 690.16	: 12,300	: 36,900
3....	19	: 291	: 567.52	: 19,200	: 57,600	: 25	: 355	: 820.76	: 23,000	: 69,000
Total.	69	: 735	: 1,624.43	: 38,200	: 114,600	: 75	: 799	: 1,877.67	: 42,000	: 126,000

-123-

Sheet	1889					1890				
	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft
1.....	25	160	366.75:	6,700:	20,100	25	160	366.75 :	7,000:	14,000
2.....	25	284	690.16:	12,300:	36,900	25	284	690.16 :	12,800:	25,600
3.....	25	355	820.76:	23,000:	69,000	25	355	820.76 :	24,200:	48,400
Total..	75	799	1,877.67:	42,000:	126,000	75	799	1,877.67:	44,000:	88,000

- 252 -

Sheet	1891					1892				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	160	366.75	7,400	14,800	25	160	366.75	7,200	14,400
2....	25	284	690.16	13,400	26,800	25	284	690.16	13,100	26,200
3....	25	355	820.76	25,200	50,400	25	355	820.76	24,700	49,400
Total.	75	799	1,877.67	46,000	92,000	75	799	1,877.67	45,000	90,000

Sheet	1893					1894				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	160	366.75	7,000	14,000	25	160	366.75	6,700	10,050
2....	25	284	690.16	12,800	25,600	25	284	690.16	12,300	18,450
3....	25	355	820.76	24,200	48,400	25	355	820.76	23,000	34,500
Total.	75	799	1,877.67	44,000	88,000	75	799	1,877.67	42,000	63,000

SUMMARY---DISTRICT NO. 22, COLORADO

Sheet	Prior to 1880					1880				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1.....	25	: 250	: 621.80	: 12,800	: 51,500	25	: 250	: 621.80	: 12,800	: 51,200
2.....	20	: 170	: 525.27	: 10,000	: 40,000	25	: 206	: 594.08	: 11,300	: 45,200
3.....	...	: ...	: .....	: .....	: .....	..	: ...	: .....	: .....	: .....
4.....	...	: ...	: .....	: .....	: .....	..	: ...	: .....	: .....	: .....
5.....	...	: ...	: .....	: .....	: .....	..	: ...	: .....	: .....	: .....
Total.	45	: 420	: 1,147.07	: 22,800	: 91,200	50	: 456	: 1,215.88	: 24,800	: 96,400

Sheet	1881					1882				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	250	621.80	12,800	51,200	25	250	621.80	12,800	51,200
2....	25	206	594.08	11,300	45,200	25	206	594.08	11,300	45,200
3....	4	61	72.76	7,100	28,400	9	110	198.72	9,600	38,400
4....	..	..	.....	.....	.....	..	..	.....	.....	.....
5....	..	..	.....	.....	.....	..	..	.....	.....	.....
Total.	54	517	1,288.64	31,200	124,800	59	566	1,414.60	33,700	134,800

Sheet	1883					1884				
	No. of ditches	Cap.	Decree	Acres	Acre-ft	No. of ditches	Cap.	Decree	Acres	Acre-ft
1....	25	252	625.80	13,000	52,000	25	252	625.80	13,000	52,000
2....	25	206	594.08	11,300	45,200	25	207	596.08	11,400	45,600
3....	25	170	351.81	14,000	56,000	25	170	355.81	14,000	56,000
4....	12	58	113.00	6,100	24,400	14	79	149.50	7,000	28,000
5....	..	...	.....	.....	.....	..	...	.....	.....	.....
Total.	87	686	1,684.69	44,000	177,600	89	708	1,727.19	45,400	181,600

Sheet	1885					1886				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:
1...	25	252	625.80	13,000	52,000	25	252	625.80	13,000	52,000
2...	25	212	604.08	11,600	46,400	25	212	604.08	11,600	46,400
3...	25	170	355.81	14,000	56,000	25	217	514.56	15,700	62,800
4...	17	146	216.00	13,100	52,400	20	173	385.75	16,100	64,400
5...	...	...	.....	.....	.....	...	...	.....	.....	.....
Total.	92	780	1,801.69	51,700	206,800	95	854	2,110.19	58,400	225,600

Sheet	1887					1888				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1...	25	254	629.80	13,200	52,800	25	254	633.80	13,300	53,200
2...	25	212	604.08	11,600	46,400	25	219	615.12	11,900	47,600
3...	25	217	514.56	15,700	62,800	25	233	587.40	16,000	64,000
4...	23	255	973.80	16,900	67,600	25	268	1017.10	17,500	70,000
5...	..	...	.....	.....	.....	26	35	48.00	700	2,800
Total.	98	938	2,722.24	57,400	229,600	106	1,009	2,901.42	59,400	237,600

-240-

Sheet	1889					1890				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	: 254	: 633.80	: 13,300	: 53,200	25	: 254	: 633.80	: 13,300	: 39,900
2....	25	: 229	: 646.12	: 12,000	: 48,000	25	: 229	: 646.12	: 12,000	: 36,000
3....	25	: 234	: 589.40	: 16,000	: 64,000	25	: 234	: 590.40	: 16,000	: 48,000
4....	25	: 272	: 1,037.10	: 17,700	: 70,800	25	: 272	: 1,040.10	: 17,700	: 53,100
5....	7	: 45	: 68.00	: 1,000	: 4,000	7	: 45	: 68.00	: 1,000	: 3,000
Total.	107	: 1,034	: 2,974.42	: 60,000	: 240,000	107	: 1,034	: 2,978.42	: 60,000	: 180,000

Sheet	1891					1892				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	: 254	: 633.80	: 12,500	: 37,500	25	: 254	: 633.80	: 11,200	: 33,600
2....	25	: 229	: 646.12	: 11,000	: 33,000	25	: 229	: 646.12	: 10,000	: 30,000
3....	25	: 234	: 590.40	: 15,000	: 45,000	25	: 234	: 590.40	: 13,500	: 40,500
4....	25	: 272	: 1,040.10	: 15,600	: 46,800	25	: 272	: 1,040.10	: 14,500	: 43,500
5....	7	: 45	: 68.00	: 900	: 2,700	7	: 45	: 68.00	: 800	: 2,400
Total.	107	: 1,034	: 2,978.42	: 55,000	: 165,000	107	: 1,034	: 2,978.42	: 50,000	: 150,000

Sheet	1893					1894				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft
1....	25	: 254	: 633.80	: 10,000	: 30,000	25	: 254	: 633.80	: 11,200	: 28,000
2....	25	: 229	: 646.12	: 9,000	: 27,000	25	: 229	: 646.12	: 10,000	: 25,000
3....	25	: 234	: 590.40	: 12,500	: 37,500	25	: 234	: 590.40	: 13,500	: 33,750
4....	25	: 272	: 1,040.10	: 12,700	: 38,100	25	: 272	: 1,040.10	: 14,500	: 36,250
5....	7	: 45	: 68.00	: 800	: 2,400	7	: 45	: 68.00	: 800	: 2,000
Total.	107	: 1,034	: 2,978.42	: 45,000	: 135,000	107	: 1,034	: 2,978.42	: 50,000	: 125,000

Sheet	1895					1896				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft
1....	25	: 254	: 633.80	: 12,500	: 37,500	25	: 254	: 633.80	: 13,455	: 36,660
2....	25	: 229	: 646.12	: 11,000	: 33,000	25	: 229	: 646.12	: 11,995	: 21,815
3....	25	: 234	: 590.40	: 15,000	: 45,000	25	: 234	: 590.40	: 16,250	: 18,880
4....	25	: 272	: 1,040.10	: 15,600	: 46,800	25	: 272	: 1,040.10	: 17,890	: 19,220
5....	7	: 45	: 68.00	: 900	: 2,700	7	: 45	: 68.00	: 1,035	: 1,710
Total	107	: 1,034	: 2,978.42	: 55,000	: 165,000	107	: 1,034	: 2,978.42	: 60,625	: 98,285

-245-

SUMMARY---DISTRICT NO. 25, COLORADO

-244-

Sheet	Prior to 1880					1880				
	No. of ditches:	Cap.:	Decree	Acres	Acre-ft:	No. of ditches:	Cap.:	Decree	Acres	Acre-ft
1....	25	446	152.30	7,600	30,400	25	446	152.30	7,600	30,400
2....	25	556	336.38	16,800	67,200	25	568	339.38	17,000	68,000
3....	25	360	104.41	5,200	20,800	25	364	106.41	5,300	21,200
4....	25	170	55.61	2,800	11,200	25	170	55.61	2,800	11,200
5....	8	55	13.06	650	2,600	21	141	28.40	1,400	5,600
6....	..	...	.....	.....	.....	..	...	.....	.....	.....
7....	..	...	.....	.....	.....	..	...	.....	.....	.....
Total	108	1,587	661.76	33,050	132,200	121	1,689	682.10	34,100	136,400

Sheet	1881					1882				
	No. of ditches	Cap.	Decree	Acres	Acre-ft	No. of ditches	Cap.	Decree	Acres	Acre-ft
1....	25	446	152.30	7,600	30,400	25	646	159.50	8,000	32,000
2....	25	568	339.38	17,000	68,000	25	568	339.38	17,000	68,000
3....	25	364	106.41	5,300	21,200	25	364	106.41	5,300	21,200
4....	25	178	57.61	2,900	11,600	25	185	60.01	3,000	12,000
5....	25	167	40.80	2,050	8,200	25	167	40.80	2,050	8,200
6....	8	45	9.76	490	1,960	12	95	11.88	600	2,400
7....	..	.....	.....	.....	.....	..	....	.....	.....	.....
Total	133	1,768	706.26	35,340	141,360	137	2,025	717.98	35,950	143,800

Sheet	1883					1884				
	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft
1....	25	658	165.30	8,260	33,040	25	658	172.50	8,600	34,400
2....	25	580	346.88	17,350	69,400	25	603	358.88	17,950	71,800
3....	25	364	106.41	5,300	21,200	25	385	112.71	5,650	22,520
4....	25	185	60.01	3,000	12,000	25	190	62.81	3,140	12,560
5....	25	167	40.80	2,050	8,200	25	171	41.80	2,100	8,400
6....	16	105	16.88	850	3,400	25	156	27.28	1,350	5,400
7....	...	...	.....	.....	.....	2	10	6.80	350	1,400
Total	141	2,059	736.28	36,810	147,240	152	2,173	732.78	39,120	156,420

Sheet	1885					1886				
	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap.:	Decree :	Acres :	Acre-ft
1.....	25	: 658	: 172.50:	8,600	: 34,400	25	: 658	: 172.50:	8,600	: 34,400
2.....	25	: 603	: 358.88:	17,950	: 71,800	25	: 603	: 362.08:	18,100	: 72,400
3.....	25	: 385	: 112.71:	5,630	: 22,520	25	: 385	: 112.71:	5,630	: 22,520
4.....	25	: 190	: 62.81:	3,140	: 12,500	25	: 203	: 64.61:	3,200	: 12,800
5.....	25	: 171	: 41.80:	2,100	: 8,400	25	: 171	: 41.80:	2,100	: 8,400
6.....	25	: 160	: 30.48:	1,500	: 6,000	25	: 160	: 30.48:	1,500	: 6,000
7.....	6	: 21	: 10.60:	530	: 2,120	9	: 33	: 15.90:	800	: 3,200
Total.	156	: 2,188:	789.78:	39,450	: 157,800	159	: 2,218:	800.08:	39,930	: 159,720

Sheet	1887					:	1888				
	No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft:		No. of ditches:	Cap.:	Decree:	Acres:	Acre-ft
1....	25	658	172.50	8,600	34,400	:	25	686	191.50	9,600	38,400
2....	25	628	375.94	18,800	75,200	:	25	648	392.94	19,650	78,600
3....	25	390	114.21	5,700	22,800	:	25	434	117.01	5,850	23,400
4....	25	203	64.61	3,200	12,800	:	25	203	64.61	3,200	12,800
5....	25	171	41.80	2,100	8,400	:	25	171	41.80	2,100	8,400
6....	25	160	30.48	1,500	6,000	:	25	169	33.98	1,700	6,800
7....	12	70	21.00	1,050	4,200	:	19	94	30.44	1,500	6,000
Total.	162	2,280	820.54	40,950	163,800	:	169	2,405	872.28	43,600	174,400

Sheet	1889					1890				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft
1....	25	: 686	: 191.50:	9,600:	38,400	: 25	: 686	: 191.50:	9,600:	38,800
2....	25	: 692	: 436.74:	21,800:	87,200	: 25	: 692	: 436.74:	21,800:	65,400
3....	25	: 434	: 117.01:	5,850:	23,400	: 25	: 434	: 117.01:	5,850:	17,550
4....	25	: 203	: 64.61:	3,200:	12,800	: 25	: 203	: 64.61:	3,200:	9,600
5....	25	: 171	: 41.80:	2,100:	8,400	: 25	: 171	: 41.80:	2,100:	6,300
6....	25	: 169	: 33.98:	1,700:	6,800	: 25	: 169	: 33.98:	1,700:	5,100
7....	21	: 101	: 33.54:	1,700:	6,800	: 21	: 101	: 33.54:	1,700:	5,100
Total	171	: 2,456	: 919.18:	45,950:	183,800	: 171	: 2,456	: 919.18:	45,950:	137,850

Sheet	1891					1892				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft
1....	25	: 686	: 191.50	: 9,600	: 28,800	25	: 686	: 191.50	: 9,600	: 28,800
2....	25	: 692	: 436.74	: 21,800	: 65,400	25	: 692	: 436.74	: 21,800	: 65,400
3....	25	: 434	: 117.01	: 5,850	: 17,550	25	: 434	: 117.01	: 5,880	: 17,550
4....	25	: 203	: 64.61	: 3,200	: 9,600	25	: 203	: 64.61	: 3,200	: 9,600
5....	25	: 171	: 41.80	: 2,100	: 6,300	25	: 171	: 41.80	: 2,100	: 6,300
6....	25	: 169	: 33.98	: 1,700	: 5,100	25	: 169	: 33.98	: 1,700	: 5,100
7....	21	: 125	: 33.54	: 2,500	: 7,500	21	: 146	: 33.54	: 3,300	: 9,900
Total	171	: 2,480	: 919.18	: 46,750	: 140,250	171	: 2,501	: 919.18	: 47,550	: 142,650

Sheet	1893					1894				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft:	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft
1...	25	: 686	: 191.50:	9,800:	27,900:	25	: 686	: 191.50:	9,000:	22,500
2...	25	: 692	: 436.74:	21,200:	63,600:	25	: 692	: 436.74:	20,500:	51,250
3...	25	: 434	: 117.01:	5,700:	17,100:	25	: 434	: 117.01:	5,500:	13,750
4...	25	: 203	: 64.61:	3,100:	9,300:	25	: 203	: 64.61:	3,050:	7,625
5...	25	: 171	: 41.80:	2,050:	6,150:	25	: 171	: 41.80:	2,000:	5,000
6...	25	: 169	: 33.98:	1,650:	4,950:	25	: 169	: 33.98:	1,600:	4,000
7...	21	: 146	: 33.54:	3,200:	9,600:	21	: 146	: 33.54:	3,100:	7,750
Total	171	: 2,501	: 919.18:	46,200:	138,600:	171	: 2,501	: 919.18:	44,750:	111,875

Sheet	1895					1896				
	No. of ditches	Cap.	Decree	Acres	Acre-ft	No. of ditches	Cap.	Decree	Acres	Acre-ft
1....	25	686	191.50	9,135	36,195	25	686	191.50	9,375	24,245
2....	25	692	436.74	19,350	76,755	25	692	436.74	21,305	55,095
3....	25	434	117.01	5,290	20,965	25	434	117.01	5,790	14,650
4....	25	203	64.61	2,810	9,930	25	203	64.61	3,125	8,110
5....	25	171	41.80	1,910	7,060	25	171	41.80	1,910	4,980
6....	25	169	33.98	1,520	4,325	25	169	33.98	1,585	4,370
7....	21	146	33.54	2,925	6,745	21	146	33.54	3,205	6,650
Total	171	2,501	919.18	42,940	161,975	171	2,501	919.18	46,295	118,100

SUMMARY--DISTRICT NO. 26, COLORADO

Sheet	Prior to 1880					1880				
	No. of ditches	Cap.	Decree	Acres	Acre-ft	No. of ditches	Cap.	Decree	Acres	Acre-ft
1....	25	: 237	: 108.18	: 4,300	: 12,900	25	: 237	: 108.18	: 4,300	: 12,900
2....	25	: 171	: 94.12	: 3,800	: 11,400	25	: 171	: 94.12	: 3,800	: 11,400
3....	25	: 290	: 101.00	: 4,050	: 12,150	25	: 290	: 101.00	: 4,050	: 12,150
4....	25	: 211	: 54.92	: 2,200	: 6,600	25	: 211	: 54.92	: 2,200	: 6,600
5....	17	: 93	: 32.40	: 1,300	: 3,900	25	: 131	: 41.90	: 1,680	: 5,040
6....	...	: ...	:	:	:	5	: 50	: 16.20	: 650	: 1,950
7....	...	: ...	: .....	: .....	: .....	...	: ...	: .....	: .....	: .....
8....	...	: ...	: .....	: .....	: .....	...	: ...	: .....	: .....	: .....
Total	117	: 1,002	: 390.62	: 15,650	: 46,950	130	: 1,090	: 416.32	: 16,680	: 50,040

-205-

Sheet	1881					:	1882				
	No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft:		No. of ditches:	Cap. :	Decree :	Acres :	Acre-ft
1.....	25	: 237	: 108.18:	4,300	: 12,900	:	25	: 237	: 108.18:	4,300	: 12,900
2.....	25	: 171	: 94.12:	3,800	: 11,400	:	25	: 171	: 94.12:	3,800	: 11,400
3.....	25	: 302	: 105.80:	4,240	: 12,720	:	25	: 310	: 108.80:	4,360	: 13,080
4.....	25	: 211	: 54.92:	2,200	: 6,600	:	25	: 211	: 54.92:	2,200	: 6,600
5.....	25	: 131	: 41.90:	1,680	: 5,040	:	25	: 134	: 44.30:	1,770	: 5,310
6.....	11	: 83	: 26.24:	1,050	: 3,150	:	16	: 104	: 31.24:	1,250	: 3,750
7.....	...	: ...	: .....	.....	: .....	:	...	: ...	: .....	.....	: .....
8.....	...	: ...	: .....	.....	: .....	:	...	: ...	: .....	.....	: .....
Total	136	: 1,135	: 431.16 :	17,270	: 51,810	:	141	: 1,167	: 441.56 :	17,680	: 53,040

Sheet	1883					1884				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft	No. of ditches:	Cap.	Decree	Acres	Acre-ft
1.....	25	237	108.18	4,300	12,900	25	237	108.18	4,300	12,900
2.....	25	171	94.12	3,800	11,400	25	171	94.12	3,800	11,400
3.....	25	310	108.80	4,360	13,080	25	310	108.80	4,360	13,080
4.....	25	211	54.92	2,200	6,600	25	211	54.92	2,200	6,600
5.....	25	134	44.30	1,770	5,310	25	134	44.30	1,770	5,310
6.....	25	208	55.84	2,230	6,690	25	219	57.24	2,290	6,870
7.....	1	2	1.60	65	195	1	53	41.50	1,660	4,980
8.....	...	...	.....	.....	.....	...	.....	.....	.....	.....
Total	151	1,273	467.76	18,725	56,175	161	1,335	509.06	20,380	61,140

Sheet	1855					1886				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft	No. of ditches:	Cap.	Decree	Acres	Acre-ft
1.....	25	237	108.18	4,300	12,900	25	237	108.18	4,300	12,900
2.....	25	171	94.12	3,800	11,400	25	171	94.12	3,800	11,400
3.....	25	310	108.80	4,360	13,080	25	324	103.80	4,560	13,680
4.....	25	211	54.92	2,200	6,600	25	211	54.92	2,200	6,600
5.....	25	134	44.30	1,770	5,310	25	134	44.30	1,770	5,310
6.....	25	226	62.44	2,500	7,500	25	226	62.44	2,500	7,500
7.....	12	55	43.10	1,725	5,175	18	77	52.80	2,100	6,300
8.....	..	...	.....	.....	.....	..	...	.....	.....	.....
Total	162	1,344	515.86	20,655	61,965	168	1,380	530.56	21,230	63,690

Sheet	1887					1888				
	No. of ditches:	Cap.	Decree	Acres	Acres-ft:	No. of ditches:	Cap.	Decree	Acres	Acres-ft
1....	25	: 237	: 108.18:	4,300:	12,900:	25	: 237	: 108.18:	4,300:	12,900
2....	25	: 171	: 94.12:	3,800:	11,400:	25	: 171	: 94.12:	3,800:	11,400
3....	25	: 324	: 113.80:	4,560:	13,680:	25	: 324	: 113.80:	4,560:	13,680
4....	25	: 211	: 54.92:	2,200:	6,600:	25	: 211	: 54.92:	2,200:	6,600
5....	25	: 134	: 44.30:	1,770:	5,310:	25	: 134	: 44.30:	1,770:	5,310
6....	25	: 226	: 62.44:	2,500:	7,500:	25	: 226	: 62.44:	2,500:	7,500
7....	25	: 159	: 68.40:	2,750:	8,250:	25	: 159	: 68.40:	2,750:	8,250
8....	5	: 25	: 8.30:	330:	990:	9	: 47	: 15.60:	625:	1,875
Total..	180	: 1,487	: 554.46:	22,210:	66,630:	184	: 1,509	: 561.76:	22,505:	67,515

Sheet	1889					1890				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft	No. of ditches:	Cap.	Decree	Acres	Acre-ft
1.....	25	: 237	: 108.18:	4,300:	12,900:	25	: 237	: 108.18:	4,300:	8,600
2.....	25	: 171	: 94.12:	3,800:	11,400:	25	: 171	: 94.12:	3,800:	7,600
3.....	25	: 324	: 113.80:	4,560:	13,680:	25	: 324	: 113.80:	4,560:	9,120
4.....	25	: 211	: 54.92:	2,200:	6,600:	25	: 211	: 54.92:	2,200:	4,400
5.....	25	: 134	: 44.30:	1,770:	5,310:	25	: 134	: 44.30:	1,770:	3,540
6.....	25	: 226	: 62.44:	2,500:	7,500:	25	: 226	: 62.44:	2,500:	5,000
7.....	25	: 159	: 68.40:	2,750:	8,250:	25	: 159	: 68.40:	2,750:	5,500
8.....	9	: 47	: 15.60:	625:	1,875:	9	: 47	: 15.60:	625:	1,250
Total.	184	: 1,509	: 561.76:	22,505:	67,515	184	: 1,509	: 561.76:	22,505	45,010

- 1029 -

Sheet	1891					1892				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft	No. of ditches:	Cap.	Decree	Acres	Acre-ft
1....	25	237	108.18	4,100	8,200	25	237	108.18	3,900	7,800
2....	25	171	94.12	3,600	7,200	25	171	94.12	3,400	6,800
3....	25	324	113.80	4,340	8,680	25	324	113.80	4,110	8,220
4....	25	211	54.92	2,090	4,180	25	211	54.92	1,980	3,960
5....	25	134	44.30	1,680	3,360	25	134	44.30	1,590	3,180
6....	25	226	62.44	2,270	4,740	25	226	62.44	2,250	4,500
7....	25	159	68.40	2,650	5,300	25	159	68.40	2,500	5,000
8....	9	47	15.60	600	1,200	9	47	15.60	580	1,160
Total.	184	1,509	561.76	21,430	42,860	184	1,509	561.76	20,290	40,580

Sheet	1893					1894				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft:	No. of ditches:	Cap.	Decree	Acres	Acre-ft:
1....	25	237	108.18	3,700	7,400	25	237	108.18	3,500	5,250
2....	25	171	94.12	3,200	6,400	25	171	94.12	3,000	4,500
3....	25	324	113.80	3,880	7,760	25	324	113.80	3,650	5,475
4....	25	211	54.92	1,870	3,740	25	211	54.92	1,760	2,640
5....	25	134	44.30	1,500	3,000	25	134	44.30	1,410	2,115
6....	25	226	62.44	2,130	4,260	25	226	62.44	2,000	3,000
7....	25	159	68.40	2,350	4,700	25	159	68.40	2,200	3,300
8....	9	47	15.60	530	1,060	9	47	15.60	500	750
Total..	184	1,509	561.76	19,160	38,320	184	1,509	561.76	18,020	27,030

Sheet	1895					1896				
	No. of ditches:	Cap.	Decree	Acres	Acre-ft	No. of ditches:	Cap.	Decree	Acres	Acre-ft
1....	25	237	108.18	3,240	9,720	25	237	108.18	3,880	3,105
2....	25	171	94.12	2,820	8,460	25	171	94.12	3,380	2,705
3....	25	324	113.80	3,420	10,260	25	324	113.80	4,100	3,280
4....	25	211	54.92	1,650	4,950	25	211	54.92	1,980	1,585
5....	25	134	44.30	1,330	3,990	25	134	44.30	1,600	1,280
6....	25	226	62.44	1,870	5,610	25	226	62.44	2,245	1,795
7....	25	159	68.40	2,050	6,150	25	159	68.40	2,460	1,970
8....	9	47	15.60	470	1,410	9	47	15.60	560	450
Total.	184	1,509	561.76	16,850	50,550	184	1,509	561.76	20,205	16,170

SUMMARY---DISTRICT NO. 27, COLORADO

Year	Sheet No. 1				Sheet No. 2				Total for district						
	No. of ditches	Cap.	Decree	Acres	Acres-ft	No. of ditches	Cap.	Decree	Acres	Acres-ft	No. of ditches	Cap.	Decree	Acres	Acres-ft
Prior to 1880.	25	115	25.00	2,000	8,000	17	41	14.15	1,285	5,140	42	156	39.15	3,285	13,140
1880.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1881.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1882.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1883.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1884.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1885.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1886.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1887.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1888.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1889.....	25	115	25.00	2,000	8,000	24	58	22.42	2,000	8,000	49	173	47.42	4,000	16,000
1890.....	25	115	25.00	2,000	6,000	24	58	22.42	2,000	6,000	49	173	47.42	4,000	12,000
1891.....	25	115	25.00	2,000	6,000	24	58	22.42	2,000	6,000	49	173	47.42	4,000	12,000
1892.....	25	115	25.00	2,000	6,000	24	58	22.42	2,000	6,000	49	173	47.42	4,000	12,000
1893.....	25	115	25.00	2,000	6,000	24	58	22.42	2,000	6,000	49	173	47.42	4,000	12,000
1894.....	25	115	25.00	2,000	5,000	24	58	22.42	2,000	5,000	49	173	47.42	4,000	10,000
1895.....	25	115	25.00	2,000	8,000	24	58	22.42	2,040	8,160	49	173	47.42	4,040	16,160
1896.....	25	115	25.00	1,345	3,210	24	58	22.42	1,325	3,550	49	173	47.42	2,670	6,740

Summary---District No. 35, Colorado

(There are no decrees in this district)

Year	Sheet No. 1			Sheet No. 2			Total for District					
	No. of ditches:	Cap. :	Acres :	No. of ditches:	Cap. :	Acres :	No. of ditches:	Cap. :	Acres :	Acres-ft		
Prior to 1880..	17	38	1,080	4,320	19	82	1,560	6,240	36	120	2,640	10,560
1880.....	17	38	1,080	4,320	19	82	1,560	6,240	36	120	2,640	10,560
1881.....	17	38	1,080	4,320	19	82	1,560	6,240	36	120	2,640	10,560
1882.....	17	38	1,080	4,320	19	82	1,560	6,240	36	120	2,640	10,560
1883.....	17	38	1,080	4,320	19	82	1,560	6,240	36	120	2,640	10,560
1884.....	18	40	1,110	4,440	19	82	1,560	6,240	37	122	2,670	10,680
1885.....	18	40	1,100	4,440	19	82	1,560	6,240	37	122	2,670	11,560
1886.....	20	44	1,330	5,320	19	82	1,560	6,240	39	126	2,890	11,560
1887.....	20	44	1,330	5,320	19	82	1,560	6,240	39	126	2,890	16,160
1888.....	21	144	2,180	8,720	20	182	1,860	7,440	41	326	4,040	18,080
1889.....	25	156	2,500	10,000	22	188	2,020	8,080	47	344	4,520	14,340
1890.....	25	156	2,500	7,500	23	190	2,280	6,840	48	346	4,780	14,340
1891.....	25	156	2,500	7,500	23	190	2,280	6,840	48	346	4,780	14,340
1892.....	25	156	2,500	7,500	23	190	2,280	6,840	48	346	4,780	14,340
1893.....	25	156	2,500	7,500	23	190	2,280	6,840	48	346	4,780	11,950
1894.....	25	156	2,500	6,250	23	190	2,280	5,700	48	346	4,780	15,020
1895.....	25	156	2,350	8,400	23	190	2,080	6,620	48	346	4,430	10,410
1896.....	25	156	2,200	5,750	23	190	1,980	4,660	48	346	4,180	

-263-

LIST OF DITCHES IN DISTRICT NO. 20, COLORADO

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
1.	Sylvia.....	Rio Grande.....	1866,1870,1874,1883..	19.00	1,000	25	1866,3; 1870,11; 1874,2.80; 1883,2.20.
2.	Atencio.....	.....do.....	1866,1873,1874,1876, 1882.....	14.54	1,000	8	1866,0.74; 1873,5.20; 1874,1.60; 1876,3.80; 1882,3.20. 1866,0.90; 1883,8.60.
3.	San Jose or Lucero...	.....do.....	1866,1883.....	9.50	500	7	1866,0.90; 1883,8.60.
4.	Montoya No. 1.....	Pinos Creek.....	1867,1879,1881.....	7.00	350	7	1867,3.80; 1879,2.40; 1881,0.80.
5.	Montoya No. 3.....	.....do.....	1870.....	.90	45	1	
6.	Montoya No. 4.....	.....do.....	1870.....	1.00	50	1	
7.	Rio Grande No. 1.....	Rio Grande.....	1871.....	12.80	1,000	18	
8.	Mexican.....	Pinos Creek.....	1871,1874,1886.....	3.70	185	4	1871,1.70; 1874,0.50; 1886,1.50.
9.	James McLeary.....	San Francisco Creek	1872.....	2.00	100	4	
10.	McDonald.....	Rio Grande.....	1872,1873.....	22.40	1,500	20	1872,12.80; 1873,9.60.
11.	College.....	San Francisco Creek	1872.....	1.50	75	2	

continued-dist. No. 20--Colo.

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
12.	Cochrane Pioneer	Rio Grande	1872	4.20	800	10	
13.	Homer	do	1873, 1874, 1876, 1880	22.53	500	12	1873, 2.20; 1874, 4.40; 1876, 8.20; 1880, 7.73.
14.	Dyer	do	1873, 1874, 1876, 1880	1.00	50	2	
15.	San Francisco Overflow	San Francisco Creek	1873, 1874, 1876, 1880	1.60	80	2	
16.	Valdez No. 2	do	1873, 1874, 1876, 1880	1.20	60	2	
17.	Pace	Rio Grande	1873, 1874, 1876, 1880	1.40	500	5	
18.	Martinez	San Francisco Creek	1873, 1874, 1876, 1880	2.40	120	4	
19.	Valdez No. 1	do	1873, 1874, 1876, 1880	3.10	165	4	
20.	Robran	Pinos Creek	1873, 1874, 1876, 1880	4.60	230	9	
21.	Jemison No. 6	do	1873, 1874, 1876, 1880	.70	35	1	
22.	Jemison No. 4	do	1873, 1874, 1876, 1880	1.00	50	1	
23.	Beran No. 6	do	1873, 1874, 1876, 1880	.66	35	1	
24.	Lavalto	San Francisco Creek	1874	1.00	50	2	
25.	Schrader No. 1	Schrader Creek	1874	1.60	80	2	
26.	Jemison & Beran No. 2	Pinos Creek	1874	2.20	110	3	
27.	Loma	Rio Grande	1874, 1881	3.00	400	8	1874, 2; 1881, 6.

continued--dist. No. 20

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
28.	Pinos Creek No. 1....	Pinos Creek.....	1874.....	13.40	670	20	
29.	Hubbard No. 2, overflow	Rio Grande.....	1874.....	1.00	50	2	
30.	Hubbard.....	.....do.....	1874.....	1.60	200	2	
31.	Centennial.....	.....do.....	1874, 1875, 1876, 1879, 1880, 1881, 1882, 1883.....	82.97	3,000	152	1874, 35.80; 1875, 4.10; 1876, 7.60; 1879, 19.37; 1880, 10.4 1881, 2.60; 1882, 1.50; 1883, 1.60.
32.	Schrader No. 2.....	Schrader Creek.....	1874.....	1.60	80	3	
33.	Fish.....	Rio Grande.....	1874, 1881.....	18.60	2,000	25	1874, 3; 1881, 15.60.
34.	Alder Creek No. 1.....	Alder Creek.....	1874.....	2.00	150	3	
35.	Kane & Collan.....	Rio Grande.....	1874, 1880, 1886...	8.20	1,000	6	1874, 1.60; 1880, 4; 1886, 2.60.
36.	Larick No. 5.....	Rock Creek.....	1874.....	2.60	130	3	
37.	Butler Irrigating.....	Rio Grande.....	1874, 1882.....	8.80	500	6	1874, 4; 1882, 4.80.
38.	Rienan No. 2.....	San Francisco Creek.....	1874.....	1.00	50	2	
39.	Rienan No. 1.....	.....do.....	1874.....	1.00	50	1	

1035

continued--

No.	Name	Stream	Date of first use	Decree	Possible acrage	Cap.	Remarks
40.	Jemison No. 9.....	Pinos Creek.....	1874.....	.70	35	1	
41.	Alder Creek No. 2....	Alder Creek.....	1874.....	2.00	150	3	
42.	Jemison No. 7.....	Pinos Creek.....	1874.....	.80	40	1	
43.	Burns, Larsen & Kiel.	San Francisco Creek	1874.....	1.00	50	1	
44.	Jemison No. 5.....	Pinos Creek.....	1874.....	.54	25	1	
45.	Jemison No. 8.....	.....do.....	1874.....	.74	35	2	
46.	Larick No. 4.....	Rock Creek.....	1874.....	2.60	130	3	
47.	Dupke No. 2.....	.....do.....	1874.....	1.30	60	2	
48.	Dupke No. 3.....	.....do.....	1874.....	1.24	60	2	
49.	Dupke No. 4.....	.....do.....	1874.....	2.08	100	2	
50.	Dupke No. 6.....	Rock Creek.....	1874.....	1.00	50	1	

continued--

NO.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
51.	Dupke No. 5.....	...do.....	1874.....	2.08	100	2	
52.	Burns.....	San Francisco Creek	1874.....	2.00	100	2	
53.	Anderson.....	Rio Grande.....	1874, 1875, 1876....	21.10	800	20	1874, 3.20; 1875, 8.30; 1876, 9.60.
54.	Grubb No. 2.....	Bear Creek.....	1874.....	1.00	60	2	
55.	Shaw No. 2.....	Spring Creek.....	1874.....	1.20	60	2	
56.	Grubb No. 1.....	Bear Creek.....	1874.....	.80	50	2	
57.	Hocker No. 1.....	Rock Creek.....	1874.....	1.82	90	2	
58.	Elliott No. 1.....	Pinos Creek.....	1875.....	1.50	75	3	
59.	Elliott No. 4.....	...do.....	1875.....	2.00	100	3	
60.	Elliott No. 3.....	...do.....	1875.....	1.00	50	2	
61.	Elliott No. 2.....	...do.....	1875.....	1.00	50	2	
62.	Elliott No. 5.....	...do.....	1875.....	1.00	50	2	
63.	Jemison No. 2.....	...do.....	1875.....	.80	40	1	
64.	Meadow Overflow.....	Rio Grande.....	1875, 1883.....	4.00	100	5	1875, 3.20; 1883, 0.80.

continued--

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
65.	Poole Jemison.....	Pinos Creek.....	1875.....	1.00	50	2	
66.	Poole Meadow.....	.....do.....	1875.....	1.00	50	2	
67.	Lease, Davis & Bingle..	Rio Grande.....	1875, 1881.....	10.34	500	6	1875, 6.03; 1881, 4.26.
68.	Ewing No. 2.....	Embargo Creek.....	1875.....	1.40	60	4	
69.	Raber.....	Rio Grande.....	1875.....	2.80	140	5	
70.	San Luis Valley Irrigating.....	.....do.....	1875, 1883.....	24.00	1,000	25	1875, 8.40; 1883, 15.60.
71.	Chadwick No. 1.....	Willow Creek.....	1875.....	2.00	100	2	
72.	Poole Fairchild.....	Pinos Creek.....	1875.....	1.80	90	2	
73.	Hocker No. 2.....	Rock Creek.....	1875.....	2.08	100	2	
74.	Smith No. 4.....	.....do.....	1875.....	.52	20	1	
75.	Jemison No. 1.....	Pinos Creek.....	1875.....	.74	35	1	
76.	Ewing No. 3.....	Embargo Creek.....	1875.....	2.00	90	3	
77.	Off.....	Rio Grande.....	1875.....	8.40	550	10	
78.	Rough and Ready.....	Rock Creek.....	1875, 1876, 1886...	34.37	1,500	21	1875, 16.67; 1876, 16.66; 1886, 1.04.
79.	McIntosh Arroyo.....	Rio Grande.....	1875, 1881, 1892...	6.40	500	6	1875, 3.80; 1881, 1.20; 1882, 1.40.

100

continued---

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
80.	McDonald & Gleason....	Rock Creek.....	1875.....	10.29	400	10	
81.	Larick No. 7.....	.....do.....	1875.....	1.00	50	1	
82.	Jarnel.....	Pinos Creek.....	1875,1892.....	8.00	400	10	1875,6; 1892,2.
83.	Larick No. 8.....	Rock Creek.....	1875.....	.68	30	1	
84.	Larick No. 6.....	.....do.....	1875.....	.76	35	1	
85.	Smith No. 3.....	.....do.....	1875.....	1.00	50	1	
86.	Cadle No. 1.....	.....do.....	1875.....	1.50	75	5	
87.	Hanna No. 1.....	Pinos Creek.....	1875.....	.70	35	1	
88.	Beran No. 2.....	.....do.....	1875.....	.70	35	1	
89.	Ewing No. 1.....	Embargo Creek.....	1875.....	.80	30	1	
90.	Hanna No. 2.....	Pinos Creek.....	1875.....	1.00	50	1	
91.	Little Anna.....	.....do.....	1875,1883,1892..	2.80	140	3	1875,1;1883,0.60;1892,1.20.
92.	Beran No. 3.....	.....do.....	1875.....	1.00	50	2	
93.	Poole-Brush.....	.....do.....	1875.....	.90	45	1	
94.	Poole-Bochle.....	.....do.....	1875.....	.70	35	1	
95.	O'Connell.....	.....do.....	1876,1886.....	1.70	85	2	1876,1; 1886, 0.70.
96.	Chadwick No. 4.....	Willow Creek.....	1876.....	1.40	70	3	

continued--

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
97.	Embargo.....	Embargo Creek.....	1876,1880,1886.....	6.70	250	12	1876,3.50;1880,1.60;1886,1.60.
98.	Elliott & Beran...	Pinos Creek.....	1876.....	1.00	50	2	
99.	Independent No. 2.	Rio Grande.....	1876,1879.....	30.40	1,200	50	1876,25.60;1879,4.80.
100.	High Water.....	...do.....	1876.....	2.00	100	2	
101.	Bishop & Lavick...	Rock Creek.....	1876.....	2.60	130	2	
102.	Beran No.5.....	Pinos Creek.....	1876.....	1.20	60	2	
103.	Fairchild No. 2...	...do.....	1876.....	.90	45	1	
104.	Barklay.....	...do.....	1876.....	1.50	75	2	
105.	Bennett No. 1.....	...do.....	1876.....	1.20	60	1	
106.	Bennett Creek.....	Bennett Creek.....	1876.....	1.00	50	1	
107.	Norris.....	Pinos Creek.....	1876.....	.90	45	1	
108.	Beran No. 4.....	...do.....	1876.....	.80	40	1	
109.	San Francisco.....	San Francisco Creek..	1876,1882.....	7.00	350	6	1876,1; 1882,6.
110.	Bennett No. 2.....	Pinos Creek.....	1876.....	1.00	50	1	
111.	Tryon.....	Rock Creek.....	1876.....	6.25	300	6	
112.	Fairchild No.1....	Pinos Creek.....	1876.....	1.00	50	1	
113.	Little Danube.....	...do.....	1876,1888,1892.....	5.60	280	10	1876,2.50; 1880,0.80;1892,2.30.

continued--

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
114.	Kiel & Larsen.....	San Francisco Creek..	1876.....	1.00	50	1	
115.	Phillips No. 1.....	Elk Creek.....	1876.....	1.20	60	2	
116.	Chadwick No. 2.....	Willow Creek.....	1876.....	1.00	50	1	
117.	Chadwick No. 3.....	...do.....	1876.....	2.00	100	2	
118.	Todd.....	Cherry Creek.....	1876.....	.90	45	1	
119.	Phillips No. 2.....	Elk Creek.....	1876.....	1.00	50	1	
120.	Town of Del Norte....	Rio Grande.....	1876.....	9.20	460	10	
121.	Ward No. 1.....	San Francisco Creek..	1877.....	1.60	80	2	
122.	Ward No. 3.....	...do.....	1877.....	1.00	50	1	
123.	Cochran Bros. No.1...	...do.....	1877.....	2.30	115	5	
124.	Cochran Bros. No. 2..	...do.....	1877.....	3.00	150	4	
125.	Ward No. 2.....	...do.....	1877.....	1.00	50	1	
126.	Bochle.....	Pinos Creek.....	1877.....	.86	45	1	
127.	Wolf Creek No. 2.....	Wolf Creek.....	1877.....	4.00	200	4	
128.	Wolf Creek No. 1.....	...do.....	1877.....	4.00	250	4	
129.	Smith No. 2.....	Rock Creek.....	1877.....	1.82	100	2	
130.	Ewing No. 4.....	Embargo Creek.....	1877.....	2.00	80	3	
131.	James Peterson.....	Rio Grande.....	1877,1892.....	4.80	200	4	1877,3.60; 1892,1.20.
132.	Smith No. 1.....	Rock Creek.....	1877.....	1.00	50	1	
133.	Jemison & Beran No. 1	Pinos Creek.....	1877.....	1.00	50	1	

continued--

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
134.	Jemison No. 3.....	do.....	1877.....	.90	45	1	
135.	Alencio No. 2.....	Rio Grande.....	1877.....	4.00	200	10	
136.	Mill.....	Rock Creek.....	1877.....	2.60	130	3	
137.	Rio Grande and Piedra Valley.....	Rio Grande.....	1877, 1880, 1881, 1883, 1884, 1886, 1887, 1888, 1889, 1890.....	76.45	5,000	90	1877, 16.60; 1880, 25.80; 1881, 4.00; 1883, 2.50; 1884, 2.40; 1886, 6.70; 1887, 2.80; 1888, 3.25; 1889, 6.70; 1890, 5.70
138.	Macleod No. 5.....	San Francisco Creek	1878.....	1.00	50	3	
139.	Shaw No. 1.....	Spring Creek.....	1878.....	4.00	200	5	
140.	Shaw No. 3.....	do.....	1878.....	1.20	60	1	
141.	Macleod No. 1.....	San Francisco Creek	1878.....	1.00	50	2	
142.	Larick No. 9.....	Rock Creek.....	1878.....	.89	40	1	
143.	Heilman & Larick....	do.....	1878.....	1.00	50	1	
144.	Compos.....	Willow Creek.....	1878.....	.80	40	1	
145.	Larick No. 2.....	Rock Creek.....	1878, 1885, 1888.....	9.33	400	10	1878, 1.00; 1885, 4.17; 1888, 4.16.
146.	Mollet.....	Pinos Creek.....	1878.....	2.00	100	2	
147.	Danes No. 1.....	Embargo Creek.....	1878.....	2.60	100	3	

continued--

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
148.	Field.....	Rock Creek.....	1878.....	1.00	50	1	
149.	Garden.....	do.....	1878.....	1.30	60	2	
150.	Larick No. 1.....	do.....	1878.....	1.04	50	1	
151.	Larick No. 3.....	Rock Creek.....	1878.....	.70	30	1	
152.	Beran No. 1.....	Pinos Creek.....	1878.....	3.20	160	4	
153.	Excelsior.....	Rio Grande.....	1879,1881,1884,1886, 1887,1888,1889,1890.	93.76	5,000	150	1879,45.70; 1881,13.70; 1882,11.60; 1886,4.50; 1887,0.66; 1888,9.10; 1889,2; 1890,6.50
154.	Pfeiffer.....	do.....	1879,1887.....	6.40	640	8	1879,3.20; 1887,3.20.
155.	West Side.....	Rio Grande.....	1879,1882.....	12.40	3,000	18	1879,2.40; 1882,10.
156.	Independent.....	do.....	1879.....	12.00	1,000	15	
157.	Ward No. 4.....	San Francisco Creek..	1879,1881.....	2.10	105	1	1879,1; 1881,1.10.
158.	Wassen.....	Willow Creek.....	1879.....	7.00	350	10	
159.	Wm. Peochy.....	Rock Creek.....	1879.....	4.17	200	5	
160.	Charlesworth No.1...	Embargo Creek.....	1879.....	1.00	40	1	
161.	Breen.....	do.....	1879.....	.90	40	1	
162.	Rio Grande	Rio Grande.....	1879,1881.....	26.40	3,000	30	1879,23.20; 1881,3.20.
163.	Star.....	do.....	1880.....	12.57	600	15	
164.	Ehrowitz.....	do.....	1880.....	1.60	80	3	
165.	Hermenthol.....	do.....	1880.....	2.80	.....	...	Included in totals of Rio Grande Canal.

153

No.	Name	Stream	Date of First Use	Decree	Possible Acreage	Cap.	Remarks
166.	Park & Green.....	do.....	1880, 1881.....	6.60	330	10	1880, 3.40; 1881, 3.20
167.	Kiel & Larsen Spring	Spring Creek.....	1880.....	1.00	50	1	
168.	D. H. Dunn.....	Rio Grande.....	1880, 1881.....	17.80			1780, 11.20; 1881, 6.40; included in totals of Rio Grande Canal.
169.	Scuch & Schmidt.....	do.....	1880 1882, 1888...	7.90			Included in totals of Rio Grande Canal; 1880, 2.50; 1882, 2.20; 1888, 3.20.
170.	Rock Creek, Anderson & Co..	Rock Creek.....	1880, 1886, 1892...	11.42	500	2	1880, 1; 1886, 4.17; 1892, 6.25.
171.	Cadle No. 3.....	do.....	1880.....	1.62	80	2	
172.	Bockman No. 1.....	Embargo Creek.....	1880.....	1.00	40	1	
173.	Cole No. 2 and extension...	Rock Creek.....	1880.....	5.20	200	3	
174.	Henderson overflow.....	Rio Grande.....	1880.....	2.20	110	3	
175.	Alder Creek No. 3.....	Alder Creek.....	1880.....	4.00	300	4	
176.	Charlesworth No. 2.....	Embargo Creek.....	1880.....	1.00	50	1	
177.	Deakman No. 1.....	Spring Creek.....	1880.....	.80	50	1	
178.	Bauer.....	Rio Grande.....	1880.....	8.40	400	15	
179.	Schacherl.....	do.....	1880, 1881.....	3.20	180	5	1880, 1.20; 1881, 2.

275

No.	Name	Stream	Date of first use	Decree	Possible Acreage	Cap.	Remarks
180.	Colo No. 1 and extension	Rock Creek.....	1880,1886,1889....	6.36	300	5	1880,.90;1886,1.56;1889,3.90
181.	Minor.....	Rio Grande.....	1880,1889.....	15.60	800	20	1880,1.60;1889,14.
182.	Nichol.....	do.....	1880.....	8.00	300	10	
183.	John Anderson.....	do.....	1881.....	3.20	200	5	
184.	Biedell.....	do.....	1881.....	20.00	...	...	Included in totals of Rio Grande Canal.
185.	Mike White.....	do.....	1881.....	13.20	...	...	Included in totals of Rio Grande Canal.
186.	Rio Grande No. 2.....	do.....	1881.....	3.20	500	5	
187.	Bachman No. 2.....	Embargo Creek.....	1881.....	3.20	130	3	
188.	Rio Grande and San Luis	Rio Grande.....	1881.....	21.60	1,000	25	
189.	Daries No. 2.....	Embargo Creek.....	1881.....	2.00	80	2	
190.	Cadee No. 1.....	Rock Creek.....	1881.....	1.50	75	3	
191.	Ladd.....	Embargo Creek.....	1881.....	.90	35	1	
192.	Bieger.....	do.....	1881,1888.....	1.80	70	2	1881,1; 1888,0.80.
193.	Bachman and Seitz.....	do.....	1881,1883.....	2.00	80	3	1881,1; 1883,1.
194.	Deekman No. 2.....	Spring Creek.....	1881.....	.90	50	1	
195.	Montoya No. 5.....	Pinos Creek.....	1881.....	1.00	50	2	
196.	Seitz.....	Embargo Creek.....	1881.....	1.00	40	3	
197.	Church.....	Rio Grande.....	1881,1889.....	1.02	175	2	1881,1;1889,0.02.
198.	Rio Grande Canal.....	do.....	1882,1885,1886,1887, 1888.....	1,050.60	60,000	1,500	1882,515.40;1885,22.80;1886, 22.80;1887,26;1888,33.60; 1889,41;1890,53.40;1891, 52;1892,293.70.
199.	John Nelson.....	do.....	1882.....	8.00	1,000	12	1882,31.16;1884,7.20.
200.	Rio Grande and Lariat..	do.....	1882,1884,1885, 1886,1887,1888, 1890.....	91.66	4,000	55	1885,11.20;1886,4.30;1887, 2.60;1888,3.50;1890,31.70.
201.	Marajo.....	do.....	1882.....	4.80	300	19	
202.	Poole-Mesa.....	Pinos Creek.....	1882.....	1.00	50	2	

27

No.	Name	Stream	Date of first use	Decree	Possible Acquire	Cap.	Remarks
203.	MacLeod No. 2.....	San Francisco Creek	1882.....	1.00	50	1	
203.	Monte Vista Canal.....	Rio Grande.....	1882,1886,1887, 1888,1889,1890	441.74	45,000	650	1882,92.20;1886,7.24; 1887,30.80;1888, 247.60;1889,14.20; 1890,49.20.
205.	Kernan.....	Pinos Creek.....	1882.....	.70	35	2	
206.	MacLeod No. 4.....	San Francisco Creek	1882.....	.70	35	1	
207.	Sprague.....	Pinos Creek.....	1882.....	.80	40	1	
208.	MacLeod No. 3.....	San Francisco Creek	1882.....	1.00	50	1	
209.	MacLeod No. 6.....	do.....	1882.....	1.00	50	1	
210.	Cole No. 6.....	Rock Creek.....	1882.....	.70	30	1	
211.	Hillsdale.....	Rio Grande.....	1882.....	1.60	80	2	
212.	Cemetery.....	San Francisco Creek	1882,1886.....	1.50	75	2	1882,0.30;1886,1.20.
213.	Dunning Mill.....	Rio Grande.....	1882.....	.60	..	..	Included in totals of Rio Grande Canal.
214.	Empire Canal.....	do.....	1883,1887,1888, 1890,1891.....	864.18	50,000	1,000	1883,374.80;1887,6; 1888,17.90;1890,463.48; 1891,29.
215.	Alamosa Town.....	do.....	1883.....	12.80	.....	12	Has not used water since 1892.
216.	Sheridan South.....	Spring Creek.....	1883,1887,1892..	8.00	450	4	1883,1;1887,2;1892,5.
217.	Corson.....	Rio Grande.....	1883, 1890....	3.80	100	2	1883,1;1890,2.60.
218.	Vors.....	do.....	1883.....	1.00	100	2	

No.	Name	Stream	Date of first use	Decree	Possible Acreage	Cap.	Remarks
219.	Sheridan North.....	Spring Creek.....	1883.....	2.00	100	2	
220.	Fuchs.....	Pinos Creek.....	1883.....	2.20	110	13	
221.	Extension of Smith.....	Rock Creek.....	1883.....	4.17	200	3	
222.	Cole No. 5.....	do.....	1883.....	.65	30	1	
223.	Cole No. 4.....	do.....	1883.....	.60	30	1	
224.	Knoblauch.....	Rio Grande.....	1884.....	1.20	60	2	
225.	San Luis Valley.....	do.....	1884, 1888, 1889, 1891, 1892.....	416.30	40,000	275	1884, 50.30; 1888, 65.90; 1889, 162.70; 1891, 6.50; 1892, 110.90.
226.	Hickory Jackson.....	Rio Grande.....	1884, 1890.....	36.00	3,000	29	1884, 19; 1890, 17.
227.	Spring Creek No. 1.....	Spring Creek.....	1884, 1888.....	12.80	700	10	1884, 6.40; 1888, 6.40.
228.	Dupke No. 1.....	Rock Creek.....	1884.....	1.04	50	1	
229.	Kiel, Larsen & Gardner.....	San Francisco Creek.....	1884.....	1.30	65	2	
230.	Barricklow.....	Pinos Creek.....	1884.....	1.00	50	2	
231.	Shotwell.....	Rock Creek.....	1884.....	2.08	100	2	
232.	Ryan.....	Cat Creek.....	1884.....	1.60	100	2	
233.	Arroyo, from Rock Creek.....	Rock Creek.....	1885.....	7.80	300	10	
234.	Clover Leaf.....	do.....	1885.....	2.08	100	3	
235.	Meadow Glen.....	Rio Grande.....	1885.....	25.00	1,500	30	
236.	Billings.....	do.....	1885.....	36.54	1,000	29	
237.	Hall.....	do.....	1885.....	1.00	50	13	
238.	Cleghorn.....	do.....	1885.....	1.00	175	1	
239.	Costella.....	do.....	1886, 1890.....	227.50	4,000	180	1886, 172.80; 1890, 54.70.
240.	Brook Farm.....	Rock Creek.....	1886.....	5.72	250	3	
241.	Rio Grande No. 4.....	Rio Grande.....	1886.....	12.00	600	20	
242.	Grubb No. 3.....	Bear Creek.....	1886.....	1.00	60	1	
243.	Meadow.....	Spring Creek.....	1886, 1887.....	4.26	250	6	1886, 3.06; 1887, 1.20.
244.	Cooley & Stannart.....	do.....	1886, 1887.....	17.00	900	10	1886, 3.20; 1887, 14.80.
245.	South Fork Highline.....	Rio Grande.....	1886.....	17.60	1,000	30	
246.	Hasselkuss.....	do.....	1886.....	2.40	500	25	

No.	Name	Stream	Date of First Use.	Decree	Possible Acreage	Cap.	Remarks
247.	Dietrich & La Cass.....	do.....	1887.....	12.80	290	3	
248.	Cochran Bros. No. 3.....	San Francisco Creek.....	1887.....	2.00	100	3	
249.	Prairie.....	Rio Grande.....	1887, 1890.....	235.00	5,500	275	1887, 192; 1890, 43.
250.	Myers.....	Embargo Creek.....	1887.....	1.30	50	2	
251.	Star Enlargement Co.'s.....	Rio Grande.....	1887.....	88.10	1,500	10	
252.	Ryan No. 2.....	Cat Creek.....	1887.....	1.60	100	3	
253.	Howlett.....	Pinos Creek.....	1887.....	1.20	60	1	
254.	Farmer's Union.....	Rio Grande.....	1888, 1889.....	544.50	60,000	325	1888, 267.20; 1889, 277.30.
255.	Spruce Lawn.....	Spring Creek.....	1888.....	16.30	850	1	
256.	Spring Ranch.....	Rio Grande.....	1888.....	9.60	480	1	
257.	Murray.....	Dry Creek.....	1888.....	6.40	320	2	
258.	Eagle.....	Rock Creek.....	1888.....	6.25	300	3	
259.	Swartz.....	do.....	1888.....	3.64	150	1	
260.	Perkins.....	Pinos Creek.....	1888.....	5.60	280	5	
261.	Bennett No. 3.....	Cherry Creek.....	1888.....	.80	40	2	
262.	Cole No. 3.....	Rock Creek.....	1888.....	.76	30	2	
263.	Newton.....	do.....	1888.....	10.00	400	8	
264.	Spring Branch.....	Spring Branch Creek.....	1888.....	.90	40	1	
265.	Kenelworth.....	Rio Grande.....	1888.....	197.05	10,000	100	
266.	Brey.....	do.....	1888.....	1.00	100	11	
Total.....				5,561.76	232,520	6,034	

DND

LIST OF DITCHES IN DISTRICT NO. 21 COLORADO

No.	Name	Stream	Date of first use	Decree	Possible acreage	cap.	Remarks
1.	El Viejo.....	Alamoso River.....	1868.....	19.20	660	9	
2.	Gomez.....	do.....	1868.....	4.62	90	4	
3.	Molino.....	do.....	1869.....	6.93	70	4	
4.	Housen La Jara Overflow No. 3.....	La Jara River.....	1870.....	21.28	1,350	11	
5.	Swamp.....	do.....	1870.....	2.49	1,000	3	
6.	Garcia No. 1.....	do.....	1870.....	4.62	260	4	
7.	McCunniff.....	do.....	1870.....	16.60	300	8	
8.	Jose Valdez.....	Alamoso River.....	1870.....	16.50	200	8	
9.	Valdez.....	do.....	1870,1887.....	86.63	1,550	7	1870,14;1887,72.63.
10.	Copulen.....	do.....	1870.....	31.37	800	15	
11.	Gabino Gallegos.....	do.....	1870.....	16.00	400	10	
12.	Volley.....	La Jara River.....	1870.....	21.02	400	6	
13.	Garcia No. 2.....	Alamoso River.....	1871.....	5.54	120	4	
14.	San Jose No. 2.....	do.....	1871.....	3.08	50	3	
15.	Cristobal Revera.....	do.....	1873.....	10.08	320	6	
16.	Jose E. Atansio.....	Hot Creek.....	1873.....	6.93	150	6	
17.	San Jose No. 1.....	Alamoso River.....	1873.....	10.39	190	8	
18.	Romero.....	La Jara River.....	1873.....	7.68	100	5	
19.	Gallegos No. 4.....	Hot Creek.....	1873.....	12.32	160	5	
20.	Gallegos No. 2.....	La Jara River.....	1873.....	11.08	160	6	
21.	Juan de Dios Vigil.....	Hot Creek.....	1873.....	11.08	90	5	
22.	Gallegos No. 1.....	do.....	1873.....	11.08	230	8	
23.	Newcomb Bros.....	La Jara River.....	1873,1877.....	13.68	600	6	1873,11.52;1877,7.16.
24.	Romaldo Valdez.....	Alamoso River.....	1873.....	4.62	70	4	
25.	Le-Mita No. 1.....	La Jara River.....	1874.....	6.93	60	5	
26.	Ramona.....	Alamoso River.....	1874.....	9.85	160	7	

280

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
27.	Head Overflow No. 5.....	do.....	1874.....	49.80	2,600	20	2,000 gross, 500 seep-age.
28.	Le-Mita No. 3.....	Hot Creek.....	1874.....	6.16	100	4	
29.	Alamosa and Spring Creek..	Alamoso River.....	1875,1877,1880, 1887.....	62.74	1,600	55	1875,5.76;1877,18.14; 1880,12.62;1887,26.22.
30.	Garden.....	Spring Creek.....	1875.....	8.10	80	4	
31.	Agua Caliente.....	Hot Creek.....	1875.....	15.40	190	8	
32.	Ortez.....	Alamoso River.....	1875.....	14.02	320	10	
33.	Eskridge Spring Creek.....	Spring Creek.....	1875.....	3.36	260	2	
34.	Sanchez No. 1.....	Hot Creek.....	1875.....	6.93	60	4	
35.	Sanchez No.2.....	do.....	1875.....	6.93	20	4	
36.	Arroyo.....	Alamoso River.....	1875.....	53.12	800	25	
37.	T. K. Walsh.....	do.....	1876.....	6.93	100	4	
38.	Union.....	do.....	1876,1882,1884, 1887.....	262.64	4,000	50	1876,14.13;1882,27.21; 1884,76.30;1887,145.00.
39.	Lovett.....	Alamoso River.....	1876.....	10.83	150	4	
40.							
41.	North Alamoso.....	do.....	1877,1887.....	49.79	600	11	1877,22.40;1887,27.39.
42.	Sanco.....	La Jara River.....	1878.....	9.60	220	6	
43.	Cottonwood.....	Alamoso River.....	1879.....	35.70	1,500	25	1879,8.46;1880,5.65; 1887,21.59.
44.	Walsh.....	do.....	1880.....	12.45	85	4	
45.	Gallegos No. 3.....	do.....	1880.....	14.94	550	8	
46.	Fenasco.....	La Jara River.....	1880.....	3.36	30	2	
47.	La Piedra.....	do.....	1880.....	4.98	1180	4	
48.	Puio Real.....	do.....	1880.....	7.20	100	5	
49.	Thielkeld.....	Alamoso River.....	1880.....	7.68	160	4	
50.	Alamoso No. 1.....	do.....	1880,1887.....	19.81	1,000	8	1880,14.52;1887,5.29.
	Eskridge and Garrett.....	La Jara River.....	1880.....	7.84	500	6	

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
51.	Le Mita No. 2	do.	1880	27.20	200	5	
52.	Hardtack	do.	1881	18.45	640	10	
53.	Lowland	do.	1881	14.94	1,000	8	
54.	Clark	Alamoso River	1881	26.75	300	4	
55.	Alanros	La Jara River	1881	8.93	160	4	
56.	Overflow No. 4	Alamoso River	1881	16.00	800	15	
57.	Nate Gernett	La Jara River	1882, 1887	13.45	320	8	1882, 7.80; 1887, 5.65.
58.	Lower La Jara	do.	1883, 1884, 1887	44.32	3,000	15	1883, 18.67; 1884, 6.23; 1887, 19.92.
59.	Worcester	Alamoso River	1883	11.83	900	8	
60.	Overflow No. 2	do.	1884	16.00	1,800	20	
61.	Norland	do.	1885	48.56	1,200	22	
62.	Flintham	do.	1885	24.90	500	12	
63.	Miller	do.	1885, 1887	66.40	3,200	35	1885, 34.86; 1887, 31.54.
64.	Overflow No. 1	do.	1886	112.00	4,500	40	
65.	Ed Newcomb	do.	1886	13.28	1,000	6	
66.	Morganville	do.	1886	20.75	1,540	15	
67.	Plano Vista	do.	1887	29.81	1,800	14	
68.	Davis-Chapman	do.	1887	51.87	2,000	20	
69.	Scandinavian	do.	1887	43.58	4,280	30	
70.	Alamoso Creek Canal	do.	1888	166.05	7,920	25	
71.	Baker	do.	1888	12.45	800	6	
72.	Coddington	La Jara River	1888	29.88	1,000	10	
73.	Ribera	Alamoso River	1888	28.80	975	15	
74.	Modril	do.	1888	12.45	580	6	
75.	Hilarie	do.	1888	3.61	385	2	
	total			1,877.67	65,545	799	

LIST OF DITCHES IN DISTRICT NO. 22, COLORADO.

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
1	Guadalupe Main.....	Conejos River.....	1855.....	69.82	1,920	32	
2	Head's Mill and Irrigation...	do.....	1855.....	7.14	200	10	(Has decree of 170 sec. ft. for mill.)
3	El Coda.....	San Antonio River.....	1856.....	25.18	1,000	15	
4	Llano.....	Los Pinos Creek.....	1856.....	31.84	1,500	18	
5	Garcia.....	Conejos River.....	1856,1857.....	12.32	320	6	1856,6.23;1857,6.09.
6	Serrietta.....	do.....	1856,1887,1888...	39.27	1,760	15	1856,31.27;1887,4;1888,4
7	Seledonia Voldez Mill and Irrigation.....	do.....	1856.....	31.77	280	6	
8	Los Pinos.....	Los Pinos Creek.....	1856.....	22.94	700	9	
9	Solozar.....	Conejos River.....	1856.....	12.32	200	3	
10	Mill.....	do.....	1856.....	12.67	200	6	
11	San Jose.....	do.....	1856.....	40.28	1,160	18	
12	Sincero.....	San Antonio River.....	1856.....	18.31	1,360	18	
13	Del Fuerticito.....	Conejos River.....	1856.....	8.76	240	3	
14	San Rafael and Conejos.....	do.....	1856,1862,1883...	21.62	1,400	12	1856,8.81;1862,8.81;1883,4.
15	El Senito.....	do.....	1856.....	6.19	280	3	
16	Gabriel Martinez.....	do.....	1857.....	.71	180	3	
17	Santiago.....	do.....	1857.....	55.59	640	12	
18	Archuleta and Trujillo No. 1..	do.....	1857.....	8.81	120	3	
19	Archuleta and Trujillo No. 2.	Natural Springs.....	1857.....	14.94	100	6	
20	Overflow.....	Conejos River.....	1857.....	11.79	160	9	
21	Trujillo.....	do.....	1857.....	53.48	460	9	1857,29.80;1863,23.68
22	Canon Irrigating.....	do.....	1857.....	42.89	1,500	8	
23	La Del Rio.....	do.....	1857.....	31.44	1,000	9	
24	Rincones.....	San Antonio and Conejos.....	1857.....	22.25	690	12	
25	Fuerticito.....	Conejos River.....	1858.....	31.47	520	9	

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
26	Mercitos.....	do.....	1859.....	38.99	1,500	16	
27	San Juan and San Rafael.	do.....	1861,1889.....	51.76	1,840	20	1861,47.76;1889,4.00.
28	Espinosa.....	Natural Springs.....	1862.....	19.54	100	3	
29	Chacon No. 1.....	Conejos River.....	1863.....	18.31	160	3	
30	Las Sauces.....	do.....	1867.....	88.43	3,500	15	
31	Lavato Irrigating.....	San Antonio River.....	1867.....	27.58	480	7	
32	Jose Bonifacio Romero...	Conejos River.....	1870,1889.....	81.97	4,000	20	1870,56.97;1889,25.00.
33	Bernardo Romero.....	do.....	1870.....	9.26	500	3	
34	Galbis.....	Los Pinos Creek.....	1870.....	10.97	200	6	
35	Sanchez.....	Conejos River.....	1871.....	27.26	800	10	
36	J. F. Chacon No. 3.....	do.....	1872.....	18.31	80	6	
37	Sabine School Section...	do.....	1873.....	11.95	320	6	
38	Jose Decedario Martinez..	Natural Springs.....	1874.....	9.26	110	3	
39	Vega Grande.....	Conejos River.....	1875,1878.....	11.54	320	6	1875,5.77;1878,5.77.
40	Au Cour Irrigating.....	do.....	1876,1885,1888.....	29.84	1,600	20	1876,10.80;1885,8.00;1888,11.04
41	Wm. Stewart & Co. Ir....	Conejos River and Springs	1876.....	11.40	300	11	1876,10.80;1885,8.00;1888,
42	J. F. Chacon No. 2.....	Conejos River.....	1877,1879,1884, 1889.....	16.08	960	9	1877,7.54;1879,4.54;1884,2.00; 1889,2.00.
43	Loroto.....	Natural Springs.....	1878.....	7.54	200	3	
44	McCarroll.....	Conejos River.....	1878.....	13.72	160	6	
45	Mauassa.....	do.....	1879.....	73.60	1,600	21	
46	Wm. Sabine No. 1.....	do.....	1880.....	7.71	160	5	
47	Martinez.....	do.....	1880.....	15.84	880	18	
48	J. M. Espinosa.....	Natural Springs.....	1880.....	26.00	120	3	
49	Cordova.....	Conejos River.....	1880.....	6.54	220	6	
50	Chavez.....	San Antonio River.....	1880.....	12.72	640	3	
51	Jack's Irrigating.....	Conejos River.....	1881.....	8.12	120	6	
52	Ephraim.....	do.....	1881.....	47.00	2,700	47	
53	Martinez (on San Antonio	San Antonio River.....	1881,1888.....	39.88	640	6	1881,13.68;1888,26.
54	Los Ojos No. 2.....	Conejos River.....	1881.....	5.95	4,200	6	2,000 acres by seepage.
55	Richfield Canal.....	do.....	1882,1886.....	168.74	5,000	56	1882,56.24;1886,112.50.

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
56	Loma Padre.....	do.....	1882.....	10.31	700	5	
57	Bancroft.....	do.....	1882.....	7.54	180	4	
58	Wm. Sabine No. 2.....	do.....	1882.....	7.71	100	5	
59	Los Ojos No. 1.....	do.....	1882.....	44.16	880	15	
60	El Mudge.....	do.....	1883.....	7.52	200	7	
61	Angostura.....	do.....	1883.....	42.72	160	3	
62	Northeastern.....	do.....	1883,1886,1888.....	122.80	20,000	35	1883,34.71;1886,41.25;1888,46.84.
63	La Vega de la Serrietta..	do.....	1883.....	6.75	160	3	
64	Cruz Charez.....	do.....	1883.....	1.00	160	3	
65	La Manga.....	San Antonio River.....	1883,1884,1886.....	10.00	640	2	1883,4;1884,4;1886,2.
66	Broyle's Overflow No. 1..	do.....	1883.....	1.50	40	2	
67	Broyle's Overflow No. 2..	do.....	1883.....	2.50	60	3	
68	Broyle's Overflow No. 3..	do.....	1883.....	1.50	60	2	
69	Jaramillo Overflow No. 1.	do.....	1883.....	2.00	80	2	
70	Jaramillo Overflow No. 2.	do.....	1883.....	2.00	80	2	
71	La Vega.....	Conejos River.....	1883,1886.....	11.40	180	6	1883,8.40;1886,3.
72	McCarroll.....	Mill Creek.....	1883.....	7.00	325	3	
73	Le Duc.....	Conejos River.....	1883,1889,1890.....	6.00	260	3	1883,3;1889,2;1890,1.
74	Home.....	do.....	1883.....	4.50	160	4	
75	Ball Bros.' Overflow No. 1	do.....	1883.....	22.00	3,000	4	1,000 acres by seepage.
76	Ball Bros.' Overflow No. 2	do.....	1883.....	20.00	3,000	4	1,000 acres by seepage.
77	Hughes's Overflow No. 1..	San Antonio River.....	1883.....	12.00	480	7	None.
78	Hughes's Overflow No. 2..	do.....	1883.....	6.00	240	5	None.
79	Manassa No. 2.....	Conejos River.....	1883.....	23.25	1,000	10	
80	Floyd Overflow No. 1.....	San Antonio River.....	1883.....	1.50	260	2	
81	Floyd Overflow No. 2.....	do.....	1883.....	2.25	160	2	
82	Floyd Overflow No. 3.....	do.....	1883.....	5.00	160	5	
83	East Bend.....	Conejos River.....	1883,1885,1886,1887, 1888,1889,1890...	45.40	1,000	10	1883,15;1885,4;1886,3.75; 1887,7.65;1888,8;1889, 4;1890,3.
84	Smith Bros.....	do.....	1883.....	8.00	640	6	
85	Gallegos & Lopez.....	San Antonio River.....	1883,1888.....	4.00	400	2	1883,1.50;1888,2.50.
86	Gallegos Northside.....	do.....	1883.....	3.50	160	3	
87	Punche.....	do.....	1883.....	15.00	320	3	

No.	Name	Stream	Date of first Use	Decree	Possible acreage	Cap.	Remarks
88	Cottonwood.....	Conejos River.....	1884.....	28.50	1,200	21	
89	A. D. Archuleta.....	do.....	1884.....	8.00	160	8	
90	Manassa Westfield.....	do.....	1885.....	54.00	6,000	60	1885,30;1887,24.
91	Bagwell.....	do.....	1885.....	7.00	180	4	
92	Fox Creek No. 2.....	Fox Creek.....	1885.....	1.50	95	1	
93	Sanford.....	Conejos River.....	1886.....	107.50	6,000	20	
94	Fox Creek No. 1.....	Fox Creek.....	1886.....	2.50	80	2	
95	Alamo.....	Conejos River.....	1886,1889.....	52.00	1,200	6	1886,36;1889,16.
96	Antonio.....	do.....	1887.....	250.00	650	20	
97	Lobato & Cordova.....	San Antonio River.....	1887.....	8.00	320	10	
98	Magote.....	Conejos River.....	1887.....	342.40	12,000	50	
99	Florida.....	San Antonio River.....	1888.....	20.80	2,400	6	
100	Branch.....	Conejos River.....	1888.....	12.00	480	5	None
101	Taos Valley No. 1.....	do.....	1888.....	(500.00)			Omit from totals.
101	Paine No. 1.....	Conejos River and Springs.....	1888.....	1.50	40	2	
102	Paine No. 2.....	do.....	1888.....	4.00	160	4	
103	Berkshire Farm.....	Conejos River.....	1888.....	12.00	1,000	9	None
104	Corpe & Reekert's Canyon.....	do.....	1888.....	16.00	180	9	
105	Storer.....	do.....	1888.....	2.50	120	2	
106	Nogales Valley.....	do.....	1888.....	12.00	640	2	
	Taos Valley No. 2.....	San Antonio River.....	1889.....	(500.00)			Omit from totals.
107	Brazos del Norte.....	Conejos River.....	1889.....	20.00	800	10	
	Taos Valley No. 3.....	San Antonio River.....	1889.....	(500.00)			Do.
Total.....				2,978.42	120,350	1,034	

933

LIST OF DITCHES IN DISTRICT NO. 24, COLORADO

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
1.	San Luis People's.....	Culebra Creek.....	1852	23.00	400	22	
2.	San Pedro.....	....do.....	1852	19.50	480	5	
3.	Acequia Madre.....	Costilla Creek....	1853	22.50	1,000	26	
4.	Montez.....	Rito Seco.....	1853	1.00	20	5	
5.	Vallejos.....	Vallejos Creek....	1854	17.00	320	20	
6.	Manzanares.....	Costilla Creek....	1854	23.00	1,000	28	
7.	Acequiacita.....	....do.....	1855	1.00	50	1	
8.	San Acocio.....	Culebra Creek....	1856	46.00	800	60	
9.	Madriles.....	Costilla Creek....	1856	12.00	500	14	
10.	Cholifa.....	....do.....	1857	10.00	400	12	
11.	Cerro.....	Culebra Creek....	1857	40.00	420	60	
12.	Francisco Sanchez.....	....do.....	1858	12.50	180	13	
13.	Mestas.....	Vallejos Creek....	1858	4.50	60	7	
14.	San Francisco.....	San Francisco Creek	1860	16.00	400	20	
15.	Trujillo.....	Costilla Creek....	1861	1.00	40	1	
16.	Little Rock.....	San Francisco Creek	1873	1.00	40	1	
17.	Garcia.....	Costilla Creek....	1873	1.00	40	1	
18.	Torcido.....	.....	1874	1.00	35	1	
19.	Abudo Martin.....	Torcido Creek....	1874	3.50	70	4	None.
20.	Guadalupe Vigil.....	Vallejos Creek....	1880	4.00	80	6	
21.	J. M. J. Maez.....	Ventero Creek....	1881	1.50	20	4	
22.	Antonio Pando.....	Culebra Creek....	1881	1.25	15	4	
23.	Guadalupe Sanchez.....	....do.....	1883	3.25	120	6	
24.	Main Eastdale.....	Costilla Creek....	1889	.....	900	25	
25.	South Eastdale.....	....do.....	1889	.....	200	10	
Total.....				265.50	7,590	356	

227

LIST OF DITCHES IN DISTRICT NO. 25, COLORADO.

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
1.	Wells Middle.....	Kerber Creek.....	1866.....	.60	30	12	
2.	Wells North.....	do.....	1866.....	.40	20	18	
3.	Wells-Kerber.....	do.....	1866,1878,1882, 1884.....	9.00	450	244	1866,2.20;1878,2;1882,4;1884, 0.80.
4.	Dittrich-Steele.....	San Luis Creek.....	1867.....	1.40	70	4.5	
5.	Dittrich No. 1.....	do.....	1867.....	.20	10	4.5	
6.	Dittrich No. 2.....	do.....	1867.....	.20	10	1	
7.	Dittrich No. 3.....	do.....	1867.....	1.00	50	2.7	
8.	Dittrich No. 4.....	do.....	1867.....	.40	40	9	
9.	Steele No. 2.....	do.....	1867,1873.....	3.80	190	11.8	1867,1.60;1873,2.20.
10.	Hoffman.....	Cotton Creek.....	1868,1870,1875...	3.40	370	6.2	1868,2.40;1870,0.60;1875,0.40.
11.	Weidhardt.....	do.....	1868,1870,1872, 1875,1875.....	10.40	550	13.7	1868,4.40;1870,1;1872,2.20; 1873,2.60;1875,0.20.
12.	Baca No. 3.....	North Crestone Creek.....	1869.....	4.00	200	12	
13.	Baca No. 4.....	South Crestone Creek.....	1869.....	7.00	350	22	
14.	Major Creek.....	Major Creek.....	1870.....	3.90	240	3.9	
15.	Garner No. 1.....	Garner Creek.....	1870.....	6.40	320	8.7	
16.	Cotton Creek.....	Cotton Creek.....	1870,1872,1873,1874, 1875.....	17.40	670	60	1870,3.60; 1872,2;1873,1.80; 1874,3.60;1875,6.40.
17.	Baca No. 9.....	Crestone Creek.....	1870,1888.....	39.00	1,950	56	1870,20;1888,19.
18.	Baca No. 11.....	do.....	1870.....	9.00	450	10.2	
19.	Baca No. 12.....	do.....	1870,1876,1878, 1882,1883,1884.	44.20	2,210	23.7	1870,17.00;1876,11.00;1878, 3.20;1882,3.20;1883,3.20; 1884,6.40.
20.	Baca No. 13.....	do.....	1870.....	5.40	270	18	
21.	Wales & Shellbarger No. 1.....	Rito Alto.....	1870,1872.....	6.60	280	65	1870,4.40;1872,2.20.
22.	Squires No. 1.....	San Luis Creek.....	1870.....	4.00	200	36.8	
23.	Baca No. 5.....	North Crestone Creek.....	1870,1883.....	5.80	270	26.9	1870,3.20;1883,2.60

233

No. 25, Colorado, continued

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
34.	Baca No. 6	do	1870	4.00	200	6.7	
35.	Baca No. 7	do	1870	4.00	200	11.2	
36.	Baca No. 14	South Branch Isabel Creek	1870	3.92	195	3.9	
37.	Baca No. 15	Willow Creek	1870	29.00	1,450	38.6	
38.	Baca No. 16	do	1870	26.00	1,300	27.7	
39.	Baca No. 17	do	1870	11.60	580	11.6	
30.	Baca No. 18	do	1870	2.40	120	7.2	
31.	Baca No. 19	Spanish Creek	1870	39.80	1,990	48.1	
32.	Baca No. 20	do	1870	5.40	270	25.4	
33.	Baca No. 21	Cottonwood Creek	1870	4.00	200	7.8	
34.	Baca No. 22	do	1870	70.00	3,600	70	
35.	Baca No. 23	do	1870	20.40	1,020	30.6	
36.	Baca No. 24	Deadman Creek	1870, 1889	39.00	1,950	40.3	1870, 10.00; 1889, 29.00
37.	Baca No. 25	do	1870	24.00	510	45	
38.	Baca No. 26	do	1870, 1889	20.80	1,040	20.1	1870, 6.00; 1889, 14.80
39.	Baca No. 27	do	1870	2.76	140	2.8	
40.	Baca No. 28	do	1870	1.00	150	1	
41.	Clayton "F"	Kerber Creek	1870	.80	90	5	
42.	San Isabel	San Isabel Creek	1870, 1872, 1874, 1876, 1886	14.90	745	26	1870, 2.80; 1872, 2.30; 1874, 5.10; 1876, 1.50; 1886, 3.20.
43.	North	do	1870, 1874, 1876, 1887	8.90	465	13	1870, 1.20; 1874, 3.60; 1876, 1.50; 1887, 2.60.
44.	Baca No. 8	South Crestone Arroyo	1870	3.80	190	3.8	
45.	Wales and Travis	Rito Alto	1870, 1874, 1883, 1887	18.86	945	29	1870, 3.60; 1874, 3.30; 1883, 7.50; 1887, 4.46.
46.	Wales No. 1	do	1870	1.00	50	20	
47.	Wales No. 2	do	1870, 1873	1.80	90	52.5	1870, 0.80; 1873, 1.00.
48.	Baca No. 10	Crestone Creek	1870, 1888	39.40	1,970	51.5	1870, 22.40; 1888, 17.00
49.	Wales & S. Hellebarger No. 2	Rito Alto	1870, 1872, 1879, 1884, 1887	36.00	1,800	69	1870, 4.40; 1872, 6.40; 1879, 6.40; 1884, 12.00; 1887, 6.80.
50.	Schultz-Dittrich	San Luis	1870, 1873, 1880	11.20	575	42.4	1870, 2.80; 1873, 5.40; 1880, 3.00

No. 25, Colorado-continued

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
51.	San Luis Co.....	do.....	1871,1874.....	12.75	670	40.8	1871,7.29;1874,5.46.
52.	Steele Creek.....	Steele Creek.....	1871.....	4.20	210	20.5	
53.	Hot Springs Creek.....	Hot Springs Creek.....	1871.....	3.96	195	4	
54.	Clayton E.....	Cottonwood Creek.....	1872.....	4.00	215	4.9	
55.	Clayton D.....	Kerber Creek.....	1872.....	4.40	265	6	
56.	Petersons No. 1.....	Wild Cherry Creek.....	1872,1874,1875, 1884.....	14.90	745	52	1872,3.00;1874,6.50; 1875,0.70;1884,4.70
57.	Wales No. 3.....	Rito Alto.....	1872,1887.....	5.50	275	17	1872,4.00;1887,1.50.
58.	Schilling.....	Spring Brook, San Luis Creek..	1872.....	2.80	140	10	
59.	Shellabarger Home No. 1.....	Rito Alto.....	1873.....	2.40	120	11	
60.	Shellabarger Home No. 2.....	do.....	1873.....	3.00	160	27.7	
61.	Tobler.....	San Luis Creek.....	1873.....	.40	20	4	
62.	H. H. Wales.....	Rito Alto.....	1873,1884.....	2.40	120	6.9	1873,0.80;1884,1.60.
63.	Greer No. 1.....	San Luis Creek.....	1873.....	2.80	140	8	
64.	Daniels & Fish No. 4.....	Kerber Creek.....	1873,1876.....	4.80	240	35.3	1873,2.00;1876,2.80.
65.	Gordon.....	Cotton Creek.....	1873.....	1.40	70	4.7	
66.	Kennedy No. 1.....	San Luis Creek.....	1873.....	2.00	100	6	
67.	Kennedy No. 2.....	do.....	1873.....	9.80	490	14.7	
68.	Shellabarger & Eaton.....	Rito Alto.....	1873,1888.....	3.30	165	53.3	1873,0.50;1888,2.80.
69.	Steele No. 1.....	San Luis Creek.....	1873.....	1.00	50	14.1	
70.	Greer No. 2.....	do.....	1873.....	3.20	160	6.4	
71.	Tabler-Rominger.....	do.....	1873.....	10.00	500	23.8	No return for 1885.
72.	San Luis.....	do.....	1873.....	4.00	200	10.8	
73.	Clayton Old Channel.....	Kerber Creek.....	1874.....	2.40	120	27	
74.	Wales San Luis No. 1.....	San Luis Creek.....	1874,1876,1880....	8.40	420	14.4	1874,3.20;1876,3.20; 1880,2.00.
75.	Wales San Luis No. 2.....	do.....	1874,1876.....	3.20	160	11	1874,1.60;1876,1.60.

0620

No. 25, Colorado-continued

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
76.	Wales No. 4.....	Rito Alto.....	1874.....	1.60	80	4.8	
77.	Hills No. 1.....	Kerber Creek.....	1874.....	.72	50	8.3	
78.	Sanchez.....	Cotton Creek.....	1874.....	.50	25	2.7	
79.	Sanford.....	Rito Alto.....	1874,1886.....	4.20	210	26	1874,2.40;1886,1.80.
80.	Greer No. 2.....	San Luis Creek.....	1874.....	3.20	160	8	
81.	Hills No. 2.....	Kerber Creek.....	1874.....	.30	15	2.7	
82.	Hills No. 4.....	do.....	1874.....	.08	5	2.7	
83.	Hills No. 3.....	do.....	1874.....	.16	15	2	
84.	Clayton A.....	Kelley Creek.....	1874.....	2.40	120	2.9	
85.	Clayton B.....	do.....	1874.....	4.00	200	4.7	
86.	Garner No. 2.....	San Luis Creek.....	1875.....	2.00	100	6.2	
87.	Hall No. 1.....	Kerber Creek.....	1875,1881,1882.....	9.70	485	26.6	1875,5.30;1881,2.00; 1882,2.40.
1891	88. Hoffman No. 2.....	Major Creek.....	1875.....	.90	45	1.5	
89.	Speigal.....	San Luis Creek.....	1875.....	2.25	130	2.3	
90.	Hice No. 1.....	Clover Creek.....	1875.....	1.50	75	6	
91.	Hice No. 2.....	do.....	1875.....	1.20	60	2	
92.	Hice No. 3.....	do.....	1875.....	2.00	100	20	
93.	Hice No. 4.....	do.....	1875.....	.20	10	1.9	
94.	Hice No. 5.....	do.....	1875.....	.80	40	1.5	
95.	Hice No. 6.....	San Luis Creek.....	1875.....	.70	35	2	
96.	Hice No. 7.....	Gooseberry Creek.....	1875.....	.30	15	5.4	
97.	Hice No. 8.....	San Luis Creek.....	1875.....	.70	35	3	
98.	Arthur Young.....	do.....	1876.....	16.00	815	38.1	
99.	Daniels & Fish Arroyo....	Kerber Creek.....	1876,1884.....	6.00	300	10.5	1876,3.20;1884,2.80.
100.	Allen No. 1.....	Crestone Creek.....	1876,1878.....	3.20	160	10.8	1876,1.60;1878,1.60.
101.	B. Clark.....	Alder Creek.....	1876.....	1.40	75	4.8	
102.	Howard & Hall.....	San Luis Creek.....	1876.....	1.30	65	3	
103.	Hehkauser No. 2.....	North Crestone Creek....	1878.....	.30	15	1.1	
104.	Ford No. 1.....	San Luis Creek.....	1878.....	1.60	80	4	
105.	Hills No. 5.....	Kerber Creek.....	1879,1884.....	3.28	165	13	1879,2.26;1884,1.00
106.	Shewalter No. 1.....	San Luis Creek.....	1879.....	.70	35	12	
107.	Shewalter No. 2.....	San Luis Creek.....	1879.....	.80	40	3	

No. 25, Colorado-continued

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
108.	Ross.....	do.....	1879.....	4.70	235	18.3	
109.	Briley.....	Kerber Creek.....	1880.....	1.20	60	1.7	
110.	Gash.....	North Crestone Creek.....	1880.....	.60	30	2.4	
111.	Hopkins.....	do.....	1880.....	.12	5	5.3	
112.	Silver Creek.....	Silver Creek.....	1880.....	2.00	100	29	
113.	Neeland.....	Neeland Creek.....	1880.....	2.40	120	6	
114.	Shellabarger No. 2.....	Rito Alto.....	1880.....	4.80	240	18.3	
115.	Means No. 1.....	Alder Creek.....	1880.....	.70	45	7	
116.	Stump No. 1.....	Clover Creek.....	1880.....	.50	25	3.4	
117.	Stump No. 2.....	do.....	1880.....	.12	5	3.5	
118.	Stump No. 3.....	do.....	1880.....	.20	15	1	
119.	Squires No. 2.....	San Luis Hot Springs.....	1880.....	.80	40	2.2	
120.	Allen.....	Crestone Creek.....	1880.....	1.60	80	4.6	
121.	Means No. 2.....	San Luis Creek.....	1880.....	.30	15	2	
122.	McFarland A and B.....	Eagle Brook and Butterfly Creek.....	1881.....	6.80	340	8	
123.	Barsch No. 1.....	Brook Creek.....	1881.....	1.60	80	13.1	
124.	Robinson.....	Spring Creek.....	1881.....	1.80	90	2.4	
125.	Robinson & Reese.....	do.....	1881.....	2.20	100	2.3	
126.	Robinson & Reese, jr.....	Raspberry Creek.....	1881.....	1.00	50	4	
127.	Davison No. 3.....	Spring Creek.....	1881.....	.16	10	6	
128.	Henry White.....	Kerber Creek.....	1881.....	11.00	35	11	
129.	Clark A.....	Rock Creek.....	1881, 1885.....	7.20	360	8	1881, 4; 1885, 3.20.
130.	Turner.....	Kerber Creek.....	1881.....	1.20	60	6.5	
131.	Richard No. 1.....	West Spring Creek.....	1881.....	1.20	60	7.7	
132.	Hidenour.....	Spring near Garner Creek.....	1881.....	.60	30	2.1	
133.	Davison No. 2.....	Spring Creek.....	1881.....	.60	30	5	
134.	Barbary Tabler.....	Cedar Creek.....	1882.....	.80	40	2.3	
135.	Kennedy No. 3.....	San Luis Creek.....	1882.....	1.00	50	9	
136.	Geo. C. Travis.....	Cedar Creek.....	1882.....	.08	5	22.6	
137.	Richard No. 2.....	East Spring Creek.....	1882.....	.24	10	6.9	
138.	Clayton G.....	Kerber Creek.....	1883.....	2.00	100	4.6	
139.	De Camp.....	San Luis Creek.....	1883.....	.60	30	8	

No.	Name	Stream	Date of first use.	Decree	Possible acreage	Cap.	Remarks
140.	Kaufman.....	Kelley Creek.....	1883.....	2.00	100	3.5	
141.	White.....	Little Kerber Creek.....	1883.....	.40	20	1	
142.	Davison No. 1.....	Spring Creek.....	1884.....	.80	40	2	
143.	Charles.....	North Crestone Creek.....	1884.....	.40	30	2.4	
144.	Malcolm.....	Alder Creek.....	1884.....	.70	35	4	
145.	Barsch No. 2.....	Brook Creek.....	1884.....	1.60	80	12	
146.	Barsch No. 3.....	do.....	1884.....	1.60	80	12	
147.	Nash.....	San Isabel Creek.....	1884, 1888.....	5.00	250	13	1884, 1.50; 1888, 3.50.
148.	H.C.Ridenour No. 1.....	Spring near Major Creek.....	1884.....	1.30	65	2.2	
149.	John De Camp B.....	San Luis Creek.....	1884.....	.60	35	1	
150.	Ewing.....	San Isabel Creek.....	1884.....	1.90	95	10	
151.	Clark "B".....	Yankee Creek.....	1884.....	3.20	160	4	
152.	Clayton "C".....	Kelley Creek.....	1884.....	3.60	180	6	
153.	Stump No. 4.....	Clover Creek.....	1885.....	.20	10	3	
154.	Sapp & Brasley.....	San Luis Creek.....	1885, 1886.....	3.60	180	3.2	1885, 2.80; 1886, 0.80.
155.	Stump.....	Clover Creek.....	1885.....	.20	10	1.7	
156.	Prairie Dog.....	Spring Creek.....	1885.....	.60	30	3.5	
157.	Norris.....	Kerber Creek.....	1886, 1888.....	2.70	135	8	1886, 0.70; 1888, 2.00.
158.	Reese Irrigating.....	Spring Creek.....	1886.....	2.40	120	6	
159.	Brasley.....	San Luis Creek.....	1886.....	1.40	70	4	
160.	Jordan No. 2.....	Kerber Creek.....	1887.....	.80	40	12	
161.	Jordan No. 1.....	Kelley Creek.....	1887.....	2.80	140	15	
162.	Alder Creek.....	Alder Creek.....	1887.....	1.50	75	10	
163.	H.C.Ridenour No. 2.....	Major Creek.....	1888.....	1.30	65	2.2	
164.	Frazee.....	San Isabel Creek.....	1888.....	4.00	200	7	
165.	Doray No. 1.....	Carpenter Creek.....	1888.....	.40	20	3	
166.	Doray No. 2.....	do.....	1888.....	.40	20	2.4	
167.	Doray No. 3.....	do.....	1888.....	.44	20	2.7	
168.	Swidensky.....	Gooseberry Creek.....	1888.....	560	30	2.7	
169.	Cody.....	Kerber Creek.....	1888.....	.30	15	1.5	

232

No. 25, Colorado-continued

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
170.	Hall No. 2.....	San Luis Creek.....	1889.....	1.60	80	4.8	
171.	Carver.....	Major Creek.....	1889.....	1.50	75	2.2	No return for 1895.
	Ditches without decrees (number unknown)				1800	45	
	Total.....			919.18	46,705	2,501.3	

LIST OF DITCHES IN DISTRICT NO. 28-COLORADO

No.	Name	Stream	Date of first use	Decree	Possible acreage (a)	Cap.	Remarks
1.	Malone-Sullivan No. 1	Saguache Creek	1866	5.20		20	
2.	Heimberger No. 1	do	1866	.30		1	
3.	Heimberger No. 2	do	1866	.80		6	
4.	Cato	do	1866	.42		8	
5.	Hazard No. 1	do	1866	.10		4	
6.	Hazard No. 2	do	1866	.10		2	
7.	Malone	do	1866	2.40		12	
8.	Lawrence Arroyo	do	1867	9.20		15	
9.	Malone-Sullivan No. 2	do	1867	1.56		12	
10.	Luengen-Sullivan	do	1867	3.70		6	
11.	Gotthelf No. 1	do	1867	8.80		12	
12.	Russell No. 4	do	1867	5.60		7	
13.	Ashley & Proffit	do	1868	8.20		11	
14.	Proffit Company	do	1868, 1870, 1872	6.00		8	1868, 1.20; 1870, 2.40; 1872, 2.40.
15.	Fullerton No. 1	do	1868	6.00		7	
16.	Stubbs & Gallego	do	1869	7.00		10	
17.	Charez Lateral	do	1869	4.40		4	
18.	Russell Company	do	1869	6.20		6	
19.	Spencer	do	1870	6.20		30	
20.	Ford	do	1870, 1871, 1872	12.40		36	1870, 3.40; 1871, 5; 1872, 4.
21.	Mears No. 5	do	1870	1.00		4	
22.	Mears No. 4	do	1870	2.00		3	
23.	Ward Highline	do	1871	3.70		3	
24.	Mountfield	do	1871	2.90		4	
25.	Braun Bros. No. 1	do	1871	4.00		8	
26.	Braun Bros. No. 2	do	1871	2.00		4	
27.	Gotthelf No. 3	do	1871	3.20		4	
28.	Gotthelf No. 4	do	1871	.30		1	
29.	Manchego	do	1871	2.20		3	
30.	Hodding No. 3	Hodding Creek	1871	.20		1	

No.	Name	Stream	Date of first use	Decree	Possible acreage (a)	Cap.	Remarks
31.	Hodding No. 4.....	Saguache Creek.....	1871.....	1.20		6	
32.	Wall.....	do.....	1872.....	11.90		12	
33.	Proffit-McDonough.....	do.....	1872.....	2.20		6	
34.	Jeep & Scandrett.....	do.....	1872.....	4.00		6	
35.	Taylor & Ashley.....	do.....	1872.....	4.60		5	
36.	Morrison.....	do.....	1872.....	2.50		8	
37.	Moses Goff No. 1.....	do.....	1872.....	3.00		8	
38.	Moses Goff No. 2.....	do.....	1872.....	2.60		8	
39.	Moses Goff No. 3.....	do.....	1872.....	5.60		15	
40.	Garcia No. 1.....	do.....	1872.....	2.60		4	
41.	Van Allen.....	do.....	1872.....	1.20		2	
42.	Houghland Creek.....	Houghland Creek.....	1872.....	.40		5	
43.	Munro No. 1.....	Saguache Creek.....	1872.....	2.50		6	
44.	Slane & Scandrett.....	do.....	1872.....	2.40		6	
45.	Nehls Co.....	do.....	1872, 1875.....	10.92		9	1872, 1.40; 1875, 9.52.
46.	Roberts Co.....	do.....	1872.....	4.80		6	
47.	Hartman Bros. No. 2.....	do.....	1872, 1875, 1877.....	12.80		20	1872, 3.80; 1875, 1.80; 1877, 7.20.
48.	Mill.....	do.....	1872.....	1.00		2	
49.	Seitz, McClure & Ashley.....	do.....	1872, 1882.....	6.00		12	1872, 4.60; 1882, 1.40.
50.	Hawkins.....	do.....	1872.....	4.00		12	
51.	George Ball.....	Saguache Creek.....	1872, 1882.....	6.00		6	1872, 3.00; 1882, 3.00.
52.	Gotthelf-Somora.....	do.....	1872.....	1.50		3	
53.	Jones.....	do.....	1872.....	.38		4	
54.	Munro No. 2.....	do.....	1872.....	2.18		18	
55.	Hartman Bros No. 2.....	do.....	1872, 1874, 1875, 1876, 1877.....	8.00		20	1872, 3.20; 1874, 1.60; 1875, 2.40; 1876, 0.80.
56.	Houghland.....	do.....	1872.....	3.40		30	
57.	Hartman Bros. No. 4.....	do.....	1874, 1875, 1876, 1877, 1878, 1881.....	24.00		35	1874, 8.48; 1875, 1.60; 1876, 1.92; 1877, 2.40; 1878, 6.40; 1881, 3.20.
58.	Ellis & Lamb.....	do.....	1874.....	2.80		6	
59.	Russell.....	do.....	1874.....	5.20		8	
60.	Jaques.....	do.....	1874.....	1.80		6	
61.	Turnbull & Luengen.....	do.....	1874, 1877, 1886.....	10.40		18	1874, 1.80; 1877, 3.60; 1886, 5.00.

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
					(a)		
62.	Hern.....	do.....	1874.....	1.00		2	
63.	Carruthers.....	do.....	1874.....	1.00		2	
64.	Russell No. 2.....	do.....	1874.....	3.00		8	
65.	North Stubbs Ex.No.3	do.....	1874.....	1.04		5	
66.	Hodding No. 2.....	do.....	1874.....	.30		6	
67.	Piquet No. 7.....	Middle Creek.....	1874.....	1.60		6	
68.	Campbell No. 1.....	Saguache Creek.....	1875.....	4.00		20	
69.	Campbell No. 4.....	do.....	1875.....	2.50		5	
70.	Monk No. 1.....	do.....	1875.....	8.40		9	
71.	Campbell No. 6.....	do.....	1875.....	6.10		30	
72.	Hartman Bros. No. 1.	do.....	1875,1881.....	4.80		12	1875,3.20;1881,1.60.
73.	Irwin.....	do.....	1875.....	9.60		30	
74.	Werner "A".....	do.....	1875.....	2.00		25	
75.	Downer No. 1.....	do.....	1875.....	2.80		10	
76.	Piquet No. 6.....	Middle Creek.....	1875.....	1.20		4	
77.	Lenders No. 1.....	Lenders Creek.....	1875.....	1.00		4	
78.	Mears No. 1.....	Saguache Creek.....	1875.....	1.30		3	
79.	Mears No. 2.....	do.....	1875.....	1.50		2	
80.	Garcia No. 2.....	do.....	1875.....	1.40		6	
81.	Hodding No. 5.....	do.....	1875.....	1.50		6	
82.	Piquet No. 1.....	Middle Creek.....	1875.....	1.60		12	
83.	John Shore.....	Saguache Creek.....	1876,1877.....	5.00		20	1875,3.20;1876,1.00; 1877,0.80.
84.	John Slane Arroyo...	do.....	1876.....	2.76		15	
85.	Middle.....	do.....	1876.....	1.60		12	
86.	Piquet No. 3.....	Middle Creek.....	1876.....	.80		2	
87.	North.....	Saguache Creek.....	1876.....	3.20		18	
88.	Ashley & Means.....	do.....	1876.....	3.20		18	
89.	O.Bergfield&Warner No 1.....	do.....	1876.....	1.90		2	
90.	O. Bergfield & Werner No. 2.....	do.....	1876.....	1.90		3	
91.	Gow & Dick.....	do.....	1876.....	1.80		1	
92.	Coleman South.....	do.....	1876.....	2.40		3	
93.	Campbell No. 5.....	Saguache Creek.....	1876.....	1.56		9	
94.	William Stowe.....	do.....	1877,1879.....	6.40		12	1876,1.08;1877,2.12;1879, 3.20.

237

No	Name	Stream	Date of first use	Decree	Possible acreage (a)	Cap.	Remarks
95.	Campbell No. 2.....	do.....	1877, 1879.....	1.90		12	
96.	Shore.....	do.....	1877.....	6.00		14	
97.	Hodgson No. 1.....	do.....	1877.....	1.60		16	
98.	Piquet No. 2.....	Middle Creek.....	1877.....	1.60		5	
99.	Piquet No. 5.....	do.....	1877.....	.80		7	
100.	Piquet No. 4.....	do.....	1877.....	1.00		5	
101.	Jones & Benjamin No. 1..	Saguache Creek.....	1877.....	2.40		3	
102.	John Slane.....	do.....	1877.....	1.40		4	
103.	Schaller No. 1.....	do.....	1877.....	1.00		6	
104.	Schaller No. 2.....	do.....	1877.....	1.00		7	
105.	Jones & Benjamin No. 2..	do.....	1877.....	.50		16	
106.	Sullivan.....	do.....	1877, 1882.....	7.20		9	1877, 4.80; 1882, 2.40.
107.	Piquet No. 10.....	Ford Creek.....	1878.....	1.40		6	
108.	Campbell No. 7.....	Saguache Creek.....	1878.....	4.80		4	
109.	Mears No. 3.....	do.....	1878.....	.40		3	
110.	Fullerton No. 2.....	do.....	1878.....	1.80		4	
111.	Laughlin.....	do.....	1878, 1880.....	1.90		8	1878, 0.90; 1880, 1.00.
112.	Piquet No. 19.....	Ford Creek.....	1879.....	1.00		9	
113.	Downer.....	Saguache Creek.....	1879.....	1.60		2	
114.	Seitz & Benjamin.....	do.....	1879.....	1.20		6	
115.	Lenders No. 2.....	Lenders Creek.....	1879.....	1.20		2	
116.	Chase & Peyton.....	Saguache Creek.....	1879.....	5.60		4	
117.	Farrington No. 1.....	do.....	1879.....	1.40		35	
118.	Piquet No. 14.....	Skelton Creek.....	1880.....	1.00		1	
119.	Piquet No. 13.....	do.....	1880.....	1.30		1	
120.	Piquet No. 16.....	do.....	1880.....	.40		4	
121.	Piquet No. 17.....	do.....	1880.....	1.40		4	
122.	Piquet No. 18.....	do.....	1880.....	.10		3	
123.	Piquet No. 19.....	do.....	1880.....	.70		3	
124.	Piquet No. 20.....	do.....	1880.....	.60		6	
125.	Osgood.....	Saguache Creek.....	1880.....	3.00		12	
126.	McCree.....	do.....	1880.....	2.00		6	
127.	Luengen.....	do.....	1880.....	9.60		21	

No.	Name	Stream	Date of first use	Decree	Possible acreage (a)	Cap.	Remarks
129.	Marshall & Arter.....	do.....	1880,1884.....	3.60		24	1880,2.20;1884,1.40.
129.	Elwes No. 1.....	do.....	1880.....	1.40		6	
130.	Elwest No. 2.....	do.....	1880.....	1.00		4	
131.	Monk No. 3.....	do.....	1881.....	2.50		4	
132.	Russell No. 3.....	do.....	1881.....	.34		6	
133.	Monteith.....	do.....	1881.....	2.80		5	
134.	Hayes-Monteith.....	do.....	1881.....	.80		5	
135.	Redmond-Monteith.....	do.....	1881.....	2.40		7	
136.	Elwes No. 3.....	do.....	1881.....	1.20		6	
137.	Piquet No. 15.....	Skelton Creek....	1882.....	.50		6	
138.	Monk No. 2.....	Saguache Creek...	1882.....	1.50		3	
139.	Jepp.....	Hunts Spring Creek	1882.....	2.40		3	
140.	Piquet No. 22.....	Middle Creek.....	1882.....	.50		6	
141.	Piquet No. 23.....	do.....	1882.....	.10		3	
142.	Hodgson No. 2.....	Saguache Creek...	1882.....	1.20		4	
143.	Holcomb.....	do.....	1883,1885.....	10.00		14	1883,4.80;1885,5.20.
144.	Lawrence No. 2.....	do.....	1883.....	4.40		4	
145.	Lawrence No. 3.....	do.....	1883.....	2.40		6	
146.	Piquet No. 12.....	Ford Creek.....	1883.....	.70		4	
147.	Piquet No. 21.....	Saguache Creek...	1883.....	.70		9	
148.	Piquet No. 8.....	Middle Creek.....	1883.....	.80		3	
149.	Arroyo.....	Saguache Creek...	1883.....	9.20		65	
150.	Piquet No. 11.....	Ford Creek.....	1883.....	.40		2	
151.	Goodwin.....	Saguache Creek...	1883,1884.....	9.00		5	1883,1.60;1884,7.40.
152.	Travis No. 1.....	do.....	1884.....	16.00		16	
153.	Travis No. 2.....	do.....	1884.....	4.00		4	
154.	Travis No. 3.....	do.....	1884.....	5.00		5	
155.	Extension Goodaker.....	do.....	1884.....	1.00		8	
156.	Freise No. 1.....	do.....	1884.....	2.00		3	
157.	David Downer.....	do.....	1884.....	.30		2	
158.	Ford Creek No. 1.....	Ford Creek.....	1884.....	.50		2	
159.	Tuttle Creek No. 2.....	Tuttle Creek.....	1884.....	.30		2	
160.	Baxter Creek No. 3.....	Baxter Creek.....	1884.....	.20		2	
161.	Sheep Creek.....	Sheep Creek.....	1884.....	3.20		4	
162.	Kirkendall & Rambo.....	Saguache Creek...	1885.....	1.60		2	

003

No.	Name	Stream	Date of first use	Decree	Possible acreage (a)	Cap.	Remarks
163.	Harence No. 1.....	Mill Creek.....	1886.....	2.00		3	
164.	Harence No. 2.....	do.....	1886.....	2.00		4	
165.	Harence No. 3.....	do.....	1886.....	2.00		6	
166.	Carter No. 4.....	Saguache Creek.....	1886.....	.80		1	
167.	Bulen No. 1.....	do.....	1886.....	2.40		4	
168.	Bulen No. 2.....	do.....	1886.....	.50		4	
169.	Phillips No. 1.....	do.....	1887.....	2.40		5	
170.	Phillips No. 2.....	do.....	1887.....	.40		6	
171.	Kirkendall No. 2.....	do.....	1887.....	.80		1	
172.	Fry.....	do.....	1887.....	1.00		9	
173.	North Houghland.....	do.....	1887.....	.50		4	
174.	Union.....	Saguache Creek.....	1887.....	.50		12	
175.	Ziegler.....	do.....	1887.....	10.00		45	
176.	Commedore.....	do.....	1887.....	5.60		6	
177.	Joys.....	do.....	1887, 1888.....	1.80		2	1887, 1; 1888, 0.80.
178.	Frieze No. 2.....	do.....	1887.....	1.00		2	
179.	Uddell & Means.....	do.....	1887.....	2.00		14	
180.	Hodding No. 1.....	do.....	1887.....	.70		2	
181.	Miely.....	do.....	1888.....	4.50		6	
182.	Sheck.....	do.....	1888.....	1.20		2	
183.	Connard.....	do.....	1888.....	.40		8	
184.	Farrington No. 2.....	do.....	1888.....	.40		5	
Total.....				561.76		1,509	

(a) These returns defective.

LIST OF DITCHES IN DISTRICT NO. 27 COLORADO

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
1.	La Loma.....	Carnero Creek	1870.....	.26	100	2	
2.	Madre.....	do.....	1870.....	2.21	60	9	
3.	Angostura.....	do.....	1870.....	1.04	60	2.8	
4.	La Isla.....	do.....	1870.....	1.30	40	2.8	
5.	Biedell No. 10.....	La Garita Creek.....	1870.....	1.95	310	13.8	
6.	La Vega.....	Carnero Creek.....	1870.....	.52	60	2.8	
7.	Wilson No. 1.....	Carnero and La Garita Creek.....	1871.....	1.82	160	8	0.52 from Carnero; 1.30 from La Garita.
8.	Wilson No. 2.....	Carnero Creek.....	1871.....	.52	60	2.8	
9.	Wilson No. 3.....	do.....	1871.....	.52	60	5.5	
10.	Biedell No. 2.....	La Garita Creek.....	1871.....	.78	125	13.8	
11.	La Magoties.....	Carnero Creek.....	1871.....	1.82	220	5.8	No return in 1896.
12.	Beaver.....	do.....	1872.....	1.30	70	8	
13.	Biedell No. 5.....	La Garita Creek.....	1872.....	.65	100	11	
14.	Romero.....	do.....	1872.....	.65	120	1.5	No return in 1896.
15.	Biedell No. 1.....	do.....	1872.....	1.04	160	5.5	
16.	Wilson No. 4.....	Carnero Creek.....	1872.....	2.60	300	7	
17.	Green No. 7.....	do.....	1873.....	.65	55	0.8	
18.	Manuel.....	La Garita Creek.....	1873.....	.78	80	0.8	
19.	McLeod No. 1.....	do.....	1873.....	.40	40	1	
20.	McLeod No. 2.....	do.....	1873.....	.40	40	1	
21.	Niggar.....	do.....	1874.....	1.04	110	1.1	
22.	Cerro.....	Carnero Creek.....	1874.....	.39	110	4	
23.	Middle.....	La Garita Creek.....	1874.....	.52	60	1	
24.	Home No. 1.....	do.....	1875.....	1.30	150	2	
25.	Garcia.....	do.....	1875.....	.52	160	1	
26.	Biedell No. 7.....	do.....	1875.....	.78	125	8	
27.	Du Bois.....	do.....	1875.....	1.04	110	2	
28.	Biedell No. 4.....	do.....	1877.....	.78	125	5.5	
29.	Stewart No. 4.....	do.....	1878.....	1.04	100	2	
30.	White No. 1.....	do.....	1878.....	1.30	110	1.3	
31.	McLeod No. 3.....	do.....	1878.....	.65	70	0.7	
32.	Green No. 1.....	Carnero Creek.....	1879.....	1.56	135	4	
33.	Green No. 2.....	do.....	1879.....	.78	65	3.6	
34.	Green No. 6.....	do.....	1879.....	1.04	90	1.4	
35.	Curby No. 1.....	La Garita Creek.....	1879.....	.78	60	1	

202

No.	Name	Stream	Date of first use	Decree	Possible acreage	Cap.	Remarks
36.	Curby No. 2.....	do.....	1879.....	.78	60	1	
37.	Curby No. 3.....	do.....	1879.....	.78	60	1	
38.	Green No. 3.....	Carnero Creek.....	1879.....	.39	35	2.8	
39.	Green No. 4.....	do.....	1879.....	.39	35	0.4	
40.	Green No. 5.....	do.....	1879.....	.78	65	2	
41.	Cassias.....	do.....	1879.....	.65	80	0.6	
42.	Torrivio.....	do.....	1879.....	.65	170	4	
43.	Curby No. 4.....	La Garita Creek.....	1880.....	1.04	90	1.3	
44.	Curby No. 5.....	do.....	1880.....	1.04	90	1.3	
45.	La Gata.....	Carnero Creek.....	1880.....	.52	30	2.8	
46.	McLeod No. 4.....	La Garita Creek.....	1880.....	1.56	165	2.5	
47.	McLeod No. 5.....	do.....	1880.....	1.56	165	2.5	
48.	Biedell Overflow No. 11.....	do.....	1880.....	.....	435	2.8	
49.	Biedell Home.....	do.....	1880.....	2.55	400	4	
Total.....				47.42	5,680	173.3	

LIST OF DITCHES IN DISTRICT NO. 35, COLORADO
 (Arranged geographically down each stream.
 Dates of construction uncertain).

No.	Name	Stream	Date of first use	Decree (a)	Capacity	Remarks
1	Chevallie.....	Trinchera Creek.....	Before 1880.....		2	
2	Private.....	do.....	do.....		1	
3	Redman north.....	do.....	do.....		2	
4	Redman south.....	do.....	do.....		2	
5	Hughes-Wohlstein.....	do.....	1889.....		2	
6	Alamos Altos.....	do.....	1889.....		2	
7	Steward north.....	do.....	Before 1880.....		1.5	
8	Steward south.....	do.....	About 1886.....		1.5	
9	Jerry McCarthy.....	do.....	do.....		2.5	
10	Meadow.....	do.....	1889.....		2	
11	Johnny.....	do.....	1874.....		2	
12	Home.....	do.....	1873.....		2.5	
13	Spring.....	do.....	1884.....		1.5	
14	Cowgill-McCarthy.....	do.....	1873.....		4	
15	Farm.....	do.....	Before 1880.....		3	
16	Canon.....	do.....	do.....		4	
17	Trinchera.....	do.....	1888.....		100	Has never carried over 40 sec.ft
18	Overflow No. 1.....	do.....	1889.....		4	
19	Overflow No. 2.....	Trinchera Creek.....	1889.....		4	
20	Ward.....	Sangre de Cristo.....	Before 1880.....		2	
21	Lamy north.....	do.....	do.....		2	
22	Lamy south.....	do.....	do.....		2	
23	Vigil No. 1.....	do.....	do.....		3	
24	Vigil No. 2.....	do.....	do.....		1.5	
25	Vigil No. 3.....	do.....	do.....		2	
26	Vigil No. 4.....	do.....	do.....		15	over
27	Garland.....	do.....	1888.....		100	Has never carried/50 sec. ft
28	Cottonwood.....	do.....	1889.....		3	
29	John.....	do.....	1889.....		3	
30	Carey.....	do.....	1890.....		2	
31	Mexican No. 1.....	Ute Creek.....	do.....		1	
32	Mexican No. 2.....	do.....	do.....		1	
33	Mexican No. 3.....	do.....	do.....		1	
34	Mexican No. 4.....	do.....	do.....		1	

304

No.	Name	Stream	Date of first use	Decree (a)	Capacity	Remarks
35	Mexican No. 5.....	do.....	do.....		1	
36	Wilkins No. 1.....	do.....	do.....		3	
37	Wilkins No. 2.....	do.....	do.....		3	
38	Wilkins No. 3.....	do.....	do.....		3	
39	Wilkins No. 4.....	do.....	do.....		3	
40	Wilkins No. 5.....	do.....	do.....		3	
41	Wilkins No. 6.....	do.....	do.....		3	
42	Ranch No. 1.....	do.....	do.....		3	
43	Ranch No. 2.....	do.....	do.....		3	
44	Ranch No. 3.....	do.....	do.....		3	
45	Etter.....	do.....	1855.....		4	
46	Thompson.....	do.....	Before 1880....		15	
47	McMillen.....	do.....	1874.....		9	
48	Arroyo.....	do.....	Before 1880....		7	
Total.....					346	

(a) This district has not been adjudicated.

LIST OF DITCHES IN DISTRICT NO.1, NEW MEXICO-SAN ANTONIO

No. of ditches:	No. on: stream:	Name	Stream	When built	Approx. loca- tion of head	Acres irri- gated	Acre-ft. of water used:			Remarks
							1894	1895	1896	
1	1	Private.....	Los Pinos Creek.....	Before 1880	Sec. 32, T. 32 N., R. 7 E.	60	240	240	240	
1	2	do.....	do.....	do.....	Sec. 34, T. 32 N., R. 7 E.	60	240	240	240	
1	3	do.....	do.....	do.....	Sec. 36, T. 32 N., R. 7 E.	60	240	240	240	
1	4	do.....	do.....	do.....	Sec. 6, T. 31 N., R. 8 E.	60	240	240	240	
4	1, 2, 3, 4	Small private.....	San Antonio Creek.....	do.....	Sec. 11, T. 30 N., R. 7 E.	200	800	800	800	
1	5	Upper San Antonio.....	North side San Antonio Creek.....	do.....	do.....	200	800	800	800	
1	6	Lower San Antonio.....	South side San Antonio Creek.....	do	Sec. 7, T. 30 N., R. 8 E.	600	2,400	2,400	1,800	
1	7	Private.....	North side San Antonio Creek.....	do.....	Sec. 4, T. 30 N., R. 8 E.	30	120	120	90	
11		Total.....				1,270	5,080	5,080	4,450	

LIST OF DITCHES IN DISTRICT NO. 2, NEW MEXICO, CHAMA

No. of ditches:	No. on stream:	Name	Stream	When built	Approx. location of head	Acres Irri-: Acre-ft. of water used :				Remarks
						gated	1894	1895	1896	
3	1,2,3	Private.....	Little Chama River.....	1892.....	Sec.31,T.32 N.,R. 3 E.	500	1,500	1,500		No water in 1896.
2	4,5	do.....	do.....	1890.....	Sec.10,T.31 N.,R. 3 E.	150	450	450		Do.
1	1	Botter's.....	Chama River.....	1889.....	Sec.5,T.30 N.,R.4 E.	50	200	200	200	
1	2	Begg's.....	do.....	1889.....	Sec.9,T.30 N.,R.4 E.	30	120	120	120	
3	3,4,5	Riverside.....	do.....	1890.....	Sec.17,T.30 N.,R. 4 E.	140	560	560	560	
1	6	Burns's.....	Canoles Creek.....	1880.....	Sec.17,T.30 N.,R. 4 E.	410	1,280	1,280	820	Small stream.
1	7	Seth's Mill.....	Chama River.....	1878.....	Sec.20,T.30 N.,R.4 E.	610	2,440	2,440	1,830	
1	1	Los Brazos.....	North side Los Brazos.....	1861.....	Sec.23,T.30 N.,R.4 E.	600	2,400	2,400	1,800	
1	2	Ensenada.....	South side Los Brazos.....	1861.....	Sec.23,T.30 N.,R.4 E.	1,500	5,000	6,000	4,500	Acreage has increased from 1,000 acres in 1892.
1	3	Parkview.....	do.....	1861.....	Sec.24,T.30 N.,R.4 E.	2,500	10,000	10,000	7,500	Acreage has increased from 1,900 acres in 1890.
1	8	Spring.....	Springs along Chama River.....	1870.....	Sec.32,T.30 N.,R. 4 E.	250	500	500	500	
1	9	Puente Bottoms.....	West side Chama River.....	1887.....	Sec. 5,T.29 N.,R. 4 E.	300	1,200	1,200	900	
3	10,11,12	Brood's.....	do.....	1891.....	Sec.34,T.28 N.,R. 2 E.	500	1,500	1,500	300	But 150 acre watered in 1896.
1	1	Tierra Amarilla.....	Nutritas Creek.....	1861.....	Sec.17,T.29 N.,R. 5 E.	1,000	3,000	3,000	2,000	
4	2,3,4,5	Private.....	do.....	1870.....	Sec.20and22,T.29N.,R.5 E.	100	300	300	300	
10	1 to 10	Private above Plaza.....	Nutritas Creek.....	1860 to 1865.....	Sec.1,2,3,T.27 N. R.4 E.	400	1,200	1,200	1,000	
13	11 to 23	Private below Plaza.....	do.....	1860-1865.....	Sec.9,16,17,T.27 N.,R.4 E.	640	1,280	1,280	320	Crop a failure in 1896.
2	1,2	Cebolla.....	Cebolla Creek.....	1877.....	Sec.24,T.27 N.,R.4 E.	450	900	900	670	
1	3	Cienega.....	Cienega Creek.....	1877.....	Sec.36,T.27 N.,R.4 E.	250	500	500	380	
8	4 to 11	Private.....	Cebolla Creek.....	1877 to 1879.....	Sec.33,34,35,T.27 N.,R.3 E.	300	600	600	450	
2	12,13	do.....	Cienega Creek.....	1877.....	Sec.31,T.27 N.,R.5 E.	50	150	150	150	Springs.
1	1	West Canjilon.....	Canjilon Creek.....	1870.....	Sec.8,T.26 N.,R. 5 E.	900	1,800	1,800	1,350	
1	2	Middle Canjilon.....	do.....	1870.....	Sec.9,T.26 N.,R.5 E.	1,100	2,200	2,200	1,100	

302

No. of ditches:	No. on stream:	Name	Stream	When built	Approx. location of head.	Acres Irrig- ated	Acre-ft. of water used:			Remarks
							1894	1895	1896	
1	3	East Canjilon.....	Branch of Canjilon Creek.....	1870.....	Sec.17,T.26 N.,R.5 E.	400	800	700	600	
1	4	Lower Canjilon.....	Springs along Canji- lon Creek.....	1875.....	Sec.11,T.25, N.,R4 E.	100	200	200	200	
9	1 to 9	Private.....	El Rito Creek above Mill.....	Before 1860...	Sec.11,T.26 N.,R.6 E.	340	1,360	1,360	1,020	El Rito drainage is always short of water.
2	10,11	Mill.....	El Rito Creek below Mill.....	Before 1860...	Sec.2-11,T.25 N.,R.6 E.	400	1,200	1,000	800	
1	12	Acequia Madre de El Rito.....	El Rito Creek.....	1720.....	Sec.18,T.25 N.,R. 7E.	1,600	3,200	2,700	2,400	
1	13	Lower El Rito.....	do.....	About 1800....	Sec.3,T.24 N.,R. 7 E.	900	1,800	1,600	1,350	
4	14,15,16,17	East El Rito.....	do.....	do.....	Sec.3,T.24 N.,R.7 E.	650	1,300	1,140	970	
2	1,2	Upper Vallecito....	Vallecito Creek.....	Before 1860...	Sec.14,T.27 N.,R.7 E.	400	1,600	1,600	1,600	Caliente drainage always fur- nishes abundant water.
2	3,4	Lower Vallecito.....	do.....	do.....	Sec.2,T.26 N.,R.7 E.	900	3,600	3,600	3,600	
1	5	Trehare Vallecito...	do.....	do.....	Sec.34,T.26 N.,R.8 E.	250	1,000	1,000	1,000	
2	6,7	Algin.....	do.....	do.....	Sec.3,T.25 N.,R.8 E.	160	640	640	640	
1	8	Ancones.....	do.....	do.....	Sec.10,T.25 N.,R.8 E.	480	1,920	1,920	1,920	
1	9	Llanito.....	do.....	do.....	Sec.14,T.25 N.,R.8 E.	200	800	800	800	

LIST OF DITCHES IN DISTRICT NO. 2, NEW MEXICO, CHAMA, continued

No. of ditches	No. on stream	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-ft. of water used			Remarks
							1894	1895	1896	
1	10	West La Cueva.....	Vallecito Creek.....	Before 1860...	Sec. 24, T. 25 N., R. 6 E.	300	1,200	1,200	1,200	
1	11	East La Cueva.....	do.....	do.....	Sec. 24, T. 25 N., R. 6 E.	40	160	160	160	
1	12	Private.....	Ojo Caliente River..	do.....	Sec. 12, T. 24 N., R. 8, E.	60	240	240	240	
1	13	Garilan.....	do.....	do.....	Sec. 13, T. 24 N., R. 8 E.	1,300	5,200	5,200	5,200	
2	14, 15	Senietta.....	do.....	do.....	Sec. 24, T. 26 N., R. 8 E.	100	400	400	400	
2	16, 17	Las Zorras.....	do.....	do.....	Sec. 9, T. 25 N., R. 9 E.	40	160	160	160	
1	1	Las Tuzas.....	Petaca Cracker.....	do.....	Sec. 6, T. 28 N., R. 8 E.	100	400	400	400	
2	2, 3	Las Tablas.....	East Fork Petaca Creek	do.....	Sec. 35, T. 28 N., R. 8 E.	160	640	640	640	
1	4	Private.....	Petaca Creek.....	do.....	Sec. 14, T. 27 N., R. 8 E.	60	240	240	240	
2	5, 6	Plaza Petaca.....	do.....	do.....	Sec. 30, T. 27 N., R. 9 E.	400	1,600	1,600	1,600	
1	1	Capulin.....	Gallinas River.....	do.....	Sec. 23, T. 23 N., R. 1 E.	200	400	300	200	Water supply poor.
1	2	Chavez.....	do.....	do.....	Sec. 14, T. 24 N., R. 1, E.	200	300	200	100	Do.
2	1, 2	Plaza Coyote.....	Rio Puerco.....	do.....	Sec. 18, T. 22 N., R. 3 E.	1,500	3,000	2,250	1,500	Water supply always short.
1	3	Private.....	do.....	do.....	Sec. 12, T. 22 N., R. 5 E.	100	200	150	100	Do.
2	1, 2	Plaza Vallecito.....	Vallecito Creek.....	do.....	Sec. 12, T. 22 N., R. 5 E.	300	600	600	450	Water supply some- times short.
1	13	Private.....	Chama River.....	do.....	Sec. 14, T. 23 N., R. 5 E.	100	400	400	400	
1	14	do.....	do.....	do.....	Sec. 24, T. 24 N., R. 5 E.	80	320	320	320	
1	15	Plaza Colorado.....	do.....	1754.....	Sec. 19, T. 23 N., R. 6 E.	300	1,200	1,200	900	
1	16	Plaza "biquiu.....	do.....	1739.....	Sec. 20, T. 23 N., R. 6 E.	560	2,240	2,240	1,680	
1	17	Loboto, south.....	do.....	1724.....	Sec. 22, T. 23 N., R. 6 E.	430	1,920	1,920	1,440	
1	18	Loboto, north.....	do.....	1754.....	Sec. 22, T. 23 N., R. 6 E.	160	640	640	480	
1	19	Placita de Martinas.....	do.....	Before 1754..	Sec. 19, T. 23 N., R. 7 E.	300	1,200	1,200	900	
1	20	Tierra a Sul.....	do.....	do.....	Sec. 30, T. 23 N., R. 7 E.	120	480	480	360	
1	21	La Vega.....	do.....	do.....	Sec. 32, T. 23 N., R. 7 E.	450	1,800	1,800	1,350	
1	22	Private.....	do.....	do.....	Sec. 33, T. 23 N., R. 7 E.	100	400	400	300	
1	23	La Cuchilla.....	do.....	Before 1800..	Sec. 25, T. 22 N., R. 7 E.	500	2,000	2,000	1,500	
123		Total.....				27,520	86,390	84,620	65,870	

LIST OF DITCHES IN DISTRICT NO. 3, NEW MEXICO-CERRO MESA

No. of ditches:	No. on stream:	Name	Stream	When Built	Approximate location of head	Acres irri- gated	Acre-ft. of water used			Remarks
							1894	1895	1896	
2	1,2	Private.....	Costilla Creek.....	1873.....	T.22N.,R.14 E.	650	2,600	2,600	2,600	
1	3	South Costilla Plaza.....	do.....	1856.....	T.22 N.,R.13 E.	300	1,200	1,200	1,200	
1	1	Cerro.....	Ritos del Lotir, Bu Medio Primero and Joroso.	1852.....	T.30 N.,R.13 E.	2,000	2,000	2,000	1,000	
1	2	Private.....	Rito del Lotir.....	1886.....	T. 30 N.,R.13 E.	450	450	450	230	
1	3	do.....	Rito Joroso.....	1886.....	T.30 N.,R.13 E.	50	50	50	20	
4	4,5,6,7	do.....	Rito Bu Medio.....	1886.....	T.30 N.,R.13 E.	120	120	120	60	
4	8,9,10,11	do.....	Rito Primero.....	1886.....	T.30 N.,R.13 E.	100	100	100	50	
1	1	Llano.....	Cobresto Creek.....	1851.....	Sec. 22, T.29 N.,R.13 E.	2,000	6,000	6,000	6,000	
1	2	Colorado Plaza.....	do.....	about 1842....	Sec.28,T.22 N.,R.13 E.	400	1,600	1,600	1,600	
1	3	Red River.....	Red River and Cobresto Creek.....	do.....	Sec.33,T.22 N.,R.13 E.	800	2,800	2,800	2,800	
1	4	Private.....	Red River.....	1851.....	Sec.23,T.29 N.,R.13 E.	50	200	200	200	
1	5	Lower Red River.....	do.....	1851.....	Sec.22,T.29 N.,R.13 E.	200	800	800	800	
1	1	Cebolla.....	Lerma Canon.....	Before 1860...	Sec.7,T.28 N.,R.13 E.	40	100	80	60	
1	1	South San Cristobal.....	San Cristobal Creek.....	do.....	Sec.30,T.28 N.,R.13 E.	400	1,200	1,200	800	
1	2	North San Cristobal.....	do.....	do.....	Sec.30,T.28 N.,R.13 E.	150	450	450	300	
1	1	Lobo (see Dist. No. 4. for Ditch No.1, from Rio Hondo)	Lobo Creek.....	1884.....	T.27 N.,R.12 E.	200	300	300	200	
1	2	South Plaza.....	Rio Hondo.....	Before 1820...	Sec.27,T.27 N.,R.13 E.	75	300	300	300	
1	3	North Plaza.....	do.....	do.....	Sec.27,T.27 N.,R.13 E.	320	1,280	1,280	1,280	
1	4	Private.....	do.....	do.....	Sec.31,T.27 N.,R.13 E.	75	300	300	300	
1	5	Rio Hondo,north.....	do.....	do.....	Sec.26,T.27 N.,R.13 E.	300	1,200	900	900	
1	6	Rio Hondo,south.....	do.....	do.....	Sec.26,T.27 N.,R.13 E.	600	2,400	1,800	1,800	
28		Total.....				9,280	25,450	24,530	22,500	

DITCHES IN DISTRICT NO. 4, NEW MEXICO-TAOS MESA

No. of ditches:	No. on stream :	Name	Stream	When Built	Approximate location of head	Acres irri- gated :	Acra-ft. of water used:			Remarks
							1894	1895	1896	
1	1	Mesa.....	Rio Hondo.....	1880.....	Sec.27,T.27 N.,R.13 E.	1,500	4,500	4,500	4,500	
1	1	Arroyo Seco.....	Lucero and Seco Creeks....	Before 1880....	Sec.11,T.26 N.,R.13 E.	1,200	2,400	2,400	1,200	
1	2	Las Colemo.....	Seco Creek.....	1886.....	Sec.7,T.26 N.,R.13 E.	500	450	450	150	
1	2	East Lucero.....	Lucero Creek.....	Pueblo (very old)	Sec.15,T.26 N.,R.13 E.	120	240	240	180	
1	3	West Lucero.....	do.....	About 1850....	Sec.16,T.26 N.,R.13 E.	160	320	320	240	
2	4,5	Middle Lucero.....	do.....	Pueblo (very old)	Sec.28,T.26 N.,R.13 E.	240	480	480	360	
1	6	Mexican.....	do.....	About 1850....	Sec.5,T.25 N.,R.13 E.	120	240	240	180	
8	7 to 14	Indian.....	Pueblo Creek, above Pueblo-Pueblo (very old)		Sec. 5, T.25 N., R.13 E.	1,920	1,920	1,920	1,440	
1	15	do.....	Pueblo Creek, below Pueblo-Pueblo		Sec.5,T.25 N.,R.13 E.	120	240	240	180	
1	16	Main.....	Pueblo Creek.....	Before 1850....	Sec. 9, T.25 N., R. 13 E.	720	1,440	1,440	1,080	
10	17 to 26	Private.....	Do.....	Do.....	Sec.2,T.25 N.,R. 12 and 13 E.	3,000	4,500	4,500	3,000	
18	1 to 18	Private, up canon.....	Taos Creek.....	About 1860....	Sec. 9, T.25 N., R. 13 and 14 E.	540	2,160	2,160	2,160	
2	19,20	Fernandez de Taos.....	Do.....	About 1800....	Sec. 22, T. 25 N., R. 13 E.	1,500	4,500	4,500	2,250	
2	21,22	Private.....	Springs in Taos Creek.....	Before 1860....	Sec.18, T.25 N.,R. 13 E.	400	800	800	600	
1	1	La Acequia del Llana....	Ranches de Taos Creek.....	Do.....	Sec.18,T.24 N., R. 13 E.	300	2,400	2,400	1,600	
1	2	La Acequia del Rio Gran- de.....	do.....	Do.....	Sec.18,T.24 N., R. 13 E.	1,800	5,400	5,400	3,600	
1	3	Del Medios del Rios.....	do.....	Do.....	Sec.12, T.24 N.,R.12 E.	200	600	600	400	
1	4	Torres.....	do.....	Do.....	Sec.12, T.24 N.,R.13 E.	200	600	600	400	
1	5	Hart.....	do.....	Do.....	Sec.36,T.25 N., R. 12 E.	300	2,400	2,400	1,600	
4	6,7,8,9	Private.....	do.....	Do.....	Sec.36,T.25 N., R. 12 E.	120	360	360	240	
1	10	North Chiquito.....	Rio Chiquito.....	Do.....	Sec. 7, T. 24 N., R. 13 E.	3,000	9,000	9,000	6,000	
1	11	South Chiquito.....	do.....	Do.....	Sec.7, T. 24 N., R. 13 E.	250	750	750	500	
61		Total.....				18,050	45,700	45,700	32,060	

LIST OF DITCHES IN DISTRICT NO. 5 NEW MEXICO-EMBUDO CREEK

No. of ditches	No. on stream	Name	Stream	When Built	Approximate location of head	Acres irri- gated	Acre-Feet of water used			Remarks
							1894	1895	1896	
1	1	Mora.....	Head of Picuris Creek.....	1880.....	T.22 N., R. 13 E.	960	2,880	2,880	2,880	Diverts wa- er to Pecos drainage.
1	2	Mora Enlargement.....	do.....	1890.....	T.22 N., R. 13 E.	960	2,880	2,880	2,880	Do.
7	3 to 9	Private.....	Canon of Picuris Creek.....	Before 1880.....	T. 22 N., R.12 and 13 E.	140	560	560	560	
1	10	South Rio Pueblo Plaza.....	Picuris Creek.....	Before 1840.....	Sec.8,T.22 N.,R.13 E.	480	1,200	1,200	960	
1	11	North Rio Pueblo Plaza.....	do.....	Do.....	Sec. 6, T.22 N., R.13 E.	240	600	600	480	
1	12	Private.....	South side Picuris Creek.....	Do.....	Sec.1,T.22N.,R.12 E.	240	600	600	480	
1	13	Do.....	North side Picuris Creek.....	Do.....	Sec.1,T.22 N.,R.12 E.	240	600	600	480	
1	14	Picuris Pueblo.....	do.....	Do.....	Sec. 29, T.23, R.12 E.	480	1,200	1,200	960	
1	15	Do.....	South side Picuris Creek.....	Do.....	Sec. 29,T.23 N., R.12 E.	300	750	750	600	
1	1	Chamizal.....	Penasco Creek.....	About 1815.....	Sec.22,T.22 N.,R.12 E.	1,200	3,600	3,600	3,600	Carried over a low divide to a side valley.
1	2	Llano San Juan.....	do.....	Do.....	Sec. 21,T.22 N.,R.12 E.	700	2,100	2,100	2,100	
1	3	Llano de la Tegua.....	do.....	Do.....	Sec.21,T. 22 N., R. 12 E.	350	1,050	1,050	1,050	
1	4	Santa Barbara.....	do.....	Do.....	Sec.9,T.22 N., R. 12 E.	350	1,050	1,050	1,050	
1	5	Penasco Plaza.....	do.....	Do.....	Sec.5, T. 23 N., R. 12 E.	180	540	540	540	
4	6,7,8,9	Private.....	do.....	Do.....	Sec.31-36,T.23 N.,R.12 E.	500	1,500	1,500	1,500	
2	1,2	Las Trampas Plaza.....	Las Trampas Creek.....	Do.....	T. 22 N., R. 12 E.	400	1,200	1,200	800	
1	3	Ojo Zarco.....	do.....	Do.....	T.22 N., R. 11 E.	400	800	800	600	Carried over a divide to Ojo Zarca Valley.
1	1	Upper Embudo.....	Embudo Creek.....	Do.....	Sec. 36, T. 25 N., R.10 E.	210	630	630	630	
1	2	Middle Embudo.....	do.....	Do.....	Sec.35,T.23 N., Ra. 10 E.	140	420	420	420	
1	3	Lower Embudo.....	do.....	Do.....	Sec.34,T. 23 N., R. 10 E.	100	300	300	300	
1	4	North Embudo.....	do.....	Do.....	Sec.35, T. 23 N., R. 10 E.	350	1,050	1,050	1,050	
1	5	La Junta.....	do.....	Do.....	Sec.20,T. 23 N.,R.10 E.	200	600	600	600	
32		Total.....				9,120	26,110	26,110	24,520	

LIST OF DITCHES IN DISTRICT NO. 6, NEW MEXICO-SANTA CRUZ

No. of ditches:	No. on: stream:	Name	Stream	When built	Approximate loca- tion of head	Acres irri- gated	Acre feet of water used:			Remarks
							1884	1885	1886	
1	1	Las Truchas	Las Truchas Creek	Before 1840	T.21 N., R.11 E.	200	600	600	400	
2	1,2	Private	Santa Cruz River	Do	T.20 N., R.9 E.	200	800	800	800	
2	3,4	Chimayo	do	Do	T.20 N., R.9 E.	1,000	3,000	3,000	3,000	
1	1	Bishops	Tusugue Creek	Do	T.18 N., R.10 E.	200	600	600	600	
6	2 to 7	Private	do	Do	T.18 N., R.9 E.	400	800	800	600	
2	8,9	Tusugue Pueblo	do	Do	Pueblo (very old) Sec.18, T.18 N., R.9 E.	300	600	600	450	
2	10,11	Private	do	Do	Old T.19 N., R.9 E.	100	200	200	150	
6	12 to 17	Cuyamaugue	do	Do	T.19 N., R.9 E.	500	1,000	1,000	750	Partially from springs.
3	18,19,20	Private	do	Do	Sec.18, T.19 N., R.9 E.	100	150	150	100	
4	1,2,3,4	Do	Nambe Creek	Do	Sec.18, T.19 N., R.9 E.	100	300	300	300	
1	5	Nambe Pueblo	do	Do	Pueblo (very old) Sec.14, T.19 N., R.9 E.	200	600	600	400	
4	6,7,8,9	Nambe Pueblo Farms	do	Do	Sec.10, T.19 N., R.9 E.	100	300	300	200	
1	10	Main Pojuaque Pueblo	Pojuaque (Nambe) Creek	Do	Sec.10, T.19 N., R.9 E.	600	1,500	1,500	900	
1	11	South Pojuaque Pueblo	do	Do	Sec.9, T.19 N., R.9 E.	360	900	900	540	
1	12	Lower Pojuaque Pueblo	do	Do	Sec.8, T.19 N., R.9 E.	240	600	600	360	
6	13 to 18	Private	do	Do	T.19 N., R.8 E.	1,200	1,800	1,800	900	
43		Total				5,800	13,750	13,750	10,450	

LIST OF DITCHES IN DISTRICT NO. 7, NEW MEXICO-SANTA FE

No. of ditches	No. on stream	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-feet of water used		
							1894	1895	1896
1	1	Private, in canon	Santa Fe Creek	Probably before 1800	T.17N.,R.10E.	100	300	300	300
2	2,3	Do	do	Do	T.17 N.,R. 10 E.	100	250	250	200
2	4,5	Do	do	Do	T.17 N.,R.10 E.	200	320	320	250
1	6	Private, at reservoir	North side Santa Fe Creek	Do	T.17 N.,R.10 E.	100	160	160	125
1	7	Do	South side Santa Fe Creek	Do	Sec.20,T.17 N.,R.10 E.	150	240	240	190
1	8	Do	North side Santa Fe Creek	Do	Sec.20,T.17 N.,R.10 E.	100	160	160	125
1	9	Do	South side Santa Fe Creek	Do	Sec.20,T.17 N.,R.10 E.	100	160	160	125
1	10	Do	North side Santa Fe Creek	Do	Sec.19,T.17 N.,R.10 E.	50	80	80	60
1	11	Acequia Madre	South side Santa Fe Creek	1800	Sec.19,T.17 N.,R.10 E.	900	1,440	1,440	1,025
1	12	Private	North side Santa Fe Creek	Probably before 1800	Sec.19,T.17 N.,R.10	150	240	240	190
1	13	Do	South side Santa Fe Creek	Do	Sec.19,T.17 N.,R. 10 E.	100	160	160	125
2	14,15	Do	North and south sides Santa Fe Creek	Do	Sec.19,T.17 N.,R.10 E.	200	320	320	250
1	16	Do	North side Santa Fe Creek	Do	Sec.24,T.17 N.,R.9 E.	100	160	160	125
1	17	Do	South side Santa Fe Creek	Do	Sec.24,T.17 N.,R.9 E.	150	240	240	190
2	18,19	Do	North side Santa Fe Creek	Do	Sec.24,T.17 N.,R.9 E.	200	320	320	250
1	20	Do	South side Santa Fe Creek	Do	Sec.23,T.17 N.,R.9 E.	150	240	240	190
2	21,22	Do	North Side Santa Fe Creek	Do	Sec.23,T.17 N.,R.9 E.	200	320	320	250
1	23	Upper Agua Fria	South side Santa Fe Creek	Do	Sec.26,T.17 N.,R.9 E.	400	640	640	500

No. 7 - continued

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated			Acre-feet of water used		
						1894	1895	1896	1894	1895	1896
3	24,25,26	Private.....	North side Santa Fe Creek.....	Do.....	Sec.27,T.17 N.,R.9 E.	300	480	480	375		
2	27,28	Do.....	North and south sides Santa Fe Creek.....	do.....	Sec.27,T.17 N.,R.9 E.	100	160	160	125		
1	29	Lower Agua Fria.....	South side Santa Fe Creek.....	Do.....	Sec.32,T.17 N.,R.9 E.	300	480	480	375		
1	30	Private.....	do.....	Do.....	Sec.31,T.17 N.,R.9 E.	50	80	80	60		
1	13	Do.....	do.....	Do.....	Sec.31,T.17 N.,R.9 E.	200	320	320	250		
1	32	Do.....	North side Santa Fe Creek.....	Do.....	Sec.6,T.16 N., R.9 E.	100	160	160	125		
1	33	Cieneguilla.....	Springs along Santa Fe Creek.....	Old.....	Sec.30,T.16 N., R.8 E.	40	80	80	80		
2	34,35	Golandrina.....	Springs along Golandrina Creek.....	Do.....	Sec.33,T.16 N.,R.8 E.	160	320	320	320		
1	36	Private.....	do.....	Do.....	Sec.33,T.16 N.,R.8 E.	100	200	200	200		
1	37	Do.....	do.....	Do.....	Sec.32,T.16 N.,R. 8 E.	150	300	300	300		
1	38	Do.....	Golandrina Creek.....	Do.....	Sec.6,T.15 N.,R.8 E.	50	100	100	100		
1	39	Upper Bonanza.....	Alamo Wash.....	Do.....	Sec.8,T.15 N.,R.8 E.	150	300	300	150		
2	40,41	Middle Bonanza.....	do.....	Do.....	Sec.8,T.15 N., R.8 E.	300	600	600	300		
1	42	Lower Bonanza.....	Springs in Alamo Wash.....	Do.....	Sec.18,T.15 N., R. 8 E.	150	300	300	150		
1	43	Private.....	Santa Fe Creek.....	Do.....	Sec.2,T.15 N.,R. 7 E.	20	60	60	60		
1	44	La Bajada.....	do.....	Do.....	Sec.7,T.15 N.,R. 7 E.	300	900	900	600		
44		Total.....				5,920	10,590	10,590	8,040		

LIST OF DITCHES IN DISTRICT NO. 8, NEW MEXICO-GALISTEO

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-ft of water used			Remarks
							1894	1895	1896	
6	1 to 6	Private.....	Galisteo Creek.....	Old.....	T.15 N., R.10 E.	300	900	900	600	
2	7,8	Colorado Plaza.....	do.....	do.....	Sec.17, T.14 N., R.10 E.	100	200	200	150	
1	9	San Cristobal.....	Arroyo San Cristobal	do.....	Sec.28, T.14 N., R.10 E.	100	150	150	100	
2	10,11	Galisteo Plaza.....	Galisteo Creek.....	do.....	Sec.25, T.14 N., R.9 E.	400	800	800	400	
1	12	Ortiz.....	do.....	do.....	Sec.5, T.13 N., R.9 E.	80	90	90	60	
2	13,14	Cerrillas.....	do.....	do.....	Sec.20, T.14 N., R.2 E.	100	200	200	200	Springs.
1	1	Tijon.....	Tijon Arroyo.....	do.....	T.13 N., R.6 E.	80	180	180	120	Do.
1	1	Placites Plaza.....	Placitos Arroyo.....	do.....	T.13 N., R.6 E.	200	300	300	200	Do.
2	1,2	San Antonito.....	Tijeras Canon.....	do.....	T.11 N., R.6 E.	400	800	800	600	
3	3,4,5	Private.....	do.....	do.....	T.10 N., R.5 E.	200	200	200	200	
2	6,7	San Antonio.....	do.....	do.....	T.10 N., R.5 E.	300	450	450	300	
23		Total.....				2,240	4,350	4,350	2,930	

LIST OF DITCHES IN DISTRICT NO. 9, NEW MEXICO--JEMEZ

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location: of head	Acres irri- gated	Acre-feet of water used		
							1894	1895	1896
1	1	Guadalupe Main.....	West side Guadalupe Creek....	Before 1800.....	Sec. 36, T. 18 N., R. 1 E.	300	3,200	3,200	2,400
3	2,3,4	Private.....	East side Guadalupe Creek....	do.....	T. 17 N., R. 2 E.	520	2,080	2,080	1,560
3	1,2,3	DO.....	Cebolla Creek.....	1884.....	Secs. 3-10, T. 19 N., R. 2 E.	200	800	800	800
2	1,2	Vallecitos de los Indios..	Springs.....	1882.....	Secs. 11-12, T. 18 N., R. 3 E.	100	300	250	200
1	1	Private.....	Jemez River.....	1882.....	Sec. 17, T. 19 N., R. 3 E.	80	320	320	320
1	2	Do.....	Do.....	Before 1874.....	Sec. 12, T. 18 N., R. 2 E.	50	200	200	200
6	3 to 8	Archuleta Valley.....	Do.....	Before 1866.....	Secs. 25-27, T. 18 N., R. 2 E.	640	2,560	2,560	2,560
2	9,10	Private.....	Do.....	Before 1800.....	Sec. 28, T. 17 N., R. 2 E.	100	400	400	400
1	11	Upper Jemez Pueblo.....	West side Jemez River.....	Pueblo-very old.	Sec. 32, T. 17 N., R. 2 E.	1,200	4,800	4,800	3,600
1	12	Do.....	East side Jemez River.....	do.....	Sec. 32, T. 17 N., R. 2 E.	500	2,000	2,000	1,500
1	13	Lower Jemez Pueblo.....	Do.....	do.....	Sec. 17, T. 16 N., R. 2 E.	400	1,600	1,600	1,200
1	1,2	Private.....	Vallecito Viejo.....	Before 1800.....	Sec. 12, T. 16 N., R. 2 E.	300	600	500	450
2	14,15	San Ysedro.....	West side Jemez River.....	do.....	Sec. 20, T. 16 N., R. 2 E.	600	1,500	1,200	900
1	16	Zia Pueblo.....	Do.....	Pueblo-very old.	Sec. 21, T. 15 N., R. 2 E.	300	450	300	150
27		Total.....				5,790	20,810	20,810	16,240

LIST OF DITCHES IN DISTRICT NO. 10, NEW MEXICO-PUERCO

No. of ditches:	No. on: stream:	Name	Stream	When built	Approximate location of head	Acre-ft. of water used:				Remarks
						Acre- gated	1894	1895	1896	
1	1	San Jose	San Jose Creek	1872	Sec. 15, T. 22 N., R. 1 W.	10	20	20	20	
1	1	La Java	La Java Creek	1872	Sec. 6, T. 21 N., R. 1 W.	600	900	900	600	
2	1, 2	Los Pinos	Los Pinos Creek	1872	Sec. 4, T. 21 N., R. 1 W.	150	150	150	100	
2	1, 2	Cuba, east and west	Rio Puerco	1872	Sec. 7, T. 21 N., R. 1 W.	1,000	1,500	1,500	1,000	
2	1, 2	Rito La Leche	Rito la Leche	1872	Sec. 23, T. 21 N., R. 1 W.	250	250	250	200	
5	1 to 5	Copper City	Rito del Nacimiento	1872	Sec. 26, T. 21 N., R. 1 W.	350	700	700	520	
1	3	Private	Rio Puerco	1872	Sec. 32, T. 21 N., R. 1 W.	180	270	270	180	
1	4	Do	do	1872	Sec. 32, T. 21 N., R. 1 W.	350	450	450	350	
1	5	La Ventana	do	1872	Sec. 31, T. 19 N., R. 1 W.	200	200	200	200	
1	6	La Tijeras	do	1872	Sec. 22, T. 17 N., R. 2 W.	600	600	600	600	
2	7, 8	Cabezon	do	1872	Sec. 6, T. 16 N., R. 2 W.	200	200	200	200	
1	9	Private	do	1872	Sec. 12, T. 16 N., R. 2 W.	170	170	170	150	
1	10	Santa Clara	do	1872	Sec. 24, T. 15 N., R. 3 W.	250	250	250	200	
1	11	Acequia de la Glorietta	do	1872	Sec. 25, T. 15 N., R. 3 W.	300	300	300	220	
1	12	Acequia Guadalupe	do	1872	Sec. 25, T. 15 N., R. 3 W.	100	100	100	80	
1	13	Commune de Salazar	do	1872	Sec. 25, T. 15 N., R. 3 W.	500	500	500	380	
1	14	Acequia del Cochino	do	1872	Sec. 35, T. 15 N., R. 3 W.	600	250	450	300	
1	15	Private	do	Old	Sec. 31, T. 7 N., R. 2 W.	150	120	120	70	
2	1, 2	Juan Tafoya Plaza	Springs	Before 1800	T. 13 N., R. 4 W.	200	300	300	300	
1	1	Mokino	East Fork Cebolletta	Do	T. 11 N., R. 5 W.	50	100	100	70	Springs.
2	2, 3	Cebolletta	Middle Fork Cebolletta Creek	Do	T. 11 N., R. 5 W.	250	750	750	750	Do.
3	4, 5, 6	Cebollettita	West Fork Cebolletta Creek	Do	T. 11 N., R. 5 W.	400	600	600	400	
4	1 to 4	Pajuate	Pajuate Creek	Before 1870	T. 11 N., R. 5 W.	600	1,500	1,500	1,200	
2	1, 2	San Mateo	San Mateo Springs	1868	T. 13 N., R. 8 W.	700	1,400	1,400	1,050	
1	1	San Miguel	San Miguel Springs	1868	T. 13 N., R. 8 W.	200	400	400	300	
4	1, 2, 3, 4	Private	Bluewater (San Jose)	1880	T. 12 N., R. 13 W.	150	450	450	450	
3	1, 2, 3	Do	Gallinas Creek	1880	T. 10 N., R. 12 W.	320	960	960	960	
2	1, 2	Do	Tenaja Creek	1880	T. 9 N., R. 12 W.	100	300	300	300	
2	5, 6	Bluewater Land and Irri- gation Co.	Bluewater Creek and Reser- voir	1895	Sec. 8, T. 12 N., R. 11 W.	1,600	600	3,200	900	See note be- low.
1	1	San Rafael	Ojo del Gollo	1870	Sec. 3, T. 10 N., R. 10 W.	600	1,200	1,200	900	

No. 10 - continued.

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irrigated	Acre-ft. of water used			Remarks
							gated	1894	1895	
1	7	Upper Acoma	Rio San Jose (Bluewater)	Pueblo, very old	Sec. 29, T. 10 N., R. 8 W.	250	750	750	500	
2	8, 9	Lower Acoma and Laguna	Rio San Jose	Do	Sec. 30, T. 10 N., R. 7 W.	4,000	10,000	10,000	4,000	
1	1	Rinconada	Rinconada Creek	Before 1860	Sec. 35, T. 11 N., R. 8 W.	300	750	750	600	
1	1	San Jose Viejo	Rito del San Jose	Do	Sec. 4, T. 10 N., R. 7 W.	300	750	750	600	
1	1	Cubero	Canon del Agua	Before 1800	Sec. 1, T. 10 N., R. 7 W.	1,000	1,500	1,500	1,000	
1	1	Ensenada	Ensenada Creek and Springs	Do	T. 10 N., R. 6 W.	300	600	600	450	
1	10	Ranchos Colorado	Rio San Jose	Pueblo, very old	Sec. 2, T. 9 N., R. 5 W.	500	750	750	250	
1	11	El Rito	Do	Before 1800	Sec. 18, T. 9 N., R. 4 W.	600	600	600	300	
62		Total				18,380	31,390	33,990	20,850	

Note: Prior to 1895, 200 acres was watered by an old ditch. Reservoir was built in 1894, and 1,600 acres watered in 1895, 600 in 1896. Company owns 2,000 acres, and 5,000 acres of good land can be watered from their ditches.

LIST OF DITCHES IN DISTRICT NO. 11, NEW MEXICO-SALADO TO BERENDA

No. of ditches:	No. on stream :	Name	Stream	When Built	Approximate location of head	Acres irri- gated :	Acre-ft of water used			Remarks
							1894	1895	1896	
2	1,2	Private.....	Alamocito Creek.....	Before 1880.....	T.2 N., R.6 W.	300	300	300	150	Always poor water supply.
2	3,4	Santa Rita.....	Rio Salado.....	Old.....	Sec.14, T.2 N., R.4 W.	300	300	300	150	Do.
5	1 to 5	Canada de Alamosa.....	Rio Alamosa.....	Before 1884.....	Ts.10 and 11 S., R.6 W.	600	1,200	1,200	900	
2	1,2,3	Private.....	Rio Cuchilla Negra.....	do.....	T.12 S., R.8 W.	200	600	600	400	
1	4	Cuchilla Negra.....	do.....	do.....	Sec.24, T.12 S., R.6 W.	500	450	450	450	
1	1	Los Palomas.....	Springs in Rio Palomas.....	1862.....	T.13 S., R. 6 W.	360	540	540	540	
7	1 to 7	Private.....	Springs in Rio Los Animas.....	1878.....	T.15 S., R. 6 W.	250	500	500	500	
2	1,2	do.....	Springs in Rio Perchas.....	1879.....	Sec.15, T.16 S., R.7 W.	100	100	100	100	
2	1,2	do.....	Springs in Cienega Apocle.....	1870.....	Sec.31, T.18 S., R.6 W.	60	120	120	120	
1	1	do.....	Springs in Berenda Wash.....	1875.....	Sec.12, T.18 S., R.7 W.	80	160	160	160	
26		Total.....				2,550	4,270	4,270	2,470	

LIST OF DITCHES IN DISTRICT NO. 12, NEW MEXICO-ESPANOLA VALLEY

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-feet of water used:			Remarks
							1894	1895	1896	
2	1,2	Creniguilla.....	Springs on Rio Grande.....	About 1815.....	Sec.29,T.24 N.,R.11 E.	100	260	260	260	
1	3	Rinconada.....	East side Rio Grande.....	1815.....	Sec.12,T.23 N.,R.10 E.	180	720	720	720	
1	4	West Rinconada.....	West side Rio Grande.....	About 1815.....	Sec.11,T.23 N.,R.10 E.	100	400	400	400	
1	5	La Bolsa.....	East side Rio Grande.....	Do.....	Sec.21,T.23 N.,R.10 E.	50	200	200	200	
1	6	Canova.....	West side Rio Grande.....	Do.....	Sec.8,T.22 N.,R.9 E.	250	1,000	1,000	1,000	
1	7	Los Chicos.....	East side Rio Grande.....	Old.....	Sec.3,T.22 N.,R.9 E.	250	1,000	1,000	1,000	
1	8	La Joya del Medico.....	do.....	Do.....	Sec.3,T.22 N.,R.9 E.	900	3,600	3,600	3,600	
1	9	Al Bosque.....	West side Rio Grande.....	Do.....	Sec.20,T.22 N.,R.9 E.	280	1,120	1,120	1,120	
2	10,11	Private.....	do.....	Do.....	Sec.30,T.22 N.,R.9 E.	200	800	800	800	
1	12	La Estoca.....	do.....	Do.....	Sec.30,T.22 N.,R.9 E.	280	1,120	1,120	1,120	
1	13	Private.....	East side Rio Grande.....	Do.....	Sec.21,T.22 N.,R.9 E.	200	800	800	800	
1	14	Alcalde.....	do.....	Probably 1800.....	Sec.30,T.22 N.,R.9 E.	1,500	6,000	6,000	6,000	
1	15	San Juan Pueblo.....	do.....	Pueblo,very old.....	Sec.35,T.22 N.,R.8 E.	1,500	6,000	6,000	6,000	
1	16	Chamita.....	West side Rio Grande.....	Old.....	Sec.35,T.22 N.,R.8 E.	240	960	960	960	
1	24	San Jose.....	Chama River.....	Do.....	Sec.32,T.22 N.,R.8 E.	2,000	8,000	8,000	4,000	
1	25	Chamita.....	do.....	Probably 1800.....	Sec.32,T.22 N.,R.8 E.	1,300	3,900	3,900	2,600	
1	26	Salazar.....	do.....	Before 1800.....	Sec.5,T.21 N.,R.8 E.	960	2,880	2,880	1,920	
1	5	Upper, on south side.....	Santa Cruz River.....	Old.....	Sec.8,T.20 N.,R.9 E.	200	600	600	400	Watered 400 acres prior to 1885 (capa- city 8 second ft.)
1	6	Middle, on south side.....	do.....	Do.....	Sec.12,T.20 N.,R.9 E.	300	600	600	450	
1	7	Kitchener, on south side.....	do.....	Do.....	Sec.12,T.20 N.,R.9 E.	300	600	600	450	
1	8	Private, on south side.....	do.....	Do.....	Sec.2,T.20 N.,R.8 E.	100	200	200	150	
1	9	Santa Cruz Plaza North.....	do.....	1809.....	Sec.6,T.20 N.,R.9 E.	1,100	2,200	2,200	1,650	
1	10	Private north.....	do.....	Old.....	Sec.1,T.20 N.,R.8 E.	350	700	700	520	
1	11	Do.....	do.....	Do.....	Sec.2,T.20 N.,R.8 E.	100	200	200	150	
1	17	Hobart.....	East side Rio Grande.....	.....	Sec.22,T.20 N.,R.8 E.	100	200	200	300	Built in 1893, but covers land for- merly watered by Santa Cruz No.5
1	18	Santa Clara.....	West side Rio Grande.....	Pueblo,very old.....	Sec.15,T.20 N.,R.8 E.	200	800	800	800	
2	1,2	Do.....	Santa Clara Creek.....	Do.....	Sec.9,T.20 N.,R.8 E.	300	600	600	300	
1	19	South San Ildefonso.....	Pojuaque Creek.....	Do.....	Sec.9,T.19 N.,R.8 E.	480	480	480	240	
1	20	North San Ildefonso.....	do.....	Do.....	Sec.9,T.19 N.,R.8 E.	240	240	240	120	
32		Total.....				14,060	44,180	44,280	38,040	

LIST OF DITCHES IN DISTRICT NO. 13, NEW MEXICO-UPPER ALBUQUERQUE

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-feet of water used		
							1894	1895	1896
2	19, 20	Cochiti Pueblo.....	East and west side Rio Grande.	Pueblo very old.	Sec. 18, T. 16 N., R. 6 E.	450	1,800	1,800	1,800
1	21	Pena Blanca.....	East side Rio Grande.....	Before 1800.....	Sec. 18, T. 16 N., R. 6 E.	850	3,400	3,400	3,400
1	22	Santo Domingo.....	Do.....	Pueblo very old..	Sec. 36, T. 16 N., R. 6 E.	200	800	800	800
2	23, 24	Santo Domingo, lower.....	Do.....	Do.....	Sec. 23, T. 15 N., R. 5 E.	200	800	800	800
1	25	Sill.....	West side Rio Grande.....	About 1820.....	Sec. 35, T. 16 N., R. 5 E.	200	800	800	600
2	26, 27	San Felipe.....	East and west sides Rio Grande	Pueblo very old..	Sec. 3, T. 14 N., R. 5 E.	500	2,000	2,000	1,500
1	28	Algodones.....	East side Rio Grande.....	Before 1800.....	Sec. 19, T. 14 N., R. 5 E.	250	1,000	1,000	750
1	29	Santa Ana.....	West side Rio Grande.....	Probably about 1810.....	Sec. 25, T. 14 N., R. 4 E.	320	1,320	1,320	990
1	30	Do.....	East side Rio Grande.....	Do.....	Sec. 1, T. 13 N., R. 4 E.	320	1,320	1,320	990
1	31	Bernalillo.....	Do.....	1700.....	Sec. 15, T. 13 N., R. 4 E.	620	2,480	2,480	1,860
1	32	Sandia Pueblo.....	Do.....	Pueblo very old..	Sec. 31, T. 13 N., R. 4 E.	450	1,350	1,800	1,120
1	33	Upper Corrales.....	West side Rio Grande.....	Before 1800.....	Sec. 23, T. 12 N., R. 3 E.	600	1,800	2,400	1,500
1	34	Alameda.....	East side Rio Grande.....	Do.....	Sec. 35, T. 12 N., R. 3 E.	630	1,890	2,520	1,580
1	35	Los Ranchos.....	Do.....	Do.....	Sec. 3, T. 11 N., R. 3 E.	550	1,650	2,200	1,380
1	36	Lower Corrales.....	West side Rio Grande.....	Do.....	Sec. 8, T. 11 N., R. 3 E.	200	600	800	500
1	37	Los Griegos De Candalaria.	East side Rio Grande.....	Do.....	Sec. 18, T. 11 N., R. 3 E.	330	1,590	2,120	1,360
1	38	La Verala.....	Do.....	Do.....	Sec. 30, T. 11 N., R. 3 E.	500	1,500	2,000	1,250
1	39	Duranos.....	Do.....	1706.....	Sec. 36, T. 11 N., R. 2 E.	280	840	1,120	680
1	40	Albuquerque.....	Do.....	Do.....	Sec. 1, T. 10 N., R. 2 E.	400	1,200	1,600	1,000
22		Total.....				8,070	28,140	32,280	23,860

LIST OF DITCHES IN DISTRICT NO. 14, NEW MEXICO-LOWER ALEBUQUERQUE

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri-:Acre-feet of water used :				Remarks
						gated	:1894	: 1895	:1896	
1	41	Ranchos de Atnico.....	West side Rio Grande....	Before 1800.....	Sec.11,T.10 N.,R. 2 E.	140	420	560	280	
1	42	Upper Atnico.....	do.....	Do.....	Sec.12,T.10 N.,R.2 E.	540	1,620	2,160	1,080	
1	43	Middle Atnico.....	do.....	Do.....	Sec.13,T.10 N.,R.2 E.	300	900	1,200	600	
1	44	Lower Atnico.....	do.....	Do.....	do.....	950	2,850	3,800	1,900	
1	45	Acequia de Pajorito.....	do.....	Do.....	Sec.12,T.9 N.,R. 2 E.	980	2,940	3,920	1,960	
1	46	Los Padillas.....	do.....	Do.....	Sec.24,T.9 N.,R. 2 E.	600	1,800	2,400	1,200	
1	47	Isleta Pueblo.....	do.....	Pueblo-very old.....	Sec.12,T.8 N.,R.2 E.	600	1,800	2,400	1,200	
1	48	Chical.....	East side Rio Grande.....	Do.....	Sec.13,T.8 N.,R. 2 E.	320	960	1,280	640	
1	49	Pickory.....	do.....	Do.....	Sec.24,T.8 N.,R.2 E.	420	1,260	1,680	840	
1	50	Romero.....	do.....	Before 1850.....	Do.....	600	1,800	2,400	1,200	
1	51	Peralta.....	do.....	Do.....	Sec.35,T.8 N.,R.2 E.	320	960	1,280	640	
1	52	Valencia.....	do.....	Do.....	Do.....	480	1,380	1,840	920	
1	53	Los Leutes.....	West side Rio Grande.....	Do.....	Do.....	600	1,800	2,400	1,200	
1	54	Los Lunas.....	do.....	Do.....	Sec.19,T.7 N.,R. 2 E.	720	2,160	2,880	1,440	
1	55	Huning's Mill & irriga- tion.....	do.....	1872.....	Sec.25,T.7 N.,R. 2 E.	1,000	3,000	4,000	2,000	
1	56	San Fernandez.....	East side Rio Grande.....	Old.....	Do.....	130	390	510	255	
1	57	Upper Toule.....	Do.....	Do.....	Sec.26,T.7 N.,R.2 E.	150	450	600	300	
1	58	Los Chavez.....	West side Rio Grande.....	Do.....	Sec.33,T.7 N.,R.2 E.	500	1,500	2,000	1,000	
1	59	Lower Toule.....	East side Rio Grande.....	Do.....	Sec.3,T.6 N.,R. 2 E.	600	1,800	2,400	1,200	
1	60	Belen.....	West side Rio Grande.....	Do.....	Sec.4,T.6 N.,R.2 E.	560	1,680	2,240	1,120	
1	61	La Sousal.....	Do.....	Do.....	Sec.9,T.6 N.,R. 2 E.	500	1,500	2,000	1,000	
1	62	La Constantia.....	East side Rio Grande.....	Very old.....	Sec.21,T.6 N.,R. 2 E.	600	1,800	2,400	1,200	
1	63	Acequia de los innocen- tes.....	West side Rio Grande.....	Old.....	Sec.29,T.6 N.,R. 2 E.	600	1,800	2,400	1,200	
1	64	Casa Colorada.....	East side Rio Grande.....	Do.....	Sec.16,T.5 N.,R. 2 E.	600	1,800	2,400	1,200	
1	65	Jaroles.....	West side Rio Grande.....	Do.....	Sec.8,T.5 N.,R. 2 E.	850	2,550	3,400	1,700	
1	66	Del Bosque.....	Do.....	Do.....	Sec.29,T.5 N.,R. 2 E.	600	1,800	2,400	1,200	
1	67	Sabinal.....	Do.....	Do.....	Sec.8,T.4 N.,R. 2 E.	600	1,800	2,400	1,200	
1	68	San Jose No. 1.....	East side Rio Grande.....	Do.....	Do.....	800	2,400	3,200	1,600	
1	69	San Jose No. 2.....	Do.....	1888.....	Sec.20,T.4 N.,R.2 E.	400	1,200	1,600	800	All this land formerly watered by San Jose No 1.
1	70	Las Nutrias.....	Do.....	Old.....	Do.....	500	1,500	2,000	1,000	
1	71	Picocho.....	West side Rio Grande.....	1868.....	Sec.7,T.3 N.,R.2 E.	300	900	1,200	600	
1	72	Los Ranchos.....	East side Rio Grande.....	Old.....	Sec.18,T.3 N.,R.2 E.	400	1,200	1,600	800	
1	73	La Joya.....	Do.....	Do.....	Sec.25,T.3 N.,R.1 E.	600	1,800	2,400	1,200	
33		Total.....				17,840	48,880	62,070	28,940	

LIST OF DITCHES IN DISTRICT NO. 15, NEW MEXICO-SOCORRO

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated	acre-ft. of water used			Remarks
							1894	1895	1896	
1	74	San Geronimo.....	West side Rio Grande.....	Old.....	Sec. 32, T. 2 N., R. 1 E.	90	270	270	220	
1	5	San Acacio.....	do.....	do.....	Sec. 31, T. 1 N., R. 1 W.	650	1,950	1,950	1,580	
1	6	Polvidava.....	do.....	do.....	Sec. 31, T. 1 N., R. 1 W.	500	1,500	1,500	1,250	
1	7	Leutar.....	do.....	do.....	Sec. 18, T. 1 S., R. 1 W.	1,000	3,000	3,000	2,500	
1	8	Socorro.....	do.....	do.....	Sec. 2, T. 2 S., R. 1 W.	600	1,800	1,800	1,200	
1	9	Publicito.....	East side Rio Grande.....	do.....	Sec. 28, T. 2 S., R. 1 E.	150	330	450	300	
1	80	Létiller.....	West side Rio Grande.....	do.....	Sec. 29, T. 2 S., R. 1 E.	600	1,500	1,600	1,200	
1	1	Cuba.....	do.....	do.....	Sec. 8, T. 3 S., R. 1 E.	200	500	600	400	
1	2	San Antonio.....	do.....	Before 1855.....	Sec. 8, T. 4 S., R. 1 E.	450	1,120	1,350	900	
1	3	Bosquecito.....	East side Rio Grande.....	do.....	Sec. 8, T. 4 S., R. 1 E.	300	250	600	400	
1	4	San Pedro.....	do.....	do.....	Sec. 8, T. 4 S., R. 1 E.	400	1,000	1,200	800	
1	5	San Antonio.....	West side Rio Grande.....	1881.....	Sec. 32, T. 4 S., R. 1 E.	150	370	450	300	
1	6	Volverde.....	East side Rio Grande.....	Before 1869.....	Sec. 10, T. 7 N., R. 1 W.	200	500	600	400	
1	7	San Marcial.....	West side Rio Grande.....	do.....	Sec. 17, T. 7 S., R. 1 W.	200	500	600	400	
1	8	La Mesa.....	East side Rio Grande.....	do.....	Sec. 20, T. 7 S., R. 1 W.	200	500	600	400	
1	9	Contidero.....	do.....	1863.....	Sec. 19, T. 7 S., R. 1 W.	200	500	600	400	
16		Total.....				5,790	15,640	17,370	12,650	

LIST OF DITCHES IN DISTRICT NO. 16, NEW MEXICO-RINCON

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate location of head	Acres irri- gated	Acre-feet of water used:			Remarks
							1894	1895	1896	
1	90	Paraje.....	East side Rio Grande.....	1863.....	Sec. 28, T. 8 S., R. 2 W.	300	750	900	600	
1	1	Fort Craig.....	West side Rio Grande.....	1887.....	Sec. 21, T. 8 S., R. 2 W.	50	120	150	100	
1	2	Cautaricio.....	do.....	1869.....	Sec. 6, T. 9 S., R. 3 W.	200	500	600	400	
1	3	San Jose Plaza.....	do.....	Before 1864.....	Sec. 4, T. 10 S., R. 3 W.	300	750	900	600	
1	4	San Albino.....	East side Rio Grande.....	Do.....	Sec. 10, T. 10 S., R. 3 W.	200	500	600	400	
1	5	Mitchell.....	West side Rio Grande.....	1884.....	Sec. 8, T. 11 S., R. 3 W.	250	620	750	200	But 100 acres water- ed in 1896.
2	96, 97	Gonzales.....	East and west sides Rio Grande.....	1884.....	Sec. 5, T. 12 S., R. 3 W.	90	220	270	180	
2	98, 99	Palomitas and Hot Springs.....	West side Rio Grande.....	1870.....	T. 14 S., R. 4 W,	900				Washed out and abandoned in 1884.
1	100	Greenhorn.....	do.....	1895.....	Sec. 6, T. 16 S., R. 4 W.	60		180	120	Failure.
1	1	Sierra.....	do.....	1895.....	Sec. 18, T. 16 S., R. 4 W.	200		600		Do.
1	2	Arroyo Bonito.....	do.....	1895.....	Sec. 35, T. 16 S., R. 5 W.	400		600	800	Good ditch; 200 acres watered in 1895.
1	3	Loma Padre.....	East side Rio Grande.....	1893.....	Sec. 29, T. 17 S., R. 5 W.	3,600	2,500	7,500	7,200	200 acres in 1893; 1,000 in 1894; 2,500 in 1895.
1	4	Colorado Plaza.....	West side Rio Grande.....	1870.....	Sec. 27, T. 18 S., R. 4 W.	4,000	10,000	12,000	6,000	
1	5	East Colorado.....	East side Rio Grande.....	1870.....	Sec. 31, T. 18 S., R. 3 W.	100	250	300	150	Watered 250 acres prior to 1889.
1	6	Private.....	West side Rio Grande.....	1895.....	Sec. 17, T. 19 S., R. 2 W.	100		150	150	Watered 50 acres in 1895.
17		Total.....				9,850	16,210	25,500	16,900	

LIST OF DITCHES IN DISTRICT NO. 17, NEW MEXICO-MESILLA VALLEY

No. of ditches:	No. on stream:	Name	Stream	When built	Approximate Loca- tion of head	Acres irri- gated	Acre-feet of water used:			Remarks
							:1894	:1895	:1896	
1	107	Dona Ana.....	East side Rio Grande.....	1844.....	Sec.24,T.21 S.,R.1 W.	4,600	11,500	11,500	11,500	About 7,000 acres watered prior to 1882; then gradually fell to 4,600 acres in 1888.
1	108	Las Cruces.....	do.....	1849.....	Sec.4,T.22 S.,R.1E.	6,000	13,750	13,750	13,750	Has same head as 108; water divided equally since 1884.
1	109	La Mesilla.....	do.....	1850.....	Sec.4,T.22 S.,R. 1 E.	5,000	13,750	13,750	13,750	4,000 acres watered in 1888.
1	110	Picacho.....	West side Rio Grande.....	1850.....	Sec.4,T.23 S.,R. 1	(2,500)				Increase has been gradual. Abandoned 1880; land now vacant.
1	111	San Miguel.....	do.....	1857.....	Sec.19,T.24 S.,R. 2	1,500	3,750	3,750	3,000	Washed out in 1884 and not used until 1890. Since 1890 takes water from San Miguel. Prior to 1884 served 1,200 acres.
1	112	Santa Tomaz.....	do.....	1857.....	Sec.20, T.24 S.,R.2	500	1,250	1,250	1,000	
1	113	Mesquite.....	East side Rio Grande.....	About 1875.....	Sec.36,T.24 S.,R.2	500	1,250	1,250	1,000	Poor ditch.
1	114	La Mesa.....	West side Rio Grande.....	1857.....	Sec.28,T.24 S.,R.2	1,500	3,750	3,750	3,000	Until 1889 part of San Miguel.
1	115	Chambarino.....	do.....	1864.....	Sec.13,T.25 S.,R.2	3,000	7,250	7,500	4,500	Prior to 1884, 3,000 acres; 1885, to 1888 2,000 acres. Then increase gradual.
1	116	Anthony.....	East side Rio Grande.....	1887.....	Sec.7,T.25 S.,R.3	500	1,250	1,250	750	1,000 acres served in 1888, 1889-90.

No. 17 - continued

No. of ditches:	No. on: stream:	Name	Stream	When built	Approximate loca- tion of head	Acres Irri- gated	Acre-feet of water used			Remarks
							1894	1895	1896	
1	117	Old La Union.....	West side Rio Grande....	1852.....	Sec.8,T.26 S.,R.3	400	1,000	1,000	600	Prior to 1884, 4000 acres watered; since 1884, 800 t 400 in 1890.
1	118	New La Union.....	East side Rio Grande....	1892.....	Sec.8,T.26 S.,R.3	3,600	6,500	9,000	5,400	1892, 600 acres; 189 1,600 acres; 1894 2,600 acres; 1895, 3,600 acres; still increasing.
12	Total.....					27,100	65,000	67,750	58,250	

AREAS WATERED BY DITCHES IN DISTRICT NO. 17, NEW MEXICO-MESILLA VALLEY

o. of: Ditch :	Prior to: 1880 :	1880 :	1881 :	1882 :	1883 :	1884 :	1885 :	1886 :	1887 :	1888 :	1889 :	1890 :	1891 :	1892 :	1893 :	1894 :	1895 :	1896 :
107	7,000	7,000	7,000	7,000	6,800	6,200	5,800	5,400	5,000	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
108	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
109	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,150	4,300	4,450	4,650	4,800	5,000	5,000	5,000
110	2,500																	
111	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
112	1,200	1,200	1,200	1,200	1,200	1,200	1,200					500	500	500	500	500	500	500
113	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
114	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
115	3,000	3,000	3,000	3,000	3,000	3,000	2,000	2,000	2,000	2,000	2,100	2,250	2,450	2,650	2,800	2,900	3,000	3,000
116									500	1,000	1,000	1,000	800	600	500	500	500	500
117	4,000	4,000	4,000	4,000	4,000	4,000	800	800	700	700	600	500	400	400	400	400	400	400
118														600	1,600	2,600	3,600	3,600
Total	31,200	28,700	28,700	28,700	28,300	27,900	22,100	21,700	21,700	21,800	21,950	22,650	22,700	23,500	24,700	26,000	27,100	27,100

RESERVOIRS ALREADY BUILT IN THE RIO GRANDE DRAINAGE

No.	When built	Name	Location	Source of supply	cap.	Remarks
					acre-ft	
1	1894	Saguache.....	T. 44 N., R., 8 E., dist. 28, Colo.	Saguache Creek	1,200	Water supply not sufficient to fill this: probably a failure.
2	1883	Cove Lake.....	7 miles east of Antonito dist. 22, Colo.	Conejos and San Antonio	9,700	Filled through Taos Valley Canal No. 3: only small amount of land can be served by it: none watered up to fall of 1899
3	1893	Santa Fe.....	3 miles east of Santa Fe, dist. 7., N. M.	Santa Fe Creek	400	Used for city supply and for irrigation.
4	1894	Bluewater.....	T. 12 N., R. 12 W., dist. 10, N. M.	Bluewater Creek	<u>20,000</u>	This can be increased to 70,000 acre-ft, but in 1896 there was not water enough in the drainage to fill it to its present capacity.
TOTAL.....					31,300	

RESERVOIRS PROJECTED WITH A FAIR PROSPECT OF CONSTRUCTION

No.	Name	Location	Source of supply	Cap. Acre-ft	Remarks
1.	Santa Maria Lakes.....	T.41N.,R.2 W., dist. 20, Colo.	Rio Grande	20,000	
2.	Mormon.....	5 miles northwest of Antonita, dist. 22, Colo.	Conejos River	20,000	
3.	Western Homestead L.& I. Co.	T.13 N., R.2 W., dist. 10, N. M	Rio Puerco	20,000	
4.	Elephant Butte.....	T. 12 and 13 S., R.2 W., dist. 16, N. Mex.	Rio Grande	<u>235,000</u>	
Total.....				285,000	

RESERVOIR SITES WHICH MAY SOME TIME BE IMPROVED

No.	Name	Location	Source of supply	Cap. Acre-ft	Remarks
1.	La Jara Meadow.....	T. 35 N., R. 6 E. Dist. 21, Colo.	La Jara Creek	20,000	Water would be used in dist., No. 21, Colo.
2.	Elk Creek Meadow.....	T. 33 N., R. 6 E. Dist. 22, Colo.	Elk Creek	8,000	Water would be used in dist., No. 22, Colo.
3.	Pinos Creek Meadow.....	T. 33 N., R. 5 E. Dist. 22, Colo.	Pinos Creek	5,000	Do.
4.	Brazos Lakes.....	T. 29, N., R. 6 E. Dist. 2, N. Mex.	South Fork Brazos Creek	20,000	Water would be used in Tierra Amarilla, N. M. Reservoir could be built to hold 50,000 acre-ft, but it is not likely that the water supply will be over 20,000 acre-ft.
5.	Hot Springs Military Reservation	T. 8, S., R. 7 W. Dist. 11, N. Mex.	Rio Alamosa	20,000	A very good site, but water supply not certain; 400 sq. mi. drainage; no snow. not
6.	Old Fort Craig.....	T. 8, 9, 10, S., R. 2 and 3 W. Dist. 16, N. Mex.	Rio Grande	360,000	It is likely that both this and the Elephant Butte dam would ever be built.
Total.....				433,000	